Attachment 4: Consultation Record

1.0 COMMENT LETTERS

- U.S. Department of Agriculture Forest Service. 2007. Boundary Hydroelectric Project, FERC No. 2144, Comments to Proposed Study Plan. Colville National Forest. January 9, 2007.

- Federal Energy Regulatory Commission. 2007. Staff comments on Boundary Hydroelectric Project Proposed Study Plan. Letter dated January 11, 2007.

- Washington Department of Fish and Wildlife. 2007. Boundary Hydroelectric Project, FERC No. 2144-035, Comments to Proposed Study Plan. January 11, 2007.

- U.S. Fish and Wildlife Service. 2007. Boundary Hydroelectric Project, FERC No. 2144, Comments of Proposed Study Plan (TAILS #14421-2007-FA-0001, File #503.0006).

USDA United States Department of Agriculture | Forest Service | Colville National Forest | Headquarters Office
765 South Main
Colville, WA 99114
509-684-7000
Fax: 509-684-7280

File Code: 2770
Date: January 9, 2007

Ms. Magalie Salas
Secretary
Federal Energy Regulatory Commission
888 First Street NE
Room 1-A
Washington, DC 20426

RE: Boundary Hydroelectric Project, No. 2144-035
Comments to Proposed Study Plan

Dear Ms. Salas:

Enclosed for filing with the Federal Energy Regulatory Commission are the USDA Forest Service Comments to Seattle City Light Proposed Study Plan for Boundary Hydroelectric Project, FERC No. 2144-035.

The USDA Forest Service has been, and will continue, working collaboratively with Seattle City Light in the development of a wide range of relicensing studies to provide the information necessary for the development of a sound Preliminary Licensing Proposal.

If you have any questions related to these Comments please contact Glenn Koehn, Forest Hydropower Coordinator, at (509) 684-7189.

Sincerely,

Craig E. Newman

for RICK BRAZELL
Forest Supervisor

Enclosure

cc: Barbara Greene, SCL, Service List

USDA Forest Service
Comments to Seattle City Light
Proposed Study Plan
For
Boundary Hydroelectric Project, FERC No. 2144-035

January 2007

General Comments

The Proposed Study Plan (PSP) generally does a good job of capturing USDA Forest Service (Forest Service) issues and study requests for the Boundary Hydroelectric Project (Project).

Not all of the documents referenced in the text of the PSP appear in the references section.

The Forest Service has worked with Seattle City Light (SCL) since the fall of 2005 through workshops and resource workgroups to develop proposed studies. Once studies are approved by the Federal Energy Regulatory Commission (FERC), Study Plan Determination, SCL has agreed that the Forest Service will have opportunity to review and provide input to the development of the actual study(s) components. Forest Service participation in the development of study components would include, for example, assisting in the development of questions to be utilized in a recreation use survey. The Forest Service appreciates and looks forward to this continued cooperation.

The Forest Service notes that the summaries of stakeholder consultation, included as various attachments, do not contain all of the consultation to date. Most cover the period from May – July 2006. There was consultation on this Project beginning in earnest in August 2005 with work groups convening in April 2006.

Specific Comments

Section 1 - Introduction

1.3.1 Project Location

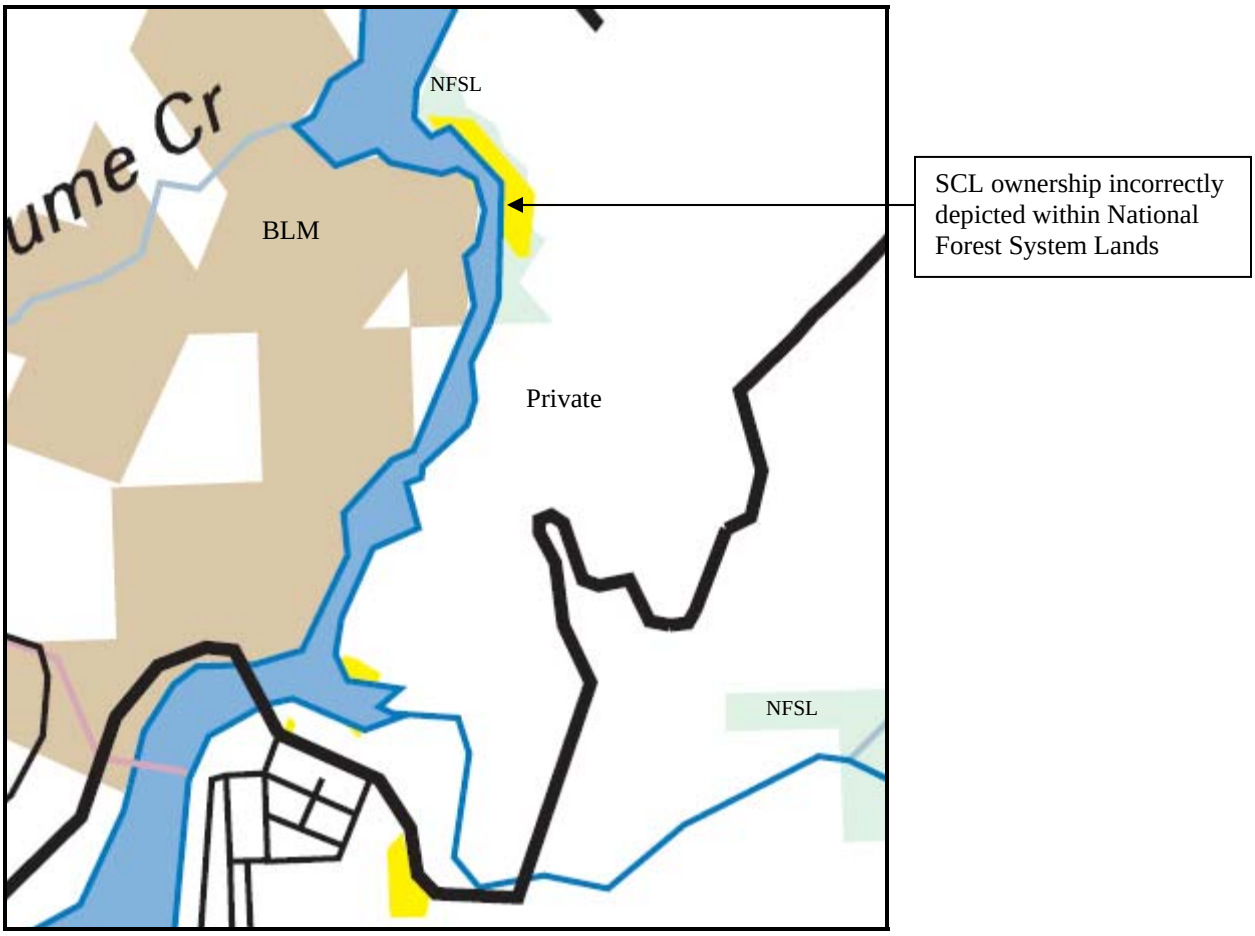
No map or verbal description of Project boundary is provided. This should be relevant as some study plans are specific to location.

1.3.2 Project-Related Facilities, Lands, and Roads

There appear to be discrepancies in land ownership on the map provided as Figure 1.3-2. Some lands identified as Private and SCL along the eastside of the reservoir north of Metaline Falls are National Forest System lands (see figure below).

SCL indicates, in Section 6.2.5 (Page 6-63), that land ownership information will be available by March 31, 2007. The Forest Service will work with SCL at that time to rectify any discrepancies regarding National Forest System lands.

From Figure 1.3-2, Section 15, T. 39 N., R. 43 E., W.M.



Attachment 1-1 Summary List of Proposed Studies

Under the table heading “Identified Resource Issues” the issue statements should be rewritten to reflect either the fuller scope of the issue or to include the effects of the dam operation in the issue statement. For example:

"Effects of the Project on toxic compounds in Boundary Reservoir" should read "Effects of the Project on the accumulation and transport of toxic compounds in Boundary Reservoir."

"Abundance, distribution and periodicity of fish in Boundary Reservoir" should read "Effects of the Project on the Abundance, distribution and periodicity of fish in Boundary Reservoir"

"Aquatic productivity in Boundary Reservoir" should read "Effects of the Project to aquatic productivity in Boundary Reservoir"

Section 2 – Geology and Soils

PSP: 2.1 Erosion Study

The Forest Service agrees with SCL's proposed Erosion Study. The agency appreciates SCL collaborative effort to provide a consensus based study proposal. The following comments are provided to add clarity and/or more specific detail to the study proposal.

2.1.3 Study Goals and Objectives

1st bullet: Consider adding "**dispersed shoreline camping**" to the example identified in the *Project-related recreation (e.g., wave action from boating)*

2.1.4 Need for Study – Summary of Existing Information

Consider adding the following information:

The shoreline can be roughly divided into two main categories.

1. Shorelines dominated by rock outcrops, rocklands, and colluvial slopes. This shoreline is more commonly found north of Metaline, but also occurs in small areas south of Metaline. Often the slopes into the reservoir are steep to very steep. Soils, if they occur are typically shallow and rocky. The trails of past rock slides are apparent.
2. Shorelines dominated by deep fine-textured materials (silt, sand, gravel). This shoreline occurs both above and below Metaline. The slopes into the reservoir are often gentle to moderate. Some beach development is evident in many of these areas, especially at the southern end of the reservoir. Where beach development is occurring, coarser material often collects at or near the waterline, offering some protection from continued erosion. At the north end of the reservoir, beach development is less common, and these slopes are often undercut (as evidenced by hanging roots).

2.1.5 Detailed Description of Study – Study Area

6th bullet: Consider adding "**and other roads identified as necessary for Project purposes**." These could be federal roads used to access wells adjacent to the Project reservoir.

Attachment 2-1 Summary of Stakeholder Comments on Erosion Study Plan

The Forest Service agrees with SCL's documentation of the agency's comments as provided in the consultation record.

Section 3 – Water Resources

SCL states that "SCL anticipates that control strategies for aquatic macrophytes will be tested and implemented following issuance of the new FERC license (to be developed as part of the Aquatic Macrophytes Management Plan submitted as part of the application for 401 water quality certification)." Language, in this section of the PSP, should also indicate when control strategies will be developed in the relicensing process. It is our expectation that an evaluation of control strategies for aquatic macrophytes will occur, as part of the Integrated Resource Analysis, in order to determine the most effective method(s) that are specific to the current operations and environmental conditions within the Project area. The potential control strategies are also expected to be presented as part of the Preliminary Licensing Proposal and/or the License Application. It is presently unclear whether this will happen. The process should be similar to SCL's process regarding strategies controlling TDG levels during relicensing.

PSP 3.1 Analysis of Peak Flood Flow Conditions above Metaline Falls

The Forest Service agrees with SCL's proposed study of Analysis of Flow Conditions. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal.

PSP 3.2 Evaluation of Total Dissolved Gas and Potential Abatement Measures

The Forest Service agrees with SCL's proposed Evaluation of Total Dissolved Gas and Potential Abatement Measures. This study plan is very well organized and provides the needed detail for the issue. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal.

PSP 3.3 Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus

The Forest Service previously requested (Sediment Analysis/Toxic Contamination Study Request) that fish tissue be sampled and analyzed in order to address our issue related to the health of the public that uses the Colville National Forest. The Forest Service believes that this issue can also be adequately addressed through the initial sampling and analysis of the water column and sediments within and adjacent to the Project area for the presence of toxics of concern followed by biotic tissue, including fish tissue, sampling and analysis if thresholds for concentrations of any of these toxics are exceeded in water and/or sediment analysis.

SCL states that "The proposed plan calls for a focused evaluation of existing information to determine whether the bioavailability of toxics of concern is influenced by the Boundary Project, i.e., establish a Project nexus, and to determine a need for a Phase 2 Toxics Assessment that would focus on field data collection." Replace this with the following: "The proposed plan calls for a focused evaluation of existing information to determine whether the bioavailability of toxics of concern is influenced by the Boundary Project, i.e., establish a Project nexus, and to develop a Phase 2 Toxics sampling and analysis plan that would focus on field data collection and analysis."

3.3.1 Nexus between Project Operations and Effects on Resources

This section should include information, contained in the Environmental Protection Agency (EPA) Assessment and Site Investigations of Mines on the Lower Pend Oreille (2002), concerning some of the water samples from the Josephine Mine site which exceeded thresholds/standards for zinc and lead and that some of the sediment samples detected mercury, lead, zinc, silver and cadmium at significant concentrations and/or that exceeded thresholds/standards. It should also be noted, as well, that these samples were taken on lands that we understand are owned by SCL.

3.3.2 Agency Resource Management Goals

Table 3.3-2 does not include Lowest Apparent Effects Threshold (LAET) or Second LAET for PCBs in sediment. There is no discussion as to how the concentrations of this toxic will be measured in sediment samples within Phase 2 of this study.

SCL states "In addition to providing information … to help agencies, with jurisdiction over water quality resources in the Project area…." Replace this with the following: "In addition to providing information … to help agencies, with jurisdiction over aquatic and terrestrial animal populations and habitat (including water quality resources) and responsibilities for health of users of such resources in the Project area…."

Under Table 3.3.2 add the following rows and language:

Mercury			0.8	3.04
PCBs			62	354

The above standards should be used for this plan until draft Freshwater Sediment Quality Criteria are finalized by Washington Department of Ecology for use in the future.

3.3.3 Study Goals and Objectives

None of the objectives address the request from Jean Parodi of Washington Department of Ecology (WDOE) for water column sampling and analysis for toxics in an August 29, 2006 response to FERC's Scoping Document 1 and also requested during the water quality meetings.

This request is not addressed in the Water Quality Constituent and Productivity Monitoring section of the PSP. As well, none of the Objectives contain language that indicates that sampling of sediments within the reservoir and within the fluctuation zone will occur. The current language, "Develop an appropriate sampling plan for toxics of concern (Phase 2 of the overall toxics evaluation) that focuses on conditions specific to Boundary Reservoir," is not adequate. The following are suggested edits of this existing section in the PSP.

Replace “The goals of the Phase 1 Toxics Assessment are to identify any pathways of contamination and/or mechanisms … Specific objectives of the Phase 1 study are listed below.” with the following:

“The goals of the Phase 1 Toxics Assessment are to identify any pathways of contamination and/or mechanisms for changes in bioavailability in Boundary Reservoir for toxics of concern and to evaluate the effect of Project operations on these pathways and/or mechanisms. Developing a more complete assessment of the effect of Project operations on the availability or conveyance of one or more of the toxics of concern will allow for the development of an appropriate toxics sampling plan (e.g., biota, water column, and/or sediments) for Boundary Reservoir (i.e., Phase 2 of toxics evaluations in Boundary Reservoir. Specific objectives of the Phase 1 and Phase 2 study plans are listed below.”

The objectives of Phase 1 should be given a heading of Phase 1. The 6th specific objective of Phase 1, in the PSP, should be eliminated. The following language should be added to elaborate on the objectives of a Phase 2 Sampling and Analysis Plan from SCL:

> Phase 2
>
> Objective 1. Determine the most appropriate form(s) of each toxic of concern for analysis.
>
> Objective 2. Sample and analyze water column and pore water for concentration of toxics of concern. Sampling protocol and method of analysis will be acceptable to all stakeholders. Sampling sites will, at a minimum, include locations in the tailrace of Box Canyon Dam, below every active or inactive mining area adjacent to the reservoir and/or with surface water drainage through the area. Sampling will also include the area immediately below the cement kiln residue along the mouth of Sullivan Creek. Sampling would occur in 2007.
>
> Objective 3. Sample and analyze sediment for concentration of toxics of concern. Sediment size to be sampled shall be 2mm or less in size. If possible, depending upon sampling method used, trend of toxic concentrations should be determined for deep water samples. Sampling protocol and method of analysis will be acceptable to all stakeholders. Sampling sites will include locations above and below the drawdown interval where Project operations affect or have the potential to affect deposition or transport of sediments. Sampling sites would specifically include the areas within the varial zone of the reservoir immediately below the cement kiln residue along the mouth

of Sullivan Creek and below every active or inactive mining area adjacent to the reservoir and/or with surface water drainage through the area to the reservoir. Sampling would occur in 2007.

Objective 4. Existing sampling and analysis of water and sediment sampling within the Project area have found concentrations of several toxics of concern that exceed thresholds/standards in the EPA Preliminary Assessments and Site Investigations Report for the Lower Pend Oreille River Mines and Mills (Ecology and Environment 2002). If the results of the water column and/or sediment sample analysis, in this phase, indicate that applicable thresholds/standards (previously agreed upon by both stakeholders and SCL) are not being exceeded for any of the toxics of concern, bioassays and tissue sampling would not be considered necessary. However, if the results of this analysis indicate that applicable thresholds/standards are exceeded for any of the toxics of concern, bioassays and tissue sampling would commence in either late 2007 or 2008.

Tissue sampling shall include tissue from larger macroinvertebrate(s) such as, but not limited to, crayfish. Tissue of fish species, representative of those found in the reservoir, shall also be sampled and analyzed for concentrations of toxics of concern. Bioassays should include the testing of the most sensitive macroinvertebrates, amphibians and fish that are resident in or adjacent to the Project Area exposed to waters and/or sediments with concentrations of toxic(s) above agreed upon thresholds/standards. Sampling protocol and methods of analysis will be acceptable to all stakeholders.

3.3.4 Study Need

Replace the Need for Additional Information section in the PSP with the following:

The Toxics Inventory and Screening evaluated toxics in the Project area based on water column information, and also reviewed sediment and fish tissue information and potential sources of contamination. Toxics with little or no information, recent exceedances of water quality standards, or potential sources of contamination in the Project area were considered to be of medium concern. The EPA report evaluated toxics in the Project area based on sediment data and the presence of contaminants in waterways. These two assessments identified toxics of concern in the Project area, but neither the screening nor the review of the EPA report identified a nexus between any toxics and specific Project operations. More information is required to assess the potential influence of Project operations on the bioavailability and transport of the six toxics identified for further evaluation.

Completing the Phase 1 Assessment and Phase 2 Sampling will provide the missing information to allow SCL and relicensing participants to assess the Project's potential influence on the bioavailability of the six toxics of concern. It is SCL's intent that the decision regarding the nature and extent of sampling will be made in consultation with relicensing participants and subject to FERC approval and that sampling of the water column and sediments for toxic concentrations will be initiated in the summer of 2007, although some sampling might have to be

conducted in 2008, following completion of the Mainstem Sediment Transport, Hydraulic Routing Model, and Shoreline Erosion studies.

3.3.5 Detailed Description of the Study

Under the Proposed Methodology section the statement is made that "Some of the potential sampling schemes are described below"; however the discussion which follows, in the PSP, does not describe sampling schemes. To correct this situation, replace the 1st paragraph under Proposed Methodology with the following:

"A detailed literature-based assessment of the toxics of concern identified in the Toxics Inventory and Screening and additional toxics assessment, i.e., arsenic, cadmium, lead, mercury, zinc, and PCBs, will be conducted. The purpose of this assessment is to develop an understanding of the nexus between Project operations and the availability and transport of these toxics. The assessment will focus on researching and answering Objectives 1 through 5 described above. The next step will be to develop an appropriate sampling and analysis plan (SAP) as part of Phase 2 described above."

Replace the 3rd paragraph under Proposed Methodology with the following:

"Analysis of concentrations of toxics currently occurring in Boundary Reservoir would require sampling of the possible media where toxics are concentrated. This would include sampling and analyzing the water column, surface sediments, and deep sediments. Sampling and analyzing tissue from aquatic biota (macroinvertebrates and fish) may occur depending upon the results of the water and sediment analysis. Collection of water, sediment and possibly biotic tissue samples will all involve analysis of toxic concentrations by a certified laboratory. Sampling these media will provide information on current concentrations of target toxics in the sampling location. Biota sampling can be conducted for either pelagic and/or benthic organisms to evaluate the transportation and accumulation of toxics in the food web and can provide some information on concentration in the water column and/or surface sediments."

Delete the following from paragraph 6 - "If sediment sampling was identified as the appropriate medium on which to evaluate toxics in the reservoir, on-site verification of results of the Phase 1 sediment deposition analysis may be required as part of the Phase 2 study."

3.3.9 Schedule

Table 3.3-3: The table does not include a target date for Phase 2. Phase 2 Sampling and Analysis Plan should be part of the Toxics Study Plan and estimated target date in 2007 should be presented.

3.3.11 Anticipated Level of Effort and Cost

Replace "Based on a cursory review of study needs, the anticipated cost for this proposed study is $95,000 all of which is required in 2007 for the Phase 1 Toxic Assessment and report

preparation. Only after the Phase 1 Report is completed, will it be possible to assess the extent of a Phase 2 sampling program, from which an estimate of effort and cost would be developed." with the following:

"Based on a cursory review of study needs, the anticipated cost for this proposed study is $95,000, which is required in 2007 for the Phase 1 Toxic Assessment and report preparation and, in 2007-8, **$X** (insert estimate) for Phase 2 water column and sediment sampling and analysis. Only after the water and sediment analysis is completed, will it be known whether biotic tissue sampling and analysis and bioassays are necessary. If this step is considered necessary, it will then be possible to assess the extent of a Phase 2 bioassay and tissue sampling and analysis program, from which an estimate of effort and cost would be developed."

Attachment 3-4 Review of EPA Data for the Lower Pend Oreille Mines and Mills

Table A-3: Surface water sample for Josephine Mine for zinc indicates that it is below LAET which is a threshold for sediment concentrations. It should read above both acute and chronic levels. Pend Oreille Mine sediment sample should be listed as above Second LAET under Comparisons to Guidelines/Threshold. It is presently blank.

Attachment 3-5 Summary of Stakeholder Comments on Draft Water Resources Study Plans

This section does not include the notes from the conference call between Forest Service and SCL concerning the Toxics study plan. Please include these notes.

PSP 3.4 Water Quality Constituent and Productivity Monitoring

The Forest Service agrees with SCL's proposed Water Quality Constituent and Productivity Monitoring. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal. The following comments are provided to add clarity and/or more specific detail to the study proposal.

"Water quality issues in Boundary Reservoir appear to be limited to pH, total dissolved gas (TDG), water temperature, and potentially toxics." A description of the proposed water quality sampling is outlined in this section of the PSP. However, there is no proposal to include the analysis of the concentrations of toxics of concern from these samples. If the Toxics Assessment does not address the request by WDOE for this type of analysis, it needs to be addressed either in this assessment or this water quality section. As well, the sampling stations presented in the PSP should be revisited to ensure the best locations to also sample for toxic concentrations in the water column.

3.4.5 Detailed Description of Study

Data on zooplankton "will be collected in the summer, winter and spring…" It is unclear why sampling should not also be done in the fall for a more complete picture of zooplankton abundance and distribution within the Project area throughout the year.

PSP 3.5 Evaluation of the Relationship of pH and DO to Macrophytes in Boundary Reservoir

The Forest Service agrees with SCL's proposed study of the relationship between pH and DO and macrophytes. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal

Section 4 – Fish and Aquatic Resources

PSP 4.1 Mainstem Aquatic Habitat Modeling Study

The Forest Service agrees with SCL's proposed Mainstem Aquatic Habitat Modeling Study. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal. The following comments are provided to add clarity and/or more specific detail to the study proposal.

4.1.4 Need for Study

Table 4.1-1: The table is labeled Aquatic macrophytes found in aquatic bed cover types. The table contains Oxeye daisy, St. Johnswort, common plantain and American speedwell. These are not considered aquatic macrophytes. The title of the table should be changed or these species taken out of the table. Also, please use the common name, Eurasian watermilfoil, rather than spike watermilfoil in reference to Myriophyllum spicatum. This is the name that is familiar to most readers.

4.1.5 Detailed Description of Study

(Page 4-43) Task 2 Aquatic Plant Field Surveys: The proposal would conduct field surveys of aquatic plant distribution and abundance in macrophyte beds within the varial zone and **may** do the same surveys in Box Canyon Reservoir to represent habitat suitability under run of the river conditions. It seems essential information for how differences in macrophyte distribution and abundance will be demonstrated under different dam operating scenarios that would otherwise have to be modeled. In addition, the surveys within the varial zone should also include some estimation of the extent and, if possible, identification of macrophytes still submerged within the reservoir beyond the lowest water surface level. This information is important to understand the breadth of the infestation, what control measures may be considered in the future and what their limitations, if any, may be.

(Page 4-49) Task 3 Benthic Communities of Soft Substrates: This task proposes two sampling transects for benthic organisms on soft substrate in Boundary Reservoir to describe the effect of the present pool level fluctuation scenario. This task also proposes one sampling transect for benthic organisms in Box Canyon Reservoir to describe the effect of minimum pool level fluctuation scenario. This task needs to include at least one additional transect to cover different substrates in Boundary Reservoir (Canyon/forebay Reach, Upper reservoir reach and Box Canyon tailrace. This would also require two additional transects in Box Canyon Reservoir in order to be able to statistically compare benthic communities under two different operating scenarios in the two reservoirs. One sampling site on 55 miles of Box Canyon Reservoir is insufficient for representation of the benthic community there. Forest Service also thinks there is an opportunity for the analysis for benthic macroinvertebrates during sediment sampling for the concentrations of toxic compounds of concern in Phase 2 of the Toxics study plan. This information would compliment the proposed level of benthic macroinvertebrate sampling. Language to this effect is needed either in the Toxics or the Aquatic Habitat Modeling Study.

PSP 4.2 Sediment Transport and Boundary Reservoir Tributary Delta Habitats

The Forest Service agrees with SCL's proposed study of Sediment Transport and Boundary Reservoir Tributary Delta Habitats. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal. The following comment is provided to add detail to the study proposal.

Table 4.2-1: Pocahontas Creek contains rainbow and cutthroat trout; Sullivan Creek also contains pygmy whitefish.

PSP 4.3 Fish Distribution, Timing and Abundance Study

The Forest Service agrees with SCL's proposed Fish Distribution, Timing and Abundance Study. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal.

PSP 4.4 Large Woody Debris Management Study

The Forest Service agrees with SCL's proposed Large Woody Debris Management Study. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal

PSP 4.5 Productivity Assessment

The Forest Service agrees with SCL's proposed Assessment of Productivity. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal. The following comment is provided to add detail to the study proposal.

4.5.5 Detailed Description of Study

Task 2) Field Sampling proposes collection of field samples of nutrients, phytoplankton and zooplankton in the Box Canyon forebay in both the littoral and deep water regions for all seasons. The purpose is to understand productivity under a different operating scenario than presently used at the Boundary Hydroelectric Project. The Forest Service does not think that there is littoral habitat in or adjacent to the Box Canyon forebay. Also the Productivity Assessment proposes to use data collected from **8** sites in Boundary Reservoir, containing littoral and deep water habitat, during the Water Quality Constituent and Productivity Monitoring study. However, only one sampling site is proposed in Box Canyon Reservoir with no littoral habitat and not representative of habitat throughout either Box Canyon or Boundary reservoirs. The Forest Service thinks that additional sampling sites are needed on Box Canyon Reservoir to adequately represent the effects on different operating scenario on productivity for this study.

PSP 4.6 Fish Entrainment and Habitat Connectivity Study

The Forest Service agrees with SCL's proposed Fish Entrainment and Habitat Connectivity Study. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal.

PSP 4.7 Recreational Fishery Study

The Forest Service agrees with SCL's proposed Recreational Fishery Study. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal.

PSP 4.8 Assessment of Factors Affecting Aquatic Productivity in Tributary Habitats

The Forest Service agrees with SCL's proposed Tributary Habitat Study. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal.

Section 5 – Botanical and Wildlife Resources

PSP 5.1 Waterfowl/Waterbird Study

The Forest Service agrees with SCL's proposed Waterfowl/Waterbird Study and offers the following comments to add clarity and/or more specific detail to the study proposal. The agency appreciates SCL collaborative effort to provide a consensus based study proposal.

5.1.5 Detailed Description of Study – Proposed Methodology

Task 1: Consider expanding the hydrologic period of record from 1987-2004 to 1986-2006.

Task 2: Consider displaying the vegetation data in 5 vertical foot increments.

5.1.6 Work Products

2ond bullet: Consider displaying the summary acreage table in 5 vertical foot increments to keep consistent with the vegetation data in Task 2.

PSP 5.2 Inventory of Riparian Trees and Shrubs

The Forest Service agrees with SCL's study proposal - Inventory of Riparian Trees and Shrubs and offers the following comments to add clarity and/or more specific detail to the study proposal. The agency appreciates SCL collaborative effort to provide a consensus based study proposal.

5.2.3 Study Goals and Objectives

3rd bullet: Consider deleting the last portion of the statement "*…if the Project were operated differently during the growing season*." None of the identified Tasks suggest evaluating different operational scenarios and their effects to riparian trees and shrubs.

5.2.5 Detailed description of Study – Proposed Methodology

Task 2 - Assessment of Potential Direct and/or Indirect Impacts: Consider adding **dispersed recreation** to "*Human activities*"

Task 3: Consider displaying the vegetation data in 5 vertical foot increments to be consistent with other resource studies using the same data collection increment.

5.2.6 Work Products

The 3rd and 7th bullets are inconsistent. Consider deleting the term "*normal*" from the 3rd bullet so the element addresses the "*lowest operating level of the reservoir*," thereby keeping it consistent with the 7th bullet, Task 3 and the study area.

PSP 5.3 Rare, Threatened, and Endangered (RTE) Plant Species Inventory

The Forest Service agrees with SCL's study proposal - Rare, Threatened, and Endangered (RTE) Plant Species Inventory and offers the following comments to specify Forest Service management requirements regarding non-vascular plants, and add clarity and/or more specific detail to the study proposal. The agency appreciates SCL collaborative effort to provide a consensus based study proposal.

5.3.3 Study Goals and Objectives

1st bullet: Consider adding "**Survey for and** *identify the RTE*…" This keeps the goal consistent with Task 2.

5.3.4 Need for Study – Summary of Existing Information

(Page 5-36) Please note that the crested shield-fern reference is incorrect. Colville National Forest (CNF), Forest Botanist found Steller's rock-brake (*Cryptogramma stelleri*) (a Regional Forester Sensitive Species), not crested shield-fern.

Table 5.3-1:

Footnote 2: USFWS does not have a date and is not referenced in Section 5.3.12, nor is the WDFW 2006 referenced in Section 5.3.12.

Footnote 3: Notes as of September 2006 the Regional Forester's Sensitive Species List is not available online. Please use the following site to download the file. **http://www.fs.fed.us/r6/nr-botany/sen_plants.htm**

5.3.5 Detailed Description of Study – Study Area

Last bullet: Consider adding "and other roads identified as necessary for Project purposes." These could be federal roads used to access wells adjacent to the Project reservoir.

5.3.5 Detailed Description of Study – Proposed Methodology

Task 2, paragraph 1: The study states that "*...select nonvascular RTE species **may be** included in the surveys if they have been **documented** on the CNF*…" (Emphasis added) The wording should be nonvascular RTE species "**will be**" included in the survey if they have been **documented or suspected** on the CNF..." Colville National Forest (CNF) Land and Resource Management Plan standards and guidelines directs the Forest Service that no actions that are likely to jeopardize the continued existence of any plant species…..will be authorized, funded or carried out by CNF. To verify whether the Project has any effects on nonvascular plant, surveys will need to be conducted.

Task 2 - Table 5.3-2: Identifies flowering periods and survey months/weeks. Table needs to include non-vascular plants and identify periods for survey – surveys can be conducted throughout the spring, summer, and fall.

Task 3 – Consider adding the following descriptor to the bulleted list for "*Attribute data*…" Relative population location (reservoir fluctuation zone, recreation areas, adjacent to Project facilities, erosion sites, invasive species infestation areas, etc)

Task 4 - 1st bullet references "Ornduff 1967, but it is not included in Section 5.3.12 Literature Cited.

5.3.12 Literature Cited

BLM 2005: the date of the list is March 2005, not January 2000

PSP 5.4 Rare, Threatened, and Endangered (RTE) Wildlife Species Study

The Forest Service agrees with SCL's proposed Rare, Threatened, and Endangered (RTE) Wildlife Species Study and only has one correctional comment. The agency appreciates SCL collaborative effort to provide a consensus based study proposal.

5.4.5 Detailed Description of Study – Proposed Methodology

1st paragraph: Consider updating the number of Tasks from three to four.

PSP 5.5 Big Game Study

The Forest Service agrees with SCL's proposed Big Game Study and offers the following comments to add clarity and/or more specific detail to the study proposal. The agency appreciates SCL collaborative effort to provide a consensus based study proposal.

5.5.2 Agency Resource Management Goals - USDA Forest Service (USFS)

Consider updating the Forest Service management direction as detailed in the agency's Big Game Study request (August 31, 2006).

5.5.5 Detailed Description of Study – Proposed Methodology

Task 5: Consider displaying cover type and acreage data in 5 vertical foot increments to be consistent with other resource studies using the same data collection increment.

5.5.6 Work Products

2nd bullet: Consider using the 5 vertical foot increment.

PSP 5.6 Bat Surveys and Habitat Inventory

The Forest Service agrees with SCL's proposed Bat Surveys and Habitat Inventory Study and only offers one suggestion. The agency appreciates SCL collaborative effort to provide a consensus based study proposal.

5.6.2 Agency Resource Management Goals – USDA Forest Service (USFS)

Consider updating the Forest Service management direction as detailed in the agency's Bat Surveys and Habitat Inventory Study Request (August 31, 2006).

Attachment 5-1: Summary of Stakeholder Comments on Botanical and Wildlife Study Plans

The Forest Service agrees with SCL's documentation of the agency's comments as provided in the consultation record.

Section 6 – Recreation and Land Use

The Forest Service agrees with SCL's proposed Recreation Study. The agency appreciates the approach SCL has taken in an effort to reach a consensus based study proposal. The following comments are provided to clarify where the agency has differences or agrees with the study plan as proposed.

PSP 6.1 Recreation Resource Study

6.1.4 Study Elements

Under the Visitor Counts section (Page 6-17), SCL states that "The focus of visitor counts will be on SCL-managed recreation sites and use areas at the Project, dispersed reservoir shoreline use areas, and the reservoir surface area (i.e., watercraft use). Less intensive visitor counts will be conducted at non-SCL-managed recreation sites in and/or adjacent to the Project." The intent should be to have a consistent level of survey in order to provide a complete and supportive picture of what is occurring.

Under Proposed Methodology (Page 6-42), SCL states that "The Future Recreation Use Analysis will build off data and summary results from the Recreation Surveys study element of the RRS." A list of specific components needed for the analysis includes an "Estimate of existing use in the Project area". The Forest Service is concerned as to whether the surveys will sufficiently capture the complexity of existing use and magnitude of the demand for recreation access to the Project.

Also within the proposed study, visitor access to the Project and impacts from that access seems primarily keyed to recreation activity along the shoreline. The Forest Service concern here can be resolved by clarification of the terminology or procedures to be utilized. A specific discussion on how the study will provide a clear picture of where the public is not only accessing the Project for recreational purposes, but what adjacent lands, SCL or non-SCL, they are utilizing during their visit.

The "Sources of information to be reviewed" (Page 6-16) should include the Colville National Forest Travel Management planning documents, as well as any environmental analysis and mapping that is available, as needed, during the study process (current estimate for completion is December 2007). The current Forest Land Management Plan revision and Travel Management planning efforts have compiled a great deal of public comment through collaborative sessions. This information should be useful especially during questionnaire development.

The Forest Service agrees with SCL's approach in using questionnaires (Page 6-21); however, whether the questionnaires will get at supply and demand concerns and issues related to quality of the recreation experience will be highly dependent on how the questionnaires and focus groups are designed. Forest Service continued involvement in the questionnaire development process is critical to our ability to make a determination as to whether Forest Service requirements will be met.

The list of resources to contact for collection and analysis of regional data (Page 6-32) should also include the following:

- Spokane Parks and Recreation Department
- Boundary Tours

The Forest Service is concerned that the list of contacts "may" only be contacted. While coordination with agencies and private land owners will be critical to providing the most feasible solutions to access problems, surveying the right people is also critical. For instance, Spokane Parks and Recreation, local and regional outfitter guides, and clubs will be more likely to have a good long term vision of what recreation opportunities will benefit the public the most.

The City of Spokane has an active outdoor program through the Spokane Parks and Recreation Department. They have tried to utilize National Forest System lands for this program and should be contacted relative to supply and demand issues. Other sources, not listed include local and regional outfitter guides, interested groups and clubs, which may provide useful input to Focus groups are as follows:

- Selkirk Trail Blazers
- NE Washington Forestry Coalition (Recreation Subcommittee)
- Spokane Mountaineers
- Back Country Horsemen
- Pacific Northwest Trail Association

Under Need for Study Element (Page 6-27), SCL states that "The Project area offers recreational opportunities that are similar to other river corridors and/or reservoirs/lakes in the region." The Forest Service disagrees with this assessment.

As criteria are developed for this study, consider the difference in experience provided by the remote canyon portion of Boundary reservoir versus other river corridors in the region. Within

the Study Area described on page 6-30, and recognizing that the regional boundary may be revised to cover a broader area, there are no river corridors offering similar recreation opportunities.

The canyon portion (60% of reservoir length) of the Boundary Reservoir differs from the southern portion (above the actual falls by the town of Metaline Falls) in that damming of the river actually created recreation opportunities, rather than removing or altering them. Prior to construction of Boundary dam, the portion of the river south of the falls was readily accessed by the public, whereas within the canyon, terrain and rapids were not conducive to recreation. Since construction of Boundary Dam, the public now has boating access to the canyon along a fairly calm waterway. This situation provides a unique opportunity to experience a narrow canyon environment with steep canyon walls and multiple waterfalls in a remote setting, and recreation opportunities need to be researched with that uniqueness in mind.

PSP 6.2 Land and Roads Study

The Forest Service requested this study and generally concurs with SCL's proposed study. The agency appreciates SCL's collaborative effort to provide a consensus based study proposal. Minor points of difference are outlined below.

Forest Service suggests that rather than making two efforts to collect information on roads being used or potentially being used for the Project (PSP, Pg. 6-65) that it is more cost effective to inventory and analyze all potential roads in one effort. The road system is not that expansive and the majority of the road mileage is likely needed to some extent.

6.2.5 Detailed Description of Study

Task 2) FERC Boundary Analysis: There are two types of monuments utilized in the survey of the Project boundary; survey monuments of the Public Land Survey System (PLSS) and monuments for the Project boundary. Both are necessary in the adequate description of the Project and for future project related management activities.

SCL states, "The USFS/BLM requested that the condition of survey monuments be assessed. SCL believes that an in-field assessment of survey monuments is not a FERC requirement…" The Forest Service requested "condition of surveyed lines and monuments" and assumes that their statement means that SCL is not proposing to gather this information. The Forest Service thinks that this information is necessary to determine that the Project boundary is accurately monumented on-the-ground; that property ownership within and immediately adjacent to the Project is readily identifiable on-the-ground; and to clearly distinguish those lands where future management activities may take place.

Task 3) Mining Claims Analysis: SCL states, "The USFS/BLM requested a broader review of mining claims information in the river corridor…" Forest Service did not intend for our study request to be interpreted to include the entire river corridor. The Forest Service thinks that

mining claim information for those claims within and immediately adjacent to the Project boundary is sufficient for the purposes intended.

Task 4) Private Shoreline Development Analysis: SCL states, "The USFS/BLM requested a broader review of private development potential in the river corridor…" Again, Forest Service did not intend for our study request to be interpreted to include the entire river corridor. The Forest Service thinks that information on private shoreline development potential within and immediately adjacent to the Project boundary is sufficient for the purposes intended.

Section 7 – Aesthetic/Visual Resources

The Forest Service agrees with SCL's proposed Aesthetic/Visual Resource Study. The agency appreciates the approach SCL has taken in an effort to reach a consensus based study proposal and address scenic landscape goals and policies of the Colville National Forest planning process.

Section 8 – Cultural Resources

PSP 8.1 Cultural Resource Study

The Forest Service concurs with SCL's PSP for Cultural Resources. The agency appreciates SCL collaborative effort to provide a consensus based study proposal. The following comments are provided to add clarity and/or more specific detail to the study proposal.

1.2.5 Development of Preliminary Licensing Proposal

"The relicensing studies will provide much of the information necessary for determining and characterizing Project impacts and identifying appropriate PME measures in light of those impacts"

The Forest Service cautions that PME measures related to cultural resources cannot be wholly characterized by the Cultural Resources Study Plan. Provisions for appropriate Interpretation and Education (I&E) must be included in PME measures for Cultural Resources as provided for in the National Historic Preservation Act Section 110 and the Archaeological Resources Protection Act (43CFR7.20). During Cultural Workgroup discussions, the Forest Service has acknowledged that SCL could best develop an integrated I&E plan that would include all resource areas of concern (Terrestrial and Aquatic Resources, Recreation, etc.).

8.1.5 Detailed Description of Study

Task 1—Archival Research: "Additional research of known historic-era sites will be conducted prior to the field inventory in order to provide site-specific data to be utilized for field documentation." The Forest Service suggests that the Archival Research take advantage of references in Attachment 8-2 provided by D. Egbers on pages 9 and 10 of the Attachment.

Specifically, references to historic mining and Chinese mining (Ah Bok society) should be carefully studied for their potential to shed light on what is likely to be the primary historic cultural theme within the Project boundary.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON D.C. 20426
January 11, 2007

OFFICE OF ENERGY PROJECTS

Project No. 2144-035-Washington
Boundary Hydroelectric Project
City of Seattle, Washington

Barbara Greene, Relicensing Program Lead
Seattle City Light Department
P.O. Box 34023
Seattle, Washington, 98124-4023

Reference: Staff comments on Boundary Hydroelectric Project Proposed Study Plan

Dear Mrs. Greene:

We have reviewed the Boundary Project proposed study plan filed October 16, 2006[1], and, pursuant to section 5.12 of the Commission's regulations, offer the following comments:[2]

Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus

You propose to use the phase 1 study results to develop the detailed toxic sampling plan that would be conducted as phase 2 of the study. You propose to work collaboratively with the agencies, Tribes, and other licensing participants to review the phase 1 study results and develop the sampling plan. That collaboration effort would consist of issuing a draft phase 1 study report in May 2007, holding a study plan meeting to discuss the phase 1 study results in May 2007, issuing a final phase 1 study report and a draft phase 2 sampling plan in June 2007, holding another study plan meeting to discuss the phase 2 sampling plan in July 2007, and then filing the sampling plan with the

[1] On January 5, 2007, an updated version of the following component of the proposed study plan was distributed electronically: Toxics Assessment—Evaluation of Contaminant Pathways, Potential Project Nexus. Our comments apply to this updated version of the proposed study plan.

[2] We provided verbal comments during the Boundary Project proposed study plan meeting on November 15, 2006. Those comments are not reiterated here.

Commission for approval in July 2007. Upon Commission approval, you would implement the sampling plan during the summer of 2007.

As you are aware, a key principal of the Integrated Licensing Process is a well defined process and schedule for resolving study needs. While the ILP is sufficiently flexible to permit the phased approach, your proposed schedule lacks detail and may not provide adequate time for the parties to comment on the sampling plan, the Commission to consider any disputes over the sampling plan, and for you to commence and complete field sampling in the summer of 2007. If you continue to recommend the phased approach in your revised study plan, we recommend that the schedule outlined in section 1.1.9 propose specific dates for each milestone and that the milestones be expanded to clearly outline the commenting procedures and timeframes for the parties.[3] You also may want to develop and review the phase 2 sampling plan with the participants concurrently with phase 1 study results instead of sequentially. While you may propose that the timeframes and steps be accelerated for this study, the participants should be made aware of the expected timeframes and commenting procedures so that they may comment on the adequacy of your proposed schedule.

If you have any questions, please contact David Turner at (202) 502-6091 or david.turner@ferc.gov.

Sincerely,

Jennifer Hill
Chief
Hydro West Branch 1

cc: Mailing List
Service List

[3] See section 18 CFR 5.15 for the steps anticipated for reviewing and commenting on the initial study report.

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Region 1 Office: 2315 North Discovery Place, Spokane Valley, WA 99216-1566 - (509) 892-1001
HABITAT PROGRAM
Major Projects Division

January 11, 2007

FILED ELECTRONICALLY

Honorable Magalie R. Salas
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

RE: WDFW Comments on Proposed Study Plan for Seattle City Light Boundary Project (FERC No. P-2144).

Dear Ms. Salas:

The Washington Department of Fish and Wildlife (WDFW) submits comments herein for the above-referenced proceeding regarding the Proposed Study Plan (PSP) for Seattle City Light's (SCL) Boundary Hydroelectric Project relicensing. The WDFW has been a regular participant in the Integrated Licensing Process (ILP) and is an agency of the State of Washington with jurisdiction over state fish, shellfish, and wildlife resources, and is charged with the duty of protecting, conserving, managing, and enhancing those resources, RCW 77.04.012.

Due to our early and continued involvement in the ILP and SCL's consideration for our input, many of our concerns and comments have already been addressed in the PSP. Generally, the PSP is comprehensive and thorough in nature and covers the scope of issues brought forth. We submit our comments with the understanding that there will be additional consultation with WDFW when technical consultants finalize study designs, and study details are further developed.

Our comments focus on Section 4, Fish and Aquatic Resources. We have concerns with the Mainstem Aquatic Habitat Modeling Study, specifically, the Habitat Suitability Index (HSI) Studies. According to the PSP, the results of these study efforts will be depth, velocity, substrate, cover, colonization and dewatering habitat suitability indices (HSI) for selected fish species and life stages, macrophytes, and macroinvertebrates. HSI

curves are used to translate physical characteristics under the different operational scenarios to an index of the amount of potential habitat that is suitable for the selected species and life stages. Fundamentally, the mainstem aquatic habitat model should be a spatial and temporal representation of physical characteristics considered biologically important as aquatic habitat in the Boundary Reservoir and the tailrace. The measured and modeled variables will be used to compare the effects of alternative operational scenarios. Alternative operational scenarios could result in changes in the frequency, magnitude and duration of varial zone inundation and dewatering, affecting the abundance and type of aquatic biota present in the varial zone. Therefore, it is important that the methods chosen to develop various HSIs accurately characterize and represent the physical and biological environment throughout the Boundary Project area.

We are particularly interested in the proposed methodology for the development of the macroinvertebrate HSI, beginning on page 4-45. For Task 2, *Benthic Communities on Hard Substrates*, sampling sites will be located along mainstem habitat transects measured for the Physical Aquatic Habitat Model Development study. Each site will be sampled using paired "fixed" and "floating" sampling units, with each set deployed at incremental depths (e.g. every 5 feet). However, only two sampling sites are proposed: a site below Metaline Falls and a site above Metaline Falls. In the 17.5-mile reservoir, there are at least three major reaches with distinct aquatic environments: the forebay, the canyon reach, and the upper reservoir above Metaline Falls. Within these reaches, there are three major substrate categories: soft substrates, hard substrates (e.g. cobble) and vertical-face hard substrates. [Task 3, on page 4-49, discusses soft substrates and comments on this are below.] However, variable substrate and velocity conditions exist that influence benthic communities. To describe the various physical habitat conditions for the model, approximately 20 transects will be used for the upper reservoir, 14 for the canyon reach, and 4 for the forebay reach. As mentioned above, HSI curves will be used to translate physical characteristics of the reservoir under different operational scenarios to an index of the amount of potential habitat that is suitable for the selected species. For the model to adequately represent and characterize response of benthic macroinvertebrates to various operations, additional sampling is necessary for developing these HSIs. The additional sampling for HSI development will improve confidence, statistically.

WDFW has been consistent with expressing concerns regarding operational impacts on the benthic macroinvertebrates (BMIs) as it relates to overall productivity of the reservoir and fish population response. The proposed sampling plan in Task 2 regarding BMIs focuses only on drifting organisms (PSP Attachment 4-1, page 27). According to SCL, the proposed approach requires that fixed sampling units only are subject to colonization by drifting organisms, so that results from the fixed stations are comparable to those from the floating units in all ways except for their exposure to different reservoir surface elevation regimes. It is our view that operational drawdowns would not affect drifting organisms (limnetic) the same as benthic organisms on the substrate, which become dewatered with drawdown. In addition, the fixed stations along the shore will be in contact with the bottom by some device; therefore, colonization of BMIs from the native substrate is probable and would bias the comparison to floating stations. Floating stations

would need to be a considerable distance offshore so that as drawdowns occur (10 to 20+ feet) the rock baskets do not hit bottom: hitting bottom would potentially bias the sample due to additional colonization from bottom substrates. This distance between the floating sampling stations and the shoreline sampling stations may further bias sample comparison because two different areas in the reservoir are being sampled: shoreline substrate versus limnetic or pelagic. Furthermore, the number and types of organisms that may occur in floating stations far offshore may not be comparable to those found on or near the substrate.

WDFW requests that Task 2 be modified (and reflected in Task 4) so that sampling is more representative of benthic organisms in the various substrates and that sampling takes place at additional sites in the reservoir. Specifically, we request that there be six sampling sites: one in the forebay reach on hard substrate or cobble; two in the canyon reach (one on a vertical-face and one hard substrate or cobble), two above Metaline Falls on hard substrate or cobble, and one in the Box Canyon Reservoir on hard substrate or cobble. All the sampling boxes should be attached directly to the bottom to sample colonization of benthic organisms from the substrate. The small rock baskets should be spaced approximately five-feet apart along each transect, although spacing may be optimized based on shoreline gradient and depth at the selected transects. Samples should be collected at five-foot increment depths ranging from full pool to the euphotic depth under maximum expected reservoir drawdown for the sample period. All the floating stations should be eliminated. Rock baskets in the Box Canyon Reservoir and at the lower depths in Boundary Reservoir that are continually inundated would serve as "controls" for comparison to baskets subject to dewatering. We request replicate sampling at each of these sites (i.e. two baskets per depth strata) to improve confidence in the sampling. Sampling sites should be located along mainstem habitat transects measured for the Physical Aquatic Habitat Model Development study. We agree with the schedule in the PSP for sampling in Task 2.

In Task 3 (page 4-49), sampling proposed for benthic communities on soft substrates includes one site in either the Canyon reach or forebay reach, one site in the upper reservoir reach, and one site within the lower Box Canyon Reservoir to describe the effects of a minimum pool level fluctuation scenario. Given the various conditions that exist in the Boundary Reservoir environments (as discussed above), additional sampling is necessary for developing these HSIs.

WDFW requests that Task 3 be modified (page 4-49) to expand sampling with three additional soft substrate sites. In total, we request that sampling occur at one site in the forebay reach; two sites in the canyon reach; two sites in the upper reach above Metaline Falls; and one site in the Box Canyon Reservoir. Samples taken in the Box Canyon Reservoir and those in the Boundary Reservoir below the drawdown zone would serve as the "controls" for samples subject to dewatering. Three to five soft substrate samples should be collected per depth strata on each shoreline as outlined in the PSP. We agree with the schedule in the PSP for sampling in Task 3.

WDFW requests that Task 4 be modified (page 4-49) to reflect our requests for Task 2. The artificial substrates should be deployed on the shoreline, not below a buoy. Colonization studies should be conducted at three locations: one in the forebay reach (hard substrate or cobble), one in the canyon reach (vertical-face substrate), and one in the upper reach above Metaline Falls (hard substrate or cobble). We request replicate sampling at each of these sites (i.e. two baskets per depth strata) to improve confidence in the sampling. We agree with the schedule in the PSP for sampling in Task 4.

All samples collected for Tasks 2-4 should be identified to the lowest taxonomic level practical: identification to Order would be acceptable.

WDFW appreciates the opportunity to review these proposals and provide comment. We look forward to modified study plans as this phase of the process concludes. If you have any questions, you may contact me by email (robisdlr@dfw.wa.gov) or by phone at 509-892-1001 ext. 322.

Best regards,

Doug Robison
Mitigation Coordinator

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Upper Columbia Fish and Wildlife Office
11103 East Montgomery Drive
Spokane, Washington 99206

January 12, 2007

Ms. Magalie R. Salas
Secretary
Federal Energy Regulatory Commission
888 First Ave., N.E.
Washington, DC 20246

Subject: Seattle City Light, Boundary Dam Relicensing (FERC No. 2144), Comments on Proposed Study Plan (TAILS #14421-2007-FA-0001, File #503.0006)

Dear Ms. Salas:

The U.S. Fish and Wildlife Service (Service) is providing the following comments concerning Seattle City Light's (Applicant) October 2006, Proposed Study Plan (PSP) for the Boundary Hydroelectric Project (Project). These comments are provided for consideration by the Federal Energy Regulatory Commission (Commission) in accordance with provisions of the Fish and Wildlife Coordination Act, the Endangered Species Act (ESA), Migratory Bird Treaty Act, Federal Power Act (FPA), and the National Environmental Policy Act (NEPA). The deadline for filing comments with the Commission is January 15, 2007.

GENERAL COMMENTS

We have reviewed the following components of the PSP prepared by the Applicant pertaining to fish and wildlife resources of concern (to the Service): *"Erosion Study; Mainstem Aquatic Habitat Modeling Study; Fish Distribution,Timing, and Abundance Study; Productivity Assessment; Fish Entrainment and Habitat Connectivity Study; Assessment of Factors Affecting Aquatic Productivity in Tributary Habitats; Waterfowl/Waterbird Study; Inventory of Riparian Trees and Shrubs; Rare, Threatened, and Endangered (RTE) Plant Species Inventory; RTE Wildlife Species Study; Big Game Study; and the Recreation Resource Study; and Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus."*

The Service is concerned about ongoing and future operation of the Project, and its impact on fish and wildlife resources in, and adjacent to, the Project area. Fish and wildlife resources that may be affected by the Project include federally listed threatened and endangered species and their habitats, non-listed migratory birds and their habitats, and other flora and fauna.

The Service seeks to obtain the most accurate and up-to-date information related to the ongoing effect of the Project on fish and wildlife resources to determine the need for mitigation pursuant to our authorities under sections 18 and 10(j) of the Federal Power Act. Mitigation may include measures that avoid or minimize adverse effects of the action, and/or compensate for those adverse effects that can not be avoided.

The Service believes that the Applicant's approach to achieve as much consensus as possible among relicensing participants with regard to development of this PSP prior to filing the Preliminary Licensing Proposal (PLP) should improve chances for a positive relicensing outcome.

SPECIFIC COMMENTS

1) Section 2.1.3, Geology and Soils, Study Goals and Objectives (p.2-4, 1st sentence): *"The primary goal of the Erosion Study is to provide the information needed to understand the relationship among several factors that may be contributing to erosion in the Project area and to identify effects of erosion on water quality, aquatic habitat, cultural resources, recreation, wildlife habitat, sensitive plants, noxious weed establishment and spread and scenic resources."* The Service endorses the proposed study concerning the potential contribution of Project operations (e.g., water levels and water level fluctuations) and associated recreation (e.g., wave action from boating). We are concerned that continued erosion will adversely affect riparian plant communities and associated fish and wildlife habitat on the perimeter of the reservoir. The results of the study should provide a reasonable estimate of erosion rates and area and volume of land that could be lost to erosion and slope failure over the term of the new license. The information obtained from this study should be useful in determining the need or extent of mitigation that will be required for the duration of the new license.

2) Section 2.1.3, Geology and Soils, Study Goals and Objectives (p.2-4, 4th bullet): *"Identify resource sites that may be impacted by Project-related erosion and slope failures and determine the feasibility of reducing erosion and slope failure at those sites."* For sites where it is determined that reducing erosion and slope failure is not feasible, the Service would recommend mitigation elsewhere in the project area and may include but would not be limited to increasing the quantity and quality of important wildlife habitats such as riparian areas and wetlands.

3) Section 2.1.5, Geology and Soils, Task 1- Information Review (p.2-9, 6th bullet): Comparing historic (pre-project) aerial photographs with recent aerial and site photographs would provide insight as to the location of natural slides within and above the varial zone of the reservoir. This information will be useful to determine the extent of erosion that has occurred since the Project area was inundated and provide a basis for a more accurate estimate of how much erosion may occur over the lifetime of a new license.

4) Section 4.3.5, Fish Distribution, Timing, and Abundance Study, Detailed Description of Study, Passive and Active Sampling (p.4-101, 3rd bullet): *"All fish sampling and handling techniques describe within this study will be conducted under state and federal biological collection permits and state and federal regulatory agencies will grant permission to conduct the sampling efforts."* If at any time an study related activity is modified where bull trout, a federally listed threatened species may be affected (e.g., gill netting), the Applicant will need to contact the Service to amend the bull trout collection permit. The Service will then review the amendment request, contact the Applicant with any questions or concerns, and reissue a permit, if appropriate.

5) Section 4.5, Fish and Aquatic Resources, Productivity Assessment (p.4-127, 2nd paragraph, last sentence): *"Therefore, it is important to understand the productivity of the Boundary Reservoir reach of the Pend Oreille River and how the productivity may or may not be affected by alternative operational scenarios."* The Service endorses the proposed study and believes that the information obtained should demonstrate if current Project operations provide the most productive aquatic system in the Boundary Reservoir.

6) Section 4.6.3, Fish Entrainment and Habitat Connectivity Study, Study Goals and Objectives (p.4-151, 1st paragraph, last sentence): *"Study results will be used to evaluate the potential benefit and efficacy of fish protection measures and opportunities to establish connectivity between habitat and populations upstream and downstream of Boundary Dam."* The Service endorses the proposed study and believes that the information obtained should provide a better understanding of fish entrainment at Boundary Dam and if appropriate, identify methods to establish safe and efficient migration opportunities for fish.

7) Section 4.8.3, Assessment of Factors Affecting Aquatic Productivity in Tributary Habitats, Study Goals and Objectives (p.4-179, 1st paragraph, last sentence): *"The goal of the study is to compile and evaluate information on Boundary Reservoir tributaries that will provide context for studies of the effects of Boundary Project operations on aquatic resources."* The Service endorses the proposed study and believes that the information obtained may be helpful in identifying any potential Project impacts to migratory fish specifically bull trout, westslope cutthroat trout, and mountain white fish.

8) Section 5.1.3, Waterfowl/Waterbird Study, Study Goals and Objectives (p.5-6, 1st sentence): *"The primary goal of the waterfowl/waterbird study is to provide information on suitable habitat in the Project area for ground-nesting waterfowl and use of this habitat, and to characterize any effects of Project operations on this habitat."* The Service endorses the proposed study and believes that information obtained regarding impacts associated with Project operations (e.g., pool level fluctuation) is needed to identify project impacts to ground nesting waterfowl in the Project area. This would be accomplished by quantifying the area of waterfowl ground nesting habitat that could potentially occur in the reservoir varial zone upstream of Metaline Falls, the amount of suitable nesting habitat impacted by reservoir fluctuations, and the degree of nest failures due to flooding.

9) Section 5.1.5, Waterfowl/Waterbird Study, Detailed Description of Study, Task 3: Waterfowl Nest Searches (p.5-10, 1st paragraph, 2nd last sentence): *"For each nest, the number of eggs will be counted."* The Service recommends counting eggs only if this information is necessary to characterize a Project effect. The revised study plan should provide more detail regarding the need for this information and sampling techniques. Regardless, nest searches must be conducted with minimal disturbance to nesting waterfowl. These efforts will need to be closely coordinated with the Service.

10) Section 5.2.3, Inventory of Riparian Trees and Shrubs, Study Goals and Objectives (p.5-18, 1st sentence): *"The goal of the Riparian Tree and Shrub Survey is to provide information needed to determine the extent, types, and structure of riparian trees and shrub species in the Project vicinity, and assess Project effects on these species."* The Service endorses the proposed survey and believes that the information obtained regarding impacts associated with Project operations (e.g., pool level fluctuation) is needed to quantify project impacts as well as the distribution and extent of riparian tree and shrub habitat that could potentially occupy the fluctuation zone if the Project were operated differently during the growing season.

11) Section 5.3.3, Rare, Threatened and Endangered (RTE) Plant Species Inventory, Study Goals and Objectives (p.5-35): *"The goal of the RTE Plant Species Inventory is to provide information needed to determine the presence of RTE plant species in the Project vicinity, assess Project effects on these species, and direct management decisions related to RTE plant species."* The Service endorses the proposed plant inventory to determine the presence of *"RTE"* plant species. The Project area, particularly within the Applicant-owned Boundary Wildlife Preserve (BWP), includes wetlands which may provide habitat for Ute ladies'-tresses a federally listed threatened plant.

12) Section 5.4, Rare, Threatened and Endangered (RTE) Wildlife Species Study, Table 5-4-1, RTE wildlife species potentially occurring in the Boundary Project vicinity (p.5-57): The Columbia spotted frog is not a Service candidate species for listing under the Endangered Species Act. Therefore, the status for the Columbia spotted frog should be changed to "no federal status."

13) Section 5.4, Rare, Threatened and Endangered (RTE) Wildlife Species Study, Table 5-4-1, RTE wildlife species potentially occurring in the Boundary Project vicinity (p.5-59): The Pacific fisher is not a Service candidate species for federal listing under the Endangered Species Act. Therefore, the status for the Pacific fisher should be changed to "no federal status."

14) Section 5.4.5, Rare, Threatened and Endangered (RTE) Wildlife Species Study, Detailed Description of Study, Task 1: Information Update (p.5-64): Updates for federally listed species can be obtained from the Service's Upper Columbia Fish and Wildlife Office (UCFWO) website at www.fws.gov.easternwashington or through written request to Suzanne Audet of my staff.

15) Section 5.4.5, Rare, Threatened and Endangered (RTE) Wildlife Species Study, Detailed Description of Study, Task 3(b): Seasonal Surveys for Avian RTE Species (p.5-66): *"During the course of the spring and summer surveys, biologists will document the status of the bald eagle nesting territories ……."* The Service recommends that biologists also document preferred forage areas and perch trees used by nesting bald eagles and pertinent information on human development, use, and potential conflict near bald eagle nests and favorite use areas.

16) Section 5.4.6, Rare, Threatened and Endangered (RTE) Wildlife Species Study, Work Products (p.5-67 to 5-68, last bullet): *"The full assessment of potential Project-related impacts, including the effects of the type and timing of Project operations and maintenance and Project-related recreation, will be part of the integrated resource analysis."* The Service recommends that the assessment of Project related recreation impacts include disturbance to wildlife and recommends that a wildlife impact assessment also be conducted for any proposed recreation facility. Recreation activities and facilities have the potential to impact wildlife resources, specifically wetlands, riparian habitat, and bald eagle, waterfowl, and other migratory bird use of the project area. Wildlife conflicts should be avoided or minimized during the planning and construction of new recreation facilities.

17) Section 5.5, Big Game Study (p.5-71, first paragraph, 2nd last sentence): *"The proposed big Game Study will be focused on deer and elk, but will also provide information that can be used to analyze Project effects on other large mammal species."* The Service is also concerned with Project related effects on other large mammal species, specifically gray wolf and grizzly bear, their habitats, including movement corridors.

18) Section 6.1.4, Recreation Resource Study Elements, Dispersed Recreation Use, Access, and Condition Analysis, Study Element Goals and Objectives (p.6-34, 3rd bullet): *"Identify and document/map trail and dispersed site-related ecological impacts (e.g., vegetation damage or removal, wetland impacts, exposed soil and compaction….)."* The Service endorses the proposed study and believes that the information obtained on vegetation damage or removal, wetlands impacts, and wildlife disturbance will be useful to determine Project effect on species such as the bald eagle, waterfowl, and songbirds.

19) Section 6.1.4, Recreation Study Elements, Dispersed Recreation Inventory and Condition Analysis (p.6-36, 8th bullet): *"Proximity to riparian habitat or other sensitive environmental features, such as nests."* The Service recommends that the sentence be changed to read: *"Proximity to riparian habitat or other sensitive environmental features, such as RTE nests."*

The following comments are based on the Service's review of the revised *"Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus,"* dated December 18, 2006, and submitted to the Service via email on December 21, 2006, by Barbara Green, (SCL). The Service supports the changes that appear in this version of the study plan over the version

included in Chapter 3 of the October 2006, PSP, and we are not submitting comments on the earlier version that appears in the PSP.

20) Section 1.1.1, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Nexus between Project Operations and Effects on Resources (p. 2, 1st complete paragraph, 2nd sentence): *"The toxics of concern can be found in a variety of forms or species (please see attached Table A-1, titled "Examples of Toxic Variants and Technical Sampling Considerations.")."* There is no table with this title included in the latest revision of the study plan and therefore we are not able to review its contents at this time. Table A-1 in the previous version of the study plan is titled *"Summary of Assessment Criteria"*.

21) Section 1.1.2, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Agency Resource Management Goals (p. 2): In our September 1, 2006, comments on the PSP, we requested that the Service be included as an agency with ongoing management activities on the Pend Oreille River. The requested language was not included in the latest (December 18, 2006) version of the study proposal. Therefore, we are resubmitting our original comment and request that the following text regarding agency resource management goals be included in Section 1.1.2: *"The Service is responsible for federally listed species, including threatened bull trout (Salvelinus confluentus), migratory birds, and supporting habitats. A short reach of Sullivan Creek commencing at it's confluence with the Pend Oreille River has been designated as critical habitat for bull trout. The draft Bull Trout Recovery Plan identifies as a recovery objective, "restore and maintain suitable habitat conditions for all bull trout life history stages and strategies," and identifies investigation and improvement of water quality as a specific action to address this objective."*

22) Section 1.1.2, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Agency Resource Management Goals, Table 3.3-1 (p. 3): Washington State surface water quality standards for cadmium (Cd) are listed as 3.7 µg/L (acute) and 1.03 µg/L (chronic), which are less stringent than the federal ambient water quality criteria (AWQC) of 1.62 µg/L (acute) and 0.21 µg/L (chronic). The federal standards were revised (to the above values) in 2001 based on studies that demonstrated adverse effects to bull trout at the previous AWQC for Cd (Hansen et al. 2002). When considering Applicable, Relevant and Appropriate Requirements (ARARs) for sites where toxics are present, Washington State acknowledges that the more stringent federal Cd criteria are appropriate. Because federally listed threatened bull trout are present in the Project area, and because of their specific sensitivity to Cd, we recommend using the federal Cd criteria in this table (with an appropriate footnote) instead of Washington State water quality standards.

23) Section 1.1.2, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Agency Resource Management Goals, Table 3.3-2 (p. 4): Lowest Apparent Effects Thresholds and Second Lowest Apparent Effects Thresholds are also available for mercury and PCBs, and should be added to this table. In addition,

Washington Department of Ecology has draft freshwater sediment quality criteria. It is our understanding that these criteria, once promulgated, will supersede the freshwater Sediment Quality Values. These draft criteria are already being used as draft ARARs for clean up of contaminated sites in Washington State, with the understanding that they will be finalized in the near future. We recommend that the Applicant consider these draft criteria for use in the toxics evaluation process and incorporate them in the table.

24) Section 1.1.3, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Study Goals and Objectives, Phase 1, *Objective 3*, vi (p.7): *"Document the level of cadmium that begins to disrupt primary production."* Please add the phrase *"and that causes adverse impacts to bull trout"* to this sentence.

25) Section 1.1.3, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Study Goals and Objectives, Phase 1 *Objective 3* (p.7): Please add the following sentence to the end of this objective and number it as vii): *"Document the effects of changing water hardness on the toxicity of arsenic, Cd, lead and zinc to aquatic organisms."*

26) Section 1.1.3, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Study Goals and Objectives, Phase 2 (p. 8): It is possible (and advisable) for the Applicant to develop a draft scope for the Phase 2 sampling plan as soon as possible, and still leave study plan specifics (such as final sampling locations, analysis methods, etc.) dependent on the results of ongoing studies. The draft study plan should identify the likely progression of field sampling activities (e.g., water column and sediment sampling and analysis, dependent on Phase 1 results, followed by potential biotic sampling and bioassays, dependent on the results of water and sediment data). The study plan should also identify "triggers" that would indicate the need to perform additional tasks: For example, if sediment data indicated that metals toxic effects thresholds for benthic macroinvertebrates were exceeded then bioassays would be conducted to determine if metals in Boundary Reservoir sediments were causing toxicity to benthic macroinvertebrates. It is important that all stakeholders are involved in determining appropriate triggers to incorporate in the study plan, as well as the appropriate effects thresholds, sampling and analysis methods and sampling locations when data are available to do so. We recommend that scoping of this study plan begin in January 2007, as soon as the Applicant's technical consultants are available, so that stakeholders have the opportunity to support the study plan within an appropriate timeframe in the FERC relicensing process.

27) Section 1.1.3, Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus, Study Goals and Objectives, Phase 2, Objective 1 (p. 8): As in the above comment (No. 20) regarding Table A-1, we did not find a table titled *"Examples of Toxic Variants and Technical Sampling Considerations"* and are therefore not able to evaluate this information at this time.

Thank you for the opportunity to provide comments on the PSP. The Service anticipates

reviewing and providing additional comments on the Applicant's Revised Study Plan pursuant to 18 CFR Part 5.13. We look forward to providing input in the areas of study interpretation and Project impacts analysis as well as the development of PME proposals to be included in the PLP. If you have any questions, please contact Dan Trochta of my staff at 509-893-8021.

Sincerely,

Richard J Torquemada
For/Supervisor

cc: FWS-R1, Habitat Conservation, Portland (Estyn Mead)
FWS-R9, Advanced Planning and Habitat Conservation, Arlington (Stephanie Nash)
USFS-Colville National Forest, SO, Colville (Glenn Koehn)
Kalispell Natural Resources Department, Usk (Deane Osterman)
WDFW, Spokane (Doug Robison)
Seattle City Light, Seattle (Barbara Greene)

Reference:

Hansen, J.A., P.G. Welsh, J. Lipton, D. Cacela, and A.D. Dailey. 2002. Relative sensitivity of bull trout (*Salvelinus confluentus*) and rainbow trout (*Oncorhynchus mykiss*) to acute exposures of cadmium and zinc. *Environ. Toxicol. Chem.* 21:67-75.

2.0 NOVEMBER 15, 2006 STUDY PLAN MEETING SUMMARY

From: Mary Pat DiLeva [marypat.dileva@Seattle.Gov]
Sent: Tuesday, January 02, 2007 1:23 PM
To: Mary Verner; Rob Masonis; Brett Swift; Thomas O'Keefe; Steve Padula; Maureen DeHaan; Kathy Bowie; Vladimir Plesa; Eric Weiss; Gary Birch; Harry Brownlow; Paul Vassilev; Diane Stutzman; Richard Bailey; Lori Blau; Paul Machtolf; Steve Skeels; Greg Vaughn; Sharon Sorby; Dermot Randles; Bill Green; Alfred Nomee; Quanah Matheson; Judy McQuary; Lea Dreher; Llewellyn Matthews; Victor Jmaeff; Bill Towey; Don Hurst; Joe Peone; Patti Bailey; Sheri Sears; Emily Andersen; Terry Turner; Allyson Brooks; Rob Whitlam; Bao Le; Ed Tulloch; Paul Szewczykowski; Jason McLellan; Doug Robison; Curt Vail; Loyce Akers; Paul Hohlt; Jim Carney; Daniel Millar; David Knight; Marcie Mangold; Jim Bellatty; Jon Jones; Jean Parodi; Jaime Short; Chuck Everett; Colleen McShane; Christine Psyk; Helen Rueda; Donald M. Martin; Jan Mulder; Richard Raymond; David Turner; Frank Winchell; Betty Higgins; Diana Sieh; Debbie Wilkins; Glenn Koehn; Kathy Ahlenslager; Lucy Wilson; Jann Bodie; Mike Gerdes; Rod Bonacker; Steve Kramer; Tom Shuhda; Dan Trochta; Julie Campbell; Rich Torquemada; Rick Donaldson; Colin Spence; Kathy Eichenberger; G. Henry Ellis; Roger Simmons; Rebecca Sherman; Jim Eychaner; Deane Osterman; Floyd Finley; John Gross; Joe Maroney; Kevin Lyons; Michelle Wingert; Ray Entz; Kevin Greenleaf; Jennifer Porter; Randall Filbert; Susan Hurley; Marcelle Lynde; Keith Kirkendall; Mark Schneider; Joan Harn; Stephanie Toothman; Susan Rosebrough; Jeff King; Stacy Horton; Tony Grover; Lawr Salo; Kevin Devitt; Bruce MacDonald; Louise Porto; Jim Harris; Chris Mylar; Dean Cummings; Jim Marthaller; Mitch Brown; Ron Curren; Andre Coleman; Bob Johnson; Russ Fletcher; Evelyn Reed; Joe Onley; Mark Cauchy; Pat Buckley; Scott Jungblom; Judy Ashton; Lonnie Johnson; Faith McClenny; John Halterman; Meg Decker; Dirk Middents; Matthew Wells; Will Stelle; Mary Lou Keefe; Phil Hilgert; Diane Williams; Ruth Watkins; Al Solonsky; Barbara Greene; Carol Butler; Christine Pratt; Doug Rough; Alec Fisken; John Halliday; Jan Drago; Kim Pate; Lisa Rennie; Lonnie Johnson; Michael Mann; Michele Lynn; Tom Van Bronkhorst; Nancy Lotze; Randy Abrahamson; Gerry Nellestijn; Bill Duncan; Dave Godlewski; Kevin Kinsella; Jeni Forman; Fayette Krause; Kaitlin Lovell; Jeff Laufle; Marian Valentine; Mike Egge; Carol Graham; Cindy Preston; Kurt Beardslee; Keith Martin; Glenn Hartmann
Subject: Boundary Relicensing Revised Study Plan Meeting Summary

We received additional revisions to the November 15, 2006 Revised Study Plan meeting summary and have posted the revised summary on the City Light Boundary Relicensing webpage at http://www.seattle.gov/light/News/Issues/BndryRelic/default.asp

Thanks for your continuing interest in Boundary relicensing and best wishes for the new year.

Boundary Hydroelectric Project (FERC No. 2144)
Proposed Study Plan Meeting
November 15, 2006
Quality Inn Oakwood
7919 Division Street
Spokane, Washington

FINAL MEETING SUMMARY

Agenda

Introductions
Goals of meeting
Review of PSP Development effort
Overview of City Light PSP

- Recreation, Land Use and Aesthetics
- Botanical and Wildlife
- Geology, soils
- Cultural
- Socioeconomics
- Water Resources
- Fish and Aquatics
- Technical Scenario team
- Scenario Tool

Meeting Summary

Introductions/Goals of meeting/Review of PSP Development effort

Barbara Greene (SCL) gave introductory comments. She said that the Revised Study Plan (RSP) would be filed mid-February and that continued stakeholder involvement would help Seattle City Light finalize the RSP.

David Turner (FERC) noted that he thought SCL had produced an excellent Proposed Study Plan (PSP), and that stakeholders would have 60 days from this meeting to submit comments on the PSP to FERC. He said that this is the period to resolve differences, and today's meeting was an opportunity for stakeholders to identify all information needs not included in SCL's PSP. He said that once the RSP is filed, stakeholders have 15 days to comment on that document. He asked that stakeholders withdraw study requests if they have come to agreement with SCL on an alternative approach (or SCL otherwise satisfies needs). He said that after a 15-day review period for the RSP, FERC will make its determination as to SCL's study program.

- *Comment*- Doug Robison (WDFW) asked if FERC would be available to stakeholders during review periods.
  Response- David Turner replied that FERC would be available as time and workload allow, and if not in person then by conference call.
- *Comment*- Don Hurst (Colville) asked if the FERC decision on a study program is the outcome of the deliberations of the three-party panel.
  Response- David Turner (FERC) replied that the three-party review panel is only invoked if an agency with mandatory conditioning authority (4[e] or 401) disputes FERC's decision regarding study determination, the outcome of which can lead to a revised decision.

Overview of City Light PSP

Recreation, Land Use, Aesthetics

Michele Lynn (SCL) gave an overview of studies planned for Recreation, Land Use, and Aesthetic resource areas (for further detail, see attached PowerPoint).

- *Comment*- David Turner (FERC) noted that the recreation study plan calls for survey/forms to be developed post RSP with stakeholders. He asked if stakeholders were comfortable with this approach. Michele Lynn commented that the agencies will be involved in the development and specific wording of the questionnaires and survey forms in early 2007 prior to implementation of the field work and that stakeholders have agreed with this.
  Response- Jann Bodie (USFS) said that stakeholders fully expect to be involved in the development of survey forms and emphasized the importance of stakeholder involvement. Jann said that she had some questions over the differing intensity of surveys on and off SCL property that she would like clarified. She was concerned that the differing survey intensities might potentially affect study results. Jann added that SCL should add a few additional contacts to their list, e.g., Spokane City Parks. Finally, she said that SCL's studies addressing ORV use/access should also take into consideration the findings of an ongoing Colville National Forest transportation planning analysis that is scheduled for completion by late 2007.
- *Comment*- Glenn Koehn (USFS) commented on SCL's two-phased approach to gather and analyze information on Project roads and their use (Phase 1 – provide detailed information on known Project roads; and Phase 2 – analyze other roads that may be needed for recreation and shoreline access after the studies have defined corridor access needs and opportunities). He noted that surveying all existing Project roads, plus potential roads or corridors that may be needed in the future, at the outset might be more economical than implementing the study in two phases, as planned, as the area that would need surveying is not too large in his opinion.

Botanical and Wildlife

Michele Lynn (SCL) gave an overview of studies planned for Botanical and Wildlife resource areas (for further detail, see attached PowerPoint).

- *Comment*- Regarding the waterfowl study, Glenn Koehn (USFS) asked what the basis was for the 5- to 10-ft analysis increments in the reservoir fluctuation zone.
  Response- Colleen replied that this level of resolution was deemed adequate by stakeholders during Terrestrial Workgroup meetings. Although the bathymetry contours are in 2-ft increments, 2 feet seemed too fine a scale for the analysis of potential habitat in the reservoir fluctuation zone.
- *Comment*- Referring to the RTE plant study, David Turner (FERC) noted that Task 2 called for survey methods for nonvascular plants to be developed after filing of the RSP and asked why the species and the methods could not be identified for inclusion in the RSP.
  Response- Michele Lynn (SCL) stated that SCL could work with stakeholders, primarily the USFS, to identify the species and appropriate survey methods to include in the RSP.
- *Comment*- Referring to RTE Plants Task 4, David Turner (FERC) said the PSP identified "outstanding issues" associated with evaluations conducted for Ute's lady's tresses and asked why this was so.
  Response- Colleen McShane (EDAW) stated that SCL needs to be sure that surveys are conducted at the appropriate time and that this varies by year, depending on moisture conditions and spring temperatures. As a result it is typically not possible to identify the appropriate survey timing more than several months in advance. She also said that including survey timing as an "unresolved issue" might not be the best way to characterize this topic; it would be better addressed as a consideration in planning the field surveys in Task 2 and this change will be reflected in the RSP. David Turner stated that it would be acceptable for study timing to be identified subsequent to filing of the RSP.
- *Comment*- Dan Trochta (USFWS) added that because climatic conditions can vary significantly from year to year, and as a result the abundance of particular plant species, surveys for RTE plants may need to be conducted in 2007 and 2008.
  Response- Colleen McShane (EDAW) referred to page 5-50 of the PSP, noting that the text acknowledged that a second year of plant surveys could be needed depending on conditions in 2007.
- *Comment*- David Turner (FERC) noted that the PSP called for additional monitoring sites of bat use areas to be identified in coordination with the USFS in 2007, after filing of the RSP.
  Response- Colleen explained that additional sites could be found while conducting the first year's bat surveys and that there was no way to anticipate where these would be in advance of the first year of fieldwork. Michele Lynn (SCL) added that the USFS had indicated its concurrence with this approach.

<u>Geology and Soils</u>

Michele Lynn (SCL) gave an overview of studies planned for Geology and Soils resource areas (for further detail, see attached PowerPoint).

- *Comment*- Don Hurst (Colville) asked if SCL's definition of "shoreline erosion" includes above, within, and below the reservoir fluctuation zone.

Response- Al Solonsky (SCL) replied that sources of sediment and deposition into the reservoir will be captured by the sediment transport study. Dan McShane (Stratum Group) added that the main goal of the erosion study is to identify areas along the shoreline where project operations are affecting erosion that could lead to adverse impacts on important resources.

- *Comment*- Glenn Koehn (USFS) asked about the dual nomenclature used to cite datum, including NGVD 29 and NAVD 88. He said that he and others at the USFS felt this was confusing.
  Response- Kim Pate (SCL) explained that the dual nomenclature in the PSP was needed until SCL makes full transition to NAVD 88. She said that SCL is in the process of establishing benchmarks and transferring over to the new datum.
- *Comment*- Don Hurst (Colville) stated that 5-10 foot increments for bathymetry results would be inadequate for assessing sediment dynamics.
  Response- Michele Lynn (SCL) replied that reservoir bathymetry data were processed at 2-ft increments and that the larger increments represented intervals used for analysis of various resources. She said that only the waterfowl and big game studies, and the inventory of riparian shrubs and trees were being conducted at larger increments.

Cultural

Lisa Rennie (SCL) gave an overview of studies planned for Cultural resources (for further detail, see attached PowerPoint).

- *Comment*- David Turner (FERC) noted that the PSP calls for finalizing the APE in early 2007. He said that the APE should be finalized in the RSP.
- *Comment*- David Turner (FERC) asked that SCL spell out site-specific Project effects under Task 5 in the Cultural Resources study plan.

Socioeconomic

Lisa Rennie (SCL) gave an overview of studies planned for Socioeconomic resource areas and reviewed a study proposed by the Selkirk School District that SCL has chosen not to adopt (for further detail, see attached PowerPoint).

- *Comment*-Llewellyn Matthews (Columbia Power) stated that effects of Project operations on downstream power generation were not addressed by any socioeconomic study.
  Response- Barbara Greene (SCL) stated that documenting the effect of potential future operating scenarios would require the completion of the 2007/08 studies and that results would be presented in SCL's PLP.
- *Comment*- David Turner (FERC) asked if information on the effects of the Project on downstream generation would be available prior to submittal of the PLP. Bill Duncan added that it will be essential for representatives from projects in Canada to participate in the TST to supply the team with appropriate information.
  Response- Barbara Greene (SCL) replied that information would be shared with stakeholders as it was developed, through their participation in the TST. Kim Pate (SCL) stated that use of the scenario tool to begin understanding future operations and effects on

downstream operations would begin in 2007. SCL intends to work with BC Hydro to evaluate the effects of Boundary operations on downstream power generation.

- *Comment*- Noting that SCL planned to conduct no socioeconomic studies, David Turner (FERC) asked if stakeholders believed that existing information was sufficient for addressing Project effects and developing PMEs.
  Response- Lisa Rennie (SCL) replied that much information regarding the Project's effects on the local economy had been gathered and summarized in the PAD; furthermore, said Lisa, additional information relevant to the socioeconomic impacts of the Project will be produced by studies conducted as part of other resource areas, recreation resources in particular.

Water Resources

Christine Pratt (SCL) gave an overview of studies planned for Water resources (for further detail, see attached PowerPoint).

Toxics

- *Comment*- Tom Shuhda (USFS) noted that he had spoken with Monica Tonel at EPA about toxics at the Josephine Mine site. Tom said that appendices to the PASI report indicated that toxics—lead, cadmium, zinc, and silver—had been found in high concentrations in waste rock piles on SCL property located adjacent to Boundary Reservoir. Don Hurst (Colville) noted that the appendix reports had named SCL as the responsible party.
  Response- Christine Pratt (SCL) agreed to secure the reports and verify this information with EPA.
- *Comment*- Don Hurst (Colville) stated that the toxics plan in the PSP still included language indicating uncertainty about whether or not there is a Project nexus for toxics of concern. Don stated that the reservoir's presence, and its acknowledged capture of sediments, represents a Project nexus, regardless of how Project operations affect the availability or mobility of specific toxics. Don referred to decisions made by FERC in connection with the Morgan Falls Project, where FERC's three-member review panel (i.e., in dispute resolution) had determined that the presence of the Project—regardless of its operation—was sufficient to constitute Project nexus.
  Response- Nick Jayjack (FERC) clarified that the three-member panel, of which he had been a member, had decided in favor of the USFWS, finding that sediment core sampling should be undertaken at the project. However, said Jayjack, FERC's Director of the Office of Energy Projects had overruled the panel's decision and required no core sampling for the project. Nick noted that project nexus was not dependent on whether a project's operations affected toxics but rather whether anything could be done at the Project to improve conditions associated with a toxic or toxics, i.e., if any PME measures could be identified. David Turner (FERC) added that Director had overruled the three-member review panel's finding because that project is operated as "run-of-river" and no PMEs could be identified within the range of existing or future operations.

- *Comment*- Don Hurst (Colville) cited two EPA reports that held further information on the Josephine Mine site: The Grandview and Josephine Mines Trip Report 2002, and the Grandview and Josephine Mines Removal Action, November 2003.
- *Comment*- Doug Robison (WDFW) asked if SCL planned to have an SAP ready for filing with the RSP on February 15.
  Response- Christine Pratt (SCL) replied that the SAP would not be developed until after Phase 1 was completed in May 2007.
- *Discussion*- Julie Campbell (USFWS) stated that existing information was sufficient to develop an SAP for the RSP. Tom Shuhda (USFS) stated that without identification of a sampling program, or at the very least a protocol for clearly identifying what sampling would be conducted depending upon the outcome of Phase 1, stakeholders could not sign off on the RSP. David Turner (FERC) stated that there is flexibility in the ILP process for accelerating the review and comment procedures for the phase 1 study results, thus allowing parties to make recommendations for sampling procedures in the SAP sooner than prescribed in the regulations. David explained that the ILP requires that an initial study report be filed within one year of the FERC Office Energy Projects Directors study plan determination (in the case of Boundary, at the end of 2007). He said that within 15 days of filing of the initial study report, SCL would be required to hold a meeting to discuss the study results and proposed changes to the study plan. Fifteen days following the meeting, SCL would file a meeting summary, including any modifications to ongoing studies, such as the proposed sampling procedures for toxics. Participants would have 30 days to comment on the meeting summary, noting any disagreements with proposed changes and sampling protocols. Responses to the comments would need to be provided in 30 days. The FERC Office Director would then have 30 days to issue a study plan determination resolving any disagreements. Turner suggested that FERC could treat the phase 1 study report as the initial study report for the toxics study. Subsequent commenting and review procedures would then follow as defined in the regulations, but would occur much sooner. Turner said that this would provide parties an opportunity to comment on the content of the SAP. Tom Shuhda (USFS) asked if the agencies would have access to a formal dispute resolution at the end of Phase 1 under the model proposed by Turner. Turner said there would be no formal dispute resolution opportunity. Shuhda stated that the USFS could not agree to any alternative process that did not involve a formal study dispute opportunity. Shuhda said that the USFS must know when the RSP is filed that a) reservoir sediments will be sampled for toxics and b) if sediment toxics levels are greater than agreed-upon thresholds, that fish tissue and other biotic sampling would be undertaken.
- *Comment*- Don Hurst (Colville) stated that the Colville Tribe had submitted a toxics study plan and that SCL, despite its obligations under the ILP to do so, did not file a formal rebuttal of that study proposal in its PSP. Don stated that the Colville Tribe would expect a formal rebuttal as part of the RSP.
  Response- Barbara Greene (SCL) replied that SCL only issued rebuttals for study requests that called for a study that SCL was not proposing to conduct. Barbara said that because SCL is proposing a toxics study, there appeared to be no need to craft a rebuttal

for toxics study requests. David Turner (FERC) clarified that if SCL was not adopting a study as specifically requested by a stakeholder in response to the PSP, i.e., including the study details provided by that stakeholder, then SCL would need to provide a rebuttal, in this case as part of its RSP filing**.**

- *Comment*- David Turner (FERC) stated that SCL seems to have already established a number of means by which the project could be affecting toxic levels in the reservoir (i.e. a Project nexus with regard to toxics at the Boundary Project), so that the remaining question relevant to the study criteria is what can SCL do to influence the situation, i.e., are PMEs possible?
  Response- Steve Padula (LVA) stated that identifying PMEs associated with Project operations would require very precise and reliable sampling protocol and that Phase 1 would be needed to achieve this. He said that submitting a poorly defined sampling protocol simply to include something with the RSP could lead to a situation where results are insufficient to identify potential PMEs. Don Hurst (Colville) stated that some PMEs are already obvious, e.g., cleanup of contaminated waste rock at the Josephine Mine site. David Turner (FERC) stated that the SAP will need to state clearly how results will be used to formulate specific PMEs, e.g., changes to Project operations.

- *Comment*- Barbara Greene (SCL) stated that a meeting with stakeholders could be scheduled to further discuss and attempt to resolve the toxics issue.

Aquatic Plant Management Study

- *Comment*- Doug Robison (WDFW) asked why the Aquatic Plant Management Study was proposed to be conducted after license issuance, instead of during relicensing studies.
  Response- Christine Pratt (SCL) replied that it would first be necessary to assess the extent of Project impact on macrophyte-related effects, i.e., SCL's proposed study to assess the effect of macrophytes on pH and DO in the reservoir. Pratt also stated that it would be necessary to use habitat modeling to assess the viability of macrophyte management strategies based on reservoir drawdown to desiccate and/or freeze macrophytes, particularly in the portion of the reservoir upstream of Metaline Falls, where the Project's effects on water levels are muted by the hydraulic control capacity of the falls. Pratt noted that the model would not be fully developed until late 2008 or early 2009.
- *Comment*- Doug Robison (WDFW) asked David Turner (FERC) if FERC would accept this approach, which included post-license aquatic plant management studies.
  Response- David Turner (FERC) replied that FERC could approve post license studies, as long as they are clearly tied to a license article. Turner added that all licenses include post-license adaptive management analyses.
- *Comment*- Tom Shuhda (USFS) stated that the USFS could agree to post-license studies specifically as part of an Aquatic Plant Management Plan included in SCL's 401 application, provided that Ecology takes into consideration USFS requests when it accepts the 401 application and management plan.
  Response- Barbara Greene (SCL) stated that SCL will involve all stakeholders in the development of its Aquatic Plants Management Plan.

TDG

- *Comment*- Patti Bailey (Colville) stated that studies should be undertaken to identify the Boundary Project's contribution to cumulative TDG concentrations in the Columbia River.
  Response- Kim Pate (SCL) replied that SCL is required by Ecology to meet the state's TDG standard at the compliance point (currently the USGS monitoring station) and that by doing so SCL would be mitigating for its contribution to cumulative exceedances to the extent required by law. David Turner (FERC) added that FERC's EIS would address cumulative impacts for TDG.
- *Comment*- Dan Trochta (USFWS) asked if FERC would request that other facilities on the Pend Oreille river take steps to reduce their TDG impacts if during the course of Boundary's relicensing it is determined that the other projects are contributing to cumulative TDG impacts.
  Response- Nick Jayjack (FERC) stated that FERC could not issue a license for the Boundary Project with articles requiring SCL to mitigate for the effects of other Projects or to require other Projects to undertake any PMEs.

Fish and Aquatics

Al Solonsky (SCL) gave an overview of studies planned for Fish and Aquatic resources (for further detail, see attached PowerPoint).

- *Comment*- Doug Robison (WDFW) asked whether use of the model to assess potential future Project operating strategies included assessing the impacts of the Project under existing operations.
  Response- Al Solonsky (SCL) replied that existing operations will be a scenario under consideration. Because baseline, as defined in the relicensing process, is existing conditions, there would be no attempt to model Project impacts relative to pre-Project conditions. David Turner (FERC) agreed, noting that FERC would evaluate project operations in terms of potential improvements that could be made relative to existing operations.
- *Comment*- Glenn Koehn (USFS) asked if a run-of-river scenario would be modeled as part of relicensing studies.
  Response- Phil Hilgert (R2) replied that the TST would determine which scenarios to model and that the agencies and tribes will be members of the TST; a run-of-river scenario could be among the scenarios selected by the TST.
- *Comment*- Tom Shuhda (USFS) asked if the model would be used to address the full range of Project operating capability.
  Response- Phil Hilgert (R2) replied that the full range of drawdown could be modeled, by month, for various locations in the reservoir.
- *Comment*- Tom Shuhda (USFS) asked whether field surveys for macrophytes would include macrophyte habitat below the maximum reservoir drawdown level.
  Response- Phil Hilgert (R2) replied that macrophyte distribution would be mapped to the depth of the euphotic zone under maximum drawdown conditions.

- *Comment*- Llewellyn Matthews (Columbia Power) stated that load-shaping on the lower Pend Oreille is dictated by the Boundary Project and that the projects downstream in Canada simply pass these effects downstream, i.e., cause no change in hydrology. Matthews said that Columbia Power analysis indicates that passing through Boundary load shaping is not aniticipated to have a significant effect on White Sturgeon below Waneta Dam after the Expansion Project. However, Matthews said, if someone were to conclude it was having an effect, the effect would be attributed to Boundary operations and not the downstream dams.

  Comment- Gary Birch (BC Hydro) said that BC Hydro had looked for an existing agreement between BC Hydro and SCL or other government bodies regarding obligations on the part of BC Hydro to moderate the impact of load shaping at Boundary on the Columbia River downstream, and that they had been unable to find any such agreement. Hence, Birch said, BC Hydro can choose to operate the Seven Mile facility according to its water license provisions and generation needs in British Columbia. Birch said that may or may not take the form of paralleling the Boundary Dam operations. Birch said that if BC Hydro chooses to parallel Boundary Dam operations and if Waneta Dam (including Waneta Expansion) follows suite, the river would be operating in full hydraulic balance and the US should expect water level fluctuations and related environmental effects of Boundary Dam load shaping to be passed to the Columbia River at the border.

  Response- Al Solonsky (SCL) stated that SCL could not be held accountable for the operations of the downstream projects but emphasized that SCL hoped for the owners of the downstream projects to be actively involved in the TST. David Turner (FERC) stated that although FERC could not condition the Boundary license to mitigate for the impacts of other projects, it would take into consideration basin-wide effects when drafting conditions for the Boundary license.
- *Comment*- Tom Shuhda (USFS) noted that to develop HSI curves as part of modeling, a portion of the benthic macroinvertebrate sampling was proposed for a single site in the littoral zone of the Box Canyon Reservoir. Shuhda stated that to assess benthic macroinvertebrate response in a "stable" reservoir environment, i.e., the conditions the Box Canyon sampling is meant to characterize, a greater number of samples would be needed in the littoral zone of Box Canyon dam, and that these should be located upstream of the forebay.

<u>Technical Scenario Team</u>

Kim Pate (SCL) gave a brief overview of the function of the Technical Scenario Team (for further detail, see attached PowerPoint). There were no additional comments.

<u>Scenario Tool</u>

John Howard (Charles Howard and Associates, Ltd.) gave an overview of the Scenario Tool and how it functions (for further detail, see attached PowerPoint).

- *Comment*- Doug Robison (WDFW) asked how the scenario tool would be incorporated into the full analysis of project effects using the habitat model.

Response- Kim Pate (SCL) replied that the scenario tool would be used to assess reservoir forebay and tailrace water levels for Project operations under a range of water year types and that this output would be translated into upstream and downstream water surface elevations using the hydraulic routing model. Pate added that output from the hydraulic routing model would then serve as input for modeling habitat conditions at various transects for fish, invertebrates, macrophytes, etc.

- *Comment*- Patti Bailey (Colville) stated that studies should be conducted to assess the indirect effects of the Boundary Project on the white sturgeon population in the Columbia River.
  Response- David Turner (FERC) stated that cumulative impacts would be assessed as part of FERC's EIS but that FERC would not condition SCL's license to mitigate for the effects of other Projects on the Pend Oreille or Columbia rivers.

General

- *Comment*- David Turner (FERC) emphasized that stakeholders, especially the USFS and Ecology, needed to clearly articulate in their mid-January PSP comments where there was disagreement with SCL on the contents of the PSP.

In Attendance

Patti Bailey, Confederated Tribes of the Colville Reservation (Colville)
Gary Birch, BC Hydro
Jann Bodie, US Forest Service (USFS)
Julie Campbell, US Fish and Wildlife Service (USFWS)
Jason Connor, Kalispel Tribe
Bill Duncan, Teck Cominco
Jim Eychaner, IAC
Chuck Everett, EDAW
Randall Filbert, Long View Associates (LVA)
Barbara Greene, Seattle City Light (SCL)
John Halterman, TEDD/Pend Oreille EDC
Glenn Hartmann, Western Shore Heritage Services
Brad Hawkins, Douglas PUD
Mike Haynes, SCL
Phil Hilgert, R2 Resource Consultants
John Howard, Charles Howard and Associates, Ltd.
Susan Hurley, LVA

Don Hurst, Colville
Nick Jayjack, Federal Energy Regulatory Commission (FERC)
Scott Jungblom, Pend Oreille PUD
Tarang Khangaonkar, Battelle
Glenn Koehn, USFS
Michele Lynn, SCL
Marcie Mangold, Washington Department of Ecology (WDOE)
Llewellyn Matthews, Columbia Power
Colleen McShane, EDAW
Dan McShane, Stratum Group
Steve Padula, LVA
Kim Pate, SCL
Paul Pickett, WDOE
Jim Puglisi, FERC
Christine Pratt, SCL
Lisa Rennie, SCL
Doug Robison, WDFW
Tom Shuhda, USDA Forest Service (USFS)
Al Solonsky, SCL
David Turner, FERC
Dan Trochta, USFWS

3.0 ADDITIONAL CONSULTATION

Summary of consultation that has occurred post-filing of the Proposed Study Plan (October 16, 2006) and that is related to the development of this Revised Study Plan.

Date	Format	Agency / organization consulted	Summary of contact
10/10/2006	Meeting summary	WDFW, KNRD	Al Solonsky (SCL) and Phil Hilgert (R2) met with Jason McLellan, Doug Robison and John Whalen (WDFW) and Jason Connor and Joe Maroney (KNRD) to discuss the Fish and Aquatic habitat and productivity modeling studies for Boundary relicensing.
10/11/2006	Email	WDOE	Paul Pickett (WDOE) emailed Tarang Khangaonkar (Battelle) with a status of the three components of the Pend Oreille River temperature TMDL model and a request for Battelle to produce a draft calibration report for the Boundary reach component.
10/13/2006	Email	USFS-Colville NF	Tom Shuhda (USFS-Colville NF) responded by email with comments on the draft summary of the 9/22/06 conference call to discuss the Toxics study plan. Barbara Greene (SCL) responded with proposed edits to the meeting summary, and Tom Shuhda approved the edits.
10/31/2006	Email	WDOE	Tarang Khangaonkar (Battelle) emailed Christine Pratt (SCL), Ed Connor (SCL), Paul Pickett (WDOE), Marcie Mangold (WDOE), Jon Jones (WDOE) and Steve Breithaupt (Battelle) a summary of the 10/30/06 conference call that had taken place between SCL, WDOE and Battelle to discuss the status of the temperature TMDL process.
10/31/2006	Meeting summary	Pend Oreille County	Barbara Greene and Lisa Rennie (SCL) met with Pend Oreille County Commissioners Ken Oliver and Dean Cummings to provide an update on the Boundary relicensing process.
11/1/2006	Phone record	Department of Archaeology and Historic Preservation	Glenn Hartmann (WSHS) called Rob Whitlam (Department of Archaeology and Historic Preservation) enquiring about procedures for documenting non-National Register-eligible historic properties.
11/1/2006	Phone record	BC Hydro	Kim Pate, Barbara Greene, and Al Solonsky (SCL) met via telephone with Harry Brownlow and Gary Birch (BC Hydro) to discuss the relicensing process for the Boundary Hydroelectric Project, the relicensing schedule and plans to conduct studies downstream of Boundary Dam, in BC Hydro's Seven Mile Reservoir.
11/3/2006	Email	Colville Tribes	Barbara Greene (SCL) emailed Don Hurst (Colville Tribes) a response to a question about SCL's treatment of the Colville's sediment study request in the PSP.
11/17/2006	Phone record	USFS-Colville NF	Barbara Greene (SCL) called Tom Shuhda (USFS-Colville NF) to discuss EPA's intention to name SCL as the only PRP in a clean up effort of the Josephine Mine.

Date	Format	Agency / organization consulted	Summary of contact
11/20/2006	Email	USFS-Colville NF	Barbara Greene (SCL) emailed Tom Shuhda (USFS-Colville NF) the Word version of SCL's proposed Toxics study plan per request (from the 10/15/06 Proposed Study Plan).
11/22/2006	Email	USFS-Colville NF	Tom Shuhda (USFS-Colville NF) emailed Barbara Greene (SCL) confirming receipt of SCL's proposed Toxics study plan and about a tentative target to get SCL the USFS's revisions to SCL's proposed Toxics study plan as early as 11/27/06 but no later than 12/1/06.
11/24/2006	Phone record	WDOE	Barbara Greene (SCL) called Marcie Mangold (WDOE) to discuss WDOE's current position regarding the proposed Toxics study plan.
11/29/2006	Email	All relicensing contacts	Mary Pat Dileva (SCL) emailed all relicensing contacts that as a follow up to the 11/15/06 Study Plan Meeting, SCL will communicate soon about future meetings and/or conference calls regarding the toxics issue.
11/30/2006	Email	USFS-Colville NF	Barbara Green (SCL) emailed Tom Shuhda (USFS-Colville NF) agreement with the target date of 12/4/06 for the USFS to provide comments on SCL's proposed Toxics study plan.
12/1/2006	Email	USFS-Colville NF	Tom Shuhda (USFS-Colville NF) emailed Barbara Greene (SCL) an electronic file of the EPA's 10/2/06 contaminant removal program for Stevens and Pend Oreille counties.
12/1/2006	Phone record	WDOE	Barbara Greene (SCL) called Marcie Mangold (WDOE) to inform her that another version of the Toxics study plan would be available for review after 12/4/06 after USFS provided its revised language.
12/1/2006	Phone record	USFS-Colville NF	Barbara Greene (SCL) called Tom Shuhda (USFS-Colville NF) to request a copy of the September 2002, Ecology and Environment's Grandview, Josephine, and Pend Oreille Mines/Mills Trip Report referenced by Don Hurst (Colville Tribe) during the 11/15/06 Study Plan Meeting.
12/1/2006	Phone record	Colville Tribes	Barbara Greene (SCL) called Don Hurst (Colville Tribes) to seek clarity about disagreements on the Toxics study plan.
12/4/2006	Email	Colville Tribes	Barbara Greene (SCL) and Don Hurst (Colville Tribes) exchanged emails regarding, specifically, the toxics reports referenced by Don during the 11/15/06 Study Plan Meeting and more generally, the current status of the Boundary Project information library.
12/5/2006	Email	WSHS	Glenn Hartmann (WSHS) emailed Rich Bailey (BLM Archaeologist) requesting a meeting to discuss the cultural resources efforts for the Boundary Project relicensing.

Date	Format	Agency / organization consulted	Summary of contact
12/5/2006	Phone record	USFS-Colville NF	Tom Shuhda (USFS-Colville NF) emailed Barbara Greene (SCL) an electronic file of the USFS's, USFWS's and the Colville Tribes' collective revisions to SCL's proposed Toxics study plan.
12/7/2006	Email	WDOE	Christine Pratt (SCL) called Paul Pickett (WDOE) with a status update on the flow and temperature data for the Pend Oreille River tributaries requested by Paul during a 12/4/06 phone call.
12/12/2006	Phone record	WDOE	Barbara Greene (SCL) left a voicemail for Marcie Mangold (WDOE) indicating that if SCL determined to take an alternative approach to the toxics study other than that in the PSP, she would contact Marcie to discuss.
12/14/2006	Email	USFS-Colville NF	Glenn Koehn (USFS-Colville NF) emailed Barbara Greene (SCL) an electronic file of the USFS's draft Proposed Study Plan comments and indicated that the USFS final comments will be filed with FERC no later than 1/15/06.
12/15/2006	Phone record	USFS-Colville NF	Lisa Rennie (SCL) called Steve Kramer (USFS-Colville NF) to discuss the Boundary Project APE definition, selection of technical consultant to perform the relicensing studies and the USDA-Colville NF letter to the FERC regarding NHPA Section 106 process and the Boundary Project.
12/15/2006	Phone record	BLM	Lisa Rennie (SCL) left a vmail for Rich Bailey (BLM Archaeologist) regarding setting up a meeting to discuss the Cultural Resources study plan, including APE definition.
12/15/2006	Email	WDOE	Christine Pratt (SCL) emailed Paul Pickett (WDOE) electronic files of flow and temperature data pulled together for the Pend Oreille River tributaries.
12/18/2006	Phone record	Kalispel Tribe	Lisa Rennie (SCL) called Kevin Lyons (Kalispel Tribe) to discuss the selection of a technical consultant to perform the relicensing studies, SCL's APE definition for the Boundary Project and the status of the Kalispel Tribe's TCP database.
12/19/2006	Email	WDOE	Christine Pratt (SCL) and Marcie Mangold (WDOE) exchanged emails confirming a conference call on 12/20/06 to discuss SCL's revised Toxics study plan. (SCL's revised Toxics study plan [dated 12/18/06] was attached to the email.)
12/19/2006	Email	BC Hydro	Al Solonsky (SCL) emailed Gary Birch (BC Hydro) thanking him for providing BC Hydro's Water Use plan report and for the offer to work together on the 2007 bull trout telemetry study.
12/19/2006	Letter	State Historic Preservation Office	Wayman Robinett (SCL) sent a letter to Allyson Brooks (State Historic Preservation Office) requesting concurrence with the Area Of Potential Effects (APE) as proposed and defined by SCL.

Date	Format	Agency / organization consulted	Summary of contact
12/20/2006	Email	USFS-Colville NF	Barbara Greene (SCL) emailed Tom Shuhda and Glenn Koehn (USFS-Colville NF) SCL's revised Toxics study plan (dated 12/18/06) in preparation for a conference call to discuss the plan.
12/20/2006	Phone record	USFS-Colville NF	Barbara Greene (SCL) called Tom Shuhda and Glenn Koehn (USFS-Colville NF) to review the most recent version of the Toxics study plan (dated 12/18/06).
12/20/2006	Phone record	WDOE	Barbara Greene and Christine Pratt (SCL) called Marcie Mangold (WDOE) to review the most recent version of the Toxics study plan (dated 12/18/06). Marcie responded that the study plan looked great and that WDOE was in support of it.
12/21/2006	Email	USFS-Colville NF	Tom Shuhda (USFS-Colville NF) emailed Barbara Greene (SCL) concurrence with Barbara's summary of their 12/20/06 conference call to review the 12/18/06 version of the Toxics study plan.
12/21/2006	Email	USFS-Colville NF, USFWS, WDFW, WDOE, Kalispel Tribe, Colville Tribes	Barbara Greene (SCL) emailed Water Quality Workgroup participants the revised version of the Toxics study plan (dated 12/18/06) and provided information on the technical contractors hired by SCL to perform the study.
1/4/2007	Email	USFWS	Barbara Greene (SCL) emailed Julie Campbell (USFWS) a response to Julie's question about the 12/18/06 version of the Toxics study plan superseding the PSP version. Barbara indicated that the 12/18 version is the current version SCL is working on but SCL will evaluate all PSP comments before determining if it will be the version included in the RSP.
1/5/2007	Email	USFS-Colville NF, USFWS, WDOE, WDFW, Kalispel Tribe, Colville Tribes	Barbara Greene (SCL) emailed Water Quality Workgroup participants an invitation to participate in a conference call on 1/12/07 to review the current version of the Toxics study plan (dated 12/18/06) and to introduce the technical consultants who will be conducting the Toxics study (resumes of the technical consultants were attached to the email).
1/8/2007	Phone record	WDOE	Christine Pratt (SCL), Jon Jones, Marcie Mangold, Paul Pickett (WDOE), Tarang Khangaonkar and Steve Breithaupt (Battelle) met via a WebEx link for Battelle to provide a status update on the calibration of the CE-QUAL-W2 model of the Boundary Reach.
1/9/2007	Email	WDOE	Paul Pickett (WDOE) emailed Kim Pate (SCL) thanking her for the status update on the TDG study plan and agreement with her proposal to schedule a meeting in the next month to discuss details of a TDG monitoring plan for 2007.
1/9/2007	Phone record	USFS	Michele Lynn (SCL) and Colleen McShane (EDAW) called Kathi Ahlenslager (USFS) to discuss USFS' expectations regarding the survey effort for RTE non-vascular plants as part of the RTE Plant Species Inventory study plan.

Date	Format	Agency / organization consulted	Summary of contact
1/10/2007	Email	WDOE	Christine Pratt (SCL) emailed Jon Jones and Paul Pickett (WDOE) with information on Boundary spill for 2004 and 2005.
1/11/2007	Email	USFS-Colville NF, USFWS, WDOE, Colville Tribes	Barbara Greene (SCL) emailed the Water Quality Workgroup participants call-in instructions and an agenda for the 1/12/07 conference call to introduce the technical consultants who will be conducting the Toxics study.
1/12/2007	Email	USFS-Colville NF, WDFW, Pend Oreille County Noxious Weed Control Board, USFWS	Colleen McShane (EDAW) emailed the Terrestrial Workgroup SCL's suggested edits to the Bat Survey and Habitat Inventory study plan (the revised text was attached to email).
1/12/2007	Phone record	USFS-Colville NF, USFWS, WDOE, Colville Tribes	The Water Quality Workgroup participated in a conference call to introduce the technical consultants who will be conducting the Toxics study and discuss SCL's proposed Toxics study plan (dated 12/18/06).
1/15/2007	Email	USFS-Colville NF, WDFW, Pend Oreille County Noxious Weed Control Board, USFWS	Colleen McShane (EDAW) emailed the Terrestrial Workgroup SCL's suggested edits to the Waterfowl/Waterbird study plan.
1/16/2007	Phone record	USFS	Colleen McShane (EDAW) called Kathi Ahlenslager (USFS) as a follow up to a 1/9/07 call regarding USFS' expectations regarding the survey effort for RTE non-vascular plants as part of the RTE Plant Species Inventory study plan.
1/16/2007	Email	USFS	Kathleen Ahlenslager (USFS) emailed Colleen McShane (EDAW) suggested revisions to the RTE Plant Species Inventory study plan (the revisions were attached to the email).
1/17/2007	Email	USFS-Colville NF, USFWS, WDOE, Colville Tribes	Barbara Greene (SCL) emailed the Water Quality Workgroup a draft summary from the 1/12/07 conference call to discuss the current version of the Toxics study plan (dated 12/18/06).
1/17/2007	Email	WDOE	Marcie Mangold (WDOE) emailed Barbara Greene (SCL) confirming that WDOE is in agreement with SCL's proposed Toxics study plan (dated 12/18/06 and as discussed during the 1/12/07 conference call with the Water Quality Workgroup) except for one suggested edit to section 2.7 of the plan.
1/17/2007	Email	WDFW	Doug Robison (WDFW) emailed concurrence with SCL's suggested edits to the Bat Surveys and Habitat Inventory study plan as provided in email dated 1/12/07.
1/17/2007	Email	WDFW	Doug Robison (WDFW) emailed concurrence with SCL's suggested edits to the Waterfowl/Waterbird study plan as identified in email dated 1/15/07.

Date	Format	Agency / organization consulted	Summary of contact
1/17/2007	Email	USFS	Mike Gerdes (USFS) emailed Colleen McShane (EDAW), Doug Robison (WDFW), Dan Trochta (USFWS), and Sharon Sorby (Pend Oreille County Noxious Weed Control Board) concurrence with SCL's suggested edits to the Waterfowl/Waterbird study plan as identified in email dated 1/15/07.
1/17/2007	Phone record	USFS	Michele Lynn (SCL) called Glenn Koehn (USFS) to discuss the USFS request for survey data to be collected as part of Land and Roads Study.
1/18/2007	Email	USFS	Colleen McShane (EDAW) and Mike Gerdes (USFS) exchanged emails regarding SCL's suggested edits to the Bat Survey and Habitat Inventory study plan provided in email dated 1/12/07.
1/18/2007	Email	FERC	David Turner (FERC) emailed Barbara Greene (SCL) comments on the draft 1/12/07 conference call summary.
1/18/2007	Email	WDOE	Kim Pate (SCL) emailed Marcie Mangold, Paul Pickett, and Jon Jones (WDOE) regarding a meeting scheduled for 2/14/07 to discuss the 2007 TDG Monitoring Plan details.
1/18/2007	Phone record	USFS	Michele Lynn (SCL) called Glenn Koehn (USFS) to (1) let him know SCL may make the RSP available ahead of the 2/14/07 filing date and (2) as a follow up to their 1/17/07 call about the USFS request for survey data to be collected as part of Land and Roads Study.
1/22/2007	Email	WDOE	Cheryl Niemi (WDOE) emailed Mary Lou Keefe (R2) in response to her request for clarification as to the correct standard to use when addressing cadmium during the planned Water Resources studies on the Pend Oreille River.
1/22/2007	Email	WDOE	Kim Pate (SCL) emailed Marcie Mangold (WDOE) thanking her for her agreement with SCL's suggested edits to the TDG TMDL schedule outlined in the TDG study plan.
1/22/2007	Email	WDOE	Kim Pate (SCL) and Jon Jones (WDOE) exchanged emails regarding SCL's suggested edits to the TDG TMDL schedule outlined in the TDG study plan.
1/23/2007	Email	USFS-Colville NF, USFWS, WDOE, Colville Tribes	Barbara Greene (SCL) emailed the Water Quality Workgroup the final summary from the 1/12/07 conference call to discuss the current version of the Toxics study plan (dated 12/18/06).
1/23/2007	Email	WDOE	Barbara Greene (SCL) emailed Marcie Mangold (WDOE) the final summary from the 1/12/07 conference call to discuss the current version of the Toxics study plan (dated 12/18/06).

Date	Format	Agency / organization consulted	Summary of contact
1/23/2007	Email	WDOE	Stephen Breithaupt (Battelle) emailed Paul Pickett (WDOE) meteorological data files for Box Canyon and Boundary used to calibrate the Boundary temperature model per Paul's request.
1/25/2007	Email	Coeur d'Alene Tribe	Lisa Rennie (SCL) emailed Quanah Matheson (Coeur d'Alene Tribe) thanking her for conveying the Tribe's continued interest in the Boundary relicensing process and an update on the status of the relicensing study program.
1/26/2007	Email	USFS-Colville NF, USFWS, Colville Tribes	Barbara Greene (SCL) emailed the Water Quality Workgroup an electronic copy of the final Toxics study plan that will be included in the Revised Study Plan (RSP) as follow up to the 1/12/07 conference call.

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Seattle City Light ***FINAL***
Boundary Project Relicensing
Fish and Aquatics Meeting
October 10, 2006
WDFW Office, Spokane, Washington
8:00 AM – Noon

Participants

Doug Robison (Washington State Department of Fish and Wildlife) - WDFW
Jason McLellan (Washington State Department of Fish and Wildlife) - WDFW
John Whalen (Washington State Department of Fish and Wildlife) - WDFW
Joe Maroney (Kalispel Tribe) - KT
Jason Connor (Kalispel Tribe) - KT
Al Solonsky (Seattle City Light) - SCL
Phil Hilgert (R2 Resource Consultants) – R2

Objective

In response to a request from Doug Robison (WDFW), Al Solonsky (SCL) agreed to meet and discuss the Fish & Aquatic (F&A) habitat and productivity modeling studies for Boundary relicensing. As part of reviewing the fish and aquatic studies, participants would review comments that Doug had provided on August 28, 2006 regarding various draft study outlines that had been presented during the summer workgroup meetings.

Introduction

Al Solonsky noted that Seattle City Light had just finished the draft Proposed Study Plan (PSP) and that it would be transmitted to the Federal Energy Regulatory Commission and relicensing participants on October 16th. Solonsky (SCL) noted that it was too late to make any changes to the PSP, but that comments or requests identified during this October 10th meeting would be noted in a short summary of this meeting. Meeting participants agreed to review a draft record, so that a final meeting summary would be available for the consultation record. There was interest in changes between the draft study outlines developed with stakeholders during summer 2006 F&A Workgroup meetings and the draft PSP. Al Solonsky (SCL) said that there were few differences in study content but that the draft study plans had more detail and included other FERC required components. Differences between the study outlines and the draft PSP would be discussed during a meeting to be held in Spokane on November 15.

Doug Robison (WDFW) asked if there would be opportunities to review interim reports on the results and data collected from the studies. Al Solonsky (SCL) noted that the Integrated Licensing Process stipulates the filing of reports at the end of 2007 and 2008. Al Solonsky (SCL) said that these year end reports will help to keep stakeholders informed on study progress and evaluate whether study modifications are warranted. Al Solonsky (SCL) added that the studies in the draft PSP are intended to be done in coordination with stakeholders.

WDFW August 28, 200 Comment Letter and Responses

Al Solonsky and Phil Hilgert (R2) had numbered each comment in the August 28 letter (see Attachment 1) and the group worked through Doug's comment and SCL responses.

Comment 1. Phil Hilgert (R2) said that study goals and objectives were not in the study outlines, but were added in the PSP along with other FERC-required information such as related management plans.

Comment 2. Phil Hilgert (R2) noted that the aquatic habitat model would allow residence times to be calculated on an hourly basis and that each operational scenario would take into account if, and where residence time changes. Phil Hilgert (R2) said that residence times in the thalweg may be different than residence times calculated in alcoves and backwater areas. The mainstem habitat model is designed to calculate velocities in cells across a transect to assess changes in residence time between alternate operational scenarios.

Comment 3, 4 and 5. Phil Hilgert (R2) described the basic sampling scheme to compare productivity under alternate operating scenarios is to sample organisms in an area of the reservoir that has relatively large pool level fluctuations (such as Boundary forebay) and compare the response of organisms to areas that have relatively small pool level fluctuations (such as Box Canyon tailrace or forebay). Jason McLellan (WDFW) asked if sampling at these two locations would really be comparable. Jason McLellan (WDFW) said that due to the local influence of water velocity, one might find differences due to the effects of vertical zooplankton migration or other differences unrelated to pool level fluctuations. Phil Hilgert (R2) noted that zooplankton and phytoplankton would be sampled in both deep water and littoral zones which they hoped would help isolate the effects of pool level fluctuations. Phil added that details of the zooplankton and benthic macroinvertebrate sampling are described in the Water Quality study plan: Water Quality Constituent and Productivity Monitoring rather than the fish and aquatics study plan. Jason McLellan (WDFW) said he was looking for specificity in how zooplankton sampling would be done and would look over that section.

Phil Hilgert (R2) said that analysis of the zooplankton samples includes reporting the concentration of zooplankton and information on size of zooplankton and species richness. Zooplankton samples would be taken in the forebay or tailrace of Box Canyon and Boundary Dams every two hours to assess diurnal changes and the response of zooplankton to changes in operations. Additional detail is provided in the Water Quality Constituent and Productivity Monitoring Study Plan.

Comment 6. On Paragraph 6, Doug Robison (WDFW) asked what range of “bounds” is envisioned when considering maximum and minimum pool level fluctuation scenarios. Phil Hilgert (R2) said that the maximum fluctuation zone would reflect the existing operational constraints and the minimum fluctuation zone would be determined by the Technical Scenarios Team in coordination with relicensing participants. Doug asked if the minimum pool level fluctuation scenario would be a run-of-river scenario. Phil Hilgert (R2) said that SCL has avoided using the phrase 'run-of-river' since it is open to interpretation. Al Solonsky (SCL) noted that according to the Pacific Northwest Coordination Agreement, the Boundary Project is a run-of-river project, as opposed to other projects being defined as storage projects. However,

Boundary is operated as a load-following facility which involves pool level fluctuations. Al Solonsky (SCL) said that because there are different interpretations of what a run-of-river scenario might mean, it is important that the minimum fluctuation zone scenario be clearly defined and developed in the Technical Scenario Team.

Comment 7. Phil Hilgert (R2) said that he agreed with WDFW that mortality and colonization need to be quantified in the habitat model. Phil Hilgert (R2) described the process by which fixed and floating substrate samples will be studied to help develop HSI curves and information about dewatering and colonization of macroinvertebrates and periphyton. Phil Hilgert (R2) drew on the board a schematic showing how fixed and floating macroinvertebrate sampling would occur. The sampling scheme includes sampling hard substrates in two reaches (two sampling sites) and sampling soft substrates in three reaches (or sampling sites). Each reach represents a specific range of reservoir pool level fluctuations. Jason McLellan (WDFW) said that he would like to see hard substrates sampled in three reaches, but more importantly, he would like to see replicates above and below Metaline Falls for sampling macroinvertebrates on hard and soft substrates. Phil Hilgert (R2) noted that the question of sample size in part is dependent on whether the site-specific data is expected to differ from literature values. Larger sample sizes would provide more baseline information, but wouldn't necessarily improve model results or help decision making. As currently proposed, the hard substrate samples consist of three to five gravel baskets placed at each 5-ft elevation from high pool level to the euphotic depth. Phil Hilgert (R2) explained that the multiple baskets at each 5-ft depth increment should provide an indication of variability at each depth, but he acknowledged that having only a series of baskets within a reach does not provide for site replication. Doug Robison (WDFW) agreed with Jason and indicated that he was interested in having replicate sample sites in each reach above and below Metaline Falls for sampling hard and soft substrates. Doug Robison (WDFW) added that sampling macroinvertebrates might be the best way to quantify project effects, since site-specific data on native salmonids may be difficult to develop and impacts on the benthos may represent a significant impact in the fish populations. Joe Maroney (KT) said that he also would like to see more data to populate the HSI curves; John Whalen (WDFW) added his support saying that more sites would help identify potential variability within a reach that could help isolate the effects of Project operations.

Jason McLellan (WDFW) said that he wanted to make sure things were well quantified to identify productive capability. Doug Robison (WDFW) said that he wanted to have a good understanding of benthos productivity, to see how project operations affect what the fish want to eat. Phil said that increasing the number of macroinvertebrate samples would be considered when the draft PSP is revised in January, but that the participants should include their requests when providing comments on the draft PSP. Phil noted that increasing the sample size for macroinvertebrates does not represent a major cost increase, but that SCL must consider the cumulative cost and potential benefits of changes to all study components when revising the PSP.

Comment 8 and 9. Phil Hilgert (R2) stepped through the conceptual methods by which the model would incorporate depth, velocity, substrate and colonization/dewatering to calculate changes in weighted areas of primary and secondary production. Phil noted that productivity will be calculated as indices to compare alternate operational scenarios and would not represent

an actual area to calculate changes in number of fish. Jason McLellan (WDFW) asked specifically about the equation and asked if things just get multiplied together. Phil Hilgert (R2) said that for most part yes, but that dewatering may be a binary HSI where the value goes to zero if some critical threshold is exceeded, such as a condition where all target organisms are killed.

Comment 10 and 11. Phil Hilgert (R2) noted that replies were discussed in response to earlier comments.

Comment 12 and 13. Phil Hilgert (R2) said that details like stratification of samples and randomization would be worked out when the Technical Contractor who will do the work gets on board. Al Solonsky (SCL) added that this would be done in coordination with stakeholders.

Comment 14. Jason McLellan (WDFW) expressed his concern about fyke nets being successfully deployed in Sullivan Creek and possibly other creeks as well. Jason McLellan (WDFW) explained that flows in Sullivan Creek may approach 1,000 cfs and he doesn't believe that fyke nets are going to stand up. Jason McLellan (WDFW) added that he thought a screw trap or other type of trap might be needed. Phil Hilgert (R2) agreed that a fyke net would be hard to deploy and fish during high flow conditions; conversely, a screw trap may not be successful during moderate and low flow conditions. Screw traps need to be sited where velocities are 5-6 fps and it may be tough to find a suitable site in Sullivan Creek. Phil added that biotelemetry is the primary tool proposed to assess fish movements between reservoir and tributary habitats; however, if few native salmonids are captured and tagged, we may have to consider other sampling methods. SCL is proposing to begin sampling in 2007 using biotelemetry and fyke nets, but if needed, will consider other methods in 2008.

Comment 15. Al Solonsky (SCL) noted that details would be worked out when the Technical Contractor was under contract.

Comment 16 and 17. Al Solonsky (SCL) said that based on WDFW comments, SCL had dropped its plans for limited collection of fish stomach contents. Al Solonsky (SCL) said that he thought it was a good idea when he was at the bass tournament and all the fish were in one place and could be easily sampled, but he agreed the information would not be adequate to evaluate competition. Al Solonsky (SCL) noted that dropping the collection of stomach samples was one area where the F&A study components were changed in the draft PSP. Doug Robison (WDFW) and Jason McLellan (WDFW) agreed that the results would not be conclusive and said that they don't have any problem with stomach sampling tasks being dropped from the studies.

Comment 18. Phil Hilgert (R2) explained that information on the distribution and abundance of various fish species at the mouths of tributaries could help understand how various species use these habitats and respond to changes in habitats under Project operations. Doug Robison (WDFW) said that obtaining HSI information made sense, but that spatial overlap does not mean that there is competition between the species. Phil agreed but noted that spatial overlap between triploid trout and native salmonids could indicate potential risk of recreational anglers inadvertently catching native salmonids when targeting triploid trout.

Comment 19. Phil Hilgert (R2) said that this change was made.

Comment 20. Phil Hilgert (R2) thanked WDFW for their comments on tagging details. Al Solonsky (SCL) added that SCL will discuss the tagging program with relicensing participants once the Technical Contractor who will be doing the study gets on board. Phil Hilgert (R2) said that SCL would need to also work with stakeholders participating in the Recreation Workgroup to finalize details that could affect the recreational creel study.

Comment 21. Phil Hilgert (R2) said that he agreed that spatial distribution of triploid trout would be difficult to determine from tag returns. Phil Hilgert (R2) said that biotelemetry was the main tool proposed by SCL to obtain information on triploid trout habitat use.

Comment 22. Phil Hilgert (R2) said that details on the creel survey would be developed in coordination with stakeholders in the Recreation Workgroup and Fish & Aquatics Workgroup once the technical contractor who will be doing the study gets on board.

Comment 23. Phil Hilgert (R2) said that the data analysis description in the PSP was scaled back with regard to how data could be used to address native salmonid recovery efforts.

Comment 24. Phil Hilgert (R2) said that language in the PSP had been changed to reflect WDFW's preferred language regarding less popular native fish.

Comment 25. Phil Hilgert (R2) agreed with WDFW's comment about the differences between the creel survey and a larger recreational use survey. Phil Hilgert (R2) added that the recreational use survey would provide some, albeit more general, information on fishing activities in the project area.

Comment 26. Doug Robison (WDFW) said that he had located the tributary delta habitat study on the relicensing website. Al Solonsky (SCL) said that it wasn't intuitive that you had to scroll down on the website to see other documents/studies.

Mainstem Aquatic Habitat Modeling

After finishing the discussion of the WDFW comment letter, Phil Hilgert (R2) went through a general presentation of how the aquatic habitat model incorporates field data to describe the effect of pool level fluctuations on biological organisms in the varial zone. Phil Hilgert (R2) drew an example transect on the board and described how the model would describe habitat conditions for each hour. Phil Hilgert (R2) described how data would be collected for each cell along a transect under a given set of conditions, and that values for cells would be used to derive a value for each transect. Phil Hilgert (R2) showed a photograph of the upper reservoir and pointed to one side of the river with thick macrophyte beds and the other side devoid of macrophytes. Meeting participants noted that differences were probably due to high velocities on one side of the river. Phil Hilgert (R2) then described how the model could determine these types of differences since velocity, depth and substrate are modeled parameters. Phil Hilgert (R2) discussed how cells along a particular transect could be analyzed to assess effective spawning area. For instance, smallmouth bass spawning could be analyzed and an index of effective spawning area could be developed for the entire reservoir for each operational scenario.

Joe Maroney (KT) asked if the selection of transects was an activity where stakeholders would be able to participate. Al Solonsky (SCL) said it was.

Joe Maroney (KT) added that it would be good if the model could not only incorporate dewatering of smallmouth bass redds, but also redds that are impacted by higher water surface elevations that could crush eggs. Phil Hilgert (R2) said it could and described how biological information is incorporated into the HSI curves. Phil Hilgert (R2) explained that the indices, such as those for smallmouth bass spawning, can't specify exactly how many redds would exist under each scenario, but the indices would be useful in comparing scenarios. John Whalen (WDFW) asked if the model could also incorporate temperature as a parameter. Phil Hilgert (R2) responded that the aquatic habitat model does not include temperature as a model parameter, but that water quality was being modeled by a separate process by the Water Quality Workgroup. Water temperature could be incorporated in the physical habitat model through life stage periodicity. Additional opportunities to incorporate the results of the Water Quality Workgroup's water temperature model into the physical habitat model could be considered during development of the model in 2008.

Referring to zooplankton sampling, Doug Robison (WDFW) said that he wanted to make sure that zooplankton sampling would identify the effects of hourly operations rather than just seasonal changes. Jason McLellan (WDFW) added that he wasn't sure that the seasonal zooplankton sampling was frequent enough to identify changes in zooplankton abundance. Phil Hilgert (R2) described the proposed monthly zooplankton sampling in littoral and deep-water habitats during May through September and November. He also noted that separate zooplankton samples would be collected every two hours on a seasonal basis to identify potential effects of hourly Project operations.

Doug Robison (WDFW) said that he didn't have many comments on the studies proposed for biotelemetry or distribution and abundance, primarily because more specifics were needed. So far, he was satisfied with the study outlines. Doug Robison (WDFW) said that he appreciated frequent meetings, like this one. Al Solonsky (SCL) said it was SCL's plan to communicate and work closely with stakeholders, and suggested Doug call Barbara Greene (SCL Boundary Relicensing Manager) if he had recommendations for more F&A meetings.

The meeting adjourned at noon

Paul Pickett (WDOE) emailed Tarang Khangaonkar (Battelle):

>>> "Pickett, Paul" <PPic461@ECY.WA.GOV> 10/11/2006 12:06 PM >>>
Unfortunately it looks like you are getting ahead of the rest of us right now. There are three areas I am trying to provide: tributary input flows and temperatures, point source flows and temperatures, and mainstem vegetative shade. For the NTP or system potential runs we need system potential temperatures for the tributaries and shade for the mainstem. I am working on these (with the help of an intern) but it will take some time to get them completed as I juggle this work with other priorities I have.

I think the best approach right now would be to provide us with a draft of the calibrated model and the support documentation so we can evaluate how this is proceeding so far. This can be considered something like a "Phase 1" 90% draft report, i.e. write up what you've done so far and then you can add to it later when more results are in. This draft should also include your monitoring data, the QA analysis of that data, and the QA analysis of model calibration.

What I'm envisioning is that once we've given you comments on this Phase 1 90% draft (you are welcome to call it something else), then hopefully you will also have most of the other missing inputs and can check that the calibration still looks good with those additions.

Once we have the calibration in good shape, we can look at the NTP/system potential runs, which also be happening for Box and ID.

I think this is consistent with our discussion at the last conference call.

If we need to discuss this more, let me know.

Paul

From: Khangaonkar, Tarang P [mailto:tarang.khangaonkar@pnl.gov]
Sent: Wednesday, October 11, 2006 10:10 AM
To: Scott Wells
Cc: annearr@cecs.pdx.edu; Breithaupt, Stephen A; Pickett, Paul; Christine Pratt
Subject: FW: NTP model data

Scott,

We mentioned during our call last month that calibration of the Boundary Reach of the Pend Oreille River temperature model is nearly complete. This e-mail is enquire if model runs corresponding to NTP or System Potential conditions have been conducted in the Idaho Reach, and in the Box Canyon Reach. Our plan is to utilize the output at Box Canyon Dam to generate the no-dam condition in the Boundary Reach.

Could you please let us know the status of these model runs and when output may become available for use?

Thanks

- Tarang

From: Breithaupt, Stephen A
Sent: Wednesday, October 11, 2006 9:55 AM
To: PPic461@ECY.WA.GOV

Cc: Christine.Pratt@Seattle.Gov; Khangaonkar, Tarang P
Subject: NTP model data

Paul,
As Tarang said in his voice mail, I am following up on our request for model inputs for the NTP run of the Boundary Reach. The two pieces of information we need are the vegetative shade and the temperature and flow output from the Box Canyon reach for the NTP condition. If you can provide the information, it would be greatly appreciated.
Thanks!
~Steve

Stephen A. Breithaupt, Ph.D.
Senior Scientist
Coastal and Water Resources Modeling Group
Pacific Northwest National Laboratory
Battelle - Seattle Research Center
1100 Dexter Ave. N, Suite 400
Seattle, Washington 98109
Phone: 206-528-3058
Fax:206-528-3552

From: "Barbara Greene" <barbara.greene@Seattle.Gov>
To: "Thomas H Shuhda" <tshuhda@fs.fed.us>
Cc: "Glenn Koehn" <gkoehn@fs.fed.us>; "Karen Demsey" <kdemsey@longviewassociates.com>; "Christine Pratt" <Christine.Pratt@Seattle.Gov>
Sent: Friday, October 13, 2006 11:28 AM
Attach: Barbara Greene.vcf
Subject: Re: 9.22 Toxics conf call_draft summary

Thanks Tom. We'll include this letter in our consultation record for the Revised Study Plan. We'll talk more about the toxics PSP at the November 15 study plan meeting.

Cheers,
Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

>>> Thomas H Shuhda <tshuhda@fs.fed.us> 10/13/2006 11:01 AM >>>
Thank you, Barbara. The new version does characterize our concern.

Tom Shuhda
Forest Fish Biologist
Colville National Forest
509 684-7211

"Any society that would give up a little liberty to gain a little security
will deserve neither and lose both." - Benjamin Franklin

"Barbara Greene" <barbara.greene@Seattle.Gov> 10/13/2006 10:36 AM

To: "Thomas H Shuhda" <tshuhda@fs.fed.us>

cc:

"Glenn Koehn"
<gkoehn@fs.fed.us>,
"Christine Pratt"
<Christine.Pratt@Seattle.Gov>

Subject
Re: 9.22 Toxics conf call_draft

summary

Tom,

Sorry to have not characterized your concern correctly. Am I correct in the revised version (attached)?

Thanks,
Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

>>> Thomas H Shuhda <tshuhda@fs.fed.us> 10/13/2006 9:03 AM >>>
I have reviewed the notes from our conference call. I think you captured
everything except one point which I brought up and thought that I had made
clear. In your notes you have that "Tom stated that he would like to see

additional language added to the study plan stating that if in the course
of sampling in the reservoir, any sample results exceed public health
standards, game fish tissue will be sampled." This is accurate. We do
want to see another step in your plan that details what SCL will do if
health standards are exceeded. What I thought that I also conveyed is
that the Forest Service does not consider SCL's presently proposed study
plan to be adequate in addressing the Forest Service issue concerning any
health risks to the public that uses National Forest lands within and
adjacent to the project boundary. I think it needs to be clearly stated,
in your notes, that we do not accept the plan in its present form due to
this missing step.

Tom Shuhda
Forest Fish Biologist
Colville National Forest
509 684-7211

"Any society that would give up a little liberty to gain a little security
will deserve neither and lose both." - Benjamin Franklin

"Barbara Greene"

<barbara.greene@S

eattle.Gov>
To
"Glenn Koehn"
<gkoehn@fs.fed.us>,
10/09/2006 08:45 "Tom Shuhda"
<tshuhda@fs.fed.us>

AM
cc
"Barbara Greene"

<barbara.greene@Seattle.Gov>,

"Christine Pratt"

<Christine.Pratt@Seattle.Gov>

Subject

9.22 Toxics conf call_draft

summary

Tom, Glenn,

Attached is a summary of our Sept 22nd discussion of the toxics study. Please let me know if you have suggested edits, points of clarification,
etc. After we finalize the attached meeting summary, it will be added to Seattle City Light's consultation record for the Revised Study Plan next February because I did not make the deadline for the consultation record for the Proposed Study Plan.

In response to Tom's concern raised in this conference call for additional language on the sampling of game fish: after further thought
and discussion we have determined that it is difficult now to make a definitive statement in this proposed toxics study plan. It remains unknown as to which media (fish, sediment, water column, etc.) will be targeted for sampling; where; for which toxicants; and utilizing which laboratory methodology. As we learn more about the conditions of any toxicants in Boundary Reservoir, through the efforts described in Phase
1 of the toxics study plan, we will be better informed and better equipped to develop specific next steps in this process. At the completion of Phase 1 of the toxics study plan, we may learn that sampling target fish tissue for specific toxicants (i.e., those which can bioaccummulate in fish tissue), and/or sampling target river-bottom
sediments in specified locations will become part of Phase 2 of this study plan. The specifics on a sampling plan remain unknown until we retain an expert in the area of toxics. We have advertised an RFP for

a
team of consultants to perform all the studies in the PSP, noting that SCL needs an expert in environmental chemistry and toxicology.

Thanks,
Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

(See attached file: USFS conf call_ 9 22 06 revsd 10 9 06.doc)(See attached
file: Barbara Greene.vcf)
(See attached file: USFS conf call_ 9 22 06 revsd 10 13 06.doc)(See attached file: Barbara Greene.vcf)

Boundary Project Relicensing
Seattle City Light - US Forest Service Conference Call
September 22, 2006
10:30 AM - 11:30 AM

Participants
Glenn Koehn – U. S. Forest Service (USFS) - for first part of conference call
Tom Shuhda - USFS
Barbara Greene - Seattle City Light (SCL)
Christine Pratt - SCL

Purpose of Call
The purpose of this conference call was to discuss the SCL response to the USFS comments (dated August 31, 2006) on the SCL revised toxics study plan. The Water Quality Study Plans, one of which was the toxics study plan, were developed in collaboration with stakeholders over the spring and summer of 2006 through a series of stakeholder workgroup meetings (May, June, July and August). After SCL's receipt of stakeholder comments on the study plans (by September 1, 2006), Christine Pratt arranged a date & time to meet on the phone with USFS staff to discuss the SCL response to the USFS comments. The goal was to ensure clear understanding of SCL's revised study for toxics in the Proposed Study Plan (PSP), identify the differences in the study plan submitted by USFS, and seek agreement on an approach that would be satisfactory to both. Christine stated that the PSP would be available for review by stakeholders on October 16, 2006.

Introduction
Tom Shuhda asked if there would be a written summary of the conference call discussion and Barbara Greene acknowledged that SCL would write a meeting summary and forward it to both Tom and Glenn for review. This written summary will prove helpful to FERC as they compare SCL's proposed toxics study plan to the study requests made by the USFS.

Christine Pratt began the discussion by acknowledging SCL's appreciation for Tom's constant and committed involvement in our study planning process with stakeholders in 2006. She stated SCL looks forward to continuing to work with Tom on finalizing the study plans for 2007-2008.

Discussion of Toxics Study Plan
Christine began the discussion by stating that 4 different approaches for the toxics study plan were presented by the 4 different entities submitting comments. Christine said this seems to indicate there is not clear agreement on how to proceed with this study plan. Barbara stated that almost all the basic components of the study plan approaches presented are included in the SCL study plan, but plan components may occur in different orders.

Christine emphasized a change in the toxics PSP regarding sampling. While earlier study versions discussed at work group meetings referenced sampling as a possible outcome, the Phase 1 study plan in the toxics PSP clearly states that sampling will occur. Specifically, the toxics PSP states in Objective 6: "Develop an appropriate sampling plan for the toxics of concern (Phase 2 of the overall toxics evaluation) that focuses on conditions specific to Boundary Reservoir".

Further, Christine acknowledged that at this stage in the study planning process, SCL believes the concerns expressed by the USFS in their comments will be addressed as the toxics study is implemented. But SCL needs to retain a technical consultant with a higher level of toxics

expertise, and develop a site-specific assessment of the subject area in order to develop a well-designed, scientifically sound study plan. SCL plans to have this expertise when the technical consultants are hired to perform the studies in the PSP. Christine stated that there would continue to be opportunities for the USFS and other stakeholders to participate in further development of this proposed study plan, including the next meeting with stakeholders scheduled for November 15, 2006.

Barbara noted that one difference between the toxics PSP and the USFS proposed study plan for toxics was that the sampling techniques identified in the PSP did not include bioassays because SCL does not have the expertise to conclude this is necessary. She went on to say this does not mean SCL will not consider bioassays or any other technique, but that SCL will follow the recommendations of the technical consultant hired to perform the study. Tom stated he didn't think the study should exclude any sampling techniques.

Christine stated that with the collective knowledge provided by stakeholders through workgroup discussions and written comments, and the technical guidance provided by SCL staff and their relicensing consultant, SCL believes the toxics study plan in the PSP make the best sense right now and SCL plans to proceed with this approach.

Tom stated that identifying when sampling would occur is not the critical factor for him, even though the timing of sampling is presented differently in the USFS and toxics PSP. Instead, Tom stated that sampling of game fish tissue is a prime interest, and this is stated in the opening paragraph of the USFS comments ("Fish tissue should be sampled from all game fish in the reservoir"). Tom stated that he would like to see additional language added to the study plan stating that if in the course of sampling in the reservoir, any sample results are found to exceed public health standards, that game fish tissue will be sampled. Tom stated that the Forest Service does not consider SCL's presently proposed study plan to be adequate in addressing the Forest Service issue concerning any health risks to the public that uses National Forest lands within and adjacent to the project boundary. Tom stated that the Forest Service wants to see another step in the toxics PSP that details what SCL will do if sampling shows that health standards are exceeded. Without such additional language, Tom stated the Forest Service would not accept the plan. Barbara stated that SCL would consider this request and provide a response.

The discussion ended with mutual recognition of the importance of the nexus to the Project.

Tarang Khangaonkar (Battelle) emailed Christine Pratt (SCL), Ed Connor (SCL), Paul Pickett (WDOE), Marcie Mangold (WDOE), Jon Jones (WDOE), and Steve Breithaupt (Battelle):

>>> "Khangaonkar, Tarang P" <tarang.khangaonkar@pnl.gov> 10/31/2006 11:40 AM >>>
A conference call was initiated by Seattle City Light and held on October 30, 2006 with attendees from Seattle City Light, Washington Department of Ecology, and Battelle staff.

The purpose of the conference call was to discuss Seattle City Light questions on the Temperature TMDL, specifically: a) what Ecology's expectation is for the requested "Calibration Report", b) when SCL might expect the Box Canyon PUD input data for the Boundary model, related to Ecology's anticipated completion date for the input of vegetative shade and tributary data to the model and c) discussion of the 401 model runs.

Those in attendance were:

Christine Pratt & Ed Connor (Seattle City Light)
Paul Pickett, Marcie Mangold, Jon Jones (Washington Department of Ecology)
Tarang Khangaonkar & Steve Breithaupt (Battelle)

Paul requested that we address the issues in the following order.

(2) Ecology's anticipated date for the completion of vegetative shade and tributary data input and the Temp TMDL schedule - Paul pointed out that the Ecology schedule for completion of the modeling for Pend Oreille River TMDL is March 2007 (per the June 2005 Workplan developed by the Interstate Temp TMDL modelers' group) . Considering this deadline, nearly 5 months away, there is sufficient time to complete the data input in a timely manner. Paul expects to give this data input a top priority over the next month or so. He did not think that there is a rush to get the modeling completed by the end of the year, unless it was dictated by FERC requirements. Christine clarified that any FERC requirement associated with the filing of the 401 certification application with Ecology is many, many months away and the March 2007 modeling time frame is well within any FERC filing deadline.

(3) Ecology's request for a SCL calibration report - Paul clarified that his comments regarding the request for a calibration report might have been misinterpreted. There is no procedural requirement for a separate model calibration report. However, Paul is interested in ensuring that data input, data quality, model setup, and model calibration is in line with the requirements specified in the QAPP document for the Pend Oreille River TMDL. Tarang clarified that the report envisioned as the final product of this study would be one document containing data summary, model input, model setup, calibration, model application - NTP, and model application - 401 runs, and results and conclusions. Tarang also pointed out that the work completed to date on Boundary model calibration is being summarized in the form of a Power Point presentation for the study plan meeting in Spokane on November 15, 2006. Paul confirmed that the Power Point presentation may be adequate for his needs now. If necessary, Paul would make requests for additional information, such as data QA report, etc. The conclusion of this discussion was that SCL will not produce a separate model calibration report at this time, but instead SCL will make the data summaries and modeling results available through the Power Point presentation format for Ecology's review.

Paul asked if SCL had plans to use the CE-QUAL-W2 model for other water quality parameters, such as pH and milfoil. Christine stated that SCL has developed study plans for pH and milfoil for the upcoming 2-year study season (2007-2008) and use of the CE-QUAL-W2 model for other water quality parameters is not anticipated at this time. However, SCL is aware of the model capabilities in this regard.

(1) Details specific to 401 issues - Not discussed at this time, as any discussion prior to NTP calculations and compliance evaluation would be considered premature.

Other miscellaneous topics discussed were as follows.

- NTP (natural thermal potential) examination was briefly discussed by Paul and Christine. This will involve model analyses of the river system, making model runs "with" and "without the project" in order to evaluate human impacts.

- Christine would like to develop a timeline highlighting all key dates and activities for both the 401 certification application process (as relates to the FERC license application process) and the temperature TMDL underway now. Paul has an example of such a timeline that he will forward to Christine.

- Christine asked when the Box Canyon input data will be available for the Boundary model. Paul said it depends on PSU's (Portland Sate University) schedule and that he will keep us posted.

- Paul will send a copy of his temperature modeling presentation to the WAG (TMDL Water Advisory Group) in Sandpoint, Idaho on October 26, 2006.

- We also briefly discussed the schedule for the meeting on November 15th where Tarang will present model results. Paul is planning to attend that part of the meeting.

- Tarang

TRIP REPORT

DATE: November 9, 2006

TO: Sung Yang, Steve Kern, Peggy Duxbury

FROM: Barbara Greene, Lisa Rennie

SUBJECT: Meetings with Pend Oreille County Commission and Pend Oreille PUD Commission

Pend Oreille County Commission:

Barbara Greene and Lisa Rennie attended the October 31 Pend Oreille County Commission meeting. Commissioners Dean Cummings and Ken Oliver were in attendance. Commissioner Mitch Brown, who lost his primary election bid, was absent and will no longer be a commissioner beginning January 1, 2007. His replacement will be elected on November 7th.

The relicensing update focused on the recent (October 16, 2006) filing of the Proposed Study Plan and the 24 studies described in the document. Barbara provided the commissioners with a handout describing the 24 studies and discussed the primary unresolved study issue relating to the toxics study methodology. She also reviewed the upcoming timeline for relicensing, focusing on FERC's 90 day comment period for the Proposed Study Plan. Comments can be filed by anyone until January 15, 2007. The commissioners requested an updated schedule of relicensing activities.

The commissioners asked follow-up questions on the toxics and wood transport studies, however the focus of their comments and questions related to milfoil. Barbara explained that the milfoil study will evaluate the various methods available to combat milfoil. Commissioner Dean Cummings also asked why SCL doesn't participate in the Tri-State Water Quality Council, a partnership of organizations, including Pend Oreille PUD, Kalispel Tribe, Pend Oreille Conservation District, working on Pend Oreille water quality issues. Commissioner Cummings also said that he intends to push for more recreation use of the Boundary reservoir, mentioning the need for a trail system around the reservoir and the Commissions work to open up and improve connectivity for quad use. Barbara said these issues will be the subject of the land and access study.

Lisa reported that SCL wants to ensure that non-FERC jurisdictional issues, such as renegotiation of the impact fee agreement and assistance requests, are coordinated and addressed by utility. Lisa said that as a starting point, SCL's Chief of Staff and Director of Government and Legislative Affairs would like to meet with commissioners to review the terms of the current agreement and begin discussions on a new agreement. A tentative date of Spring 2007 was identified.

What We Learned:

- The County put together a package of funding from local, state, and federal sources for the purchase of a new AquaMog for milfoil control on the Box reservoir. The federal money is no longer available and the Commission is looking for financial assistance from sources such as SCL.
- Impact Payments: Last year our impact payment fee payment was mistakenly sent to Pend Oreille County PUD. Under a new agreement the County may be interested in quarterly payment rather than the single payment they now receive at the end of year. Since the County's budget process starts in earnest in October, they would like to begin talks on the new agreement this spring. Tom Metzger, Pend Oreille County Prosecutor, was involved in the previous agreement's negotiations and will likely participate again.
- The commissioners were pleased with the report and asked that Lisa and Barbara continue the quarterly visits to keep them apprised of Boundary relicensing activities.

Pend Oreille County PUD:

Barbara Greene and Lisa Rennie attended the Pend Oreille PUD Board of Commissioners meeting on October 31 to brief them on Boundary relicensing activities. Commissioners Dan Peterson (President), Curt Knapp (Vice –President), and Ken Hirsch (Secretary) were in attendance. They were joined by key staff including, Bob Geddes (General Manager), John Jordan (Financial Officer), and Mark Cauchy, (Director Regulatory & Environmental Affairs). A representative of Penderay Newsprint covered the meeting.

What We Learned:

- The PUD would like to remain in close contact regarding the turbine upgrade at their Box Canyon Dam, a condition of their new FERC license to operate the dam. They are concerned that any alternative operations at Boundary could affect the tailrace of Box Canyon dam thereby reducing head and power production --all of which would have a bearing on the selection of their new turbines. Barbara suggested SCL generation engineers should be in contact with PUD staff about this.

- The PUD is evaluating whether they should intervene in the Boundary relicensing process regarding the continuation of Article 49 in the next Boundary license, in accordance with the 2000 MOA between the City of Seattle and the PUD. The Commission asked for City Light's reaction and thoughts on whether this is something they should do and, if so, the appropriate timing. Barbara and Lisa said they would take this issue back to senior management.

- The PUD is interested in how SCL will respond to Initiative 937 if it passes, .as they will have some amount of incremental efficiency available from their turbine upgrades which SCL may be interested in purchasing to help met the requirements of a state RPS. Lisa said that SCL's IRP takes into consideration external polices such as a state RPS and that their request would be passed on to the IRP Manager.

- The commissioners asked if City Light had interest in the PUD's Sullivan Creek dam as an off-site mitigation measure for fish protection. The FERC license to operate Sullivan Creek dam will expire soon and the PUD recently filed a brief with FERC alleging no new license is required because it provides storage for Lake Sullivan and does not provide any generation. If FERC agrees, the dam could stay in place and continue to provide storage and recreation for the Sullivan Lake area. Barbara responded that it is too soon for City Light to discuss mitigation measures, but would keep the PUD's offer in mind.

Follow Up

- Barbara Greene has sent the County Commissioners a timeline outlining upcoming key dates and meetings related to Boundary relicensing.

- Mike Haynes will contact the Pend Oreille PUD regarding any discussion of their new turbines.

- Pend Oreille PUD will have the opportunity of deciding whether to file as an intervenor in the Boundary relicensing proceeding in 2009 following FERC's notice of receipt of City Light's formal license application. If the PUD did file, it would afford them formal notice from FERC of all actions related to the Boundary relicensing proceeding, including status to intervene in any appeals that may arise. This decision is several years away and is largely a decision by the PUD.

C O M M U N I C A T I O N S R E C O R D

DATE: November 1, 2006

TO: Consultation file

FROM: Glenn Hartmann (WSHS)

SUBJECT: Telephone conversation with Rob Whitlam (Department of Archaeology and Historic Preservation)

I called Rob Whitlam (Department of Archaeology and Historic Preservation) to enquire about procedures for documenting non-National Register-eligible historic properties. Specifically, my question was, “Should we fill out NRHP determination of eligibility (DOE) forms for all sites within a project APE; or, is it sufficient to assert that certain sites are not eligible?” Rob replied that there is a form that the National Park Service has developed for other projects and suggested we might want to look at it. For projects on federal lands, a federal land manager indicates on the form that a site is not NRHP-eligible. This form is then appended to the site form that is filed at Department of Archaeology and Historic Preservation (DAHP). For sites on non-federal lands, the project manager (or designee) for the FERC-licensed project provides the same certification. For NRHP-eligible sites, DAHP would complete a NRHP DOE form.

Seattle City Light ***FINAL***
Boundary Project Relicensing
SCL – BC Hydro Conference Call
November 1, 2006
11:00 AM – Noon

Participants

Harry Brownlow (BC Hydro) - BCH
Gary Birch (BC Hydro) - BCH
Barbara Greene (Seattle City Light) - SCL
Kim Pate (Seattle City Light) - SCL
Al Solonsky (Seattle City Light) - SCL

Objective

Kim Pate (SCL) arranged the conference call to discuss the Seattle City Light (SCL) relicensing process for the Boundary Hydroelectric Project, the relicensing schedule and plans to conduct studies downstream of Boundary Dam, in BC Hydro's Seven Mile Reservoir.

Boundary Relicensing Overview

After introductions, Kim Pate (SCL) provided an overview of the Federal Energy Regulatory Commission (FERC) relicensing process and relicensing schedule for the Boundary Hydroelectric Project. Kim Pate (SCL) said that studies would occur in 2007 and 2008, the license application would be filed in 2009, and a new license would be obtained in 2011 when the existing license expires. Kim Pate (SCL) said that study designs had been posted on SCL's relicensing website in a document called the Preliminary Study Proposal (PSP). Harry Brownlow (BCH) said that he had briefly scanned the PSP and Gary Birch (BCH) said he was familiar with the entrainment and connectivity parts of the PSP.

Timing

Barbara Greene (SCL) explained that the license application to be filed with FERC in 2009 will include protection, mitigation and enhancement (PM&E) measures proposed by SCL to operate the project over the next license term. Gary Birch (BCH) explained that the timing of the Boundary license application coincides nicely with BC Hydro's schedule for updating the Water Use Plan (WUP) for the Seven Mile Project. Harry Brownlow (BCH) said that BC Hydro will definitely want to know what changes are proposed. Kim Pate (SCL) explained that SCL is planning to look at various operational scenarios and BC Hydro is welcome to participate in SCL's relicensing process where these scenarios will be discussed. Gary Birch (BCH) said that the documentation developed in the Boundary relicensing process will be valuable for the Seven Mile WUP.

Fisheries Studies

Gary Birch (BCH) mentioned that BC Hydro expects to receive approval of the WUP in November 2006 and the telemetry studies on the Salmo River are expected to occur in spring 2007.

Al Solonsky (SCL) described the studies that SCL is planning to conduct in the Seven Mile Project area. Al explained how the studies would help understand relationships between operation of the Boundary Project and aquatic resources in the Boundary tailrace reach. Al described three main study components:

1) a bathymetric survey from the US/Canadian border to Seven Mile Dam,
2) habitat transects and modeling from the US/Canadian border to the confluence of Red Bird Creek (with possible collection of supporting biological information), and
3) installation and monitoring of stationary biotelemetry receivers.

Gary Birch (BCH) said that this information would be useful when BC Hydro goes through the next water use planning process. Gary Birch (BCH) said that it would be good to work cooperatively with SCL on these studies and BC Hydro would be able to help SCL work with property owners in Canada. Gary Birch (BCH) said that SCL might consider contacting Canadian provincial and federal agency biologists to see if they have comments on SCL's study plans in Canada. Al Solonsky (SCL) said that Canadian agencies and first nations are on relicensing mailing lists and have been invited to meetings. Barbara Greene (SCL) said that SCL would be interested in talking to them if they do have comments so a letter may be a good idea. Al Solonsky (SCL) agreed to write letters and Gary Birch (BCH) said that he would provide contact information. Gary Birch (BCH) said that he was meeting with fishery agency biologists in a few days and he would mention the relicensing studies that SCL is planning to conduct in Canada.

Al Solonsky (SCL) asked if BC Hydro had any bathymetric data that might meet SCL's needs for hydraulic analysis and habitat modeling. Gary Birch (BCH) said that bathymetric data in Seven Mile was very limited and only rudimentary data were available for some shallow areas near Salmo River. Gary Birch (BCH) said that new, detailed bathymetric data around the Salmo River would be valuable. Gary Birch (BCH) added that it would also provide BC Hydro with a better storage curve. Al Solonsky (SCL) asked if BC Hydro would be interested in partnering in the study. Harry Brownlow said that he would look into the value of the information for BC Hydro, but he was not sure if detailed bathymetric data would help much with operations. Harry Brownlow (BCH) said that they could help in other ways, like logistics.

Wrap-up

Harry Brownlow (BCH) thanked SCL for copying BC Hydro on relicensing information. Barbara Greene (SCL) asked BC Hydro to make sure to ask if there was interest in any additional information.

The meeting adjourned at noon

From: Barbara Greene
To: Hurst, Don
Date: 11/3/2006 11:16:07 AM
Subject: Re: study request?

Don, Patti -

We determined that the appropriate response to your study was to incorporate comments in the PSP clarifying our intent to conduct sediment sampling if it is identified as the appropriate medium through which to evaluate toxics in the reservoir after on-site verification of the results of the Phase 1 sediment deposition analysis.

Please see Sec. 3.3.8. Consultation with Agencies, Tribes, and Other Stakeholders in the PSP, excerpted below.

"Stakeholders' comments on the PAD, FERC's Scoping Document 1, and SCL's proposed study program were submitted to FERC on or before September 1, 2006. Following review of these comments, SCL revised the Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus study plan to clarify the intent and goals of the overall approach to toxics assessment in Boundary Reservoir. The Project Nexus section of this study plan was revised to reflect that Phase 1 is being conducted to develop an understanding of the connections between the toxics of concern and Project operations, and to design an appropriate Phase-2 toxics sampling program for the reservoir. Similar revisions were made to the Study Goals and Objectives, Need for Additional Information, Proposed Methodology, and Work Products sections of this study plan. In its PAD/Scoping comments, Ecology asked whether SCL planned to conduct field verifications of the results of its Phase 1 sediment deposition analysis (Ecology 2006). SCL does not intend to conduct field studies to "ground-truth" the results of the Phase 1 sediment deposition analysis. Rather, if sediment sampling is identified as the appropriate medium through which to evaluate toxics in the reservoir, on-site verification of the results of the Phase 1 sediment deposition analysis may be required as part of the Phase 2 study.

Please let me know if you have further questions. I hope to see you at the study plan meeting November 15 in Spokane, details on our webpage at http://www.seattle.gov/light/News/Issues/BndryRelic/default.asp

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

>>> "Don Hurst" <don.hurst@colvilletribes.com> 11/2/2006 4:18 PM >>>
Barbara,

Within the PSP were several sections that presented SCL's rationale for not adopting specific studies requested by agencies, tribes, or other stakeholders. However, there was no PSP discussion of SCL's rationale for not adopting the sediment study requested by the Colville Tribes as part of the water resources study plans. FERC confirmed electronic submittal of our study plan on 9/1/2006, the deadline for submission. So we're wondering, what's up?

Don Hurst

CC: Bailey, Patti; Filbert, Randall; Greene, Barbara; Padula, Steve; Pratt, Christine

Seattle City Light

Memorandum

DATE: November 17, 2006

TO: Consultation file

FROM: Barbara Greene, SCL

SUBJECT: Phone call with Tom Shuhda, USFS-Colville NF

Barbara called Tom Shuhda (USFS) to inquire if he had contacted EPA about the Josephine Mine, because EPA stated they intended to name SCL as the only PRP in a clean up of the site. This led to discussion of the toxics study. Tom offered verbal language that Barbara asked him to send to her as a possible way to resolve the disagreements over the toxics study. He agreed to do that.

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Monday, November 20, 2006 8:56 AM
To: Tom Shuhda
Cc: Barbara Greene
Subject: Toxics study

Attachments: PSP_Phase 1 Toxics Assessment.doc; Barbara Greene.vcf


PSP_Phase 1 Toxics Assessment....


Barbara Greene.vcf (306 B)

Tom,

Per our discussion on Friday Nov 17, attached is the word version of the Toxics PSP. Please use the track change feature to identify what changes you suggest.

Thanks,
Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

From: Thomas H Shuhda [tshuhda@fs.fed.us]
Sent: Wednesday, November 22, 2006 9:02 AM
To: Barbara Greene
Subject: Re: Toxics study

Got it, Barbara. I am planning on working on it today and friday. I will have to pass it on for review and comment by my betters next week since everyone will be off for the holiday before then. I would anticipate having it to you by December 1st at the very latest; November 27th at the earliest. I understand your time crunch but this is the best I can do.

I hope you have a nice holiday with family and friends away temporarily from the stresses of your job.

Tom Shuhda
Forest Fish Biologist
Colville National Forest
509 684-7211

"Any society that would give up a little liberty to gain a little security will deserve neither and lose both." - Benjamin Franklin

Seattle City Light

Memorandum

DATE: November 24, 2006

TO: Consultation file

FROM: Barbara Greene, SCL

SUBJECT: Phone call with Marcie Mangold, WDOE

Barbara called Marcie Mangold (WDOE) to inquire whether the toxics study plan in the PSP was still acceptable to her. Marcie reiterated what she stated at the November 15, 2006 study plan meeting, that SCL's toxics study in the PSP was acceptable to WDOE.

From: Mary Pat DiLeva [marypat.dileva@Seattle.Gov]
Sent: Wednesday, November 29, 2006 2:19 PM
To: Mary Verner; Rob Masonis; Brett Swift; Thomas O'Keefe; Steve Padula; Maureen DeHaan; Kathy Bowie; Vladimir Plesa; Eric Weiss; Gary Birch; Harry Brownlow; Paul Vassilev; Diane Stutzman; Richard Bailey; Lori Blau; Paul Machtolf; Steve Skeels; Greg Vaughn; Sharon Sorby; Dermot Randles; Bill Green; Alfred Nomee; Quanah Matheson; Judy McQuary; Lea Dreher; Llewellyn Matthews; Victor Jmaeff; Bill Towey; Don Hurst; Joe Peone; Patti Bailey; Sheri Sears; Emily Andersen; Terry Turner; Allyson Brooks; Rob Whitlam; Bao Le; Ed Tulloch; Paul Szewczykowski; Jason McLellan; Doug Robison; Curt Vail; Loyce Akers; Paul Hohlt; Jim Carney; Daniel Millar; David Knight; Marcie Mangold; Jim Bellatty; Jon Jones; Jean Parodi; Jaime Short; Chuck Everett; Colleen McShane; Christine Psyk; Helen Rueda; Donald M. Martin; Richard Raymond; David Turner; Frank Winchell; Betty Higgins; Diana Sieh; Debbie Wilkins; Glenn Koehn; Kathy Ahlenslager; Lucy Wilson; Jann Bodie; Mike Gerdes; Rod Bonacker; Steve Kramer; Tom Shuhda; Dan Trochta; Julie Campbell; Rich Torquemada; Rick Donaldson; Colin Spence; Kathy Eichenberger; G. Henry Ellis; Roger Simmons; Rebecca Sherman; Jim Eychaner; Deane Osterman; Floyd Finley; John Gross; Joe Maroney; Kevin Lyons; Michelle Wingert; Ray Entz; Kevin Greenleaf; Jennifer Porter; Randall Filbert; Susan Hurley; Marcelle Lynde; Keith Kirkendall; Mark Schneider; Joan Harn; Stephanie Toothman; Susan Rosebrough; Jeff King; Stacy Horton; Tony Grover; Lawr Salo; Kevin Devitt; Jayson Kurtz; Bruce MacDonald; Louise Porto; Jim Harris; Chris Mylar; Dean Cummings; Jim Marthaller; Mitch Brown; Ron Curren; Andre Coleman; Bob Johnson; Don Comins; Evelyn Reed; Joe Onley; Mark Cauchy; Pat Buckley; Scott Jungblom; Judy Ashton; Lonnie Johnson; Faith McClenny; John Halterman; Meg Decker; Dirk Middents; Matthew Wells; Will Stelle; Mary Lou Keefe; Phil Hilgert; Diane Williams; Ruth Watkins; Al Solonsky; Alec Fisken; Barbara Greene; Carol Butler; Christine Pratt; Doug Rough; John Halliday; Jan Drago; Kim Pate; Lisa Rennie; Lonnie Johnson; Mary Pat DiLeva; Michele Lynn; Michael Mann; Tom Van Bronkhorst; Nancy Lotze; Randy Abrahamson; Gerry Nellestijn; Bill Duncan; Dave Godlewski; Kevin Kinsella; Jeni Forman; Fayette Krause; Kaitlin Lovell; Jeff Laufle; Marian Valentine; Mike Egge; Carol Graham; Cindy Preston; Kurt Beardslee; Keith Martin; Glenn Hartmann
Subject: Seattle City Light Boundary Relicensing Update

Thanks to all of you who participated in the study plan meeting on November 15th. As a follow up item, City Light agreed to further review new information relayed at the meeting regarding toxics. We are reviewing the information and will communicate about future meetings and/or conference calls next week.

Thanks for your patience. We appreciate your significant contributions to our proposed study plan and look forward to working with you in efforts to resolve outstanding issues.

Barbara

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Thursday, November 30, 2006 4:03 PM
To: Thomas H Shuhda
Cc: Barbara Greene
Subject: Re: Toxics study

Attachments: Barbara Greene.vcf

Barbara Greene.vcf
(306 B)

Tom,

We will work with that timeline, and appreciate whatever thoughts you have on this study.

I have not scheduled any follow up meetings yet because we were not aware of the two reports Don mentioned in the last meeting, and feel we all need the same information before we can have a productive conversation. We have been unable to get one of the two reports, and
appear to be facing some delays from EPA in obtaining it. The report
we are waiting for is the Sept. 2002 report - Ecology & Environment's Grandview, Josephine, and Pend Oreille Mines/Mills Trip Report.

Thanks,
Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

>>> Thomas H Shuhda <tshuhda@fs.fed.us> 11/30/2006 3:48:52 PM >>>
Barbara, I will get you my edits by the cob this coming monday. I am
sorry but there is one reviewer that will not get to it until monday.
I'm very sorry and hope this does not screw up your schedule.

Tom Shuhda
Forest Fish Biologist
Colville National Forest
509 684-7211

"Any society that would give up a little liberty to gain a little security will deserve neither and lose both." - Benjamin Franklin

From: Thomas H Shuhda [tshuhda@fs.fed.us]
Sent: Friday, December 01, 2006 1:51 PM
To: Barbara Greene
Subject: Re: fax

Attachments: removal update 10-3 RonK brief.doc

removal update 10-3 RonK brief...

Barbara, sorry the fax did not go through. Sometimes I think that age has something to do with my less than stellar thought processes but maybe it's just me. I just remembered that I received this electronically rather than in hard copy. Here is the document.

(See attached file: removal update 10-3 RonK brief.doc)

Tom Shuhda
Forest Fish Biologist
Colville National Forest
509 684-7211

"Any society that would give up a little liberty to gain a little security will deserve neither and lose both." - Benjamin Franklin

EPA Removal Program Update on Work in Stevens County and Pend Oreille County, WA (as of 10/02/06)

During the 2001 field work for the Upper Columbia River site, a number of sites were visited and sampled to determine whether they are a potential source of contamination to the Upper Columbia River or its tributaries. The sites were identified to EPA by the Colville Confederated Tribes. Based on the results of the 2001 site visits and sampling conducted, the EPA Region 10 Site Assessment Program referred several sites to the EPA Removal Program for follow up. Below is an update on those sites. All activities have been closely coordinated with DOI, the state, Tribes, and affected landowners.

Stevens County

1. **Bonanza Mill.** A time-critical removal action was conducted by the EPA Removal Program from October through November 2002. This included the placement of a clean barrier to cover exposed contaminated mine waste soils and sediments over approximately 6 acres of the site; reconstructing roughly 450 linear feet of the southeast drainage ditch with a protective barrier and design to mitigate on-site flooding; and reconstructing approximately 150 linear feet of new impoundment berm and riprap along the shoreline to prevent further erosion of exposed contaminated mine waste into the Colville River and to protect the site from flooding events. Topsoil and seed were placed within the riprap to promote revegetation and habitat enhancement. No further work by the EPA Removal Program is anticipated. Earl Liverman, EPA OSC.

2. **Le Roi/Northport Smelter.** A time-critical removal action was conducted by the EPA Removal Program from July through October 2004. The following removal actions were completed:

- 29 residential properties were remediated
- 10,500 tons of contaminated soil was removed from the residential Northport properties to the on-site consolidation area
- over 10,000 cubic yards of contaminated soil was removed from the smelter excavation area to the on-site consolidation area. A wire fence was placed around the 11-acre consolidation area to minimize the likelihood of disturbance to the protective barrier.
- The contaminated soils were covered with a 8-mil reinforced polyethylene cover, 32,000 tons of granular select fill to break the direct contact exposure pathway, thousands of yards of wood waste for biomaterial, and native seed for revegetation of the areas.
- BNSF demolished the remaining smelter stack and remediated the city-leased park and surrounding BNSF property.

No further work by the EPA Removal Program is anticipated. Earl Liverman, EPA OSC.

3. **Anderson-Calhoun Mine and Mill**. A time-critical removal action was conducted by the EPA Removal Program from October through November 2002. Site activities included the characterization, containerization, and proper disposal of hazardous substances, including more than one hundred 55-gallon drums of unknown contents, many PCB-contaminated transformers and other oil-filled electrical equipment, and mining assay laboratory chemicals. While the action addressed the imminent and substantial risks posed by site contaminants, further work was determined necessary. The EPA entered into an Administrative Order on Consent (AOC)with the PRPs in August 2004, for completion of an Engineering Evaluation/Cost Analysis (EE/CA) and payment of future EPA Oversight Costs. The draft EE/CA is expected to be completed within several

months. The EE/CA will be finalized following public comment, and another AOC is anticipated for likely conduct of a PRP-lead removal action during 2007. This is currently a PRP-lead non-time critical removal action. EPA involvement at this site is ongoing as of October 2006. Earl Liverman, EPA OSC.

4. **Cleveland Mine and Mill.** A time-critical removal action was started the week of September 24, 2006. Site stabilization activities include the construction of an earth berm-and-channel to divert upslope runoff from entering the underground mine workings; excavation of the adit No. 3 channel and a nearby mine waste materials pile, which is located adjacent to an unnamed tributary to Hunters Creek; and consolidation of the excavated mine waste contaminated soils and sediments elsewhere on site beneath a protective barrier. Activities also include the collection of sediment samples from the confluence of Hunters Creek and Lake Roosevelt continuing upstream along Hunters Creek at half mile intervals to the Cleveland Mine and Mill site. The data will be used to assess the nature and extent of contamination from the site to Hunters Creek. The site stabilization activities should be completed by mid-November 2006. Earl Liverman, EPA OSC.

5. **Colville Post and Pole.** A time-critical removal action commenced at this site during the week of September 24, 2006 and is projected to finish early November 2006. Prior phase 1 removal actions included the disposal of product, wastewater and sludge, fencing to restrict access around the treatment area and further site characterization work. Some of the Phase 2 removal action activities are to excavate, stockpile, sort, transport and dispose contaminated soil and sediments; demolish process area building and drip pads; cover high use, stressed vegetation, and known contaminated areas with 6 inches clean soil; revegetate; and install additional groundwater monitoring wells to model PCP destination and attenuation in shallow groundwater. Michael Boykin, EPA On-Scene Coordinator.

Pend Oreille County

6. **Pend Oreille Mine and Mill.** Earl Liverman, EPA On-Scene Coordinator visited the site on April 4, 2004. The OSC did not observe any apparent, imminent and substantial threats to human health or the environment that warranted the continued involvement of the EPA Removal Program. The site was subsequently referred to the Washington State Department of Ecology for follow-up regarding the following observations made during the site visit: suspected inadequate waste material container storage areas, improper container management and labeling, failure to cleanup waste material surface spills such as used oil, conduct of a waste rock pile stability assessment because of the proximity of the pile to the Pend Oreille River, and consideration for implementation of stormwater-related best management practices (BMPs). No further work by the EPA Removal Program is anticipated.

For the Pend Oreille County sites identified below, no removal actions have started. The removal assessment and PRP search work has been completed. All three of the sites need some form of removal work. The work required is listed below in order of the site priority:

7. **Josephine Mill #1 (Old Josephine mill)**. This site has mine tailings/mine waste adjacent to a fast moving creek. The levels of heavy metals contamination at this location are very high. The recommended removal work is excavation of the contamination along the creek and stock piling this material in an engineered repository to be located at the mill site. The site will also require drainage control and covering the excavation and repository areas with clean soil caps for stabilization and prevention of off site migration of heavy metals contamination. Carl Kitz, EPA OSC

8. **Josephine Mine (river area)**. This site has mine waste located along the Pend Oreille River with very high levels of heavy metals. Seattle City Light has been identified as a PRP. This site will require removal work consisting of excavation and relocation of the mine waste to a repository away from the river, and replacement of the removed tailings with clean rock to protect the river bank from erosion. Carl Kitz, EPA OSC

9. **Grandview Mine.** This site has high levels of heavy metals in drainage channels which lead to the river. This will require removal work to cleanup the drainage channels, and relocation of waste rock to a secure location.

The next steps for these three sites is notification of the PRPs to see whether they will conduct the required removal work, and the development of Action Memorandum(s) authorizing the cleanup work. The Removal Program anticipates sending notice letters to the PRPs this winter 2006 and developing the Action Memo(s) before summer 2007.

Seattle City Light

Memorandum

DATE: December 1, 2006

TO: Consultation file

FROM: Barbara Greene, SCL

SUBJECT: Phone call with Marcie Mangold, WDOE

Barbara called Marcie Mangold (WDOE) to let her know another version of the toxics study would be available for review after 12/4/06. She noted that she understood that Tom Shuhda (USFS-Colville NF) was continuing to work on some track changes to the previous version of the plan. Marcie relayed that she had seen USFS's red-line comments on the proposed study plan and was concerned that SCL had not yet received them. Barbara responded that she expected to receive comments from Tom Shuhda, but didn't realize he was coordinating his comments with other stakeholders. Marcie offered to forward the current red-line version to SCL for its information.

Seattle City Light

Memorandum

DATE: December 1, 2006

TO: Consultation file

FROM: Barbara Greene, SCL

SUBJECT: Phone call with Tom Shuhda, USFS-Colville NF

Barbara called Tom Shuhda (USFS) to request a copy of a report ("Ecology and Environment's Grandview, Josephine and Pend Oreille Mines/Mills Trip Report", September 2002) that Don Hurst (Colville Tribe) had mentioned at the November 15, 2006 study plan meeting. Tom indicated that he did not have the report in question.

Seattle City Light

Memorandum

DATE: December 1, 2006

TO: Consultation file

FROM: Barbara Greene, SCL

SUBJECT: Phone call with Don Hurst, Colville Confederated Tribes

Barbara called Don Hurst (Colville Tribe) to seek clarity about disagreement on the toxics study. She asked if he could confirm the reports he mentioned at the 11/15/06 study meeting. She reminded Don that SCL had asked stakeholders to offer any additional information they found related to any study. Don responded that we should have found the information already, as he had been raising the issue since May 2006. Don relayed the names of the reports to Barbara, who requested if Don could send the reports to her. Don responded that his copy machine was broken and couldn't get them to SCL until the following week. Barbara asked about the differences in the timing of the sampling in the Tribe's proposed study and SCL's study – approximately 1 month – and asked if this was a significant problem for the Tribe. Don responded that the timing was not the biggest issue, but that the Tribe is concerned that SCL will not commit to sampling in the study plan. Don stated that if a link was made in the revised study plan to sample sediments, water column, pore water, he could probably live with that approach. He reiterated that he wanted a commitment to sample, that it could not be conditional on what was identified in SCL's proposed Phase 1 of the study. Don said that he proposed the sampling plan in the Tribe's proposed study to get SCL to commit to sampling. Barbara responded that some sampling would be likely but would depend on the outcome of Phase 1. Don stated that he believed SCL would look for any off-ramp to avoid sampling. Don also stated that he understood David Turner (FERC) to have told people at the 11/15/06 study meeting to be wary of conditional elements of a study, that they may lose their opportunity to raise an issue if they didn't do it in response to the PSP.

From: don.hurst@colvilletribes.com

To: barbara.greene@Seattle.Gov

Cc: Christine.Pratt@Seattle.Gov; lynn.best@Seattle.Gov; patti.bailey@colvilletribes.com; tshuhda@fs.fed.us; Julie_Campbell@fws.gov

Subject: RE: Don,

Date: Mon, 4 Dec 2006 9:43 AM

Barbara,

On the phone 12/1/2006 we discussed four reports. The two you reference have catalog publication numbers TDD:03-05-003 and TDD:02-06-008. The two you don't reference are ***Josephine Mill No. 1 Preliminary Assessment Report Metaline Falls, Washington,*** March 2003 (TDD:02-07-004) and ***Josephine Mill/Mine Removal Action Pend Orielle County, Washington Part 1: Baseline Potentially Responsible Party Search Report,*** August 2004.

That said, I feel a need to state the obvious: there may be other applicable, relevant, and appropriate references to environmental condition of Boundary Dam Project in addition to those I cited on 11/15 and forwarded by phone Friday. These reports went public 2-4 years ago; not exactly late-breaking research. Finding them is the Applicant's obligation, not mine or the Forest Service, or National Parks, or anyone other than SCL. Really, SCL's corporate demeanor from the first working group meeting I attended is as if I'm making this stuff up. Frankly, SCL's research effort to date has been _____ (you fill in the blank. Be honest…). How, during the course of the numerous literature searches that have been claimed by SCL and their consultants in the FERC process to date, did none of these PRP-critical documents see the light of Applicant review. There are only a few possible answers, and none of them shine favorably on SCL.

Collaboratively Yours, Don Hurst

-----Original Message-----
From: Barbara Greene [mailto:barbara.greene@Seattle.Gov]
Sent: Friday, December 01, 2006 3:26 PM
To: Don Hurst; Barbara Greene
Cc: Christine Pratt; Lynn Best
Subject: Don,

Don,

As a follow up to our conversation this morning, I want to reiterate that we have not scheduled further discussion on the toxics study because we did not anticipate it taking so long to get the two reports you cited at the Nov 15, 2006 study plan meeting. I'd appreciate it if you could confirm that the two reports you referenced are:

1. Nov. 2003 EPA report - Ecology & Environment's "Grandview and Josephine Mines Removal and Assessment Report - Metaline Falls, WA"

2. Sept. 2002 report - Ecology & Environment's Grandview, Josephine, and Pend Oreille Mines/Mills Trip Report"

I appreciate your sharing verbally the concepts that you would like a revised toxics study to incorporate, and look forward to reviewing the language. Following our review, we'll be in touch about next steps.

As I said on the phone, City Light has a history of working collaboratively with agencies such as EPA on clean up investigations and removal. We will continue this collaborative approach to meet any obligations we have for investigation and cleanup of toxics along Boundary reservoir. Any follow up on City Light clean-up activities will be coordinated through City Light's Environmental Affairs Division under Director Lynn Best's leadership.

Thanks,
Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

C O M M U N I C A T I O N S R E C O R D

DATE: December 5, 2006

TO: Rich Bailey (BLM)

FROM: Glenn Hartmann (WSHS)

SUBJECT: Email communication regarding a request for a meeting

Lisa Rennie (SCL) and I were hoping to come to Spokane in the next couple of weeks and we'd like to get together with you to visit about the cultural resources efforts for the Boundary Dam FERC relicensing. Are there any days that are particularly good/bad for you? If possible, we'd really like to meet before the holidays. Please let me know when a good time(s) might be. Thanks, Glenn

From: Thomas H Shuhda [tshuhda@fs.fed.us]
Sent: Tuesday, December 05, 2006 7:23 AM
To: Barbara Greene
Cc: Glenn Koehn; Walt Dortch
Subject: Re: fax

Attachments: PSP_Phase 1 Toxics Assessment.doc

PSP_Phase 1 Toxics Assessment....

Barbara, this edited document was reviewed by Don Hurst, Julie Campbell, Glenn Koehn and asundry FS hydropower staff. This does not imply that the CCT or the USFWS totally agree with our position as they have different authorities, responsibilities and perhaps priorities. Thank you for the opportunity to elaborate in writing how the plan can meet FS issues.

(See attached file: PSP_Phase 1 Toxics Assessment.doc)

Tom Shuhda
Forest Fish Biologist
Colville National Forest
509 684-7211

"Any society that would give up a little liberty to gain a little security will deserve neither and lose both." - Benjamin Franklin

1.1. Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus

DRAFT

During preliminary planning for the relicensing effort in spring 2005, SCL identified toxic substances (toxics) as an issue that needed to be addressed as part of the FERC relicensing and Washington State 401 certification processes. A Toxics Inventory and Screening was conducted by SCL in 2005 to identify toxics of potential concern in the Project area (R2 2006). The Toxics Inventory and Screening primarily focused on water quality data, but also reviewed sediment and fish tissue data and potential sources of contamination. Since the release of this report, an additional evaluation of toxics was conducted by reviewing information contained in the Environmental Protection Agency's (EPA) Preliminary Assessments and Site Investigations Report for the Lower Pend Oreille River Mines and Mills (Ecology and Environment 2002). The review of the EPA data is summarized in Attachment 3-4. Based on the results of these initial reviews, further study has been recommended for six toxics: arsenic, cadmium, lead, mercury, zinc, and PCBs. This study plan describes the next step in understanding the relationship between these toxics of concern and the Boundary Project. The proposed plan calls for a focused evaluation of existing information to determine whether the bioavailability of toxics of concern is influenced by the Boundary Project, i.e., establish a Project nexus, and to ~~determine the need for~~develop a Phase 2 Toxics ~~Assessment~~ sampling and analysis plan that would focus on field data collection and analysis. This Phase 1 Toxics Assessment is scheduled to begin in early 2007.

1.1.1. Nexus between Project Operations and Effects on Resources

Toxics of potential concern in the lower Pend Oreille River are five metals associated with historical and current mining activity and PCBs. As noted above, a Toxics Inventory and Screening was conducted by SCL in 2005 and additional evaluation of potential contaminants was conducted in 2006. Based on the results of the screening and additional evaluation, six toxics of concern were identified: arsenic, cadmium, lead, mercury, zinc, and PCBs.

Reservoirs can impact the presence and transport of toxics in several ways. The decrease in river velocity due to impoundment tends to increase the accumulation of fine sediment upstream of dams, and thereby the potential for the accumulation of toxics in those sediments (Ecology 2005). In addition, TDG supersaturation may result in the oxidation of dissolved metals into an insoluble particulate form, potentially affecting the bioavailability of toxics through metals precipitation. Lastly, fluctuating water levels within reservoirs may lead to erosion and re-suspension of fine particles containing toxics, thereby increasing the concentration of toxics in the water column, in surface sediments, and at the sediment-water interface. If maintained in these locations, the biological availability of toxics would potentially increase.

To identify any connections between the toxics of concern and Project operations, and to design an appropriate toxics sampling program, additional information on potential contaminant pathways in Boundary Reservoir is required.

1.1.2. Agency Resource Management Goals

In addition to providing information needed to characterize Project effects, the proposed assessment will provide information to help agencies, with jurisdiction ~~over~~ over aquatic and terrestrial animal populations and habitat (including water quality resources) and responsibilities for health of users of such resources in the Project area, identify appropriate conditions for the new Project license pursuant to their respective mandates. Boundary studies are specifically designed to meet relicensing requirements, but may also be relevant to recent or ongoing management activities by other agencies. A brief description of the related resource management goals, by entity, follows.

Washington Department of Ecology (Ecology)

Ecology's relevant toxic substance surface water quality standards, based on a hardness of 80 mg/L $CaCO_3$ and a pH of 8.0, are presented in Table 3.3-1.

Table 3.3-1. Washington Department of Ecology toxic substance surface water quality standards (WAC 1997).

Toxic Substance	Acute Criteria (µg/L)	Chronic Criteria (µg/L)
Toxic Substances (Aquatic Life/Public Health Category)	Must be below those which have the potential to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon that water, or adversely affect public health.	
Arsenic	360	190
Cadmium	3.7	1.03
Lead dd	51	2.0
Mercury s	2.1[3]	0.012[4]
Polychlorinated Biphenyls (PCBs)	2[2]	0.014[2]
Zinc	94.7[3]	86.5[4]

Notes:

Standards calculations assumes a hardness of 80 mg/L $CaCO_3$ and a pH of 8.0

1 An instantaneous concentration not to be exceeded at any time
2 A 24-hour average not to be exceeded
3 A 1-hr average concentration not to be exceeded more than once every three years on the average.
4 A 4-day average concentration not to be exceeded more than once every three years on the average

There are no specific Washington State standards for toxics in freshwater sediments. Instead, Ecology has established freshwater sediment quality values based on 33 studies and tested the efficiency and sensitivity that sediment quality values have in predicting

biological effects. As a result of these studies, two levels of thresholds were developed, the Lowest Apparent Effects Threshold (LAET) and the Second Lowest Apparent Effects Threshold (2LAET), both of which are presented in Table 3.3-2 for relevant toxics. Surface soil guidelines, also provided in Table 3.3-2, are based on the Model Toxics Control Act (MTCA) and Cleanup Regulation (for greater detail on these thresholds and guidelines, refer to Attachment 3-4).

Table 3.3-2. Surface soil and freshwater sediment cleanup levels, effects levels, and sediment quality values.

Constituent	Surface Soil[1]	Freshwater Sediment		
	MTCA Method A Cleanup Level for Unrestricted Land Use (mg/Kg)	Typical Background (mg/Kg)[2]	Lowest Apparent Effects Threshold (mg/Kg)[3]	Second Lowest Apparent Effects Threshold (mg/Kg)[3]
Arsenic	20.0	1.1	31.4	50.9
Cadmium	2.0	0.1-0.3	2.39	2.9
Lead	250	4-17	335	431
Zinc		7-38	683	1080
Mercury			0.8	3.04
PCBs			62	354

Notes:

1 Ecology Table 740-1
2 NOAA Screening Quick Reference Table for Inorganics in Solids
3 Ecology Sediment Quality Values (Michelsen 2003)

The above standards shall be used for this plan until draft Freshwater Sediment Quality Criteria are finalized by Washington Department of Ecology for use in the future.

U.S. Environmental Protection Agency (EPA)

The Clark Fork – Pend Oreille Basin Water Quality Study: A Summary of Findings and a Management Plan was prepared in 1993 as a cooperative effort among the states of Montana, Idaho, and Washington with assistance from the EPA (EPA 1993). This report summarizes three years of water quality research in the Clark Fork-Pend Oreille River basin and provides a management plan for protection of the basin's water quality. This report identifies management objectives for the Clark-Fork River basin, Lake Pend Oreille, and the Pend Oreille River basin. Only one objective is applicable to toxics in the Pend Oreille River: Improve Pend Oreille River water quality through macrophyte management and tributary nonpoint source controls. Actions as related to this objective and toxics include:

1. Develop and maintain programs to educate the public on their role in protecting and maintaining water quality.

2. Establish and maintain a water quality monitoring network to monitor effectiveness and trends and to better identify sources of pollutants.

Water Resource Inventory Area (WRIA) 62

Numerous agencies and stakeholders in 1998 formed the Water Resource Inventory Area (WRIA) 62 planning unit, the goal of which is to "develop strategies that will balance competing demands for water, while at the same time addressing local concerns, preserving and enhancing the health of the watershed and considering the economic stability of the watershed." In January of 2005, a Watershed Management Plan for WRIA 62 was completed (Golder Associates 2005). This plan identified five goals and related objectives for water quality. The applicable goals and objectives as related to surface water quality and toxics in the Pend Oreille River are described below. This proposed toxics assessment may help in understanding pathways by which toxics might influence water quality and the ability to meet standards.

- WQUAL-1: WRIA-wide coordination of water quality monitoring.
- WQUAL-3a: Watershed Planning Implementing Body to participate in (interact and provide input to) the TMDL process for tributary streams that originate within WRIA 62.

  Objective: Remove tributary streams in WRIA 62 from the 303(d) list of impaired waters by meeting State and tribal (where appropriate) water quality standards in impaired tributary streams
- WQUAL-3b: Watershed Planning Implementing Body to participate in (interact and provide input to) the TMDL process for the mainstem of the Pend Oreille River.

  Objective: Meet State and tribal (where appropriate) water quality standards in the mainstem Pend Oreille River
- WQUAL-5: Protect water bodies of high water quality and improve water quality of impaired water bodies.

  Objective: Maintain compliance with state water quality standards and prevent degradation of waters that meet or exceed state water quality standards in WRIA 62.

USDA Forest Service (USFS)

Portions of the Boundary Project are located within the Colville National Forest. As such, the USFS is a participating stakeholder in the relicensing of the Boundary Project. The information collected as part of the proposed Boundary toxics assessment will support management goals and objectives identified by the USFS for the Pend Oreille Basin. The Land and Resource Management Plan, completed in 1988, is applicable to water quality and management within the basin (USFS 1988). This plan identifies five management activities in the soil and water division including:

1. Coordinate with other resources to provide support and advice that helps protect the soil and water resource.
2. Monitor the effect of the Forest Plan activities on the soil and water resources.
3. Restore damaged soil and water resources.
4. Work with Washington State Department of Ecology or others as needed to secure water rights.
5. Coordinate with other agencies or interested parties.

1.1.3. Study Goals and Objectives

The goals of the Phase 1 Toxics Assessment are to identify any pathways of contamination and/or mechanisms for changes in bioavailability in Boundary Reservoir for toxics of concern and to evaluate the effect of Boundary Project operations on these pathways and/or mechanisms. Developing a more complete assessment of the effect of Project operations on the availability or conveyance of one or more of the toxics of concern will allow for the development of an appropriate toxics sampling plan (e.g., biota, water column, and/or sediments) for Boundary Reservoir (i.e., Phase 2 of toxics evaluations in Boundary Reservoir~~). Only after the Phase 1 Toxics Assessment is completed will it be possible to begin constructing more specific triggers related to particular toxics, pathways of contamination, or mechanisms for changes in bioavailability.~~ . Specific objectives of the Phase 1 and Phase 2 ~~study~~ study plans are listed below.

Phase 1

Objective 1. Update data/information for toxics of concern summarized in the Toxics Inventory and Screening and the EPA data review with any new studies or reports.

Objective 2. Characterize existing conditions in Boundary Reservoir that are relevant to toxics contamination and bioaccumulation.

i) Use existing information to describe reservoir surface elevation changes, flows, velocities, sediment dynamics, temperature, TDG, and DO.
ii) Identify data gaps for information necessary to understand a potential Project nexus.

Objective 3. Determine the potential pathways of contamination and mechanisms affecting bioavailability for arsenic, cadmium, lead, mercury, zinc, and PCBs that could occur in Boundary Reservoir.

i) Document what conditions are conducive to, alter, or prevent leaching of arsenic, cadmium, lead, and/or zinc in nearby waters including the influence of dissolved oxygen and pH.

ii) Document what conditions are conducive to, alter, or disrupt the precipitation of arsenic, cadmium, lead, and/or zinc in aquatic environments including the influence of dissolved oxygen and pH..

iii) Document factors that influence the rate of methylation of mercury.

iv) Document current sources and probable pathways for PCBs into Project waters and biota present within Project waters.

v) Document what conditions are conducive to the transformation of lead into inert or bioavailable forms.

vi) Document the level of cadmium that begins to disrupt primary production.

Objective 4. Determine areas within Boundary Reservoir where sediments with grain size characteristics similar to mine waste rock and/or tailings are likely to have been deposited.

i) Document historical location, volume, and particle size of mine waste rock and/or tailings supplied to the Pend Oreille River, including potential input from Box Canyon Dam.

ii) Determine the capacity of the Pend Oreille River to transport sediment with similar grain-size characteristics as the mine waste rock and/or tailings over a wide range of flow conditions.

iii) Based on daily flow records for the Pend Oreille River prior to September 1967, determine the capacity of the Pend Oreille River to transport mine waste rock and/or tailings on an annual basis prior to closure of Boundary Dam and the initiation of Boundary Project operations.

iv) Determine if there was potential for the Pend Oreille River in the Project area to have received large deposits of mine waste rock and/or tailings just prior to closure of Boundary Dam and the initiation of Boundary Project operations.

v) Identify zones of sediment deposition within Boundary Reservoir; these zones of deposition will contain sediment from all sources, of which mine waste rock and/or tailings are expected to be a small portion of the total accumulation of sediment.

vi) Determine where sediments with grain-size characteristics similar to mine waste rock and/or tailings are likely to have accumulated in Boundary Reservoir between 1967 and 2006.

Objective 5. Identify any relationship between Boundary Reservoir operations and pathways of contamination and/or mechanisms of bioavailability for the six toxics of concern (Ar, Cd, Pb, Hg, Zn, & PCBs).

i) Describe the conditions identified in Objective 3 that are currently occurring in Boundary Reservoir.

ii) Document the data or factual evidence that indicates a Project-related influence on a pathway of contamination or mechanism of bioavailability (i.e., a Project nexus) or the lack thereof.

~~*Objective 6*. Develop an appropriate sampling plan for the toxics of concern (Phase 2 of the overall toxics evaluation) that focuses on conditions specific to Boundary Reservoir.~~ Phase 2

Objective 1. Determine the most appropriate form(s) of each toxic of concern for analysis.

Objective 2. Sample and analyze water column and pore water for concentration of toxics of concern. Sampling protocol and method of analysis will be acceptable to all stakeholders. Sampling sites will, at a minimum, include locations in the tailrace of Box Canyon Dam, below every active or inactive mining area adjacent to the reservoir and/or with surface water drainage through the area. Sampling will also include the area immediately below the cement kiln residue along the mouth of Sullivan Creek. Sampling would occur in 2007.

Objective 3. Sample and analyze sediment for concentration of toxics of concern. Sediment size to be sampled shall be 2mm or less in size. If possible, depending upon sampling method used, trend of toxic concentrations should be determined for deep water samples. Sampling protocol and method of analysis will be acceptable to all stakeholders. Sampling sites will include locations above and below the drawdown interval where project operations affect or have the potential to affect deposition or transport of sediments. Sampling sites would specifically include the areas within the varial zone of the reservoir immediately below the cement kiln residue along the mouth of Sullivan Creek and below every active or inactive mining area adjacent to the reservoir and/or with surface water drainage through the area to the reservoir. Sampling would occur in 2007.

Objective 4. Existing sampling and analysis of water and sediment sampling within the project area have found concentrations of several toxics of concern that exceed thresholds/standards in the Environmental Protection Agency's (EPA) Preliminary Assessments and Site Investigations Report for the Lower Pend Oreille River Mines and Mills (Ecology and Environment 2002). If the results of the water column and/or sediment sample analysis, in this phase, indicate that applicable thresholds/standards (previously agreed upon by both stakeholders and SCL) are not being exceeded for any of the toxics of concern, bioassays and tissue sampling would not be considered necessary. However, if the results of this analysis indicate that applicable thresholds/standards are exceeded for any of the toxics of concern, bioassays and tissue sampling would commence in either late 2007 or 2008.
Tissue sampling shall include tissue from larger macroinvertebrate(s) such as, but not limited to, crayfish. Tissue of fish species, representative of those found in the reservoir, shall also be sampled and analyzed for concentrations of toxics of concern. Bioassays should include the testing of the most sensitive macroinvertebrates, amphibians and fish that are resident in or adjacent to the Project Area exposed to waters and/or sediments with concentrations of toxic(s)

above agreed upon thresholds/standards. Sampling protocol and methods of analysis will be acceptable to all stakeholders.

~~Examples (not an exhaustive list) of sampling considerations that may be relevant for developing plans in Boundary Reservoir follow.~~

- ~~i) Determine the best indicator organism(s) for cadmium and lead based on proposed mechanism of action and conditions in Boundary Reservoir.~~
- ~~ii) Determine the appropriate form of mercury to measure and the best location(s) for making measurements.~~
- ~~iii) Determine the most appropriate method for mercury analysis.~~
- ~~iv) Determine the best indicator organism for bioaccumulation of PCBs, considering the likely mechanism of contamination and potential Project nexus.~~

1.1.4. Need for Study

Summary of Existing Information

Toxics can potentially enter the Boundary Project area through river and stream point and nonpoint sources, fallout from the atmosphere, and recycling from sediments. Nonpoint source pollution is caused by rainfall or snow melt moving over and through the ground and picking up natural and human-made pollutants in the process. The main contaminant sources of concern are those associated with historical and current mining activities. A detailed summary of available information on location and historical mining activities of the mines in the Project area (the Metaline Mining District) was included in Appendix 4-1 of the Boundary Project relicensing Pre-Application Document (PAD).

Mining in the Pend Oreille River area dates back to 1855 (Ecology and Environment 2002); however, permanent settlement of the area did not occur until 1884. The Lehigh Cement Co. Plant and quarries were developed in 1904 followed by the opening of several lead-zinc mines. The Lehigh Cement Company operated a cement plant in Metaline Falls from 1914 to 1989. Cement kiln dust from the cement-making process was landfilled on site and capped in 1996. Groundwater contamination below the landfill and downgradient now requires cleanup; contaminants include arsenic, chromium, lead and manganese. Contaminated groundwater flows into Sullivan Creek and Sullivan Creek flows into the Pend Oreille River. Extensive mining did not occur in the area until after dynamiting of the Box Canyon channel in 1906, which allowed for navigation downstream to Metaline Falls. The Pend Oreille River area was home to two of the largest mines in Washington, the Pend Oreille Mine and Grandview Mine. The Pend Oreille Mine is a lead and zinc mine, which by 1964 had produced 63 percent of the total lead and zinc mined (Baltien 1996) in Pend Oreille County. Between 1952 through 1967, mine tailings were discharged directly to the Pend Oreille River, while after 1967 tailings were deposited on land at the mine site (Ecology 2004). The Pend Oreille Mine closed in 1977, but was reopened in early 2004 by Teck Cominco. Claims for the Grandview Mine were patented before 1900 and between 1940 to 1951 production was l.2 million tons of

zinc, lead, and traces of silver (Baltien 1996). However, by 1964 the Grandview Mine was reported to be exhausted and the operation was closed.

Historically, metal extraction and processing were relatively inefficient, yielding large volumes of metal-rich tailings that were deposited to nearby streams (Maret and Skinner 2000). Mine tailings in the Boundary Project vicinity typically contain elevated levels of arsenic, cadmium, copper, lead, mercury, and zinc (Ecology and Environment 2002). As described in Appendix 4-1 of the PAD, the Pend Oreille Mine is currently the only active mine in the Project vicinity.

Point sources are authorized discharges to the Pend Oreille River, regulated by the Washington Department of Ecology through the National Pollutant Discharge System (NPDES) permitting process. Any authorized discharge through the NPDES permitting program requires routine monitoring and reporting of all discharges to the river. The Pend Oreille Mine, the wastewater treatment plants associated with the small municipalities along the river and the Ponderay Newsprint Company all manage outfalls to the Pend Oreille River.

A nonpoint toxic of concern is PCBs. PCBs were banned in the United States in the 1970s, but continue to be a problem in the environment. PCBs have been found in the tissue of fish captured in Boundary Reservoir at concentrations above the Ecology/EPA recommended health standard for human consumption of fish (see section 4.4.5.5.3 of the PAD, Toxic Compounds [SCL 2006] for a thorough description of existing information on toxics in the Project area). The source of PCB contamination is unknown.

Other pathways of toxics into the Project area are from atmospheric fallout and recycling from the sediments. No information is available regarding atmospheric fallout. Recycling from sediments has been shown in some cases to be an important pathway. The transport of dissolved chemical species between the water column and the underlying sediment is termed benthic flux (USGS 2000). Benthic flux is considered to be positive when the transport of metals is from the sediment into the water column, but can also be negative when the transport of metals is from the water column into the sediment. Several factors affect the transport of metals between the sediment and water column including advection, diffusion, oxidation-reduction reactions, and several biological processes. At the sediment-water interface, advection is the transport of metals by the movement of the overlying water. Diffusion refers to the transport of metals between the sediment and water column as a result of a concentration gradient. Metals temporarily stored in sediments may dissolve in pore waters and diffuse to overlying waters due to gradient concentrations (Zago et al. 1999). If the concentration of a metals species is greater in the sediment pore water than in the water column, there is a tendency for the metals to transfer from the sediment into the water, and vice versa.

The geochemistry of the sediment and overlying water is also an important factor in the magnitude of benthic flux by metal species. Metal speciation is a function of pH, redox potential, and the presence of complexing ligands such as carbonate, dissolved organic carbon, and sulfide (IWRRI 2002). One example is the reduction of iron from ferric to

ferrous forms under anoxic conditions. In this example, the presence or absence of oxygen influences the benthic flux of iron. Anoxic conditions favor the dissolution of certain metal oxides and can thereby enhance metal desorption and mobilization (IWRRI 2002). In this case, the concentration gradient of one species is interrelated with that of another and the release of one solute only occurs when another solute is depleted. Ligands, molecules that may donate an electron to a metal by a covalent bond, can also be a factor. Both dissolved sulfides and organic molecules are ligands. Sulfides, for example, can inhibit the release of trace elements by the formation of insoluble sulfidic minerals.

Other biological factors may also influence the rate of benthic flux. For example, bioturbation, the mixing of sediment by burrowing, ingestion, and defecation by benthic communities, can increase the sediment-water interface affecting the chemical fluxes between the sediment and water column. Similarly, bioirrigation, the flushing of burrows with overlying waters by benthic organisms, can also enhance the exchange of dissolved solutes.

In order to determine which toxics may be present within Boundary Reservoir, two reviews of toxics have been conducted, as noted above. The first, the Toxics Inventory and Screening was conducted by SCL in 2005 to identify toxics of potential concern in the Project area, i.e., those for which recent exceedances of water quality standards have been documented in the existing literature and for which there is thought to be a potential Project nexus (R2 2006). (The second review, an additional evaluation of potential contaminants, was conducted in 2006 and is discussed in Attachment 3-4.) Based on results of this review of existing information, toxics were grouped into one of two categories: low concern or medium concern (refer to the Toxics Inventory and Screening for more detail). No toxics of high concern were identified. Toxics of low concern will receive no additional evaluation as part of the FERC relicensing and 401 certification processes. The four toxics (cadmium, lead, mercury, and PCBs) determined during the Toxics Inventory and Screening to be of medium concern and with a potential for a Project nexus will be further evaluated in this Phase I Toxics Assessment study. Below is a summary of the initial assessment of these four toxics completed during the Toxics Inventory and Screening (R2 2006).

Cadmium — Cadmium is a natural element found in soils and rocks and is often extracted during the production of other metals such as zinc, lead, and copper. Boundary Reservoir operations could affect cadmium concentrations through toxics accumulation, metals precipitation, or erosion and leaching. There were five dissolved concentrations and three total concentrations exceeding the cadmium criteria in the 1970s and in 1985 at the Metaline Falls and International Border water quality monitoring stations. Dissolved cadmium data collected in the early 1990s at the Newport station were below detection limits. EPA found elevated levels of cadmium in soils at the Josephine, Grandview, and Oriole abandoned mines and at the Pend Oreille Mine site (Ecology and Environment 2002). Cadmium is considered of medium concern given the lack of recent measurements in the Project area and the potential contamination sources from active and abandoned mines (R2 2006).

Lead — Operations of Boundary Reservoir could influence lead contamination through toxics accumulation and erosion and leaching. Historical measurements collected between 1975 and 1991 at the Newport and International Border stations show exceedances of dissolved lead concentrations beyond the chronic water quality standard. Measurements exceeding the chronic criterion of approximately 2 µg/L were 10 µg/L (7/11/1977), 10 µg/L (10/16/1979), and 7 µg/L (11/6/1985). The measurement exceeding the acute criterion of approximately 51 µg/L was 500 µg/L (12/8/1975). The mean value of recent total lead concentrations collected by the Kalispel Tribe in Box Canyon reservoir is below water quality standards, but the standard deviation of the data suggests a recent exceedance of the chronic standard. However, this measurement is of the total concentration and the standard is based on the dissolved fraction, which may be much lower. Two recent readings of lead collected in Boundary Reservoir did not show water quality exceedances. The current source of lead is assumed to be runoff from abandoned mine sites. Lead may also be discharged in effluent from the Pend Oreille Mine, but these discharges must meet water quality guidelines outlined by Ecology in the mine's NPDES permit. Given the exceedances and the current sources of contamination from abandoned mine sites, lead is considered of medium concern (R2 2006).

Mercury — Mercury is a naturally occurring metal that can take several forms in the environment. In soil and water, bacteria can form methylmercury, a form that can accumulate in fish tissue. The methylation of mercury is found to be more pronounced in wetland areas and to be enhanced by low DO, increased nutrients, and increased temperature. Current sources of mercury contamination include abandoned mine sites and effluent from the Pend Oreille Mine. Boundary Project operations could affect contamination of mercury through increased methylation rates and erosion. Absence of recent data and uncertainty associated with previous data due to historically high method detection limits make qualitative assessment of mercury contamination difficult. Given the lack of recent data, the current sources in the Project area, and the ability of mercury to bioaccumulate, mercury is considered of medium concern (R2 2006). Additional assessment of the potential for mercury contamination in Boundary Reservoir is needed.

Polychlorinated Biphyenyls — PCBs are man-made mixtures of chlorinated compounds used as coolants and lubricants in electrical equipment. Manufacture of PCBs was banned in 1977. PCBs bind strongly to soil and adhere to organic compounds and sediments. They are also taken up by small organisms and can accumulate in fish. The operation of Boundary Reservoir can potentially influence the contamination of PCBs through erosion caused by the daily fluctuation of reservoir levels. An Ecology fish tissue verification study completed in 2004 found PCBs above the recommended health standard for the consumption of fish. In Boundary Reservoir, total PCB fish tissue concentrations were measured at 16.8 µg/Kg ww and 14.5 µg/Kg ww in largescale suckers, 7.4 µg/Kg ww in northern pike minnows, and less than detection in yellow perch. The NTR criterion for total PCBs is 5.3 µg/Kg wet weight. To address PCB contamination from a regional perspective, this study also compared total PCB concentrations in the Pend Oreille River to other fish tissue samples collected in Washington state. This comparison found total PCBs collected in the Pend Oreille River

to fall below the 30th percentile. PCB concentrations of fish tissue samples of largescale suckers collected in the Pend Oreille River are low relative to other samples. As a result, the Ecology report suggested that a TMDL specific to the Pend Oreille River is not necessarily warranted, but that perhaps a statewide approach is better. Despite the documented bioaccumulation of PCBs in fish tissue located in the Project area, PCBs are considered to be of medium concern because levels are low compared to other statewide samples and given the conclusions of the Ecology fish tissue verification study (R2 2006). More information is needed to assess PCBs in Boundary Reservoir.

The Toxics Inventory and Screening reviewed all types of toxics data (water, sediment, and fish tissue), but mainly focused on available water quality data. As described above, SCL has conducted an additional screening effort that reviewed the mine and mills sampling data reported in the Preliminary Assessment and Site Investigation Report prepared by EPA (Ecology and Environment 2002). Unlike the Toxics Inventory and Screening, the EPA review focuses on the toxicity of sediment samples taken from mine sites rather than water samples in the Pend Oreille River. The recent review of EPA toxicity data is described in Attachment 3-4.

In the EPA study, 21 active mines (including Pend Oreille Mine, 2 miles downstream, or north of, Metaline Falls) and abandoned mine sites along the Pend Oreille River from Metaline to the international border were assessed. Of the 21 sites visited, 5 were found to have potential contamination sources. At these five sites, sediment, surface soil, and some water quality samples were collected and their concentrations were evaluated by EPA for determination of those that were "elevated" or "significant" compared to background levels. SCL reviewed the data for elevated/significant toxics identified in the EPA report and compared it to regional toxicity guidelines and contaminant toxicity information in order to determine what contaminants should be considered in more detail as part of SCL's Boundary relicensing studies. Fourteen elevated or significant toxics were found and subsequently evaluated.

A two-tiered system was used to compare elevated/significant toxics with scientific criteria (refer to Table A-1 in Attachment 3-4). The first tier compared concentrations of toxics to Ecology's freshwater sediment and surface soil guidelines (refer to Attachment 3-4 for details and references). If the concentration of a toxic substance within EPA samples was below these guidelines, then the toxic was not considered for further analysis. If the concentration of a toxic within EPA samples exceeded guidelines, then the second tier criteria were evaluated. The second tier consists of three separate criteria: 1) was the constituent detected in a waterway or from a target sample (as defined in Attachment 3-4), 2) was the constituent of medium or high toxicity (as described in Attachment 3-4), and 3) was there documented reoccurrence of elevated/significant levels of the toxic within the basin. If the toxic met the first tier criteria and two or more of the second tier criteria, then it was recommended for further study.

Of the 14 constituents evaluated, 4 (arsenic, cadmium, lead, and zinc) were recommended for further study (Table A-5 in Attachment 3-4). The other 10 (barium, chromium, copper, DDT, manganese, mercury, nickel, selenium, silver, and vanadium) were

recommended for omission. Eight of the nine toxics were omitted because their concentrations did not exceed state guidelines. Only one toxic, silver, exceeded state guidelines but was omitted because it did not meet the second tier criteria. A summary of the four toxics recommended for further analysis based on review of data in the EPA report is provided below.

Arsenic — Arsenic is a naturally occurring element that is used to preserve wood and used in some pesticides (US Dept of Health and Human Service 2006). Arsenic can be toxic in the environment. Inorganic forms are more toxic to organisms in the environment than organic forms, and, among inorganic forms, arsenite is more toxic than arsenate (Greenfacts 2006). Arsenite is thought to be toxic because it binds to sulfhydryl groups, which are found on proteins. Arsenate affects the key energy producing process that takes place in all cells. Arsenic compounds can cause short-term and long-term effects in plants and animals including death, inhibition of growth, photosynthesis and reproduction, and behavioral effects (Greenfacts 2006). Arsenic-contaminated environments are characterized by limited species abundance and diversity. Based on the above information, arsenic was classified as having high biological toxicity. Arsenic concentrations were found to have values exceeding surface soil guidelines. Although there was low reoccurrence within the watershed, given the elevated levels of arsenic found in target samples and its high toxicity, it is recommended that arsenic be included in the toxic assessment study.

Cadmium — Cadmium is a natural element found in soils and rocks and is often extracted during the production of other metals such as zinc, lead, and copper. Cadmium is highly toxic and bioaccumulates at all trophic levels, accumulating in the livers and kidneys of fish (Sindayigaya et al. 1994). Cadmium can be toxic to plants at lower soil concentrations than other heavy metals and is more readily taken up than other metals. Based on the information above, cadmium is considered to be of high biological toxicity. Based on the tier 1 and tier 2 assessment criteria, it is recommended that cadmium be included in the toxic assessment. Note that cadmium was already recommended for inclusion in further relicensing studies based on the water quality assessment described in the Toxics Inventory and Screening.

Lead — Lead adversely affects algae, invertebrates, and fish. Fish exposed to high levels of lead exhibit a wide range of effects including muscular and neurological degeneration and destruction, growth inhibition, mortality, reproductive problems, and paralysis (Eisler 1988). Lead can cause reduced growth, photosynthesis, mitosis, and water absorption at elevated levels in plants (Eisler 1988). Lead can be bioconcentrated from water, but does not bioaccumulate and tends to decrease with increasing trophic levels in freshwater habitats (Eisler 1988). Lead partitions primarily to sediments, but becomes more bioavailable under low pH, hardness and organic matter content. Lead bioaccumulates in algae, macrophytes and benthic organisms, but the inorganic forms of lead do not biomagnify. Based on the information above, lead is considered to be of medium biological toxicity. It is recommended that lead be included in the toxic assessment study because it met the tier 1 criteria and three of the tier 2 criteria. Note that lead was already

recommended for inclusion in further relicensing studies based on the water quality assessment described in the Toxics Inventory and Screening.

Zinc — Zinc is a common element found in air, soil, and water. Zinc is currently, and was historically, found adjacent to the Project area. It is also used in industry to make paint, dyes, wood preservatives, and ointments. Elevated levels of zinc can adversely affect the growth, survival, and reproduction of aquatic plants and animals (Eisler 1993). Based on the information above, zinc is considered to be of medium biological toxicity. Zinc meets the tier 1 criteria as well as three of the tier 2 criteria and should therefore be included in the toxic assessment study.

Two of the four toxics of concern recommended for further analysis after review of the EPA data were among the four recommended for further analysis in the Toxics Inventory and Screening (R2 2006). Thus there are six total toxics of concern that are recommended for the Phase 1 Toxic Assessment: arsenic, cadmium, lead, mercury, PCBs, and zinc.

Need for Additional Information

The Toxics Inventory and Screening evaluated toxics in the Project area based on water column information, and also reviewed sediment and fish tissue information and potential sources of contamination. Toxics with little or no information, recent exceedances of water quality standards, or potential sources of contamination in the Project area were considered to be of medium concern. The EPA report evaluated toxics in the Project area based on sediment data and the presence of contaminants in waterways. These two assessments identified toxics of concern in the Project area, but neither the screening nor the review of the EPA report identified a nexus between any toxics and specific Project operations. More information is required to assess the potential influence of Project operations on the bioavailability and transport of the six toxics identified for further evaluation.

~~This Phase 1 Toxic Assessment will develop the information needed to design a Phase 2 study, which would include collection of field samples for toxic analysis within Boundary Reservoir. Given the length of the reservoir (17.5 miles long), the relatively small volume of potentially contaminated sediments from mine sources, and a desire for an accurate assessment of Project conditions, a mechanism to focus any future sampling effort is warranted. In addition to the results of the Phase 1 analysis, three of the studies proposed for implementation in 2007/2008 (the Sediment Transport and Boundary Reservoir Tributary Delta Habitats Study [section 4.2], Mainstem Aquatic Habitat Modeling Study, hydraulic routing model component [section 4.1], and Erosion Study [section 2.1]) may provide information useful to help determine potential sites for collection of sediment samples, if such sampling is deemed appropriate. However, results from the latter three studies will only be available to guide potential sampling in 2008; i.e., the results of these studies will not be available until the end of the 2007 study season. To inform potential sediment sampling in the interim period prior to completion of the three aforementioned studies, Objective 4 has been included in the Phase 1~~

~~Assessment to identify areas within Boundary Reservoir where accumulation of sediments similar in size to mine waste rock and/or tailings may have been deposited.~~

Completing the Phase 1 Assessment and Phase 2 Sampling will provide the missing information to allow SCL and relicensing participants to assess the Project's potential influence on the bioavailability of the six toxics of concern. ~~Based on the results of the Phase 1 study, a decision will be made as to what field sampling is needed to better understand the potential Project impact, what sampling protocols would be most appropriate (i.e., water column, biota, or sediment), and where within the reservoir sampling should be focused.~~ It is SCL's intent that the decision regarding the nature and extent of sampling will be made in consultation with relicensing participants and subject to FERC approval and that ~~toxics~~ sampling of the water column and sediments for toxic concentrations ~~identified~~ will be initiated in the summer of 2007, although some sampling might have to be conducted in 2008, following completion of the Mainstem Sediment Transport, Hydraulic Routing Model, and Shoreline Erosion studies.

1.1.5. Detailed Description of Study

Study Area

The study area encompasses Boundary Reservoir and adjacent potential source areas for toxics. (Refer to section 1.3 of this PSP for a description of the Boundary Project location, facilities, and reservoir.) Potential toxics sources include the five mines identified in the Preliminary Assessments and Site Investigations Report as having potential sources of contamination and historical users of PCBs. PCBs have been banned since 1977, but because they bind tightly to soil and can accumulate in fish, they are still present in the Project vicinity. The five mines identified as having potential sources of contamination include the Pend Oreille, Josephine, Blue Bucket, Oriole, and Grandview mines. The Blue Bucket mine is located less than half a mile from the west side of the Pend Oreille River between river miles 29 and 30. The Oriole mine is located approximately 1.5 miles from the west side of the Pend Oreille River between river miles 27 and 28. The Josephine mine is located less than 0.25 miles from the west side of the Pend Oreille River between river miles 25 and 26 downstream of Flume Creek. The Grandview mine is located less than 0.25 miles from the east side of the Pend Oreille River near river mile 26. The Pend Oreille mine is located less than 0.5 miles from the east side of the Pend Oreille River between river miles 25 and 26. The Lehigh Cement Company landfill is located in Metaline Falls at approximately milepost 14.7 along Highway 31. These potential sources of contamination within the Project vicinity, including tributaries and mines, are shown in Figure 3.3-1.

Proposed Methodology

A detailed literature-based assessment of the toxics of concern identified in the Toxics Inventory and Screening and additional toxics assessment, i.e., arsenic, cadmium, lead, mercury, zinc, and PCBs, will be conducted. The purpose of this assessment is to develop and understanding of the nexus between Project operations and the availability and transport of these toxics. The assessment will focus on researching and answering

Objectives 1 through ~~6~~ 5 described above. ~~Based on the Phase 1 assessment of the six toxics of concern, t~~The next step will be to develop an appropriate sampling and analysis plan (SAP) ~~to fulfill Objective 6~~as part of Phase 2 described above.

To determine whether the relationship between operations of Boundary Reservoir and the potential mobilization of contaminants, several sampling strategies are available. As part of the proposed study, all of the potential sampling strategies will be reviewed and the most appropriate selected. Some of the potential sampling schemes are described below.

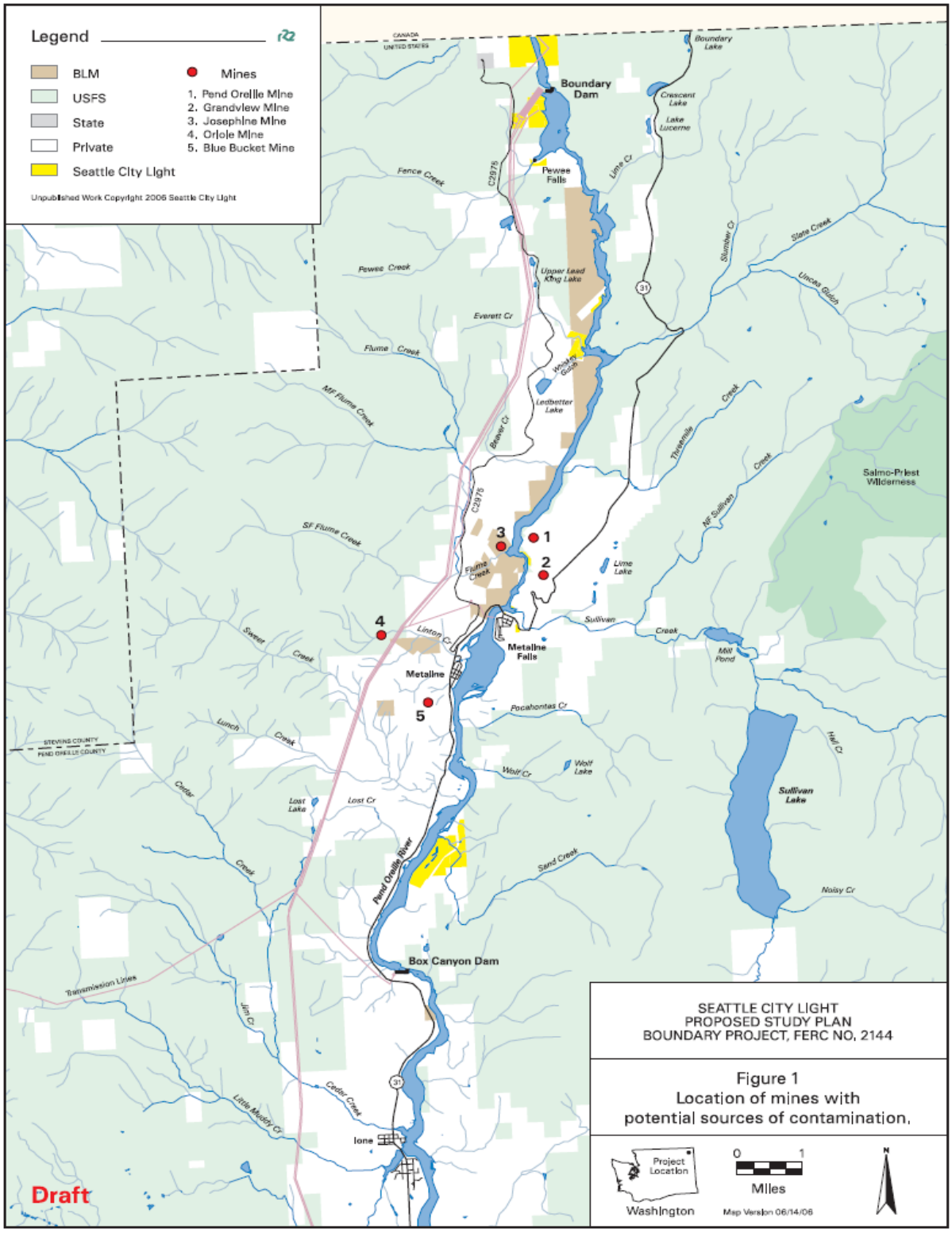

Figure 3.3-1. Project area and location of mines with potential sources of contamination.

Analysis of concentrations of toxics currently occurring in Boundary Reservoir would require sampling of ~~at least one of~~ the possible media where toxics are concentrated. This would include sampling and analyzing ~~including~~ the water column, ~~, aquatic biota,~~ surface sediments, ~~sediment-water interface, or~~and deep sediments. Sampling and analyzing tissue from aquatic biota (macroinvertebrates and fish) may occur depending upon the results of the water and sediment analysis. Collection of water~~, biota, or~~ sediment and possibly biotic tissue samples will all involve analysis of toxic concentrations by a certified laboratory. Sampling these media will provide information on current concentrations of target toxics in the sampling location. Biota sampling can be conducted for either pelagic and/or benthic organisms to evaluate the transportation and accumulation of toxics in the food web and can provide some information on concentration in the water column and/or surface sediments.

To understand the transport of toxics from the sediment into and out of the water column, benthic flux studies can be conducted. Sampling programs to document the occurrence of benthic flux include water column and pore water sampling. Water column sampling at different depths will measure water column gradients and generally would indicate a potential benthic source. However, toxic concentration gradients may also be a result of settling of detrital material from the euphotic zone or a density-driven horizontal source (USGS 2000). Pore water samples also can be tested for toxic concentrations. For this method, devices are inserted into the sediment to collect the pore water and allowed to equilibrate for several weeks. After equilibration, pore water is extracted and measured for metals concentrations.

During the Phase 1 Toxic Assessment the advantages and disadvantages of different sampling options will be considered to identify an appropriate sampling strategy. The sampling strategies selected will be dependent on the target toxics to be analyzed as well as the existing environmental conditions in the reservoir and potential Project effect. Regardless of the sampling strategy, sampling sites should be strategically located in areas with the maximum potential for contamination, such as downstream of historic mining sites, near target sources identified in the EPA PA/SI report, or in areas of specific geochemical conditions that might influence the transport of toxics. To facilitate success of possible future sediment sampling efforts SCL proposes to determine what areas in Boundary Reservoir are likely to have sediments characteristic of mine tailings. The proposed approach incorporates two basic methods: 1) comparison of historic and current bathymetric maps to determine where sediment has been deposited within the reservoir between 1967 and 2006; and 2) development of a one-dimensional hydraulic model to determine where sediment with grain size characteristics similar to mine tailings were likely to have accumulated within the reservoir. Specific tasks associated with this approach include the following:

i) Review available literature to document historical location, volume, and particle size of mine waste rock and/or tailings supplied to the Pend Oreille River (including potential input from Box Canyon Dam).

ii) Develop a one-dimensional, steady-state hydraulic model of the Pend Oreille River from Box Canyon Dam to the international border using bathymetry of the river prior to construction of the dam.

iii) Use the hydraulic model to determine the capacity of the Pend Oreille River to transport sediment with similar grain size characteristics as the mine waste rock and/or tailings for a wide range of flow conditions.

iv) Use daily flow records of the Pend Oreille River prior to September 1967 to determine the capacity of the Pend Oreille River to transport mine waste rock and/or tailings on an annual basis prior to closure of Boundary Dam and initiation of Project operations.

v) Compare the annual quantities of mine waste rock and/or tailings transport capacity with quantities of mine tailings supplied to the river to determine if there was potential for the Pend Oreille River in the Project area to have large deposits of mine waste rock and/or tailings just prior to closure of Boundary Dam and initiation of Project operations.

vi) Compare bathymetry of the river prior to construction of the dam (USGS 1938 and Seattle City Light 1957) with available current bathymetry (2006) to identify zones of sediment deposition within the reservoir. These zones of deposition will consist of sediment from all sources, of which mine tailings are expected to be a small portion of the total accumulation of sediment.

vii) Use the hydraulic model to help determine where sediments with grain size characteristics similar to mine waste rock and/or tailings were likely to accumulate within the reservoir between 1967 and 2006.

SCL does not intend to conduct field studies to "ground-truth" the results of the Phase 1 sediment deposition analysis. ~~If sediment sampling is identified as the appropriate medium through which to evaluate toxics in the reservoir, on-site verification of the results of the Phase 1 sediment deposition analysis may be required as part of the Phase 2 study.~~

The Phase 2 sampling and analysis plan would address the types (i.e., water, sediment, fish tissue, etc., and dissolved versus total concentration), frequency, time of year to collect, and location of samples needed to best evaluate the effects of the operation of Boundary Reservoir on the toxics of concern. As part of a sampling and analysis plan, SCL will develop a Quality Assurance Project Plan (QAPP). The QAPP will describe the project team and responsibilities, the sampling locations, sampling frequency, data collection methods, laboratory analysis, including measurement methods and method detection limits, QA/QC measures including quality control sample types and frequency and measurement quality objectives, and data management. The QAPP will be consistent with Ecology and EPA protocols.

1.1.6. Work Products

A draft and final report are the major work products required for completion of this study. The draft report, to be completed by May 1, 2007, will summarize the findings of the Phase 1 Toxic Assessment. Following issuance of the draft Phase 1 report, SCL will meet with relicensing participants to review findings and determine how to proceed with

a sampling program. Following the meeting, SCL will produce the final report, which will contain the proposed sampling plan(s) and the Sampling and Analysis and Quality Assurance Project plans, as appropriate. The final Phase 1 report will be completed by June 15, 2007.

The SAP will address the following issues: the goals of the study, steps needed to meet those goals, the type of sampling necessary (i.e., water column, sediment, fish tissue, etc), the specific analyses required, the number of samples, the frequency of sampling, and a schedule of sampling. The QAPP will address elements specified by Ecology guidelines including the following items.

- Title Page with Approvals
- Table of Contents with Distribution List
- Background
- Project Description
- Organization and schedule
- Quality Objectives
- Sampling Process Design
- Sampling Procedures
- Measurement Procedures
- Quality Control
- Data Management Procedures
- Audits and Reports
- Data Verification and Validation
- Data Quality Assessment

The SAP and QAPP are similar in content except the SAP will focus on what questions need to be answered and how they will be answered through additional field sampling. The QAPP, on the other hand, will focus on the methodology to collect the field data and the QA/QC procedures required to ensure a robust sampling program. These two work products will be combined into a single document.

1.1.7. Consistency with Generally Accepted Scientific Practice

The approach to this literature-based assessment has been developed in consultation with the agencies, tribes and other stakeholders. The sampling and analysis plans and quality assurance project plans referred to herein would follow Ecology guidelines.

1.1.8. Consultation with Agencies, Tribes, and Other Stakeholders

As indicated above, SCL met with Ecology in 2005 to identify issues to be addressed as part of the 401 certification process. The following relicensing participants reviewed the scope of the Toxics Inventory and Screening in 2005: Ecology, USFS, WDFW, Pend Oreille Mine, and Teck Cominco American, Inc. The screen was requested by and provided to the following relicensing participants: Jean Parodi (Ecology), Jon Jones (Ecology), David Knight (Ecology), Tom Shuhda (USFS), Doug Robison (WDFW), Kevin Kinsella (Pend Oreille Mine), and Bill Duncan (Teck Cominco American, Inc.).

Input regarding the literature-based assessment study plan was provided by relicensing participants during Workshops and Workgroup meetings. Workshops were held in Spokane, Washington, on November 30, 2005, and February 16, 2006. Workgroup meetings were held in Spokane on May 22, 2006, and August 16, 2006, and in Metaline Falls on June 29, 2006.

During the May 22 workgroup meeting, an outline for the Assessing Toxics of Concern: Evaluation of Contaminant Pathways and Potential Project Nexus study plan was presented. During the June 29 workgroup meeting, the draft Assessing Toxics of Concern: Evaluation of Contaminant Pathways and Potential Project Nexus study plan was presented. The four toxics of concern included in this plan, which were identified during the Toxics Inventory and Screen (SCL 2005), were cadmium, lead, mercury, and PCBs. During the August 16 workgroup meeting, SCL presented the next iteration (with revised title) of the draft Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus study plan, which was revised based on stakeholder comments provided at the June 29 workgroup meeting. In preparation of this revised study plan, SCL reviewed the EPA's 2002 Preliminary Assessments and Site Investigations Report for the Lower Pend Oreille River Mines and Mills (PASI) to ascertain whether additional toxics should be included in the Phase 1 toxics assessment. Based on evaluation of the PASI document, arsenic (i.e., along with cadmium, lead, mercury, and PCBs) identified by the inventory and screening (for greater detail on study plan development, see section 3.3.4 of this study plan, under Summary of Existing Information).

Relicensing participants providing comments on the study approach at these meetings included Ecology, the USFS, U.S. Fish and Wildlife Service, Confederated Tribes of the Colville Reservation, Kalispel Tribe of Indians, Canadian Columbia River Intertribal Fisheries Commission, BC Hydro, Pend Oreille County Public Utility District, Columbia Power Corporation, Environment Canada, Ponderay Newsprint, and Teck Cominco. Comments provided by relicensing participants are summarized in Attachment 3-5 to this study plan and can also be found in workgroup meeting summaries (available on SCL's relicensing website [http://www.seattle.gov/light/news/issues/bndryRelic/]).

Stakeholders' comments on the PAD, FERC's Scoping Document 1, and SCL's proposed study program were submitted to FERC on or before September 1, 2006. Following review of these comments, SCL revised the Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus study plan to clarify the intent and goals

of the overall approach to toxics assessment in Boundary Reservoir. The Project Nexus section of this study plan was revised to reflect that Phase 1 is being conducted to develop an understanding of the connections between the toxics of concern and Project operations, and to design an appropriate Phase-2 toxics sampling program for the reservoir. Similar revisions were made to the Study Goals and Objectives, Need for Additional Information, Proposed Methodology, and Work Products sections of this study plan.

In its PAD/Scoping comments, Ecology asked whether SCL planned to conduct field verifications of the results of its Phase 1 sediment deposition analysis (Ecology 2006). SCL does not intend to conduct field studies to "ground-truth" the results of the Phase 1 sediment deposition analysis. Rather, if sediment sampling is identified as the appropriate medium through which to evaluate toxics in the reservoir, on-site verification of the results of the Phase 1 sediment deposition analysis may be required as part of the Phase 2 study.

Involvement of relicensing participants in the design and execution of the Phase 1 and Phase 2 toxics studies will be ongoing throughout the study program. SCL will conduct a formal study plan meeting with relicensing participants after filing this PSP. Subsequent study plan meetings may be scheduled to resolve outstanding issues following the initial meeting but prior to the deadline for PSP comments. SCL will consult with relicensing participants on proposed responses to their PSP comments (i.e., revisions for the Revised Study Plan [RSP]). Following issuance of the RSP, SCL will hold workgroup meetings to review and discuss proposed study implementation details. After the RSP is filed, FERC will issue its final study plan determination (for greater detail, refer to section 1.2 of this PSP).

1.1.9. Schedule

The schedule for completing the Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus study is provided in Table 3.3-3. The final Phase 1 study report is scheduled for release on June 15, 2007. Field sampling, the extent of which will be determined based on the outcome of Phase 1, would be initiated in summer of 2007 and continue through 2008, as necessary.

Table 3.3-3. Proposed project schedule.

Phase	Target Date
Study mobilization/startup	February 2007
Conduct Assessment	March 2007
Draft Phase 1 Study Report	May 1, 2007
SCL communication with stakeholders	May 2007
Final Phase 1 Study Report	June 15, 2007
Final Phase 2 Sampling and Analysis Plan	?/ 2007

1.1.10. Progress Reports, Information Sharing, and Technical Review

Prior to release of the Phase 1 Toxics Assessment report, SCL will initiate communication with relicensing participants to discuss the study results. Comments from the relicensing participants will be addressed when preparing the Phase 1 final report. The Phase 1 final report will contain an appendix of water quality data reviewed during the proposed study; these data will also be available in digital format.

In accordance with the results of the Phase 1 evaluation, a detailed Phase 2 sampling plan will be developed and sampling will begin in 2007. Formal reporting requirements related to the Phase 2 approach would include the Initial Study Report (March 2008), the Updated Study Report (March 2009), and corresponding meetings to discuss these reports. Prior to release of these reports, SCL will meet with agencies, tribes, and other stakeholders to discuss the study results, as described in section 1.2.4 of this document. In addition, SCL plans to provide updates, generally on a quarterly basis, to keep relicensing participants apprised of study progress and to communicate significant developments. Following each official Study Report meeting, the FERC ILP regulations provide the opportunity for SCL and/or relicensing participants to request modifications to the study plan in light of the progress of the study program and results to date.

1.1.11. Anticipated Level of Effort and Cost

Based on a cursory review of study needs, the anticipated cost for this proposed study is ~~$95,000~~ ?, ~~all of~~ which is required in 2007 for the Phase 1 Toxic Assessment and report preparation and, in 2007-8, for Phase 2 water column and sediment sampling and analysis. Only after the ~~Phase 1 report~~the water and sediment analysis is completed, will it be known whether biotic tissue sampling and analysis and bioassays are necessary. If this step is considered necessary, it will then be possible to assess the extent of a Phase ~~2~~ 2 bioassay and tissue sampling and analysis program, from which an estimate of effort and cost would be developed.

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Seattle City Light

Memorandum

DATE: December 7, 2006

TO: Consultation file

FROM: Christine Pratt

SUBJECT: Telephone communication with Paul Pickett (WDOE)

Following up to a phone call from Paul Pickett (WDOE) on December 4, I called Paul back with a status on his request for flow and temperature data of the Pend Oreille River tributaries that be inputted into the temperature TMDL model. Taylor Associates will be providing the temperature data collected in the tributaries for 2004-2006 once it is reviewed internally. R2 Resource Consultants is reviewing their data files for similar information.

Seattle City Light

Memorandum

DATE: December 12, 2006

TO: Consultation file

FROM: Barbara Greene, SCL

SUBJECT: Phone call with Marcie Mangold, WDOE

Barbara left a voicemail for Marcie Mangold (WDOE) that while in meetings most of the rest of the week, if SCL determines to take any alternative approach to the toxics study other than that in the PSP, she would call Marcie to discuss it with her. She offered to try and get in touch next week since SCL was working this week on potential revisions to the toxics study plan.

From: Glenn Koehn [gkoehn@fs.fed.us]
Sent: Thursday, December 14, 2006 10:18 AM
To: barbara.greene@Seattle.Gov
Cc: rick_donaldson@fws.gov; dosterman@knrd.org; robisdlr@dfw.wa.gov; dman461@ecy.wa.gov
Subject: DRAFT FS Comments to Boundary PSP

Attachments: draft_usfs_comments_psp_121406.doc

draft_usfs_comments_psp_121406...

Barbara:

Attached, as we discussed, is a draft of the Forest Service Comments to SCL Proposed Study Plan. We are providing this to SCL to assist you in your review and edit of the PSP as you prepare your Revised Study Plan. Please keep in mind that this is draft. The FS will be filing our final comments with FERC on or before January 15, 2007. If you have any questions please feel free to contact me.

Regards, Glenn

(See attached file: draft_usfs_comments_psp_121406.doc)

Glenn Koehn
Hydropower Coordinator and
Lands/Minerals Program Mgr.
509-684-7189
gkoehn@fs.fed.us

Seattle City Light

Memorandum

DATE: December 15, 2006

TO: Consultation file

FROM: Lisa Rennie

SUBJECT: Phone call to Steve Kramer, Archaeologist, USDA-Colville NF regarding APE definition and technical consultant selection.

Lisa Rennie called Steve Kramer on 12/15/06 and left message requesting call back to discuss the Boundary Project APE definition and selection of technical consultant to perform the relicensing studies. Steve Kramer returned call on 12/18/06. In addition, to discussing the APE definition and technical consultant selection, Lisa and Steve also talked about the USDA-Colville NF letter to the FERC regarding NHPA Section 106 process and the Boundary Project.

Seattle City Light

Memorandum

DATE: December 15, 2006

TO: Consultation file

FROM: Lisa Rennie

SUBJECT: Phone call to Rich Bailey, BLM Archaeologist

Lisa Rennie called Rich Bailey on 12/15/06 and left message regarding setting up meeting to discuss the Cultural Resources study plan, including APE definition.

Christine Pratt (SCL) emailed Paul Pickett (WDOE):

>>> Christine Pratt 12/15/2006 3:01 PM >>>
Paul - Attached is the data pulled together by our R2 Resources folks.

Look for a follow-on e-mail with the trib temeprarure data that the Taylor & Associates folks collected over the 2004 - 2006 time frame.

Christine

>>> "Alan Olson" <aolson@r2usa.com> 12/7/2006 3:04 PM >>>
Christine-

Here is what I've dug up....
Flow:

Daily flow data is available for Sullivan Creek. I recommend that Mr. Picket download this data himself from the USGS web site to get the most recent data in a format of his choosing.

Terrapin Environmental took 6 spot measurement flows in lower Slate Creek during the late summer/early fall of 1999. Unfortunately, these flows are incompletely documented in their report (see Document 380 page 4 and 5 in the Boundary electronic library, attached).

McLellan (2001; Document 373 in the electronic library) took a flow measurement on each day habitat surveys were conducted on a number of tributaries.

Slate Creek 7/31/00 - 0.31 cubic meters per second (cms)
Sullivan Creek 8/16/00 - 2.20 cms
Sweet Creek 9/11/00 - 0.15 cms
Flume Creek 9/6/00 - 0.25 cms
Lime Creek 9/26/00 - 0.08 cms
Pewee Creek 9/25/00 - 0.01 cms
Sand Creek 9/7/00 - 0.01 cms

Temperature:

R2 collected summertime temperature data for a number of tributaries during 1996 and 1997. The pertinent data from the report is attached.

Terrapin collected temperature data in Slate Creek during the late summer 1999. The report only had a graph (attached).

McLellan collected temperature in a number of creeks. His data is in the attached in the excel workbook.

This is all the flow and temperature data for the tributaries that I am aware of. Call if you have any questions.

Alan

Seattle City Light

Memorandum

DATE: December 18, 2006

TO: Consultation file

FROM: Lisa Rennie

SUBJECT: Phone call to Kevin Lyons, Archaeologist, Kalispel Natural Resources Department regarding selection of technical consultant selection.

Lisa Rennie spoke to Kevin Lyons on 12/18/06 regarding the selection of technical consultant to perform the relicensing studies. Lisa and Kevin also discussed SCL's APE definition for the Boundary Project and the status of the Kalispel Tribe's ethnobiological study and TCP database.

Christine Pratt (SCL) emailed Marcie Mangold (WDOE):

>>> Christine Pratt 12/19/2006 10:01 AM >>>
Hi Marcie -
Please find attached Seattle City Light's Draft Toxics Assessment Plan (PSP) - dated December 18, 2006. Barbara and I would like to talk with you about this tomorrow morning at 10:30 (per earlier phone meeting invitation this morning).
Look forward to talking with you tomorrow -

Christine
206.386.4571

>>> "Mangold, Marcie (ECY)" <DMAN461@ECY.WA.GOV> 12/19/2006 7:57 AM >>>
Sounds good.

From: Christine Pratt [mailto:Christine.Pratt@Seattle.Gov]
Sent: Tuesday, December 19, 2006 7:55 AM
To: Mangold, Marcie (ECY)
Cc: Barbara Greene; Christine Pratt
Subject: Re: Phone Meeting - "Toxics Assessment"

Hi Marcie -

Heard back from Barbara - Wednesday morning looks good on our end. Hope that still works for you. I've targeted 10:30 Wednesday as a time to meet over the phone and discuss changes to the "Toxics Assessment" - please let us know if that time works for you - or suggest another (not before 9 please).

I'll be forwarding the "Toxics Assessment" to you later on today.
Thanks, Marcie.
Christine

>>> "Mangold, Marcie (ECY)" <DMAN461@ECY.WA.GOV> 12/18/2006 2:32 PM >>>
I have an appointment at 3:30, so I have to leave at 3:00. Can we have it any earlier?

D. Marcie Mangold
Water Quality Program
Department of Ecology
4601 North Monroe Street
Spokane, WA 99205-1295
phone 509 329 3450
fax 509 329 3570
dman461@ecy.wa.gov

1.1. Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus

DRAFT

During preliminary planning for the relicensing effort in spring 2005, SCL identified toxic substances (toxics) as an issue that needed to be addressed as part of the FERC relicensing and Washington State 401 certification processes. A Toxics Inventory and Screening was conducted by SCL in 2005 to identify toxics of potential concern in the Project area (R2 2006). The Toxics Inventory and Screening primarily focused on water quality data, but also reviewed sediment and fish tissue data and potential sources of contamination. After the release of the inventory and screening report, an additional evaluation of toxics was conducted by reviewing information contained in the Environmental Protection Agency's (EPA) Preliminary Assessments and Site Investigations Report for the Lower Pend Oreille River Mines and Mills (Ecology and Environment 2002). The review of the EPA data is summarized in Attachment 3-4. Based on the results of these initial reviews, further study has been recommended for six toxics: arsenic, cadmium, lead, mercury, zinc, and PCBs. This study plan describes the next steps in understanding the relationship between these toxics of concern and the Boundary Project. The proposed plan calls for a focused evaluation of existing information to determine how the bioavailability of toxics of concern is influenced by Boundary Project operations, i.e., establish specific Project nexus, and to develop and implement a Phase 2 Toxics Sampling and Analysis Plan that will focus on field data collection and analysis. Phase 1 is scheduled to begin in early 2007, with Phase 2 to commence in summer of 2007 with carry over into 2008 as needed.

1.1.1. Nexus between Project Operations and Effects on Resources

Toxics of potential concern in the lower Pend Oreille River are five metals associated with historical and current mining activity and PCBs. As noted above, a Toxics Inventory and Screening, based on water column and biotic sampling results, was conducted by SCL in 2005 and an additional evaluation of potential contaminants was conducted in 2006, for which SCL reviewed existing sediment toxics data (EPA 2002) to help identify additional toxics of concern for inclusion into Phase 1 of this study plan (see Section 1.1.2). Based on the results of the screening and additional evaluation, six toxics of concern were identified for this assessment: arsenic, cadmium, lead, mercury, zinc, and PCBs.

Reservoirs can impact the presence and transport of toxics in several ways. The decrease in river velocity due to impoundment tends to increase the accumulation of fine sediment upstream of dams, and thereby increase the potential for the accumulation of toxics in those sediments (Ecology 2005). In addition, TDG supersaturation may result in the oxidation of dissolved metals into an insoluble particulate form, potentially affecting the bioavailability of toxics through metals precipitation. Further, fluctuating water levels

within reservoirs may lead to erosion and re-suspension of fine particles containing toxics, thereby increasing the concentration of toxics in the water column, in surface sediments, and at the sediment-water interface. If such contaminated sediments occur in these locations, the biological availability of toxics would potentially increase.

To identify any connections between the toxics of concern and Project operations, and to help design an appropriate Phase 2 toxics sampling program, Phase 1 is intended to provide additional information on potential contaminant pathways in Boundary Reservoir. The toxics of concern can be found in a variety of forms or species (Please see attached Table A-1, titled "Examples of Toxic Variants and Technical Sampling Considerations,") Determining what form(s) of toxic substances should be sampled in Phase 2 requires a better understanding of how Project operations interact with local water chemistry and the speciation, diagenesis, and toxicity of each of the toxics of concern under local conditions. In addition, there are multiple sampling methods and numerous sampling locations throughout the Project area that could be incorporated into a toxics sampling plan. A more detailed review of the toxics of concern and improved knowledge of potential sediment locations and transport mechanisms will facilitate the selection of the most appropriate methods and sampling locations within Boundary Reservoir, and thereby produce a Phase 2 sampling plan that will more accurately assess the potential effect of the Project on toxics of concern in the Project area. These site-specific details will be clarified as part of Phase 1 of this proposed study and will be used in development of the Phase 2 sampling program.

1.1.2. Agency Resource Management Goals

In addition to providing information needed to characterize Project effects, the proposed assessment will provide information to help agencies with jurisdiction over aquatic and terrestrial animal populations and habitat (including water quality resources) and with responsibilities for health of users of such resources in the Project area identify appropriate conditions for the new Project license pursuant to their respective mandates. Boundary studies are specifically designed to meet relicensing requirements, but may also be relevant to recent or ongoing management activities by other agencies. A brief description of the related resource management goals, by entity, follows.

Washington Department of Ecology (Ecology)

Ecology's relevant toxic substance surface water quality standards, based on a hardness of 80 mg/L $CaCO_3$ and a pH of 8.0, are presented in Table 3.3-1.

Table 3.3-1. Washington Department of Ecology toxic substance surface water quality standards (WAC 1997).

Toxic Substance	Acute Criteria (µg/L)	Chronic Criteria (µg/L)
Toxic Substances (Aquatic Life/Public Health Category)	Must be below those which have the potential to adversely affect characteristic water uses, cause acute or chronic conditions to the	

	most sensitive biota dependent upon that water, or adversely affect public health.	
Arsenic	360	190
Cadmium	3.7	1.03
Lead dd	51	2.0
Mercury s	2.1[3]	0.012[4]
Polychlorinated Biphenyls (PCBs)	2[2]	0.014[2]
Zinc	94.7[3]	86.5[4]

Notes:

Standards calculations assumes a hardness of 80 mg/L $CaCO_3$ and a pH of 8.0

1 An instantaneous concentration not to be exceeded at any time
2 A 24-hour average not to be exceeded
3 A 1-hr average concentration not to be exceeded more than once every three years on the average.
4 A 4-day average concentration not to be exceeded more than once every three years on the average

There are no specific Washington State standards for toxics in freshwater sediments. However, Ecology has established freshwater sediment quality values based on 33 studies and tested the efficiency and sensitivity that sediment quality values have in predicting biological effects. As a result of these studies, two levels of thresholds were developed, the Lowest Apparent Effects Threshold (LAET) and the Second Lowest Apparent Effects Threshold (2LAET). In evaluating the potential toxics for inclusion into Phase 1 of this study plan, SCL used the LAET and 2LAET, along with occurrence and biological toxicity information. The toxics that were found to have sediment concentrations that met or exceeded the criteria in the Project area (EPA 2002) (see Section 1.1.1) are listed in Table 3.3-2. The surface soil guidelines in Table 3.3-2 are based on the Model Toxics Control Act (MTCA) and Cleanup Regulation. (For greater details on these thresholds and guidelines, please refer to Attachment 3-4). SCL used these thresholds in reviewing the existing data (EPA 2002) to help identify the toxics of concern for inclusion in Phase 1 of this study plan.

Table 3.3-2. Surface soil and freshwater sediment cleanup levels, effects levels, and sediment quality values for significant toxics documented in the Lower Pend Oreille Preliminary Assessment and Site Investigation (EPA 2002).

Constituent	Surface Soil[1]	Freshwater Sediment		
	MTCA Method A Cleanup Level for Unrestricted Land Use (mg/Kg)	Typical Background (mg/Kg)[2]	Lowest Apparent Effects Threshold (mg/Kg)[3]	Second Lowest Apparent Effects Threshold (mg/Kg)[3]
Arsenic	20.0	1.1	31.4	50.9
Cadmium	2.0	0.1-0.3	2.39	2.9
Lead	250	4-17	335	431
Zinc		7-38	683	1080

Notes:

1 Ecology Table 740-1
2 NOAA Screening Quick Reference Table for Inorganics in Solids
3 Ecology Sediment Quality Values (Michelsen 2003)

U.S. Environmental Protection Agency (EPA)

The Clark Fork – Pend Oreille Basin Water Quality Study: A Summary of Findings and a Management Plan was prepared in 1993 as a cooperative effort among the states of Montana, Idaho, and Washington with assistance from the EPA (EPA 1993). This report summarizes three years of water quality research in the Clark Fork-Pend Oreille River basin and provides a management plan for protection of the basin's water quality. This report identifies management objectives for the Clark-Fork River basin, Lake Pend Oreille, and the Pend Oreille River basin. Only one objective is applicable to toxics in the Pend Oreille River: Improve Pend Oreille River water quality through macrophyte management and tributary nonpoint source controls. Actions as related to this objective and toxics include:

1. Develop and maintain programs to educate the public on their role in protecting and maintaining water quality.
2. Establish and maintain a water quality monitoring network to monitor effectiveness and trends and to better identify sources of pollutants.

Water Resource Inventory Area (WRIA) 62

Numerous agencies and stakeholders in 1998 formed the Water Resource Inventory Area (WRIA) 62 planning unit, the goal of which is to "develop strategies that will balance competing demands for water, while at the same time addressing local concerns, preserving and enhancing the health of the watershed and considering the economic stability of the watershed." In January of 2005, a Watershed Management Plan for WRIA 62 was completed (Golder Associates 2005). This plan identified five goals and related objectives for water quality. The applicable goals and objectives as related to surface water quality and toxics in the Pend Oreille River are described below. This

proposed toxics assessment may help in understanding pathways by which toxics might influence water quality and the ability to meet standards.

- WQUAL-1: WRIA-wide coordination of water quality monitoring.
- WQUAL-3a: Watershed Planning Implementing Body to participate in (interact and provide input to) the TMDL process for tributary streams that originate within WRIA 62.

  Objective: Remove tributary streams in WRIA 62 from the 303(d) list of impaired waters by meeting State and tribal (where appropriate) water quality standards in impaired tributary streams
- WQUAL-3b: Watershed Planning Implementing Body to participate in (interact and provide input to) the TMDL process for the mainstem of the Pend Oreille River.

  Objective: Meet State and tribal (where appropriate) water quality standards in the mainstem Pend Oreille River
- WQUAL-5: Protect water bodies of high water quality and improve water quality of impaired water bodies.

  Objective: Maintain compliance with state water quality standards and prevent degradation of waters that meet or exceed state water quality standards in WRIA 62.

USDA Forest Service (USFS)

Portions of the Boundary Project are located within the Colville National Forest. As such, the USFS is a participating stakeholder in the relicensing of the Boundary Project. The information collected as part of the proposed Boundary toxics assessment will support management goals and objectives identified by the USFS for the Pend Oreille Basin. The Land and Resource Management Plan, completed in 1988, is applicable to water quality and management within the basin (USFS 1988). This plan identifies five management activities in the soil and water division including:

1. Coordinate with other resources to provide support and advice that helps protect the soil and water resource.
2. Monitor the effect of the Forest Plan activities on the soil and water resources.
3. Restore damaged soil and water resources.
4. Work with Washington State Department of Ecology or others as needed to secure water rights.
5. Coordinate with other agencies or interested parties.

1.1.3. Study Goals and Objectives

The goals of Phase 1 of the Toxics Assessment are to identify any pathways of contamination or mechanisms for changing the bioavailability in Boundary Reservoir of

toxics of concern and to evaluate any effect of Boundary Project operations on these pathways and mechanisms. Developing a more complete assessment of the effect of Project operations on the availability or conveyance of one or more of the toxics of concern will allow for the development of an appropriate toxics sampling plan (e.g., biota, water column, or sediments) for Phase 2 of this assessment. The goals of Phase 2 are to assess Project impacts on toxics of concern that were identified as having a potential Project nexus in Phase 1 and to generate information that will be useful to the relicensing participants in developing appropriate measures for the State 401 water quality certification and the new FERC license.

In developing the Phase 2 sampling plan, SCL intends to work in collaboration with the mandatory conditioning agencies, the Tribes and the other relicensing participants to design an appropriate and rigorous sampling design to document Project effects. SCL intends to schedule a formal study plan meeting with relicensing participants in mid-2007 to collaborate on the development of the Phase 2 study plan. Thereafter, SCL will complete the Phase 2 sampling plan and submit it to FERC for its review and concurrence, and proceed with implementation of Phase 2 in the second half of 2007 and, if appropriate, into 2008.

The specific objectives of the Phase 1 and Phase 2 study plans are listed below.

Phase 1

Objective 1. Update data/information for toxics of concern summarized in the Toxics Inventory and Screening and the EPA data review with any new studies or reports.

Objective 2. Characterize existing conditions in Boundary Reservoir that are relevant to toxics contamination and bioaccumulation.

i) Use existing information to describe reservoir surface elevation changes, flows, velocities, sediment dynamics, temperature, TDG, and DO.

ii) Identify data gaps for information necessary to understand a potential Project nexus.

Objective 3. Determine the potential pathways of contamination and mechanisms affecting bioavailability for arsenic, cadmium, lead, mercury, zinc, and PCBs that could occur in Boundary Reservoir.

i) Document what conditions are conducive to, alter, or prevent leaching of arsenic, cadmium, lead, and/or zinc in nearby waters including the influence of dissolved oxygen and pH.

ii) Document what conditions are conducive to, alter, or disrupt the precipitation of arsenic, cadmium, lead, and/or zinc in aquatic environments including the influence of dissolved oxygen and pH.

iii) Document factors that influence the rate of methylation of mercury.

iv) Document current sources and probable pathways for PCBs into Project waters and biota present within Project waters.

v) Document what conditions are conducive to the transformation of lead into inert or bioavailable forms.

vi) Document the level of cadmium that begins to disrupt primary production.

Objective 4. Determine areas within Boundary Reservoir where sediments with grain size characteristics similar to mine waste rock and/or tailings are likely to have been deposited.

i) Document historical location, volume, and particle size of mine waste rock and/or tailings supplied to the Pend Oreille River, including potential input from Box Canyon Dam.

ii) Utilize a one-dimensional model to determine the capacity of the Pend Oreille River to transport sediment with similar grain-size characteristics as the mine waste rock and/or tailings over a wide range of flow conditions.

iii) Based on daily flow records for the Pend Oreille River prior to September 1967, determine the capacity of the Pend Oreille River to transport mine waste rock and/or tailings on an annual basis prior to closure of Boundary Dam and the initiation of Boundary Project operations.

iv) Determine if there was potential for the Pend Oreille River in the Project area to have received large deposits of mine waste rock and/or tailings just prior to closure of Boundary Dam and the initiation of Boundary Project operations.

v) Identify zones of sediment deposition within Boundary Reservoir; these zones of deposition will contain sediment from all sources, of which mine waste rock and/or tailings are expected to be a small portion of the total accumulation of sediment.

vi) Determine where sediments with grain-size characteristics similar to mine waste rock and/or tailings are likely to have accumulated in Boundary Reservoir between 1967 and 2006.

Objective 5. Identify any relationship between Boundary Reservoir operations and pathways of contamination and/or mechanisms of bioavailability for the six toxics of concern (Ar, Cd, Pb, Hg, Zn, & PCBs).

i) Describe the conditions identified in Objective 3 that are currently occurring in Boundary Reservoir.

ii) Document the data or factual evidence that indicates a Project-related influence on a pathway of contamination or mechanism of bioavailability (i.e., a Project nexus) or the lack thereof.

Phase 2

Objective 1. Develop an appropriate sampling plan for the toxics of concern that have been identified in Phase 1 as being potentially affected by Boundary Project operations. The sampling plan will identify the specific sites, sampling methodologies and techniques, and other relevant procedures and protocols as appropriate. Multiple sampling options are reviewed in the attached table (Examples of Toxic Variants and Technical Considerations for Sampling). The sampling plan design and methods will be consistent with generally accepted scientific practice.

Objective 2. Conduct field sampling and sample analysis. Sampling sites will likely be located below active or inactive mining areas that are adjacent to the reservoir or that contain surface water drainage that connects to the Pend Oreille River. Sampling sites also will likely include locations within and below the drawdown zone of the Project reservoir where Project operations have the potential to affect the deposition or transport of contaminated sediments. Results of the one-dimensional hydraulic model completed in Phase 1 also will be used to focus sampling efforts. Sampling will include sediments, water column, and aquatic biota as appropriate based on the results of Phase 1. The sampling design and methods will be consistent with generally accepted scientific practice. Sampling would begin in 2007 after the completion of Phase 1, and may carry over into 2008.

Objective 3. Conduct additional sampling as necessary. SCL will consult with Ecology to establish appropriate triggers that indicate if additional field sampling is required. If the results of sampling indicate that triggers are activated for any of the toxics of concern, additional sampling, such as tissue sampling, could be conducted in late 2007 or 2008. The sampling design and methods would be consistent with generally accepted scientific practice.

Objective 4. Review new information from related studies. SCL will conduct three studies in 2007 that may be relevant to this Toxics Assessment: the Sediment Transport and Boundary Reservoir Tributary Delta Habitats Study [section 4.2], the Mainstem Aquatic Habitat Modeling Study, hydraulic routing model component [section 4.1], and the Erosion Study [section 2.1]. SCL will review the results from these studies to determine if additional Phase 2 sampling may be necessary or useful to evaluate Project impacts. Any additional sampling required would be incorporated into the Phase 2 sampling plan for 2008.

1.1.4. Need for Study

Summary of Existing Information

Toxics can potentially enter the Boundary Project area through river and stream point and nonpoint sources, fallout from the atmosphere, and recycling from sediments. Nonpoint source pollution is caused by rainfall or snow melt moving over and through the ground

and picking up natural and human-made pollutants in the process. The main contaminant sources of concern are those associated with historical and current mining activities. A detailed summary of available information on location and historical mining activities of the mines in the Project area (the Metaline Mining District) was included in Appendix 4-1 of the Boundary Project relicensing Pre-Application Document (PAD).

Mining in the Pend Oreille River area dates back to 1855 (Ecology and Environment 2002); however, permanent settlement of the area did not occur until 1884. The Lehigh Cement Co. Plant and quarries were developed in 1904 followed by the opening of several lead-zinc mines. The Lehigh Cement Company operated a cement plant in Metaline Falls from 1914 to 1989. Cement kiln dust from the cement-making process was landfilled on site and capped in 1996. Groundwater contamination below the landfill and downgradient now requires cleanup; contaminants include arsenic, chromium, lead and manganese. Contaminated groundwater flows into Sullivan Creek and Sullivan Creek flows into the Pend Oreille River. Extensive mining did not occur in the area until after dynamiting of the Box Canyon channel in 1906, which allowed for navigation downstream to Metaline Falls. The Pend Oreille River area was home to two of the largest mines in Washington, the Pend Oreille Mine and Grandview Mine. The Pend Oreille Mine is a lead and zinc mine, which by 1964 had produced 63 percent of the total lead and zinc mined (Baltien 1996) in Pend Oreille County. Between 1952 through 1967, mine tailings were discharged directly to the Pend Oreille River, while after 1967 tailings were deposited on land at the mine site (Ecology 2004). The Pend Oreille Mine closed in 1977, but was reopened in early 2004 by Teck Cominco. Claims for the Grandview Mine were patented before 1900 and between 1940 to 1951 production was l.2 million tons of zinc, lead, and traces of silver (Baltien 1996). However, by 1964 the Grandview Mine was reported to be exhausted and the operation was closed.

Historically, metal extraction and processing were relatively inefficient, yielding large volumes of metal-rich tailings that were deposited to nearby streams (Maret and Skinner 2000). Mine tailings in the Boundary Project vicinity typically contain elevated levels of arsenic, cadmium, copper, lead, mercury, and zinc (Ecology and Environment 2002). As described in Appendix 4-1 of the PAD, the Pend Oreille Mine is currently the only active mine in the Project vicinity.

Point sources are authorized discharges to the Pend Oreille River, regulated by the Washington Department of Ecology through the National Pollutant Discharge Elimination System (NPDES) permitting process. Any authorized discharge through the NPDES permitting program requires routine monitoring and reporting of all discharges to the river. The Pend Oreille Mine, the wastewater treatment plants associated with the small municipalities along the river and the Ponderay Newsprint Company all manage outfalls to the Pend Oreille River.

A nonpoint toxic of concern is PCBs. PCBs were banned in the United States in the 1970s, but continue to be a problem in the environment. PCBs have been found in the tissue of fish captured in Boundary Reservoir at concentrations above the Ecology/EPA recommended health standard for human consumption of fish (see section 4.4.5.5.3 of the

PAD, Toxic Compounds [SCL 2006] for a thorough description of existing information on toxics in the Project area). The source of PCB contamination is unknown.

Other pathways of toxics into the Project area are from atmospheric fallout and recycling from the sediments. No information is available regarding atmospheric fallout. Recycling from sediments has been shown in some cases to be an important pathway. The transport of dissolved chemical species between the water column and the underlying sediment is termed benthic flux (USGS 2000). Benthic flux is considered to be positive when the transport of metals is from the sediment into the water column, but can also be negative when the transport of metals is from the water column into the sediment. Several factors affect the transport of metals between the sediment and water column including advection, diffusion, oxidation-reduction reactions, and several biological processes. At the sediment-water interface, advection is the transport of metals by the movement of the overlying water. Diffusion refers to the transport of metals between the sediment and water column as a result of a concentration gradient. Metals temporarily stored in sediments may dissolve in pore waters and diffuse to overlying waters due to gradient concentrations (Zago et al. 1999). If the concentration of a metals species is greater in the sediment pore water than in the water column, there is a tendency for the metals to transfer from the sediment into the water, and vice versa.

The geochemistry of the sediment and overlying water is also an important factor in the magnitude of benthic flux by metal species. Metal speciation is a function of pH, redox potential, and the presence of complexing ligands such as carbonate, dissolved organic carbon, and sulfide (IWRRI 2002). One example is the reduction of iron from ferric to ferrous forms under anoxic conditions. In this example, the presence or absence of oxygen influences the benthic flux of iron. Anoxic conditions favor the dissolution of certain metal oxides and can thereby enhance metal desorption and mobilization (IWRRI 2002). In this case, the concentration gradient of one species is interrelated with that of another and the release of one solute only occurs when another solute is depleted. Ligands, molecules that may donate an electron to a metal by a covalent bond, can also be a factor. Both dissolved sulfides and organic molecules are ligands. Sulfides, for example, can inhibit the release of trace elements by the formation of insoluble sulfidic minerals.

Other biological factors may also influence the rate of benthic flux. For example, bioturbation, the mixing of sediment by burrowing, ingestion, and defecation by benthic communities, can increase the sediment-water interface affecting the chemical fluxes between the sediment and water column. Similarly, bioirrigation, the flushing of burrows with overlying waters by benthic organisms, can also enhance the exchange of dissolved solutes.

In order to determine which toxics may be present within Boundary Reservoir, two reviews of toxics have been conducted, as noted above. The first, the Toxics Inventory and Screening was conducted by SCL in 2005 to identify toxics of potential concern in the Project area, i.e., those for which recent exceedances of water quality standards have been documented in the existing literature and for which there is thought to be a potential

Project nexus (R2 2006). (The second review, an additional evaluation of potential contaminants, was conducted in 2006 and is discussed in Attachment 3-4.) Based on results of this review of existing information, toxics were grouped into one of two categories: low concern or medium concern (refer to the Toxics Inventory and Screening for more detail). No toxics of high concern were identified. Toxics of low concern will receive no additional evaluation as part of the FERC relicensing and 401 certification processes. The four toxics (cadmium, lead, mercury, and PCBs) determined during the Toxics Inventory and Screening to be of medium concern and with a potential for a Project nexus will be further evaluated in this Phase I Toxics Assessment study. Below is a summary of the initial assessment of these four toxics completed during the Toxics Inventory and Screening (R2 2006).

Cadmium — Cadmium is a natural element found in soils and rocks and is often extracted during the production of other metals such as zinc, lead, and copper. Boundary Reservoir operations could affect cadmium concentrations through toxics accumulation, metals precipitation, or erosion and leaching. There were five dissolved concentrations and three total concentrations exceeding the cadmium criteria in the 1970s and in 1985 at the Metaline Falls and International Border water quality monitoring stations. Dissolved cadmium data collected in the early 1990s at the Newport station were below detection limits. EPA found elevated levels of cadmium in soils at the Josephine, Grandview, and Oriole abandoned mines and at the Pend Oreille Mine site (Ecology and Environment 2002). Cadmium is considered of medium concern given the lack of recent measurements in the Project area and the potential contamination sources from active and abandoned mines (R2 2006).

Lead — Operations of Boundary Reservoir could influence lead contamination through toxics accumulation and erosion and leaching. Historical measurements collected between 1975 and 1991 at the Newport and International Border stations show exceedances of dissolved lead concentrations beyond the chronic water quality standard. Measurements exceeding the chronic criterion of approximately 2 µg/L were 10 µg/L (7/11/1977), 10 µg/L (10/16/1979), and 7 µg/L (11/6/1985). The measurement exceeding the acute criterion of approximately 51 µg/L was 500 µg/L (12/8/1975). The mean value of recent total lead concentrations collected by the Kalispel Tribe in Box Canyon reservoir is below water quality standards, but the standard deviation of the data suggests a recent exceedance of the chronic standard. However, this measurement is of the total concentration and the standard is based on the dissolved fraction, which may be much lower. Two recent readings of lead collected in Boundary Reservoir did not show water quality exceedances. The current source of lead is assumed to be runoff from abandoned mine sites. Lead may also be discharged in effluent from the Pend Oreille Mine, but these discharges must meet water quality guidelines outlined by Ecology in the mine's NPDES permit. Given the exceedances and the current sources of contamination from abandoned mine sites, lead is considered of medium concern (R2 2006).

Mercury — Mercury is a naturally occurring metal that can take several forms in the environment. In soil and water, bacteria can form methylmercury, a form that can accumulate in fish tissue. The methylation of mercury is found to be more pronounced in

wetland areas and to be enhanced by low DO, increased nutrients, and increased temperature. Current sources of mercury contamination include abandoned mine sites and effluent from the Pend Oreille Mine. Boundary Project operations could affect contamination of mercury through increased methylation rates and erosion. Absence of recent data and uncertainty associated with previous data due to historically high method detection limits make qualitative assessment of mercury contamination difficult. Given the lack of recent data, the current sources in the Project area, and the ability of mercury to bioaccumulate, mercury is considered of medium concern (R2 2006). Additional assessment of the potential for mercury contamination in Boundary Reservoir is needed.

Polychlorinated Biphyenyls — PCBs are man-made mixtures of chlorinated compounds used as coolants and lubricants in electrical equipment. Manufacture of PCBs was banned in 1977. PCBs bind strongly to soil and adhere to organic compounds and sediments. They are also taken up by small organisms and can accumulate in fish. The operation of Boundary Reservoir can potentially influence the contamination of PCBs through erosion caused by the daily fluctuation of reservoir levels. An Ecology fish tissue verification study completed in 2004 found PCBs above the recommended health standard for the consumption of fish. In Boundary Reservoir, total PCB fish tissue concentrations were measured at 16.8 µg/Kg ww and 14.5 µg/Kg ww in largescale suckers, 7.4 µg/Kg ww in northern pike minnows, and less than detection in yellow perch. The NTR criterion for total PCBs is 5.3 µg/Kg wet weight. To address PCB contamination from a regional perspective, this study also compared total PCB concentrations in the Pend Oreille River to other fish tissue samples collected in Washington state. This comparison found total PCBs collected in the Pend Oreille River to fall below the 30th percentile. PCB concentrations of fish tissue samples of largescale suckers collected in the Pend Oreille River are low relative to other samples. As a result, the Ecology report suggested that a TMDL specific to the Pend Oreille River is not necessarily warranted, but that perhaps a statewide approach is better. Despite the documented bioaccumulation of PCBs in fish tissue located in the Project area, PCBs are considered to be of medium concern because levels are low compared to other statewide samples and given the conclusions of the Ecology fish tissue verification study (R2 2006). More information is needed to assess PCBs in Boundary Reservoir.

The Toxics Inventory and Screening reviewed all types of toxics data (water, sediment, and fish tissue), but mainly focused on available water quality data. As described above, SCL has conducted an additional screening effort that reviewed the mine and mills sampling data reported in the Preliminary Assessment and Site Investigation Report prepared by EPA (Ecology and Environment 2002). Unlike the Toxics Inventory and Screening, the EPA review focuses on the toxicity of sediment samples taken from mine sites rather than water samples in the Pend Oreille River. The recent review of EPA toxicity data is described in Attachment 3-4.

In the EPA study, 21 active mines (including Pend Oreille Mine, 2 miles downstream, or north of, Metaline Falls) and abandoned mine sites along the Pend Oreille River from Metaline to the international border were assessed. Of the 21 sites visited, 5 were found to have potential contamination sources. At these five sites, sediment, surface soil, and

some water quality samples were collected and their concentrations were evaluated by EPA for determination of those that were "elevated" or "significant" compared to background levels. SCL reviewed the data for elevated/significant toxics identified in the EPA report and compared it to regional toxicity guidelines and contaminant toxicity information in order to determine what contaminants should be considered in more detail as part of SCL's Boundary relicensing studies. Fourteen elevated or significant toxics were found and subsequently evaluated.

A two-tiered system was used to compare elevated/significant toxics with scientific criteria (refer to Table A-1 in Attachment 3-4). The first tier compared concentrations of toxics to Ecology's freshwater sediment and surface soil guidelines (refer to Attachment 3-4 for details and references). If the concentration of a toxic substance within EPA samples was below these guidelines, then the toxic was not considered for further analysis. If the concentration of a toxic within EPA samples exceeded guidelines, then the second tier criteria were evaluated. The second tier consists of three separate criteria: 1) was the constituent detected in a waterway or from a target sample (as defined in Attachment 3-4), 2) was the constituent of medium or high toxicity (as described in Attachment 3-4), and 3) was there documented reoccurrence of elevated/significant levels of the toxic within the basin. If the toxic met the first tier criteria and two or more of the second tier criteria, then it was recommended for further study.

Of the 14 constituents evaluated, 4 (arsenic, cadmium, lead, and zinc) were recommended for further study (Table A-5 in Attachment 3-4). The other 10 (barium, chromium, copper, DDT, manganese, mercury, nickel, selenium, silver, and vanadium) were recommended for omission. Eight of the nine toxics were omitted because their concentrations did not exceed state guidelines. Only one toxic, silver, exceeded state guidelines but was omitted because it did not meet the second tier criteria. A summary of the four toxics recommended for further analysis based on review of data in the EPA report is provided below.

Arsenic — Arsenic is a naturally occurring element that is used to preserve wood and used in some pesticides (US Dept of Health and Human Service 2006). Arsenic can be toxic in the environment. Inorganic forms are more toxic to organisms in the environment than organic forms, and, among inorganic forms, arsenite is more toxic than arsenate (Greenfacts 2006). Arsenite is thought to be toxic because it binds to sulfhydryl groups, which are found on proteins. Arsenate affects the key energy producing process that takes place in all cells. Arsenic compounds can cause short-term and long-term effects in plants and animals including death, inhibition of growth, photosynthesis and reproduction, and behavioral effects (Greenfacts 2006). Arsenic-contaminated environments are characterized by limited species abundance and diversity. Based on the above information, arsenic was classified as having high biological toxicity. Arsenic concentrations were found to have values exceeding surface soil guidelines. Although there was low reoccurrence within the watershed, given the elevated levels of arsenic found in target samples and its high toxicity, it is recommended that arsenic be included in the toxic assessment study.

Cadmium — Cadmium is a natural element found in soils and rocks and is often extracted during the production of other metals such as zinc, lead, and copper. Cadmium is highly toxic and bioaccumulates at all trophic levels, accumulating in the livers and kidneys of fish (Sindayigaya et al. 1994). Cadmium can be toxic to plants at lower soil concentrations than other heavy metals and is more readily taken up than other metals. Based on the information above, cadmium is considered to be of high biological toxicity. Based on the tier 1 and tier 2 assessment criteria, it is recommended that cadmium be included in the toxic assessment. Note that cadmium was already recommended for inclusion in further relicensing studies based on the water quality assessment described in the Toxics Inventory and Screening.

Lead — Lead adversely affects algae, invertebrates, and fish. Fish exposed to high levels of lead exhibit a wide range of effects including muscular and neurological degeneration and destruction, growth inhibition, mortality, reproductive problems, and paralysis (Eisler 1988). Lead can cause reduced growth, photosynthesis, mitosis, and water absorption at elevated levels in plants (Eisler 1988). Lead can be bioconcentrated from water, but does not bioaccumulate and tends to decrease with increasing trophic levels in freshwater habitats (Eisler 1988). Lead partitions primarily to sediments, but becomes more bioavailable under low pH, hardness and organic matter content. Lead bioaccumulates in algae, macrophytes and benthic organisms, but the inorganic forms of lead do not biomagnify. Based on the information above, lead is considered to be of medium biological toxicity. It is recommended that lead be included in the toxic assessment study because it met the tier 1 criteria and three of the tier 2 criteria. Note that lead was already recommended for inclusion in further relicensing studies based on the water quality assessment described in the Toxics Inventory and Screening.

Zinc — Zinc is a common element found in air, soil, and water. Zinc is currently, and was historically, found adjacent to the Project area. It is also used in industry to make paint, dyes, wood preservatives, and ointments. Elevated levels of zinc can adversely affect the growth, survival, and reproduction of aquatic plants and animals (Eisler 1993). Based on the information above, zinc is considered to be of medium biological toxicity. Zinc meets the tier 1 criteria as well as three of the tier 2 criteria and should therefore be included in the toxic assessment study.

Two of the four toxics of concern recommended for further analysis after review of the EPA data were among the four recommended for further analysis in the Toxics Inventory and Screening (R2 2006). Thus there are six total toxics of concern that are recommended for the Phase 1 Toxic Assessment: arsenic, cadmium, lead, mercury, PCBs, and zinc.

Need for Additional Information

The Toxics Inventory and Screening evaluated toxics in the Project area based on water column information, and also reviewed sediment and fish tissue information and potential sources of contamination. Toxics with little or no information, recent exceedances of water quality standards, or potential sources of contamination in the Project area were considered to be of medium concern. The EPA report evaluated toxics in the Project area

based on sediment data and the presence of contaminants in waterways. These two assessments identified toxics of concern in the Project area, but neither the screening nor the review of the EPA report identified a nexus between any toxics and specific Project operations. More information is required to assess the potential influence of Project operations on the bioavailability and transport of the six toxics identified for further evaluation.

Phase 1 of this Toxics Assessment will develop the information needed to design the Phase 2 sampling and analysis plan, which will include collection of field samples for toxic analysis within Boundary Reservoir. Given the length of the reservoir (17.5 miles long), and a desire for an accurate assessment of Project conditions, a mechanism to focus future sampling effort is warranted. In addition to the results of the Phase 1 analysis, three of the studies proposed for implementation in 2007 (the Sediment Transport and Boundary Reservoir Tributary Delta Habitats Study [section 4.2], Mainstem Aquatic Habitat Modeling Study, hydraulic routing model component [section 4.1], and Erosion Study [section 2.1]) may provide information useful to help determine potential sites for collection of sediment samples during Phase 2. However, results from the latter three studies will only be available to guide potential sampling in 2008; i.e., the results of these studies will not be available until the end of the 2007 study season. To inform potential sediment sampling in the interim period prior to completion of the three aforementioned studies, Objective 4 has been included in the Phase 1 Assessment to identify areas within Boundary Reservoir where accumulation of sediments similar in size to mine waste rock and/or tailings may have been deposited.

Completing Phase 1 and Phase 2 of this Assessment will provide the missing information to allow SCL and relicensing participants to assess the Project's potential influence on the bioavailability of the six toxics of concern. It is SCL's intent that the decision regarding the nature and extent of the Phase 2 sampling will be made in collaboration with the relicensing participants and submitted to FERC for its review and approval, and that Phase 2 sampling will be initiated in the summer of 2007. Phase 2 sampling may also carry over into 2008, following completion of the Mainstem Sediment Transport, Hydraulic Routing Model, and Shoreline Erosion studies.

1.1.5. Detailed Description of Study

Study Area

The study area encompasses Boundary Reservoir and adjacent potential source areas for toxics. (Refer to section 1.3 of this PSP for a description of the Boundary Project location, facilities, and reservoir.) Potential toxics sources include the five mines identified in the Preliminary Assessments and Site Investigations Report as having potential sources of contamination and historical users of PCBs. PCBs have been banned since 1977, but because they bind tightly to soil and can accumulate in fish, they are still present in the Project vicinity. The five mines identified as having potential sources of contamination include the Pend Oreille, Josephine, Blue Bucket, Oriole, and Grandview mines. The Blue Bucket mine is located less than half a mile from the west side of the Pend Oreille River between river miles 29 and 30. The Oriole mine is located

approximately 1.5 miles from the west side of the Pend Oreille River between river miles 27 and 28. The Josephine mine is located less than 0.25 miles from the west side of the Pend Oreille River between river miles 25 and 26 downstream of Flume Creek. The Grandview mine is located less than 0.25 miles from the east side of the Pend Oreille River near river mile 26. The Pend Oreille mine is located less than 0.5 miles from the east side of the Pend Oreille River between river miles 25 and 26. The Lehigh Cement Company landfill is located in Metaline Falls at approximately milepost 14.7 along Highway 31. These potential sources of contamination within the Project vicinity, including tributaries and mines, are shown in Figure 3.3-1.

Proposed Methodology

A detailed literature-based assessment of the toxics of concern identified in the Toxics Inventory and Screening and additional toxics assessment, i.e., arsenic, cadmium, lead, mercury, zinc, and PCBs, will be conducted. The purpose of this assessment is to develop an understanding of the nexus between Project operations and the availability and transport of these toxics. The assessment will focus on researching and answering Objectives 1 through 5 described above. The next step will be to develop an appropriate sampling and analysis plan (SAP) as part of Phase 2 described above.

To determine whether the relationship between operations of Boundary Reservoir and the potential mobilization of contaminants, several sampling strategies are available. As part of the proposed study, all of the potential sampling strategies will be reviewed and the most appropriate selected. Some of the potential sampling schemes are described below.

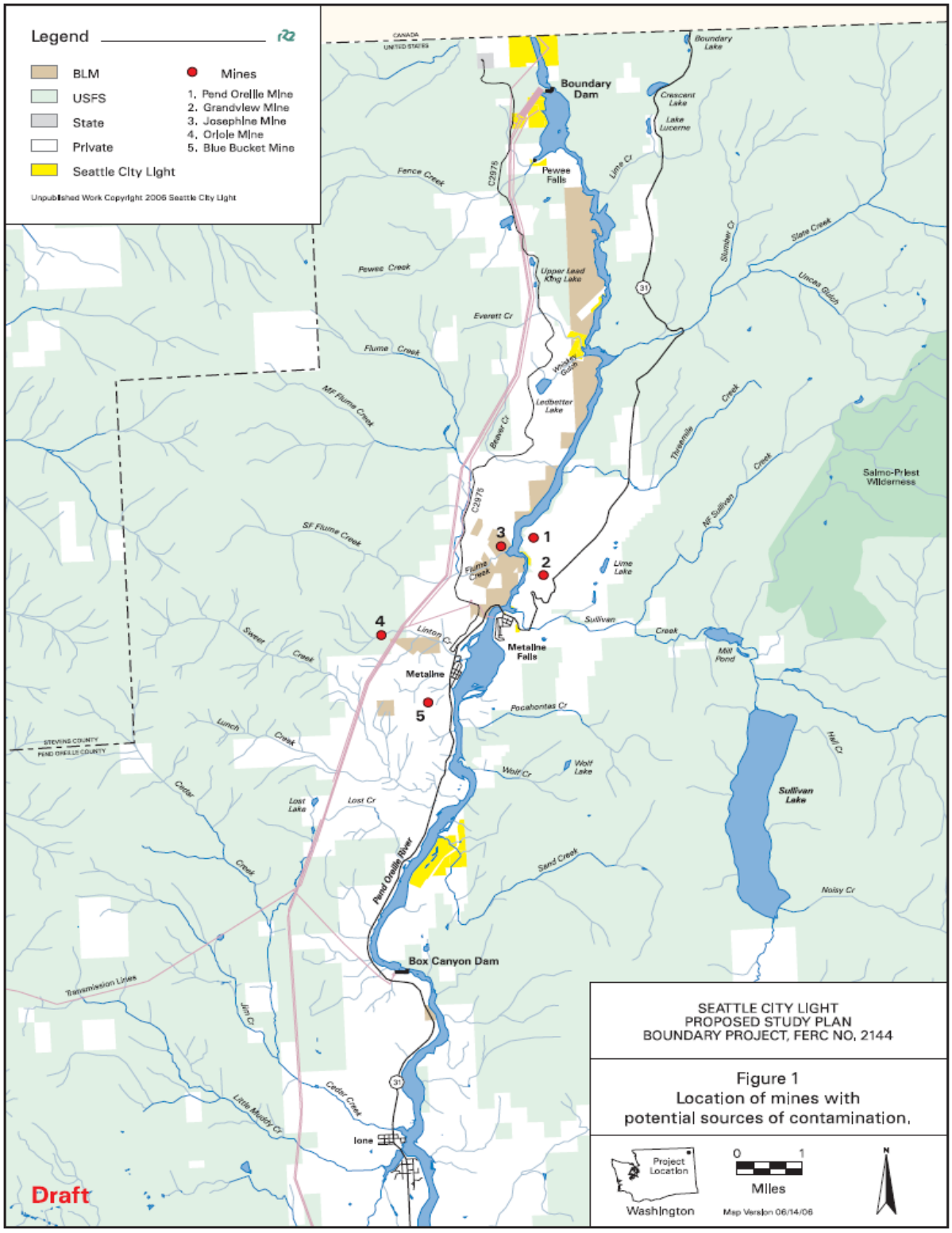

Figure 3.3-1. Project area and location of mines with potential sources of contamination.

Analysis of concentrations of toxics currently occurring in Boundary Reservoir would require sampling of the possible media where toxics are concentrated. This could include sampling and analyzing the water column, surface sediments, and deep sediments. Sampling and analyzing tissue from aquatic biota (macroinvertebrates and fish) may also occur,depending upon the results of the water and sediment analysis. Collection of water, sediment, and biotic tissue samples would involve analysis of toxic concentrations by a certified laboratory. Sampling these media would provide information on current concentrations of target toxics in the sampling location. Biota sampling can be conducted for either pelagic and/or benthic organisms to evaluate the transportation and accumulation of toxics in the food web and can provide some information on concentration in the water column and/or surface sediments.

To understand the transport of toxics from the sediment into and out of the water column, benthic flux studies can be conducted. Sampling programs to document the occurrence of benthic flux include water column and pore water sampling. Water column sampling at different depths will measure water column gradients and generally would indicate a potential benthic source. However, toxic concentration gradients may also be a result of settling of detrital material from the euphotic zone or a density-driven horizontal source (USGS 2000). Pore water samples also can be tested for toxic concentrations. For this method, devices are inserted into the sediment to collect the pore water and allowed to equilibrate for several weeks. After equilibration, pore water is extracted and measured for metals concentrations.

During Phase 1 of the Toxic Assessment, the advantages and disadvantages of different sampling options will be considered to identify an appropriate sampling strategy in Phase 2. The sampling strategies selected will be dependent on the target toxics to be analyzed as well as the existing environmental conditions in the reservoir and potential Project effect. Regardless of the sampling strategy, sampling sites should be strategically located in areas with the maximum potential for contamination, such as downstream of historic mining sites, near target sources identified in the EPA PA/SI report, or in areas of specific geochemical conditions that might influence the transport of toxics. To facilitate success of possible future sediment sampling efforts SCL proposes to determine what areas in Boundary Reservoir are likely to have sediments characteristic of mine tailings. The proposed approach incorporates two basic methods: 1) comparison of historic and current bathymetric maps to determine where sediment has been deposited within the reservoir between 1967 and 2006; and 2) development of a one-dimensional hydraulic model to determine where sediment with grain size characteristics similar to mine tailings were likely to have accumulated within the reservoir. Specific tasks associated with this approach include the following:

i) Review available literature to document historical location, volume, and particle size of mine waste rock and/or tailings supplied to the Pend Oreille River (including potential input from Box Canyon Dam).

ii) Develop a one-dimensional, steady-state hydraulic model of the Pend Oreille River from Box Canyon Dam to the international border using bathymetry of the river prior to construction of the dam.

iii) Use the hydraulic model to determine the capacity of the Pend Oreille River to transport sediment with similar grain size characteristics as the mine waste rock and/or tailings for a wide range of flow conditions.

iv) Use daily flow records of the Pend Oreille River prior to September 1967 to determine the capacity of the Pend Oreille River to transport mine waste rock and/or tailings on an annual basis prior to closure of Boundary Dam and initiation of Project operations.

v) Compare the annual quantities of mine waste rock and/or tailings transport capacity with quantities of mine tailings supplied to the river to determine if there was potential for the Pend Oreille River in the Project area to have large deposits of mine waste rock and/or tailings just prior to closure of Boundary Dam and initiation of Project operations.

vi) Compare bathymetry of the river prior to construction of the dam (USGS 1938 and Seattle City Light 1957) with available current bathymetry (2006) to identify zones of sediment deposition within the reservoir. These zones of deposition will consist of sediment from all sources..

vii) Use the hydraulic model to help determine where sediments with grain size characteristics similar to mine waste rock and/or tailings were likely to accumulate within the reservoir between 1967 and 2006.

The Phase 2 sampling and analysis plan will address the types (i.e., water, sediment, fish tissue, etc., and dissolved versus total concentration), frequency, time of year to collect, and location of samples needed to best evaluate the effects of the operation of Boundary Reservoir on the toxics of concern. As part of a sampling and analysis plan, SCL will develop a Quality Assurance Project Plan (QAPP). The QAPP will describe the project team and responsibilities, the sampling locations, sampling frequency, data collection methods, laboratory analysis, including measurement methods and method detection limits, QA/QC measures including quality control sample types and frequency and measurement quality objectives, and data management. The QAPP will be consistent with Ecology and EPA protocols.

1.1.6. Work Products

A draft and final report are the major work products required for completion of this study. The draft report, to be completed by May 1, 2007, will summarize the findings of the Phase 1 Toxic Assessment. Following issuance of the draft Phase 1 report, SCL will work in collaboration with the agencies, Tribes and other relicensing participants to review the findings from Phase 1 and to develop the details of the Phase 2 sampling plan. SCL intends to schedule a formal study plan meeting in mid-2007 (July) with the relicensing participants in order to collaborate on the design of Phase 2. Following the meeting, SCL will produce the final report, which will contain the proposed Draft Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP). The final Phase 1 report will be completed in June 2007, and the Phase 2 SAP will be submitted to FERC for its review and concurrence.

The SAP will address the following issues: the goals of the study, steps needed to meet those goals, the type of sampling necessary (i.e., water column, sediment, fish tissue, etc), the specific analyses required, the number of samples, the frequency of sampling, and a schedule of sampling. The QAPP will address elements specified by Ecology guidelines including the following items.

- Title Page with Approvals
- Table of Contents with Distribution List
- Background
- Project Description
- Organization and schedule
- Quality Objectives
- Sampling Process Design
- Sampling Procedures
- Measurement Procedures
- Quality Control
- Data Management Procedures
- Audits and Reports
- Data Verification and Validation
- Data Quality Assessment

The SAP and QAPP are similar in content except the SAP will focus on what questions need to be answered and how they will be answered through additional field sampling. The QAPP, on the other hand, will focus on the methodology to collect the field data and the QA/QC procedures required to ensure a robust sampling program. These two work products will be combined into a single document.

1.1.7. Consistency with Generally Accepted Scientific Practice

The approach to this toxics assessment has been developed in consultation with the agencies, tribes and other stakeholders. The SAP and Quality Assurance Project Plan (QAPP) referred to herein would follow Ecology guidelines.

1.1.8. Consultation with Agencies, Tribes, and Other Stakeholders

As indicated above, SCL met with Ecology in 2005 to identify issues to be addressed as part of the 401 certification process. The following relicensing participants reviewed the scope of the Toxics Inventory and Screening in 2005: Ecology, USFS, WDFW, Pend Oreille Mine, and Teck Cominco American, Inc. The screen was requested by and provided to the following relicensing participants: Jean Parodi (Ecology), Jon Jones

(Ecology), David Knight (Ecology), Tom Shuhda (USFS), Doug Robison (WDFW), Kevin Kinsella (Pend Oreille Mine), and Bill Duncan (Teck Cominco American, Inc.).

Input regarding the literature-based assessment study plan was provided by relicensing participants during Workshops and Workgroup meetings. Workshops were held in Spokane, Washington, on November 30, 2005, and February 16, 2006. Workgroup meetings were held in Spokane on May 22, 2006, and August 16, 2006, and in Metaline Falls on June 29, 2006.

During the May 22 workgroup meeting, an outline for the Assessing Toxics of Concern: Evaluation of Contaminant Pathways and Potential Project Nexus study plan was presented. During the June 29 workgroup meeting, the draft Assessing Toxics of Concern: Evaluation of Contaminant Pathways and Potential Project Nexus study plan was presented. The four toxics of concern included in this plan, which were identified during the Toxics Inventory and Screen (SCL 2005), were cadmium, lead, mercury, and PCBs. During the August 16 workgroup meeting, SCL presented the next iteration (with revised title) of the draft Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus study plan, which was revised based on stakeholder comments provided at the June 29 workgroup meeting. In preparation of this revised study plan, SCL reviewed the EPA's 2002 Preliminary Assessments and Site Investigations Report for the Lower Pend Oreille River Mines and Mills (PASI) to ascertain whether additional toxics should be included in the Phase 1 toxics assessment. Based on evaluation of the PASI document, arsenic (i.e., along with cadmium, lead, mercury, and PCBs) identified by the inventory and screening (for greater detail on study plan development, see section 3.3.4 of this study plan, under Summary of Existing Information).

Relicensing participants providing comments on the study approach at these meetings included Ecology, the USFS, U.S. Fish and Wildlife Service, Confederated Tribes of the Colville Reservation, Kalispel Tribe of Indians, Canadian Columbia River Intertribal Fisheries Commission, BC Hydro, Pend Oreille County Public Utility District, Columbia Power Corporation, Environment Canada, Ponderay Newsprint, and Teck Cominco. Comments provided by relicensing participants are summarized in Attachment 3-5 to this study plan and can also be found in workgroup meeting summaries (available on SCL's relicensing website [http://www.seattle.gov/light/news/issues/bndryRelic/]).

Stakeholders' comments on the PAD, FERC's Scoping Document 1, and SCL's proposed study program were submitted to FERC on or before September 1, 2006. Following review of these comments, SCL revised the Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus study plan to clarify the intent and goals of the overall approach to toxics assessment in Boundary Reservoir. The Project Nexus section of this study plan was revised to reflect that Phase 1 is being conducted to develop an understanding of the connections between the toxics of concern and Project operations, and to design an appropriate Phase-2 toxics sampling program for the reservoir. Similar revisions were made to the Study Goals and Objectives, Need for

Additional Information, Proposed Methodology, and Work Products sections of this study plan.

In its PAD/Scoping comments, Ecology asked whether SCL planned to conduct field verifications of the results of its Phase 1 sediment deposition analysis (Ecology 2006). SCL does not intend to conduct field studies to "ground-truth" the results of the Phase 1 sediment deposition analysis. Rather, if sediment sampling is identified as the appropriate medium through which to evaluate toxics in the reservoir, on-site verification of the results of the Phase 1 sediment deposition analysis may be required as part of the Phase 2 study.

Involvement of relicensing participants in the design and execution of the Phase 1 and Phase 2 Toxics Assessment will be ongoing throughout the study program. SCL conducted a formal study plan meeting with relicensing participants after filing this PSP on November 15, 2006. SCL also has consulted with relicensing participants regarding comments received subsequent to the study plan meeting After the RSP is filed, FERC will issue its final study plan determination.

1.1.9. Schedule

The schedule for completing the Phase 1 Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus study is provided in Table 3.3-3. The final Phase 1 study report is scheduled for release in June 2007. Phase 2 field sampling, the extent of which will be determined based on the outcome of Phase 1, would be initiated in summer of 2007 and continue through 2008, as necessary.

Table 3.3-3. Proposed project schedule.

Phase	Target Date
Study mobilization/startup	February 2007
Secure FERC final determination on the RSP	March 2007
Initiate Phase 1 of the Assessment	March 2007
Draft Phase 1 Study Report	May 2007
Schedule formal study plan meeting on the draft Phase 1 report	May 2007
Issue the Final Phase 1 Study Report and Draft Phase 2 Sampling and Analysis Plan (SAP)	June 2007
Schedule formal study plan meeting on the draft Phase 2 SAP	July 2007
Complete the Phase 2 SAP and submit it to FERC	July 2007
Commence Phase 2 Sampling and Analysis	Summer 2007
Review year 1 study results	March 2008
Continue Phase 2, Year 2 Sampling and Analysis (if necessary)	2008

1.1.10. Progress Reports, Information Sharing, and Technical Review

SCL will distribute the draft Phase 1 study report in May 2007 and initiate communication with relicensing participants to discuss the study results. Comments from the relicensing participants will be addressed when preparing the Phase 1 final report and the draft Phase 2 SAP. The Phase 1 final report will contain an appendix of water quality data reviewed during the proposed study; these data will also be available in digital format.

In accordance with the results of the Phase 1 evaluation, a detailed Phase 2 sampling and analysis plan will be developed and submitted to FERC for approval. Sampling will begin in mid-2007. Formal reporting requirements related to the Phase 2 approach would include the Initial Study Report (March 2008), the Updated Study Report (March 2009), and corresponding meetings to discuss these reports. Prior to release of these reports, SCL will meet with agencies, tribes, and other stakeholders to discuss the study results. In addition, SCL plans to provide updates, generally on a quarterly basis, to keep relicensing participants apprised of study progress and to communicate significant developments. Following each official Study Report meeting, the FERC ILP regulations provide the opportunity for SCL and the relicensing participants to request modifications to the study plan in light of the progress of the study program and results to date.

1.1.11. Anticipated Level of Effort and Cost

Based on a cursory review of study needs, the anticipated cost for Phase 1 is $95,000, which is required in 2007 for the Phase 1 Toxic Assessment and report preparation. A Phase 2 sampling cost estimate cannot be generated until a SAP is developed at the onset of Phase 2.

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-----Original Message-----
From: Al.Solonsky@Seattle.Gov
To: Gary.Birch@bchydro.bc.ca
Cc: sdpadula@aol.com; philgert@r2usa.com; barbara.greene@Seattle.Gov
Sent: Tue, 19 Dec 2006 10:10 AM
Subject: Re: SEV CC Rpt (ISBN) Feb2003[1].pdf

That's good news Gary, congratulations on your new license and I appreciate getting a copy. I'd like to work with James to identify tags, so thanks for the offer to work together.

>>> "Birch, Gary" <Gary.Birch@bchydro.bc.ca> 12/19/2006 10:02 AM >>>
Al, I just received word that we have received the water license order from the Comptroller of Water Rights (CWR). That means we should be in a position to work with you on the bulltrout telemetry next spring. I'm going to push for us to order the tags in January, so may ask James to check with you on type of tag etc.

I've attached a copy of the Water Use plan report so that you know what we have to deliver because of this order.

Cheers, and Merry Christmas.

Gary

City of Seattle
Gregory J. Nickels, Mayor

Seattle City Light
Jorge Carrasco, Superintendent

December 19, 2006

VIA FEDERAL EXPRESS

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology and Historic Preservation
1063 South Capitol Way, Suite 106
Olympia, WA 98501

Re: APE for Seattle City Light Boundary Hydroelectric Project Relicensing (FERC Project No. 2144-035)

Dear Dr. Brooks:

Seattle City Light, in coordination with the Federal Energy Regulatory Commission (FERC), is proposing to relicense the Boundary Hydroelectric Project, located in Pend Oreille County, Washington. As you know, FERC has authorized Seattle City Light to conduct day-to-day Section 106 consultation responsibilities regarding relicensing, subject to FERC's ultimate responsibility for all findings and determinations. Pursuant to this authorization, we are writing to request your concurrence with the definition of the Area of Potential Effects (APE) for the Boundary Project.

As part of the relicensing effort, Seattle City Light and interested stakeholders have engaged in a series of workshops and workgroup meetings on a number of topics, including cultural resources. The cultural resources workgroup includes representatives from FERC, the United States Forest Service, interested tribes and the Department of Archaeology and Historic Preservation (Dr. Whitlam). The focus of the workgroup process throughout the spring and summer of 2006 was development of plans for studies to be conducted as part of relicensing, including a cultural resources study.

Seattle City Light submitted its Proposed Study Plan (PSP) to FERC in October, 2006. The PSP describes the undertaking, i.e., Project relicensing. A copy of the relevant PSP sections is attached. The PSP also describes the proposed APE for the undertaking, which was developed through the collaborative workgroup process. For your convenience, the proposed APE is provided below. A map showing the physical location of the APE is also provided.

In order to make any necessary revisions to the study plan within FERC timelines, we would appreciate your response by January 19, 2007.

If you have any general questions about the relicensing process or the proposed APE, please contact Lisa Rennie by phone at (206) 684-3793 or by e-mail at lisa.rennie@seattle.gov.

Sincerely,

Wayman Robinett

Wayman Robinett
Power Supply & Environmental Affairs Officer

Enclosures: Project description (PSP Sections 1.3 and 1.4)
APE description
APE map

cc: David Turner, Project Manager, FERC
Frank Winchell, Archaeologist, FERC
Robert Whitlam, Ph.D., State Archaeologist, Dept. of Archaeology and Historic Preservation
Glen Nenema, Chairman, Kalispel Tribe of Indians
Deane Osterman, Natural Resources Department Director, Kalispel Tribe of Indians
Kevin Lyons, Cultural Resources Program Manager, Kalispel Tribe of Indians
Michael Marchand, Chairman, Confederated Tribes of the Colville Reservation
Camille Pleasants, THPO, Confederated Tribes of the Colville Reservation
Jennifer Porter, Tribal Chair, Kootenai Tribe of Idaho
Richard Sherwood, Chairman, Spokane Tribe of Indians
Randy Abrahamson, THPO, Spokane Tribe of Indians
Chief Allan, Chairman, Coeur d' Alene Tribe
Quanah Matheson, THPO, Coeur d' Alene Tribe
James Stelle, Jr., Chairman, Confederated Salish and Kootenai Tribe
Richard Bailey, District Archaeologist, Bureau of Land Management
Steve Kramer, Colville National Forest

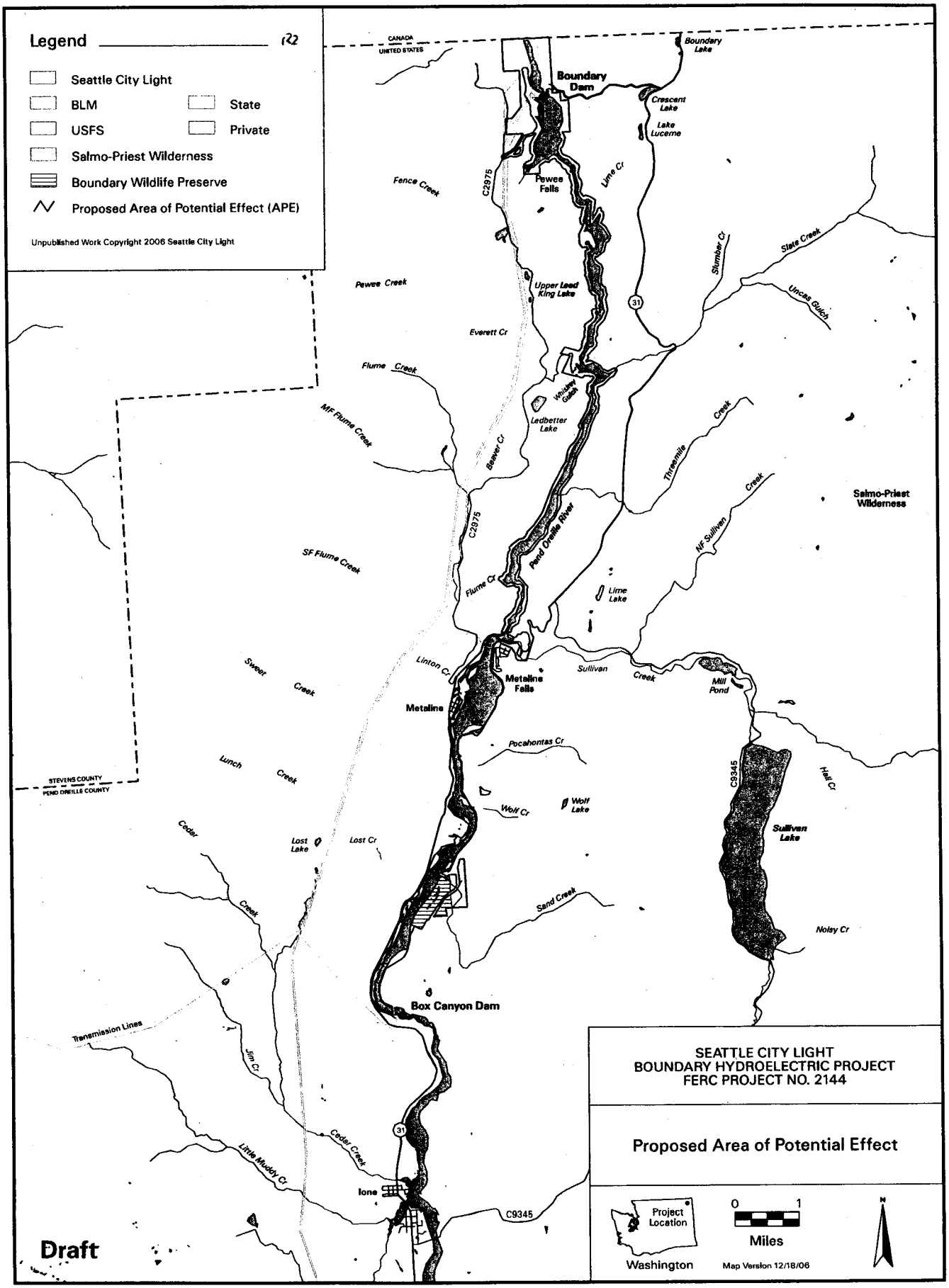
Area of Potential Effects for
Seattle City Light Boundary Hydroelectric Project Relicensing
(FERC Project No. 2144-035)

For the purposes of the relicensing analysis, the Project APE is defined as follows:

- Downstream of Metaline Falls: The reservoir and the land within the FERC Project boundary, which includes most Project facilities, the land 200 horizontal (i.e., along the ground surface) feet inland of the high water elevation (1,990 feet NGVD 29 [1,994 feet NAVD 88]) along both shorelines, and the transmission line right-of-way (ROW) from the powerhouse to the Bonneville Power Administration interconnection.
- Upstream of Metaline Falls: The reservoir and the land within the FERC Project boundary, plus the land within 25 horizontal feet inland of the high water elevation along both shorelines (approximately 2,015 feet NGVD 29 [2,019 feet NAVD 88]), extending south to the FERC project boundary for the Box Canyon Project.[1]
- The SCL-owned Boundary Wildlife Preserve (155 acres) and adjoining SCL-owned property (85 acres).
- Major Project-related roads: The SCL ROW for the road from Boundary Dam to the Vista House and the road from the dam to County Road No. 2975. The Pend Oreille County ROW for the road from the Vista House to State Highway 31.
- All SCL–owned lands outside the FERC Project boundary, in the Pend Oreille valley between Box Canyon Dam and the international border, including lands where there are Project–related structures or activities, such as maintenance and equipment staging locations.
- In addition, the APE would be adjusted to include any areas where other Boundary relicensing resource studies (e.g., erosion, dispersed recreation) identify a Project effect in an area not within the original APE.

The ability to conduct field surveys on private lands within the APE outside of the FERC Project boundary (mainly upstream of Metaline Falls) may be limited due to access constraints in these areas.

[1] The estimated high water elevation of 2,015 feet upstream of Metaline Falls is based on the review of existing hydrology, as described in section 1.3.5 of the PSP (see Table 1.3-1). Following completion of the Hydrology Dataset and Statistics in January 2007 (see section 1.4.2), SCL will review and refine, as necessary, this elevation range.


Legend
Seattle City Light
BLM
State
USFS
Private
Salmo-Priest Wilderness
Boundary Wildlife Preserve
Proposed Area of Potential Effect (APE)
Unpublished Work Copyright 2006 Seattle City Light
CANADA
UNITED STATES
Boundary Dam
Boundary Lake
Crescent Lake
Lake Lucerne
Pewee Falls
Fence Creek
C2975
Lime Cr
Pewee Creek
Upper Lead King Lake
Slumber Cr
State Creek
Uncas Gulch
Everett Cr
Flume Creek
Whiskey Gulch
Ledbetter Lake
MF Flume Creek
Beaver Cr
Thirtemile Creek
Salmo-Priest Wilderness
SF Flume Creek
Pend Oreille River
NF Sullivan Creek
Flume Cr
Lime Lake
Linton Cr
Metaline Falls
Sullivan Creek
Mill Pond
Sweet Creek
Metaline
Pocahontas Cr
STEVENS COUNTY
PEND OREILLE COUNTY
Lunch Creek
Wolf Cr
Wolf Lake
C9345
Hall Cr
Sullivan Lake
Cedar Creek
Lost Lake
Lost Cr
Sand Creek
Nolay Cr
Box Canyon Dam
Transmission Lines
Jim Cr
Cedar Creek
Little Muddy Cr
Ione
C9345
Draft
SEATTLE CITY LIGHT
BOUNDARY HYDROELECTRIC PROJECT
FERC PROJECT NO. 2144
Proposed Area of Potential Effect
Project Location
Washington
0
1
Miles
Map Version 12/18/06
N

beyond the requirements of the ILP and represent SCL's good-faith effort to offer relicensing participants an effective opportunity for substantive input within the ILP framework.

As in the approach it has taken with regard to development of this PSP, SCL hopes to achieve as much consensus as possible among relicensing participants on the licensing proposal prior to filing the PLP, to improve chances for a positive relicensing outcome and to foster effective working relationships with relicensing participants in the next license term. SCL believes its proposed approach is well-suited to accomplishing these objectives, and is feasible within the constraints of the ILP.

1.3. Boundary Project Overview

This section provides a brief overview of the Project location, facilities, and operations, including lands and facilities that SCL has identified for possible addition to the Project under the new license. The studies described in this PSP have been designed to develop the necessary information to evaluate the Project as described in this section. For more detail regarding the Project's facilities and operations, please refer to the PAD (SCL 2006; available on the Boundary Project relicensing website, www.seattle.gov/light/news/issues/bndryRelic/).

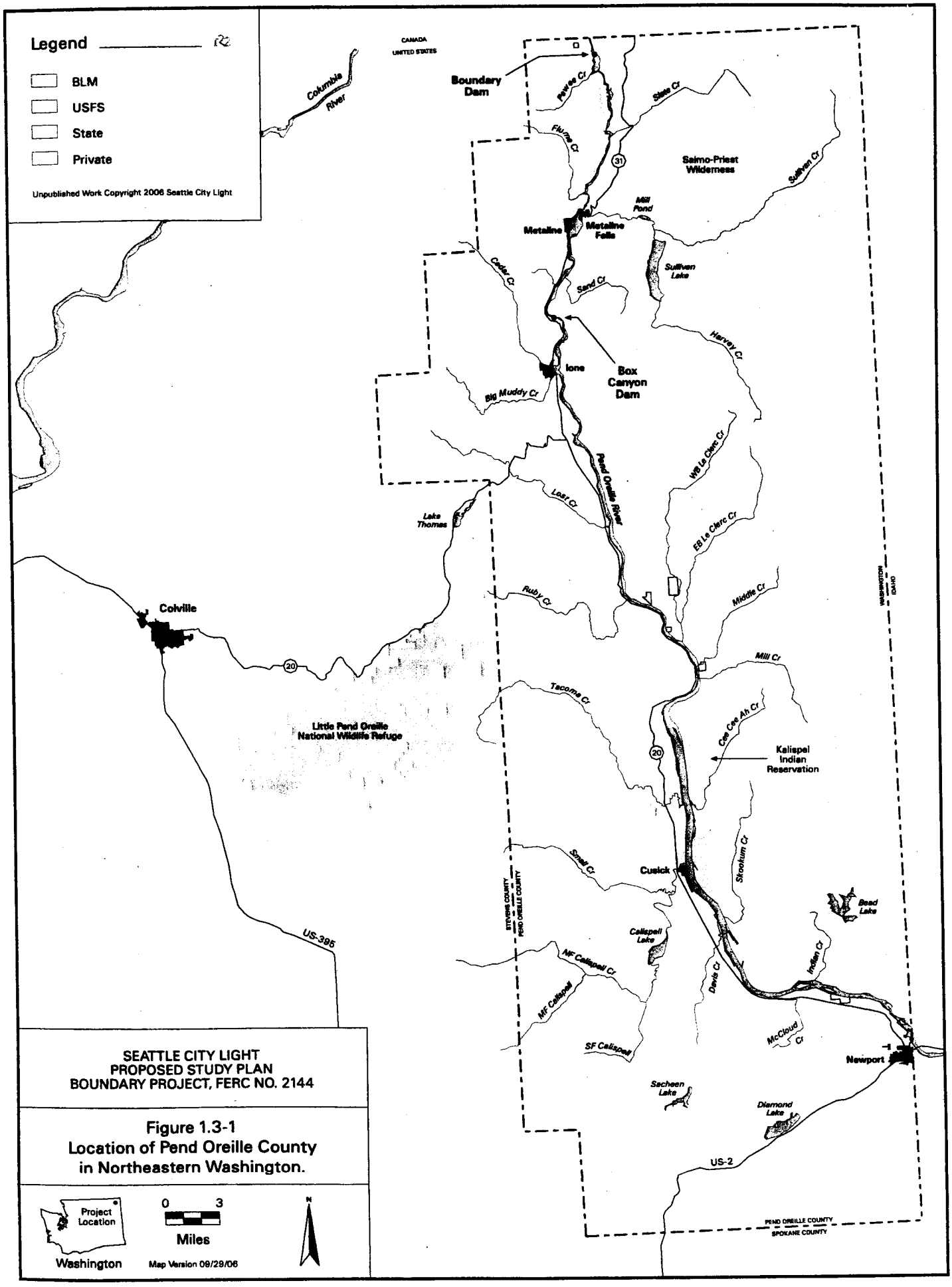
[Note: Because SCL is in the process of converting all Project information from an older elevation datum to a more recent elevation datum, key elevations are provided relative to both the National Geodetic Vertical Datum of 1929 (NGVD 29) and the North American Vertical Datum of 1988 (NAVD 88) throughout this PSP. A conversion table for key Project elevations is provided as Attachment 1-3. Future licensing documents will primarily cite elevations relative to NAVD 88.]

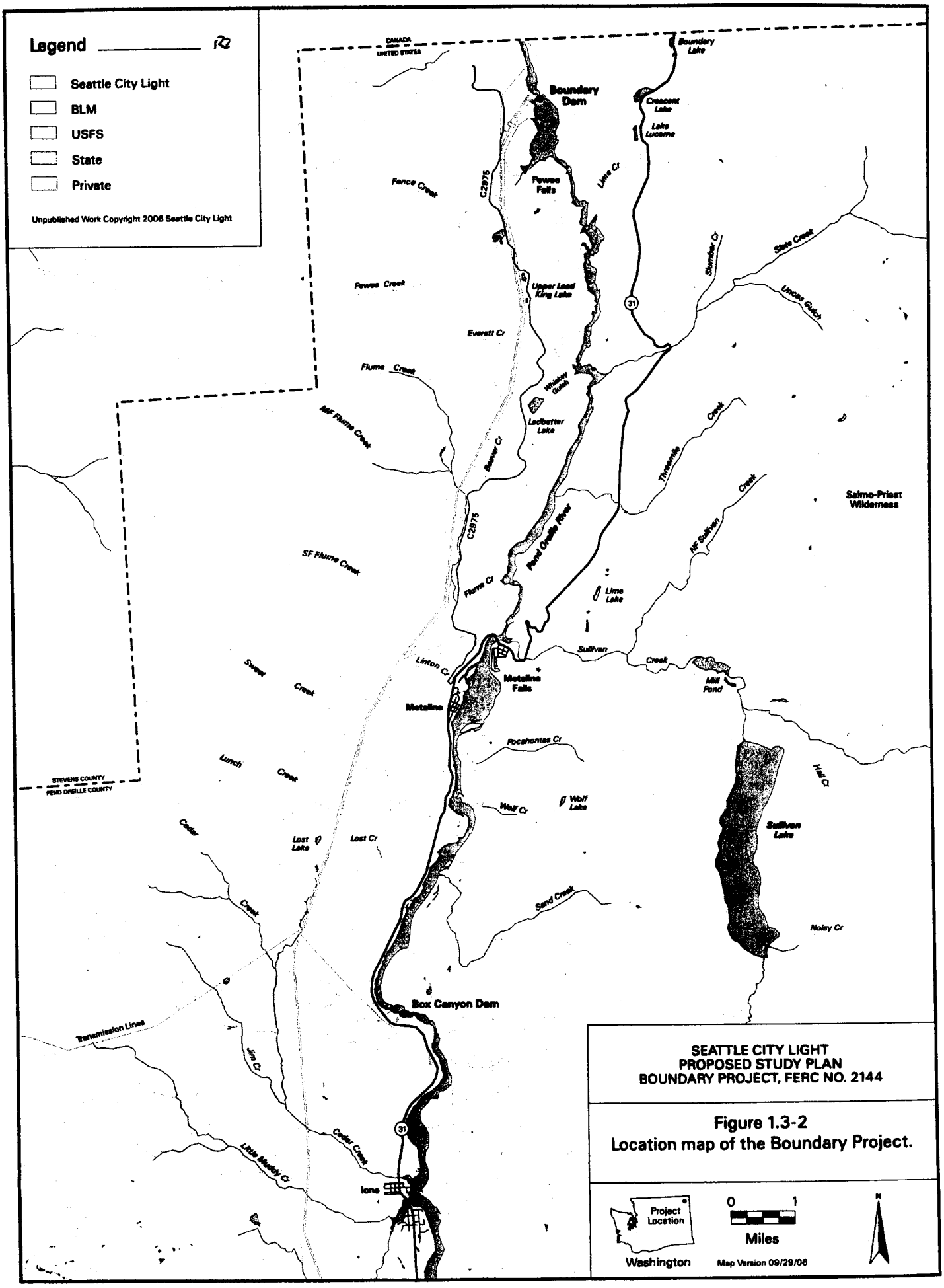
1.3.1. Project Location

The Boundary Project is located on the Pend Oreille River in northeastern Washington, one of a total of eleven hydroelectric and storage projects within the Clark Fork - Pend Oreille River basin. The dam is located 1 mile south of the Canadian border, 16 miles west of the Idaho border, 107 miles north of Spokane, and 10 miles north of Metaline Falls, in Pend Oreille County (Figure 1.3-1). The dam is at river mile (RM) 17.0 on the Pend Oreille River, in the NW 1/4 of Section 10, Township 40N, Range 43E, Willamette Meridian. The upstream end of the Project reservoir (Boundary Reservoir) is located immediately downstream of the Box Canyon Dam, at RM 34.5, in the NE ¼ of Section 19 of Township 38N, Range 43E. The Project facilities, surrounding geographic features, and land ownership are shown on the general location map in Figure 1.3-2.

1.3.2. Project-Related Facilities, Lands, and Roads

Licensed in 1961, the Project principally consists of an arch dam, reservoir, and underground power plant. The Project began commercial operation in 1967, with turbine-generator Units 51 through 54. In accordance with a 1982 license amendment approving expansion of the Project, Units 55 and 56 were constructed in two previously excavated bays in the machine hall and came on line in 1986.


Legend
BLM
USFS
State
Private
Unpublished Work Copyright 2006 Seattle City Light
CANADA
UNITED STATES
Columbia River
Boundary Dam
Pierce Cr
Flume Cr
State Cr
Selmo-Priest Wilderness
Sullivan Cr
Mill Pond
Metaline
Metaline Falls
Cedar Cr
Sand Cr
Sullivan Lake
Harvey Cr
Box Canyon Dam
Ione
Big Muddy Cr
WB Le Clerc Cr
Pend Oreille River
Lost Cr
Lake Thomas
EB Le Clerc Cr
Ruby Cr
Middle Cr
Colville
Mill Cr
Tacoma Cr
Cee Cee Ah Cr
Little Pend Oreille National Wildlife Refuge
Kalispel Indian Reservation
Small Cr
Cusick
Skookum Cr
Bead Lake
Calispell Lake
NF Calispell Cr
MF Calispell
SF Calispell
Davis Cr
Indian Cr
McCloud Cr
Newport
Sacheen Lake
Diamond Lake
US-395
US-2
STEVENS COUNTY
PEND OREILLE COUNTY
PEND OREILLE COUNTY
SPOKANE COUNTY
WASHINGTON
IDAHO
SEATTLE CITY LIGHT
PROPOSED STUDY PLAN
BOUNDARY PROJECT, FERC NO. 2144
Figure 1.3-1
Location of Pend Oreille County
in Northeastern Washington.
Project Location
Washington
0 3
Miles
Map Version 09/29/06
N


Legend
Seattle City Light
BLM
USFS
State
Private
Unpublished Work Copyright 2006 Seattle City Light
CANADA
UNITED STATES
Boundary Lake
Boundary Dam
Crescent Lake
Lake Lucerne
Fence Creek
C2875
Pewee Falls
Lime Cr
Pewee Creek
Upper Lead King Lake
Everett Cr
Flume Creek
Whitney Gulch
Ledbetter Lake
Slumber Cr
State Creek
Uncas Gulch
31
NF Flume Creek
Beaver Cr
Thompson Creek
Salmo-Priest Wilderness
SF Flume Creek
Flume Cr
Pend Oreille River
NF Sullivan Creek
Lime Lake
Sullivan Creek
Mill Pond
Sweet Creek
Linton Cr
Metaline Falls
Metaline
Pocahontas Cr
Lunch Creek
STEVENS COUNTY
PEND OREILLE COUNTY
Wolf Cr
Wolf Lake
Hall Cr
Sullivan Lake
Cedar Creek
Lost Lake
Lost Cr
Sand Creek
Noisy Cr
Box Canyon Dam
Transmission Lines
Jim Cr
Cedar Creek
Little Muddy Cr
Ione
SEATTLE CITY LIGHT
PROPOSED STUDY PLAN
BOUNDARY PROJECT, FERC NO. 2144
Figure 1.3-2
Location map of the Boundary Project.
Project Location
Washington
0
1
Miles
Map Version 09/29/06
N

The forebay for the power plant was excavated from the left abutment upstream of the dam. A trashrack structure prevents floating debris from entering the forebay. Six gate-controlled power tunnels and six penstocks connect the forebay with the machine hall, which is located underground in a pyramidal rockmass adjacent to the left abutment of Boundary Dam. Six turbine-generator units, installed in the machine hall, discharge into the Pend Oreille River below the dam through six draft tubes. Six transformers, which step up the generator output, are connected via the approximately 0.5-mile-long Project transmission lines to a non-Project switchyard, which is integrated into the transmission line system of the Bonneville Power Administration (BPA). The total generation capacity of the Project is approximately 1,070 MW.

The Project also includes two recreation facilities — the Tailrace Recreation Area below the dam and the Forebay Recreation Area above the dam. A third SCL-owned recreation facility near the Project — the Vista House (which affords the public views of the dam), located on the east side of the river — is not included in the current Project license. Also not included within the Project boundary, but purchased by SCL as mitigation to fulfill the requirements of Article 51 of the license, is approximately 155 acres of land that SCL has set aside as a wildlife preserve; this land, referred to as the Boundary Wildlife Preserve (BWP), is located between RM 31.6 and RM 32.5 adjacent to the Upper Reservoir Reach (see section 1.3.3, below). SCL anticipates that the 155-acre BWP will be formally included in the new Project license.

There are three Project-related roads (i.e., roads that have been identified as receiving Project-related use). These include (1) the West Side Access Road, which provides access to the entrances of the machine hall and dam access tunnels; (2) the access road from the Vista House to the crest of the dam; and (3) the access road to the Vista House, off State Route (SR) 31 near the U.S.-Canada border. The first road is contained within the FERC Project boundary as currently licensed; neither of the other two roads is within the Project boundary.

Project-related lands and existing facilities that are not in the current Project license but that SCL proposes to add into the Project under the new license are as follows:

- Project maintenance buildings and yard located just north of the current Project boundary
- Vista House and access road to the crest of the dam
- Boundary Wildlife Preserve (BWP)

1.3.3. Boundary Reservoir

Boundary Reservoir extends 17.5 miles upstream from the dam (RM 17.0). The reservoir occupies three main reaches; from downstream to upstream these are:

- *Forebay Reach* — this reach is relatively wide and extends upstream from Boundary Dam (RM 17) to approximately RM 19.4.
- *Canyon Reach* — this reach occupies a narrow gorge extending from the downstream end of Z Canyon (RM 19.4) upstream to Metaline Falls (RM 27.8).
- *Upper Reservoir Reach* — this reach is wider and shallower than the downstream two reaches, and extends from Metaline Falls up to Box Canyon Dam (RM 34.5).

Total storage in the reservoir (between elevations 1,740 and 1,990 feet NGVD 29 [1,744–1,994 feet NAVD 88]) is approximately 95,000 acre-feet, and total useable storage (between elevations 1,950 and 1,990 feet NGVD 29 [1,954–1,994 feet NAVD 88]) is approximately 43,000 acre-feet at the normal full-pool elevation of 1,990 feet NGVD 29 (1,994 feet NAVD 88).

1.3.4. Project Coordination with Upstream and Downstream Projects

The Pend Oreille River is a highly regulated river with several hydroelectric projects located upstream and downstream of the Boundary Project. The Box Canyon Project and Seven Mile Project are immediately upstream and downstream of the Boundary Project, respectively. Albeni Falls Dam regulates nearly all the flow in the river upstream of Box Canyon Dam. The Boundary Project operation creates a backwater effect on the tailwater of Box Canyon Dam. As a result, a tailwater encroachment agreement is in place between the Public Utility District No. 1 of Pend Oreille County (PUD) and the City of Seattle to compensate for lost generation due to backwater effects in compliance with Article 48 of the current FERC operating license for the Boundary Project. In addition, the City of Seattle and British Columbia Hydro and Power Authority (BC Hydro) have an agreement in place for tailwater encroachment losses caused by the Seven Mile Project generating station, located downstream of the Boundary Project in Canada.

1.3.5. Project Operations

The Boundary Project is operated in a load-following mode that shapes available water to deliver power during peak-load hours with a total plant capability of 1,070 MW from its six turbines. This operating regime allows SCL to meet continued service area load growth and provide regional system reliability. The normal maximum reservoir water surface is at elevation 1,990 feet NGVD 29 (1,994 feet NAVD 88). The reservoir has relatively little useable storage (about 43,000 acre-feet) within the maximum drawdown of 40 feet (elevation 1,990 to elevation 1,950 feet NGVD 29 [1,994–1,954 feet NAVD 88]) authorized under the current license. During the summer recreation season (approximately Memorial Day weekend through Labor Day weekend), SCL voluntarily restricts the water surface fluctuations to a 10-foot range (between elevations 1,980 and 1,990 feet NGVD 29 [1,984–1,994 feet NAVD 88]) to facilitate reservoir access and related recreational activities during daytime hours. For the remainder of the year, the water surface may fluctuate between elevations 1,990 feet and 1,970 feet NGVD 29 (1,994–1,974 feet NAVD 88). Storage between elevation 1,970 feet and elevation 1,950 feet NGVD 29 (1,974–1,954 feet NAVD 88) is reserved for extreme system load requirements. Flood storage is not provided, and other than the operating goals noted above, there are no seasonal or minimum flow requirements.

For the purposes of planning and conducting relicensing analyses, SCL believes that the hydrologic record from 1987–2004, the period of record since the major expansion of the Project to add the last two generating units, is representative of the existing and expected range of water surface elevations due to Project operations and inflows to Boundary Reservoir. Annual ranges of water surface elevations in the Boundary Reservoir forebay and the Pend Oreille River below Box Canyon Dam (Primary Gage 12396500) for the years 1987–2004 (based on USGS gage data) are summarized in Table 1.3-1. The effect of Metaline Falls is most apparent when the

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Table 1.3-1. Annual number of hours that water surface elevations in the forebay of Boundary Reservoir and in the Pend Oreille River at the Primary USGS Gage below Box Canyon Dam (Gage No. 12396500) are within specified elevation range (NGVD 29, based on Calendar Years 1987 through 2004). (See Attachment 1-3 for conversion of NGVD 29 elevations to NAVD 88 elevations.)

	Number of hours that water surface elevation is within specified elevation range															
	Greater than or equal to 1950 and less than 1960		Greater than or equal to 1960 and less than 1970		Greater than or equal to 1970 and less than 1980		Greater than or equal to 1980 and less than 1990		Greater than or equal to 1990 and less than 2000		Greater than or equal to 2000 and less than 2010		Greater than or equal to 2010 and less than 2020		Total	
Year	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)	Boundary Reservoir Forebay	Pend Oreille River Below Box Canyon Dam (USGS Primary Gage 12396500)
1987	0	0	0	0	391	0	8,197	1,230	172	978	0	0	0	0	8,760	2,208
1988	0	0	43	0	629	0	7,918	5,956	194	2,828	0	0	0	0	8,784	8,784
1989	18	0	140	0	1,021	0	7,359	4,488	223	4,113	0	159	0	0	8,760	8,760
1990	0	0	41	0	1,342	0	7,202	3,239	176	4,440	0	695	0	0	8,760	8,374
1991	0	0	15	0	1,142	0	7,454	3,309	149	4,520	0	932	0	0	8,760	8,760
1992	0	0	1	0	409	0	8,141	5,382	233	3,258	0	0	0	0	8,784	8,639
1993	0	0	5	0	726	0	7,759	4,758	270	4,002	0	0	0	0	8,760	8,760
1994	0	0	7	0	549	0	7,965	5,786	240	2,974	0	0	0	0	8,760	8,760
1995	14	0	37	0	869	0	7,687	3,326	154	5,320	0	115	0	0	8,760	8,760
1996	0	0	2	0	333	0	8,349	2,276	100	4,571	0	1,422	0	0	8,784	8,269
1997	0	0	0	0	284	0	8,364	1,937	112	4,283	0	698	0	920	8,760	7,838
1998	0	0	0	0	84	0	8,474	2,856	202	4,455	0	251	0	0	8,760	7,562
1999	0	0	5	0	554	0	8,048	3,481	153	4,469	0	810	0	0	8,760	8,760
2000	0	0	2	0	862	0	7,878	5,420	42	3,364	0	0	0	0	8,784	8,784
2001	2	0	61	0	742	0	7,915	6,880	40	1,880	0	0	0	0	8,760	8,760
2002	0	0	0	0	587	0	8,151	4,979	22	2,777	0	1,004	0	0	8,760	8,760
2003	0	0	11	0	1,102	0	7,634	5,501	13	3,113	0	146	0	0	8,760	8,760
2004	0	0	11	0	1,855	0	6,906	6,268	13	2,516	0	0	0	0	8,784	8,784
Raw Average	2	0	21	0	749	0	7,855	4,282	139	3,548	0	346	0	51	8,767	8,227
Adjusted Average	*2*	*0*	*21*	*0*	*749*	*0*	*7,855*	*4,563*	*139*	*3,781*	*0*	*369*	*0*	*54*	*8,767*	*8,767*
Frequency based on Adjusted Average	***0.02%***	***0***	***0.2%***	***0***	***9%***	***0***	***90%***	***52%***	***2%***	***43%***	***0***	***4%***	***0***	***0.6%***	***8,767***	***8,767***

Note:
The available record of water surface elevations for the Primary USGS Gage on the Pend Oreille River below Box Canyon Dam (Gage No. 12396500) for the period from 1987 to 2004 is incomplete.

frequency of water surface elevations between 1,970 feet and 1,980 feet (1,974–1,984 feet NAVD 88) is compared to elevations between 1,980 feet and 1,990 feet (NGVD 29) for the Boundary Reservoir forebay and USGS gage below Box Canyon (above Metaline Falls), as shown in Table 1.3-1. As indicated in Table 1.3-1, the water surface at the Boundary Reservoir forebay only dropped below elevation 1,970 feet (NGVD 29) an average of 23 hours a year for a frequency of less than 0.3 percent of the time. The information in Table 1.3-1 indicates that the water surface at the USGS gage below Box Canyon never dropped below elevation 1,980 feet (NGVD 29).

Water surface elevations less than 1,970 feet (NGVD 29) in the Boundary Reservoir forebay for the period 1987–2004 (Table 1.3-1) most likely occurred as a response to different system load conditions including, but not limited to: (1) balancing the SCL system load to comply with the Skagit River fishery agreement (no daytime ramping is allowed at the Skagit Project in February, March, April, and May), and (2) maximum generating capacity was reached at other projects under increased demand conditions.

These statistical summaries of water surface elevations for the Boundary Reservoir forebay and Pend Oreille River below Box Canyon Dam are preliminary and based on incomplete gage data. This information will be refined and analyzed through incorporation of the final Project hydrologic record (see section 1.4.2, below), comparison with Project operations data, and use of the operations and hydraulic models described in section 1.4.3 of this PSP.

When the Project is operating at forebay water surface elevations lower than the top of Metaline Falls (approximate water surface range of elevation 1,980 feet to elevation 1,975 feet NGVD 29 [1,984 – 1,979 feet NAVD 88]), there are almost no daily water surface elevation fluctuations in the upper reservoir reach at the two USGS gages (primary and auxiliary) below Box Canyon Dam. (Refer to Figure 3.4-6 in the PAD for illustration of this effect.) The change in bathymetric characteristics of Boundary Reservoir at Metaline Falls may result in significant attenuation in the upstream reach of the reservoir (above Metaline Falls) of the relatively large water surface elevation fluctuations that occur in the portion of the reservoir downstream of Metaline Falls. (Refer to the Figures 3.4-3 through 3.4-5 in the PAD for illustration of this phenomenon.) In addition to the apparent dampening of the magnitude of water surface elevation fluctuations, the constriction at the site of Metaline Falls, which slows the passage of water, may also slow the response time of the Upper Reservoir Reach to elevation changes in the Canyon Reach and Forebay Reach of the reservoir.

Recent installation of stage recorders (in September 2006; discussed in Attachment 1-4, under Water Resources — Hydrology) in conjunction with ongoing hydrologic analysis and use of the Scenario Tool (discussed below in sections 1.4.2 and 1.4.3, respectively) will provide the basis for SCL in the near term to achieve a more precise understanding of elevation stage changes in the Upper Reservoir Reach compared to concurrent changes in the downstream Canyon and Forebay reaches. This understanding will be critical to several study implementation planning efforts, including analysis of peak flood flow conditions above Metaline Falls (see section 3.1), development of the hydraulic routing model (part of the Mainstem Aquatic Habitat Modeling Study, described in section 4.1), and several terrestrial resource studies (described in section 5).

1.4. Ongoing Relevant Studies and Analyses

SCL is currently undertaking a number of studies and analyses that are relevant to, but not incorporated in, the study program outlined in this PSP. These efforts, which are described in this section, include water temperature modeling, hydrology analyses, and use of an operational Scenario Tool application. SCL initiated these efforts prior to the formal relicensing study program because they are prerequisite to other studies and needed to be started in advance to be available to inform the study program. A TDG abatement alternatives assessment process is also currently underway; SCL's efforts to date related to the ongoing TDG abatement process are described in the Existing Information section of the TDG study plan (section 3.1 of this PSP).

SCL also previously completed (in 2005 and 2006) selected field and research efforts to provide additional basic resource information on the Project vicinity (such as vegetation cover and existing recreation facilities). Development of this basic background information was undertaken in advance of the formal study program to help focus study planning and thereby make the maximum use of the limited field seasons available under the ILP. The results of these early information development (EID) efforts were described in the PAD (to the extent they were completed at that time) and are also summarized as applicable in the relevant portions of this PSP. The completed and upcoming EID efforts are not discussed below but are listed and described briefly in Attachment 1-4.

Although the ongoing studies and analyses described below are not presented as study plans, SCL did carefully consider them in light of the FERC PSP requirements to ensure these efforts reflect consistency with the FERC study criteria (CFR 18 Part 5, § 5.9(b)), such as addressing a nexus between Project operations and resource effects and using methods that comport with standard industry practice. SCL has also presented information regarding these early efforts to relicensing participants during development of this PSP.

1.4.1. Temperature Modeling

Temperature modeling of the Boundary Project area is needed to satisfy regulatory requirements associated with certification of the Project under Section 401 of the federal Clean Water Act (401 certification) and for the Washington-Idaho Interstate Temperature TMDL processes. Although this modeling is being conducted prior to initiating the formal relicensing studies program, it addresses a nexus between Project operations and resource effects, and has implications for evaluation of potential alternative operational scenarios. Temperature modeling is being conducted for SCL by Battelle, Pacific Northwest National Laboratory.

The primary objective is to develop a predictive temperature model of the Pend Oreille River from the tailrace of Box Canyon Dam to the International Border downstream of Boundary Dam. The model, which is based on a state-of-the-art, industry-standard program (CE-QUAL-W2; Cole and Wells 2002), will be used to understand the physical processes controlling water temperature in the system, including the effects of Boundary Reservoir on existing conditions and potential future operating scenarios. The model will be used to demonstrate the Project's compliance with the Washington Department of Ecology's water temperature standards for the lower Pend Oreille River as part of the 401 certification process and will be linked to other CE-

QUAL-W2 models developed for the remainder of the Pend Oreille River in Washington and Idaho to establish waste load allocations (WLAs) as part of the Interstate Temperature TMDL process.

Specific objectives being addressed as part of temperature modeling are as follows:

- Review and processing of available bathymetric, hydrologic, meteorological, and water quality data needed for setup and calibration of the model
- Setup and calibration of the model for simulation of hydrodynamics and temperature
- Conducting model application and analyses for the following scenarios:
  - Existing condition — Linkage of individual reaches of the model for the calibration condition to simulate the entire system using inflow data
  - Natural Thermal Potential (NTP) — Simulation of temperature in the Project portion of the Pend Oreille River system in the absence of the Project, but with all other hydrologic and land-use conditions remaining the same
  - Alternatives — Simulation of the temperature response in the Project area for alternative operational scenarios that may be identified during the FERC relicensing process

Following completion of the tasks identified above (other than the modeling of alternative operational scenarios), anticipated to be finished in late 2006 or early 2007, a draft report will be prepared to summarize the results of the modeling effort. The report will include background, objectives, results, and a summary of the temperature modeling results. The report will also include a detailed account of model setup, calibration, and application and provide conclusions and recommendations based on model results. Data products provided in the report will include:

- Graphical presentation of model inputs
- Temperature prediction time-series and vertical profiles compared to the observed data
- Model calibration results and a list of model parameters
- Model application results for existing conditions and NTP

1.4.2. Hydrology Dataset and Statistics

Hydrologic conditions influence the way the Project operates. Daily reservoir surface elevation is influenced by changes in releases from upstream projects and inflow to Boundary Reservoir, in addition to operation of the Boundary Project. Analyses of existing hydrology data have been initiated by SCL to produce the reliable hydrologic dataset and statistics (hydrologic record) that are needed to conduct environmental and energy production analyses (as described in section 1.4.3) for FERC relicensing of the Project. These hydrology analyses therefore indirectly address a nexus between Project operations, resource effects, and potential alternative operational scenarios.

The primary sources of hydrologic data for the Project are USGS gages 12396500 (Pend Oreille River below Box Canyon) and 12398600 (Pend Oreille River below Boundary Dam), as well as SCL Boundary Project forebay water surface elevation records. The hydrologic analyses are being completed by R2 Resource Consultants on behalf of SCL based on the data from these gages, hydrographic and topographic surveys, and stage recorder data. The analyses involve a rigorous quality assurance procedure to identify and correct errors before data are used in finalizing study implementation plans and subsequent modeling. The end product will be a high-quality hourly hydrologic record that will be used to assess potential Project effects.

The quality assurance process will include a water balance comparison of inflow to Boundary Reservoir with outflow from Boundary Reservoir plus the change in reservoir storage. Missing data will be estimated using streamflow records from nearby watersheds with similar characteristics or from synthesized data. Accurate reservoir bathymetry data are currently being collected to help quantify the available reservoir storage. Following completion of the bathymetry survey, the reservoir elevation/storage capacity curve will be updated, and the quality assurance process will be completed. A technical summary report including a database with hourly records of hydrologic data and statistics will be available in January 2007. Results from this technical summary report will be used as input for study implementation planning and related modeling efforts.

1.4.3. Technical Scenario Team and Modeling Efforts

Proposed Study Plan Modeling Efforts

Computational analysis and modeling of Project operations, hydrology, habitat analyses, and biologic time series are proposed for use in the Boundary Project relicensing effort to evaluate a range of potential environmental impacts associated with alternative operational scenarios. The models will be used to compare the environmental and economic effects of alternative Project configurations (scenarios) developed and evaluated by the Boundary Project resource workgroups during the course of the relicensing process. Relicensing participants and SCL staff are currently represented in the resource workgroups.

Scenario Tool

SCL began developing a Scenario Tool in 2005 to optimize and simulate hydrologic regimes and operating and physical constraints related to existing operations and assess potential future operation of the Project. The Scenario Tool, which is based on an optimization engine that operates as an add-in to Microsoft Excel® software, will be used to help assess potential future Project energy production associated with alternative operational scenarios. The Scenario Tool calculates Project generation, upstream and downstream hydrologic conditions given reservoir inflows, generating targets and reserves, upstream and downstream water level ramping, and upstream and downstream channel routing. The Scenario Tool will produce hourly discharge output (in cfs) for use as input to the models that will be used in the relicensing studies described in this PSP.

SCL presented information on the Scenario Tool to relicensing participants at workshops and workgroup meetings in November 2005, February, May and August 2006, during development

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Wednesday, December 20, 2006 1:08 PM
To: Glenn Koehn; Tom Shuhda
Subject: Toxics study revision

Attachments: PSPToxicsAssessment_Revised SCL 12.20.06.doc; Barbara Greene.vcf


PSPToxicsAssessment_Revised SC... (306 B) Barbara Greene.vcf

Tom, Glenn,

Sorry for not getting this to you sooner, I've been in meetings constantly since we spoke earlier today. Here is the study for discussion.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

Summary of Conference Call with U.S. Forest Service on Seattle City Light's Revised Toxics Study
December 20, 2006

Participants:
Barbara Greene, Seattle City Light (SCL)
Tom Shudha, U.S. Forest Service (USFS)
Glenn Koehn, U.S. Forest Service (USFS)

Barbara Greene spoke by conference call with Glenn Koehn and Tom Shuhda on December 20, 2006 about SCL's revised toxics study.

Barbara expressed appreciation for the USFS comments provided on 12.15.06 to all SCL studies and noted that there may be language in that document related to the toxics study that SCL may consider. She relayed that because of the power outage that left her without power or water for 5 days, she was unable to review the language in detail prior to completing review of SCL's revised toxics study.

USFS still has the following outstanding issues with SCL's current toxics study:

1. Tom stated he remains concerned that SCL's plan does not commit to water column and sediment sampling. Tom stated he did not agree with SCL's reliance on Phase 1 results before determining Phase 2 because he believes there is sufficient information available now to warrant a commitment to these two types of sampling in Phase 2. An example in the study plan cited by Tom where such specificity would help is in Phase 2, Objective 2 where SCL states "Sampling will include sediments, water column, and aquatic biota as appropriate based on the results of Phase 1". "As appropriate" suggests to Tom that SCL won't commit to any specific sampling prior to Phase 1 results.

2. Tom noted that if aquatic biotic tissue sampling is deemed appropriate, he would want a commitment to macro invertebrate sampling as well because he believes it is equally important as fish tissue sampling. He noted that macro invertebrate sampling will identify potential affects on amphibians, while fish tissue sampling would identify potential affects to forest users, i.e. fishers, as well as potential affects to the health of listed species. Tom noted that he heard from the USFWS of their concern about potential affects to fish by cadmium, and that they believe cadmium has a specific negative impact on listed species, specifically bull trout. He suggested SCL follow up with USFWS on this issue.

3. Tom does not agree that SCL should omit mercury and PCBs from Table 3.3-2.

4. Tom noted that in Phase 2 Objective 3, SCL states "Conduct additional sampling as necessary. SCL will consult with Ecology to establish appropriate triggers that indicate if additional field sampling is required." Tom remains concerned that this may reflect intent to only consult with Ecology and not the other mandatory conditioning authorities on the development of the Phase 2 sampling plan. Barbara stated it was SCL's intent to work with all stakeholders on the SAP, and that Ecology has a specific role to play in this. Tom responded that the language appeared inconsistent with SCL's stated intent to work with all stakeholders in other parts of the document, and that this intent should be clarified in Phase 2 Object 3.

5. In that same objective (3), Tom stated that thresholds is a better term than triggers, and asked if SCL meant thresholds.

6. In that same objective (3), Tom believes that the "tissue sampling **would be,** (not could be), conducted in late 2007 or 2008."

Barbara called Tom's attention to several other edits to review:

- The last paragraph above 1.1.5 where SCL attempted to provide clarity on SCL's intent to collaborate with stakeholders in the design of the Phase 2 sampling plan and the suggestion the Phase 2 sampling plan be submitted to FERC for review and approval.

- The first paragraph of 1.1.6 - Work Products where additional language was inserted on the details of the study work products.

- The more detailed project schedule.

Barbara asked Tom's suggestions for discussions with the USFWS and Colville Tribe. Tom responded that the Colville Tribe noted which of Tom's edits they liked but this may not encompass all changes the Tribe will request. Tom suggested there is a willingness on the part of all three stakeholders to have a conference call or meeting to discuss SCL's current version of the toxics study plan.

Barbara agreed to review USFS comments of 12.15.06 to see if any additional ideas there are helpful for revising the language in the toxics study plan.

Barbara agreed to contact the USFWS and Colville Tribe to discuss SCL's revised study plan.

Seattle City Light

Memorandum

DATE: December 20, 2006

TO: Consultation file

FROM: Barbara Greene, SCL

SUBJECT: Phone call with Marcie Mangold, WDOE

Barbara and Christine Pratt (SCL) spoke with Marcie Mangold (WDOE) about the most recent version of the toxics study plan (dated 12/18/06). Marcie indicated that the study plan looked great and that WDOE was in support of it.

From: Thomas H Shuhda [tshuhda@fs.fed.us]
Sent: Thursday, December 21, 2006 2:34 PM
To: Barbara Greene
Cc: Glenn Koehn
Subject: Re: Summary of our conference call on toxics study

Barbara, I think you hit all the pertinent points of our conversation.
Thanks for doing this.

Tom Shuhda
Forest Fish Biologist
Colville National Forest
509 684-7211

""I have always given it as my decided opinion that no nation had a right to intermeddle in the internal concerns of another; that everyone had a right to form and adopt whatever government they liked best to live under themselves." - George Washington

----- Original Message -----
From: Barbara Greene
To: Don Hurst ; Patti Bailey ; Doug Robison ; Marcie Mangold ; Glenn Koehn ; Tom Shuhda ; Julie Campbell ; John Gross
Cc: Steve Padula ; Rick Donaldson ; Randall Filbert ; MaryLouise Keefe ; Barbara Greene ; Christine Pratt
Sent: Thursday, December 21, 2006 3:46 PM
Subject: Boundary Relicensing Toxics Study

Please find attached for your review City Light's most recent version of the proposed study on toxics for Boundary Relicensing.

City Light will have technical contractors on board early in January. The contractors who will perform the toxics study are:

Jerome Diamond, Director of Environmental Toxicology at Tetra Tech's Biological Research Facility. Mr. Diamond has a Ph.D. in Ecology and Stream Biology, and is the editor of the international journal Environmental Toxicology and Chemistry. Among many notable items on Mr. Diamond's resume, he has developed a manual for EPA that evaluates and recommends appropriate methods for sediment collection, handling, storage, and manipulations for chemical analyses and toxicity testing.

Gary Drendal, Regional Manager for Risk Assessment at Tetra Tech. Mr. Drendal is a certified ecologist and is adjunct faculty member at the Colorado School of Mines, Department of Environmental Science and Engineering where he is teaching a course in Risk Assessment. He has also been an adjunct faculty member of the University of Denver, Environmental Policy and Management Division where he taught courses in Toxicology and Environmental Health.

We will forward resumes for both Mr. Diamond and Mr. Drendal for your review.

Please respond to this email if you are interested in participating in a conference call with these new technical consultants to discuss City Light's toxics study plan. This conference call will be scheduled for the second week in January.

Thanks and have a wonderful holiday season.

Barbara

-----Original Message-----
From: Barbara Greene [mailto:barbara.greene@Seattle.Gov]
Sent: Thursday, January 04, 2007 11:48 AM
To: Julie_Campbell@fws.gov
Cc: Steve Padula; Emily Andersen; Rick_Donaldson@fws.gov; Randall Filbert; MaryLouise Keefe; Barbara Greene; Christine Pratt
Subject: Re: Fw: Boundary Relicensing Toxics Study

Hi Julie,

We will evaluate comments on the PSP before we determine if the 12.18.06 version of the toxics study will be the version we submit in the Revised Study Plan (due to FERC 2/14/07). However, the 12.18.06 version is the most current one we are working with.

I am in the process of reviewing the 12.18.06 version of the toxics study with our new technical consultants from Tetra Tech who came on board this week. I planned to invite you and others to participate in a conference call with Tetra Tech staff on Thursday (1/11) or Friday (1/12) of next week. While I realize your PSP comments will likely be completed, I thought it would be helpful to introduce our new consultants as soon as possible. It would also be an opportunity for you to ask questions of the consultants.

In addition, we are looking at scheduling a meeting with stakeholders after the FERC study plan determination is issued on March 16. This would be a further opportunity for us to try to resolve differences on any outstanding studies.

Would a conference call next week be helpful to you?

I'll plan to send the invite today or tomorrow after I hear back from Tetra Tech about their availability next week.

Thanks, hope you had a good holiday,

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

>>> <Julie_Campbell@fws.gov> 1/4/2007 11:19 AM >>>

Hi Barbara

I have reviewed and written comments on the revised toxics study plan (that you submitted on Dec. 21, 2006, per the attached message) instead of the previous version included in Chapter 3 of the Oct. 2006 PSP. My comments will be incorporated into the FWS formal comments, to be filed w/ FERC by the Jan. 15 deadline. My assumption was that this latest revision of the toxics

study plan will supersede the Oct. 2006 PSP version. Can you verify that this is a correct assumption?

Thanks very much,
Julie

^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
Julie Campbell
U.S. Fish and Wildlife Service
Upper Columbia Fish and Wildlife Office
11103 E. Montgomery Drive
Spokane, WA 99206
(509)893-8004
Julie_Campbell@fws.gov
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

Forwarded by Julie Campbell/UCRB/R1/FWS/DOI on 01/04/2007 10:35 AM

"Barbara Greene" <barbara.greene@Seattle.Gov
12/21/2006 03:46 PM
To: "Don Hurst" <don.hurst@colvilletribes.com>, "Patti Bailey" <patti.bailey@colvilletribes.com>, "Doug Robison" <robisdlr@DFW.WA.GOV>, "Marcie Mangold" <dman461@ecy.wa.gov>, "Glenn Koehn" <gkoehn@fs.fed.us>, "Tom Shuhda" <tshuhda@fs.fed.us>, "Julie Campbell" <julie_campbell@fws.gov>, "John Gross" <jgross@knrd.org>
Cc: "Steve Padula" <sdpadula@aol.com>, "Rick Donaldson" <rick_donaldson@fws.gov>, "Randall Filbert" <randallfilbert@msn.com>, "MaryLouise Keefe" <mkeefe@r2usa.com>, "Barbara Greene" <barbara.greene@Seattle.Gov>, "Christine Pratt" <Christine.Pratt@Seattle.Gov>
Subject: Boundary Relicensing Toxics Study

Please find attached for your review City Light's most recent version Of the proposed study on toxics for Boundary Relicensing.

City Light will have technical contractors on board early in January. The contractors who will perform the toxics study are:

Jerome Diamond, Director of Environmental Toxicology at Tetra Tech's Biological Research Facility. Mr. Diamond has a Ph.D. in Ecology and Stream Biology, and is the editor of the international journal Environmental Toxicology and Chemistry. Among many notable items on Mr. Diamond's resume, he has developed a manual for EPA that evaluates and recommends appropriate methods for sediment collection, handling, storage, and manipulations for chemical analyses and toxicity testing.

Gary Drendal, Regional Manager for Risk Assessment at Tetra Tech. Mr. Drendal is a certified ecologist and is adjunct faculty member at the Colorado School of Mines, Department of Environmental Science and Engineering where he is teaching a course in Risk Assessment. He has also been an adjunct faculty member of the University of Denver, Environmental Policy and Management Division where he taught courses in Toxicology and Environmental Health.

We will forward resumes for both Mr. Diamond and Mr. Drendal for your review.

Please respond to this email if you are interested in participating in a conference call with these new technical consultants to discuss City Light's

toxics study plan. This conference call will be scheduled for the second week in January.

Thanks and have a wonderful holiday season.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

[attachment "PSPToxicsAssessment_Revised SCL 12.20.06.doc" deleted by Julie
Campbell/UCRB/R1/FWS/DOI]

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Friday, January 05, 2007 9:45 AM
To: Don Hurst; Patti Bailey; Doug Robison; David Turner; Glenn Koehn; Tom Shuhda; Julie Campbell; Rick Donaldson; Bill Duncan
Cc: rfilbert@longviewassociates.com; spadula@longviewassociates.com; mkeefe@r2usa.com; Christine Pratt; donald.beyer@tteci.com; virginia.howell@tteci.com
Subject: Toxics Study Follow Up

Attachments: Robert Plotnikoff.PDF; resume_diamond.pdf; Drendal resume.pdf; PSPToxicsAssessment_Revised SCL 12.20.06.doc; Barbara Greene.vcf


Robert tnikoff.PDF (102 KB


resume_diamond.pdf (78 KB)


Drendal resume.pdf (56 KB)


PSPToxicsAssessment_Revised SC...


Barbara Greene.vcf (303 B)

As a follow up to our previous discussions on SCL's proposed study on toxics, you are invited to participate in a conference call on Friday January 12, 2007 at 10am.

The purpose of this call will be to briefly review SCL's newest version of the study (dated 12.18.06), and to introduce the technical consultants who will be conducting the toxics study. We realize you have probably completed your comments on the PSP by 1/12/07. However, we have worked very quickly through the process to hire the Tetra Tech consultants and wanted to give you the opportunity to meet them and hear their independent opinions of the toxics study. We anticipate a work group meeting on the toxics issue in March or April following the FERC study plan determination, where you can meet the consultants in person and discuss the toxics study in more depth.

Attached are the resumes for the three consultants - Rob Plotnikoff, Gerry Diamond, and Gary Drendal, and SCL's revised toxics study.

If you are interested in participating in the call, please respond to this email for further information on how to call in.

Thanks for your interest in this issue and in Boundary relicensing.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

From: Christine Pratt [Christine.Pratt@Seattle.Gov]

Sent: Tuesday, January 09, 2007 8:22 AM

To: Steve Padula; Mary Loiuse Keefe; Randall Filbert; Stephen Breithaupt; Tarang P Khangaonkar

Cc: Emily Anderson; Al Solonsky; Barbara Greene; Kim Pate

Subject: Meeting Notes - WebEx Meeting w/ Ecology-Temperature ModelUpdate-1/08/07

All -

Below are brief notes of the WebEx-linked meeting we had Monday morning, Jan. 8th @ 10:00 am with WDOE folks in Spokane and Olympia. The purpose of this meeting was to update the Ecology folks on progress made by Battelle on the water temperature model of the Boundary reach of the Pend Oreille River - essentially, completion of calibration.

Participants were: Jon Jones - WDOE-Spokane - TMDL Coordinator
Marcie Mangold - WDOE-Spokane (for first few minutes only)
Paul Pickett - WDOE-Olympia - Environmental Assessment Program
Christine Pratt - SCL
Tarang Khangaonkar - Battelle
Steve Breithaupt - Battelle

1) Tarang introduced the 38-slide presentation to participants and reminded folks this was work being done to support the 401 Certification. He also reminded Paul that it is SCL's hope that this slide presentation will fulfill the prior request made by Paul to compose a "Calibration Report". Christine reminded Paul that SCL is willing to travel to Sandpoint, ID for the Jan. 25th WAG Meeting, if Paul thinks it necessary once we've reviewed the slides together - with a friendly reminder that SCL's preference is for Paul to present the information to WAG participants, given the cost considerations.

2) Steve reviewed the 38-slide PowerPoint version of this presentation (there's also a 15-slide presentation, which is more likely the version to be presented to the WAG Jan. 25th) - we invited Paul to ask as many questions as he needed, for his own clear understanding and prep for the WAG.

3) Basically, Steve reviewed the work accomplished to date on the temperature modeling effort - that model calibration is complete. The slide show reviews details on how this calibration was done, showing graphic portrayals on the input data (flow in the Boundary reach of the Reservoir, tributary flows, water surface elevations, inflow temperatures from Box Canyon & tribs, met data, and shade calculations); more graphic portrayals of the temperature calibrations at the different data collection stations, showing the correlations between the data and the model; tables showing summaries of error analyses (again, showing very close correlations between the data and the model - and comparisons to other model applications, revealing that this Boundary effort has a very low error factor - or very high correlations factor); and next steps (NTP setup and run compared to existing conditions, alternative analyses and final report).

4) Regarding model inputs (slide 5), the following data will be reviewed for completeness: Sullivan Creek USGS data (Paul has 2005 data he will send to Tarang - not sure why this wasn't available on the USGS website), no spill data for 2004-2005 (Christine will check this & update Battelle & Ecology - believe there is 2005 spill data to input).

5) Tarang asked when SCL might expect the shade and NTP data from Paul - Paul estimated the end of January.

6) The next Modelers' Meeting is January 17th @ 3:00 pm at which calibration and linkages are likely to be

discussed. BEFORE this meeting, Tarang & Christine plan to call Paul and ask if he has any expectations of SCL once we fulfill our commitment to provide the calibrated model of our Boundary Reach....and continue our work later with Ecology on the 401 Certification aspects of temperature.

7) CONCLUSION:
a. Steve will forward both the 15-slide and 38-slide version of the PowerPoint to all participants.
b. Paul will forward the July '04 - Oct. '05 Sullivan Creek temp data to all.
c. Christine will provide to all an update on any spill data for 2004-2005.
d. Paul will let us all know if the 38-slide presentation will satisfy his need for a "Calibration Report".
e. At this point, SCL understands that Paul feels comfortable presenting the PowerPoint presentation - essentially a Boundary Reach calibration update - to the WAG.

Christine

From: Pickett, Paul [PPic461@ECY.WA.GOV]
Sent: Tuesday, January 09, 2007 11:32 AM
To: Kim Pate
Cc: Steve Padula; Emily Andersen; Jones, Jon W. (ECY); Al Solonsky; Barbara Greene; Daniel Kirschbaum; Peter Barton; Mangold, Marcie (ECY)
Subject: RE: 2007 TDG Monitoring Plan for Boundary

Thanks Kim - sounds good. Send me a draft agenda and propose some dates, and we'll take it from there. Paul

-----Original Message-----
From: Kim Pate [mailto:Kim.Pate@Seattle.Gov]
Sent: Tuesday, January 09, 2007 9:07 AM
To: Mangold, Marcie (ECY); Pickett, Paul
Cc: Steve Padula; Emily Andersen; Jones, Jon W. (ECY); Al Solonsky; Barbara Greene; Daniel Kirschbaum; Peter Barton
Subject: 2007 TDG Monitoring Plan for Boundary

Hi Paul and Marcie,

I just want to update you after the flurry of activity this past fall.
As you know, SCL has contracted
with a consultant team to perform the Study Plans, including the TDG study plan. The consultant prime is Tetra Tech with subconsultants consisting of Hatch (Keith Moen, lead), ENSR (Chick Sweeney, lead), and Dr. John Gulliver, with Paul Carson (EES) contracted directly with SCL to perform the TDG study plan.

SCL will have a kick-off meeting with the Technical Consultant (Tetra Tech and all subconsultants) this Wednesday, January 10th and break off in specific resource work groups. More detailed, resource specific meetings will be conducted through mid-February to clarify scope, costs, and schedules. Dan Kirschbaum will be SCL's lead engineer for conducting the TDG study plan with significant support by Peter Barton. Peter will also be involved in the fish entrainment study with Al Solonsky. I will continue to manage the TDG effort, yet focus my involvement on the operations and modeling efforts. Also, our strategic consultant team, Longview Associates, will continue to support SCL during implementation of the study plans as they did in supporting the development of the study plans this past year throughout our stakeholder meetings.

Within the next month, we (SCL staff and lead Technical consultant
staff) would like to meet with
you to define the monitoring plan for this year in the context of the Pend Oreille River TMDL and TDG study plan goals and objectives. This monitoring plan is specifically identified as Task 1.3.5 in the TDG study plan, but of course, this needs to be discussed within the context of the entire study plan approach.

I look forward to hearing from you to develop an agenda and determine possible meeting dates.
We (Dan Kirschbaum, Peter Barton, Tetra Tech consultants, and myself) expect the initial meeting with you to take 4 hours to provide introductions, discuss the monitoring plan approach, and begin delving into details. Of course, if you feel we need more or less time, we'll accommodate your needs.

Take care,
Kim

Seattle City Light

Memorandum

DATE: January 9, 2007

TO: Consultation file

FROM: Michele Lynn

SUBJECT: Phone conference with Kathy Ahlenslager and Colleen McShane

Colleen and I talked with Kathy today to follow up on comments she made on the proposed RTE Plant Study. Her comments on the proposed methodology related to nonvascular plants. On the same topic, at the Nov. 15 meeting, David Turner requested that we attempt to nail down the details of this portion of the study.

I started the conversation by saying that we want to focus our survey efforts in areas where we might expect project-related impacts – such as in the vicinity of project facilities, project-related recreation sites, and the reservoir fluctuation zone. Because these surveys can be so time-intensive, we want to be very specific about where surveys will be conducted and what species we'll survey for. I said we think it makes sense to focus on semi-aquatic species, such as splashzone moss and brook lichen. We would focus our efforts along the tribs within the 200' study area.

Kathy told us about 2 documented occurrences of naked kidney lichen not too far from the project. She said that since it has been documented twice in the Pend Oreille valley, it might be the species most likely to be found.

Kathy said she had talked to Glenn Koehn and the USFS wants to make sure we cover the entire study area. They don't want to limit the effort before we know the extent and nature of potential project impacts. Colleen asked if they have specific protocol surveys for these species or whether we should just keep an eye out for them while we're surveying for vascular species. Kathy said they wouldn't ask us to do anything more than they would do themselves. She would expect our botanists to keep a sharp eye out for mossy rocks, downed trees and tree trunks, scanning for textural and color differences. Kathy also wants the person(s) doing the surveys to be familiar with the 10 RTE species on the USFS's list. Colleen said she'd write some language to include in the study and would send it to Kathy for review.

Christine Pratt (SCL) emailed Jon Jones and Paul Pickett (WDOE):

>>> Christine Pratt 1/10/2007 3:51 PM >>>
Hi Jon & Paul -
I'm following up on our Monday (Jan. 8th) WebEx Meeting to update you Ecology folks on the Battelle work done to date on the CE-QUAL-W2 Model for the Boundary Reach of the Pend Oreille River - essentially, completion of calibration.

Regarding the question of spill data for 2004-2005 -
1) SCL did not spill in 2004 and
2) for 2005, there was very limited spill in June only, this information will be available in mid-February when a Hydrologic Report will be finalized.

Steve (Battelle) tells me that he anticipates any effect on temperature from the short-term spill in June '05 will be negligible. Nevertheless, to complete calibration, we'll update the model when this data becomes available.

Thanks.
Christine
206.386.4571

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Thursday, January 11, 2007 9:26 AM
To: Don Hurst; Marcie Mangold; David Turner; Tom Shuhda; Julie Campbell
Cc: Steve Padula; Emily Andersen; Randall Filbert; MaryLouise Keefe; Barbara Greene; Harry Gibbons; Rob Plotnikoff; Don Beyer; Virginia Howell
Subject: SCL Toxics Call Information

Attachments: TT_Drendal resume.doc; Robert Plotnikoff.PDF; resume_diamond_long.doc


TT_Drendal resume.doc (92 KB)


Robert tnikoff.PDF (102 KB


resume_diamond_lo ng.doc (113 K...

Following is the call number and agenda for tomorrow's conference call on the toxics study. The call will begin at 10am. I have attached the resumes for the Tetra Tech staff working on the toxics study.

Call in number:

Toll Free Dial: (888) 422-7124

PARTICIPANT CODE: 540753

Agenda

1 - Introductions
2 - Thoughts from Tetra Tech consultants on toxics study
3 - Questions/answers/discussion
4 - Next Steps

We look forward to your participation in this discussion. Please let me know if you need any additional information prior to the call.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

Colleen McShane (EDAW) emailed the Terrestrial Resources Workgroup:

Bat Study Section.doc (30 KB)

>>> Colleen McShane 1/12/2007 10:27 AM >>>
Greetings and Happy New Year to all!

As you know, SCL has recently selected a team of consultants to conduct the technical studies for the Boundary Project. A team lead by Tetra Tech was awarded this contract, and a very large kick-off meeting was held yesterday. In her opening comments Barbara Green directed the team to implement the study plans as developed by the collaborative group (acknowledging that there will be some changes based on the stakeholder comments on the PSP). However, in a meeting subsequent meeting on terrestrial resources, the Tetra Tech biologists suggested a slight variation in the methods proposed for two tasks in the Bat Surveys and Habitat Inventory.

When we wrote the study plan, we were assuming that the "ultarsonic bat detectors" to be used would be the standard Anabat detectors. As you all know, some Myotis species are very difficult to differentiate with these detectors, primarily because the full range of the ecolocation call is not captured by the detector. As a result, bats need to be captured to confirm species identification, and that is what we proposed in Task 5 for determining bat use of potential foraging sites. Tetra Tech is proposing to use a newer technology called the SonoBat detector, which produces a much more high resolution sonogram (see www.sonobat.com/index.html). As a result, it is possible that a lower level of effort will be needed for mist netting.

SCL would like to revise the study plan slightly to reflect use of the SonoBat detectors and a reduced effort for mist netting, depending on site characteristics. I have attached the text showing the changes.
Please let me know if this revision meets with your approval.

Please note that my e-mail address format has changed:
colleen.mcshane@edaw.com

Task 3: Roost Site and Maternity Colony Surveys

All sites above the normal high water level identified as having potential for bat use will be investigated at least twice during June–August to determine if they are being used for roosting or as maternity colonies. This will be accomplished by conducting nocturnal emergence/dispersal surveys (Kunz et al. 1996), which are conducted without entering the structures to minimize disturbances to bats. At this time, no internal surveys of mines or caves are anticipated. However, human-built structures may be entered during daylight hours to determine if the structures are being used as day roosts. Daytime surveys of bridges and other human-built structures will also be conducted to evaluate day roost use.

During each emergence/dispersal survey, observers will be positioned such that flying bats are silhouetted against the sky, but positioned as far from the entrance as feasible to minimize disturbance. Set up will occur at least 30 minutes before dark and continue for at least two hours after sunset (Tuttle and Taylor 1998). Observers will count the number of exits and entries over the survey period to estimate the number of bats using the site. Night-vision devices may also be used along with additional illumination for optimum bat viewing. A headlamp with an opaque lens and a photographic filter or any red or infra-red filter is suitable. For very large colonies, emergence/dispersal surveys result in only a rough estimate of numbers of bats as it is impossible to track the many exits and re-entries of individual bats.

It is often difficult or impossible to identify bat species by observation only because many species, particularly the *Myotis*, are of similar size and appearance. The Townsend's big eared bat and pallid bat are the only two species expected to occur in the study area that may be identifiable by observation alone during an emergence/dispersal survey. Consequently, ultrasonic bat detectors, specifically the Sonobat AudioRecorder, will also be deployed during the emergence/dispersal surveys at roost sites. This equipment detects echolocating bats. Analyzing recordings from the ultrasonic detectors will increase confidence of detecting bat activity and will be used to identify bat species ~~(although some *Myotis* species are very difficult to differentiate with recorded calls)~~. Recorded calls will be analyzed on a personal computer by comparing the sonograms with reference recordings using SonoBat Software. Local reference recordings for some species may be available from the USFS, BLM, or WDFW.

Trapping may be performed at selected roost sites if it is determined that the external surveys do not provide adequate information. The trapping would involve deploying mistnets or Harp traps outside of the openings (Jones et al. 1996). The nets would be constantly monitored during one or two nights of survey effort at each site. Captured bats would be immediately removed from the net, held in cloth bags, measured, identified to species, sexed, and if possible, aged as adults or juveniles (young of the year), and released. Trapping will only be conducted on federal or SCL lands; trapping on federal lands will be closely coordinated with the USFS and/or BLM.

If a bat maternity colony is suspected in a Project facility or at a site potentially affected by Project activities, then limited trapping may be conducted to determine if the site is a

maternity colony and the species using it. Trapping will be conducted only if it can be accomplished in a manner that does not disrupt or cause evacuation of the colony. Trapping at a suspected maternity colony will be closely coordinated with the USFS or BLM, and USFS personnel will assist with the trapping effort. Once the colony has dispersed, a visual search of the site will document whether the site was a maternity colony and, if so, what species possibly occupied the site.

Task 4: Hibernacula Surveys

Sites that may be potentially used by hibernating bats during the winter will be identified, in coordination with the USFS, from the data collected in Task 2. Sites suspected of being winter hibernacula will be surveyed one or two times during the fall when bats are entering and swarming around their hibernacula (Vonhof and Gwilliam 2000). The fall surveys will be conducted by using the ultrasonic detectors deployed near the potential hibernacula; temperature, relative humidity, and air flow data will also be recorded.

Use of caves or mine adits by hibernating bats can only be confirmed by entering these structures. Consequently, up to six potential hibernacula sites on federal land in the study area that have not been included in past USFS surveys will be selected for winter surveys. The site selection process and the surveys will be conducted in coordination with the USFS. As required by the USFS for safety reasons, surveys of caves and adits will require the involvement of a certified minerals inspector. Data on temperature, air flow, and relative humidity will be measured at 8 inches below the ceiling within the twilight zone of the adit/cave entrance and every 50 feet beyond. Additional USFS guidelines for surveying potential hibernacula are provided in Appendix 1 of this study plan.

Task 5: Foraging Site Sampling

At least seven sites in the study area will be sampled with ~~mistnets and ultrasonic~~ SonoBat AudioRecorders and mistnets ~~detectors~~ to document foraging bat species. Potential sampling sites include the following:

- The ponds and associated wetlands on the BWP
- The wetland and riparian habitat near the mouth of Sullivan Creek
- The mouth of Slate Creek
- The riparian zone just downstream of Box Canyon Dam
- The riparian zone just downstream of Boundary Dam
- A site near Boundary Dam or the Forebay
- Suitable open forested/upland sites

Mist nets will be deployed at all sites, but the number used will depend on site characteristics and ambient noise levels. ~~At each site, 2–5 m~~Mistnets will be ~~deployed~~ set directly over the surface of water bodies or perpendicular to forest edges and roadways, depending on the characteristics of the netting site. In addition, harp traps may be utilized if warranted. Biologists will directly supervise the traps for 2–4 nighttime

hours. Captured bats will be immediately removed from the net, held in cloth bags, measured, identified to species and sexed and released. If possible, captured bats will also be aged as adults (with reproductive status determined) or juveniles (young of the year). Information from this task will be used to characterize available forage habitat for bats in the study area.

Boundary Hydroelectric Project (FERC No. 2144)
Toxics Study Plan Conference Call
January 12, 2007

DRAFT CONFERENCE CALL SUMMARY

Participants

Patti Bailey, Confederated Tribes of the Colville Reservation (Colville)
Don Beyer, Tetra Tech
Julie Campbell, US Fish and Wildlife Service (USFWS)
Jerry Diamond, Tetra Tech
Gary Drendal, Tetra Tech
Bill Duncan, Teck Cominco
Randall Filbert, Long View Associates (LVA)
Harry Gibbons, Tetra Tech
Barbara Greene, Seattle City Light (SCL)
Virginia Howell, Tetra Tech
Don Hurst, Colville
Nick Jayjack, Federal Energy Regulatory Commission (FERC)
Jon Jones, Washington Department of Ecology (Ecology)
MaryLou Keefe, R2 Resource Consultants (R2)
Steve Padula, LVA
Marcie Mangold, Ecology
Rob Plotnikoff, Tetra Tech
Christine Pratt, SCL
Tom Shuhda, USDA Forest Service (USFS)
David Turner, FERC

Conference call summary

Barbara Greene (SCL) noted that Seattle City Light had distributed a revised *Toxics Assessment: Evaluation of Contaminant Pathways, Potential Project Nexus* study plan to stakeholders on December 20, 2006. Barbara introduced the Tetra Tech team, stated that SCL would submit a revised toxics study plan—the version to be filed with the RSP—to stakeholders by January 26, and noted that the revised study plan would include a more detailed and precise schedule for Phase 1 deliverables and stakeholder involvement.

Rob Plotnikoff (Tetra Tech) outlined Tetra Tech's approach to conducting Phase 1 of the toxics evaluation for the Boundary Project. Rob stated that the first step would be to develop a "conceptual model" of potential toxics pathways in Boundary Reservoir. The model would then be validated, to the extent possible, with existing information, and where existing information is inadequate, information gaps would be identified. A one-dimensional sediment dynamics model would be developed for initial evaluation of reservoir sediment deposition patterns. Based on the data gaps identified, the one-dimensional sediment transport model, and hypotheses regarding

how Project operations influence toxics pathways, Tetra Tech would develop a Phase 2 Sampling and Analysis Plan (SAP) to be initiated in summer 2007. Rob stated that results from the 2007 sampling, in combination with the results of other 2007 studies (i.e., shoreline erosion, mainstem sediment transport model, tributary delta model, and hydraulic routing model) would be used to plan for additional toxics sampling in 2008, as needed. Rob emphasized that the purpose of the analysis was to be able to identify the source and fate of contaminants in the reservoir and explain the role of Project operations on potential pathways of toxics contamination.

Rob Plotnikoff emphasized that the thorough, incremental approach outlined above would be necessary to ensure that useful information is generated in a timely manner, avoiding erroneous results, including false negatives, by sampling in the appropriate locations, at the proper times, and focusing on the appropriate sampling media. Rob recalled a study on the Similkameen River, where prematurely formed assumptions regarding deposition locations of toxic compounds turned out to be inaccurate (in this case producing false negatives) and actual toxics accumulations occurred in areas further down-gradient.

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Rob reiterated the following Phase 1 tasks identified by Tetra Tech and SCL, noting that Tasks 1, 2, and 3, would be conducted during the first quarter of 2007:

1. Development of a conceptual model for evaluating potential toxics pathways in the Boundary Project area
2. Analysis of existing data and literature review to evaluate toxics of concern within the framework of the conceptual model and identify "data gaps"
3. Develop and apply a one-dimensional model for initial evaluation of sediment dynamics
4. Develop hypotheses regarding potential Project impacts on the availability or conveyance of the toxics of concern
5. Develop a Phase 2 sampling and analysis plan

- *Comment/Question* – Tom Shuhda (USFS) stated that SCL's consultants had already assembled existing toxics information for the PAD and asked why there was a need to collect additional information and/or reevaluate existing information.
  Response – Rob Plotnikoff (Tetra Tech) replied that Tetra Tech was proposing a more in-depth evaluation of existing information in the context of the conceptual model.

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  Response – Barbara Greene (SCL) reiterated that SCL was planning to revise the schedule to include the information requested by Tom and that this revised schedule would be included in the study plan submitted to stakeholders on January 26, 2007.

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- *Comment/Question* – Referring to Table 3.3-3 in the toxics study plan, Tom Shuhda (USFS) stated that the Phase 1 analysis was scheduled to be initiated in March 2007 and asked why it could not begin immediately.
  Response – David Turner (FERC) stated that the initiation date had been established by SCL to follow the issuance of FERC's study determination. Barbara Greene (SCL) stated, however, that despite the initiation date in the study plan, Tetra Tech was already working on the Phase 1 assessment and recalled the first quarter tasks previously listed by Rob Plotnikoff (see above). Harry Gibbons (Tetra Tech) stated that Phase 1 study elements would, to the extent possible, be conducted in parallel.

- *Comment/Question* – Don Hurst (Colville) stated that a one-dimensional sediment model that addresses only longitudinal sediment dynamics would not provide detailed enough information upon which to develop a SAP.
  Response – Harry Gibbons (Tetra Tech) replied that the one-dimensional model would only be used initially during Phase 1, to help inform the development of the conceptual model. Harry stated that the mainstem sediment transport model, once fully developed, would be used in Phase 2 to refine sampling needs for consideration in 2008.

- *Comment/Question* – Don Hurst (Colville) stated that according to the study plan, the one-dimensional modeling was to be used to identify areas in Boundary Reservoir where sediments with grain sizes similar to waste rock or tailings are likely to have been deposited. Don stated that particle size distributions in waste rock piles are poorly understood and that care should be taken to ensure that the modeling takes into account the full range of relevant particle sizes.

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- *Comment/Question* – Julie Campbell (USFWS) asked if it would be possible for stakeholders to review the conceptual model before March, to provide input as it is being developed.
  Response – Rob Plotnikoff (Tetra Tech) stated that a draft of the model would be completed by or before the end of March 2007. Barbara Greene (SCL) replied that SCL would confer with Tetra Tech and determine if the draft is sufficiently refined for release and review at the end of March, and build in stakeholder review of the draft on the project schedule.

- *Comment/Question* – Tom Shuhda (USFS) stated that the study plan called for a meeting with stakeholders to review the draft Phase 2 sampling plan in July 2007. Tom stated that it would be better to hold the meeting in June to ensure adequate time to begin field sampling in summer.
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- *Comment/Question* –David Turner (FERC) stated that there was only a 15-day stakeholder comment period for the RSP and urged stakeholders to begin review of the toxics study plan on January 26. David emphasized that stakeholders should make it clear in their RSP comments whether they are in agreement with the toxics study as proposed or still disagree with the proposed plan. If they still disagree, they need to make clear where they disagree with the study plan and what they want done instead. Any proposed modifications to the study plan should address the criteria in 18 CFR section 5.9(b).

- *Comment/Question* – Marcie Mangold (Ecology) stated that Ecology found the revised toxics study plan to be adequate and recognized the progress being made since Tetra Tech had been engaged. Bill Duncan (Teck Cominco) agreed with Ecology's assessment.

Colleen McShane (EDAW) emailed the Terrestrial Resources Workgroup:

>>> Colleen McShane 1/15/2007 12:47 PM >>>
Greetings!

As you are aware, SCL is in the process of revising the study plans for the Boundary Project relicensing process. Most of the comments received to date for the terrestrial studies are fairly straightforward and consistent with the input received during the stakeholder meetings last summer. However, the USFWS has requested one change to the methods for the Waterfowl /Waterbird Study for which SCL would like the concurrence of the rest of the group prior to revising this plan.

In Task 3 of the methods, the study plan states that "For each nest, the number of eggs will be counted." The USFWS "recommends counting eggs only if this information is necessary to characterize a Project effect."

Determining clutch size was part of an earlier version of the study plan which included the task of estimating nesting productivity in the study area. Estimating productivity is not part of the existing study plan and is not necessary to characterize Project impacts on waterfowl.
For these reasons, SCL would like to revise the study plan to address the USFWS's comment. Please let me know your thoughts on this issue.

Thanks!

Please note that my e-mail address format has changed:
colleen.mcshane@edaw.com

C O M M U N I C A T I O N S R E C O R D

DATE: January 16, 2007

TO: Kathy Ahlenslager, CNF Botanist

FROM: Colleen McShane

SUBJECT: Non-Vascular Plant Methodology

Michele Lynn and I spoke with Kathy Ahlenslager, CNF botanist, on January 9, 2007, to discuss what the USFS was expecting in terms of survey effort for RTE non-vascular plants. After this phone call I revised the methods section of the study plan for the RTE plant inventory and sent it to Kathy for her review. She made some revisions and sent it back to me via e-mail with a request that I call her to discuss a few points.

Specifically, Kathy wanted to make sure that any plant species of questionable identification, particularly non-vascular taxa, were collected in the field and sent to experts for identification. In addition, she wanted the field crew to collect any rare/unusual non-vascular species found in the study area and to provide them to the USFS for baseline reference collection. Kathy also wanted to make sure that RTE plant populations were reported by land ownership category as it is important for the USFS to know the number and location of any populations of these species on their lands. The study plan for the RTE plant inventory was revised to reflect the Kathy's' requests, as these were part of FERC's request that we be as specific as possible in terms of species and methods to be included in the plan.

Kathleen Ahlenslager (USFS) emailed Colleen McShane (EDAW):

>>> Kathleen E Ahlenslager <kahlenslager@fs.fed.us> 1/16/2007 2:30 PM>>>
Hi Colleen, please give a call about the reference I included. Thanks.
Kathy

(See attached file: boundary.wording.plant.survey.doc)

Kathy Ahlenslager, Forest Botanist
Colville National Forest
765 S. Main, Colville, WA 99114
509-684-7178/FAX 509-684-7280

Hi Kathy

Thank you for taking the time to talk to Michele and I about the non-vascular RTE plant surveys for the Boundary Project. Below are 2 paragrahs that I plan to insert in the study plan. If you could do a quick review it would be greatly appreciated. Please feel free to edit as you see fit. As Michele mentioned, the intent is not to avoid surveying for these species, but to make sure that the effort is focused appropriately.

Hi Colleen, my changes are in red (track changes). Please contact me, if you have any questions. Do you have a copy of the Threatened, Endangered and Sensitive Plant Survey Field Guide and Form, as well as the TES Element Occurrence Field Guide and Form? Kathy

There is relatively little known about the 10 non-vascular RTE plants on the target list for the Colville National Forest. Only one species-naked kidney lichen (*Nephroma bellum*)-has been documented near the Project. This species was found ~~at 2 sites~~ on the CNF about ~~2~~two miles east of the Project~~, one on Bluebird Ridge~~near Haliday Fen ~~and another on Dry Canyon Ridge~~. Suitable habitats for this species and the other nine non-vascular plants on the target list could potentially occur in the study area (pers. comm. K. Ahlenslager, Botanist, CNF, Colville, WA, January 9, 2007).

Survey protocols for non-vascular plants follow those for vascular plants found in the USDA Threatened, Endangered and Sensitive Plant Survey Field Guide and Form. ~~There are no protocol survey methods for any of the 10 target non-vascular RTE plants.~~ USFS botanists searching for these species typically look for textural differences in the cover of non vascular plants~~mosses and lichens~~ on trees, logs, and rocks while conducting surveys in potential habitats for vascular and non-vascular RTE plants. Habitat features with observed textural differences are investigated further for the presence of RTE ~~lichens or mosses~~non-vascular plants (pers. comm. K. Ahlenslager, Botanist, CNF, Colville, WA, January 9, 2007). Questionable or new taxa are collected and sent to experts for identification. Similar methods will be used in searching for non-vascular plants in the study area. These searches will be focused on USFS lands and will be conducted in conjunction with surveys for vascular RTE species. Particular attention will be given to mossy rocks, large tree trunks, and down trees, when these habitat features are encountered.

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Wednesday, January 17, 2007 5:25 PM
To: Don Hurst; Patti Bailey; Marcie Mangold; Jon Jones; David Turner; Tom Shuhda; Julie Campbell; Bill Duncan
Cc: Steve Padula; Emily Andersen; Barbara Greene
Subject: Summary of Jan 12, 2007 Toxics Conference Call

Attachments: Toxics_Conf Call Summary 01.17.07.doc; Barbara Greene.vcf


Toxics_Conf Call Summary 01.17...


Barbara Greene.vcf (306 B)

Please see the attached draft summary of our conference call from last Friday Jan 12th. I would appreciate any comments and/or suggested edits to this by COB Monday January 22, 2007 so we can include it in City Light's consultation record for the RSP.

Thanks,
Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

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From: Mangold, Marcie (ECY) [DMAN461@ECY.WA.GOV]
Sent: Wednesday, January 17, 2007 9:43 AM
To: Barbara Greene
Subject: RE: Ecology PSP comments

Yes Barbara, that is correct. Thank you very much for your clarification.

-----Original Message-----
From: Barbara Greene [mailto:barbara.greene@Seattle.Gov]
Sent: Wednesday, January 17, 2007 9:09 AM
To: Mangold, Marcie (ECY); Barbara Greene
Cc: Emily Andersen
Subject: Re: Ecology PSP comments

Marcie,

Thanks for the call today. I wanted to clarify for the record that Ecology has not filed comments with FERC on the PSP, but you do have one verbal comment for SCL to consider for the toxics study. You suggested that we clarify in Sec 2.7 of the toxics study - Consistency with Generally Accepted Scientic Practice - that while we will follow Ecology guidelines, they are based on EPA guidelines and by law states cannot have lower standards than EPA. Rob Plotnikoff, formerly of Ecology and now a consultant from Tetra Tech assisting SCL with the toxics study, was instrumental in developing the Ecology guildelines based on EPA guidelines.

I would appreciate it if you could verify that my interpretation of your comments above are accurate.

Thanks Marcie, I appreciate your efforts in this relicensing process and look forward to working with you on implementation details.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

Doug Robison (WDFW) emailed Colleen McShane (EDAW):

>>> "Doug Robison" <robisdlr@DFW.WA.GOV> 1/17/2007 11:29 AM >>>
Hi Colleen,
I reviewed the website for Sonobat and found that it's a Pettersson Autorecorder that uses Sonobat software to process and analyze calls.
We support the proposed changes to the study plan.

Thanks,

Doug

>>> "Colleen McShane" <Colleen.McShane@edaw.com> 01/12/2007 10:27 AM
>>>

Greetings and Happy New Year to all!

As you know, SCL has recently selected a team of consultants to conduct the technical studies for the Boundary Project. A team lead by Tetra Tech was awarded this contract, and a very large kick-off meeting was held yesterday. In her opening comments Barbara Green directed the team to implement the study plans as developed by the collaborative group (acknowledging that there will be some changes based on the stakeholder comments on the PSP). However, in a meeting subsequent meeting on terrestrial resources, the Tetra Tech biologists suggested a slight variation in the methods proposed for two tasks in the Bat Surveys and Habitat Inventory.

When we wrote the study plan, we were assuming that the "ultarsonic bat detectors" to be used would be the standard Anabat detectors. As you all know, some Myotis species are very difficult to differentiate with these detectors, primarily because the full range of the ecolocation call is not captured by the detector. As a result, bats need to be captured to confirm species identification, and that is what we proposed in Task 5 for determining bat use of potential foraging sites. Tetra Tech is proposing to use a newer technology called the SonoBat detector, which produces a much more high resolution sonogram (see www.sonobat.com/index.html). As a result, it is possible that a lower level of effort will be needed for mist netting.

SCL would like to revise the study plan slightly to reflect use of the SonoBat detectors and a reduced effort for mist netting, depending on site characteristics. I have attached the text showing the changes.
Please let me know if this revision meets with your approval.

Please note that my e-mail address format has changed:
colleen.mcshane@edaw.com

Doug Robison (WDFW) emailed Colleen McShane (EDAW):

>>> "Doug Robison" <robisdlr@DFW.WA.GOV> 1/17/2007 11:18 AM >>>
Hi Colleen,
I spoke with Zender and we concur with recommended changes. Thanks for the consultation.

Doug

>>> "Colleen McShane" <Colleen.McShane@edaw.com> 01/15/2007 12:47 PM
>>>

Greetings!

As you are aware, SCL is in the process of revising the study plans for the Boundary Project relicensing process. Most of the comments received to date for the terrestrial studies are fairly straightforward and consistent with the input received during the stakeholder meetings last summer. However, the USFWS has requested one change to the methods for the Waterfowl /Waterbird Study for which SCL would like the concurrence of the rest of the group prior to revising this plan.

In Task 3 of the methods, the study plan states that "For each nest, the number of eggs will be counted." The USFWS "recommends counting eggs only if this information is necessary to characterize a Project effect."

Determining clutch size was part of an earlier version of the study plan which included the task of estimating nesting productivity in the study area. Estimating productivity is not part of the existing study plan and is not necessary to characterize Project impacts on waterfowl.

For these reasons, SCL would like to revise the study plan to address the USFWS's comment. Please let me know your thoughts on this issue.

Thanks!

Please note that my e-mail address format has changed:
colleen.mcshane@edaw.com

Mike Gerdes (USFS) emailed Colleen McShane (EDAW), Sharon Sorby (Pend Oreille County Noxious Weed Control Board, Dan Trochta (USFWS) and Doug Robison (WDFW):

>>> Michael Gerdes <mgerdes@fs.fed.us> 1/17/2007 1:49 PM >>>
In reviewing the study proposal goals and objectives, I am OK with deleting "For each nest, the number of eggs will be counted." from Task 3. We may consider also deleting "Clutch size" from the data recorded list.

Mike Gerdes
Acting Wallowa-Whitman NF Hydropower Coordinator Zone Terrestrial Resource Specialist USDA Forest Service - PNW Ochoco NF 3160 NE 3rd St.
Prineville, OR 97754
Phone # 541.416.6521
Cell # 541.419.9296
FAX # 541.416.6695
email mgerdes@fs.fed.us

"Colleen McShane" <Colleen.McShane@edaw.com>
1/12/2007, 10:27 AM
To <ssorby@cahnrs.wsu.edu>, <robisdlr@dfw.wa.gov>, <mgerdes@fs.fed.us>, dan_trochta@r1.fws.gov
cc "Michele Lynn" <LynnM@Seattle.Gov>
Subject: Boudnary Project Question

Greetings!

As you are aware, SCL is in the process of revising the study plans for the Boundary Project relicensing process. Most of the comments received to date for the terrestrial studies are fairly straightforward and consistent with the input received during the stakeholder meetings last summer. However, the USFWS has requested one change to the methods for the Waterfowl /Waterbird Study for which SCL would like the concurrence of the rest of the group prior to revising this plan.

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Determining clutch size was part of an earlier version of the study plan which included the task of estimating nesting productivity in the study area. Estimating productivity is not part of the existing study plan and is not necessary to characterize Project impacts on waterfowl.
For these reasons, SCL would like to revise the study plan to address the USFWS's comment. Please let me know your thoughts on this issue.

Thanks!

Please note that my e-mail address format has changed:
colleen.mcshane@edaw.com

Seattle City Light

Memorandum

DATE: January 17, 2007

TO: Consultation file

FROM: Michele Lynn

SUBJECT: Phone conversation with Glenn Koehn

I called Glenn to get more detail on his PSP comments, re: collecting survey information as part of the Land and Road Study (LRS).

I told him that we might be proposing project boundary adjustments in the PLP and that it doesn't make sense to do detailed survey work now only to have to redo it later. I said we plan to conduct survey work that will be necessary for our license application and for mitigation purposes (such as related to siting of a rec site, etc.), but that it's a matter of timing and sequencing.

I asked Glenn to provide more detail on his comment: "…The Forest Service thinks that this information [condition of surveyed lines and monuments] is necessary to determine that the Project boundary is accurately monumented on-the-ground; that property ownership within and immediately adjacent tot the Project is readily identifiable on-the-ground; and to clearly distinguish those lands where future management activities may take place."

Glenn said it's important to know where USFS property is located relative to the project boundary. He said that if we end up proposing any on-the-ground projects, federal regs and state law require that you know you're on federal land. His said that checking the location and condition of project boundary monuments is key to providing this guarantee.

Glenn also said that we should locate the PLSS monuments. I asked how the PLSS monuments relate to our project. He said that the project boundary is dependent on the PLSS survey, and that for mitigation, this is important information. He said it's not really a matter of project-related impacts, but more as information that will be useful as we move forward. He said he just wants to know what's out there now; he's not asking us to conduct detailed surveys. He thought this might entail retracing the original survey lines to see if the markers are still there and assessing their condition. He said he knows that on other locations on the Colville, there is some erroneous survey information.

I told Glenn that I would need to discuss this with the project team and with the City's surveying group. I said I wanted to understand the level of effort it would really require to provide the information he's asking for.

Colleen McShane (EDAW) emailed Mike Gerdes (USFS):

>>> Colleen McShane 1/18/2007 10:05 AM >>>
Hi Mike

I couldn't open the attached file---I get an error message that says the file is damaged. Perhaps you can resend.

I probably was a bit misleading in my characterization of the equipment. TetraTech is proposing to use a Peterson AudioRecorder with Sonobat software. They actually already have at least some of these units and the software from other studies they have done, so I'm not sure how much flexibility there is in the actual detectors or software that they will use. I believe that all they really want is to be able to have some flexibility to reduce the number of mist nets used at each site since they believe that their equipment is very good a producing a positive identification. So, in actually, it would be using mist nets to augment positive species identification through acoustic surveys. However, I make no claim to being an expert on bat detection technology, and at this point I agree that we should leave the study plan as written. We can have a broader discussion on the equipment and number of mist nets for the next stakeholder meeting, which will probably be in April and well before the field season.

So, to summarize, there will be no changes to the Bat Study Plan related to methods.

>>> Michael Gerdes <mgerdes@fs.fed.us> 1/17/2007 1:40 PM >>>
Hi all, I've reviewed the request and offer the following: After reviewing a couple of recent inventory and monitoring papers, and the sonobat website, I find that there several options for ultrasound or echolocation detectors. Sonobat is just one option. With out a through review of the pros and cons of acoustic equipment I suggest that we not tie our hands by listing specific acoustic equipment. I would prefer that we leave the wording in our study plan as is which states that "ultrasonic bat detectors will also be deployed..." I realize that SCL is footing the bill for these studies but it would be well worth our time to compare echolocation detectors and determine which one best fits our site-specific needs.
For
example: Pettersson, http//www.batsound.com offers several models with ranges of features.

Additionally, I see that the use of acoustic surveys are to augment positive species identification through the use of mist nest surveys.
The
two methods combined will best maximize identificaiton of the species present.

Attached is the first of the two papers I mentioned.

(See attached file: Bat MonitoringProtocolMay05.pdf)

Mike Gerdes
Acting Wallowa-Whitman NF Hydropower Coordinator Zone Terrestrial Resource Specialist USDA Forest Service - PNW Ochoco NF 3160 NE 3rd St.
Prineville, OR 97754
Phone # 541.416.6521
Cell # 541.419.9296
FAX # 541.416.6695
email mgerdes@fs.fed.us

"Colleen McShane"
<Colleen.McShane@
edaw.com>

To
<ssorby@cahnrs.wsu.edu>,
01/12/2007 10:27 <robisdlr@dfw.wa.gov>,
AM <mgerdes@fs.fed.us>,
<dan_trochta@r1.fws.gov>

cc
"Michele Lynn"
<LynnM@Seattle.Gov>

Subject
Boudnary Project Question

Greetings and Happy New Year to all!

As you know, SCL has recently selected a team of consultants to conduct the technical studies for the Boundary Project. A team lead by Tetra Tech was awarded this contract, and a very large kick-off meeting was held yesterday. In her opening comments Barbara Green directed the team to implement the study plans as developed by the collaborative group (acknowledging that there will be some changes based on the stakeholder comments on the PSP). However, in a meeting subsequent meeting on terrestrial resources, the Tetra Tech biologists suggested a slight variation in the methods proposed for two tasks in the Bat Surveys and Habitat Inventory.

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SCL would like to revise the study plan slightly to reflect use of the SonoBat detectors and a reduced effort for mist netting, depending on site characteristics. I have attached

the text showing the changes.
Please let me know if this revision meets with your approval.

Please note that my e-mail address format has changed:
colleen.mcshane@edaw.com
[attachment "Bat Study Section.doc" deleted by Michael Gerdes/R6/USDAFS]

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Thursday, January 18, 2007 8:02 AM
To: David Turner
Cc: Steve Padula; Emily Andersen
Subject: RE: Summary of Jan 12, 2007 Toxics Conference Call

Attachments: Barbara Greene.vcf

Barbara Greene.vcf
(306 B)

Thanks David, we'll make this correction.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

>>> "David Turner" <David.Turner@ferc.gov> 1/18/2007 5:02 AM >>>
Barbara,

I may not have been as clear as needed regarding stakeholder comments on the RSP. Please revise to read:

* Comment/Question - David Turner (FERC) stated that there was only a 15-day stakeholder comment period for the RSP and urged stakeholders to begin review of the toxics study plan on January 26.
David emphasized that stakeholders should make it clear in their RSP comments whether they are in agreement with the toxics study as proposed or still disagree with the proposed plan. If they still disagree, they need to make clear where they disagree with the study plan and what they want done instead. Any proposed modifications to the study plan should address the criteria in 18 CFR section 5.9(b).

David Turner
202-502-6091

-----Original Message-----
From: Barbara Greene [mailto:barbara.greene@Seattle.Gov]
Sent: Wednesday, January 17, 2007 8:25 PM
To: Don Hurst; Patti Bailey; Marcie Mangold; Jon Jones; David Turner; Tom Shuhda; Julie Campbell; Bill Duncan
Cc: Steve Padula; Emily Andersen; Barbara Greene
Subject: Summary of Jan 12, 2007 Toxics Conference Call

Please see the attached draft summary of our conference call from last Friday Jan 12th. I would appreciate any comments and/or suggested edits to this by COB Monday January 22, 2007 so we can include it in City Light's consultation record for the RSP.

Thanks,
Barbara

Kim Pate (SCL) emailed Paul Pickett, Marcie Mangold and Jon Jones (WDOE) 1/18/07:

Subject: Boundary 2007 TDG Monitoring Plan
Location: Seattle Municipal Tower, Room 4070

Start: Wed 2/14/2007 11:00 AM
End: Wed 2/14/2007 3:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Hi folks, please come prepared to discuss and specifically define the TDGmonitoring plan for this year in the
context of the proposed study plangoals and objectives. Paul Pickett and Marcie Mangold will join us from
Ecology, along with the Tetra Tech team members lead by Keith Moen of Hatch Energy, SCL's consultant,
Paul Carson, and of course, SCL's Dan Kirschbaum and Peter Barton. An agenda will be distributed about
a week before the meeting via email distribution. - Kim

Kimberly Pate, M.S., P.E.
Seattle City Light
Power Supply & Environmental Affairs
700 5th Avenue, Suite 3300
P.O. Box 34023
Seattle, WA 98124-4023
PH: 206.684.3705
FAX: 206.684.3799
kim.pate@seattle.gov

C O M M U N I C A T I O N S R E C O R D

DATE: January 18, 2007

TO: File

FROM: Michele Lynn

SUBJECT: Phone conversation with Glenn Koehn re: USFS's request for survey information

1) I told Glenn SCL will likely post the RSP to our website in advance of the Feb. 16 filing date. I said he'd be notified by email.

2) Land and Road Study:

I told Glenn I discussed his survey data request with the entire project team and with one of the City's surveyors. At this point in time, we are not proposing to conduct the work he requested. We see it as a timing and sequencing issue.

First of all – it's not really a study element, it's more of an administrative task

But more importantly, we anticipate that, in our PLP, we'll need to propose some changes to the FERC boundary. And it wouldn't be until FERC issues the license order that we'll know if the proposed changes would be accepted as a license condition. So it doesn't make sense to do survey work now, possibly to have to redo it later.

Also, concerning the level of effort -- I was told by our surveyor that retracing the old survey lines would be a monumental task. She said it could take nearly a year to complete. She said she didn't see a reason as to why we would want or need to do that. She felt that it was prudent to identify areas of key interest or concern as we conduct the studies, and then focus needed survey efforts in those areas.

In the R&L Study as currently proposed, we plan to compile all FERC Project boundary and related survey information. That includes locations of surveyed lines and monuments. It makes sense to us to start by compiling this information and seeing where holes need to be filled.

Once we have: 1) all the information that will be compiled in the R&L study, 2) a good handle on the FERC Exhibit G requirements, and 3) a handle on the areas of concern or interest, we can decide where to focus our efforts.

Glenn responded by saying that he will go along with our approach. He said, while the information will be really useful, especially in the future, it isn't imperative that it be completed right away.

Glenn also said the USFS is waiting to see the revised version of the landownership map. They think landownership may be germane to some of the studies. I told him I would email

the updated map to him. I explained that we see it as a working document and that if the USFS wants to start researching their records for areas that they believe they own (but the maps show as being in City ownership), they should feel free to do so.

---------- Original Message ----------
Subject: RE: cadmium water quality standard
From: "Niemi, Cheryl (ECY)" <cnie461@ECY.WA.GOV>
Date: Mon, January 22, 2007 11:04 am
To: mkeefe@r2usa.com
Cc: "Braley, Susan (ECY)" <SUBR461@ECY.WA.GOV>

Hi Mary Lou,

I just left you a voice-mail message, but here is a written response as well. The e-mail below provides more detail than your voice-mail, so this e-mail will be more complete.

The ARAR's referenced below are used in the Toxics Conrol Program to implement the Model Toxics Control Act. The MTCA rules confer the flexibility of looking for the most recent or updated "criteria" or other regulatory level from which to calculate a clean-up level. If you are looking at clean-up as part of the relicensing you should talk to Craig McCormack (cmcc461@ecy.wa.gov, 360-407-7193) here in our TCP to discuss the proper ARAR for the river. The Water Quality Program would not be developing the agreement language for an ARAR.

For purposes of Clean Water Act NPDES permitting or other regulation, such as 303(d) listing or TMDLs, we use the CWA approved criteria listed in the state standards. In the case of cadmium Washington has not updated the state criteria to match the EPA recommended criteria. The last revision to our toxics criteria for metals was in 1997.

So - it is possible that we could have two sets of cadmium values applied to the same waterbody, but for different purposes.

Hope that helps, please let me know if you need further clarification.

Sincerely,

Cheryl Niemi

Cheryl A. Niemi
Surface Water Quality Standards
Department of Ecology
P.O. Box 47600
Olympia WA 98504
360.407.6440
cnie461@ecy.wa.gov

-----Original Message-----
From: Braley, Susan (ECY)
Sent: Friday, January 19, 2007 9:56 AM
To: 'mkeefe@r2usa.com'; Niemi, Cheryl (ECY)
Subject: RE: cadmium water quality standard

Cheryl--Can you respond to MaryLou Keefe's question below regarding state standards to apply for cadmium? She is working on the Boundary Dam re-licensing project on the Pend Oreille River, and received comments from USFWS regarding the appropriate cadmium criteria to apply for Washington. According to USFWS' comment below, there has been some "agreement" with Ecology that the more stringent federal standard will be applied to waters affecting bull trout. I told MaryLou you would get back to her early next week. If you respond by email, please "cc" me as I am curious what the answer is.

Thanks--Susan

-----Original Message-----
From: mkeefe@r2usa.com [mailto:mkeefe@r2usa.com]
Sent: Friday, January 19, 2007 9:43 AM
To: Braley, Susan (ECY)
Cc: RandallFilbert@aol.com
Subject: cadmium water quality standard

Hi Susan:

As we discussed over the phone, we are trying to understand the correct standard to use when addressing cadmium during our studies in the Pend Oreille River. We have listed state standards as 3.7 µg/L (acute) and
1.03 µg/L (chronic), indicating that these assume a water hardness of 80 mg/L CaCO3 and a pH of 8. However, as indicated by the quote below, USFWS has suggested that the state may have agreed to use a different more stringent standard. Can you please help to clairfy this small discrepancy for us?

"Washington State surface water quality standards for cadmium (Cd) are listed as 3.7 µg/L (acute) and 1.03 µg/L (chronic), which are less stringent than the federal ambient water quality criteria (AWQC) of 1.62 µg/L (acute) and 0.21 µg/L (chronic). The federal standards were revised (to the above values) in 2001 based on studies that demonstrated adverse effects to bull trout at the previous AWQC for Cd (Hansen et al.2002).
When considering Applicable, Relevant and Appropriate Requirements (ARARs) for sites where toxics are present, Washington State acknowledges that the more stringent federal Cd criteria are appropriate."

Thank you,

MaryLouise Keefe
Aquatic Scientist
R2 Resource Consultants, Inc.

From: Kim Pate [Kim.Pate@Seattle.Gov]
Sent: Monday, January 22, 2007 1:40 PM
To: Marcie (ECY) Mangold
Subject: RE: Pend Oreille TMDL for TDG - Revise Draft & FinalSchedules?

Great, thank-you Marcie.

Kim

>>> "Mangold, Marcie (ECY)" <DMAN461@ECY.WA.GOV> 1/22/2007 1:35:38 PM
>>>
Fine for me.

-----Original Message-----
From: Kim Pate [mailto:Kim.Pate@Seattle.Gov]
Sent: Monday, January 22, 2007 12:05 PM
To: Mangold, Marcie (ECY)
Cc: Jones, Jon W. (ECY)
Subject: Pend Oreille TMDL for TDG - Revise Draft & Final Schedules?

Greetings Marcia and Jon,

Just revising the TDG study plan to reflect minor adjustments and wondered if you have a revised scheduled for the Draft and Final reports? The current version has October and December 2006 - does January and March 2007 work for you as a schedule revision?

Take care,
Kim

From: Kim Pate [Kim.Pate@Seattle.Gov]
Sent: Monday, January 22, 2007 3:50 PM
To: Marcie (ECY) Mangold; Jon W. (ECY) Jones
Cc: Emily Andersen; Susan Hurley
Subject: RE: Pend Oreille TMDL for TDG - Revise Draft & FinalSchedules?

Thank-you for the update, Jon, we'll shift the dates for the public review of the Draft/Final TMDL for TDG to February/April 2007 in our revised TDG Study Plan to the FERC.

I caution that these changes in the TMDL schedule will be reflected in SCL's Revised Study Plan (RSP) based on stakeholder comments received as of last week, to be submitted to the FERC by the end of this month. The FERC will publically file the RSP by mid-February. Just so you know, there were no major comments filed on the TDG study plan and it will look essentially the same as in the PSP filed in October - primarily reformatting and consistent language - all the substantive Phase 1 (2007) and Phase 2 (2008/9) work efforts are totally intact.

I've "cc" a couple team members on this email that will need to make the TMDL schedule edits in the TDG study plan.

Take care and look forward to removing the "Draft" on the TDG abatement plan, Kim

>>> "Jones, Jon W. (ECY)" <JOJO461@ECY.WA.GOV> 1/22/2007 3:34:40 PM
>>>
Hi Kim --

We put a due date of 1/31/07 on the Volume II. However, that date will once again be changed because after the document goes through all the internal reviews and sign-offs, and after the 30-day public comment period, and after the comments are incorporated into the final, it looks like Volume II will be complete sometime in April, but that's just a guess.

To bring you up to speed on what's happening, the DRAFT Volume II went out to the Tribe and EPA last week. I should get it back from them with their comments this week. I'll then begin the rest of the routing chore.

I'll also need to have SCL review the TDG Abatement Plan that you put together. It's in a DRAFT form, but I didn't see any changes between that and your large study plan (Water Quality Section). So, before we go to press on that one, I'll need you to tell me I can take off the "DRAFT".

I hope the temperature TMDL goes smoother than this one. Too bad you guys got saddled with a new guy (me). :-)

Later, jj

-----Original Message-----
From: Kim Pate [mailto:Kim.Pate@Seattle.Gov]
Sent: Monday, January 22, 2007 12:05 PM
To: Mangold, Marcie (ECY)
Cc: Jones, Jon W. (ECY)
Subject: Pend Oreille TMDL for TDG - Revise Draft & Final Schedules?

Greetings Marcia and Jon,

Just revising the TDG study plan to reflect minor adjustments and wondered if you have a

revised scheduled for the Draft and Final reports? The current version has October and December 2006 - does January and March 2007 work for you as a schedule revision?

Take care,
Kim

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Tuesday, January 23, 2007 8:33 AM
To: Don Hurst; Patti Bailey; David Turner; Tom Shuhda; Julie Campbell; Bill Duncan
Cc: Steve Padula; Emily Andersen; Randall Filbert; MaryLouise Keefe; Christine Pratt; Harry Gibbons; Rob Plotnikoff; Don Beyer; Virginia Howell
Subject: Summary of Jan 12, 2007 conference call on toxics study

Attachments: Toxics_Conf_Call_Summary_01_19_07 final.doc; Barbara Greene.vcf


Toxics_Conf_Call_Summary_01_19...


Barbara Greene.vcf (306 B)

Please find attached a summary of our discussion of City Light's revised toxics study discussed on the January 12, 2007 conference call.

Thanks for participating and sharing your ideas and questions.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Tuesday, January 23, 2007 8:39 AM
To: Marcie Mangold
Cc: Barbara Greene
Subject: Summary of Jan 12 toxics discussion

Attachments: Toxics_Conf_Call_Summary_01_19_07 final.doc; Barbara Greene.vcf


Toxics_Conf_Call_Summary_01_19...


Barbara Greene.vcf (306 B)

Marcie,

Attached is the summray of our Jan 12 conference call on City Light's revised toxics study.

Barbara

Barbara Greene
Boundary Relicensing Program Lead
Seattle City Light
206.615.1091
barbara.greene@seattle.gov

Stephen Breithaupt (Battelle) emailed Paul Pickett (WDOE):

>>> "Breithaupt, Stephen A" <stephen.breithaupt@pnl.gov> 1/23/2007 4:02 PM >>>
Paul,
There are two meteorological input files: one for the two branches downstream of Box Canyon and the other for the two branches on either side of Boundary Dam. (Of course, the model branches I refer to are the main stem of the Pend Oreille River.) When looking at the data in the files, recall that for our model calibration W2's internal solar radiation calculations were used in lieu of the input data. Also, the data in the files are the same as included in the calibration presentation we gave to you.

If you have any questions, let us know.
~Steve

From: Pickett, Paul (ECY) [mailto:PPic461@ECY.WA.GOV]
Sent: Tuesday, January 23, 2007 11:21 AM
To: Breithaupt, Stephen A; Khangaonkar, Tarang P
Cc: Mangold, Marcie (ECY); Christine.Pratt@Seattle.Gov
Subject: Met data for Pend Oreille runs

Can you send me the meteorological model input data you used for the 2004-2005 simulations of Boundary Dam? I'm using them for tributary temperature estimates.

Paul

Paul J. Pickett, P.E.
Water Quality Engineer
Environmental Assessment Program
Washington State Dept. of Ecology
P.O. Box 47710
Olympia, WA 98504-7710

voice (360) 407-6882
fax (360) 407-6884

From: Lisa Rennie [Lisa.Rennie@Seattle.Gov]
Sent: Thursday, January 25, 2007 11:16 AM
To: Quanah Matheson
Cc: Barbara Greene
Subject: Re: Hello Coeur d'Alene Tribe

Mr. Matheson,

Thank you for your expression of interest in the ongoing cultural resources consultation for Boundary relicensing, including consideration
of any potential TCPs within the Project APE.

Seattle City Light worked with the Cultural Resources Workgroup
(CRWG) through out the spring and summer of 2006 to develop the Cultural Resources Study, which was filed as part of the Preliminary Study Plan
(PSP) with FERC on October 16, 2006. In response to comments received at the November 15 study plan meeting and in response to comments filed with FERC on the PSP, the Cultural Resources Study has been further modified for submittal in the Revised Study Plan (RSP). The RSP will be filed with FERC on or before February 14, 2006.

You will receive a copy of the RSP and will continue to receive notices of upcoming CRWG meetings and activities. I'm very pleased that you will be following the study's progress, including reviewing data and reports.

Once again, thank you for the reminder of the Coeur d' Alene Tribe's interest in the Boundary Project. I look forward to working with you.

Please do not hesitate to contact me if you have any questions.

Lisa Rennie
Office of External Affairs
Seattle City Light
PO Box 34023
Seattle, WA 98124-4023
(206) 684-3793

>>> "Quanah Matheson" <qmatheson@cdatribe-nsn.gov> 12/12/2006 9:53 AM
>>>
Ms Lisa Rennie,

I am the CRMP Manager and THPO for the Coeur d'Alene Tribe of Indians in Plummer, Idaho.
I just wanted to state our ongoing interest in this project and wanted to make sure we are still part of the study plans.
Our consultation would be limited on my end to identifying TCP's for the area.

I haven't gone to any meetings but, I have been following the progress.
This email is just a reminder of our interest in this project and our ongoing consultation with you folks regarding cultural reviews or data
you would need from us as we are one of the affected Tribes.

Thank you again and I hope to hear from you soon.

Quanah Matheson

Cultural Resource Manager/THPO

Coeur d'Alene Tribe

208-686-0675

qmatheson@cdatribe-nsn.gov

From: Barbara Greene [barbara.greene@Seattle.Gov]
Sent: Friday, January 26, 2007 2:53 PM
To: Don Hurst; Patti Bailey; Marcie Mangold; David Turner; Glenn Koehn; Tom Shuhda; Julie Campbell; Bill Duncan
Cc: Steve Padula; Emily Andersen; Rick Donaldson; Susan Hurley; Randall Filbert; William Stelle; MaryLouise Keefe; Barbara Greene; Christine Pratt; Harry Gibbons; Rob Plotnikoff; Don Beyer; Virginia Howell
Subject: Boundary Relicensing Toxics Revised Study

Attachments: Study 4 Toxics Assessment FINAL 01-29-07.pdf; Barbara Greene.vcf


Study 4 Toxics Assessment FINA...


Barbara Greene.vcf (306 B)

As a follow up to our January 12, 2007 conference call on City Light's revised toxics study, please find attached the revised toxics study plan that will be filed with FERC on February 14, 2007. Some of the changes include the additional tasks that the Tetra Tech staff reviewed for us on January 12, and a revised schedule to include more detail. We appreciate your time and efforts to improve this study and look forward to continuing to work with you to implement City Light's study plan.

Barbara

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