SITE C | CLEAN ENERGY PROJECT

RESPONSE TO WORKING GROUP AND PUBLIC COMMENTS ON THE SITE C CLEAN ENERGY PROJECT ENVIRONMENTAL IMPACT STATEMENT

Technical Memo

ARCHAEOLOGY

MAY 8, 2013

REVISION 1 – JULY 19, 2013

Subject: Archaeology

Purpose

This technical memo has the following purposes:

1. To provide a chronology of the development and implementation of the archaeological component of the heritage resources assessment.

2. To address questions raised during the comment period on the EIS about the archaeological component of the heritage resources assessment, and to clarify the requirements for an effects assessment and the separate requirements for an Archaeological Impact Assessment prior to construction activities and receipt of heritage permits for the construction phase under the *Heritage Conservation Act* (HCA).

3. To provide supplemental information in response to questions from the BC Archaeology Branch.

4. To provide supplementation information in response to comments from the Treaty 8 Tribal Associations.

Chronology of Archaeological Component of the Heritage Resources Assessment

1974 – 1981	• Archaeological surveys are completed to support hydroelectric assessment studies in the Peace River valley.
2008 – 2009	• A literature review and gap analysis, and a review of existing archaeological site GIS and location data. • Heritage Technical Advisory Committee (TAC), key government agencies and Aboriginal groups participate. Workshop is held with regional archaeologists. • Archaeology Branch recommends BC Hydro commission a GIS-based archaeological potential model to guide field work for a future Archaeological Impact Assessment.
2010	• LiDAR-based archaeological potential model developed (spring). • Application for HCA Inspection Permit submitted to Archaeology Branch in July 2010, Archaeology Branch consults with affected First Nations. • HCA Inspection Permit issued (HCA 2010-0378) restricted to field testing to support evaluation of the potential model (fall). Field work completed (fall).
2011	• Report on model testing, including description of model revisions, provided to Archaeology Branch and First Nations for review and comment (January). • Application to amend HCA 2010-0378 submitted to Archaeology Branch, Archaeology Branch consults with affected First Nations; BC Hydro, heritage consultant and Archaeology Branch meet and exchange correspondence with T8TA to address concerns; T8TA submits written comments to Archaeology Branch (spring). • BC Hydro submits Draft EIS Guidelines, followed by public and agency working group comment periods. BC Hydro responds to public comments (spring). • HCA 2010-0378 issued for full program by the Archaeology Branch with conditions to address T8TA's concerns (May). • Field work completed in accordance with methodology described in HCA 2010-0378 (summer / fall). • EIS Guidelines issued. Heritage consultant prepares EIS materials in accordance with EIS Guidelines (September).

2012	• Report on 2011 field work submitted to Archaeology Branch and First Nations for review (January). • Application to expand the study area for HCA 2010-0378 submitted to Archaeology Branch, Archaeology Branch refers application to First Nations. • Archaeology Branch issues amended HCA 2010-0378 (April). • Field work completed in accordance with methodology described in HCA 2010-0378 (summer / fall).
2013	• Heritage Resources effects assessment completed and submitted in EIS, section 32 and Volume 4 Appendix C.

Requirements for Archaeology for the Environmental Impact Statement

Background

An extensive research program has been completed for the heritage resources effects assessment for the EIS. The archaeological component of the program was comprised of data compilation, background research, development and testing of an archaeological potential model and an intensive field program. Furthermore, as described in Volume 4, Appendix C, the results of this program have been shared with Blueberry River First Nations, Doig River First Nation, Fort Nelson First Nelson, Halfway River First Nation, Kelly Lake Cree Nation, McLeod Lake Indian Band, Prophet River First Nation, Saulteau First Nations, Treaty 8 Tribal Association, West Moberly First Nations and Dene Tha.

Requirements for the Environmental Impact Statement

EIS Guidelines, s. 18 Heritage Resources Effects Assessment, states that the “EIS will summarize the potential adverse effects of the Project on heritage resources, including physical and cultural heritage resources, and any structure, site or thing that is of historical, archaeological, palaeontological or architectural significance” (p. 98) and the “EIS will describe [the] location and nature of known heritage resources that could be impacted by the project.” (EIS Guidelines, s. 18.2.3 Heritage Resources Baseline).

The heritage field program describes the location and characterizes the nature of heritage resources within the LAA , allowing the potential Project effects on those resources to be assessed. Building upon existing baseline information, including extensive field studies undertaken by archaeologists from Simon Fraser University between 1974 and 1987, a heritage resources field inventory was undertaken during 2010, 2011 and 2012. The additional heritage baseline included inventories of palaeontological and historical sites, which had not been specifically assessed in previous work, as well as a substantial archaeological inventory, recognizing that undetected heritage resources may be also encountered during the life of the Project. Such resources, if found, would be managed in a manner consistent with applicable legislation and policies.

As described in Section 32.2.2 of the EIS, additional inventory and assessment will be completed in the areas described in that section as detailed design proceeds.. Reports on future heritage assessment work would be submitted to relevant Provincial agencies and Aboriginal groups in accordance with legislative and permit requirements.

The archaeological component of the program, which entailed digging approximately 60,000 subsurface tests and is likely the largest such investigation undertaken in British Columbia, is complete for the purposes of the environmental assessment. The information presented in Section 32 and Volume 4 Appendix C of the EIS meets the requirements of Section 18 in the EIS Guidelines for the Heritage Resources Effects Assessment.

Regulatory Framework for Archaeology in British Columbia

As stated in Section 32.1.1.4, Heritage Resources Effects Assessment in the EIS, archaeological sites on non-federal lands in British Columbia are administered by the B.C. Archaeology Branch ("Branch") in accordance with the *Heritage Conservation Act* ("HCA"). Authorization of impacts to archaeological resources are administered through a permit system issued under the HCA. For archaeological work that involves subsurface testing to locate or better understand archaeological resources, the Branch issues Section 14 Inspection and Section 14 Investigations permits. To authorize alteration or removal of archaeological sites, the Branch issues Section 12 Site Alteration permits. All permit applications are referred to potentially affected First Nations for comments prior to issuance.

The requirements and procedures for heritage resource studies undertaken for development projects, such as the Site C Clean Energy Project, are described in the British Columbia AIA Guidelines ("Guidelines") (BCMNRO 1998:13). The archaeological field inventory completed to date was undertaken in accordance with the Guidelines and HCA Inspection Permit 2010-0378 ("HCA 2010-0378"), which the Branch issued following consultation with First Nations (EIS section 32.2.2.). Prior to commencing construction activities in particular areas, BC Hydro will need to complete the requirements of the AIA as described in the Guidelines and in HCA 2010-0378.

Additional Field Inventory Prior to Construction

The substantial archaeological field program undertaken to date will comprise the majority of the AIA, however, as noted in EIS s. 32.2.2 the field inventory will need to be completed prior to construction, and prior to application for archaeological Site Alteration Permits under the *Heritage Conservation Act*. It is not uncommon to have AIAs completed following issuance of an Environmental Assessment Certificate and a "course of action decision" under CEAA. This has been the case with several projects in recent years, including the South Fraser Perimeter Road, Port Mann/ Highway 1 Project, the Interior-Lower Mainland Transmission Project, and the Northwest Transmission Line Project. In each case the proponent committed to completing the AIA in all potentially affected areas prior to construction in those areas. For the Project, there are three general reasons why particular areas within the Project activity zone have not yet been inventoried:

1) Areas where, for the EIS, a corridor or area was identified within the Project activity zone, but a specific footprint was not yet confirmed for defined construction activities.

For these areas information on previously known heritage sites was used for the effects assessment, as well as information from the Archaeological Overview Assessment (which identifies the high, moderate or low potential for archaeological resources using a model). These areas include:

- Construction of access roads
- Off-site and one potential on-site construction materials area
- Transmission line to Peace Canyon Dam
- Existing infrastructure that may require relocation (buried services and pipelines)

2) Areas that may contain a human burial.

Further investigative activity would proceed as appropriate, once the Project was approved to proceed, with confirmation that the location cannot be avoided by the Project.

3) Private land where owners have not granted access to BC Hydro for the purpose of undertaking archaeoligcal field work.

Field inventory in these areas would be undertaken prior to construction activites, when BC Hydro acquires access rights to these properties.

Additional field work will be completed in cultivated fields as part of the AIA. Although numerous fields have been inspected, and archaeological sites discovered, exposure was generally poor except during a short interval between tilling and seeding. In several fields, surface inspection was completed, but subsurface testing had to be deferred to post harvest due to a restricted seeding schedule. However, after crops were harvested the ground was covered with plant debris and surface exposure was limited. Field crews will return to cultivated fields that have been subject to surface inspection to complete subsurface testing. BC Hydro is also attempting to identify further opportunities to disc and plow additional fields to conduct additional surface and subsurface inspections.

Future mitigation work for archaeological sites would be completed under Investigation Permits or Site Alteration Permits, in advance of construction activities (EIS section 32.6).

Responses to Questions from the BC Natural Resources Agencies

In the following section, BC Hydro provides answers to comments and questions received from the BC Natural Resources Agencies during the EIS comment period. The BC Natural Resources Agency comments are differentiated by italics. This information is not required for the purpose of environmental assessment.

Request (gov_0010-846):

a) Please provide estimates of the areal extent of the Archaeological deposits that would be impacted by the project based on the data obtained during the archeological impact assessment fieldwork.

b) Request the proponent address the question of "How much archaeological deposit would be impacted by the Project?"

Request (gov_0010-850) *that the proponent define archaeological sites in a consistent manner, based on the observed distribution of archaeological materials, so as to facilitate estimation of the quantity of archaeological deposit that would be impacted by the Project.*

Request (gov_0010-857) *that the proponent compare different parts of the LAA (e.g., the north and south banks of the Peace River) in terms of the areal extent of identified archaeological deposits, rather than the number of identified sites. This will require that sites be consistently defined with reference to the observed distributions of archaeological materials. Comparison in terms of the numbers of reported sites is less meaningful, due to the considerable variability in the size and density of reported sites.*

Response (gov_0010-846, 850, 857)

Table 1 shows the total area (hectares of land) for all known archaeological site deposits contained within the LAA. There are 88.73 hectares of known archaeological site deposits in the LAA. It does not include: portions of sites located outside the LAA; previously recorded sites that were not examined by the Golder team due to access restrictions at the time of the study; and sites in Project components that have not yet been assessed by the field program.

In comment gov_0010-850, the phrase “define archaeological sites in a consistent manner” is interpreted to refer to methods used to establish the boundaries of archaeological sites, but note that the comment could also refer to size based on artifact counts (Volume 4 Appendix C, section 5.2.5.5), artifact density or classes of archaeological sites (Volume 4, section 32.2.2.2). The methods for defining site boundaries have been consistently applied throughout the study and are described in Volume 4, Appendix C,section 5.1.5.14.

Table 1 Areal Extent of Known Site Deposits (in Hectares) within the LAA

	Valley		Plateau		Total	
	Hectares	**Percentage**	**Hectares**	**Percentage**	**Hectares**	**Percentage**
North Bank	72.91	90.80%	2.65	31.39%	**75.56**	**85.16%**
South Bank	7.39	9.20%	5.78	68.61%	**13.17**	**14.84%**
Total	**80.30**	**100**	**8.43**	**100**	**88.73**	**100**

Evidence indicates comparisons based on site counts produce similar results to those based on site area. Based on site area, 85.16% of the known site deposits in the LAA are located on the north bank of the Peace River. Site counts, as reported in section 5.2.5.5, indicate 88% of the sites in the LAA are located on the north side of the river. Similarly, based on site area, 90.50% of the site deposits are located in the valley portion of the LAA, while site counts indicate that 77.93% of the sites are in the valley. The higher percentage based on site area may be due to a general tendency for valley sites to be larger (as discussed in section 5.2.5.5, Volume 4 Appendix C) than Plateau sites.

Request (gov_0010-848) *that the proponent explain the derivation of the estimated numbers of archaeological sites in different parts of the LAA that were generated by earlier studies, and reconcile these estimates with the data obtained during the archaeological impact assessment fieldwork reported in the EIS. Analysis of the limited data presented in the EIS suggests that the earlier estimates significantly under-represent the number of archaeological sites in the LAA.*

Response (gov_0010-848)

The "earlier studies" referred to in comment gov_0010-848 are interpreted to mean Spurling's 1977-78 study (Spurling 1980a, 1980b). Similar methods were used to define site area in both the earlier study and the current study, but Spurling's study used randomly placed 1 m^2 shovel tests with a 50 m testing interval rather than the 12 m testing interval used for the systematic testing in the current sudy. If a smaller testing interval had been used in the earlier study, more sites would have been located. Most of these additional sites would have been small sites (see response gov_0010-849). The range of 360 to 1,166 sites estimated for the project area provided by the earlier study may have been greater if a smaller test interval had been used. It is not possible to directly compare the results of the two studies because the sampling strata, sampling methods, and study area are not the same. Using random sampling methods, the early study (Spurling 1980b:Table1) sampled approximately 11% of a 150 km^2 (15,000 ha) study area (approximately 16.5 km^2 or 1,650 ha) using 50 m test intervals and located 250 sites in the sample area.

In the current study, a different sampling methodology was utilized as required by the permit granted by the Archaelogy Branch. First, the entire Project area was divided into areas of high, moderate and low archaeological potential using an archaeological predictive model, as advised by the BC Archaeology Branch (see Section 5.1.2 in Volume 4 Appendix C of the EIS). As summarized in Tables 5.12 and 5.13 in Volume 4 Appendix C of the EIS, the current study then used a 12 m testing interval to systematically sample 573 ha of the Project area that was modeled as having high archaeological potential, and found a total of 185 known and previously unknown archaeological sites at least partially contained within these lands.

Request (gov_0010-849) *that the proponent clarify the statement that "based on statistical tests, few large sites (often the most significant sites) have been missed", by identifying the statistical tests employed, and quantitatively defining the terms "few" and "large."*

Response (gov_0010-849)

Using the Site ID Confidence Calculator created by the Archaeology Branch, a large site covering more than 2,500 m^2 (ca. 50 m x 50 m) with an average density of 6.7 artifacts/ test (see response to gov_0010-852) has a 0% probability that it will be missed using 12 m shovel testing interval (16 tests). The artifact density would need to be less than 1 artifact/ test, before the probability would change. More than 40 sites of this size exist in the LAA.

Request (gov_0010-852) *the proponent calculate the density of identified archaeological deposits as the number of artifacts identified in subsurface tests, divided by the total excavated area within*

the site boundary, rather than the number of identified artifacts divided by the total area within the defined site boundary.

Response (gov_0010-852)

Artifact densities were calculated for each site in the LAA by dividing the total number of artifacts found in subsurface tests at the site by the total excavated area within the site boundary. Table 2 provides the mean densities found in different parts of the LAA based on these calculations. The 186 sites used in these calculations do not include: previously recorded sites that were not examined by the heritage consultant due to access restrictions at the time of the study; sites in Project components that have not yet been assessed by the field program; and sites that could not be found again.

Using this methodology, artifact densities range from 0 (no artifacts in the heritage consultant's tests) to 158.8 artifacts/m^2. The mean is 6.7 artifacts/m^2 for the LAA, with the some of the highest densities found in the archaeology site complexes (described in Section 5.2.5.5) that have a mean of 11.7 artifacts/m^2.

Table 2 Mean Artifact Density based on Area of All Subsurface Tests at a Site

Location	Mean Artifact Density Artifacts/m²
North Side	7.4
South Side	4.6
Valley	7.3
Plateau	4.5
LAA	6.7

Request (gov_0010-853) *that the proponent individually report the areas subjected to surface inspection in: 1) fallow fields; 2) cultivated fields; and 3) vegetated lands "when proceeding to and from targeted testing locations."*

Request (gov_0010-854) *that the proponent address the reported failure to employ "Prescribed tillage with a plough, cultivator, or harrow to increase visibility in previously cultivated fields." Request that BC Hydro provide for completion of this prescribed program.*

Request (gov_0010-855) *that the proponent estimate the extent of archaeological deposits on lands modeled as having low or moderate archaeological potential, with reference to the data recorded during systematic survey of cultivated and fallow fields.*

Response (gov_0010-853, 854, 855)

Table 3 shows the area of cultivated fields examined by the surface inspections during the study. Exposure was generally poor on cultivated fields, except during a short interval at locations where the Golder team was allowed to inspect a field between tilling and seeding. Most fields were either

overgrown pasture, in crop that could not be disturbed, or covered by post-harvest debris. The few tilled fields that were subject to surface inspection could not be collected or tested before the fields were seeded, after which, access was denied. Harrowing and plowing was started soon after the snow had gone, providing few opportunities to survey the fields prior to seeding. After the crops were harvested, the ground was covered with plant debris from the harvest, again preventing good surface exposure.

The best method for locating sites where the site densities and artifact frequencies are low (as is typical of the low and moderate potential lands) is through use of systematic surface inspections where the soil has been exposed by cultivation. Discovery rates are low when shovel testing is used to locate sites with such artifact distributions, whereas cultivation exposes large areas where even low density sites can be identified.

Systematic surface inspection of tilled fields, followed by surface collection and testing of any archaeological sites would provide data that willconfirm the distribution of cultural material in the large areas of low and moderate potential not subject to intensive testing program used in high potential areas.

Given the knowledge that could be gained from inspections of freshly tilled fields and the challenges experienced in implementing this component of the archaeological resources field program, the current plan is to have cultivated fields disced and plowed solely for the purpose of archaeological surface inspections. Data obtained through such inspections will contribute to the final AIA.

Table 3 Number of Hectares Examined Through Surface Inspection of Cultivated Fields

Potential	Area (m²)	Area (ha)	Area (%)
High	679360.3	67.9	12.7%
Low	3873483.4	387.3	72.3%
Moderate	801760.3	80.2	15.0%
Total	5354604.0	535.5	

Responses to Questions from Treaty 8 Tribal Association

In the following section, BC Hydro provides information related to comments and questions received from the Treaty 8 Tribal Association (T8TA) during the EIS comment period about the heritage program methodology with respect to the archaeological program undertaken in accordance with an Inspection Permit issued under the *Heritage Conservation Act*.

Background on Permits for the Archaeology Field Inventory Program

The heritage resources effects assessment presented in s. 32 of the EIS meets the requirements set out in s. 18 of the EIS Guidelines.The archaeological field inventory, presented in s. 32 and Volume 4 Appendix C of the EIS, was completed in accordance with B.C.'s Archaeological Impact Assessment (AIA) Guidelines and *Heritage Conservation Act* Inspection Permit 2010-0378 (HCA 2010-0378), which the Branch issued following consultation with First Nations.

In spring 2010, BC Hydro hired archaeological consultants (the heritage consultant) to undertake the heritage resource effects assessment for the Project, including developing and implementing the methods and related field program for the archaeological impact assessment (AIA) component. The AIA provided information necessary for the assessment of Project effects on heritage resources.

The methodology for the AIA is described in detail in HCA 2010-0378, which was issued by the BC Archaeology Branch following consultation with affected First Nations on the permit applicationin fall 2010 and spring 2011. The Archaeology Branch also approved an amendment to the study area for HCA 2010-0378 following consultation with affected First Nations in spring 2012. During the permit application process the Archaeology Branch referred the application to First Nations for their review. First Nations provided comments in writing and during in-person meetings that included the Archaeology Branch, BC Hydro and the heritage consultant. BC Hydro offered funding to First Nations on two occasions to support them in their review of the initial permit application and the amendment: in June 2010 for the initial permit application and in January 2011 for the application to amend HCA 2010-0378. T8TA accepted the offered funds.

During the review of the application to amend HCA 2010-0378, both BC Hydro and the Archaeology Branch responded to comments and concerns raised by T8TA with respect to the proposed methods, including the use of the predictive model, consideration of traditional information in the predictive model, field sampling in areas of archaeological potential. On May 24, 2011, the Branch issued HCA 2010-0378 including the methodology for the program, which had been revised during the application process, with addition of several conditions to address T8TA's outstanding concerns.

Annual reports on work completed in 2010 and 2011 have been provided to First Nations and the Branch in accordance with HCA 2010-0378, and the heritage resources effects assessment presented in s. 32 and Volume 4 Appendix C of the EIS meets the requirements for an annual report for work completed in 2012. The appendix report was also filed with the Archaeology Branch directly, and included sensitive heritage information redacted from the EIS appendix, and these are available to First Nations consulted on HCA 2010-0378 upon request. Presentations on all three years of field work have also been provided to First Nations, including T8TA.

Comments on Methodology

The archaeological program methodology is set out in detail in HCA 2010-0378. The following discussion provides a summary of those methods as they relate to questions and comments submitted by T8TA during the EIS review period.

During Site C Heritage TAC meetings held in fall 2008 and spring 2009, the Branch recommended that BC Hydro commission an archaeological predictive model (model) using GIS to guide field work for an AIA that would be required before the Project could be built. First Nations were invited to participate in the TAC process, and T8TA and BC Hydro held a similar, separate process. Early in 2010, BC Hydro commissioned Millennia Research Ltd. to develop a GIS predictive model (see s. 5.1.2 of Volume 4 Appendix C Heritage Resource Assessment Report of the EIS). Millennia Research had developed a similar model in the Peace region for the Ministry of Forests and Range, which continues to be referenced for use in the archaeology process guidelines issued by the Oil and Gas Commission.

In mid 2010 the heritage consultant applied for HCA 2010-0378, proposing use of the predictive model. T8TA expressed concerns about the methodology presented in the permit application for HCA 2010-0378. In particular, T8TA stated that the model was not sufficient and should include Traditional Land Use Study (TLUS) data. To address the T8TA concerns, the Archaeology Branch issued the permit in 2010 restricted to the purpose of evaluation of the model, and asked the heritage consultant to incorporate TLUS data into the model if T8TA made existing data available to the heritage consultant in time to inform the model and the field program, for example TLUS data from studies funded by the Province. BC Hydro and the heritage consultant asked for TLUS data on several more occasions and T8TA did not share these data. The heritage consultant did not receive TLUS data from T8TA until the Site C commissioned TLUS was received in March 2012.

In 2010, a field program was undertaken for the purpose of model evaluation, followed by analysis to evaluate the model. This program resulted in some revisions to the model, which were outlined in the field report for that year. The heritage consultant updated the methodology outlined in HCA 2010-0378 and applied for a permit amendment in March 2011 for the full program. In late May, the Branch issued the permit authorizing the full program with the following additional conditions to address concerns raised by T8TA:

1. Identified human remains would not be disturbed until consultation with the Branch and appropriate cultural group(s) were concluded;
2. If the Branch is not satisfied with the samples obtained using methodologies outlined in the permit application to allow reasonably precise and accurate estimates of the number of sites across all aspects of the Project area, the Branch could require that additional studies be undertaken prior to completion of the AIA;
3. The heritage consultant would allot 25 person-days to inspection of areas, within the Project area, that may be selected by T8TA.
4. T8TA would be notified of any discovery of human remains, regardless of their apparent age; and
5. When T8TA has identified specific sites as spiritually significant, or have defined the identifying characteristics of spiritually significant sites in a manner that allows them to be recognized in the field, protocols for the removal of artifacts from such sites will be determined in consultation between the Branch and T8TA.

Although requested by the heritage consultant and BC Hydro, T8TA did not select areas for field inspection and they did not provide information about specific locations considered spiritually significant. In addition, BC Hydro offered in May 2011 to fund a session with T8TA to discuss collaboration on all aspects of the heritage program, but T8TA did not take up the offer.

In early 2011 T8TA raised concerns about the quality of the field program in relation to permit requirements. In response to concerns about the quality of field work being completed by the heritage consultant, BC Hydro offered to support an independent field audit by the Branch. This audit was undertaken in July 2011and the results were provided and presented to T8TA, BC Hydro and the heritage consultant in December 2011. The Branch found no evidence of defective tests and that quality control measures were considered effective, and made no subsequent amendments to the permit methodology.

When T8TA submitted the TLUS report funded by BC Hydro in March 2012, BC Hydro and the heritage consultant reviewed the report and maps for information that could be incorporated into the field program for 2012, the assessment, or subsequent analysis. However, the information provided did not provide enough detail or spatial specificity to develop a new archaeological predictive model or to modify the existing model.

In February 2012, the heritage consultant submitted an application to the Archaeology Branch to amend the study area for HCA 2010-0378 to include additional Project components. The Archaeology Branch referred the application to affected First Nations for a 30 day review. The Archaeology Branch issued the amended HCA 2010-0378 on April 10, 2012.

Comments on Selection of Key Indicators and Key Issues for the EIS

Questions and comments from Aboriginal groups about the heritage resources VC were received and responded to by BC Hydro through the information request process for the Draft EIS Guidelines.

As set out in s. 18 of the EIS Guidelines, the heritage resources effects assessment was to consider the effects of the Project on physical and cultural heritage resources, and any structure, site or thing of historical, archaeological, palaeontological or architectural significance, with the exception of intangible heritage resources which would be considered as part of the effects assessment on the exercise of asserted or established Aboriginal rights and treaty rights (s. 20 of the EIS Guidelines). As noted in s. 18 of the EIS Guidelines, the heritage resources VC is comprised of palaeontological, archaeological, and historical sites.

As described in s. 32.1.2 and s. 32.1.3 of the EIS, starting in 2008, BC Hydro consulted with the public, key government agencies, Aboriginal groups and archaeologists to develop an archaeology program to support the environmental assessment of the Project. Starting in 2010 the heritage consultant joined consultation efforts and information was gathered from Aboriginal groups, research institutions, local citizens or associations, and government agencies to support identification of the Heritage Resources valued component and to guide the development of the scope of the heritage assessment proposed by BC Hydro in the Draft EIS Guidelines. Key issues raised included:

- the treatment of human burials,
- the excavation and housing of artifacts and palaeontological specimens,
- participation in the archaeological field program,
- the incorporation of traditional use information in the archaeological program, and
- the potential effects of the Project on heritage sites, such as Rocky Mountain Fort.

Where information was available, these key issues informed the literature research program, the field program and the effects assessment. As noted in the previous section, traditional land use information was reviewed, however information was not provided at the level of detail required to be incorporated into the heritage resources effects assessment. Other sources were used to inform ethnohistory relevant to the heritage resources assessment, as described in Volume 4, Appendix C.

Comments on Selection of Spatial Boundaries

The Local Assessment Area (LAA) and the Regional Assessment Area (RAA) were defined as the Project activity zone in the Draft EIS Guidelines and the EIS Guidelines. In response to questions and

comments received through the information request process for the Draft EIS Guidelines, BC Hydro provided the following rationale:

> "With respect to the RAA for the heritage effects assessment, as heritage sites are fixed in space, the Project will have no significant effects on heritage sites beyond the limits of the project activity zone, which includes all project components except existing infrastructure that will be used without modification. Within the LAA, effects assessments will be completed for each specific heritage site, therefore heritage sites located outside of the project activity zone are not relevant for the site-specific assessment. In addition, the province designates heritage sites using site-specific boundaries." (Comment ID # EISG_r2_ACFN-MCFNDTFN_013)

As stated in s. 32.1.6.1 of the EIS, the rationale for the spatial boundaries is consistant with the response to the above-noted response:

> "Given the site-specific and stationary nature of heritage resources, this is the maximum area where potential direct and indirect Project effects on heritage resources are reasonably expected to occur. The Regional Assessment Area (RAA) is also defined as the Project activity zone as other projects are not expected to have residual effects on heritage sites within the LAA."

No interaction of the Project with heritage resources downstream of the dam site is anticipated during construction or operations. This change would be negligible within 2 km downstream of the construction site. During diversion of the Peace River (see section 11.4.3.2.3 in the EIS), both the extreme maximum and minimum water levels as well as the rate of change of water levels would be less than under existing conditions downstream of the diversion tunnel outlets. Hydraulic changes would be negligible at Taylor and further downstream. During operations the surface water regime would have no interaction with heritage resources downstream of the Project activity zone. As stated in Section 11.4.5.2.1 of the EIS, the limited amount of active storage in the Site C reservoir would limit the degree to which the Project could change the downstream flow regime. The predicted changes in low and high water levels on the Peace River as a result of the Project [shown in the flow duration curves included in Appendix D of Volume 2 Appendix D, Part 2 Downstream Flow Modelling (1D)] would have no influence on heritage resources.

Please also see the Spatial Boundary Selection Technical Memo.

Peace River Region as a Cultural and Rural Historical Landscape

The Peace River Valley and its associated uplands, which include the rural landscape characterized by farms within the valley, will remain as a landscape feature should the Project proceed. The Project will not result in a change to the context of the cultural landscape as described in Section 32.2.2.3; therefore, it was not added as a key aspect in the heritage resources assessment.

The heritage resources assessment was completed in accordance with the factors specified in EIS Guidelines Section 18.2.4. As noted in EIS Guidelines Section 18, the interests of aboriginal groups, including intangible heritage resources were to be considered in the EIS. Intangible heritage resources, including potential changes to the cultural landscape, were considered in accordance with the EIS Guidelines Section 15 (Traditional Lands and Resource Use) and Section 20 (Asserted or Established

Aboriginal Rights and Treaty Rights, Aboriginal Interests and Information Requirements), Sections 19 and 34 in the EIS respectively. Potential effects of the Project on physical heritage sites were considered in Section 32 of the EIS.

Volume 1 Appendix H presents a summary of the issues, concerns, and interests identified by Aboriginal groups in consultation activities with BC Hydro between November 1, 2007 and November 30, 2012. Those related to changes to the cultural landscape are summarized in Table 4 below. Volume 3 Appendix F Current Use of Lands and Resources for Traditional Purposes Summary presents a summary of the current use of lands and resources for traditional purposes for the 29 Aboriginal groups identified in Volume 1 Section 9 Information Distribution and Consultation. Specific references to cultural landscapes in Volume 3 Appendix F are summarized in Table 5. Further detail on the current use of lands and resources for traditional purposes for those Aboriginal groups with which BC Hydro entered into agreement for a TLUS or other submissions related to traditional land use and where those reports have been approved to be included in the EIS, are included in Volume 5 Appendix A, Part 5.

Table 4 Summary of Specific Concerns from Aboriginal Groups Regarding Changes to Cultural Landscape (summarised from Volume 1 Section 9 Appendix H Aboriginal Information, Distribution and Consultation Supporting Documentation)

Issue, Concern or Interest	Source of Input	BCH Consideration in the EIS
Loss of visual cultural referents in the form of the visual landscape, which people use to communicate history, knowledge, and elements of culture to next generations.	Treaty 8 Tribal Association	Volume 3 Section 27 Visual Resources considered any information provided by First Nations regarding specific locations that should be assessed for visual changes.
Significant changes to the landscape are expected to have both short-term and long-term health effects, including both physical well-being and psychological and spiritual health. Saulteau members rely on the land to collect medicinal plants, and for spiritual and ceremonial purposes, and other plants for sustenance.	Saulteau First Nations	Volume 3 Section 19 Current Use of Land and Resources for Traditional Purposes Issues considered changes to landscape and the use of land for cultural purposes.
Potential impacts on cultural fragmentation, loss of cultural identity, and destruction of traditional way of life.	Blueberry River First Nations Treaty 8 Tribal Association Saulteau First Nations	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes. The assessment also considered changes in the use of and access to culturally important places and

Issue, Concern or Interest	Source of Input	BCH Consideration in the EIS
		valued landscapes are also considered in the assessment.
Potential impacts on future generations and families, including: • Ability for youth to sustain themselves and practice traditional activities • Inter-generational respect and loss of time together for youth and elders • Loss of educational areas for transfer of knowledge to the young • Loss of land used for cultural camps to maintain the heritage of our relationship between elders and youth • Impacts to opportunities for the transmission of Aboriginal languages • Loss of opportunity for inter-band and family socialization and cultural exchange • Loss of capacity to pass on and receive traditional knowledge • Lack of control or voice in future land use	Athabasca Chipewyan First Nation Blueberry River First Nations Dene Tha' First Nation Fort Chipewyan Métis Association Métis Nation British Columbia Mikisew Cree First Nation Saulteau First Nations Treaty 8 Tribal Association	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes. The assessment also considered changes in the use of and access to culturally important places and valued landscapes are also considered in the assessment, including teaching sites.
Reduced time on the land and sense of connectedness with the natural landscape. Reduced ability to travel on the land freely and in quiet enjoyment. Psycho-social dysfunction associated with loss of understanding of and connection to the land base, loss of faith in the health of traditional resources, and loss of control over changes occurring on the land. Increased land alienation may lead to sedentary trend; lack of ability/desire to go out on land.	Treaty 8 Tribal Association Saulteau First Nations	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes. The assessment also considered changes in the use of and access to culturally important places and valued landscapes are also considered in the assessment, including teaching sites.

Issue, Concern or Interest	Source of Input	BCH Consideration in the EIS
Maintenance of, or impacts to, opportunities for the transmission of customary law. Loss of the Peace River islands, which have specific histories, some associated with particular dreamers and spiritual power.	Athabasca Chipewyan First Nation Dene Tha' First Nation Mikisew Cree First Nation Treaty 8 Tribal Association	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes. The assessment also considered changes in the use of and access to culturally important places and valued landscapes are also considered in the assessment, including teaching sites.
Flooding would create a loss of identity, values, cultural connectedness (individually and collectively)	Expressed by participants attending BC Hydro-led First Nations Integrated Resource Plan Workshops held in Prince George or Fort St. John in 2011 and 2012. Comments were not attributed unless requested by the participant.	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes. The assessment also considered changes in the use of and access to culturally important places and valued landscapes are also considered in the assessment, including teaching sites.

Table 5 Summary of Specific Concerns from Aboriginal Groups Regarding Changes to Cultural Landscape (summarized from Volume 3 Appendix F Current Use of Lands and Resources for Traditional Purposes Summary)

Issue, Concern or Interest	Source of Input	BCH Consideration in the EIS
Most families still practice traditional lifestyles – hunting, trapping, harvesting, and fishing – making at least some part of our living off the land and harvesting in all seasons and across a wide cultural landscape.	Fort Nelson First Nation	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes. The assessment also considered changes in the use of and access to culturally important places and valued landscapes are also

Issue, Concern or Interest	Source of Input	BCH Consideration in the EIS
		considered in the assessment, including teaching sites.
SFN trapper #5 … noted that thousands of ceremonial flags have been placed in the traditional territory, and these are culturally important and used for traditional practices.	Saulteau First Nations	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes, including changes in the use of and access to culturally important places and valued landscapes.
Peace River valley's importance for: • Gathering places • Cultural/spirituality • Heritage/burial sites • Memories/stories/histories	Treaty 8 Tribal Association	Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes provides an assessment of the potential effects of the Project on the current and reasonably anticipated future use of lands and resources for traditional purposes, including changes in the use of and access to culturally important places and valued landscapes.

The historical resources program described in Section 6 of Volume 4 Appendix C of the EIS included documentary research, a historical resources overview assessment, stakeholder interviews, and field investigations. Interviews with stakeholders were conducted to provide an understanding of what historical resources are valued within the LAA, the rural historical landscape, and why they are important. As well, participants were asked to identify sites, places, buildings, or other resources of historical or heritage importance in the LAA that reflect their values and ideas of heritage. Stakeholders comprised: (1) groups and organizations that have a potential interest in the historical sites and heritage values of the LAA such as local and regional historical societies, museums, an archives committee, and a committee dedicated to documenting locations of local cemeteries, and (2) property owners or lessees in the LAA, as well as individuals whose families were former residents of the LAA. A summary of the results of the stakeholder interviews is provided in Section 6.2.3, providing documentation of stakeholder values and ideas of heritage in the LAA of Volume 4 Appendix C of the EIS, which can be considered in the planning for appropriate mitigation measures as described in Section 32.3.3 of the EIS.

With respect to the continuation of the rural landscape should the Project proceed, BC Hydro acknowledges that a number of land holdings will be impacted by the Project; however, the majority of the farms identified as being affected by the Project would have only part of their farm area affected,

and would be able to continue farm operations, as described in Sections 20.3.5.2 and 20.3.5.3 of the EIS. Further information related to landowners are addressed in the EIS in Section 9.1.2.3.3 (Consultation Activities), Section 11.3 (Land Status, Tenure, and Project Requirements), and in the Technical Memo on Private Property – Project Requirements and Tenure, including the section on Property Owner Liaison and Consultation.

References Cited

Spurling, B. 1980a. The Site C Heritage Resource Inventory and Assessment Final Report. HCA Permit 1978-014. Unpublished report on file with the B.C. Archaeology Branch, Ministry of Forests, Lands and Natural Resource Operations. Victoria, B.C.

Spurling, B. 1980b. The Site C Heritage Resource Inventory and Assessment Final Report, Substantive Results. Unpublished report on file with BC Hydro. Vancouver, B.C.

Related Comments / Information Requests:

This technical memo provides information related to the following Information Requests:

gov_0010-846	gov_0010-848	gov_0010-849	gov_0010-850	gov_0010-852
gov_0010-853	gov_0010-854	gov_0010-855	gov_0010-857	gov_0010-859
gov_0013-066	pub_0693-001	pub_0702-001	pub_0742-001	pub_0855-001
pub_0890-001	pub_0910-001	pub_0941-001	ab_0001-626	ab_0001-635
ab_0001-642	ab_0001-654	ab_0001-655	ab_0001-656	ab_0001-658
ab_0001-659	ab_0001-691	ab_0001-702	ab_0001-703	ab_0003-042
ab_0010-115				