

***Boundary Hydroelectric Project (FERC No. 2144)***

***Study No. 24***

***Cultural Resources Study***

***Interim Report (Public Summary)***

**Prepared for  
Seattle City Light**

**Prepared by  
Historical Research Associates  
(Under Contract to Tetra Tech)**

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# **Study No. 24: Cultural Resources Study Interim Report (Public Summary) Boundary Hydroelectric Project (FERC No. 2144)**

## **1 INTRODUCTION**

Study No. 24, Cultural Resources Study, was conducted in support of the relicensing of the Boundary Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) No. 2144, as described in the Revised Study Plan (RSP; SCL 2007), submitted by Seattle City Light (SCL) on February 14, 2007, and approved by the FERC in its Study Plan Determination letter dated March 15, 2007. This is the public summary version of the interim report for the 2007 efforts of the Cultural Resources Study. Because of the potentially sensitive nature of the information regarding archaeological and historic resources, the complete report is not being distributed to the general public. The full report may be obtained by request to SCL or FERC (subject to confidentiality requirements).

Tasks in 2007 included archaeological and historic resources inventory survey, archaeological testing of a prehistoric site, archival records research, and preparation of resource documentation. The Cultural Resources Study will be completed in 2008 and a final report will be produced.

## **2 STUDY OBJECTIVES**

The goal of the Cultural Resources Study is to gather information that will be used to develop a Historic Properties Management Plan (HPMP) with recommended protection, mitigation, and enhancement measures for the management of historic properties under the new Project license. The objectives of the study include the following:

- A field inventory to identify historic properties within the Project area of potential effects (APE)
- Consultation with Tribal representatives to document any Traditional Cultural Properties (TCPs) and other culturally significant locations within the APE
- Evaluation of resources to assess whether they meet criteria for National Register of Historic Places (NRHP) eligibility
- Documentation of Project-related effects on any NRHP-eligible historic properties

This draft interim report presents the results of the 2007 field inventory; tasks addressing the remaining three objectives are planned for 2008. The Cultural Resources Study is being conducted in consultation with the Washington State Department of Archaeology and Historic Preservation (WDAHP), Indian tribes, federal agencies, and other interested parties. Toward this end, SCL has contacted the following with regard to planning the Cultural Resources Study: the Colville National Forest, the Bureau of Land Management (BLM), the Kalispel Tribe of Indians, the Confederated Tribes of the Colville Reservation, the Kootenai Tribe of Idaho, the Spokane Tribe of Indians, the Coeur d'Alene Indian Tribe, the Confederated Salish and Kootenai Tribe,

and the WDAHP. A number of these parties participated in the Cultural Resources Workgroup (CRWG). CRWG members have actively participated in meetings to develop the 2007 Implementation Plan for the Cultural Resources study and reviewed progress reports, testing plans, and preliminary products.

### 3 STUDY AREA

#### 3.1. Project Area of Potential Effects

The Area of Potential Effects (APE or study area) for a project is defined as “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historical resources if any such cultural resources exist” (36 Code of Federal Regulations [CFR] 800.16). For the purposes of this 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 (1,994 feet NAVD 88 [1,990 feet NGVD 29])<sup>1</sup> along both shorelines, and the transmission line right-of-way (ROW) from the powerhouse to the Bonneville Power Administration (BPA) interconnection (Figure 3.1-1).
- 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 2,019 feet NAVD 88 [2,015 feet NGVD 29]), extending south to the FERC Project boundary for the Box Canyon Project.
- The SCL-owned Boundary Wildlife Preserve (BWP) (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 resource studies (e.g., erosion, dispersed recreation) identify a Project effect in an area not within the original APE.

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<sup>1</sup> SCL is in the process of converting all Project information from an older elevation datum (National Geodetic Vertical Datum of 1929 [NGVD 29]) to a more recent elevation datum (North American Vertical Datum of 1988 [NAVD 88]). As such, elevations are provided relative to both data throughout this document. The conversion factor between the old and new data is approximately 4 feet (e.g., the crest of the dam is 2,000 feet NGVD 29 and 2,004 feet NAVD 88).

Ownership of lands within the Project APE is shown in Table 3.1-1. For ease of general location reference, portions of the Project APE are referred to herein as the Upper Reservoir Reach, the Lower Reservoir Reach, and the Tailrace Reach as defined below:

- Upper Reservoir Reach – includes the area from the south end of the Project APE below Box Canyon Dam to Metaline Falls
- Lower Reservoir Reach – includes the area from Metaline Falls downstream to the dam. As such, the Lower Reservoir Reach includes the narrow, incised canyon portion of the river.
- Tailrace Reach – includes the SCL-owned land from the dam north to the end of SCL-owned land at the U.S.-Canadian border (see Figure 3.1-1).

**Table 3.1-1.** Ownership of land within the Project APE.

Owner	Acres
BLM	317.1
BPA	29.4
City of Metaline	14.4
City of Metaline Falls	7.6
Federal - Other	4.5
PUD	1.5
Pend Oreille County	1.8
Pend Oreille Valley Railroad	0.1
Private	66.9
SCL	965.5
Selkirk School District	1.1
USFS	623.7
WDNR	1,335.2
WSDOT	1.6
Unknown	21.5
<b>Total Acres</b>	<b>3,370.5</b>

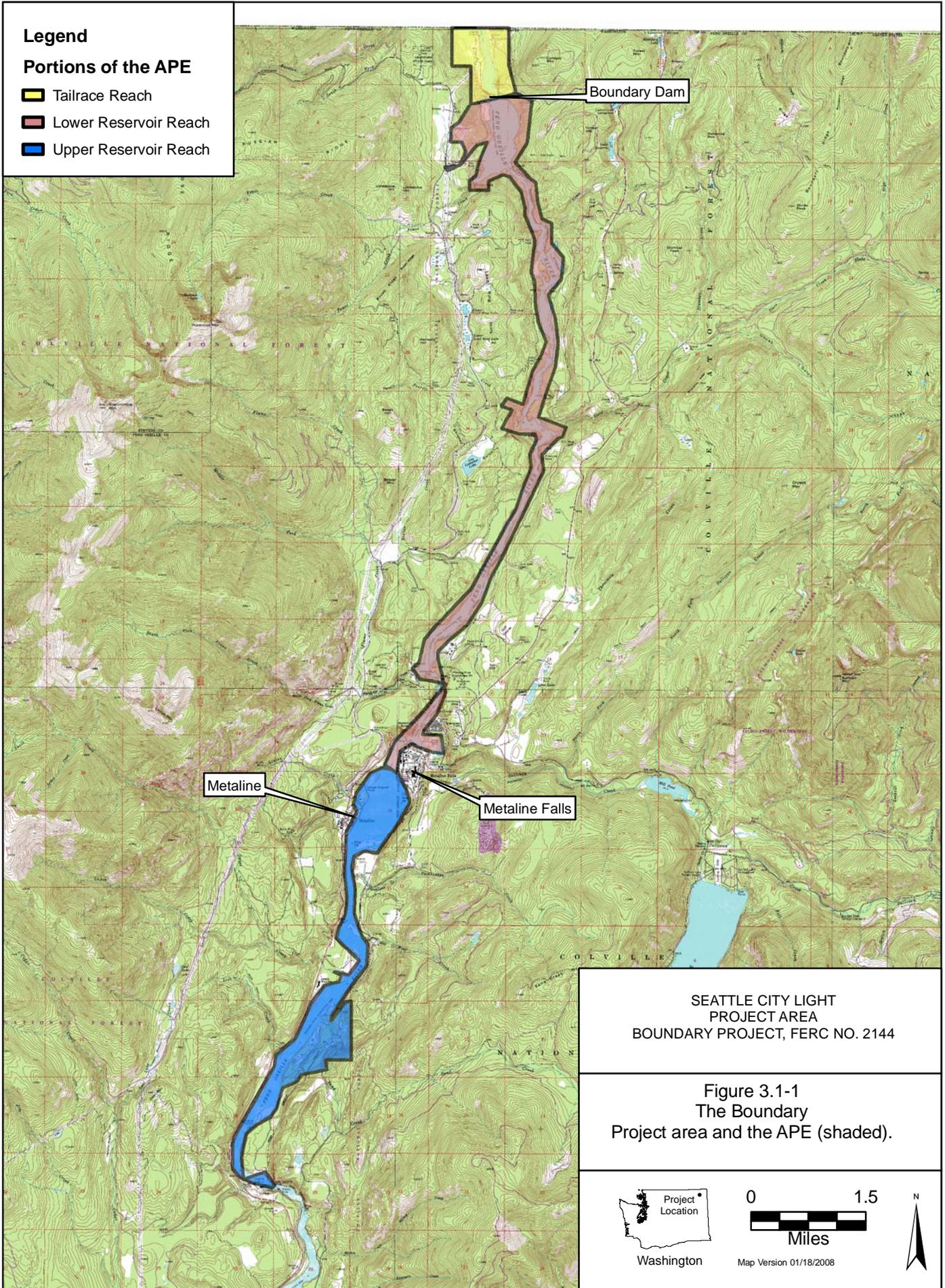
Notes:

- BLM – Bureau of Land Management
- BPA – Bonneville Power Administration
- PUD – Pend Oreille County Public Utility District
- SCL – Seattle City Light
- USFS – U.S. Forest Service
- WDNR – Washington Department of Natural Resources
- WSDOT – Washington State Department of Transportation

**Legend**

**Portions of the APE**

-  Tailrace Reach
-  Lower Reservoir Reach
-  Upper Reservoir Reach



### 3.2. Cultural Resources Context

Background information for the prehistoric/ethnographic and historic periods is presented in the Pre-Application Document (PAD) (SCL 2006) and RSP (SCL 2007). In addition, information about previous cultural resource studies in the vicinity of the project is summarized in these documents, as well as the full Study 24 Interim Report (SCL 2008). For the full Study 24 Interim Report historic period background section, supplemental records research was conducted at various local and state historical archives and libraries.

### 3.3. Archaeological Expectations

The physical geography of the Boundary Project produces two distinct zones for cultural resources investigations. Upstream of Metaline Falls, the river approximates its pre-development configuration. The river gradient is moderate, and alluvial fans and terraces are evident. Below the falls, the pre-development river was incised into a deep, steep-sided gorge. There, the original riverside environments are now deeply submerged by as much as 300 feet of water.

A predictive model for prehistoric archaeological sites was developed using empirical environmental data to better explain the potential distribution of prehistoric archaeological sites in the Boundary Project. This predictive model was supplemented with additional information from previous archaeological investigations in the Pend Oreille valley and with locational information derived from ethnohistorical literature. The model is essentially a set of Geographic Information System-based maps that describe zones as having high, moderate, or low potential to contain prehistoric archaeological sites. The underlying assumption in developing the model was that most prehistoric archaeological occurrences are associated with sets of environmental and cultural variables. The model was developed in consultation with the Boundary CRWG.

Archaeological sensitivity mapping for prehistoric sites suggests that the Project APE downstream from Metaline Falls has a low potential to contain cultural resource sites; however, the part of the Project upstream of the falls has greater potential for prehistoric archaeology. Conversely, the area downstream of the falls contains extensive mineral deposits that were mined in the historic era. Thus, there is greater potential for evidence of these activities downstream from the falls. There is potential for logging-related features and isolated artifacts throughout the Project APE.

## 4 METHODS

This section describes the methodologies used to perform the tasks noted in Section 1. Fieldwork, consisting of archaeological and historic resources survey and archaeological testing of one site (EC-1) was conducted in the spring and fall of 2007. Archival research was conducted prior to the initial field surveys, and in the summer and fall of 2007.

### 4.1. Archival Research

Background research in various libraries and archives was conducted for completion of the historic context section of this report and portions of the Historic Property Inventory forms prepared for this study. Archival research also was conducted to collect information on specific

archaeological sites and features found by the archaeological survey. Documentation and photographs at local, regional, and personal archives were consulted for information on inventoried properties within the Project APE. These historic collections included the Metaline Community Library in Metaline Falls; the records of local Metaline Falls resident and historian John Ogmundson; the Newport Public Library in Newport, Washington; and the Pend Oreille County Museum and Historical Society in Newport. Additionally, in early phases of background research for historic context of the Project APE, the historian consulted the SCL relicensing library.

## 4.2. Archaeological Resources Inventory

During the spring and fall of 2007, Historical Research Associates (HRA) field personnel conducted an archaeological field survey. Methods followed that described in the Implementation Plan (HRA 2007) and summarized here. The field survey entailed crews of two to four archaeologists walking transects spaced at intervals no greater than 82 feet across the accessible terrain within the Project APE. In most places survey transects were narrower than 82 feet as a result of the width of the APE. Prior to initiation of the spring fieldwork, the predictive model maps were examined to assist field investigation planning. Landforms in the Lower Reservoir Reach are varied, often steep, and include fewer areas of high or moderate probability. In this area, pedestrian survey transects followed the topography and adjusted to the landforms encountered as necessary. Where the steep topography was unsafe for crews to access and/or the 200-foot APE occurs entirely on low-probability landforms visible from the river, a tactical survey approach was used. In these areas, crews moved by boat to specific landforms to investigate, rather than sweeping nonstop along the length of the APE. In such places, decisions about where to survey were made in consideration of both safety and the potential for any cultural resources. The Field Director or Crew Chief examined the shorelines from the river to determine survey feasibility.

Areas not surveyed for safety reasons (e.g., excessively steep terrain or unstable footing) or due to access constraints from private landowners were documented. In addition, the field crew systematically examined all horizontally and vertically exposed sediment surfaces (i.e., cutbanks) for archaeological materials. In non-riverine upland environments, shovels or trowels were used to clear areas of forest duff to examine the mineral soil for evidence of artifacts, features, soil discoloration, and other potential anthropogenic characteristics. Crews also examined exposed bedrock faces for potential petroglyphs and pictographs. The ability to conduct field surveys on private land within the APE (mainly upstream of Metaline Falls) was limited by access constraints in seven locations.

For the purpose of classifying cultural resources, HRA used current WDAHP definitions for isolates and archaeological site types. Sites are defined as at least two artifacts within an area 50 feet in diameter or one or more archaeological features in spatial association with any number of artifacts. Isolated finds are defined as less than two artifacts within an area 50 feet in diameter; solitary prospect pits were also recorded as isolates. Collapsed historic-era structures are recorded as archaeological sites on Washington Archaeological Site Inventory forms.

The completion of the archaeological inventory was facilitated by the delineation of separate survey segment types. The extent of each survey segment was defined and mapped in the field

based on the survey strategy employed at each segment with the strategy largely based on accessibility, which was primarily the result of the topography. Survey segments were defined as one of three categories: 1) pedestrian survey with supplementary shovel test probes (STPs); 2) pedestrian survey without STPs; and 3) survey via visual reconnaissance only. Each survey segment category is described below. All segments were documented photographically and plotted on Project maps.

#### **4.2.1. Pedestrian Survey with STPs**

Survey segments where pedestrian survey could be supplemented with STPs were common where alluvial terraces occur within the APE. Surface visibility in these segments was adequate for pedestrian survey but STPs were conducted to determine if any cultural materials were present below the ground surface. In the upper reservoir, most STPs were excavated on alignments that followed the top of the riverbank edge.

#### **4.2.2. Pedestrian Survey Without STPs**

Portions of the APE often were conducive to pedestrian survey, but were located where excavating STPs was not feasible or would not have provided any applicable information. For example, in certain areas, shovel probes were not excavated given the recent nature of beach deposits and the character of undercut terraces (i.e., the steepness of forested slopes directly above survey areas).

#### **4.2.3. Visual Reconnaissance**

As described above, survey segments where the Field Director determined it unsafe to attempt pedestrian transects due to steep inclines, or when the terrain is otherwise inaccessible or unstable, were examined only through visual reconnaissance. For areas along the reservoir, this generally was viewed from a boat at the reservoir elevation. Areas further from the reservoir that were surveyed through visual reconnaissance were examined from nearby roads (e.g., the upper elevations of the SCL wildlife preserve lands and the hillside below the dam east of the river).

#### **4.2.4. Shovel Test Probes**

STPs were used for subsurface investigation of areas of high and moderate probability for archaeological materials during survey to assess the presence/absence of subsurface cultural material and to determine the density and types of archaeological materials at recorded sites. Also, STPs were used as part of the evaluative testing at site EC-1. Specific locations and numbers of STPs to be excavated were determined by the Field Director. STPs averaged approximately 14 inches in diameter, but varied in diameter depending on the character of the local soils. All sediments were screened through standard 1/8-inch mesh hardware cloth. A total of 132 STPs were excavated in the Project APE.

### **4.3. Historic Resources Inventory**

On September 5 and 6, 2007, HRA inventoried the Boundary Project (the dam, powerhouse, guyed aluminum mast towers and transmission lines, Vista House, and associated maintenance

buildings), as well as the Pend Oreille Mines and Metals Company (POMMC) Powerhouse, all of which are more than 40 years old and are located within the Project APE. The built environment examined, photographed, and recorded was inventoried at a reconnaissance level as described in the WDAHP guidelines. Recorded information required includes the location and architectural style of the resource, any obvious modifications or disturbances, and at least one photograph. Historic Property Inventory forms were completed as required by WDAHP. Additional information will be gathered for each inventoried resource during the evaluation phase in 2008 in order to be able to describe each property's potential eligibility for inclusion in the NRHP.

#### **4.4. Archaeological Testing**

Archaeological testing, for the purposes of evaluating a site for potential NRHP eligibility, was conducted at one site (EC-1; Section 5.1.1). Test excavations were conducted following standard professional procedures and techniques. Investigations were limited to controlled surface mapping of cultural materials, excavation of exploratory STPs to determine the spatial extent of the site's deposits, and excavation of subsurface units to document the archaeological site contents.

### **5 PRELIMINARY ARCHAEOLOGICAL SURVEY RESULTS**

Summary information of all archaeological sites inventoried (Table 5.0-1) within the Project APE is presented in the sections below. The survey resulted in 12 newly recorded historic archaeological sites (temporary numbers BH-1-6, JL-1, JL-3, EC-1-4) and two historic-era isolated finds (IF-E1, IF-E2). In addition to the newly recorded sites and isolates, archaeological site forms for four previously recorded sites (45PO122, 45PO520, NELDP-0012, NELDP-0018) and one previously recorded isolate (BLMiso-39) were updated. NELDP site numbers are for sites recorded for the BLM's Northeast Lands Data Project (Ferguson and Root 2004) and represent previously recorded cultural resources on BLM lands that have yet to be assigned Smithsonian trinomial site numbers. Washington Archaeological Site Inventory forms have been prepared for all newly recorded sites.

#### **5.1. Inventory Results**

HRA archaeologists conducted field survey from May 15 to 23 and from October 3 to 11, 2007. The cultural resource inventory recorded 12 new archaeological sites and revisited four previously recorded sites and one isolated find. Site narratives presented below are arranged geographically from the southernmost site in the Upper Reservoir Reach to the northernmost.

**Table 5.0-1.** Cultural archaeological sites identified within the Project APE.

Site	WDAHP Type	Date Recorded
45PO520	Historic Mining Properties	05/22/07 and 10/05/07 <sup>1</sup>
NELDP-0018	Historic Mining Properties	05/22/07 <sup>1</sup>
NELDP-0012	Historic Mining Properties	05/22/07 <sup>1</sup>
JL-1	Historic Homestead	05/17/07
JL-3	Historic Homestead	05/17/07
BH-1	Historic Mining Properties	05/19/07
BH-2	Historic Road and Historic Structure Unknown	05/19/07
EC-1	Pre-Contact Feature	05/16/07 and 10/09/07
EC-2	Historic Structure Unknown	05/18/07
EC-3	Historic Mining Properties	05/18/07
EC-4	Historic Homestead	10/06/07
BH-3	Historic Structure Unknown	10/03/07
BH-4	Historic Debris Scatter	10/04/07
BH-5	Historic Mining Properties	10/07/07
BH-6	Historic Mining Properties	10/04/07
45PO122	Historic Structure Unknown	10/06/07 <sup>1</sup>

Note:

1 Re-inventory date

### 5.1.1. Site EC-1

The spring 2007 survey recorded site EC-1 as comprising a single Fire Cracked Rock (FCR) feature (Feature 1), partly visible on the surface among thick grass. Along with at least 30 pieces of FCR, a small piece of dark green quartzite debitage and a possible tested cobble were also observed. A single shovel test probe found additional FCR and charcoal. The site occurs on a slope near the margin of two distinct vegetation zones—conifer-dominant forest to the east and the slough immediately west.

A total of 20 STPs were excavated at EC-1. One excavation unit (EU1) was oriented perpendicular to the hill slope. FCR constituted the only artifacts recovered from the EU. The FCR were found in one cultural level (Strata Ia/b) but are dispersed throughout these sediments. As a result, no specific fill was identified as might be found in a buried, intact fire hearth. Soils present in the cultural level are alluvial in origin and demonstrate that the slough was cut by floods well before the FCR feature occurred. Soil horizons below the cultural layer follow the angle of the hill slope, indicating that the slough was developed prior to deposition of these sediments.

A charcoal sample was taken from EU1 at the base of the cultural deposit, approximately 12 inches below datum. Radiocarbon dating analysis returned a calibrated result of 1010 to 1170 years A.D. This indicates that the sediments (and FCR) seen in EC-1 have been in place for some time and cannot be attributed to recent events. Given the age of the wood charcoal that was dated, it is probably the result of cultural activities that date to that time period. Additional fire-modified rock and charcoal were observed on the surface upslope of EC-1, but they likely are a result of more recent events such as a forest fire. The radiocarbon date and the sediment stratigraphy indicate that the dispersed fire-related feature found in EU1 dates to after creation of the slough. Therefore, the feature remnant is located on a much steeper slope than where hearth features are commonly found. Kevin Lyons, Kalispel Tribal Archaeologist, noted during a visit

to EC-1 that Native Americans did make use of hearth features on slopes for the purpose of catching winds for drying roots and other foodstuffs. Another explanation is presented by the dispersed nature of the FCR and charcoal in the sediments; they may represent cleanout debris from a nearby hearth or oven feature.

### **5.1.2. Site BH-4**

Site BH-4 (the POMMC Powerhouse Dump) represents a historic-era trash dump, a depression/building foundation, and a large dump of rough aggregate cement. These features are likely associated with the 1937 construction and subsequent operation of the POMMC Powerhouse (see Section 6).

The historic-era trash dump includes household and domestic items as well as items seemingly related to the construction and/or maintenance of the POMMC powerhouse facility. A depression south of the dump represents the top of a shaft excavated between the powerhouse water diversion tunnel and the ground surface, as shown on blueprints of the location found in SCL records. One STP was excavated near the dump to examine the possibility that artifacts were located below the surface. The sediments present in this probe are highly disturbed, likely the result of grading of the site. The feature appears to have been the target of vandals. The potential foundation is represented by a depression. Nearby, scattered piles of concrete show different aggregate types. Some of the broken concrete appears to have once been part of stairs. Disturbance to the vegetation and surrounding soils indicates the effects of heavy machinery on this feature and the surrounding site area.

### **5.1.3. NELDP-0012**

The Flume Creek Aqueduct (site #NELDP-0012) was originally used to provide water that turned a Pelton water wheel which in turn provided power for a Westinghouse turbine generator at the Josephine Mine. The portion of the aqueduct within the Project APE represents disassembled 30-foot sections of the pipe and the aqueduct bridge across the river.

### **5.1.4. Site NELDP-0018**

NELDP-0018 (Chickahominy Prospects) consists of “at least three (and possibly four) mine prospects” (Ferguson and Root 2002a). The four prospects appear as a pit (Feature 1) and three short trenches (Features 2-4). In 2007, the condition of this site was completely unchanged from its previous recordation

The pit (Feature 1) measures 14 feet long (east-west) by 13 feet wide and was originally 9 to 10 feet deep at the rear of the cut, tapering to the surface at the front. A leveled dump covered with moss and duff extends 11 feet west from the front of the cut. Feature 2 is a short trench, open at one end, measuring 9 feet long by 4 feet wide, that is mostly filled with slump covered with a thick growth of moss and other vegetation. A small, leveled dump of overburden extends 8 feet in front of the open end. Feature 3 is a trench situated on the east side of a small bedrock knob. The trench is 15 feet long (northwest-southeast), 7 feet wide, and 9 feet deep at the rear. The trench is open at its east end and is filled with slump and small trees. Feature 4 is a shallow rectangular pit measuring 11.5 feet long (northwest-southeast) by 7 feet wide.

### 5.1.5. 45PO520

Site 45PO520 (Josephine Mine) was originally recorded by Ferguson and Root (2002b) for BLM, although some of the site falls within the SCL Project APE. HRA inventoried those portions of the site that were within the Project APE and found their condition to be unchanged since the previous recordation.

HRA found previously recorded Features 1, 26, 28, 29, and 31 (Ferguson and Root 2002b) to be present within the Project APE. Feature 1 is the electric powerhouse foundation made of concrete and cinder blocks. The Flume Creek Aqueduct delivered water to this building to turn a Pelton water wheel. Feature 26 is a mine prospect, open at the downslope end. The trench is mostly filled with slump and is currently about 5 feet deep. Feature 28 is a large ditch that runs north-south across a flat bench at the eastern edge of the site. Feature 29 is a 3-foot-high pile of telephone poles and miscellaneous pieces of lumber. Feature 31 is a “mine shaft near the Pend Oreille River...The wooden cover over the opening has partially collapsed. Two seven-inch-diameter timbers from a headframe remain erect near the shaft. The remainder of the headframe has collapsed” (Ferguson and Root 2002b).

Additionally, HRA identified one new feature, inventoried as Feature 29a. This feature is a mine shaft (Figure 5.1-1) consisting of a square wood platform and support structure, constructed of 3-by-12-inch and 2-by-12-inch planks and 4-inch-diameter posts, which has partially collapsed into the circular hard rock shaft.



**Figure 5.1-1.** Newly recorded Feature 29a at Site 45PO520.

### 5.1.6. Site BH-6

Site BH-6 (Raise 3) represents a historic-era mining site with a partially collapsed shaft (Feature 1) and two standing buildings (Building 1, Building 2). Also present on site are the remnants of two roads and a small pile of deteriorated milled lumber.

Feature 1 is a partially collapsed mine shaft. The shaft collar (approximately 10 feet in diameter) and the shaft itself is at least 30 feet deep, with its true depth obscured by water. To the north of the shaft opening, several shoring logs can be seen. Also present is one piece of 1-inch cart rail that is currently falling into the shaft. Building 1 is a single-room building with exterior walls made of milled 1-by-6-inch shiplap boards and 1-by-2-inch milled slats. Lateral double-pane windows are present on the east and west elevations, and the south elevation has two sets of windows: one lateral double-pane right-to-left sliding window, and one four-light window with individual panes. The east elevation has a doorway that measures 3 by 6 feet. The roof and flooring are both present but are in highly eroded states.

Building 2 is a small utility building measuring 3 by 3.6 by 6 feet, with a 0.5-inch thick plywood door. The roof is made of thin gauge corrugated tin layered over 5/8-inch plywood. No floor or windows were found in this building.

### 5.1.7. Site EC-2

Site EC-2 represents a mining- or logging-related landing site and consists of four features. Feature 1 is a large arranged pile of cobbles 18 feet in diameter; all of the cobbles are generally the same size (0.6 to 1.0 foot) and are in a pile approximately 2 feet in height. Several tree stumps are present in the pile indicating that the feature was created before reservoir clearing operations that date to the age of the trees that were removed. Feature 2 comprises two linear mounds of cobbles and boulders that are situated roughly perpendicular to the shoreline. The west end of the mounds, closest to the water, is closer together than the eastern portion forming a wedge-like formation. Earthen berms, containing few to no cobbles, continue past the cobble berms upslope into the woods. A 6.5 feet wide trench was observed between the berms, and this could indicate that these cobbles are waste rock from a placer mining effort. Feature 3 is a 131-by-52-foot landing with log piles and areas that have been cleared of large boulders and cobbles. Feature 4 consists of an 8-foot-wide road that rises to the northeast on an approximate 45 degree bearing. The landing is made of shale and silt on an otherwise cobble and boulder shoreline.

### 5.1.8. Site BH-5

Site BH-5 consists of two debris piles representing the remains of two structures (Feature 1, Feature 2) from the unpatented Riverside Mine (Hart Crowser 2006). Both features are associated with additional unrecorded historic mining features located outside of the Project APE.

Feature 1 is a collapsed building (Figure 5.1-2) located on the edge of a steep cliff overlooking the Pend Oreille River. Milled lumber found on site includes 1- by 8-inch, 1- by 10-inch, and 2- by 4-inch boards. Feature 2 is a collapsed building measuring 12 by 15 feet consisting of 1- by 6-inch, 1- by 12-inch, and 1- by 7-inch shiplap boards. A partially intact portion of one wall is

leaning against a few small trees. The remnant of a 45-degree gabled roof was also identified within the debris.



**Figure 5.1-2.** Feature 1 at Site BH-5.

### **5.1.9. Site EC-3**

Site EC-3 consists of a prospect trench located on a steep slope 79 feet above the ordinary high water mark of the Pend Oreille River. The trench has been excavated into bedrock and measures 6.5 by 13 feet, and is 11.4 feet in depth. An apron of waste rock extends directly downslope. Several feet to the west of the prospect trench is a circular prospect pit that measures 3.5 feet in diameter and is approximately 2 feet deep. No additional artifacts were identified.

### **5.1.10. Site BH-1**

Site BH-1 (Robert E. Lee Lode) consists of two collapsed adits or tunnels (Feature 1, Feature 2) and a small amount of associated artifacts including milled lumber and a segment of 1-inch rail line. These features correspond with Discovery and Improvement tunnels recorded on a 1905 Mineral Survey.

Feature 1 is a collapsed adit or tunnel (Figure 5.1-3) that measures about 25 feet in length to the point where roof fall and scree have obscured the view. This feature is excavated into a 40-degree slope with exposed bedrock faces. The portal consists of a milled lumber board and batten door that has been nailed to the outer face. Two small metal hinges attach the door to log

shoring. Additionally, a small pile of cut timbers or uniformly cut logs is present just outside the door on the waste rock apron. This waste rock apron extends for 15 feet. Feature 2 also is a collapsed adit or tunnel that has been significantly overgrown by vegetation and is more deteriorated than Feature 1. Accurate measurements of the portal are difficult to attain given the deterioration; however, the cut extends approximately 25 feet into the cliff face and is approximately 12 feet wide. A small stack of cedar planking is present just outside the portal. The waste rock apron for this feature is approximately 40 feet in length and 12 feet in height.



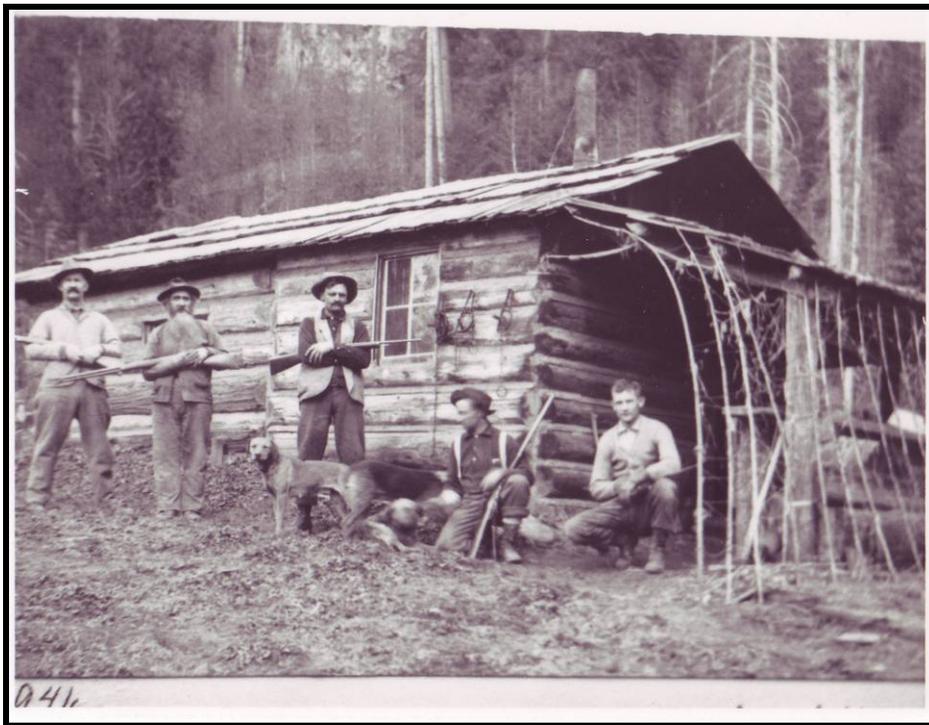
**Figure 5.1-3.** Feature 1 at Site BH-1.

#### **5.1.11. Site EC-4**

Site EC-4 is the Harvey Homestead. Civil War veteran Carl C. Harvey (Figures 5.1-6 and 5.1-7) was a well-known early prospector who came to Pend Oreille County in 1868; by 1889, Harvey had built a cabin homestead near Z Canyon and worked the gravel bars for placer gold. According to General Land Office (GLO) land entry files, Harvey made a homestead application on December 1, 1913, for lots in the vicinity of the current site. Site EC-4 was originally recorded during the 2007 spring survey as two prospect pits and two can scatters. The Harvey Homestead site includes a collapsed log cabin, the remnants of an outhouse or privy (Feature 5), two can dumps (Feature 1, Feature 2) of disparate temporal association, and two mining prospects (Feature 3, Feature 4).



**Figure 5.1-4.** Carl Harvey in front of his cabin ca. 1900 (photograph courtesy of Janis Haglund).



**Figure 5.1-5.** Carl Harvey (second from left) at his cabin with hunters (photo courtesy of John Ogmundson).

Features 1 and 2 are discrete can scatters, containing mostly food cans. Feature 1 is a small scatter of historic debris dating to the 1900–1960s era that includes 80 or more cans, 2 bottle fragments, a shovel blade, an alarm clock casing, woodstove parts, and a boot heel. The cans are

primarily food cans with solder dot and seal-hole in top cans. The woodstove parts are likely part of the woodstove remnant visible within the collapsed cabin. Feature 2 is another trash dump of primarily cans and a few bottle fragments. Can types found in this feature show that Feature 2 appears to be older than that of Feature 1. The cans found are hole in cap (machine soldered rings on cap) and date the feature to approximately between 1880 and 1920. Features 3 and 4 are prospect trenches dug horizontally into an east-facing bedrock promontory. Feature 3 is now collapsed and rubble-filled. Both Features 3 and 4 appear to be targeting limestone promontories. Feature 5 is a depression, likely the privy for the Harvey Cabin.

The Harvey cabin is partially collapsed, with the north and east walls retaining the most integrity (Figure 5.1-6). The cabin was constructed of cedar logs which appear to have been cut with an axe and possibly a cross-cut saw. Both east and north elevations are chinked with wood slats, and the six visible roof purlins are made of cedar. Cedar shake shingles were used on at least the eastern half of the roof and were likely present on the entire roof.



**Figure 5.1-6.** October 2007 photograph of the north elevation showing the northeast corner in collapse. View is to the west.

The cabin door, made of milled boards with a 5-inch door hinge, has been moved and placed between the west wall and roof. Interior walls are flat and hand hewn with an axe. The cabin is divided into two separate rooms by an interior east-west wall. No cabin floor or foundation is present. According to the GLO records, Harvey's log house was approximately 12 by 20 feet with one door and two windows, and was furnished with a cooking stove, bed, bedding, dishes, cooking utensils, and other household equipment. A small shed was located on the east side and

south end of the house. Also on this land was a ground cellar, but no other buildings were found or claimed. According to the GLO commissioner reviewing Harvey's homestead claim, no one else who had been in the country more than two or three years resided within 5 miles of the land.

Seven STPs were excavated around the cabin to assess the potential for an intact subsurface component. One STP was positive with a small piece of quartzite FCR found near the surface. Three STPs excavated through the can scatters were positive for cultural materials very close to the surface. This indicates that although the scatters are largely intact, all of the contents occur on the surface.

#### **5.1.12. 45PO122**

Site 45PO122 was originally recorded in 1981 and revisited by Ferguson and Root in 2002 for BLM. The site is described as a river landing built from large sawn, unpeeled logs that are cribbed with shorter logs (Miss 1981). The logs act as a retaining wall for a leveled landing area. The shoring logs are three courses high and span approximately 90 feet. HRA revisited this site as part of the current study and found it to be as described in the 1981 site form. The age and function of the landing are unknown.

#### **5.1.13. Site BH-2**

Site BH-2 consists of a north-south trending road that runs down from an upper bench to a small, simply-constructed landing at the water's edge. The landing is made up of six shoring logs laid vertically on top of each other. The logs are held in place by local aggregate rip rap on the uphill side that pins the shore logs to two large stumps and boulders. Similar to 45PO122, the age and function of the landing are unknown. One STP was excavated in hope of finding buried artifacts that could aid in determining what the landing was used for; however, the probe was terminated at large cobbles 10 inches below surface with no finds.

#### **5.1.14. Site JL-1**

Site JL-1 consists of two collapsed cabins and two dugout structures (Features 1 to 4). Also present on site is a prospect pit (Feature 5). A low-density scatter of historic artifacts is present. SCL staff members have provided anecdotal accounts that the site may have been used by Chinese miners conducting placer mining in the intermittent stream channel that passes through the site.

Feature 1 is a collapsed log cabin, generally five logs high measuring 16 by 16 feet across and 3.5 feet high. The north, west, and south elevations remain partially standing. The east elevation is collapsed into the structure. On-site debris was limited to a few segments of 1.5 inch braided cable located at the southeast corner of the structure. Feature 2 is a collapsed log cabin in an advanced state of decay. It measures 12 feet across east to west and 11.5 feet north to south. The remaining logs appear to be saw-cut cedar. Logs at the bottom of the structure are rotted and buried with forest debris. Feature 3 is a depression, possibly a cellar feature, with an associated trash dump. Trash debris includes pieces of a rusted iron single-sized bed frame with springs, whisky bottle, brown crockery fragments, a wood stove top, a blue and white enamel ware basin, and a modern beer bottle. Nearby is Feature 5, a linear prospect pit. Feature 4 is a depression approximately 2 feet deep located against the steep slope of a knoll. The dugout was likely deeper, however, because it is covered in a thick layer of forest duff.

### 5.1.15. Site BH-3

Site BH-3 consists of a small developed spring comprised of a large corrugated culvert and associated well heads and piping. The bedrock southwest of the well head has also been modified, probably as an attempt to improve the spring. There is a low density of scattered milled lumber present and a small tin pail.

### 5.1.16. Site JL-3

Site JL-3 consists of three main structures: two likely residential buildings (Feature 1 and Feature 3) and one building possibly related to timber milling (Feature 2); an outhouse (Feature 4); and a cistern with trash debris (Feature 5). Several ponds and apple trees are present to the north of the features. Although there are two concentrations of trash debris at the site and some other manufactured objects (pipe, a burner chimney), there is a noticeable lack of an extensive can dump or other commonly encountered historic household or industrial debris (e.g., ceramics, bottle glass) found at similar kinds of sites. A long length of steel tram cable with a rock anchor at one end, a hose anchor (in the water), and the burner chimney were all found on the exposed cobble beach below the buildings and may be evidence of a dredge operation.

Feature 1 is a partially collapsed building that was likely a residence, a picnic table, and two fire rings. The main structure is a severely collapsed single-story building with a brick chimney and cellar, constructed of milled wood with log foundation supports. The roof is milled wood covered with deteriorating corrugated tin. The cellar is constructed of log supports and milled wood. It appears that the building had a front porch facing the Pend Oreille River. Closely associated with the building are a makeshift picnic table and two fire rings. Both fire pits show recent use and they (and perhaps the picnic table) may be of more recent construction than the period when the buildings were occupied.

Feature 2 is a collapsed building constructed of milled wood and logs. The internal structure of the building indicates that the building may have housed a sawmill; however, there are no remnants of equipment to provide further indications. There is a pile of approximately 20 deteriorating sawed logs southwest of the main building of Feature 2. Feature 3 is a severely collapsed building constructed mainly of logs with milled wood elements. The building, overgrown with vegetation, is front gabled and facing north with at least three windows on the west or river-facing side. Feature 4 is a two-seat outhouse facing east and located approximately 50 feet northwest of Feature 1. It is constructed of milled wood and has two doorways, with only one remaining door with metal hinges and a canvas door handle. The remaining door is sprayed with blue paint that reads “Ladies and Gentlemen.” Inside, it has two holes cut into wood slats, separated by a wood partition.

Feature 5 is a covered stone cistern and trash dump. The cistern is located at the base of a side hill and is extremely difficult to discern amongst the overgrown vegetation. This feature appears to be a partially buried cistern faced with stacked rock (6 to 8 courses visible) and covered with what appears to be a rotting log roof that has a protruding ventilation pipe. Safety concerns precluded further investigation of this feature.

**5.1.17. ISOLATES**

Three isolates (Table 5.1-1) were identified in the course of the 2007 cultural resource inventory. All isolates are mining-related in nature.

**Table 5.1-1.** Isolates identified in the Project APE.

Isolate Number	Isolate Type	Dimensions L x W x D feet
IF-E1	Prospect pit	8.5 x 10 x 6.5
IF-E2	Prospect trench	6.5 x 22.9 x 3.2
BLMiso-39	Prospect trench	9.8 x 22.9 x 9.8

**5.2. Archaeological Resources Condition**

The 2007 recordation of the newly identified archaeological resources in the Project APE provides a baseline for future assessment of their condition. These resources identified are all subject to ongoing natural erosion and weathering in place as the principal factors on their current condition. The condition of previously recorded sites within the Project APE also reflect weathering and erosion, with their assessment largely based on comparative observations from the baseline provided by their original recordation and historical documentation.

Archaeological site conditions will be more fully addressed in the final study report to discuss integrity in evaluating NRHP site eligibility potential, Project-related effects to eligible historic properties, and assessment and documentation of whether the effects are adverse.

**6 PRELIMINARY HISTORIC RESOURCES INVENTORY**

The historic resources inventory consisted of structures associated with the original POMMC Powerhouse, the Boundary Project, and the Ross Cabin. The Highway 31 Bridge over the Pend Oreille River at Metaline Falls was inventoried as part of a highway survey in 2001 and found to be not eligible and so was not re-examined for this study.

**6.1. Site JL-2, the Ross Cabin**

Site JL-2, the Ross Cabin, is located in SCL’s Forebay Recreation Area that includes a campground and boat launch. The door to the cabin is nailed closed; thus, the interior was not available for inventory. Further information is needed to address conflicting reports regarding whether or not the cabin was relocated to its present site and the degree of modification. The cabin is maintained as a tourist attraction and is in excellent condition.

The cabin (Figure 6.1-1) measures 15 feet east-west and 19.2 feet north-south. It is a single gabled building with a south-facing front. The north and south elevations are 22 logs high, while the west and east elevations are 15 logs high. The logs have a diameter of 10 to 15 inches and are chinked with mortar and lath. The logs are sawed and square notched. The roof is supported by a log structure consisting of eight purlins on either side (east and west) with a central log ridge, for a total of 17 logs. There is an additional roof support structure, perhaps more decorative than functional, on the east and west elevations under the eaves, consisting of three evenly spaced log supports placed diagonally outward from the elevation to the roof. The roof is steeply pitched with two layers of apparently hand-hewn wood shakes.



**Figure 6.1-1.** Site JL-2, the Ross Cabin, front elevation, looking northeast.

The cabin has entry doors and attic doors on both the north and south elevations. There is an additional door or covered window opening on the west side of the building. The entry doors are constructed of milled wood planks with modern manufactured door handles. The window and attic doors are constructed in a similar fashion of milled wood planks with cross supports nailed on the top and bottom and a diagonally set support nailed to the doors. No hinges are visible. There is a single six-light window with a fixed sash on the south elevation. There is a broken milled wood shutter on the west side of the window.

The cabin is surrounded by a modern unsupported zigzag pole fence placed approximately 15 feet away from the structure on all sides. The log fence consists of sections of five interlocking horizontally stacked logs (no vertical posts) set at an angle creating a zigzag effect.

## 6.2. Pend Oreille Mines and Metals Company Powerhouse

With the backing of Lewis P. Larsen, the POMMC built the first hydroelectric project on the Pend Oreille River in 1937 (Figure 6.2-1). Not only was it the first on the river, it was also one of the most unique in the nation. Gustav A. Pehrson, a Spokane architect-engineer, designed the powerhouse. Pehrson was a Swedish-born architect who is credited with the design of hundreds of buildings in Spokane and the Inland Empire of the Pacific Northwest from 1913 until his death at the age of 85 in 1968. Pehrson began his long Spokane career with the well-respected firm of Cutter & Malgren and served as the project architect for the design of the Davenport Hotel in that city. Louis M. Davenport was a famous restaurateur whose hotel, after its opening in 1914, became the social and commercial center for the city of Spokane (HistoryLink.org 2008). After a falling-out with Kirkland Cutter in 1916, Pehrson established his own firm and continued as Louis Davenport's architect for several decades. During the 1920s and 1930s, he operated a diverse architectural practice, designed numerous highly regarded commercial and residential projects (including the POMMC Powerhouse), and gained regional fame. By the early 1940s, Pehrson was among the most well-known and well-established architects practicing in the Inland Empire. Pehrson designed several buildings in Metaline Falls during his career, including the Pend Oreille Mines and Metals Building (also known as Lewis Larsen Apartments), which is listed on the National Register of Historic Places (Harvey and Krafft 2004).



**Figure 6.2-1.** POMMC Powerhouse, view from river during drawdown, September 2007.

Instead of a dam, the POMMC drilled and blasted a 12-foot by 20-foot diversion tunnel 720 feet through solid rock from the powerhouse to above Metaline Falls, with an elevation fall of 25 feet over that length. At that elevation, much of the powerhouse was submerged (see ordinary pool level mark in Figure 6.2-1), nearly disappearing during high water. As a result, the entrance also was bored through rock, from the bluff above, with a stairway that passed down from a concrete structure that formed the entry.

HRA was limited to an exterior survey and inventory of the Pend Oreille Powerhouse because the structure has been permanently enclosed and the interior was, therefore, inaccessible. The majority of the overview evaluation of this powerhouse was conducted by boat. A pre-scheduled drawdown of the river allowed greater visibility of the partially submerged structure for inventory purposes. The powerhouse, built in 1937, is of reinforced concrete construction. Construction plans show that the powerhouse originally had large glass-block windows at its top; whether they are extant under the steel plates that currently cover a large portion of the façade is unknown.

The roof is pyramidal in form and four tailrace gates are located on the western façade of the structure. According to archival records, the control equipment was originally located on the balcony floor, and a surge tank stabilized the starting and stopping operations. The plant was planned as a two-turbine operation, but the second generator was not installed until 1948, at which time the plant reached its full capacity between 4,000 and 5,000 kilovolts (with a greater efficiency during low water than high water). A concrete building inscribed with “PO. M. & M. Co Power Plant 1937” is located on the bluff above the powerhouse. Construction blueprints show this structure to be the entrance portal to the powerhouse, with a set of stairs descending 60 feet to the powerhouse below (Miscellaneous Blueprints, in SCL archives).

Topographical maps from the early 1950s on which the site plan is imposed show the presence of a transformer facility (which appears to be an unenclosed switchyard) and two operators’ houses. These buildings are no longer extant, although a scatter of debris and some foundation materials are located near the portal and may be the remains of one or more of these structures (Miscellaneous Blueprints, in SCL archives).

### **6.3. Boundary Hydroelectric Project – Dam, Powerhouse, Vista House, Mast Towers, and Maintenance Buildings**

Boundary Dam is situated in a narrow canyon of the Pend Oreille River and is constructed on interbedded limestone and dolomite of the Metaline Limestone formation. It is a variable-radius concrete arch dam with a total height of 360 feet above the lowest part of the foundation and a structural height of 340 feet. It is a relatively thin structure and varies in thickness from 8 feet at the crest to 32 feet at the base. The dam has a crest length of 508 feet and a total length, including the spillways, of 740 feet. The dam impounds the Pend Oreille River to a normal high-water level at elevation 1,994 feet NAVD 88 (1,990 feet NGVD 29), as measured in the forebay (SCL 2006). It is located 1 mile south of the Canadian border and 14 miles west of the Idaho state line.

Beginning in 1963, builders excavated one-half million cubic yards of limestone to create the largest underground powerhouse in the United States (Figure 6.3-1). Studies before construction showed that the underground location was more cost effective and more efficient for the power plant. An additional million cubic yards of rock was excavated to create the forebay from which the Pend Oreille River water enters intake tunnels and penstocks (Sugiyama 1980).

The underground machine hall is 76 feet wide, 172 feet high, and 477 feet long. It houses four 208,000-horsepower (hp) and two 268,000-hp Francis Turbines, with four 165 megawatt (MW) and two 205 MW generators, for a total plant capability of approximately 1,070 MW.

Seven low-level sluices through the dam under a head of 190 feet provide 252,000 cubic feet per second (cfs) of the total 360,000 cfs discharge capacity of the dam at reservoir elevation 1,994 feet NAVD 88 (1,990 feet NGVD 29). The sluices are steel-plate lined, including the entrance transitions that incorporate a surface against which the maintenance bulkhead seals. Electric seal heaters are located on the downstream fixed seal surfaces against which the operating gates seat. Seals are hydraulically inflated using anti-freeze fluid supplied from an elevated tank and deflated by bleeding the fluid and pumping it back to storage. The sluice gates are fixed-wheel gates, 17 feet wide by 21 feet high, operated by cable hoists located on a hoist deck along the downstream face of the dam at elevation 1,864 feet NAVD 88 (1,860 feet NGVD 29). A sluice maintenance bulkhead, 35 feet wide by 57 feet high, can be moved into position on the upstream face of the dam over a sluice entrance and utilized for dewatering the sluices for maintenance purposes. In addition, there is one bascule-type (hinged-leaf) skimmer gate, 26 feet wide by 9 feet high, adjacent to the left spillway to permit passage of debris from the reservoir. The seven sluice gates represent a distinctive feature of the structure. The seven gates increase the Project's ability to release water, thus allowing for rapid reservoir drawdown.



**Figure 6.3-1.** Photograph of machine hall within the bedrock at Boundary Powerhouse.

The Vista House (Figures 6.3-2 and 6.3-3) on the northeast bluff overlooking the dam was constructed to provide a perspective point from which visitors could view the dam. Later, the incorporation of interpretive displays and interactive exhibits within the building enhanced the visitor experience. The educational installations allowed the visiting public to learn how the Project works as well as the benefits of hydroelectricity.



**Figure 6.3-2.** Overview of the Boundary Hydroelectric Project; Vista House at left, Dam at center, and powerhouse is in the bedrock at right.



**Figure 6.3-3.** Vista House, Boundary Hydroelectric Project.

The Vista House, guyed aluminum mast transmission towers or “pickle forks,” a commonly used label that derives from the utensil they resemble (Figure 6.3-4), and four ancillary buildings are directly associated in function and location with the Boundary dam and powerhouse. The pickle forks are located on the bluff to the northwest of the dam face. The four ancillary buildings are located north of the dam and powerhouse on the west side of the river and include the oil house, a garage, a steel building that houses shipping and receiving and office space for the Project, and the paint shop. None of these four buildings is of significant architectural design and each is either too recent or has been substantially altered since their original construction, compromising its historical integrity.

Power is transmitted up the vertical face of the left abutment of the dam by six individual three-phase, 230-kilovolt (kV) lines to six pairs of transmission towers, which include the pickle forks on top of the abutment. From there, transmission lines run approximately 3,000 feet to the BPA switching station.



**Figure 6.3-4.** Guyed aluminum mast towers (pickle forks), Boundary Dam Hydroelectric Project.

#### **6.4. Historic Resources Condition**

The structural components that compromise the Boundary Project are fulfilling the purposes for which they were built and are maintained as such. Modifications for these facilities (for example, the addition of interpretive panels in Vista House, alterations to the maintenance buildings, alterations of the facility grounds to assist additional security measures), may or may not have affected their potential historical integrity. The 2008 study effort will also include assessment of NRHP eligibility.

## 7 SUMMARY

The 2007 phase of the cultural resources inventory is complete. The fall archaeological survey accessed several higher elevation areas from nearby roads for the purpose of inventorying mine features that were revealed in documentation from the Washington State Department of Ecology. Finding such features in this manner indicates that additional survey of the upper limits of the 200-foot Project APE boundary and SCL-owned land in the Lower Reservoir Reach that may be accessible from roads is warranted. In addition, a pedestrian survey will be conducted in spring 2008 to complete the comprehensive inventory of the Project APE above Metaline Falls.

Potential NRHP eligibility of all resources documented within the Project APE will be analyzed in 2008. Additional research on all resources will be necessary to clarify potential NRHP eligibility. Assessment of potential Project effects will be determined for eligible resources. Consultation will continue with tribal representatives to document any TCPs or other culturally significant locations within the Project APE.

## 8 VARIANCES FROM FERC-APPROVED STUDY PLAN AND PROPOSED MODIFICATIONS

The cultural resources inventory followed the RSP (SCL 2007) with few exceptions. Testing required preparation of a site-specific testing plan and its review by the CRWG prior to finalization and implementation during the fall fieldwork. Also, inventory work at the Harvey Homestead and surrounding area was extended beyond the Project APE boundary on USFS land. As noted in Section 5, SCL discussed the issue with the USFS representative to the CRWG and made an exception that allowed inventory beyond the Project APE at this location.

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