

June 28, 2013

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Dear Mr. Murphy, Ms. Jones and Mr. Neil:

RE: Questions to assist BCEAO and CEAA in understanding responses to ‘themes’ submitted during EIS Public Review Period

In follow-up to our discussion on June 3, Ross provided me with a list of four questions to assist the BCEAO and CEA Agency in understanding responses to selected ‘themes’ of comments submitted by Aboriginal groups and government agencies during the EIS Public Review Period. BC Hydro wishes to provide the following preliminary responses to the questions, and is prepared to engage in further discussion at your request.

“1. (a) How has BCH used the information on effects, mitigation measures, accommodation and follow-up from past hydro-electric projects, as documented in the historical narrative section, in the consideration of baseline conditions and cumulative effects assessments for VCs? “

The question refers to the “historical narrative section” of the EIS. BC Hydro understands that the EAO and Agency are referring to Section 11.1 Previous Development of the EIS. In considering BC Hydro’s response, it is important to bear in mind the purpose of that Section, which is defined in section 9.1 of the EIS Guidelines. The purpose is:

“The EIS will include a narrative discussion of existing hydro-electric generation projects on the Peace River (W.A.C. Bennett Dam and the Peace Canyon Dam). The narrative

will include the description of any existing studies of changes to the environment resulting from those projects that are similar to potential changes resulting from the project, including any mitigation measures that were implemented, and any long term monitoring or follow up program that were conducted. The effectiveness of those mitigation measures and key results of monitoring or follow-up programs would be described. This narrative discussion should include historical data, where available and applicable, to assist interested parties to understand the potential effects of the Project and how they may be addressed.”

In Section 8.5.3, the EIS Guidelines also state that the discussion of “Previous Developments” might contribute to the assessment of the potential cumulative effects of the Project:

“Information contained in Section 9.1 Previous Developments may contribute to the cumulative effects assessment.”

To understand how the information provided in section 11.1 is considered in other sections of the EIS, an explanation of the relationship between technical data and valued components (VCs) is required. As described in Section 10.2 of the EIS, the method for identifying VC and is set out in section 8.3 of the EIS Guidelines. Each candidate valued component was taken through steps 1-3 to determine whether it is a VC for the purposes of the assessment of the potential effects of the Project. A number of candidate VC were not carried through the assessment as VCs, but technical data with respect to those candidate VCs were taken into account in assessing the potential effects of the Project on other valued aspects of the environment that were carried through the assessment as VCs.

A number of technical data topics are discussed in section 11.1, and are listed below. Table 1 is a simplification of the table provided in the Executive Summary of the EIS showing the relationship between technical data topics and the VCs, the effects on which were assessed taking into account those technical data topic.

Table 1. Relationship between technical data topics and VCs

Technical Data Topic	Valued Component
Surface Water Regime	Community Infrastructure and Services; Fish and Fish Habitat; Vegetation and Ecological Resources, Harvest of Fish and Wildlife Resources; Navigation; Outdoor Recreation and Tourism; Transportation; Current Use of Lands and Resources for Traditional Purposes; Wildlife Resources
Water Quality	Fish and Fish Habitat; Human Health
Methyl Mercury	Human Health; Fish and Fish Habitat; Wildlife Resources
Thermal and Ice	Fish and Fish Habitat; Navigation; Outdoor Recreation and Tourism;

Regime	Transportation; Wildlife Resources; Current Use of Lands and Resources for Traditional Purposes
Fluvial Geomorphology and Sediment Transport	Community Infrastructure and Services; Fish and Fish Habitat; Navigation; Vegetation and Ecological Communities; Wildlife Resources; Oil, Gas & Energy; Human Health (water quality)

In understanding how the information in Section 11.1 was used, it is also important to understand the differences between the W.A.C. Bennett Dam and Williston Reservoir and the Project. Differences include:

- Size of the inundation zone or surface water area - The Site C reservoir would have a surface area of approximately 9,310 hectares which is approximately 5% of the size of the Williston Reservoir.
- Water level fluctuations – The licenced range of reservoir levels in Williston reservoir is 30m, though it typically ranges annually by less than 18m. The normal operating range in Dinosaur reservoir is approximately 3m. The predicted normal operating range for Site C would be 1.8m. Further, the drawdown on the Williston Reservoir is on an annual cycle, whereas the drawdowns of the Site C Reservoir would occur on daily timeframes.

The Site C reservoir water level would be relatively stable, with limited daily storage, and would typically operate in approximate hydraulic balance with the upstream facilities over any given day. As such, the water flowing into the Site C reservoir would be approximately equal to the water released through the turbines. In general, the limited amount of active storage (storage within the normal operating range) limits the degree to which the Project could change the downstream flow regime.

As required by the EIS Guidelines, a narrative discussion of the existing hydro-electric generation projects is provided in Section 11.1 of the EIS. Additional detail regarding the changes to environmental factors as a result of the existing facilities is provided elsewhere in the EIS and is summarized in the sections below. In Section 11.1, the following subjects are discussed:

- Methylmercury
- Dust Storms
- Flow Regime
- Thermal Regime
- Fluvial Geomorphology and Sediment Transport
- Water Quality
- Dissolved Gas Concentrations
- Aquatic Resources
- Vegetation Communities

- Wildlife Resources

The section below provides a summary of section 11.1 and then describes how this information was incorporated into the analysis of potential changes in a technical topic or in the assessment of potential effects on a valued component, as a result of the Project.

Methylmercury

Section 11.1, page 11-3 describes the potential for methyl mercury increases following inundation of reservoirs associated with previous developments.

Assessment of methyl mercury concentrations in environmental receptors was first conducted in the Peace River system in 1980, following the development of existing hydroelectric facilities. Methyl mercury levels in key environmental receptors (i.e., water, sediment, invertebrates, fish) were observed to be elevated above that expected in lakes in the region; and, in some species of fish, methyl mercury levels exceeded some Health Canada guidelines for consumption. However, follow-up assessments have demonstrated that, as expected, the increase in methyl mercury levels in environmental receptors following reservoir development was not permanent. Concentrations have declined and are expected to continue to decline to levels reflective of expected pre-regulation conditions (EVS Environment Consultants 1999).

Volume 2 Appendix J Mercury Technical Reports, Part 1 Mercury Technical Synthesis Report, of the EIS, provides more detailed information on the effects of previous hydroelectric developments on methyl mercury in the Peace system. More specifically, section 4.4 Baseline Hydrology and Limnology in this appendix, describes the baseline hydrology and limnological features of the Peace River system, including Williston and Dinosaur reservoirs, as they relate to current, baseline conditions and implications for mercury methylation potential within the Site C reservoir. This section describes the hydrology, trophic status, water temperature and oxygen in Williston and Dinosaur reservoirs. Other subsections of this appendix that describe conditions in Williston and/or Dinosaur reservoir as relevant to the Project include:

- Section 4.4.2 Baseline Chemical Conditions
- Section 4.5 Sediment Chemistry
- Section 4.6 Zooplankton
- Section 4.7 Benthic Invertebrates
- Section 4.8 Fish

This baseline information was used to support predictions of mercury and methyl mercury concentrations, cycling and bioaccumulation in aquatic environmental media within the proposed Site C reservoir. Details of the modelling are described in EIS Volume 2 Appendix J, Part 3 Mercury Reservoir Modelling. A human health risk assessment for mercury in fish was also conducted based on this information and is provided in EIS Volume 2 Appendix J, Part 2 Human Health Risk Assessment of Methylmercury in Fish. The findings of the mercury baseline studies and the human health risk assessment were taken into account in the assessment of

potential effects on human health (EIS Volume 4 Section 33 Human Health) in the following sections:

- Section 33.3.5 Country Foods and Methylmercury in Fish
- Section 33.4.9 Effects Assessment – Operations – Change in Country Foods and Effect on Human Health
- Section 33.4.10 Mitigation Measures – Change in Country Food and Effects on Human Health

This section describes implementation of a monitoring program to measure mercury levels in commonly consumed fish species to identify any changes in mercury concentrations. If monitoring and risk analysis results indicate a potential health risk related to consumption of fish obtained from the LAA, information will be provided to responsible regulatory authorities for supporting fish consumption advisories. Lessons learned regarding the identification of what information is needed and how to effectively communicate with the public regarding a mercury advisory on Williston was considered.

Dust Storms

Section 11.1, pages 11-3 and 11-4 of the EIS describes the effects of dust generation as a result of drawdown on Williston, as follows:

- Drawdown on Williston leaves the littoral zone exposed for periods of several weeks to several months each year. During drawdown, wind storms can pick up fine particles of clay and silts from certain beaches in the northern end of the reservoir. This causes dust storms which can affect air quality and community health.
- The dust generation is of concern from April to June each year. Williston reservoir water levels are typically their lowest in April and the majority of the drawdown zone where dust is generated is flooded again by June.
- Dinosaur reservoir has limited drawdown and a different topography which limits dust generation and there has been no reported incidence of concerns about air quality resulting from dust generation.

Given the configuration of the proposed Site C reservoir, its steep banks, and the smaller reservoir level operating range (1.8m), dust generation is not expected to pose an air quality issue.

However, potential changes in air quality as a result of construction and operation of the Project are described in section 11.11 of the EIS. During construction, activities that would contribute to combustion and fugitive dust emissions include operating construction vehicles and equipment, clearing and burning vegetation and debris, and extracting and transporting construction materials. Potential emission sources during operation would be combustion emissions from maintenance vehicles and vessels. The changes in air quality as a result of these activities were

predicted and considered in the assessment of potential effects to Human Health, section 33 of the EIS.

Flow Regime

Section 11.1, pages 11-4 and 11-5 of the EIS describes the flow regime changes due to W.A.C. Bennett and Peace Canyon dams, as follows:

- Prior to development of the existing facilities, the seasonal flow pattern of the Peace was similar to that observed in other large northern rivers. Flows in the Peace River were dominated by snowmelt runoff and rainfall that produced high spring and summer flows; low flows were typical in late fall and winter.
- Operations of the Peace Canyon generating station are generally in balance with the upstream, G.M. Shrum generating station at the W.A.C. Bennett Dam such that the daily flow through both generating stations is approximately equal
- Williston and Peace Canyon reservoirs – Nature and extent of the changes to the surface water regime due to regulation depend on: 1) time of year, and 2) distance downstream from the point of regulation (i.e., Peace Canyon Dam).
- Long-term average flows have not been altered due to regulation, but there have been changes on an annual basis and more noticeable changes in seasonal and daily flow patterns; generally higher flow releases in winter than in spring, and higher flow releases during the day than at night.
- Changes in river flow and water levels resulting from flow regulation are most pronounced immediately downstream of Peace Canyon Dam, and attenuate with the addition of unregulated tributary inflows as distance increases downstream. Several unregulated tributaries (e.g., Halfway, Pine, Beaton, Kiskatinaw, Smoky, and Wabasca Rivers) join the Peace River downstream of the existing dams and dampen the changes resulting from flow regulation.

Section 11.4 Surface Water Regime of the EIS describes the existing surface water regime of the Peace River (baseline conditions) and potential changes during the construction and operational phases of the Project. Information on the pre-regulation (i.e., pre-W.A.C. Bennett Dam) surface water regime of the Peace River is also included to provide context for the changes that are expected with the Project. Lessons learned from changes due to the Williston and Peace Canyon facilities (for example an understanding of the changes that are of interest to fish, wildlife, and other Valued Components) were fundamental in appropriately characterising the changes in the surface water regime predicted due to the Project.

More specifically, changes to the surface water regime due to regulation are described in subsection 11.4.2.3 of the EIS. Pre-regulation flows are compared to post-regulation flows using data collected from existing Water Survey of Canada stations on the Peace River. Subsection 11.4.2.4 describes the current post-regulation flow regime of the Peace River in more detail.

Subsection 11.4.3 describes the predicted changes to upstream and downstream flows and water levels during the channelization and diversion stages of construction, using hydraulic models representing each stage of construction. Inputs to the model included a decade of historical Peace River flows. Predicted changes in surface water regime as a result of reservoir filling are described in Volume 1 Appendix B Reservoir Filling Plan.

Subsection 11.4.4 of the EIS describes the predicted surface water regime during operation of the Project (reservoir). This subsection provides an overview of the approach and methods used for the analysis of BC Hydro operations with and without the Project, the expected reservoir levels and change in operational releases, and the uncertainties related to the predictions. Optimization modelling was used to capture the operation of the entire BC Hydro energy system, including planned generating assets, transmission capabilities, loads, and market conditions. A 60-year historical inflow sequence was input to the models to capture the historical variability of flows; forecasted loads and market prices for electricity for the year 2028–2029 were also input to the model. A supplemental analysis based on historical flows was also conducted to gain perspective on the project spills that would result based on historical flows. Predicted changes in the surface water regime as a result of the Project were taken in account in the assessment of potential effects on the following valued components:

- Fish and Fish Habitat
- Current Use of Lands and Resources for Traditional Purposes
- Harvest of Fish and Wildlife Resources
- Outdoor Recreation and Tourism
- Navigation
- Community Infrastructure and Services
- Transportation

Thermal Regime

Section 11.1, pages 11-4 and 11-5 of the EIS describes the thermal regime changes due to Williston and Peace Canyon dams, as follows:

- Existing facilities have changed the temperature regime; water temperature does not change as quickly in a reservoir as it would in a river, so temperature at the outlet of the reservoir would be cooler in the spring/summer and warmer in the fall/winter, and the daily variability of water temperatures at the outlet of a reservoir would be smaller compared to that on a river reach
- Changes in the thermal regime resulting from construction of the existing facilities have affected the ice regime of the Peace River in two ways: 1) modification of the seasonal timing, duration, and location of the annual ice front progression up the river, and 2) alteration of the freeze-up and breakup conditions. Prior to hydroelectric development, ice front development progressed upstream of the location of existing hydroelectric facilities. However, after that, in all but extreme years, the ice front has not been observed in the reach of river immediately downstream of the Peace Canyon Dam.

- Due to the smaller volume and the shorter flow-through times of the Dinosaur Reservoir compared to the Williston Reservoir, it has relatively smaller influence on water temperatures
- Further downstream, near the Town of Peace River in Alberta, ice cover still develops each year; however, the timing of freeze-up and ice front progression is delayed in comparison to that occurring prior to hydroelectric development.
- Flow regulation does not appear to have affected timing or duration of the ice cover on the river downstream of the Town of Peace River; however, increased regulated river flows have altered the ice freeze-up levels both at the Town of Peace River and farther downstream to Peace Point, Alberta.

Volume 2 Section 11.7 Thermal and Ice Regime of the EIS describes the changes in temperature and ice on the Peace River as a result of Williston and Dinosaur reservoirs. More specifically, subsection 11.7.1.1 Baseline Thermal Regime describes the existing thermal regime of the Peace River, with an explanation of how the existing reservoirs influence water temperature downstream. Descriptions of the changes in thermal and ice regime as a result of the existing facilities are incorporated in the descriptions of baseline conditions in section 11.7.1 of the EIS. Subsection 11.7.1.2 Baseline Ice Regime describes ice formation processes and the observed ice conditions in the Peace River as a result of regulation, incorporating observations of the ice front in the Peace River collected annually Alberta Environment and BC Hydro since 1973. This analysis shows ice front locations with respect to the W.A.C. Bennett Dam and a concise representation of the timing of freeze-up and breakup and the duration of the ice cover each year at any location along the river (subsection 11.7.1.3).

Volume 2 Appendix G Downstream Ice Regime Technical Data Report describes, in detail, the Current Ice Regime (subsection 2.2) and provides a summary of the History of Ice Jam Flooding at the Town of Peace River (subsection 2.3), including a description of pre- and post-regulation effects on ice jams and flooding. A description of the BC/Alberta Joint Task Force and its purpose are described in subsection 2.4 of this technical data report. The Joint Task Force was formed to coordinate ice break-up observations and to make recommendations related to BC Hydro operations to reduce the ice jam flooding hazard at the Town of Peace River at break-up. Operational procedures have continuously been updated and improved as better science and more information about ice processes on the Peace River become available. Appendix A Operations during Freeze-up and Break-up in Volume 2 Appendix G includes details related to BC Hydro and Alberta operations during freeze-up and break-up of the ice cover at the Town of Peace River. Although it was not explicitly stated in the EIS, BC Hydro committed in responses to comments that operations would continue to be guided by the recommendations made by the Joint Task Force on Peace River Ice to reduce the ice jam flooding hazard at the Town of Peace River.

The thermal and ice regime in the Peace River during existing conditions (which considers the influence of the existing facilities) were simulated using models, and these results were used to predict the regime during construction and operation of the Site C dam (subsection 11.7.2 Thermal and Ice Regime during Construction, and subsection 11.7.3 Thermal and Ice Regime during Operations).

Predicted changes in the thermal and ice regime as a result of the Project were taken in account in the assessment of potential effects on the following valued components:

- Fish and Fish Habitat
- Wildlife Resources
- Current Use of Lands and Resources for Traditional Purposes
- Outdoor Recreation and Tourism
- Navigation

Fluvial Geomorphology and Sediment Transport

Section 11.1, pages 11-4 and 11-5 of the EIS describes the fluvial geomorphology and sediment transport regime changes due to Williston and Peace Canyon dams, as follows:

- Prior to hydroelectric development, fluvial geomorphology and sediment transport regime in the Peace River were naturally dynamic due to the localized nature of sediment inputs from tributaries and valley-wall landslides, and due to a seasonal range in flows.
- The influence of hydroelectric development:
 - Suspended sediment generated in the Peace River watershed upstream of the two dams is trapped in the two reservoirs; this has a reduced suspended sediment load in the river downstream of the dams
 - Moderation of flows in the Peace River downstream of the Peace Canyon Dam has resulted in reduced bed material mobility. This in turn has resulted in the accumulation of bedload from tributaries, which is expressed in the form of expanded alluvial fans at tributary confluences and increased bed elevation in the Peace River downstream from confluences.
 - Vegetation encroachment onto gravel bars and side channels along the Peace River, and an overall reduction in active channel width of the Peace River
 - These changes are most pronounced in the proximal reaches downstream of the Peace Canyon Dam, and diminish in the downstream direction due to water and sediment inflows from tributaries
 - Fluvial geomorphology and sediment transport regime in the Peace River have been, and will continue to be, in a state of adjustment to the regulated flow conditions for decades to come

Volume 2 Section 11.8 Fluvial Geomorphology and Sediment Transport Regime describes the changes in geomorphology and sediment transport on the Peace River due to flow regulation. The potential changes in fluvial geomorphology and sediment transport regimes related to the Project have been considered in light of the fact that the baseline conditions in the Peace River are both naturally variable and are undergoing a long-term response to regulation. For example,

subsection 11.8.3.6 Bed Material Mobility, page 11-128, considered the effects of regulation on bedload transport in its description of bed material mobility under current baseline conditions. Subsection 11.8.3.7 Historical Erosion and Deposition Patterns describes the characterization of cumulative erosion and deposition resulting from long periods of gradual change and/or many discrete events. More detailed information describing the historical channel erosion and deposition patterns is provided in Section 3.5 of Volume 2 Appendix I Fluvial Geomorphology and Sediment Transport of the EIS. The physical setting and regulation history of the Peace River are important factors in developing a characterization of baseline erosion and deposition patterns in the river.

The predictions of fluvial geomorphology and sediment transport during construction and operations of the Project were made with consideration for a range of Peace River flow conditions. Subsection 11.8.4 Construction states the following: “The fine sediment loads associated with each activity were estimated based on a consideration of construction material volume and grain size, and the historical range of river flows, levels, and velocities encountered in the corresponding season in which the construction activity is planned to occur.” To predict changes in fluvial geomorphology and sediment transport during operations baseline meteorology, hydrology, and suspended sediment transport data for the period 2000 to 2009 were used as inputs to the model (Subsection 11.8.5 Operation).

Predicted changes in the fluvial geomorphology and sediment transport regime as a result of the Project were taken in account in the assessment of potential effects on the following valued components:

- Fish and Fish Habitat
- Wildlife Resources
- Vegetation and Ecological Communities
- Oil, Gas & Energy
- Navigation
- Community Infrastructure and Services (water quality for water supply systems)
- Human Health (water quality)

Water Quality

Section 11.1, page 11-5 of the EIS describes the water quality changes due to the construction and operation of the W.A.C Bennett and Peace Canyon dams, as follows:

- As a result of the development of Williston and Dinosaur Reservoirs and the regulation of the flow of the Peace River, the seasonal and spatial variability of specific water quality characteristics has been dampened.
- The river now tends to have lower and more consistent concentration of dissolved components. This is believed to be caused by 1) interception of dissolved constituents

from tributaries flowing into the two reservoirs, and 2) reduced seasonal variability of river flow released from the two dams.

- Flow regulation does not appear to have affected the river's dilution capacity for the various industrial and municipal discharges currently entering the river.

Volume 2 section 11.5 Water Quality describes baseline water quality in the Peace River. Potential changes to water quality as a result of the existing facilities are reflected in the current water quality conditions in Williston and Dinosaur Reservoirs. Water released from these facilities would influence water quality downstream. Baseline conditions described in subsection 11.5.2 considered water samples collected from the forebay of Williston Reservoir, from Dinosaur Reservoir, the Peace River mainstem and tributaries to the Peace River from the Peace Canyon dam to the confluence with the Alces River.

Predicted changes in water quality as a result of the Project were taken in account in the assessment of potential effects on the following valued components:

- Fish and Fish Habitat
- Community Infrastructure and Services (water quality for water supply systems)
- Human Health (water quality)

Dissolved Gas Concentrations

Section 11.1, page 11-6 of the EIS describes the dissolved gas concentrations changes due to W.A.C. Bennett and Peace Canyon dams, as follows:

- Periodically altered dissolved gas concentrations due to existing facilities
- Elevated levels of total dissolved gases (TDG) are directly associated with 1) operations of spillways, and 2) specific non-routine low flow operations of the generation stations
- Tributary inflows below Peace Canyon Dam that flow into Peace River have been documented to reduce elevated gas concentration

Volume 2 section 11.5.2.1 Total Dissolved Gas Pressure describes the baseline levels in TDG in the Peace River. It also describes the effects the existing facilities had on TDG levels historically to understand seasonal variability as it relates to dam and generating stations operations. This historical information was considered in the effects assessment on fish and fish habitat (Volume 2 Section 12 of the EIS, see section 12.4.4.3, page 12-62, line 28 for an example)

Biological Conditions:

The construction and operation of the hydroelectric facilities have resulted in some changes to biological conditions in the Peace River relative to that which occurred prior to hydroelectric developments. Information on the current status of aquatic, vegetation, and wildlife resources is available for the geographic area affected by the existing facilities. However, there is limited

information that describes biological conditions prior to the construction of the W.A.C. Bennett dam. Therefore, it is not possible to describe species composition, distribution, and productivity in biological resources that existed in the time prior to construction of W.A.C. Bennett dam from recorded observations. This makes it impossible to measure directly any change to those factors resulting from development of the hydroelectric facilities. Furthermore, other anthropogenic changes to the Peace River system have occurred that are unrelated to hydroelectric development (e.g., forestry, agriculture, oil and gas), resulting in biological changes and further confounding any effort to quantify changes that may be attributable to the existing hydroelectric facilities. Below is a summary description of general changes to aquatic resources, vegetation communities, and wildlife resources.

Aquatic Resources:

Section 11.1, pages 11-7 and 11-8 of the EIS describes the general changes in aquatic resources both in Williston and Dinosaur Reservoirs, as well as downstream as follows:

- The impoundment of Williston and Dinosaur Reservoirs resulted in the transformation of flowing river sections of the Peace, Findlay, and Parsnip rivers into two physically separated, adjacent lake-like water bodies.
- This transformation resulted in changes to the physical nature of the habitat conditions available for aquatic resources, including:
 - Increased habitat volume
 - Reduction in diversity of types of habitat available for fish and aquatic organisms
 - Alteration of hydraulic conditions (e.g., depth and velocity) and seasonal patterns of water levels
 - Changes to thermal and ice regime
 - Changes to water quality
- Changes to these physical parameters resulting from reservoir creation resulted in changes in the composition and productivity of aquatic communities, including:
 - a shift of the trophic structure of aquatic food webs from predominantly benthic to pelagic-based food webs
 - a shift in the fish community to species that can exploit pelagic habitats for food resources and still meet life history requirements in the unaffected portion of reservoir tributaries
- The existing dams also affected the movement and survival of fish, and the dispersal of fish downstream which may have consequences for genetic diversity.
- Passage of reservoir fish through discharge structures of the dams still occurs but also causes injury or mortality to some fish and, in general, reduces the potential productivity of upstream fish populations.
- Upstream movements are currently completely blocked.
- Downstream changes due to changes to surface water flow regime and channel morphology, including:
 - Loss of side-channel habitat, due to river channel changes

- Reduced suitability of side channel habitats, due to reduced inundation frequency
- Reduced suitability of near-shore mainstem shallow water habitat, due to fluctuating water levels
- Increased risk of fish stranding and fish egg dewatering, due to increased daily and seasonal variation in flow levels
- Changes to the accessibility of tributaries, resulting from changes to tributary fan morphology and seasonal changes in river flow
- Reduced productivity of benthic communities, due to seasonal and daily flow fluctuations
- Periodic production of elevated levels of TDG effects

Physical changes resulting from the flow regulation and channel changes are most apparent immediately downstream of Peace Canyon Dam and diminish downstream, to where they are negligible at the Town of Peace River, AB. Information is available to describe the composition and relative productivity of benthic and fish communities downstream of the dams as well as certain physical changes that occurred as a result of hydroelectric development. However, there is no information about the structure and productivity of aquatic communities located in the Peace River as it existed prior to the construction of the W.A.C. Bennett Dam.

Volume 2 section 12 Fish and Fish Habitat describes baseline information and the effects assessment on fish and fish habitat. The effects assessment of fish and fish habitat includes computer modelling of water quality, water temperature and ice regime, fluvial geomorphology, sediment transport, aquatic productivity and fish population dynamics. Physical and biological information used in the effects assessment is shown in the table below. Many of these other physical and biological factors considered changes as a result of the existing facilities in their descriptions and analyses, as summarized in this document.

Environmental Factors	Volume 2, Section Number	Volume 2 Appendices
Previous Development	Section 11.1 Previous Development	
Geology, Terrain, and Soils	Section 11.2 Geology, Terrain, and Soils	Appendix B Geology, Terrain Stability, and Soil Reports
Surface Water	Section 11.4 Surface Water Regime	Appendix D Surface Water Regime Technical Memos
Water Quality	Section 11.5 Water Quality	Appendix E Water Quality Baseline Conditions in the Peace River
Thermal and Ice Regime	Section 11.7 Thermal and Ice Regime	Appendix G Downstream Ice Regime Technical Data Report Appendix H Reservoir Temperature and Ice Regime Technical Data Report
Fluvial Geomorphology and Sediment Transport	Section 11.8 Fluvial Geomorphology and Sediment Transport Regime	Appendix I Fluvial Geomorphology and Sediment Transport Technical Data Report
Methylmercury	Section 11.9 Methylmercury	Appendix J Mercury Technical Data Reports
Aquatic Productivity		Appendix P Aquatic Productivity Reports

Historical information and an understanding of changes resulting from the existing facilities were incorporated into the assessment of potential effects on fish and fish habitat as a result of the Project, as follows:

- Subsection 12.2.1 Summary of Available Studies, pages 12-7 and 12-8 of the EIS, summarizes fish studies conducted since the 1970s, which includes work conducted in Williston and Dinosaur reservoirs, the mainstem Peace River, and many tributaries in BC and Alberta.
- Volume 2 Appendix O Fish and Fish Habitat Technical Data Report synthesizes historical and more recent data to interpret fish and fish habitat baseline information to understand the ecology of the fish community potentially affected by the Project. This understanding provided the foundation of the effects assessment on fish and fish habitat. Subsection 3.0 Data Sources and Appendix A1 and A2 of V2 Appendix O summarizes the information reviewed. Section 4.0 Fish Habitat describes the current fish habitat available in the Peace River which would reflect the changes as a result of regulation on fluvial geomorphology, sediment transport, surface water regime, etc. Section 5.0 Fish Community provides detail on the fish species, ecological status, species composition, species diversity and distribution, fish assemblages and fish abundance. This section provides a comparison between historical fish species information and more recent information, indicating a shift in species composition between the late 1980s and present

(see section 5.2.1 Species Composition). It also describes a change in recruitment level from upstream Peace Canyon dam and changes in species in Williston Reservoir.

- The influence of predicted changes in surface water regime, sediment transport regime, thermal and ice regime and aquatic productivity on fish habitat is described in Volume 2 subsection 12.4.2.2 Downstream Habitat Changes of the EIS.
- Volume 2 Subsection 12.4.3.1 Changes in Fish Health and Survival Due to Sediment Inputs of the EIS, incorporated the predicted changes in sediment transport in the assessment of potential effects on fish health and survival during construction of the Project. Subsection 12.5.2.2 Operations describes BC Hydro's approach to mitigate the potential effects of TDG generation on fish health and survival during operations, which includes: 1) modifying spillway design to reduce the magnitude of TDG generated; and 2) developing an operational plan to reduce magnitude, duration, and geographic extent of TDG generation during reservoir filling. These mitigation options were proposed based on lessons learned from gaining an understanding of TDG generation at other hydroelectric facilities, including the existing upstream facilities.
- Volume 2 Appendix P Aquatic Productivity, Part 1 Baseline Aquatic Productivity report describes habitat attributes and the assemblage and production of aquatic life that supports fish in the Peace River from the forebay of Williston reservoir, Dinosaur reservoir, the proposed Site C damsite to the confluence with the Alces River. This study also incorporated earlier work conducted in Williston reservoir (see 1.0 Introduction). The existing reservoirs were included to provide insight into composition and rates of production of biota that may ultimately colonize and grow in the Site C reservoir. The status in Williston and Dinosaur Reservoirs of the following parameters is described in section 2 of that Appendix:
 - Section 2.5 Trophic State
 - Section 2.6 Algae
 - Section 2.7 Invertebrates
 - Section 2.8 Fish Food Organisms

This baseline information was used to model future conditions in the Peace River as a result of the development of the Project as described in Volume 2 Appendix P Aquatic Productivity, Part 3 Future Aquatic Conditions. A summary of the limnology in Williston and Dinosaur Reservoirs is provided in section 2.2 Williston and Dinosaur Reservoirs, which provides an understanding of changes in nutrient loadings.

- Volume 2 Appendix Q2 Attachment A Fish Passage Alternatives makes reference to the use of data from Williston Reservoir as input to a kokanee population model used to

predict population characteristics, such as abundance, size, density and entrainment mortality of Kokanee. More detailed information on the kokanee model can be found in Volume 2 Appendix Q3 Fish Management Plan, Attachment B Fish Passage Biological Modelling. This latter document describes the status of kokanee, and also Arctic grayling in Williston and Dinosaur reservoirs as reported in the literature (see section 2.6 Arctic Grayling Model, section 2.7 Kokanee Model, section 3.2 Arctic Grayling Model (results), section 3.3 Kokanee Model (results), section 4.2 Arctic Grayling (discussion) and section 4.3 Kokanee (discussion)).

Vegetation Communities

Section 11.1, pages 11-8 and 11-9 of the EIS, describes the general changes in vegetation communities in Williston and Dinosaur Reservoirs as well as downstream as follows:

- Upstream of Peace Canyon Dam:
 - Flooding in the Williston Reservoir resulted in some loss of vegetation communities occupying river floodplains, and riparian features such as wetlands. To a lesser extent, upland areas within these valleys were also flooded up to the maximum reservoir elevation.
 - Seasonal variation in storage of water and consequent variation in the reservoir surface area have created an extensive drawdown zone around the 1,770 km perimeter of Williston Reservoir. The composition and productivity of riparian communities colonizing this drawdown zone is now regulated by patterns of reservoir level variation.
 - More limited valley bottom flooding occurred during the flooding of Peace Canyon to form Dinosaur Reservoir. Topography and physiography of the canyon and the operational strategy of limited variation in surface water levels (3 m) limited the extent to which riparian vegetation communities were changed.
- Downstream of Peace Canyon Dam:
 - Seasonal changes to the surface water regime have altered the structure of riparian vegetation communities.
 - Reduced annual flood flows and increased winter flows have modified the extent and seasonal timing of floodplain inundation.
 - At upper elevations of the river floodplain, colonizing herb and shrub communities have encroached on exposed river bars due to reduced flood flows, and have progressed to early riparian forest stands. At lower floodplain elevations, successional processes have been delayed due to inundation during elevated spring and winter flows.

The Fish and Wildlife Compensation Program (FWCP) for the Peace Region delivers projects that conserve and enhance fish, wildlife and their supporting habitats affected by the creation of

the Williston and Dinosaur reservoirs. Mitigation measures outlined in Volume 2 section 13 of the EIS are consistent with mitigation measures applied to other projects and took into consideration compensation programs that have been employed with the FWCP. For example, a project at Neilson Lake showed the capability of a cooperative project between BC Hydro and Ducks Unlimited for wetland enhancement. This provided the rationale to suggest that BC Hydro would complete a survey of habitat enhancement projects in the RAA and provide financial or in-kind assistance to a managing organization (e.g., Ducks Unlimited) for wetland compensation.

Wildlife Resources

Section 11.1, page 11-9 of the EIS, describes the general changes in wildlife resources in Williston and Dinosaur Reservoirs as well as downstream as follows:

- Upstream of Peace Canyon Dam:
 - The flooding of river valleys upstream of the existing hydroelectric developments transformed the terrestrial ecosystem, which resulted in loss of river valley bottom habitats used by wildlife, and displacement of wildlife to upland habitats or to adjacent unaffected river valleys.
 - The types of changes that would have been expected due to formation of the reservoir include:
 - Loss of productive area for wildlife including semi-aquatic and riparian habitat
 - Loss of wetlands
 - Reduced functionality/productivity of remaining habitats located in drawdown zones surrounding the reservoir
 - Loss of animals unable to escape flooding
 - Fragmentation home ranges, territories, and migration corridors
- Downstream of Peace Canyon Dam:
 - Flow regulation has altered the quality and quantity of habitat conditions for wildlife resources downstream of Peace Canyon Dam
 - Primary change to wildlife habitat along the Peace River resulted from changes to the physical structure and vegetation communities inhabiting floodplain habitats
 - The quality of riparian and semiaquatic habitats has been affected by 1) modification of the composition of vegetation communities in riparian habitats, and 2) alteration of the timing, extent, and frequency of floodplain inundation.
 - Changes in the quality of riparian and semiaquatic habitats can reduce productivity of riparian or semiaquatic species groups by reduced food availability, reduced reproductive success, or reduced cover for avoiding predation, which affects local areas used for movement or migration

- Channel downsizing processes result in the modification of tributary fan areas and the abandonment of side channels and back channels, resulting in a reduction in the areal extent of river floodplain habitats
- Changes to the river ice regime may have impeded movements of ungulates and other species groups between habitats during winter.

Similar to vegetation communities, the Fish and Wildlife Compensation Program (FWCP) for the Peace Region delivers projects that conserve and enhance fish, wildlife and their supporting habitats affected by the creation of the Williston and Dinosaur reservoirs. Reports published as part of the FWCP - Peace Region were reviewed to see what mitigation (including compensation measures) could be employed. In addition, field summary reports for a number of species-specific studies associated with the Peace Fish and Wildlife Compensation Program were reviewed to see what species assemblages may persist or establish themselves around a reservoir. Reports reviewed include:

- Wetland enhancement projects
- Use of artificial nesting structures and loafing sites
- Osprey and Bald Eagle nesting surveys along the Williston Reservoir
- Amphibian reconnaissance surveys
- Fisher ecology studies
- Songbird surveys

Follow-up programs

Volume 2 Section 11.1 of the EIS describes four follow-up programs which were implemented to address effects of the construction and operation of the existing hydroelectric facilities on Peace River, and are ongoing today. The general objectives of these programs are to: 1) address ongoing environmental effects of operations of the W.A.C. Bennett and Peace Canyon facilities; and 2) address footprint effects associated with construction of the existing facilities. These include:

- Alberta-British Columbia Joint Task Force on Peace River Ice
- Peace Region Fish and Wildlife Compensation Program
- Williston Reservoir Dust Management
- Peace River Water Use Plan (WUP)

Lessons learned and experience gained through these programs have been considered, as follows:

- Fish and Fish Habitat:
 - Design and development of side channels downstream of the dam for mitigation of flow fluctuations

- Considered information on TDG monitoring programs to understand how existing fish populations are affected by TDG exposure
- Evaluation of the effects of flow fluctuation on water intake infrastructure
- Design of large river mainstream monitoring programs (ecological productivity, fish population).
- Vegetation and Ecological Communities
 - Design and development of wetland habitats
- Vegetation, Clearing and Debris Management Plan
 - Previous BC Hydro debris management programs on the Williston Reservoir are continued today through the WUP. Lessons on the importance of minimising floating debris to facilitate recreation use of the reservoir and general habitat support were taken into account in Site C planning, which include advance removal of timber and debris, deployment of booms to collect debris during construction and operations, and a commitment to ongoing debris management.
- Oil, Gas and Energy
 - WUP studies provide information relevant to consideration of potential effects of Site C construction and operations on Spectra Energy water intakes at Taylor, BC.
- Community Infrastructure and Services
 - WUP studies provide information relevant to consideration of effects on District of Taylor water supply system due to Site C operations
- Outdoor Recreation and Tourism
 - WUP studies provide a technical design basis for proposed boat launches, including docks and upland supporting infrastructure. WUP program outlined the need for a Peace River Creel Survey, which was undertaken in conjunction with a recreational use survey for the Site C assessment.
- Heritage Resources
 - WUP studies include erosion monitoring of archaeological resources. A similar program has been proposed to monitor the effects of erosion on heritage resources for the Site C reservoir during operations.

Cumulative Effects Assessment

The information provided in Volume 2 Section 11.1 of the EIS was not used in a separate analytical step in assessing the potential cumulative effects of the Project.

The potential cumulative effects of the Project were assessed using the methodology set out in Section 8.5.3 of the EIS Guidelines. That method does not call for the direct use of the information in Volume 2 Section 11.1 of the EIS. However, as described above, the information in Volume 2 Section 11.1 of the EIS was taken into account in assessing the potential residual effects of the Project. Those residual effects were, in turn, accounted for in the cumulative

effects assessment. Consequently, although the information was not used in a separate analytical step, it has been taken into account in assessing the potential cumulative effects.

“1(b) What other means (such as comparative analysis, conceptual models, trends analysis, carrying capacity analysis, use of archival remote sensing data, etc.) were used to identify specific residual effects in baseline assessments for VCs that could interact with specific residual effects in the project or future-case?”

In responding to this question, BC Hydro firstly notes the following:

- BC Hydro understands that the question is with respect to the assessment of potential effects on Fish and Fish Habitat, Wildlife Resources, and Vegetation and Ecological Communities.
- A “baseline assessment” has not been conducted. Rather, as required by the EIS Guidelines, in the EIS the baseline for each VC is “described.” See, for example, EIS Guidelines, page 55, Section 11.2.3.
- The reference to “specific residual effects in baseline assessments” may be a reference to specific effects of past projects and activities. However, there is no requirement to conduct an environmental assessment of past activities and projects: see the Cumulative Effects Assessment Topic Summary. As required by the Section 8.5.3.1 of the EIS Guidelines, the potential cumulative effects of the Project have been assessed taking into account residual effects of certain projects and activities that will be carried out in the future: see, for example, EIS Section 13.5.2.

BC Hydro did not use any of the methods listed in the parentheses in describing the baseline of any of the three VCs. While a trend analysis can be conducted, reliable data is required. Further, such an analysis would reliably demonstrate a trend over a period of time in the past. Using the results of a trend analysis to predict what may occur in the future is uncertain because it would be affected by factors beyond the changes resulting from the Project. For example, a trend going forward would likely be influenced by changes in management objectives for a particular wildlife or vegetation species, and the management objectives themselves are subject to change over time. In view of the uncertainty, trend analysis was not used in the assessment.

While trend analyses were not used in describing the baselines of the three VCs, BC Hydro did take into account information about changes that have occurred as result of the development of dams. In assessing the potential for the loss of moose habitat to alter moose populations, for example, the wildlife team considered population changes that occurred at other dams in the province and elsewhere, in addition to the existing hydro-electric facilities on the Peace River. Similar analyses were conducted in assessing potential alteration and fragmentation of habitat for terrestrial ecosystems and rare plants (Vegetation and Ecological Communities) and potential alteration and fragmentation of habitat for, and the direct mortality of individual members of, key indicator species and species groups (Wildlife Resources).

“2. Can BCH explain why no CE was found for the current uses VC, whereas a significant CE was found for the vegetation and ecological communities VC, for the wildlife resources VC (baseline case without the Project), and a CE (not significant) was found for the harvest of fish and wildlife resources VC due to cumulative displacement of hunted species from the LAA?”

BC Hydro notes, firstly, what appears to be a misconception in the question. It suggests that the assessment demonstrates a cumulative effect on the harvest of fish and wildlife VC “... due to cumulative displacement of hunted species from the LAA.” However that is not the case. The assessment concludes that there is a potential cumulative effect because areas will be occupied by projects and, consequently, the ability of hunters to gain access to those areas will be reduced. This is discussed further, below.

As described in Section 10.5 of the EIS, the methods used to assess potential cumulative effects of the Project are in accordance with Section 8.5.3 of the EIS Guidelines. Please also see the Technical Memo: Cumulative Effects Assessment provided to the BCEAO and CEA Agency on May 8, 2013.

To determine whether the residual effects of the Project would combine with residual effects of other projects to result in a cumulative effect on the Current Use of Lands and Resources for Traditional Purposes, the following steps were taken:

Step 1: Project Screening

From the list of projects reviewed in the cumulative effects assessments of EIS Sections 12, 13, and 14, projects were screened to identify those whose potential residual effects may overlap with those of the Project and combine to result in cumulative effects on fishing, hunting and trapping, and other current use of lands and resources for traditional purposes.

- For cumulative effects on fishing for traditional purposes, the list of projects considered in the assessment of the potential cumulative effects of the Project on Fish and Fish Habitat (EIS, Section 12.7) was used (Dunvegan Hydroelectric Project and the Montney Gas Play).
- For cumulative effects on hunting and trapping for traditional purposes, the lists of projects considered in the assessment of the potential cumulative effects of the Project on Wildlife Resources (EIS, Section 14.6.2.1) and on Vegetation and Ecological Communities (EIS, Section 13.5.2) were considered.
- As discussed in EIS Section 19.6.6.1 (page 19-109), the projects and activities in the Project Inclusion List are generally well removed from the LAA and are unlikely to have any residual effect on the use for cultural and traditional purposes of the lands and resources that may be adversely affected by the Project. Consequently, the residual effects of the Project are unlikely to overlap with the effects of those projects and activities. Further, Section 19.6.6.1 explains that the adverse effect of the Project results from inundation of particular high value sites. Consequently, even if there were some overlap, the effects would not accumulate. For these reasons, the Project was assessed as being unlikely to result in a cumulative effect on the

use of lands and resources for other cultural and traditional purposes. No further project screening or analysis was undertaken in the EIS.

- As described in the Technical Memo: Cumulative Effects Assessment provided to the BCEAO and CEA Agency on May 8, 2013, four projects identified by the Treaty 8 Tribal Association were reviewed for cumulative effects. For a discussion of these projects and the updated assessment of cumulative effects for all Valued Components where residual effects were identified, including Current Use of Lands and Resources for Traditional Purposes, please see the Technical Memo: Cumulative Effects Assessment.

Step 2: Review documentation

Once the projects were identified, the following materials were reviewed:

- cumulative effects assessments set out in EIS Sections 12, 13, 14;
- publically available information describing the projects, including, where available, applications for Environmental Assessment Certificates (EAC) and assessment reports provided under CEAA;
- written advice from the Wildlife and Vegetation consultant, a copy of which is attached (see Attachment 1); and,
- residual effects assessment set out in EIS Section 19.

Step 3: Analysis

The analysis undertaken for the cumulative effects assessment in EIS Section 19 is summarized below.

Fishing for Traditional Purposes

For cumulative effects pertaining to fishing for traditional purposes, neither the Dunvegan nor the Montney Gas Play projects were assessed as likely to have effects that would combine with those of the Project to produce a cumulative effect on fish and fish habitat (EIS Section 12). Given these results, the conclusion was that there would be no cumulative effects on access to, nor on availability of, fish for fishing for traditional purposes.

Hunting and Trapping for Traditional Purposes

The assessment of the potential effects of the Project on the Current Use of Lands and Resources for Traditional Purposes draws directly on the assessment of the potential effects on Vegetation and Ecological Communities (EIS Section 13) and on Wildlife Resources (EIS Section 14). However, the assessments are not identical. To assess the potential effects and cumulative effects on Vegetation and Ecological Communities and on Wildlife Resources, the potential changes to those VCs (for example, reduction in certain types of habitat) have been predicted. The assessment of the potential effects of the Project on the Current Use of Lands and Resources for Traditional Purposes assesses the potential changes to the use of and access to those resources, as well as changes in the availability of those resources. For

example, a reduction in a particular population of a particular species does not necessarily translate into a reduction in traditional harvesting. This is the case regardless of whether the change resulting from the Project is considered as an effect or as a cumulative effect. The assessment of the potential cumulative effects of the Project on Current Use of Lands and Resources for Traditional Purposes was based on written advice from the Wildlife and Vegetation consultant (see Attachment 1).

For cumulative effects pertaining to hunting and trapping for traditional purposes, publically available records of projects considered in the Wildlife Resources cumulative effects assessment were screened to identify those projects expected to result in measurable reductions of habitat associated with ungulates, fur-bearers, non-migratory game birds and migratory waterfowl. Those that would have measurable reductions were brought forward into the assessment of the cumulative effects of the Project on Current Use of Lands and Resources for Traditional Purposes. No further analysis was undertaken for projects identified as likely to result in cumulative effects on species that were not identified in Project-specific TLUS reports as species harvested by Aboriginal groups (e.g. Groundbirch East Receipt Meter Station). Projects were reviewed to identify whether there was information pertaining to potential effects on current use of lands for traditional purposes. Only the following projects provided assessments of potential effects on such use:

- Alliance Pipeline Sunrise Meter Station Relocation (Alliance)
- Groundbirch Mainline (Groundbirch)
- Provident Beatton River Replacement Project (Provident)
- Wildmare Wind Energy Project (Wildmare)
- Wartenbe Wind Energy Project (Wartenbe)

Alliance and Provident: the Alliance and Provident projects underwent environmental assessments which explicitly identified that they would have no effect on current use of lands and resources for traditional purposes. Consequently, the Project was assessed as unlikely to result in a cumulative effect with those two projects.

Wartenbe: The EAC application for the Wartenbe project identifies potential effects on traditional land use but does not provide a residual effects assessment. The EAC application states that “Dokie Wind Energy has worked diligently with the TLUS team to respond to all TLUS recommendations through avoiding and or minimizing impacts to sensitive and significant traditional land use resources within the project area” and that “the impact of the project has been significantly reduced” (Hélimax et al. 2006: pages 224-225).

The Wildlife Resources effects assessment for the Project concluded that residual effects of the Wartenbe project on species at risk may combine with those of the Project and result in a cumulative effect (EIS Section 14.6.2.1.17 page 14-97). The species at risk were not identified in Project-specific TLUS reports as being harvested by Aboriginal groups.

Based on the results of the Wartenbe environmental assessment and the conclusions of the Project Wildlife Resources effects assessment (EIS Section 14), the conclusion of the

cumulative effects assessment undertaken in EIS Section 19 for the Wartenbe project was that there would be no cumulative effects on hunting and trapping for traditional purposes.

Groundbirch and Wildmare: the Groundbirch and Wildmare projects explicitly identified potential residual effects on current use of lands and resources for traditional purposes and were further analyzed against the findings of the Wildlife Resources VC.

The Groundbirch Environmental and Socio-economic Assessment identifies two residual effects on traditional use (Nova Gas Transmission Ltd 2010: pages 6-58 and 6-59):

- Site-specific TLU identified during on-going engagement may be affected during construction and operation. The residual effect is characterized as short-term and of low magnitude.
- Disruption of subsistence hunting, trapping and gathering may occur during construction. The residual effect is characterized as short-term, and of negligible to low magnitude. The Environmental and Socio-economic Assessment states that “no issues or concerns with respect to subsistence activities have been raised”.

“Short-term is defined as “Occurs during construction phase only”; “negligible” is defined as “Residual effects are not detectable” and low magnitude is defined as “Low Potential residual effects are detectable, but well within environmental, social and/or regulatory standards or tolerance” (TransCanada 2010: pages 6-3 and 6-4). The construction phase of the Groundbirch project was expected to be undertaken in 2011 and 2012 and, therefore, there would be no temporal overlap with the Project. In addition, the Wildlife Resources VC concluded that the residual effects of the Groundbirch project would not overlap with the residual effects of the Project. For these reasons, the conclusion was that there would be no cumulative effects on hunting and trapping for traditional purposes.

The Wildmare project identified residual effects on First Nations traditional use activities based on a Cultural and Traditions Study (CTS) undertaken by Saulteau First Nations (SFN) and consultation with West Moberly First Nations (WMFN), Halfway River First Nation (HRFN), McLeod Lake Indian Band (MLIB), and Doig River First Nation (DRFN). At the time of submission of the Wildmare project EAC application, traditional use studies were being undertaken by the WMFN, HRFN and MLIB and the results of those studies were not included in the application. However, the Wildmare project EAC application states that “West Moberly First Nations have confirmed through consultation that members of the community utilize the Project area for hunting (results of project Open House in Finavera Wind Energy Inc. 2011: page 796)”. Species hunted by West Moberly First Nations were not listed in the EAC application. The SFN CTS resource summary table provided in the Wildmare project EAC application indicates that SFN hunts birds (unspecified), deer, elk, fur-bearing animals (unspecified), moose, “other”, and “other mammals” within 500 m of the Wildmare project footprint. (Finavera Wind Energy Inc. 2011: page 802).

The EAC application for the Wildmare project concludes that the project would likely result in the following residual effects (Finavera Wind Energy Inc. 2011, page 817):

- Negligible decrease in Traditional Use Activities (in the project footprint area); and

- Low decrease in value to hunting values (in the local study area, which is a 500 m buffer around the project footprint)

In the Wildmare EAC application, “negligible” is defined as “no measureable change over the baseline condition”, and “low magnitude” is defined as “impact expected above baseline, but with no measureable effect on First Nations culture. Traditional/Cultural Activities and treaty rights may still be practiced unhindered in the First Nations’ own territory.” (Finavera Wind Energy Inc.: 2011, page 818)

The Wildlife Resources cumulative effects assessment for the Project concluded that effects of the Wildmare project to bat, raptor, breeding, and migratory bird species at risk may combine with those of the Project and result in a cumulative effect (EIS Section 14.6.2.1.18 page 14-98). The species noted are not species identified in Project-specific TLUS reports as being harvested by Aboriginal groups.

Based on the results of the Wildmare environmental assessment and the conclusions of the Project Wildlife Resources effects assessment (EIS Section 14), the conclusion of the cumulative effects assessment undertaken in EIS Section 19 for the Wildmare project was that there would be no cumulative effects on hunting and trapping for traditional purposes.

Where the assessment of projects did not identify any results or conclusions pertaining to effects on traditional land use, the assessment of the cumulative effects of the Project on current use of lands and resources for traditional purposes was conducted on the basis of the assessment of the effects of the Project on the Wildlife Resources VC (EIS Section 14) and advice from BC Hydro’s wildlife consultant. EIS Section 14 concluded that the residual effects of the Dokie Wind Energy and Carbon Creek Coal Mine projects (Sections 14.6.2.1.9 and 14.6.2.1.15, respectively) to species at risk would likely combine with those of the Project and result in a cumulative effect. According to BC Hydro’s wildlife consultant, neither of these projects was expected to have measurable reductions in the regional populations of ungulates, waterfowl, non-migratory game birds, and fur-bearers, all of which had been identified in Project-specific TLUS reports as being harvested by Aboriginal groups. Consequently, no cumulative effects on hunting and trapping for traditional purposes were identified.

General oil and gas and general forestry activities were reviewed. Although the Wildlife Resources effects assessment concluded that oil and gas, forestry, and the Project combined will likely result in a decrease in the regional populations of furbearers and ungulates (notably moose and mule deer) as noted above, BC Hydro’s wildlife consultant advised that “the populations of furbearers and ungulates, while reduced, are likely to continue to persist on the landscape to the point where hunting and trapping is still permissible. The regional populations of waterfowl and game birds should remain relatively unchanged.” (See Attachment 1)

May 2013 Assessment of Additional Projects

The Treaty 8 Tribal Association identified the following four projects for review in the Project cumulative effects assessment: Horn River Mainline Loop, Sierra Yoyo Desan Road Upgrades, Chetwynd Forest Industries Biomass, and Highway 2 and 97 Improvements Projects. The

following are the results of BC Hydro's review of these projects, as set out in in the Technical Memo: Cumulative Effects Assessment:

- Horn River Main Loop and Sierra Yoyo Desan Road Upgrades Projects: These two projects lie outside the RAA delineated for the Current Use of Lands and Resources for Traditional Purposes VC (Fish and Fish Habitat RAA and Wildlife Resources RAA). Consequently, residual effects from those two projects will not overlap in space with the residual effects of the Project on current use of lands and resources for traditional purposes.
- Chetwynd Forest Industries Biomass Project:
 - No information was found pertaining to the projects potential effects on traditional use.
 - The project lies outside the Fish and Fish Habitat RAA. Consequently, there will be no cumulative effect on fishing for traditional purposes.
 - The Chetwynd Forest biomass plant will be built on an existing industrial property. Measureable reductions in the regional populations of ungulates, waterfowl, non-migratory game birds, and fur-bearers are not expected. For these reasons, the Cumulative Effects Assessment Technical Memo concluded that a cumulative effect on hunting, trapping and other cultural and traditional uses is unlikely.
 - Highway 2 and 97 Improvements Project:
 - No information was found pertaining to the projects potential residual effects on current use of lands and resources for traditional purposes.
 - The highway projects were assessed as unlikely to have effects that would combine with those of the Project to produce a cumulative effect on fish and fish habitat. Given this result, the Project is unlikely to result in cumulative effects on fishing for traditional purposes.
 - The highway projects were assessed as likely to have effects that would combine with those of the Project to produce a cumulative effect on wildlife and wildlife habitat. However, according to BC Hydro's wildlife consultant, measureable reductions in the regional populations of ungulates, waterfowl, non-migratory game birds, and fur-bearers are not expected. Consequently, the Technical Memo concluded that the Project is unlikely to result in cumulative effects on hunting and trapping for traditional purposes with the Highway projects.
 - Construction activities appear to be within or near the current use of lands and resources LAA south of Taylor. In particular, the project will widen Highway 97 at the base of South Taylor Hill to four lanes, south from Taylor Bridge for two kilometres. Traditional Use Studies submitted to BC Hydro by Aboriginal groups indicate that some Aboriginal groups (Blueberry River First Nation, Duncan's First Nation, the First Nations represented by Treaty 8 Tribal Association, and Horse Lake First Nation) may use the area for other cultural or traditional purposes (e.g. harvest of berries and plants, use of overnight sites). Consequently, residual effects of that project may combine with those of the Project and it is likely that they will result in a cumulative effect. The Cumulative Effects Assessment Technical Memo characterized the residual cumulative effect of the

Project as negative, low magnitude, and local. The effect would happen once and would be permanent and irreversible. The importance of the area was characterized as low importance and the multiplicity of use criteria was deemed 'single/few'. The residual cumulative effect on current use of lands and resources for other cultural and traditional purposes would not be significant.

References:

Hélimax, AXYS Environmental Consulting Ltd. and Jacques Whitford. 2006. Wartenbe Wind Energy Project Environmental Assessment Application.

NOVA Gas Transmission Ltd. 2010. Environmental and Socio-Economic Assessment for the Proposed Nova Gas Transmission Ltd. Groundbirch Mainline (Saturn Section) Project.

Finavera Wind Energy Inc. 2011. Application for an EA Certificate for the Wildmare Wind Energy Project.

Harvest of Fish and Wildlife Resources (EIS section 24)

In section 24.7 of the EIS, this is stated....

“the Project would result in a residual effect on hunting opportunities during construction due to change in access to hunting areas within the LAA,”

The “hunting areas” that are being referred in that statement are those parts of the Project activity zone where access will be prohibited, either permanently (the largest areas being the inundation zone and the dam site area) or temporarily.

The conclusion in Section 24.7.2 of the EIS, in particular, the statement that “... access to public hunting areas would be expected to decrease overall, resulting in a cumulative residual adverse effect...” is based on this analysis:

- Hunters may seek alternative hunting locations, including unrestricted areas within the LAA (the Project activity zone). As indicated in Section 24.4.4.1, the area temporarily or permanently unavailable for hunting as a result of Project construction includes 0.8% (22,199 ha) of the Limited Entry Hunting (LEH) 7-20a.
- It was assumed that, as with the Project, access to hunting would be reduced in the “project activity zone” of some of the reasonably foreseeable projects in the RAA.
- The Project activity zone is found within the Limited Entry Hunt (LEH) area 7-20a, and the LEH area 7-20a is found within the RAA. The total area available for hunting in LEH 7-20a would be reduced by an amount equal to the areas unavailable within the Project activity zone and the areas unavailable for hunting by the reasonably foreseeable projects within LEH area 7-20a. This combined reduction in area available for hunting within LEH 7-20a is characterized as a cumulative effect.

“3. Does BCH acknowledge that, outside of the assessment of current uses VC, the impacts of the Project may impact Treaty 8 rights held by the 11 Treaty 8 First Nations who do not exercise their rights within the current uses LAA?”

BC Hydro does not acknowledge that the Project will adversely impact the exercise of treaty rights of the eleven Treaty 8 First Nations who do not exercise their rights within the Current Use of Lands and Resources for Traditional Purposes LAAs.

BC Hydro sought information from all 29 Aboriginal groups identified by the Executive Director of the BCEAO and the Federal Minister of the Environment as potentially affected by the Project (listed in Table 34.1 of the EIS) on their current and reasonably anticipated future use of lands and resources, including activities conducted in the exercise of their treaty rights.¹

Of the twenty-one Treaty 8 First Nations listed in Table 34.1, eleven² reported no current use of lands and resources within the Current Use of Lands and Resources for Traditional Purposes LAAs. The information provided by those eleven First Nations indicates that their traditional territories are some distance from the LAAs. In *Mikisew*³ the Supreme Court of Canada noted that a First Nation’s “meaningful right to hunt” [or trap or fish] is not to be ascertained on a treaty-wide basis, but in relation to territories over which a First Nation traditionally practiced those harvesting rights.” Although BC Hydro is aware that Treaty 8 First Nations have a right under the treaty to hunt, trap and fish anywhere in the Treaty 8 territory, the assessment of the potential impact of the Project on the exercise of their treaty rights is based on the information provided by the First Nations themselves. Therefore, the Project is not expected to have an adverse impact on the exercise of treaty rights by those eleven First Nations who do not report current use of lands and resources in the Current Use of Lands and Resources for Traditional Purposes LAAs.

“4. Has BCH conducted analysis to support its conclusions that there are reasonable opportunities to hunt and trap elsewhere? Where are these sites?”

As described in Section 34.3.3 of the EIS and the Amendment Report filed May 24, 2013, although the Project has the potential to adversely impact the exercise of treaty rights of ten Treaty 8 First Nations to hunt and trap, those First Nations “would continue to have the opportunity to exercise their rights to hunt and trap within the LAA, within their traditional territories, and within the wider Treaty 8 territory.”⁴ This conclusion is based on the analysis set out in Section 19 of the EIS and on current land use information provided by the First Nations themselves, as well as other available sources.

¹ See letters from Trevor Proverbs to various First Nations, dated September 21, 2012

² Athabasca Chipewyan First Nation, Beaver First Nation, Deninu K’ue First Nation, Fort Nelson First Nation, Little Red River Cree First Nation, Mikisew Cree First Nation, Salt River First Nation, Smith’s Landing First Nation, Sturgeon Lake Cree Nation, Tallcree First Nation, Woodland Cree First Nation

³ *Mikisew Cree First Nation v Canada (Minister of Canadian Heritage)*, 2005 SCC 69, at para. 48

⁴ See e.g., Section 34.3.3, p. 34-17, lines 21-24, re: T8TA

Firstly, some hunting and trapping locations within the LAA will be inundated, but others will not be affected.⁵ In addition, during construction, the Project would have a temporary effect on the ability of harvesters to access some parts of the LAA, but new access will be created. The effect on hunting and trapping would be temporary.⁶ Opportunities for Aboriginal groups to hunt and trap within the LAA will remain.

Secondly, the ten Treaty 8 First Nations will continue to have opportunities to hunt in their traditional territories and the wider Treaty 8 territory. That conclusion is based on information considered as part of the baseline conditions for the current use of lands and resources for traditional purposes found at Section 19.3. Traditions Consulting was asked to consider information relating to the exercise of asserted Aboriginal or treaty rights by each Aboriginal group outside the current use LAAs and RAAs.⁷ In addition to considering information provided by the First Nations, Traditions reviewed other publicly available traditional land use information. This information was incorporated into the description of baseline conditions for current use found at Section 19.3, as appropriate.⁸

Information from the ten Treaty 8 First Nations and from the publicly available sources demonstrates that their members currently exercise their rights to hunt and trap in numerous locations that will not be affected by the Project. Several of the studies reviewed also include comments from members of the First Nations relating to where they hunt. For example, Blueberry River First Nations Councillor Russell Apsassin stated: “We hunt and trap all over ... We move when we go hunting. Where the moose move, that’s where we go hunting; the moose move around, the lynx move around, that’s where we go hunting.”⁹

Similarly, Métis harvesters will continue to have the opportunity to exercise their asserted rights to hunt and trap within the LAA and within the Study Area identified in the Métis Use and Occupancy Study.¹⁰

Examples of hunting and trapping practices of the ten Treaty 8 First Nations are set out in the attached memorandum. The memorandum is not intended to be an exhaustive or comprehensive representation of hunting and trapping activities of those First Nations, but sets out information from various sources, including the Project Traditional Land Use studies, other

⁵ See, e.g., with respect to ungulates, p. 19-82, lines 18-41; see also Table 19-11 (p. 19-91)

⁶ Section 19.4, p. 19-79, lines 3-12; Section 34.3.3 for each First Nation (e.g., p. 34-17, lines 12-17 re: T8TA)

⁷ See Aboriginal Land and Resource Use Summaries, at Volume 5, Appendix A4, Question 5.

⁸ See Section 19.2, line 33; see also references cited at end of each Aboriginal Land and Resource Use Summary, Volume 5, Appendix A4.

⁹ See Alaska Pipeline Project, BRFN Traditional Land Use Study, May 8, 2012 (Bouchard & Kennedy), p. 103 citing Councillor Russell Apsassin; for similar quotes, see also EnCana Cabin Gas Plant, DTFN Aboriginal Knowledge and Land Use Study, September 18, 2009, p. 17; NOVA Gas Transmission Ltd., Horn River Mainline Project, DTFN Aboriginal Knowledge and Land Use Study, November 4, 2009, p. 21; and “I want to eat caribou before I die” Initial Submission for the Proposed Mining Activity at First Coal Corporation’s Goodrich Property, West Moberly First Nations Land Use Department, June 2009, at p. 15 (citing Brody)

¹⁰ Métis Nation British Columbia Traditional Land Use Amendment Report submitted May 24, 2013, p. 24

publicly available traditional land use studies reviewed by Traditions, and additional studies more recently obtained by BC Hydro.

If you require additional information or clarification, please do not hesitate to contact the writer at 604-695-5241.

Sincerely,



Trevor Proverbs
Director, First Nations Engagement Team
Site C Clean Energy Project

Encl. Attachment 1 -- Written advice from BC Hydro Wildlife/Vegetation Consultant regarding Cumulative Effects Assessment
Attachment 2 -- Traditional Land Use Information

Attachment 1: Written advice from BC Hydro Wildlife/Vegetation Consultant regarding Cumulative Effects Assessment

The conversion of habitats due to multiple projects and activities within the RAA will put increased pressure on wildlife populations, particularly to those species that are habitat specialists - strongly associated with mature and old forest, or wetlands. Species generalists, or those more tolerant of habitat edges and early seral vegetation communities, may also be affected, but could also respond positively to the change.

Most projects and activities will result in a further reduction of habitats within the RAA; however not all projects would lead to measureable changes to intact mature and old forest communities and wetlands. The detail of specific residual effects of many of the projects and activities that were reviewed is limited, but based on information that is readily available, notable projects that are expected to result in a measureable reduction of habitats associated with ungulates, furbearers, non-migratory game birds (grouse), and migratory waterfowl is provided below.

- **Provident Beatton River Replacement Project** - the project may affect Sharp-tailed Grouse leks, will remove habitats within an ungulate winter range, and crosses two wetlands that are recognized as migratory waterfowl habitat (National Energy Board 2011). The project is not expected to have a measureable effect to regional populations of the any of these species groups.
- **Dokie Wind Project** – the project was described as reducing black huckleberry habitat, and would affect old forest, riparian habitats and wetlands (Hélimax et al. 2006). Measureable reductions to regional populations of any of these species groups are not anticipated.
- **Carbon Creek Coal mine** – With a planned open- pit surface and underground coal mine, reductions in forests and possibly wetlands are anticipated. However, measureable reductions in the regional populations of ungulates, waterfowl, non-migratory game birds, and furbearers are not expected.
- **General Oil and Gas Activities** – The development of pipelines, seismic lines, drill sites, and access roads leads to habitat fragmentation and a reduction of interior habitats removed from unnatural (anthropogenic) edges. In addition to habitat loss, species that are less tolerant of human disturbance may be displaced. Collectively, oil and gas activities are expected to have measureable reductions to the total population of furbearers in the region. Depending on the location of the activity waterfowl, game birds, and ungulates may also be affected.
- **General Forestry Activities** – The same pressures associated with oil and gas activities would occur with forestry as well; however, typically this industry specifically targets mature and old forest stands. Therefore some furbearers (pine marten and fisher) will see measureable decreases in suitable habitats, and reductions in the regional populations are anticipated. Wetlands are generally avoided unless access is limited and there is no other feasible option. Together with oil and gas these two

industries result in the greatest number of access roads within the RAA. While this does allow for greater access for hunting and trapping into previously inaccessible areas it also allows for greater industrial and recreational use which may put further pressure on harvestable species. Therefore, the potential for measureable reductions to ungulate populations within the RAA are also anticipated.

Oil and gas, as well as, forestry are considered the more prevalent activities occurring within the RAA. However, these activities are generally more scattered on the landscape, occurring as smaller developments across a wider area. The Project, which is mostly confined to the Peace River valley, is the single largest foreseeable future development within the RAA. Oil and gas, forestry, and the Project combined will likely result in a decrease in the regional populations of furbearers and ungulates (notably moose and mule deer). Taking into account the changes to habitat that would result from these projects and activities, the populations of furbearers and ungulates, while reduced, are likely to continue to persist on the landscape to the point where hunting and trapping is still permissible. The regional populations of waterfowl and game birds should remain relatively unchanged.

Literature Cited:

National Energy Board. 2011. Reason for Decision: Provident Energy Pipeline Inc. OH 2 2011. Provident Energy Pipeline Inc.

Hélimax, AXYS Environmental Consulting Ltd. and Jaques Whitford. 2006. Dokie Wind Energy Project Environmental Assessment Application. Report prep. for British Columbia Environmental Assessment Office, Canadian Environmental Assessment Agency.

Attachment 2 – Traditional Land Use information

The following sets out examples of land use by the ten Treaty 8 First Nations whose exercise of treaty rights may be impacted by the Project. This is not intended to be an exhaustive or comprehensive representation of hunting, trapping and fishing practices by these First Nations. The information is gathered from the traditional land use studies funded by BC Hydro and provided by those First Nations for the Project, and other publicly available studies or other documents, such as affidavits, related to other projects.

British Columbia First Nations

Blueberry River First Nations

Dawson Creek/Chetwynd Area Transmission Project: Blueberry River First Nations Traditional Land Use, April 18, 2011

- The study area extends approximately 7 km on either side (north and south) of the existing transmission line between Dawson Creek and approximately 21 km east of Chetwynd (p. 2)
- BRFN hunt and trap in Pouce Coupe/Dawson creek area (pp. 41-42)

Alaska Pipeline Project BRFN Traditional Land Use Study, May 8, 2012

- Project area: APP pipeline corridor and environs - from the Sikanni Chief River in the north to Altona on the Beatton River in the south (northeast BC) (see pp. 4-7)
- Kennedy and Bouchard interviewed 26 BRFN members, including some site visits to the project area (pp. 10-11)
- they have three family traplines (Appaw, Apsassin, Wolf/Davis) intersected by the proposed route of the Alaska Pipeline Project (p. 55)
- hunt elk around Peace River, at the government reserve east of Beatton River, and in the north, in the area of the Appaw trapline (p. 55)
- hunt north of BRFN reserve in Pink Mountain Range (p. 100)
- report hunting moose, elk, bear, caribou both north and south of the Peace River (p. 100)
- hunt and trap at eastern end of Two Creeks Road, which crosses Prespatou Creek (in the area between BCKP610 and BCKP625) (p. 101)
- historically hunted and trapped in Nig Creek area (p. 101)
- hunt and camp at Beatton River road crossing (p. 101)

- hunt at Donnie Creek (in the north) (p. 101)
- hunt at Coal Creek (in the southwest) (p. 101)
- BRFN Councillor Russell Apsassin:
 - “We hunt and trap all over. There are lots of roads in there. There is no place we don’t hunt or trap. We move, when we go hunting. Where the moose move, that’s where we go hunting; the moose move around, the lynx move around, that’s where we go hunting. So there is no place we don’t trap. One year you go trapping, there’s a whole bunch of lynx that year, you trap there, same with moose. They move. We follow the tracks. We don’t just trap in one area one year. We just don’t go one area. We trap and hunt the whole area.” (p. 103)
- Detail on where moose, elk, caribou, deer, bear are hunted in the APP project area set out at pp. 104-110
- Detail on where small game are hunted and trapped in the APP project area, including beaver, lynx, rabbit, muskrat, coyote, marten, wolverine set out at pp. 110-122
- Detail on where waterfowl and birds are hunted in the APP project area set out at p. 124
- Detail on fishing in the APP project area (Beaton river, Nig creek, Sikanni Chief river, Donnie creek, Blueberry river) set out at p. 124-125

Site C Project, Traditional Land Use Study, November 6, 2011

- The TLUS includes nine theme maps that depict the locations of selected harvesting areas.
- Traditions Consulting, in its summary in answer to Q5, identifies the following activities occurring outside the LAA/RAA for current use:
 - Mountain sheep and moose harvesting on the north shore of Williston Reservoir.
 - Mountain sheep harvesting on the Halfway River near the junction with the Graham River.
 - Caribou harvesting in areas west and north of Dunlevy Creek and on the upper Graham River.
 - Fish harvesting on the Williston Reservoir, lower Dunlevy Creek, Beaton River, Montney Creek, Fish Creek, Charlie Lake, and the headwaters of the Halfway River.
 - Moose and buffalo harvesting near Pink Mountain, as well as caribou and hoary marmot harvesting.

Doig River First Nation

Nova Gas Transmission - Groundbirch Mainline Project, June 2010

- Three TLU sites were identified near the proposed right-of-way including cabins 600 m north, diamond willow fungus 75 m east, McQueen Slough 600 m south (p. 2)

Site C Clean Energy Project - Doig River First Nation, Prophet River First Nation, Halfway River First Nation, and West Moberly First Nations Traditional Land Use Study (prepared by Firelight Group), March 2012 [note: this TLUS covers all four First Nations and the use reported is generally not attributed to a particular First Nation]

- Traditions Consulting, in its summary in answer to Q5 (activity outside the LAA & RAA) states:
 - There is an “other” fish symbol on the north side of Williston Reservoir, at Horetzky Point
 - There is a concentration of “other” fish symbols and two temporary habitations at Crying Girl Prairie, and further up the Graham River at Christina Falls there is a permanent habitation, an environmental feature, and a fish symbol.
 - On the upper Halfway River near Brady Ranch there is an elk and a whitefish symbol.
 - Between the confluence of the Halfway and Cameron Rivers there is a cluster of symbols. Traditions notes that because of the scale of the map and the size of the symbols it is difficult to determine whether the values depicted are inside or outside the Current Use of Lands and Resources (Wildlife Resources) RAA.
 - In the area west of Doig River Reserve 206, there is a concentration of subsistence use values including “chickens”, grouse, rabbit, bear, mule deer, other fish, moose and drinking water source.
- The TLUS report included a map entitled “TLUS - Area of Interest”¹¹ which displays the original study area proposed by T8TA for the TLUS. The map includes the disclaimer: “This does not represent the extent of the four First Nations’ traditional territories, or the extent of the lands over which they exercise their section 35(1) rights, both historically and presently.”

Halfway River First Nation

Initial Submissions of the Halfway River First Nation to Mineral Titles Division, Energy, Mines and Petroleum Resources respecting Coal Licences Applications nos. 417666, 417689, 417691,

¹¹ The map can be found at http://www.ceaa-acee.gc.ca/050/documents_staticpost/63919/85328/Vol5_Appendix-Doig_River-Maps_Part1.pdf

417694, 417703, 471704, 417727, and 471742, July 2010 [attached to affidavit of Russell Lilly, Ex D, sworn March 22, 2012, and filed in BCSC Petition, Victoria Registry No. 12-1111]

- The Coal Licence area (in the Peace Reach area) is within the area utilized by HRFN members historically and to the present day (p. 10)
- Dunlevy Creek watershed and the Coal Licence Area specifically are preferred locations to continue to exercise Treaty rights; the area has high wildlife value (p. 26, or p. 86 of Lilly affidavit)
- Appendix B: The Significance of the Peace Canyon and Surrounding Areas to the Mountain (Hudson's Hope) Dunne-za of British Columbia, by Wendy Aasen, June 2010 (beginning at p. 108 of Lilly affidavit):
 - The Peace River canyon area was a traditional meeting place for the Mountain Dunne-za. Mobility was a key factor in the use of the area. (p. 27 or p. 134 of Lilly affidavit)
 - The annual seasonal round was how the Dunne-za organized their lives and their food production as they moved across the landscape at different times, in different sized grouping, to use the resources found in their territory. (p. 28)

Chief Russell Lilly, on behalf of HRFN v British Columbia, Oil & Gas Commission, and Olympic Seismic Ltd et al, BCSC Petition, Victoria Registry No. 12-1111, filed March 26, 2012

- In the Petition, HRFN alleges:
 - It is concerned about industrial activity in Peace Reach of Williston Lake, Dunlevy Creek, Hackney Hills and Butler Ridge ("Peace Reach" area) (para. 16)
 - HRFN is preparing a TLUS for the Peace Reach area (para. 17)
 - The oil & gas approvals (in the Peace Reach area) are in HRFN's "preferred traditional hunting and trapping grounds" (para. 25)
- Affidavit of Russell Lilly, Chief of HRFN, sworn March 22, 2012:
 - Peace Reach of Williston Lake, including Dunlevy Creek, Hackney Hills, Butler Ridge heavily utilized by HRFN as an important part of our seasonal round (para. 13), and for hunting, trapping, food and medicine gathering, travel and to exercise our spiritual and cultural practices (para. 14)
 - "Although the Dunne-za seasonal round has adapted to today's economic realities, many HRFN members, including myself, continue our traditional practices. The Peace Reach Area as part of our preferred Treaty territory, is well suited for our hunting and trapping needs as well as our current mode of life. Proximity to reserve is important as it allows us to exercise our Treaty rights with

Elders who transmit their cultural, ecological and spiritual knowledge to members of our community.” (para. 17)

- Affidavit of Roslyn Pokiak, land use manager HRFN, sworn March 22, 2012:
 - Peace Reach of Williston Lake, including Dunlevy Creek, Hackney Hills, Butler Ridge is an important place for hunting, fishing, trapping and exercising our cultural and spiritual practices (para. 5)
 - Peace Reach area is a preferred location to exercise our Treaty rights, containing high value wildlife, sacred places and trails, and proximity to reserve (para. 6)
 - HRFN preparing a cultural study of the Peace Reach area (paras. 18-19)

Site C Clean Energy Project - Doig River First Nation, Prophet River First Nation, Halfway River First Nation, and West Moberly First Nations Traditional Land Use Study (prepared by Firelight Group), March 2012 [note: this TLUS covers all four First Nations and the use reported is generally not attributed to a particular First Nation]

- see summary under Doig River First Nation. As no differentiation of use by the four First Nations was presented in the TLUS, this information was assessed as applying to all four First Nations.

McLeod Lake Indian Band

Westcoast Energy Inc., cba Spectra Energy Transmission (Westcoast), Goodrich Extension Re-Injection Pipeline, Appendix 5 - Traditional Land Use Sites Assessment, November 2009

- Proposed pipeline project: south and east of Pine River, north of the North Burnt River and west of Gwillim Lake
- MLIB considers project area within its traditional land use territory (pp. 15-16)

Enbridge Northern Gateway Project, sec. 52 Application, Volume 5B: Aboriginal Traditional Knowledge, May 2010

- Hunting, fishing, trapping, plant gathering occur in the Bear Lake area (pp. 5-12)
- Parsnip River-Chuchinka Creek area (hunting and fishing)
- Arctic Lake area (hunting, being impacted)
- Merton Lake (multi-use area)

Enbridge Northern Gateway Project, Aboriginal Traditional Knowledge Community Report, MLIB (Tse'Khene Nation), July 2010 [Exhibit "B" to affidavit of Derek Orr, sworn April 16, 2012, filed with Enbridge Northern Gateway Project Joint Review Panel, OH-4-2011]

- Sixteen hunting and trapping areas were identified: Greater Bear Lake area, Bear Lake area, shores of Parsnip River, area east of Parsnip River, Chuchinka Creek north area and south area, Angusmac Creek area, area where Chuchinka and Angusmac Creeks meet, Muskeg River area, Merton Lake area, Davie Lake area, Wicheeda Lake area, Dominion Lake area, Tacheeda Lake area (p. xii, pp. 7-7 to 7-8)
- Traditional fishing areas identified: Wicheeda Lake, Tacheeda Lakes, area where Chuchinka and Angusmac Creeks meet, Merton Lake, Davie Lake, Hart Lake (p. xv)

Nova Gas Transmission - Groundbirch Mainline Project, June 2010

- Two TLU sites identified by MLIB members: cabins - 600 m north of proposed line; moose lick - 400 m north (both avoided) (p. 11)

Nova Gas Transmission - Groundbirch Mainline (Saturn Section) Project, Traditional Knowledge Report, June 2011

- LSA: 2 km wide band centred on the pipeline route and meter station, and to specific communities; RSA: generally 15 km wide band centred on the Project
- Participants (MLIB, NE Metis Association, SFN, HLFN, WMFN) reported that hunting and trapping occur throughout the lands surrounding and encountered by the pipeline, particularly hunting for moose and bear, and trapping rabbit (p. 7)
- Moose, elk, black bear, grizzly bear, grey wolf, white-tailed deer, rabbit use the lands traversed by the pipeline route (p. 7)
- MLIB members noted community members tend to hunt closer to Tumbler, McLeod, Bear and Carp Lakes (p. 15)
- MLIB members fish for rainbow trout in Stewart Lake (p. 16)
- Community-owned traplines north of Dawson Creek and in the areas of Carp Lake and Parsnip River (p. 16)

Site C Project, Traditional Land Use Study, May 6, 2013

- The TLUS includes five theme maps that depict harvesting activities as described in interviews with MLIB members. Information from only 12 of the 39 interviewees is depicted on the maps. Land use activities outside the Peace River region are only partially represented on the maps (pp. 19, 76)

- Traditions Consulting, in its revised summary in answer to Q5 identifies the following harvesting activities outside the LAA/RAA:
 - Hunting south and east of McLeod Lake, south of Chetwynd, and east of Tumbler Ridge.
 - Fishing on the Pine River east of Moberly Lake, on lakes southwest of McLeod Lake, on a small stretch along the Misinchinka River, and on a number of localities at the mouths of streams flowing into western Williston Reservoir.
 - Transportation routes going to the fishing locations around Williston Lake.
 - Habitation areas at many of the fishing localities and at Finlay Forks in the area of western Williston Reservoir.

Prophet River First Nation

Nova Gas Transmission - Horn River Mainline Project [Update Report for TLUS, August 2010] and Northwest Mainline Expansion [Appendix 6 – TLUS Report, April 2011] (note: content re PRFN is the same in both documents)

- Study area shown on p. 6 - region around proposed pipeline east of Fort Nelson
- Moose, white elk, deer hunted in study region (p. 4 of Tab 10)
- Right-of-way considered excellent wildlife habitat
- Whole area is a good hunting area, especially for moose, bear and beaver
- Prefer hunting closer to and south of Prophet River reserve
- no known fishing areas in the Project Footprint (p. 4)

Nova Gas Transmission - Northwest Mainline Expansion, Supplemental Traditional Knowledge Report, November 2011

- RSA for Kyklo Creek section shown on p. 2 in northeast BC, by Alberta border, just south of Kotcho Lake
- Good habitat for birds (p. 10)
- Ideal habitat for bear, moose
- Good trapping for martin, beaver, weasel, rabbit, lynx

Site C Clean Energy Project - Doig River First Nation, Prophet River First Nation, Halfway River First Nation, and West Moberly First Nations Traditional Land Use Study (prepared by Firelight

Group), March 2012 [note: this TLUS covers all four First Nations and the use reported is generally not attributed to a particular First Nation]

- see summary under Doig River First Nation. As no differentiation of use by the four First Nations was presented in the TLUS, this information was assessed as applying to all four First Nations.

Saulteau First Nations

Westcoast Energy Inc (cba Spectra Energy Transmission), Goodrich Extension Re-Injection Pipeline, Traditional Land Use Sites Assessment, Basic Report, November 2009

- Proposed project is south and east of Pine River, north of the North Burnt River and west of Gwillim Lake
- SFN considers project area within its traditional land use territory (p. 16)
- Detailed results of study not published, however SFN answered “yes” to questions: “are you aware of any additional animal habitat sites within the proposed project area that were not recorded during the field assessment” and “are you aware of any additional fishing sites within the proposed project area that were not recorded during the field assessment” (pp. 51-52)

Nova Gas Transmission - Groundbirch Mainline Project, June 2010

- Seven TLU sites were identified near the proposed right-of-way including moose/elk lick 400 m north; cabins and meadow mushrooms 600 m north; beaver lodge and dam 10 m south, bear den 5 m south (p. 13)

Nova Gas Transmission - Groundbirch Mainline (Saturn Section) Project, Traditional Knowledge Report, June 2011

- LSA: 2 km wide band centred on the pipeline route and meter station, and to specific communities; RSA: generally 15 km wide band centred on the Project
- Participants (MLIB, NE Metis Association, SFN, HLFN, WMFN) reported that hunting and trapping occur throughout the lands surrounding and encountered by the pipeline, particularly hunting for moose, bear and trapping for rabbit (p. 7)
- Moose, elk, black bear, grizzly bear, grey wold, white-tailed deer, rabbit use the lands traversed by the pipeline route (p. 7)
- Hunting camp ~600m southwest of the pipeline route

Apsassin et al v Canada (Attorney General) et al, BCSC No. 07-0612, Victoria Registry

- Affidavit of Gilbert Davis, SFN member, sworn Feb 7, 2007:

- “I have exercised my Treaty 8 rights to hunt and fish there [territory claimed by Lheidli Teneh Band, portion of BC to Alberta border, east and slightly south of MLIB reserve] for at least the past twenty years. My family has consistently exercised their treaty rights in the overlap for at least four generations ...” (para. 5)
- “There is a historic trail through the overlap area that Treaty 8 people have used to travel between Tumbler Ridge and Grand Cache, Alberta. Along the way, there is good hunting for mountain goat, big horn sheep, moose, caribou, elk, deer, grouse, ducks and geese, grizzly bear and black bear. Within the overlap area there are two camping sites that I am familiar with along the Wapiti Forest Service Road, east of Mount Duke and north of the Wapiti River, that have meat drying racks for making dry meat. Often Treaty 8 people make dry meat after the hunt, before returning home. There are many other camp sites on the Red Deer Creek, the Wapiti River, Huguenot Creek and Holtslander Creek that are used by many people.” (para. 7)

Saulteau First Nations Culture and Traditions Study, In reference to the proposed BC Hydro Site C Clean Energy Project Impact Analysis. Site C (prepared by Nesoo Watchie Resource Management Ltd.), March 29, 2011

- Traditions Consulting, in its summary, in answer to Q5 states:
 - Outside the CTS Project Area, the CTS refers to the SFN “hunting lands” as including the Pine and Moberly watersheds, Sukunka and Murray Rivers and the Boucher Lake area.
 - Trapping is stated to have occurred throughout the “traditional territory”
 - Brody noted that hunting had become concentrated in the approximately 2,850 square kilometres around SFN Reserve 169

West Moberly First Nations

Chief Roland Willson on behalf of West Moberly First Nations v British Columbia (Chief Inspector of Mines), BCSC Victoria Registry 09-4823

- Affidavit of Roland Willson, Chief of WMFN, sworn October 19, 2009
 - “Hunting grounds close to our reserve are part of our preferred Treaty territory” (para. 6); “It is important to access hunting grounds relatively proximate to our reserve ...” (para. 7)
- Affidavit of George Desjarlais, former Chief of WMFN (1990-99), sworn October 20, 2009
 - Elders taught him they would rely on Moberly Lake for fishing (para. 14)

- They would go to the mountains during the fall and kill five or six caribou, as well as moose and marmot (para. 15)
- Affidavit of Catherine Dokkie, elder WMFN, sworn October 19, 2009
- My father, and other families in our community took hunting trips to the mountains to hunt caribou (paras. 3, 5)

“I want to eat caribou before I die” Initial Submission for the Proposed Mining Activity at First Coal Corporation’s Goodrich Property, West Moberly First Nations Land Use Department, June 2009

- Section 2.4 Seasonal Round and Wah stzee in the Round (p. 15), citing Brody:
 - ... “But in the North, thanks to great herds of buffalo and caribou or an abundance of moose, deer and beaver - converters of vegetation into meat to which humans have become so thoroughly adapted - hunters continue to practice their system following ancient, though never static, patterns. ... (Brody 1988:29)
 - “Most of the species hunted, especially moose and deer, tend to be dispersed. In their hunting, the men either follow the game’s seasonal movements, or they travel to areas where a specialized habitat supports particular species in abundance. ... The people travel to areas, which, based on their knowledge of animal behaviour and distribution and their understanding of the current populations levels of the major resource species, they will predict animals may be numerous enough to provide their winter supply of dry meat. (Brody 1999: 191)

Nor are these the same each year. At times of great need, when moose and deer populations are low, they may move to distant areas to hunt for mountain sheep and caribou. ... Everywhere, moose and deer have long been the main animals hunted; although whenever possible or necessary, fish, goose, whistler (hoary marmot), sheep, goat, bear, elk and caribou are taken too.”

[note: this passage was also cited in “*We used to come here all the time*”, filed for DCAT, pp. 51-52]

- fall hunting in Dokkie Creek - mountains (p. 17)
- depended on Moberly Lake (p. 18)

Westcoast Energy Inc (cba Spectra Energy Transmission), Goodrich Extension Re-Injection Pipeline, Traditional Land Use Sites Assessment, Basic Report, November 2009

- Proposed pipeline project: south and east of Pine River, north of the North Burnt River and west of Gwillim Lake
- WMFN considers project area within its traditional land use territory (p. 16)
- Detailed results of study not published, however WMFN answered “yes” to questions: “are you aware of any additional animal habitat sites within the proposed project area that were not recorded during the field assessment” and “are you aware of any additional fishing sites within the proposed project area that were not recorded during the field assessment” (pp. 51-52)

Nova Gas Transmission - Groundbirch Mainline (Saturn Section) Project, Traditional Knowledge Report, June 2011

- LSA: 2 km wide band centred on the pipeline route and meter station; RSA: generally 15 km wide band centred on the Project
- Participants (MLIB, NE Metis Association, SFN, HLFN, WMFN) reported that hunting and trapping occur throughout the lands surrounding and encountered by the pipeline, particularly hunting for moose, bear and trapping for rabbit (p. 7)
- Moose, elk, black bear, grizzly bear, grey wolf, white-tailed deer, rabbit use the lands traversed by the pipeline route (p. 7)

“We used to come here all the time” - A Review of the Proposed Dawson Creek to Chetwynd Transmission Line in Western Treaty No. 8”, WMFN Land Use Department, July 2012

- Section 3.2.1: “According to Brody (1988), by the 1970s, the Dunne-za hunting economy required adaptive strategies (flexibility, adaptability and mobility) and a land-base to support those strategies. The need for these adaptive strategies was directly related to the impacts of large-scale energy projects on the land and resources within Dunne-za territory. Adaptation and flexibility was not new to the Dunne-za traditional economy, however. Brody noted that a ‘mixed economy’ had developed since the earliest days of the fur trade, which incorporated wage labour activities into the mode of life. (p. 57)
- Section 4.2: species scoped by WM in reference to DCAT project include moose, caribou, bear, ducks, geese, grouse, bison (hunting), and fisher, wolverine, marten, lynx, cougar, wolf, squirrel, mink, muskrat, bobcat (trapping) (p. 115)
- Pine River area is prime moose habitat (p. 149)

A Review of Project Effects on West Moberly First Nations' Traditional Seasonal Round with a Consideration of the Historical Context, DCAT Transmission Project, submitted by AMEC Americas Limited, March 2013

- East Pine area - presence of hunting grounds and trails, north and northeast of the confluence of the Pine and Murray rivers was identified by WMFN as significant to their traditional seasonal round (pp. 5-8 to 5-9)
- Appendix A lists land uses identified by WMFN (p. B-0):
 - Hunting: Tumbler Ridge, Pink Mountain, just north of Hudson's Hope, Butler Ridge, Groundbirch, Sunset Prairie, El Rio
 - Moose: Cameron Creek, Barrel Prairie Road area north of Hudson's Hope toward WAC Bennett dam; Butler Ridge; portion of historic trail that cuts through Pine River area
 - Beaver: Jackfish and Boucher Lakes
 - Fishing and Trapping: Trail from west of Rocky Mountains through Pine Pass to east of Pine River, which travelled through Groundbirch up to Peace River

Site C Clean Energy Project - Doig River First Nation, Prophet River First Nation, Halfway River First Nation, and West Moberly First Nations Traditional Land Use Study (prepared by Firelight Group), March 2012 [note: this TLUS covers all four First Nations and the use reported is generally not attributed to a particular First Nation]

- see summary under Doig River First Nation. As no differentiation of use by the four First Nations was presented in the TLUS, this information was assessed as applying to all four First Nations.

Alberta First Nations

Dene Tha' First Nation

Dene Tha' First Nation, Consultation Process and Schedule of Fees, Information Package, 1998 (attached to affidavit of May Mah-Paulson, sworn December 12, 2011, Exhibit 1, filed in BC Supreme Court proceedings S108341, Vancouver Registry)

- DTFN provided this information package to oil and gas proponents in an apparent effort to clarify its preferred consultation approach and capacity needs with respect to resource development occurring within its traditional territory.
- The document includes a list of DTFN trappers and traplines in Alberta, B.C., and NWT as of 1998. The following traplines are identified:

- B.C. (8): #755T013, #755T014, #755T015, #756T001, #756T014, #756T015, #756T016, #756T017 (the locations are noted in a study conducted by the Oil and Gas Commission, cited below, at p. 8)
- Alberta (32): #84, #86, #88, #90, #93, #95, #99, #104, #107, #181, #184, #185, #186, #189, #203, #219, #224, #241, #251, #1036, #1063, #1203, #1366, #1377, #1422, #1514, #1547, #1719, #1752, #2100, #2816, #2928.
- NWT (1): #510.

Mackenzie Gas Project. Survey of Dene Tha' First Nation Traditional and Current Land and Resource, November 2006

- The Petitot River and its tributaries are used extensively by DTFN members for fishing and hunting (p. 6)
- Bistcho Lake is used for fishing by DTFN members. It is a "significant fishery" (p. 6)
- DTFN members report traveling to the Bistcho Plateau area where there are healthy populations of moose, caribou, wolverine, ducks and geese (p. 6)

Survey of Dene Tha' First Nation Traditional and Current Land Resource Uses, Areas that may be affected by the proposed land sales in the Horn River Basin of north-eastern British Columbia, 2008 (attached to affidavit of May Mah-Paulson, sworn December 12, 2011, Exhibit 6, filed in BC Supreme Court proceedings S108341, Vancouver Registry)

- The study was submitted to the Province as part of the consultation process for the disposition of 21 parcels of subsurface oil and gas tenures in the Cordova Embayment Boundary Area of northeastern B.C. The adequacy of the consultation process was challenged by DTFN which gave rise to following decision: *Dene Tha' First Nation v. British Columbia (Minister of Energy and Mines)*, 2013 BCSC 977. This study was filed as part of an affidavit filed in those proceedings (Affidavit of May Mah-Paulson, sworn December 12, 2011, Exhibit 6)
- Note that the title of the study, which refers to the Horn River Basin, is apparently an error. The Province clarified in affidavit evidence that the 21 parcels are not located in the Horn River Basin, but rather, the Cordova Embayment Boundary Area. The Horn River Basin is west of the Cordova Embayment Boundary Area (see affidavit of May Mah Paulson, at para. 16)
- The methodology involved interviews with 19 DTFN members, focusing on their historical, current and future use of land in "the portion of the DTFN traditional territory within north eastern British Columbia which may be potentially affected by the proposed land sales" (affidavit pp. 306-307).
- A brief written summary is provided of "landmarks and important resources areas" identified in the interviews (affidavit p. 309), including:

- Thinahtea Lake (Tsu Keh, Women's Lake) - identified as an important harvesting area for hunting, trapping, fishing, berries and medicine.
 - Calendar Creek and Kotcho, June, July, August, February and Midwinter Lakes - identified as prime fishing areas.
 - Midwinter Lake and Wolf Lake - identified as prime trapping areas.
 - Calendar Creek - identified as prime fur bearer habitat.
 - July Lake - identified as an excellent fishing location (jackfish, whitefish, walleye, greyling, and suckers) and as a gathering place, with cabins present. Hunting, berry and medicinal plant harvesting is also prevalent around the lake.
 - Kimea Lake - identified as having trapping potential, and also as a gathering place.
- In addition, areas identified by interviewees as being used for resource harvesting are depicted on individual maps. There is also a composite map which compiles the information from the individual maps (affidavit p. 376).

Non-Project Specific Phase II TLU Data, Dene Tha' First Nation, British Columbia Oil & Gas Commission Funding Deliverable 1.3 2008/2009 (attached to affidavit of May Mah-Paulson, sworn December 12, 2011, Exhibit 7, filed in BC Supreme Court proceedings S108341, Vancouver registry)

- The study was funded through Oil and Gas Commission and was not prepared in relation to a particular project or proposed industrial development (p. 2). The methodology involved interviews with 18 DTFN members, focused on identifying traditional use areas in B.C. Only 11 of the 18 interviewees reported information regarding traditional use in B.C. (pp. 3-4).
- The report consists of written summaries of the 18 interviews, together with a composite map depicting traditional use areas in B.C. The map shows the location of the eight DTFN traplines in B.C., all of which are located in the northeastern corner of B.C. close to the Alberta and NWT borders (p. 8).
- A brief written summary is provided of trapping, hunting and fishing areas identified in the interviews (p. 6), which included:
 - Trapping occurs on trapline #755T014 (mainly in the winter months when travel to this area is easier). Targeted species include: beaver, fisher, mink, fox, coyote, lynx, porcupine, and muskrat.
 - Hunting occurs in the southern portion of the traditional territory near the Doig River First Nation reserves. Targeted species include ducks and moose.

- Fishing occurs to the west of Fort Nelson on the Muskwa River, Fort Nelson River and surrounding creeks (Akua Creek, Pouce Creek and Etane Creek).

EnCana Cabin Gas Plant, Aboriginal Knowledge and Land Use Study, September 18, 2009

- The methodology involved interviews with 60 DTFN members, focusing on DTFN's use of land in northeastern B.C. and specifically in the RAA for the project near Cabin Lake, in the Horn River Basin. Twenty (20) of the interviews that best represented DTFN's use in the vicinity of the project were incorporated into the final report (p. 12)
- The section on "TLUS Limitations" includes the following statement: "The specificity of TLUS mapping often over-shadows the broader environmental context with 'specific' sites that can be singularly represented on a map. As a result, a common response for many interview queries of 'where do you hunt?' is met with a somewhat bewildered response of 'we go everywhere!'" (p. 17). The same statement is included in DTFN's TLUS for the Horn River Mainline Project (described below).

Hunting (p. 34-35)

- Participants noted that any place in B.C. accessible by vehicles is where DTFN members hunt. Specific areas identified by participants included: along Highway 97 from Fort St. John to Fort Nelson; near communities of Doig and Blueberry First Nations; winter access road from Rainbow Lake to Fort Nelson; Forestry Road near Sulphur Lake crossing B.C. Border; along Hay River; highway between Fort Nelson and Fort Liard.
- Specific areas reported as hunting areas within the project RAA included: area south of Kotcho Lake; along Fort Nelson River to Shekilie River towards Kotcho Lake; Kotcho Lake north to July Lake; near Ethithun Lake; Trap Line #756T001 to Fort Nelson; Etsho Plateau.
- Participants reported that DTFN members do not always frequent the same place to hunt moose, but rather follow moose and travel to where they were available.

Trapping (p. 37)

- Areas in northeastern BC where participants reported trapping included: traplines (#755T013, #755T104, #755T015, #756T015, #756T016, #756T014, #756T017, #756T001); along Petitot River; confluence of Shekilie River and Hay River; around Fort Nelson; between Fort Liard and Fort Nelson; near the Doig First Nation community; northeast of July Lake.
- Specific areas reported as trapping areas within the project RAA included: along Rainbow Lake Winter Road to Fort Nelson; in the vicinity of Kotcho Lake; northwest of Kotcho Lake; Etsho Plateau

Fishing (p. 39)

- Areas where participants reported fishing in northeastern B.C. included: Kwokullie Lake; June Lake; July Lake; Muncho Lake; Andy Bailey Lake; Kimea Lake; Ekwan Lake.
- Specific areas reported as fishing areas within the project RAA included: area around Kotcho Lake; Shekilie River north to Kotcho River; Etsho Plateau; Cabin Lake.

NOVA Gas Transmission Ltd., Horn River Mainline Project, Aboriginal Knowledge and Land Use Study, November 4, 2009

- Proposed pipeline project: Located in the Horn River Basin approximately 70 km east of Fort Nelson, BC.
- The TLUS methodology involved interviews with 60 DTFN members, with the objective of identifying “Aboriginal knowledge and traditional land use information in the vicinity of the Project located in northeast British Columbia and within the western portion of Dene Tha’ First Nation traditional territory” (p. 2). Twenty-three of the interviews that best represented DTFN’s use in the vicinity of the project were incorporated into the final report (p. 13).

Hunting (pp. 34-35)

- Current and historic hunting areas in northeastern B.C. identified by participants include: along Hay River; around Kotcho Lake; near the B.C./Alberta border, south of Hay River; Beaver Creek; hills near Tooga Lake; Shekilie River; along the Kotcho River; at the confluence of the Hay River, Kotcho River and Shekilie River; around Kotcho Lake.
- Specific hunting areas in the vicinity of the proposed project include: winter access road from Rainbow Lake to Fort Nelson; trail along the Hay River to Kotcho River to Fort Nelson; south of Mobil road; an area west of Hay Zama, approximately 15km on either side of the B.C./Alberta border; the area from the southern portion of the Etsho Escarpment to Fort Nelson and to the east; “Horn River Area” ranging from Kotcho Lake north to Estine Lake and Kwokullie Lake east approximately 50 km; southern portion of the Etsho escarpment to the Fort Nelson River and east to Hay River; the area of the Little Hay River; along Townsoitoi Creek; along Kyklo Creek; along Sahtaneh Creek; Alberta trapline #88 around the Ekwan Meter Station.

Trapping (pp. 41-42)

- Current and historic trapping areas in northeastern B.C. identified by participants include: traplines (#756T0001; #755T014, #756T015; #756T016; #755T017; #756T017; #755T015); confluence of the Shekilie River and Hay River; around Kotcho Lake; south of Kotcho Lake and east of Fort Nelson; Kwokullie Lake north to July Lake and east to Dickens Lake; Etsho Plateau; along Kotcho River.
- Specific trapping areas in the vicinity of the proposed project include: along Rainbow Lake winter road from Rainbow Lake to Fort Nelson; travel route along the Hay River to

the Shekilie River to Ekwan Lake; along the Little Hay River; along the Hay River; Alberta trapline #88 around the Ekwan Meter Station; along Sahtaneh Creek.

Fishing (pp. 46-47)

- Current and historic fishing areas in northeastern B.C. identified by participants include: Kotcho Lake; Ekwan Lake; Cabin Lake; Shekilie (or Beaver) River; Little Hay River; confluence of Shekilie and Hay Rivers; confluence of Kotcho and Hay Rivers; confluence of Hay, Shekilie and Kotcho Rivers.
- Specific fishing areas in the vicinity of the proposed project include: Hay River; Little Hay River; Townsoitoi Creek; Kyklo Creek; Sahtaneh Creek.

TransCanada Pipelines Limited, Proposed Northwest System Expansion Projects, Dene Tha' Traditional Land Use, Concerns and Mitigation Measures, Alberta Portion, October 18, 2011, and BC Portion, October 18, 2011

- Proposed project: 365 km of pipeline and two compressor stations in northwestern Alberta and northeastern B.C.
- DTFN completed traditional use studies for the “Alberta portion” and “B.C. portion” of the proposed project. The methodology for both studies involved interviews with 45 DTFN members. Information provided by interviewees included:
 - Dene Tha’ hunt and trap extensively in the area southwest of Hay-Zama lakes, particularly in the area bounded by the Hay River (p. 35).
 - The dominant activity undertaken during the winter by the Dene Tha’ is moose hunting by truck and all-terrain vehicles (ATVs or quads), whereby many Dene Tha’ hunt moose from winter-only access roads, cutlines, seismic lines, power transmission lines and other anthropogenic created linear disturbances (p. 16).
 - With the moderation of temperatures in late March-early April, many Dene Tha’ trappers would return to their trapping areas to hunt beaver/muskrat/otter for a month or more. While some Dene Tha’ no longer participate in the spring beaver/rat hunt, many still do. These animals are hunted/trapped until about mid-May (p. 16).
 - Moose are also hunted in the summer by vehicle, ATV and foot access on land as far south as the Sulphur Lake/Clear Hills/Worsely/Doig area; east as Dixonville/Hawk Hills area; north as the NWT border; and west as Ft. Nelson/Liard Highway (p. 17).
 - Many Dene Tha’ hunt moose, deer, ducks, bear, grouse (chickens), rabbits and other small game by canoe/kicker along the Chinchaga, Hay and Meander rivers each summer. (p. 17)

- Dene Tha' make extensive use of the Chinchaga Forestry Road every year to hunt moose, particularly in the late summer and early fall (August and September), often travelling as far as its western terminus near Tanghe Creek. (p. 22)
- In the fall (October/November), the most heavily used fall moose hunting areas are southwest of Hay-Zama lakes to the BC border on either side of the Chinchaga Forestry Road, and from Sulphur Lake to the Doig River Reserve in BC. Some Dene Tha' continue to hunt moose by canoe/kicker along the Hay and Chinchaga rivers. Moose are hunted as far away as Ft. Nelson, Ft. Liard, Trout Lake and the NWT border. (p. 19).
- Geese and duck hunting occurs during the summer along rivers with boats/canoes along rivers, often in conjunction with other species, and around lake shores, particularly Hay-Zama lakes (p. 17). Geese and ducks, most notably around the Hay-Zama lakes complex, are also hunted every fall (p. 19).
- Fishing is a popular winter activity, especially around Hay-Zama lakes, including the Chinchaga, Amber, and Sousa rivers forks. Fish are also taken in the winter at Rainbow Lake, and as far away as Bistcho Lake, Ekwan Lake, Petitot River, and the Kutcho/Shikilie forks (p. 16).
- Hay-Zama lakes, Rainbow Lake and the Chinchaga, Amber and Shekilie forks long the Hay River remain the most popular fishing locations for the Dene Tha' in the spring (p. 17).
- Rainbow (Long) Lake and Hay-Zama lakes, particularly the Amber, Chinchaga and Sousa rivers forks, are the most heavily fished areas in during the summer (p. 18).

Site C Project, Traditional Land Use Study, October 22, 2012

- The methodology for the TLUS involved interviews with 20 DTFN members, focusing on harvesting activities in the following locations:
 - Specific Study Area - the north side of the Peace River extending approximately 30 kilometres north and then east from the Halfway River in B.C. to the Peace River in Alberta north of Silver Hills.
 - General Study Area - the lower fifth of Dene Tha' traditional territory, located south of the Notikiwen River and extending to the Peace River (referred to in the TLUS as the Sulphur Lake-Boundary Lake hunting corridor).
- DTFN provided information regarding the General Study Area "for the explicit purpose of placing Dene Tha' land use and occupation within the Specific Study Area in proper historical, cultural and geopolitical context" (p. 2).

- Traditions Consulting, in its summary in answer to Question 5 (relating to activity outside the LAA & RAA for current use) states:
 - Within the General Study Area, Dene Tha' hunt from Deadwood, Alberta, to Cecil Lake, British Columbia, including the region of the Clear Hills, Alberta (p. 2)
 - The area bounded by the Notikewin-Doig River headwaters in the north, the Peace River in the south, the Mackenzie Highway in the east, and the Fort Nelson to Liard Highway in the west is one of the main areas that the DTFN depend on for moose. Most hunting activity is centred around the base, slope and plateau of the Clear Hills escarpment, but some hunting occurs as far south as Rycroft and Spirit River (p. 11)
 - The area between Sulphur Lake, Alberta and Goodlow, British Columbia (Sulphur Lake-Boundary Lake hunting corridor) is considered by DTFN hunters to be a relatively pristine area that is not heavily used by others. Cabins or camps in the area are used on a recurring basis. DTFN hunters return to the area multiple times in a year for stays that extend from two days to nearly two weeks (pp. 11-12)
 - DTFN members hunt moose in the area north of Fort St. John and east of Charlie Lake, and on either side of the Alaska Highway from Fort St. John to Fort Nelson (pp. 17, 19)
 - Within the General Study Area, ducks and geese are hunted in the fall on the Peace River to the east and north of Manning, Alberta; around Cardinal Lake, Alberta; and in farmers' fields in the Clear Hills (p. 19)
 - Dene Tha' do not fish intensively in the General Study Area because there is better fishing closer to Dene Tha' reserves. There is some fishing in Charlie Lake, in Sulphur Lake, Alberta, and on the Peace River east of Manning, Alberta (pp. 17-18)

Duncan's First Nation

Nova Gas Transmission Ltd., Watino Crossover and Calais Extension Pipeline Project, December 2010

- Moose, elk and deer are hunted by DFN in Birch Hills, northwestern Alberta (p. 8).

Site C Project, Traditional Land Use Survey 2011, Community and Public Report, November 2011

- The TLUS consists of maps of kill sites for species of mammals, birds and fish that are targeted by DFN.

- The geographic scope of the TLUS is a large area in northeastern BC and northwestern Alberta. The area chosen “was large enough to capture the majority of community members use of lands” (p. 14).
- Traditions Consulting summarized the findings of the TLUS in its summary included in Volume 5 Appendix A4 of the EIS. Harvesting activities depicted in the maps, as summarized by Traditions, include:
 - Deer: Kill sites are concentrated in the area of Peace River Wildlands and north to Cardinal Lake, Alberta, and east of the town of Peace River, Alberta. In total, 155 kill sites are recorded, including two in the Current Use of Lands and Resources RAA.
 - Moose: Kill sites are concentrated in the area of Peace River Wildlands, and to the north on both sides of the Peace River in Alberta. In total, 649 kill sites are identified, including two in the Current Use of Lands and Resources LAA and 20 in the Current Use of Lands and Resources RAA.
 - Elk: Kill sites are more dispersed, with the majority depicted north of the Peace River in Alberta. In total, 73 kill sites are identified, including two in the Current Use of Lands and Resources RAA
 - Birds: Kill sites are concentrated in the area of Cardinal Lake, Alberta and in the area of the main DFN Indian Reserve. Other kill sites are dispersed to the north and to the east of the town of Peace River, Alberta. In total, 174 kill sites are identified, including three in the Current Use of Lands and Resources RAA.
 - Fish: In total, 363 kill/catch sites are identified, including 10 in the Current Use of Lands and Resources LAA and a large number in the Current Use of Lands and Resources RAA. Outside of the LAA/RAA, kill/catch sites are dispersed generally north and west of the Peace River.
- No information on trapping is provided in the TLUS.

Horse Lake First Nation

NOVA Gas Transmission Ltd., Groundbirch Mainline Project, Final Update Report on Traditional Land Use Studies, June 2010

- HLFN members hunt moose, elk and deer, as well as smaller game such as snowshoe hare and grouse, in the Saddle Hills area of Alberta (p. 6)

Site C Project, Traditional Land Use Survey 2011, Community and Public Report, January 2012

- The geographic scope of the TLUS is a large area in northeastern BC and northwestern Alberta. The area chosen “was large enough to capture the majority of community members use of lands” (p. 15)

- The TLUS consists of maps of kill sites for species of mammals, birds and fish that are targeted by HLFN members. Traditions Consulting summarized the findings of the TLUS in its summary included in Volume 5 Appendix A4 of the EIS. Harvesting activities depicted in the maps, as summarized by Traditions, include:
 - Moose: Kill sites are concentrated in the area east of Dawson Creek in Alberta and south of Dawson Creek on both sides of the border, with a smaller concentration in the Clear Hills in Alberta. In total, 1,642 kill sites are identified, including two in the Current Use of Lands and Resources LAA and 18 in the Current Use of Lands and Resources RAA.
 - Elk: Kill sites are concentrated in the areas east and south of Dawson Creek in Alberta. In total, 274 kill sites are identified, including two in the Current Use of Lands and Resources LAA and four in the Current Use of Lands and Resources RAA.
 - Deer: Kill sites are concentrated in the areas east and south of Dawson Creek in Alberta. In total, 102 kill sites are identified, including one in the Current Use of Lands and Resources LAA and eight in the Current Use of Lands and Resources RAA.
 - Birds: Kill sites are concentrated in areas east and south of Dawson Creek in Alberta. In total 455 kill sites identified, including one unidentified bird kill in the Current Use of Lands and Resources RAA.
 - Fish: In total, 859 kill/catch sites are identified, both within and outside of the LAA/RAA for Current Use of Land and Resources. Outside of the LAA/RAA, kill sites are depicted south of Dawson Creek on both sides of the Alberta/B.C. border. There are small concentrations of kill/catch sites on the western ends of Lesser Slave Lake and Utikuma Lake in Alberta.
- No information is presented in the TLUS on trapping.