17. ASSESSMENT OF CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES EFFECTS

17.1 INTRODUCTION

This chapter assesses the potential effects of the Murray River Coal Project (the Project) during the Construction, Operation, Decommissioning and Reclamation, and Post Closure phases on the current use of lands and resources for traditional purposes by Aboriginal groups, hereafter referred to as "Current Aboriginal Use."

The Aboriginal groups considered in the chapter are based on the direction provided by the Section 11 order issued by the British Columbia Environmental Assessment Office (BC EAO) and the EIS Guidelines issued by the Canadian Environmental Assessment Agency (CEA Agency). The Section 11 order directs the Proponent to consult with the West Moberly First Nations (WMFN), Saulteau First Nations (SFN), and McLeod Lake Indian Band (MLIB). Section 9.2 of the EIS Guidelines directs the Proponent to hold meetings and make key EA summary documents (baseline studies, EIS and key findings) available to the Blueberry River First Nations (BRFN), MLIB, SFN, WMFN and the Horse Lake First Nation (HLFN). The EIS Guidelines also direct the Proponent to make key EA summary documents (draft/final EIS and key findings) accessible and make plain language summaries of these documents available to the Doig River First Nation (DRFN), Fort Nelson First Nation (FNFN), Halfway River First Nation (HRFN), Prophet River First Nation (PRFN), Kelly Lake Métis Settlement Society (KLMSS) and Métis Nation BC (MNBC). Subsequent to the issuance of the EIS Guidelines, the CEA Agency notified the Proponent on October 28, 2013 that Sucker Creek First Nation (SCFN) should be consulted based on their assertion that their Treaty 8 rights and related interests may be affected by the Project. Consultation requirements with the SCFN are the same as the DRFN, FNFN, HRFN, PRFN, KLMSS and MNBC.

The assessment of effects on Current Aboriginal Use is informed by the assessment of potential effects on valued components (VCs) related to fish and fish habitat, surface water quality, wildlife, terrestrial ecosystems, heritage, navigation and human health.

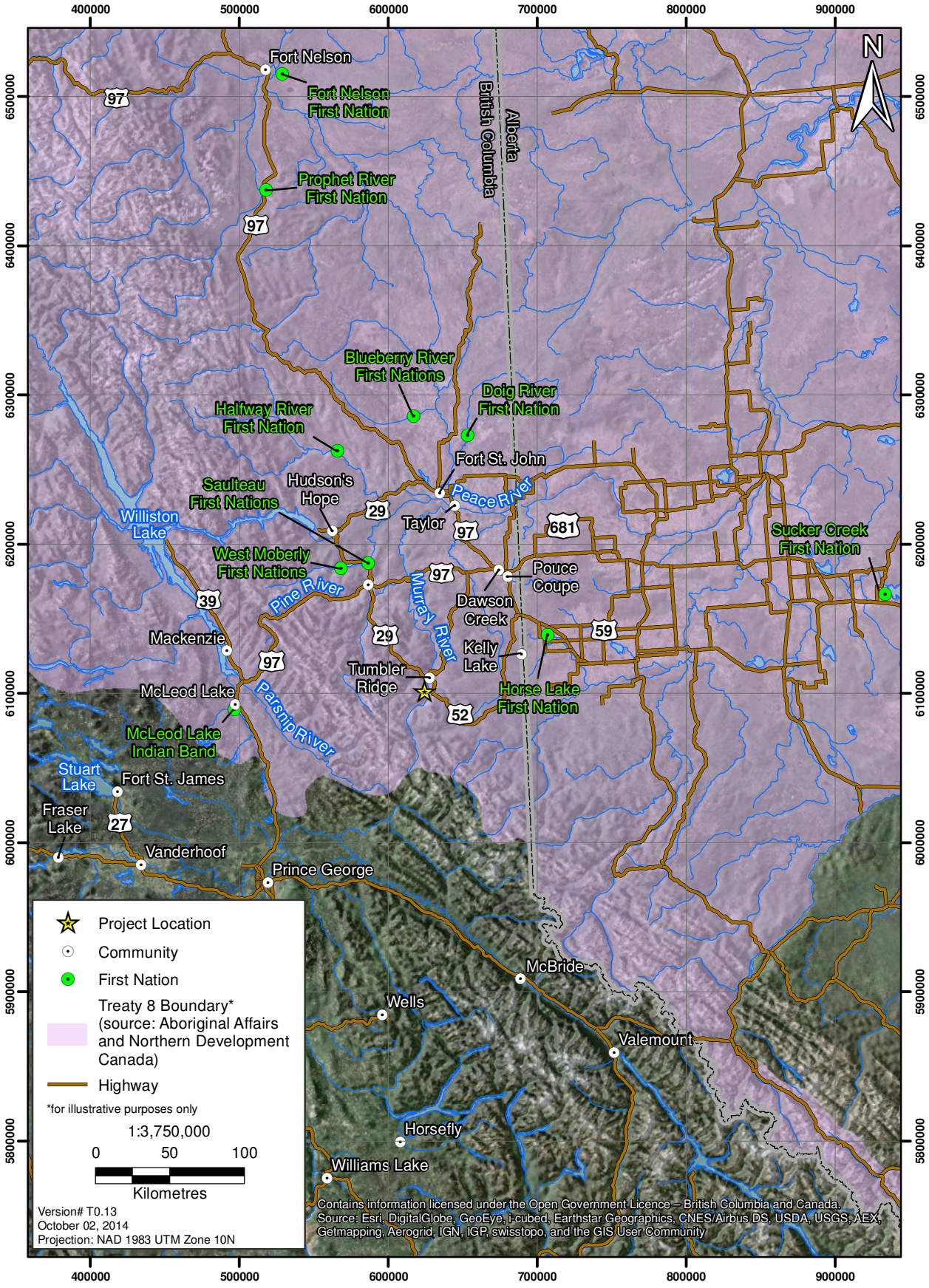
17.2 REGULATORY AND POLICY FRAMEWORK

17.2.1 Treaty 8

The Project is located within Treaty 8 (Figure 17.2-1). Except for the KLMSS and the MNBC, all Aboriginal groups identified in the Section 11 order and EIS Guidelines are Treaty 8 First Nations. Concluded in 1899, Treaty 8 is one of 11 numbered treaties negotiated between Canada and First Nations between 1871 and 1921. Treaty 8 covers 324,900 square miles and encompasses 39 First Nations communities within four provincial and territorial administrations: 23 Alberta First Nations; three Saskatchewan First Nations; six Northwest Territory First Nations; and eight British Columbia First Nations (BC MARR and Council of Western Treaty 8 Chiefs 2008).

Figure 17.2-1

Treaty 8 First Nations Considered in the Assessment



Treaty 8 provides Treaty 8 First Nations with the right to carry out their "usual vocations" of hunting, fishing, and trapping within the Treaty 8 area. This right is protected by section 35 of the *Constitution Act*, 1982, and is subject to the right of the Crown to "take up" lands for settlement, mining, lumbering, trading or other purposes.

17.2.2 Dawson Creek Land and Resource Management Plan

The Project is located within the boundaries of the Dawson Creek LRMP, which guides resource management activities on Crown land within the Dawson Creek Forest District[1] (totalling 2.9 million hectares [ha])in northeastern BC (Dawson Creek LRMP Working Group 1999b). The LRMP was approved by the Province in March 1999.

The Dawson Creek LRMP is divided into 12 resource management zones (RMZs) based on resource values, economic activity, environmentally important areas, and Agricultural Land Reserve boundaries. The LRMP also identifies several principles which provide General Management Directions (GMDs) and establishes 16 new Protected Areas, encompassing over 180,000 ha or approximately 6% of the LRMP area. GMDs relevant to Current Aboriginal Use are outlined in Table 17.2-1.

Table 17.2-1. Dawson Creek LRMP General Management Directions Relevant to Current Aboriginal Use

General Management Direction	Objectives
First Nations	• Recognize and avoid unjustifiable infringement of Aboriginal and Treaty rights. • Provide opportunities for the pursuit of traditional uses. • Enhance First Nations participation in resource planning.
Culture and Heritage	• Recognize and conserve cultural heritage resources. • Provide opportunities for the enjoyment of spiritual and cultural values. • Recognize and conserve significant heritage resources (e.g., paleontological features).
Fish and Wildlife	• Sustain and manage wildlife habitat for red, blue and yellow-listed species. • Sustain and manage fish and water quality for red, blue and yellow-listed species. • Provide opportunities for the sustainable harvest of fish and wildlife resources. • Sustain and manage wildlife and critical wildlife habitat to reduce wildlife-agriculture/range conflicts. • Sustain and manage habitat for resident and migratory wildlife species.
Trapping	• Recognize existing trapping tenures, manage furbearer habitats and populations and provide long-term opportunities for trapping. • Recognize trapping and the use of trapping areas as a way of life and of special year-round cultural significance to First Nations.

(continued)

[1] Excluding the Kakwa Recreation Area.

Table 17.2-1. Dawson Creek LRMP General Management Directions Relevant to Current Aboriginal Use (completed)

General Management Direction	Objectives
Access	• Sustained access management – intends to support existing and ongoing managed means access. • Optimum access management – addressing both preservation and enhanced resource development. • Sensitive access management – identifying key resource features and the means for their conversation through limitation or specific conditions for development.

17.2.3 *Canadian Environmental Assessment Act, 2012*

Section 5(1)(c) of the *Canadian Environmental Assessment Act, 2012* (2012b) requires that: "for the purposes of this Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are […] (c) with respect to Aboriginal peoples, an effect occurring in Canada of any change that may be caused by the environment on […] (iii) the current use of lands and resources for traditional purposes." Section 10.1.3 of the EIS Guidelines identifies this requirement, and the chapter has been prepared to meet this requirement.

17.3 REGIONAL OVERVIEW

On the Rocky Mountain and Peace foothills landscapes that characterize northeastern BC, Aboriginal peoples have developed similar cultural and social adaptations throughout history, including patterns of community organization and land and resource use practices. Aboriginal people traditionally followed a seasonal round, which involved harvesting resources as they were available at different times of the year. Ethnographers have identified common seasonal cycles, hunting methods, and ceremonies among the Tsek'ehne (Sekani), Dane-zaa (Beaver), Cree, Saulteaux[2] and Métis ethnolinguistic groups, from which the Aboriginal groups in the area descend. Significant events in these seasonal cycles included the gathering of regional groups during the summer months to fish and engage in social activities, and the dispersion into smaller groups during the fall and winter to hunt moose, caribou, and bison, where available.

Hunting and trapping has been central to the economic life of Aboriginal groups inhabiting the upper Peace River drainage. Historically, land throughout the region was used for hunting and trapping. Moose were typically hunted by spearing them in deep snow. Caribou were driven into pounds or shot with bows and arrows at stream crossings. Snares and other traps were generally used for smaller mammals and birds.

In the Peace Region whitefish, trout, suckers and other fish were traditionally caught using spears, hooks, nets and weirs in the summer. Ice fishing was common in the winter.

[2] The Saulteau First Nations dropped the 'x' from their name following their migration to BC from Manitoba in the early 1900s. However, the spelling of the ethnolinguistic group from which they originate is still spelled with an 'x.'

Aboriginal groups in the Peace Region relied on food plant resources, including a variety of berries, edible tubers and bulbs, and cambium from trees such as lodgepole pine. The bark and wood of various trees were used to create baskets and other implements, while rushes and riparian grasses were used for weaving. Today, berries and medicinal plants still play an important role in the lives of Aboriginal groups discussed in this chapter.

First Nations and Métis peoples travelled through the upper Peace River drainage between communities to reach hunting grounds, traplines, lakes or streams, and trading posts. The shore of Peace River was an overland route between the Alberta Plains and the Rocky Mountains of BC, and Highway 97 now runs through Pine Pass. There are historical trails throughout the region, including through the Flatbed valley to the Wapiti River, and along the Monkman Pass to the Fraser headwaters.

17.4 BASELINE STUDIES

17.4.1 Information Sources and Consultation

Information related to Current Aboriginal Use was collected between March 2012 and October 2014.

17.4.1.1 Secondary Information Sources

An ethnographic literature review and a desk-based Traditional Knowledge and Traditional Use (TK/TU) study regarding WMFN, SFN, and MLIB was conducted in order to provide regional context on broader cultural and land use trends and, where available, to detail site-specific current uses in the vicinity of the Project. Subsequent to the CEA Agency's identification of HLFN and BRFN at the high end of the consultation spectrum in July 2013, the Proponent expanded the ethnographic literature review and a desk-based TK/TU study to include HLFN and BRFN. This information is described in the *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report* (Appendix 17-A). Additional literature review of publically available secondary source information was initiated in September 2014 to identify use of lands and resources near the Project by DRFN, HRFN, PRFN, MNBC, and SCFN.

Secondary information was collected from the following sources:

- Treaty 8 and related treaty documents, including academic literature (e.g., Government of Canada 1966; Fumoleau 1976; Madill 1986; Mair 1999);
- Ethnohistorical and anthropological literature (e.g., Goddard 1916; Jenness 1937; R. Ridington 1968; Mandelbaum 1979; Denniston 1981; R. Ridington 1981; Slobodin 1981; Smith 1981; Michael Robinson 1983; Harris 1984; Darnell 2001; R. Ridington 2008);
- Literature associated with the Northeast British Columbia Land Use and Occupancy Study (Weinstein 1979; UBCIC 1980; Brody 1981);
- Local histories of the Peace River region (e.g., MacGregor 1952; Bowes 1963; Calverley 1980; Leonard 1995; Helm 2000, 2001, 2008); and

- EA Applications of other projects located in the vicinity of the proposed Project (e.g., Terrane 2008; Golder Associates 2009; TMW 2009; PRCI 2010; Finavera 2011b; Kennedy 2011; Bouchard and Kennedy 2012; Davison and Danda 2012; A. Ridington 2013).
- Publically available internet and print materials prepared by Aboriginal Affairs and Northern Development Canada (AANDC 2014), and the Ministry of Aboriginal Relations and Reconciliation (MARR n.d.);
- Publically available internet and print materials prepared by Aboriginal groups and Aboriginal organizations (e.g., KLMSS 2010; Nesoo Watchie 2011; MLIB 2012; WMFN 2012)

A bibliography of sources reviewed for a *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report* is provided at the end of Appendix 17-A. Additional references are also provided at the end of this chapter from research conducted after the completion of the *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*.

A draft of the *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report* was provided to WMFN, SFN, and MLIB on November 1, 2012 for their review and comment. The Proponent asked WMFN, SFN, and MLIB to identify information gaps, inaccuracies and/or concerns and to provide additional information with respect to their TK/TU. Extracts of the draft report relating to HLFN's current use of lands and resources were provided to HLFN on October 23, 2013 for its review and comment. The Proponent asked HLFN to review the information to verify its accuracy and to identify any information gaps that may exist. Extracts of the draft report relating to BRFN's current use of lands and resources were provided to BRFN on March 3, 2014 for its review and comment. The Proponent asked BRFN to review the information to verify its accuracy and to identify any information gaps that may exist.

WMFN replied to the Proponent on December 14, 2012, indicating that the draft report is not reflective of WMFN and recommending that WMFN undertake their own TK/TU study. Details regarding the proposed study are located in Section 17.4.1.2. SFN did not comment on the draft TK/TU study. Details regarding SFN's Knowledge and Use Study are located in Section 17.4.1.2. MLIB did not comment on the draft TK/TU study. Details regarding primary TK/TU research with MLIB are located in Section 17.4.1.2. HLFN did not comment on extracts related to the draft TK/TU study. BRFN did not comment on extracts related to the draft TK/TU study.

17.4.1.2 Primary Information Sources

Prior to the issuance of the EIS Guidelines in July 2013, the Proponent worked with WMFN, SFN, and MLIB to collect primary information related to Aboriginal land use in the vicinity of the Project.

<u>West Moberly First Nations</u>

The Proponent sent a letter to WMFN on April 17, 2012 requesting a meeting with Chief and Council to discuss engagement of WMFN in human environment baseline studies, including TK/TU studies. The Proponent followed up on this request on May 29, 2012, June 18, 2012, July 4, 2012, August 9, 2012, and September 5, 2012. The Proponent met with WMFN's Land Manager on September 6, 2012 to discuss collection of human environment baseline information, including TK/TU information.

As noted in Section 17.4.1.1, WMFN indicated on December 14, 2012 its preference to conduct its own TK/TU study. As noted in Section 17.4.1.1, the Proponent provided WMFN with a draft *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report* on November 1, 2012 for its review and comment. The Proponent contacted WMFN regarding TK/TU research on December 21, 2012, January 10, 2013, and February 15, 2013. On March 18, 2013, WMFN reiterated its preference to identify a consultant of its choosing to undertake a primary TK/TU study. To date, the WMFN has not initiated a TK/TU study. The Proponent will discuss TK/TU information provided by WMFN, if any, during the Application/EIS review stage.

McLeod Lake Indian Band

The Proponent sent a letter to MLIB on April 17, 2012 requesting a meeting with Chief and Council to discuss engagement of MLIB in human environment baseline studies, including TK/TU studies. The Proponent met with MLIB on June 19, 2012 and July 12, 2012 to introduce its human environment baseline research program, including TK/TU research, and to request guidance on how to proceed to gather the required baseline information. The Proponent followed up with MLIB on September 5, 2012 to ask MLIB's preferences for engagement with respect to the collection of TK/TU information. In response to MLIB's request, the Proponent held a community information session with MLIB on October 1, 2012 to introduce the Project and research programs, including TK/TU research. On October 4, 2012, the Proponent provided MLIB with information regarding the human environment baseline study program information requirements, including TK/TU research. On October 31, 2012, MLIB informed the Proponent that Chief and Council would like to meet with the Proponent before considering the research request. The Proponent requested a meeting with Chief and Council on October 31, 2012.

As noted in Section 17.4.1.1, the Proponent provided MLIB with a copy of the draft TK/TU report on November 1, 2012. On January 10, 2013, the Proponent provided MLIB with a draft TK/TU research plan for its review and comment. The Proponent followed up with MLIB on the draft TK/TU research plan on January 17, 2013. On February 2, 2013, MLIB informed the Proponent that it had accepted the draft TK/TU research plan, but that the study could not go ahead until a MOU, which includes a confidentiality clause, is in place between MLIB and the Proponent. The Proponent followed up with MLIB regarding TK/TU research and MLIB agreed to identify community members and elders who might participate in the study and review draft TK/TU interview questions. On April 5, 2013, MLIB informed the Proponent that MLIB did not wish to go ahead with the TK/TU study as outlined, but would conduct its own TK/TU study and provide the results to the Proponent. On April 5, 2013, the Proponent requested a written decision from MLIB regarding the proposed TK/TU research study. The Proponent attempted to follow up with MLIB regarding the TK/TU study decision on April 16, 2013, April 24, 2013, April 25, 2013, April 30, 2013 and May 1, 2013.

The Proponent met with MLIB on May 16, 2013 to discuss the human environment baseline research program, including TK/TU studies. MLIB informed the Proponent that it would reconsider the original TK/TU research plan provided by the Proponent, but that research could not be undertaken until a MOU is in place between MLIB and the Proponent which includes a capacity and confidentiality clause. MLIB informed the Proponent that the draft MOU had yet to be reviewed by Chief and Council. The Proponent attempted to follow up with MLIB on the human environment baseline research program, including TK/TU studies on May 29, 2013, June 18, 2013, June 19, 2013,

June 24, 2013, June 28, 2013, and July 16, 2013. On July 25, 2013, the Proponent requested to meet with MLIB to discuss the current status of the MOU and next steps for the human environment baseline research program, including TK/TU studies. The Proponent followed up on the meeting request on July 26, 2013, July 29, 2013, July 30, 2013, and September 4, 2013. MLIB provided the Proponent with a draft MOU on September 5, 2013 for its review and comment. The Proponent provided a revised MOU to MLIB on November 25, 2013. In its response, MLIB indicated that MLIB would request funding to undertake a traditional use study with respect to the Project.

The Proponent attempted to follow up with MLIB on the human environment baseline research program, including TK/TU studies, on November 6, 2013 and November 8, 2013. On December 9, 2013, MLIB indicated that it would provide the Proponent with a scope of work for the traditional land use study upon completion of the MOU negotiations. The Proponent attempted to follow up with MLIB on the human environment baseline research program, including TK/TU studies, on January 3, 2014. To date, the MOU has not been finalized and the Proponent has not received a scope of work for the proposed TK/TU study. The Proponent will discuss TK/TU information provided by MLIB, if any, during the Application/EIS review stage.

Saulteau First Nations

The Proponent sent a letter to SFN on April 17, 2012 requesting a meeting with Chief and Council to discuss engagement of SFN in human environment baseline studies, including TK/TU studies. The Proponent met with SFN Councillors and lands staff on July 13, 2012 to provide a Project update, introduce the human environment baseline research program, including TK/TU research, and to request guidance on how to proceed to gather the required baseline information. SFN indicated its preference to initiate a land use study with a consultant of its choosing (the Firelight Group), and that it would request capacity funds to undertake the study. The Proponent held a conference call with SFN and the Firelight Group on October 11, 2012 to discuss the scope of the traditional land use study.

As noted in Section 17.4.1.1, the Proponent provided SFN with a draft *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report* on November 1, 2012 for its review and comment. The Proponent met with SFN Chief and Council and Lands staff on November 22, 2012 to discuss a variety of issues, including the traditional use study. The Proponent met with SFN Chief and Council on March 26, 2013 to discuss a variety of issues, including the SFN knowledge and use study. SFN provided the *Saulteau First Nations Knowledge and Use Study* to the Proponent on May 1, 2014. The Proponent met with the SFN Land Use Office in the SFN community on May 21, 2014 to review the results of the study and to discuss how the results may be integrated into the Application/EIS. The findings from the SFN Knowledge and Use Study are integrated into this chapter and Chapter 20. The *Saulteau First Nations Knowledge and Use Study* is appended to this chapter (Appendix 17-B).

Horse Lake First Nation

The Proponent met with the President of the HLFN Industrial Relations Committee on October 16, 2013 to provide an overview of the Project and to discuss HLFN's interests. The Proponent provided HLFN with an information package including a Project Description, EIS Guidelines, BC EAO

Application Information Requirements, and a list of studies to be completed. HLFN provided the Proponent with a letter on October 23, 2013, outlining its interests and concerns. The letter states that HLFN members use the Project area for hunting, fishing, trapping, and gathering activities. The Proponent will discuss TK/TU information provided by HLFN, if any, during the Application/EIS review stage.

Blueberry River First Nations

The Proponent met with the BRFN Chief and Council on October 15, 2013 to provide an overview of the Project and to discuss BRFN's interests. The Proponent provided BRFN with an information package, including a Project Description, EIS Guidelines, BC EAO Application Information Requirements, a list of studies to be completed, and the BC EAO First Nations Consultation Plan. During the meeting, BRFN indicated that it was not interested in undertaking TK/TU research with respect to the Project. BRFN wrote a letter to the CEA Agency on October 16, 2013 indicating that Chief and Council were pleased with the discussion and that consultation with BRFN can commence. The Proponent will discuss TK/TU information provided by BRFN, if any, during the Application/EIS review stage.

Additional Consultation with Aboriginal Groups

On April 25, 2014 the Proponent wrote to SFN, WMFN, MLIB, BRFN, HLFN, DRFN, FNFN, HRFN, PRFN, SCFN, KLMSS, and MNBC to provide them with: a 1) plain language summary of the Project; and 2) a document outlining a) the Proponent's understanding of each Aboriginal groups' treaty and Aboriginal rights and related interests that may be affected by the Project, b) the Proponent 's understanding of issues and concerns about the Project raised by each Aboriginal group, c) environmental assessment topics related to each group's Aboriginal and treaty rights and related interests, and d) the Proponent's proposed methods to assess potential effects of the Project on each Aboriginal group's Aboriginal and treaty rights and related interests. Aboriginal groups were requested to review the materials and to provide any comments to the Proponent prior to submission of the Application/EIS so that those comments could be addressed and integrated into the submission. The Proponent received responses from MNBC, KLMSS, and HLFN (See Chapter 2). The Proponent is currently following up with MNBC to determine whether its members exercise Aboriginal rights in the Project area. The KLMSS did not raise any concerns about the Proponent's characterization of Metis' rights in the Project area, nor about the Proponent's proposed assessment methods. HLFN requested the Proponent to fill out the HLFN Project Notification Form and to provide further information regarding the Project. The Proponent has followed up with HLFN to receive the required forms.

17.4.2 Study Areas

The draft *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report* (Appendix 17-A) and subsequent secondary source research considered Current Aboriginal Use within a Local Study Area (LSA) and Regional Study Area (RSA). The LSA is approximately 2,276 km^2 and surrounds the Project (Figure 17.4-1). The LSA was delineated to encompass the area where Project components and activities are likely to interact with current Aboriginal uses. The LSA captures the area where the majority of direct and indirect effects to lands and fish, wildlife and plant

resources utilized by Aboriginal groups are anticipated. Ecological factors such as height of land and watershed boundaries, which can act as barriers to movement, were considered when selecting the LSA boundary. Species information, such as home range, habitat use, and seasonal movement patterns, were also considered. The LSA also captures potential Project interactions with access routes and the sensory environment for current Aboriginal uses. Potential access routes with which the Project may interact include sections of the Murray River and the Murray River Forest Service Road. The sensory environment for current Aboriginal use includes the extent of the area where visual and auditory interactions with land users are likely, as defined in Chapter 18: Assessment of Health Effects.

The RSA is approximately 42,913 km^2 and is bounded in the north by the Peace River, in the east by the Alberta border, and in the south and west by the Continental Divide (the height of land separating the Pacific and Arctic drainages). The boundary of the RSA is based on the broad traditional migration, travel, and settlement patterns of Aboriginal people throughout the Peace River region of British Columbia (Figure 17.4-1).This area is intended to capture broad potential effects on current Aboriginal use patterns that may occur outside of the LSA.

17.4.3 Resource Use by Aboriginal Groups

Tables 17.4-1 to 17.4-3 identifies fish, wildlife and plant resources harvested by the WMFN, SFN, MLIB, BRFN, HLFN and Métis based on the TK/TU study undertaken by the Proponent, other EA Applications, and publically available reports. The tables are intended to provide a representative sample of the resources available in the RSA and valued by Aboriginal groups considered in this assessment. The tables are not intended to be an exhaustive list of all resources used by all Aboriginal groups.

17.4.4 McLeod Lake Indian Band Current Use of Lands and Resources

Information summarized in this section is based on information collected during consultation with MLIB (see Section 17.4.1 and Chapter 2: Information Distribution and Consultation) and from secondary information sources (see Section 17.4.2 and Appendix 17A: *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*). Key secondary materials reviewed include Jenness (1937); Denniston (1981); Harris (1984); Davis (2007); R. Ridington (2008); Golder Associates (2009); TMW (2009); PRCI (2010); Finavera (2011b, 2011a); MWE (2013); A. Ridington (2013); Stantec (2013b); and Traditions Consulting Services (2013b). Figure 17.4-2 identifies MLIB traditional and current use locations in relation to MLIB reserves, MLIB traditional territory (McLeod Lake Indian Band nd), and the LSA and RSA.

17.4.4.1 Current Fishing

MLIB members harvest fish in the spring and summer at a number of locations, including the headwaters of the Parsnip River and Tabor Lake; Phillip Lake, Nation Lake, McLeod Lake, Summit Lake and Dinosaur Lake; and the Peace and Halfway rivers. Char, burbot, and suckers are harvested from Summit Lake, and burbot is harvested from McLeod Lake (both outside of the RSA; Terrane 2008).

Figure 17.4-1
Ethnographic Overview and Traditional Knowledge / Traditional Use Study Areas

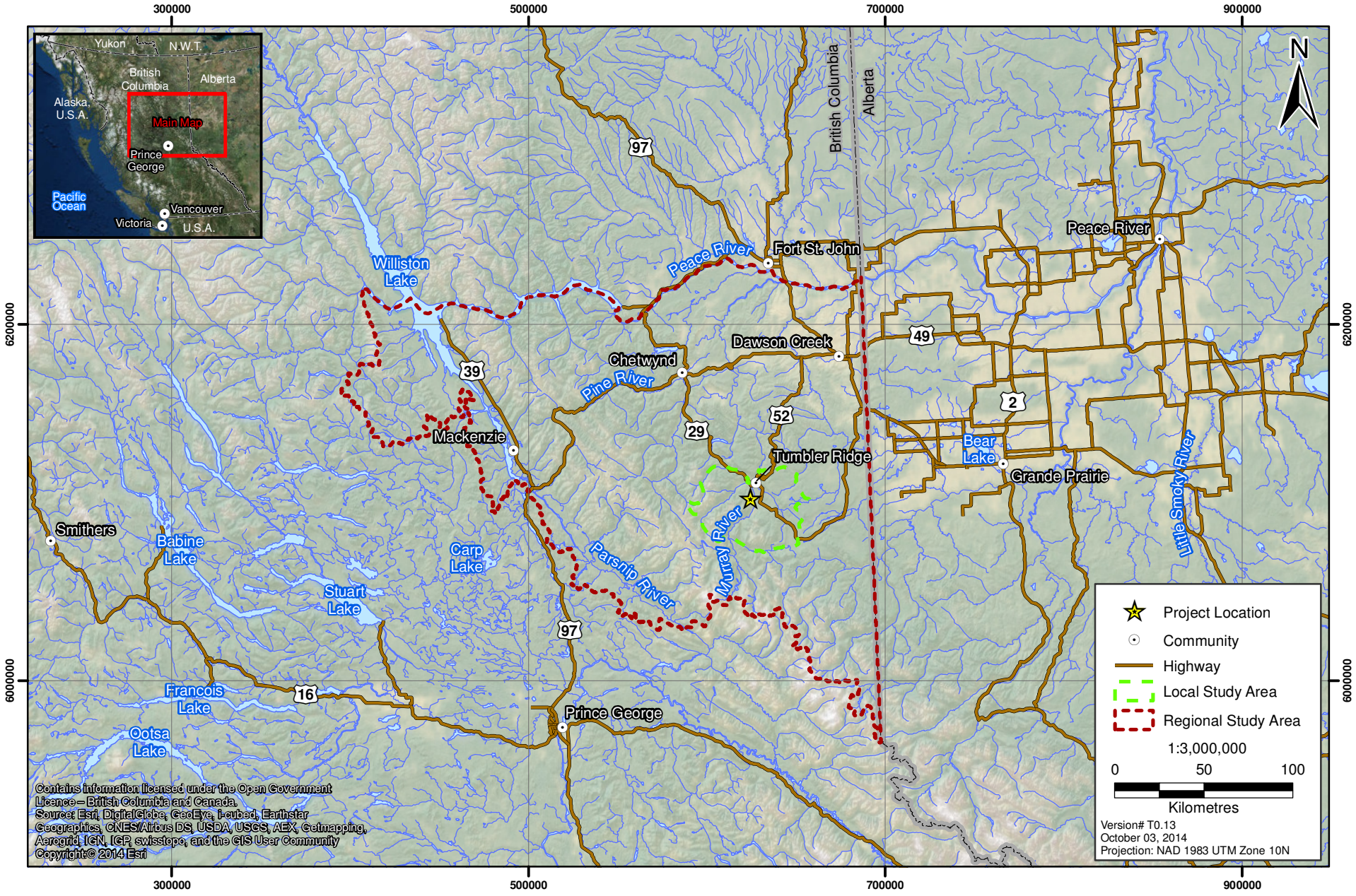


Table 17.4-1. Fish Resources Harvested by Aboriginal Groups in the Regional Study Area

Species	MLIB	SFN	WMFN	BRFN	HLFN	Métis
Rainbow Trout	✓	✓	✓	✓	✓	✓
Bull Trout	✓	✓	✓	✓	✓	✓
Lake Trout	✓	✓	✓			
Trout Other	✓	✓	✓			
Dolly Varden	✓	✓	✓	✓	✓	✓
Jackfish (Northern pike)		✓	✓	✓	✓	
Whitefish	✓	✓	✓	✓	✓	
Grayling	✓	✓	✓	✓	✓	
Burbot (Lingcod)	✓	✓	✓	✓	✓	
Pickerel/Walleye				✓	✓	✓
Kokanee				✓		
Sucker	✓	✓	✓	✓	✓	✓
Goldeye					✓	

Note: This table is not an exhaustive (complete) list and it is not intended to represent the importance placed on fish resources harvested by the Aboriginal groups.

Table 17.4-2. Wildlife Species Harvested by Aboriginal Groups in the Regional Study Area

Species	MLIB	SFN	WMFN	BRFN	HLFN	Métis
Moose	✓	✓	✓	✓	✓	✓
Caribou	✓	✓	✓	✓	✓	✓
Deer (mule and white-tailed)	✓	✓	✓	✓	✓	✓
Elk	✓	✓	✓	✓	✓	✓
Mountain Goat	✓	✓	✓	✓	✓	
Mountain Sheep	✓		✓	✓	✓	✓
Bison		✓	✓	✓	✓	✓
Grizzly Bear	✓	✓	✓	✓	✓	✓
Black Bear	✓	✓	✓	✓	✓	✓
Hoary Marmot	✓		✓	✓		
Porcupine	✓		✓		✓	✓
Ground Squirrel	✓	✓				✓
Red Squirrel						✓
Grouse (species available)	✓	✓	✓	✓	✓	✓
Ducks (species available)	✓	✓	✓	✓	✓	✓
Geese (species available)	✓	✓	✓	✓	✓	✓
Ptarmigan (species available)		✓			✓	

(continued)

Table 17.4-2. Wildlife Species Harvested by Aboriginal Groups Referenced in the Regional Study Area (completed)

Species	MLIB	SFN	WMFN	BRFN	HLFN	Métis
Hare/rabbit	✓	✓	✓	✓	✓	✓
Beaver	✓	✓	✓	✓	✓	✓
Wolf		✓			✓	✓
Eagle		✓				
Otter			✓		✓	✓
Mink		✓				✓
Weasel		✓				✓
Coyote		✓			✓	✓
Marten	✓	✓	✓		✓	✓
Wolverine		✓	✓		✓	✓
Fisher		✓	✓			✓
Lynx	✓	✓	✓		✓	✓
Fox		✓			✓	✓
Muskrat		✓	✓			✓

Note: This table is not an exhaustive (complete) list and it is not intended to represent the importance placed on wildlife resources harvested by the Aboriginal groups.

Table 17.4-3. Plant Species Harvested by the Aboriginal Groups in the Regional Study Area

Species	MLIB	SFN	WMFN	BRFN	HLFN	Métis
Fireweed	✓					
Wild Mint	✓		✓	✓		
Devil's Club	✓					
Soapberries	✓					
Highbush Cranberry	✓		✓	✓	✓	✓
Swamp cranberry	✓			✓	✓	
Blueberry	✓	✓		✓	✓	✓
Strawberry	✓	✓		✓	✓	✓
Raspberry	✓		✓	✓	✓	✓
Blackberry				✓		
Chokecherry	✓		✓	✓	✓	✓
Huckleberry	✓		✓	✓	✓	
Currant (var)	✓					
Thimbleberry (berries and shoots)	✓					
Saskatoon berry	✓	✓	✓	✓	✓	✓
Gooseberry	✓		✓		✓	
Crowberry (?)			✓			

(continued)

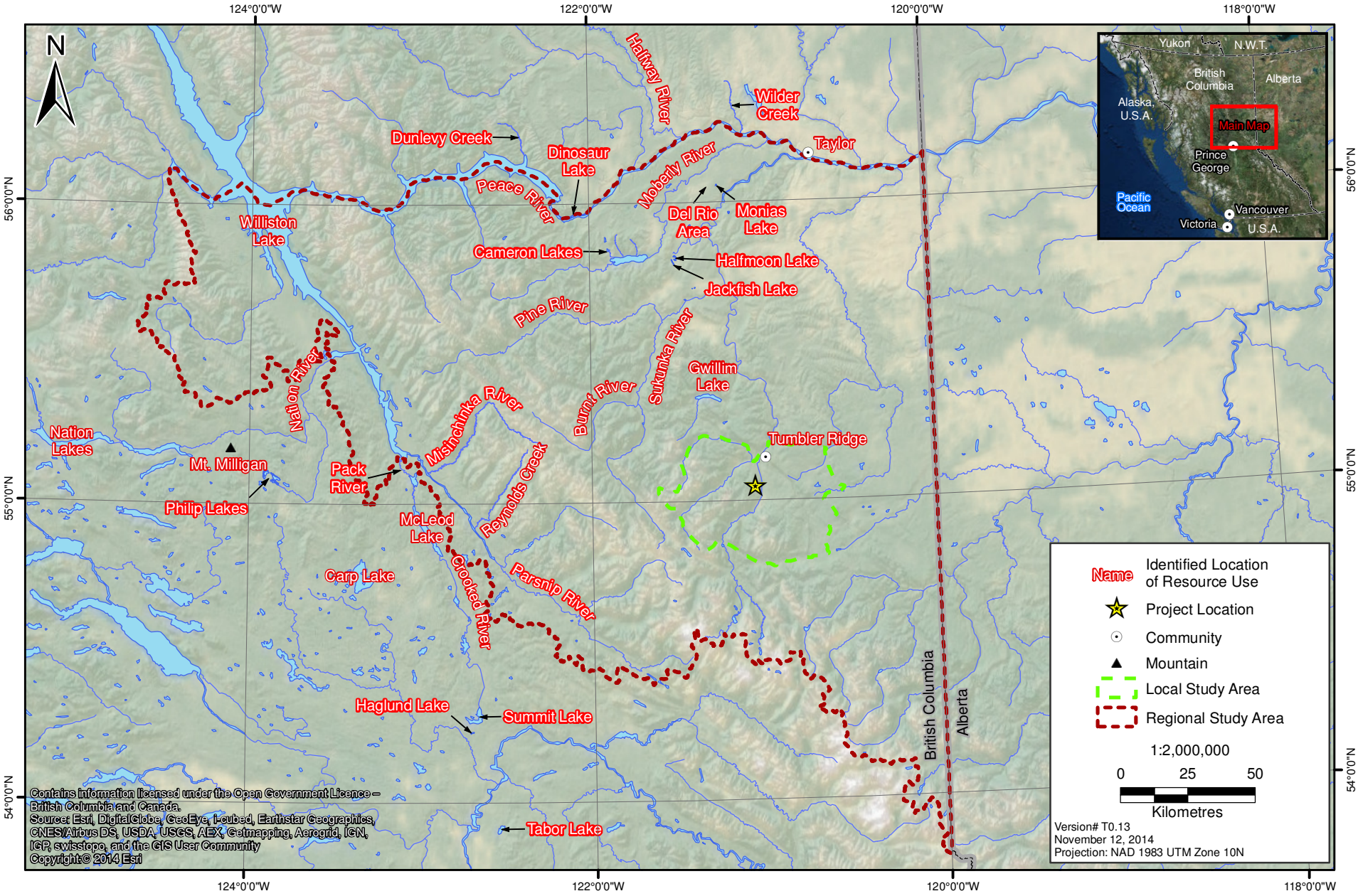
Table 17.4-3. Plant Species Harvested by the Aboriginal Groups in the Regional Study Area (completed)

Species	MLIB	SFN	WMFN	BRFN	HLFN	Métis
Loganberry					✓	
Wild onion		✓				
Indian potato	✓			✓		
Labrador Tea	✓	✓	✓	✓		
Red-osier (Dogwood)	✓					
Cow Parsnip	✓			✓		
Water parsnip ('wild carrot')				✓		
Avalanche Lily	✓					
Fiddlehead	✓					
Bracken fern	✓					
Spruce	✓			✓		
Balsam Fir	✓			✓		
Red willow	✓					
Trembling Aspen				✓		
Mountain Ash ('moose berries')	✓					
Cottonwood	✓					
Poplar				✓		
Pine	✓			✓		
Juniper	✓					
Violet	✓					
Sweet flag ('rat root')		✓			✓	
Iceland moss ('caribou lichen')	✓					
Rushes (var)	✓	✓				
Riparian grasses (var)	✓					
Alpine sweet vetch ('grizzly bear root')	✓					
Sitka valerian ('caribou plant')	✓					
Heart-leaved Arnica ('porcupine feet')	✓					
Venus' Slipper	✓					
Spring Beauty	✓					

Note: This table is not an exhaustive (complete) list and it is not intended to represent the importance placed on plant based resources harvested by the Aboriginal groups.

Figure 17.4-2

McLeod Lake Indian Band: Locations of Traditional and Current Land Use in Relation to the Local and Regional Study Areas



Rainbow trout and Dolly Varden are harvested from Dinosaur Lake (Traditions Consulting Services 2013b). Rainbow trout, Dolly Varden and grayling are harvested in the Peace River (A. Ridington 2013). Fishing in the Peace River extends from Hudson's Hope to the Alberta border. Bull trout and Dolly Varden are harvested at the mouth of the Halfway River. Fish are also harvested from the Pine River, east of Moberly Lake, the Misinchinka River, and the creeks flowing into Williston Lake. All of these locations are within the RSA but outside of the LSA.

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.4) and consultation efforts with MLIB (Section 17.4.1.2 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify MLIB fishing sites or areas within the LSA.

17.4.4.2 Current Hunting and Trapping

MLIB currently harvest elk for food and hides. Marmot, beavers and hare are currently trapped for their pelts and meat. Porcupines are occasionally harvested for their quills. MLIB members also harvest grouse, geese and ducks. Bears are now infrequently harvested by MLIB members. (Terrane 2008).

MLIB members currently hunt and trap along the rivers and lakes that drain to the east into the Parsnip River, including Carp Lake (outside of the RSA), Nation River, and Nation Lakes (outside of the RSA; R. Ridington 2008). MLIB members hunt elk, deer, waterfowl, and moose on the south side of the Peace River between the confluence of Halfway and Moberly rivers. The Del Rio area (near Chetwynd, in the RSA) is used for hunting moose, deer and grouse. MLIB members also indicated they hunt moose east of Tumbler Ridge (in the LSA) (A. Ridington 2013).

The south side of the Peace River from Hudson's Hope to Taylor, between Chetwynd and the east end of Moberly Lake, Finlay Forks, and the lower reaches of Dunlevy Creek (the latter outside of the RSA) are also identified by MLIB as hunting areas. Waterfowl are identified as being abundant along the Peace River. They are also hunted on the wetlands north of the lower Moberly River (in the RSA), in the slough opposite Wilder Creek, and the mouth of Halfway River. Grouse are hunted in the area north of Monias Lake (Traditions Consulting Services 2013b).

17.4.4.3 Current Gathering

MLIB members harvest blueberries, soapberries, huckleberries, low bush and high bush cranberries, saskatoon berry, strawberries, raspberries, chokecherries, currants and gooseberries. They are prepared for storage by canning or freezing. Labrador tea, mint, devil's club, strawberries, juniper, violet, fireweed, red willow, jack pine, balsam, and pine (bark and sap), are harvested for medicinal purposes, primarily from wetlands (Traditions Consulting Services 2013b).

Cranberries are harvested in the riparian areas along the Peace and Moberly rivers. Halfmoon and Jackfish lakes, east of Moberly Lake, are identified as areas for harvesting berries, medicinal plants and Labrador Tea (Traditions Consulting Services 2013b). All of these areas are within the Current Aboriginal Use baseline RSA and outside of the LSA.

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.4) and consultation efforts with MLIB (Section 17.4.1.2 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify MLIB plant gathering sites or areas within the LSA.

17.4.4.4 Use of Habitations, Trails, Cultural and Spiritual Sites

MLIB identifies a hunting camp site located at the confluence of the Moberly and Peace rivers (A. Ridington 2013). This camp is within the RSA and outside of the LSA.

MLIB member and elder Harry Chingee recalled his how his father's people used to camp at Gwillim Lake, and how the land surrounding the lake was also used by the Moberly people (WMFN and SFN- see Sections 17.4.5 and 17.4.6). Gwillim Lake was reported to be the northernmost extent of his father's traditional travel area, and they "lived there for a while sometime, summertime", but would only make the trek to the lake "maybe once every five years or something like that, they say that"(MWE 2013). He recalls that the lake could be circumnavigated in a day of good walking, and that his father's people would fish the lake. They travelled to the general area along a trail up the Burnt River to the Sukunka River, and considered the Murray River the extent of their travelling range. Gwillim Lake and the Burnt River and Sukunka River are within the RSA but outside of the LSA.

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.4) and consultation efforts with MLIB (Section 17.4.1.2 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify MLIB habitations, trails, cultural or spiritual sites within the LSA.

17.4.5 Saulteau First Nations Current Use of Lands and Resources

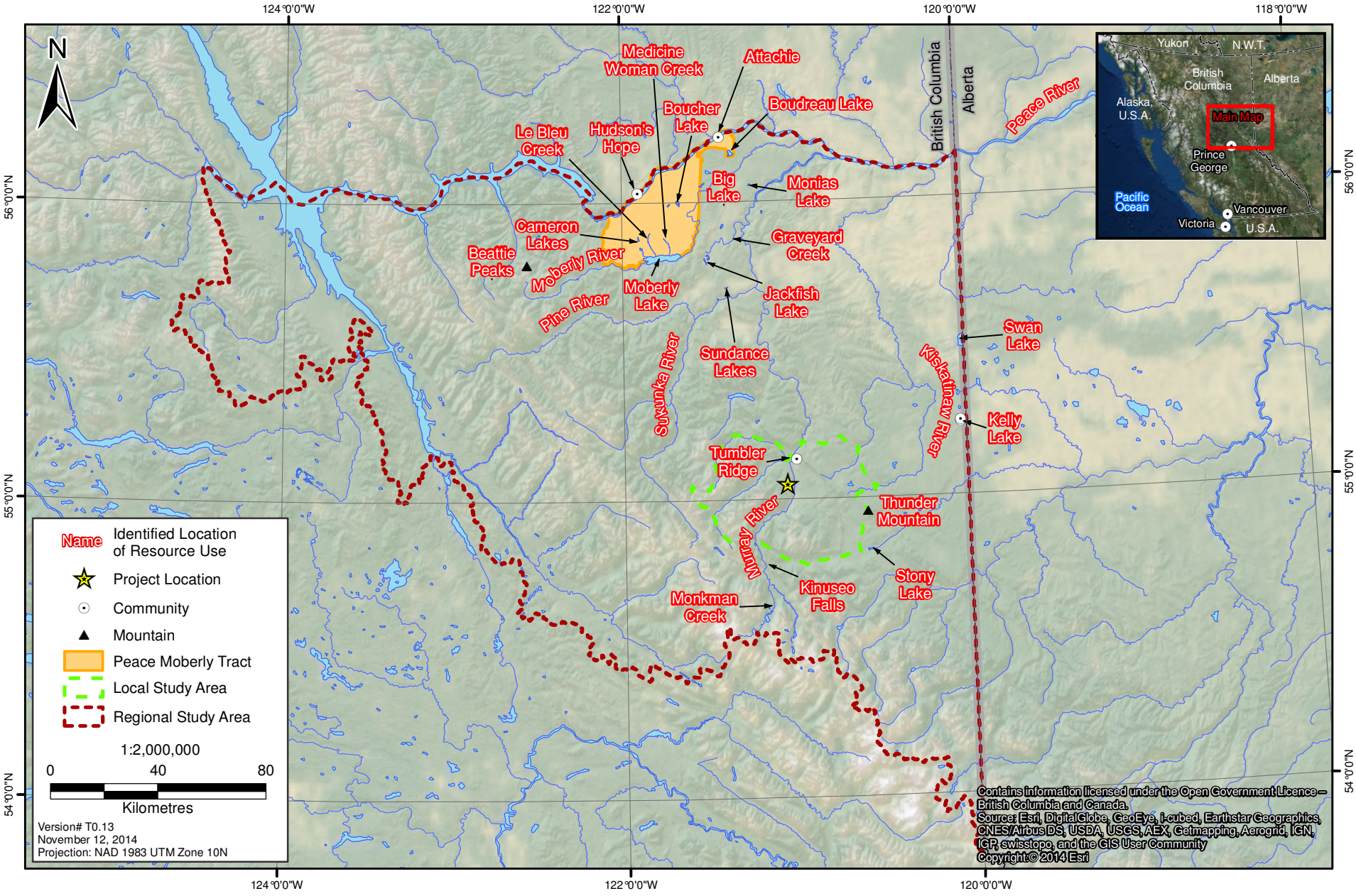
Information summarized in this section is based on information collected during consultation with SFN (see Section 17.4.1 and Chapter 2: Information Distribution and Consultation), the *Saulteau First Nations Knowledge and Use Study* (Appendix 17-B), and supplementary secondary information (Appendix 17A: *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*) Key secondary materials reviewed include Weinstein (1979); UBCIC (1980); Brody (1981); Michael Robinson (1983); BC, SFN, and WMFN (2006); Mokakioyis (2008); TMW (2009); PRCI (2010); Finavera (2011a, 2011b); Nesoo Watchie (2011); JRP (2012); and Traditions Consulting Services (2013c).

Figure 17.4-3 identifies SFN traditional and current use locations in relation to SFN reserves and the LSA and RSA, based on available information. The SFN indicate their use of lands extends east from Moberly Lake to include the Murray River and south to include the area south of Tumbler Ridge where the Project is located (Appendix 17-B). SFN have identified a number of site specific subsistence uses, including game kill locations, fish catch sites, plant and firewood gathering sites, and a drinking water collection site, in the vicinity of the Project (Appendix 17-B) including:

- 44 values within 250m of the Project;
- 20 further values within 5km of the Project
- 91 further values within 25km of the Project.

Figure 17.4-3

Saulteau First Nations: Locations of Traditional and Current Land Use in Relation to the Local and Regional Study Areas



17.4.5.1 Current Fishing

Based on a recent survey (UNBC, UM, and AFN 2011), 42% of SFN members fish for food. Salmon (all species), trout, and northern pike are the most popular fish species consumed in the community. SFN members have commonly fished for rainbow trout, Dolly Varden, "jackfish" (northern pike), greyling, bull trout, and sucker (Traditions Consulting Services 2013c).

SFN members report fish harvesting within the vicinity of the Project (Appendix 17-B: Saulteau First Nations Knowledge and Use Study). SFN members report catching bull trout, grayling, rainbow trout, and whitefish within 250m of the Project. Members also report multiple fishing sites for bull trout, grayling, and rainbow trout downstream from the Project on the Murray River, particularly around Tumbler Ridge. These places all appear to be in the LSA. Kinuseo Falls was also an important fishing place where SFN members often fished (JRP 2012); Kinuseo Falls may remain an important fishing location. Some SFN fishers reported that they no longer fish in the Murray River due to water quality concerns related to the Quintette Mine. Other SFN fishing takes place in the Peace River, Moberly River, Cameron Lakes, Boucher Lake, and Pine River (Traditions Consulting Services 2013c). All of these areas are within RSA and outside of the LSA. Key fish species harvested include (in descending order of frequency): rainbow trout, dolly varden, trout (unspecified), jackfish, grayling, bull trout, sucker and small trout (Traditions Consulting Services 2013b). Stony Lake was fished for jackfish and whitefish (JRP 2012).

17.4.5.2 Current Hunting and Trapping

Based on a recent survey (UNBC, UM, and AFN 2011), 47% of SFN members hunt and trap for food. SFN members eat moose meat an average of 90 days per year, followed by elk meat, which is consumed an average of 17 days per year. Of the 45% of SFN survey participants who consume wild birds, grouse is the most popular (40%) followed by geese (23%), mallards (6%), and ptarmigan (3%).

SFN members report wildlife harvesting activities within the vicinity of the Project (Appendix 17-B). Moose, elk, deer, wolf, grouse, rabbit, and porcupine have been harvested within 250m of the Project. Additional species, including caribou, goat, and sheep, have been harvested within 5km of the Project (Appendix 17-B). Other key SFN hunting areas include Pine River, Moberly River, Cameron Lakes, Boucher Lake and Monias Lake (Traditions Consulting Services 2013c). Target species harvested at these locations include (in descending order of frequency) moose, elk, deer, black bear, grizzly bear, mountain goat, and caribou. Bird species harvested by SFN members include grouse, waterfowl, and bald eagles (Traditions Consulting Services 2013b). Stony Lake was also utilized for hunting and trapping (JRP 2012).

Within the Project footprint, a general trapping area was indicated (Appendix 17-B). Other SFN traplines are concentrated in areas around Boucher Lakes, southwest of Monias Lake, and on the south side of the Peace River opposite from Hudson's Hope and Attachie, around Moberly Lake, around Big Lake, along the upper Pine River, along the Moberly River, and around Boudreau Lake (Traditions Consulting Services 2013b). Species harvested in these locations include (in descending order of frequency) rabbit, beaver, wolf, lynx, marten, squirrel, muskrat, weasel, coyote, fisher, mink, wolverine, and fox (Traditions Consulting Services 2013b). All of these hunting and trapping areas are within the RSA and outside of the LSA.

17.4.5.3 Current Gathering

Based on a recent survey (UNBC, UM, and AFN 2011), 60% of SFN members collect wild plant food. Nearly all respondents (98%) reported eating wild berries, with the most popular varieties being strawberries, Saskatoon berry, and blueberries. Approximately half of SFN respondents reported consuming wild plant roots, tree foods, and shoots and greens.

SFN members report plant gathering sites within the vicinity of the Project (Appendix 17-B). Members report gathering blueberries and firewood within 250m of the Project, and huckleberries and cranberries within 5km of the Project. A medicine plant gathering area is identified by the SFN in the immediate area of the Project footprint. Huckleberries are identified as being harvested in the Kinuseo area in the RSA (JRP 2012).

Other SFN gathering takes place along the shores of Moberly Lake, in the upper Moberly River watershed, in the area around Boucher Lakes, and in the general area north of Moberly Lake, in the general vicinity of Big Lake, around Monias Lake, around Cameron Lakes, and in the vicinity of the confluence of Farrell Creek and Alder Creek. Resources gathered in these location include (in descending order of frequency): berries; trees (wood); plants (herb); Labrador tea; rat root; bullrush; wild onion; hay; and lumber (Traditions Consulting Services 2013b).

The area lying between Moberly Lake and the Peace River comprises approximately 1,090 km^2 of land now known as the Peace Moberly Tract (BC, SFN, and WMFN 2006; MNRO 2012; Figure 17.4-4). The Peace Moberly Tract is a key supply area for traditional foods for both SFN and WMFN (see Section 17.4.6). Apart from hunting, trapping and fishing activities, the area provides medicinal plants, as well as products used in cultural ceremonies, crafts, and the fabrication of items such as canoes, drums and snowshoes (BC, SFN, and WMFN 2006).

17.4.5.4 Use of Habitations, Trails, Cultural and Spiritual sites

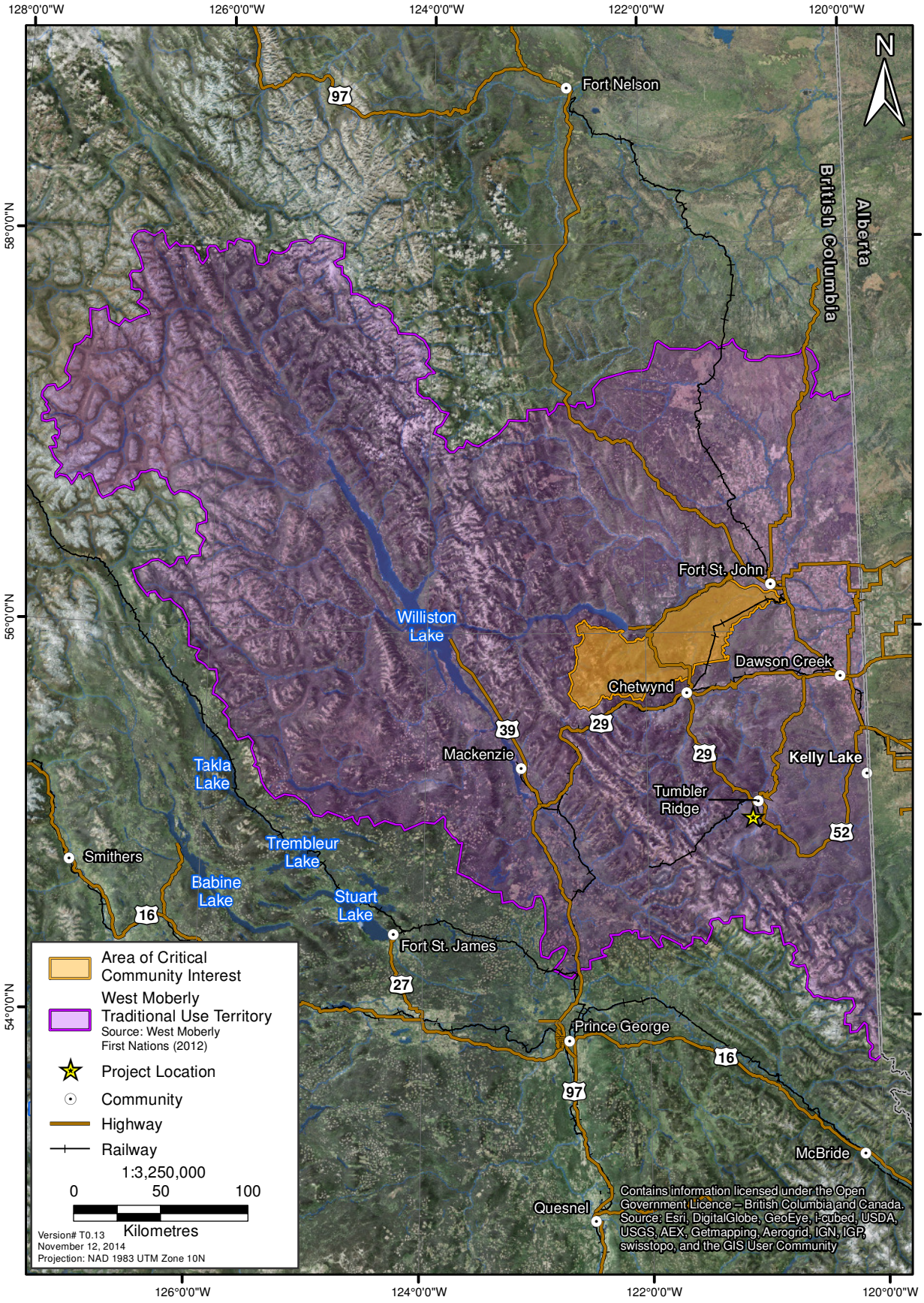
Within the Project footprint, a permanent hunting cabin along the Murray River was utilized by SFN members in the 1960s, but it no longer exists. A camping site and a sacred site were are identified in the Project footprint (Appendix 17-B). The area of Flatbed Creek adjacent to the highway (in the LSA) is identified as a spiritual area containing graveyards (JRP 2012).

The SFN have cabins located south and east of Boucher Lake, around Big Lake, Graveyard Creek, and on or near the Moberly River south of Boudreau Lake. There are also camps located near the mouth of the south side of the Moberly River, the north side of the Pine River near the mouth, near Monias Lake, east of Boudreau Lake, on the south side of Peace River opposite Attachie, and in the Groundbirch area (Traditions Consulting Services 2013c). These cabins and camps are located within the RSA and outside of the LSA.

The Murray River, from Tumbler Ridge up to Kinuseo Falls, is utilized as a water route by SFN members to access hunting and fishing areas. SFN members use the Murray River Forest Service Road (FSR) and other roads in the area to access areas for hunting, fishing, and berry picking. SFN members identified a trail heading northwest from the Murray River in the southwest section of the Project footprint (Appendix 17-B). This trail follows M20 Creek to its headwaters and then down Mast Creek.

Figure 17.4-4

West Moberly First Nations Traditional Use Territory and Area of Critical Community Interest



Information provided by SFN during the panel hearings for the Enbridge Northern Gateway Project shows that SFN members camped at Sukunka River (RSA) Tumbler Ridge (LSA) and Kinuseo Falls (RSA) as well as Stony Lake (RSA), and travelled from Moberly Lake via Murray River on to Kelly Lake to visit relatives (JRP 2012). These camping locations and travel routes may be used currently by SFN members.

The Twin Sisters Mountains (Beattie Peaks) are reported to be sacred to SFN as a place of healing and sanctuary. One of the "Dreamer places" (an area considered significant to Dane-zaa Dreamers, upon which a tall cross or medicine pole was erected) is located at Twin Sisters Mountains (Aird and Abel 2013). Carbon Lake, at the foot of the mountains, was one of the main meeting and camping sites for the Dane-zaa. A cultural landscape was is identified in the Mount Wartenbe area (DWE 2006). These places are within the RSA and outside of the LSA.

The historic Thunder Mountain War Site is located in the valley between Thunder Mountain and the unnamed ridge to the west, from Stony Lake north to Gap Lake (TMW 2009). The occurrence and location of the battle was identified SFN and KLMSS members during interviews conducted for the Thunder Mountain Wind Project. This war took place between the Danne-zaa and Cree. According to community members interviewed, the Cree pushed the Dane-zaa back to the west during this war and it is said that the sounds of shots can still be heard from this war at night close to the mountain. The battle event itself holds a high community value for the SFN and KLMSS. The Thunder Mountain War Site is within the RSA and outside of the LSA.

17.4.6 West Moberly First Nations Current Use of Lands and Resources

Information summarized in this section is based on information collected during consultation with WMFN (see Section 17.4.1 and Chapter 2: Information Distribution and Consultation) and from secondary information sources (see Section 17.4.2 and Appendix 17A: *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*).. Key secondary materials reviewed include R. Ridington (1968); Weinstein (1979); UBCIC (1980); Brody (1981); R. Ridington (1981); Michael Robinson (1983); BC, SFN, and WMFN (2006); Mokakioyis (2008); TMW (2009); PRCI (2010); Finavera (2011a, 2011b); Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative (2012); and WMFN (2012).

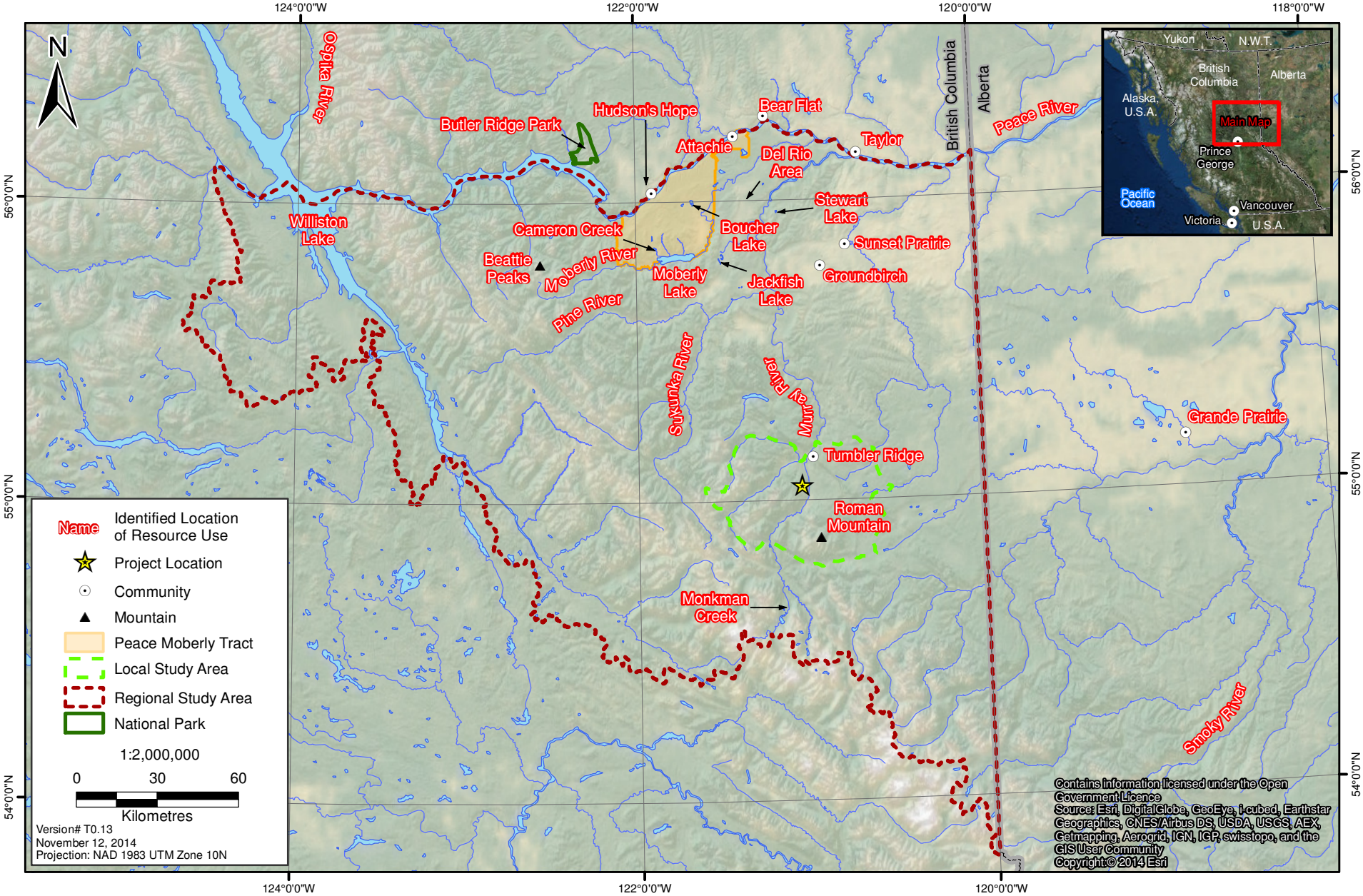
Figure 17.4-5 identifies WMFN traditional and current use locations in relation to WMFN reserves, WMFN's traditional territory (West Moberly First Nations 2012), the WMFN/SFN "Area of Critical Community Interest," including the "Peace Moberly Tract" (Integrated Land Management Bureau 2006), and the LSA and RSA, based on available information. Further information about WMFN's traditional territory is provided in Chapter 20, Section 20.5.2.1.

17.4.6.1 Current Fishing

The WMFN harvest fish throughout their traditional territory. Members fish for trout (lake, Dolly Varden and rainbow), whitefish, jackfish and other species in the Peace River and its tributaries, including Moberly River and Halfway River. They also ice-fish on Moberly Lake in the winter (WMFN 2012). The Sukunka River was identified as a spawning area for bull trout (WMFN 2012). The Moberly Lake and Sukunka River are within the RSA and outside of the LSA.

Figure 17.4-5

West Moberly First Nations: Locations of Traditional and Current Land Use in Relation to the Local and Regional Study Areas



Review of secondary source materials (Section 17.4.1.1 and Section 17.4.6) and consultation efforts with MLIB (Section 17.4.1.2 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify WMFN fishing sites or areas within the LSA.

17.4.6.2 Current Hunting and Trapping

Members consider the Pine River, Moberly River, Cameron Lakes and Boucher Lake to be critical hunting and gathering areas (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012). Other hunting areas include the area around Groundbirch, the Rice property west of Stewart Lake, Sunset Prairie, Del Rio, Cameron Creek, Butler Ridge, and Tumbler Ridge (WMFN 2012). Some hunting areas are identified in the Monkman Pass and Trail region, including areas north of Roman Mountain (Robinson 1983; PRCI 2010). Priority game species for WMFN members are, in order of importance, caribou, moose, elk and deer (Site C First Nations Engagement Team 2013). WMFN consider the Peace Moberly Tract (see Section 17.4.5.3) to be the best remaining habitat for moose and the "motherland" of ungulates hunted by WMFN members (Site C First Nations Engagement Team 2013).

WMFN has a community trapline in the Upper Moberly Watershed (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012). Industrial development in the Peace Moberly Tract has affected animals harvested by West Moberly First Nations.

During a May 17, 2013 meeting with The Proponent (Appendix 2-D) WMFN noted that the Project's Coarse Coal Rejects area is a current hunting area and described with the Project site in general is "good elk county" (Appendix 2-D).

17.4.6.3 Current Gathering

WMFN harvest berries at Stewart Lake and upper Moberly River (WMFN 2012). Areas used to gather medicinal plants and materials used in cultural ceremonies, crafts and other goods include the Peace Moberly Tract (BC, SFN, and WMFN 2006), Stewart Lake, and upper Moberly River (WMFN 2012). These areas are within the RSA and outside of the LSA.

WMFN identify plant gathering sites at Bear Flats (outside of the RSA), as well as Boucher, Moberly and Cameron lakes, and the Moberly and Pine rivers (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012; Aird and Abel 2013). A number of gathering places important to WMFN are known, these include Attachie (outside the RSA), the Upper Moberly watershed, and Twin Sisters Mountain (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012; Aird and Abel 2013).

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.6) and consultation efforts with WMFN (Section 17.4.1.2 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify WMFN plant gathering sites or areas within the LSA.

17.4.6.4 Use of Habitations, Trails, Cultural and Spiritual Sites

The WMFN indicate there were cabins or camps at Moberly Lake, Jackfish Lake and Boucher Lake (WMFN 2012). These habitations may be used currently. These areas are located within the RSA and outside of the LSA.

The Twin Sisters Mountains (Beattie Peaks) are reported to be sacred to WMFN as a place of healing and sanctuary. One of the "Dreamer places" (an area considered significant to Dane-zaa Dreamers, upon which a tall cross or medicine pole was erected) is located at Twin Sisters Mountains (Aird and Abel 2013). Carbon Lake, at the foot of the mountains, was one of the main meeting and camping sites for the Dane-zaa. A cultural landscape was also identified in the Mount Wartenbe area (DWE 2006). These places are within the RSA and outside of the LSA.

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.6) and consultation efforts with WMFN (Section 17.4.1.2 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify WMFN habitations, trails, cultural or spiritual sites within the LSA.

17.4.7 Blueberry River First Nations Current Use of Lands and Resources

Information summarized in this section is based on information collected during consultation with BRFN (see Section 17.4.1 and Chapter 2: Information Distribution and Consultation) and from secondary information sources (see Section 17.4.2 and Appendix 17A: *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*). Key secondary materials reviewed include Goddard (1916); R. Ridington (1968); Weinstein (1979); UBCIC (1980); Brody (1981); R. Ridington (1981); Bouchard and Kennedy (2011); and Kennedy (2011).

Figure 17.4-6 and Figure 17.4-7 identifies BRFN traditional and current use locations in relation to BRFN reserves, BRFN traditional territory (Blueberry River First Nations 2012), and the LSA and RSA.

17.4.7.1 Current Fishing

While less important than game, BRFN members catch a variety of fish, including whitefish, dolly varden (bull trout), rainbow trout, grayling, lake trout, kokanee, ling (burbot), jackfish, sucker, walley, pike, and squawfish.

South of the Peace River, Dolly Varden and rainbow trout are the most preferred species (Kennedy 2011). Key fishing areas south of the Peace River include Pine River, Moberly River, Moberly Lake, and Cameron Creek. BRFN members noted fishing for walleye in Gwillim Lake near Tumbler Ridge and fishing for pike at Moberly Lake (Kennedy 2011). These areas are within the RSA and outside the LSA.

Figure 17.4-6

Blueberry River First Nations Traditional Use Territory

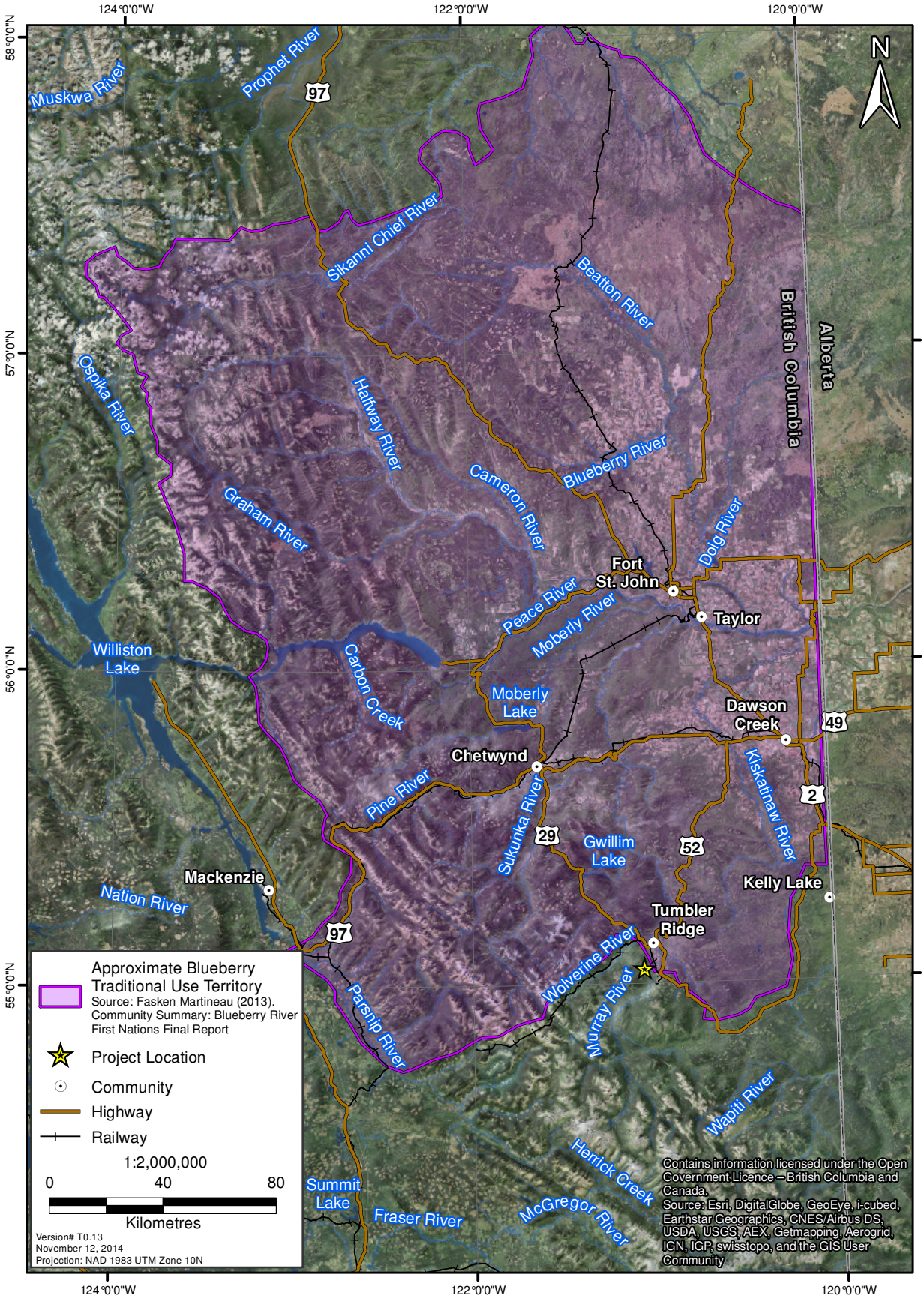
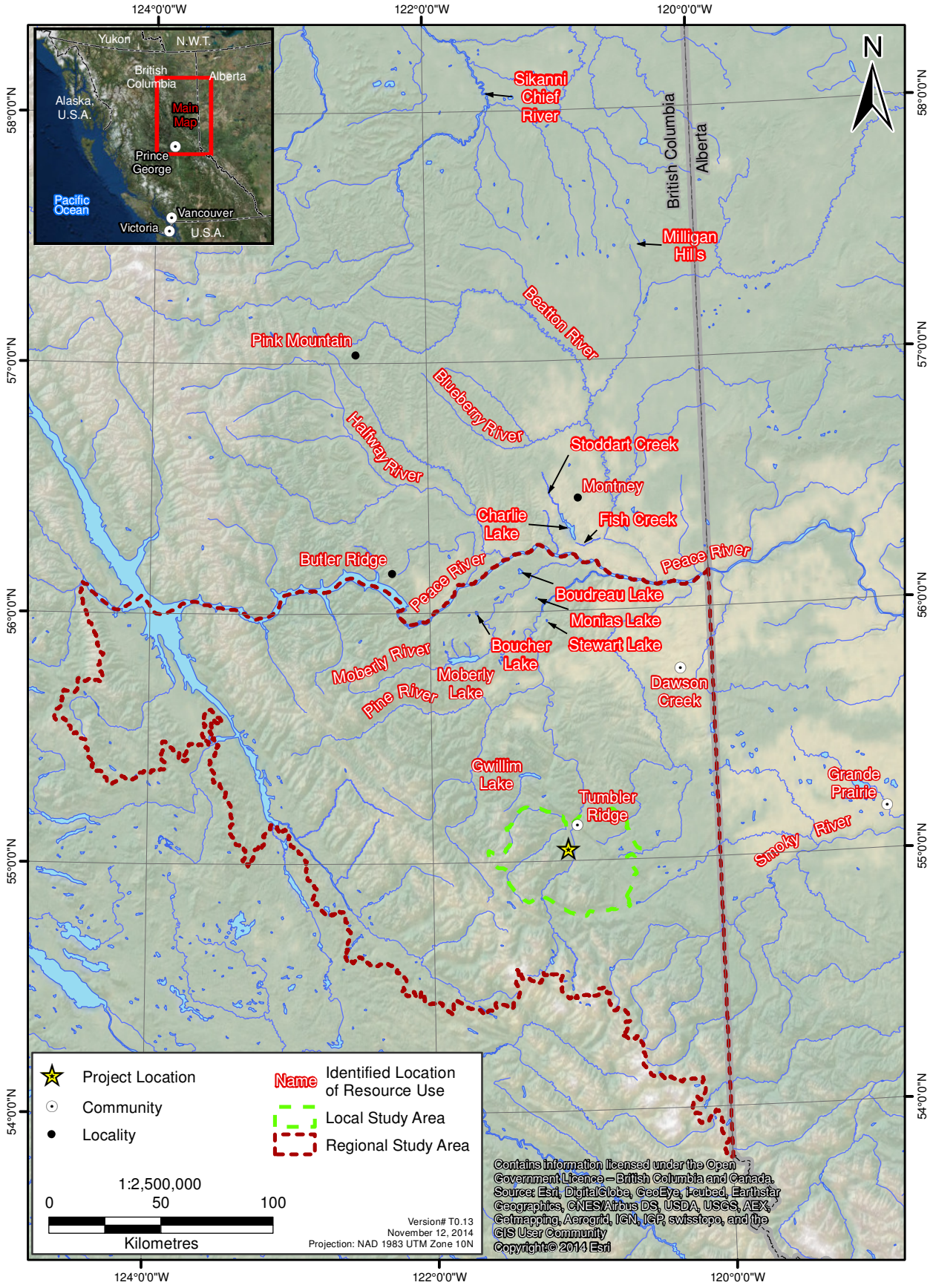


Figure 17.4-7

West Moberly First Nations: Locations of Traditional and Current Land Use in Relation to the Local and Regional Study Areas



Review of secondary source materials (Section 17.4.1.1 and Section 17.4.7) and consultation efforts with BRFN (Section 17.4.7 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify BRFN fishing sites or areas within the LSA.

17.4.7.2 Current Hunting and Trapping

Hunting areas are generally concentrated north of the Peace River, west of Beatton River and at Pink Mountain (Brody 1981; Bouchard and Kennedy 2011). However, BRFN members also harvest wildlife south of the Peace River. Moose, elk, deer and bear are hunted on both sides of the Peace River and along the Pine River. Hunters harvest moose towards the Moberly River, as far south as the northeast end of Moberly Lake. A road past Boucher Lake leads to an area where BRFN members hunt both elk and moose. There is an important elk hunting area along the Pine River from the river mouth southwest to Monias, extending north to the Moberly River and along the road east to the environs of Boudreau Lake (Bouchard and Kennedy 2011). These areas are within the RSA and outside the LSA.

Several BRFN members identify bear hunting on the south side of the Peace River as well, including the area between the Pine and Moberly rivers, and around Stewart Lake. BRFN also report harvesting bear on the west side of the Pine River in the Monias area. Snares are set for beaver dams up and down the Moberly River (Kennedy 2011). In the LSA, several BRFN members report moose hunting around Tumbler Ridge (Kennedy 2011).

A number of traplines are registered to BRFN members. The traplines cover an area extending from the area around the Blueberry River reserve northward to the Sikanni Chief River, east to the Milligan Hills, and west to the Blueberry River. This same area is also considered to be the core hunting area of the Blueberry River First Nation people (Finavera 2011a). These traplines are all outside of the RSA.

17.4.7.3 Current Gathering

BRFN members harvest Saskatoon berry in the Montney Hills (outside of the RSA) north of Fort St. John. BRFN also harvest berries along the Peace River, and in the hills northeast of Charlie Lake (outside of the RSA; Kennedy 2011). Farther to the west, BRFN members harvest huckleberries and high bush blueberries around Butler Ridge (just outside of the RSA). They also harvest mint (*Mentha arvensis*) and Labrador tea, both used for medicine, along the banks of the Halfway River (outside of the RSA). On the south bank of the Peace, Saskatoon berry and chokecherries are harvested in abundance in the Monias area. Along the Pine River they harvest raspberries, Saskatoon berry, blueberries and high bush cranberries.

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.7) and consultation efforts with BRFN (Section 17.4.7 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify BRFN plant gathering sites or areas within the LSA.

17.4.7.4 Use of Habitations, Trails, Cultural and Spiritual Sites

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.7) and consultation efforts with BRFN (Section 17.4.7 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify BRFN habitations, trails, cultural or spiritual sites within the LSA or RSA.

17.4.8 Horse Lake First Nation Current Use of Lands and Resources

Information summarized in this section is based on information collected from secondary information sources (see Section 17.4.2 and Appendix 17A: *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*) and from a letter provided from HLFN to the Proponent (see Section 17.4.1 and Chapter 2: Information Distribution and Consultation). Key secondary materials reviewed include Goddard (1916); R. Ridington (1968, 1981); Bouchard and Kennedy (2012); Davison and Danda (2012); The JLS Report (2013); and Traditions Consulting Services (2013a).

Figures 17.4-8 and 17.4-9 identifies HLFN traditional and current use locations in relation to HLFN reserves, HLFN traditional territory (Traditions Consulting Services 2013a), and the LSA and RSA.

17.4.8.1 Current Fishing

Kinuseo Creek and Falls (just outside of the LSA to the south), and Murray River (in the LSA), are used by the HLFN for fishing, as well as Kelly Lake, Stony Lake, the upper Kiskatinaw River, Red Deer Creek near Red Deer Falls, and Swan Lake (in the RSA). Smoky River and Wapiti River (outside of the RSA) are also identified as fishing spots (Bouchard and Kennedy 2012; Savard and Geernaert 2013; The JLS Report 2013). HLFN members fish for trout (bull trout and other species of trout), northern pike, walleye, whitefish, and grayling.

17.4.8.2 Current Hunting

The Project, the HLFN indicate they hunt and trap in the Tumbler Ridge area (in the LSA; The JLS Report 2013), Quintette Mountain, Stony Lake, and near Monkman Falls (in the RSA) (Savard and Geernaert 2013). Outside of the RSA, the HFLN hunt up and down the Peace River from Dunvegan to Many Islands; south of Grande Prairie, up to the Wapiti River; Red Deer Creek, Nose Creek, and in the Nose Mountain area, directly south of Horse Lake. Pink Mountain (outside the RSA) was also identified as a hunting area by HLFN (Bouchard and Kennedy 2012).

Species harvested by HLFN members include moose, white tailed deer, mule deer, elk, bear (grizzly and black bear), and other ungulate (includes caribou, mountain goat, sheep). Birds hunted by HLFN members include waterfowl and upland birds.

17.4.8.3 Current Gathering

The Tumbler Ridge area (in the LSA) was identified by the HLFN as a place where they collect medicinal plants such as "rat root" (The JLS Report 2013). Huckleberries are picked along the Wapiti River. Belcourt Creek is also identified as a berry picking area. Members collect a variety of berries, including Saskatoon berry, wild raspberry, blueberry, wild strawberry, choke cherry, and low bush/ hi bush cranberry (Savard and Geernaert 2013).

Figure 17.4-8

Horse Lake First Nation Traditional Use Territory

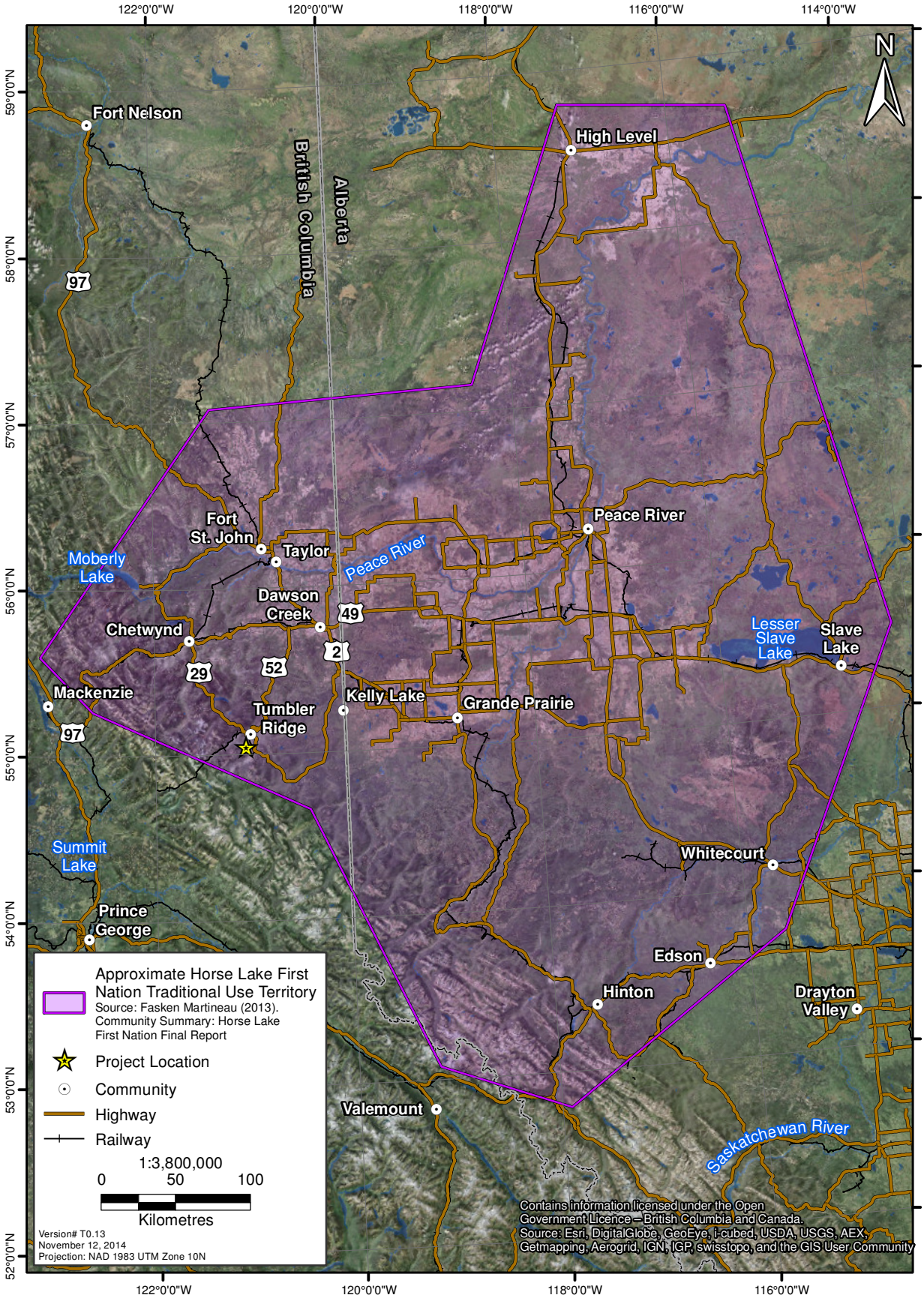
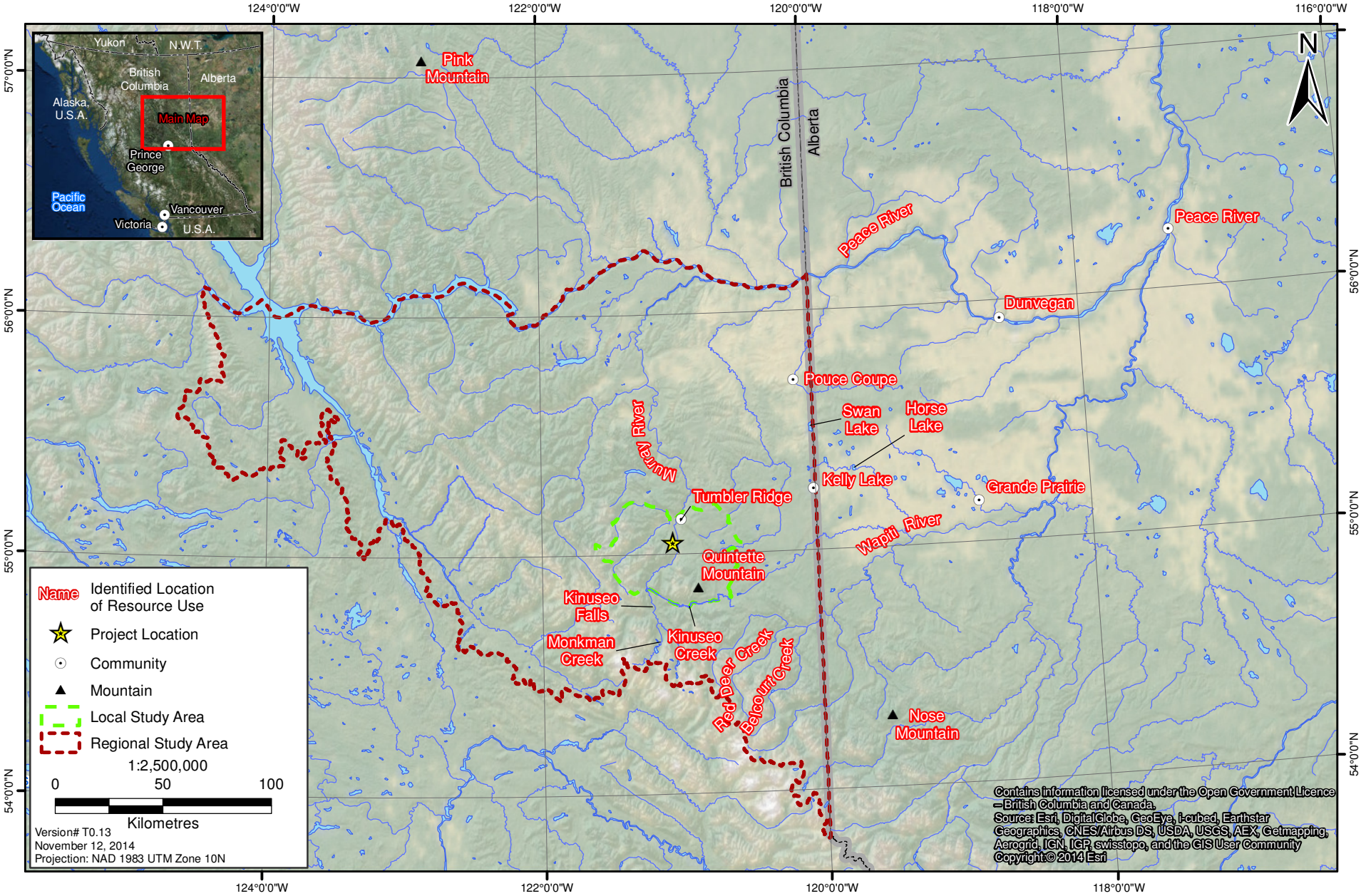


Figure 17.4-9

Horse Lake First Nation: Locations of Traditional and Current Land Use in Relation to the Local and Regional Study Areas



17.4.8.4 Use of Habitations, Trails, Cultural and Spiritual Sites

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.8) and consultation efforts with HLFN (Section 17.4.8 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify HLFN habitations, trails, cultural or spiritual sites within the LSA or RSA.

17.4.9 Kelly Lake Métis Settlement Society Current Use of Lands and Resources

Information summarized in this section is based on secondary information sources (see Section 17.4.2 and Appendix 17A: *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*). Consultation efforts with KLMSS are described in Section 17.4.1 and Chapter 2: Information Distribution and Consultation. Key secondary materials reviewed include Ballantyne (1978); M. Robinson and Hocking (1982); Michael Robinson (1983); Andrews (1985); Kwarakwante (2007); KLCN (2009); TMW (2009); (ENGP 2010); KLMSS (2010); PRCI (2010); and Davison and Danda (2012).

Figures 17.4-10 and 17.4-11 identifies KLMSS traditional and current use locations in relation to KLMSS traditional territory (Davison and Danda 2012), and the LSA and RSA. These locations lie within the traditional uses and occupancy boundary known as the "Kelly Lake Trapping Region". The boundary was developed by Robinson (1983) in consultation with community elders in the early 1980s. It represents the furthest reaches of the Kelly Lake trappers for the period between 1920 and 1940. The Kelly Lake Trapping Region extends in British Columbia from Gauthier Lake (north of Kelly Lake on the Alberta border) southwest past Bearhole Lake and Quintette Mountain (both in the LSA) to Kinuseo Creek (just outside the LSA), then west to Hook Lake, south past Monkman Glacier in the Hart Ranges to the confluence of Fontaniko and Herrick Creeks (outside of the RSA), southeast along Herrick Creek, and then northeast along the Narraway River to the Alberta provincial border. Although not used as frequently as in the past, these locations continue to be used by the Kelly Lake Métis (Davison and Danda 2012).

17.4.9.1 Current Fishing

Kelly Lake Métis harvest Dolly Varden from Belcourt Lake and rainbow trout from Onion Lake. Bull trout are harvested from Upper and Lower Blue lakes. Walleye and suckers are harvested from Steep Rock Creek near Kelly Lake (ENGP 2010; Davison and Danda 2012). Hook Lake, Kiskatinaw River, Stony Lake, Trout Lake, and Monkman Creek are also utilized for fishing. These areas are all within the RSA and outside of the LSA. Some Kelly Lake fishing parties snowmobile into Mountain (Quintette) Lake and Hambler Lakes to ice fish (both in the LSA; Michael Robinson 1983).

17.4.9.2 Current Hunting and Trapping

Animals most commonly consumed by KLMSS members include moose, elk, deer, muskrat, porcupine, rabbit, caribou, and beaver (ENGP 2010). The "Kelly Lake Trapping Region" is utilized by KLMSS for hunting and includes the middle reaches of Flatbed Creek and the adjoining creek systems to the west, namely Hambler Creek, Quintette Creek, Five Cabin Creek and Kinuseo Creek (all within or just on the edge of the LSA) (Michael Robinson 1983). The area around Belcourt Lake in particular has been trapped by the Belcourt family since their arrival in the Kelly Lake area (Davison and Danda 2012).

Figure 17.4-10
Kelly Lake Métis Settlement Society Traditional Territory

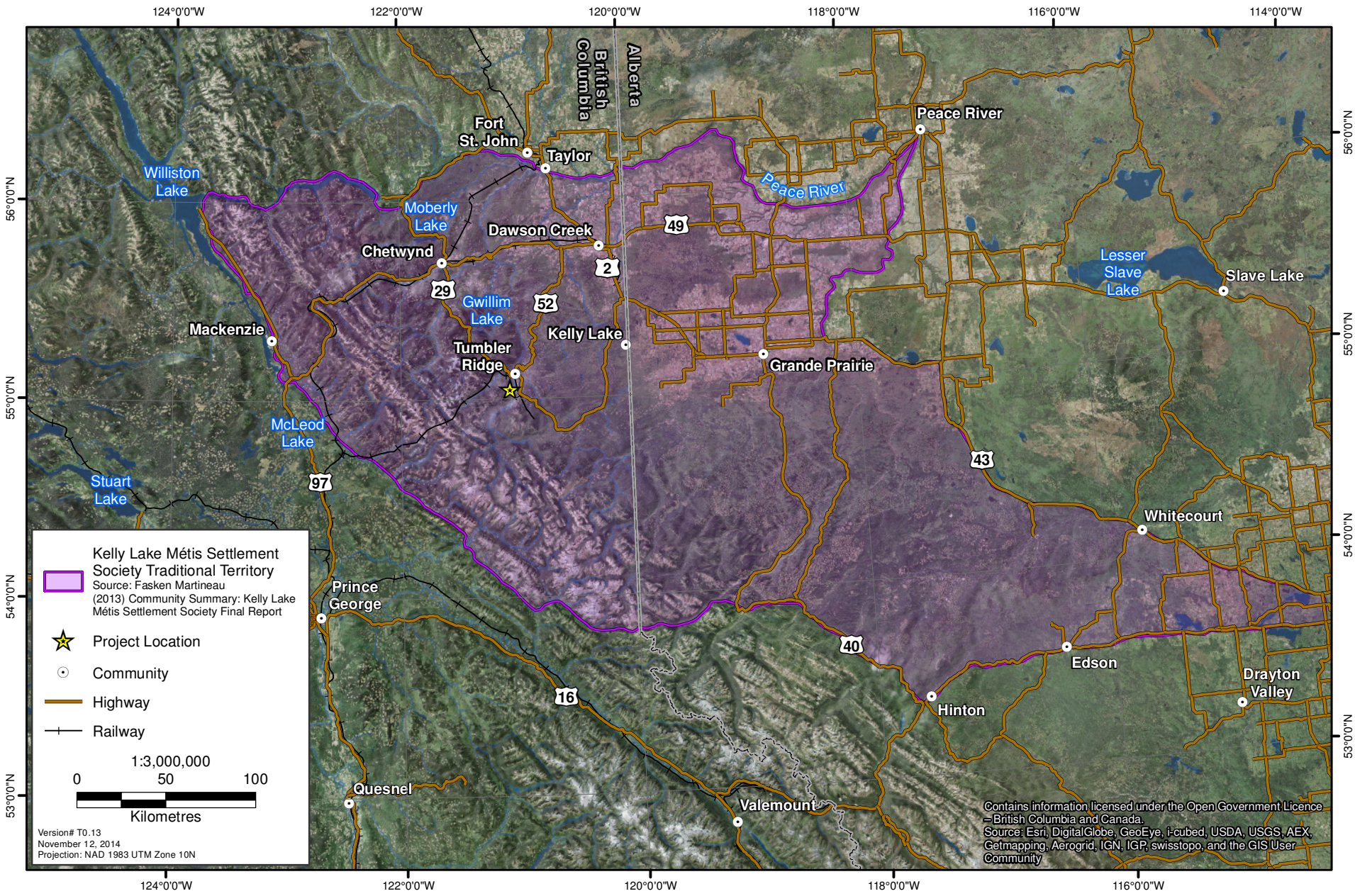
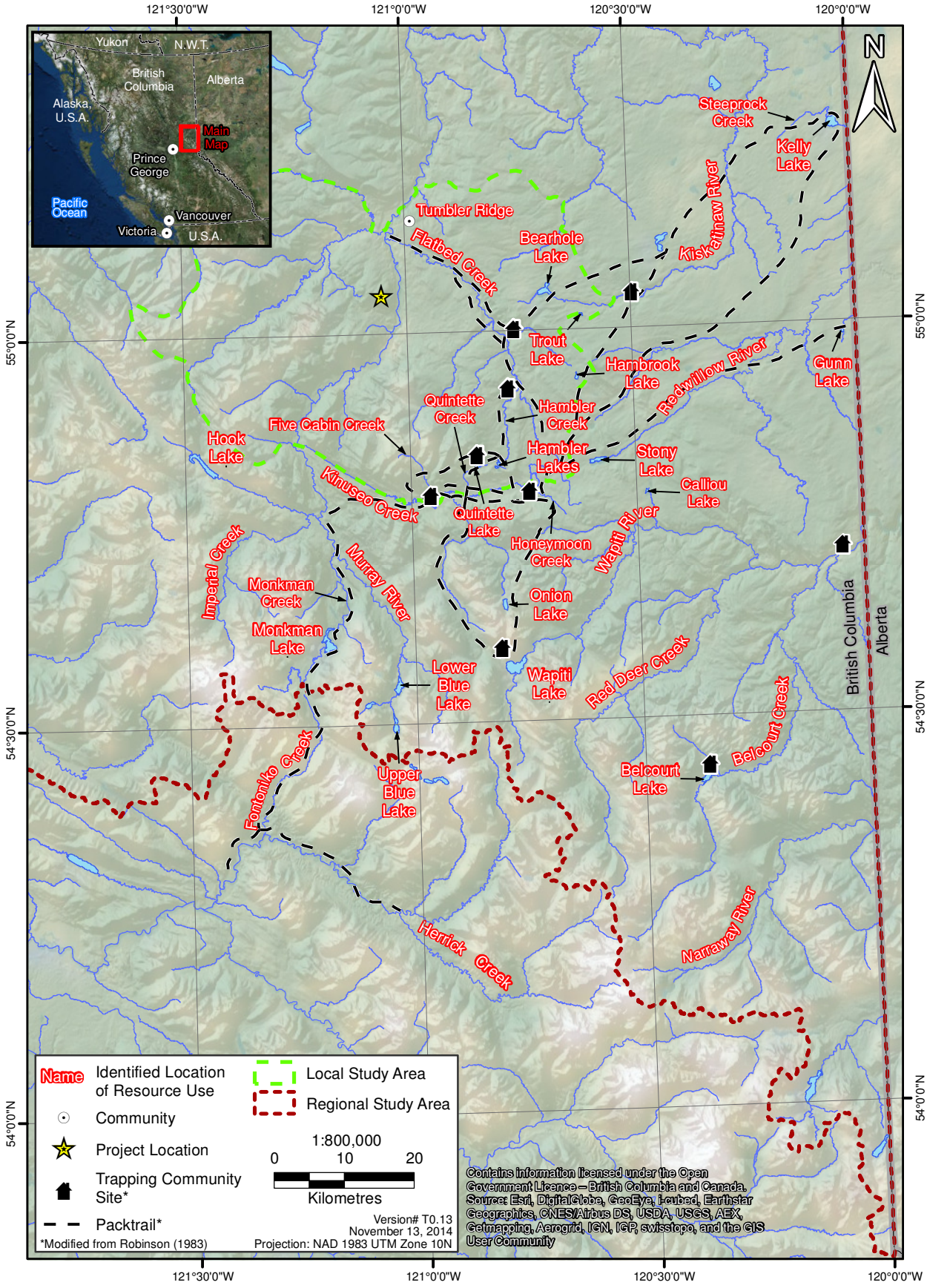


Figure 17.4-11

Kelly Lake Métis Settlement Society: Locations of Traditional and Current Land Use in Relation to the Local and Regional Study Areas



Species trapped by the Kelly Lake Métis include beaver, lynx, marten, mink, muskrat, red squirrel, weasel, otter, coyote, fisher, and wolverine.(Michael Robinson 1983). The Five Cabins and Monkman Cabins sites (see Section 17.4.9.4) are also used by the Kelly Lake Métis for hunting moose and elk (Michael Robinson 1983).

The Kelly Lake Métis also harvest moose in the Fort St. John area (outside of the RSA), Kelly Lake, the Little Smoky River (outside of the RSA), and the Wapiti River (Davison and Danda 2012).

17.4.9.3 Current Gathering

Berry plants commonly used by KLMSS include strawberries, Saskatoon berries, raspberries, dew berries, low and highbush cranberries, huckleberries, low and highbush blueberries, black currants, and red currants. Medicinal plants include rabbit root, rat root, Labrador tea, purple aster, buffalo berry, mint tea, carrot root, valerian and spruce gum from black spruce bark, jackpine, white lily, alder bark, cow parsnip, fireweed, ferns, and moss. Important areas for gathering medicines include the Wapiti River and areas in Alberta (ENGP 2010), both outside the RSA.

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.9) and consultation efforts with KLMSS (Section 17.4.9 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify KLMSS plant gathering sites or areas within the LSA or RSA.

17.4.9.4 Use of Habitations, Trails, Cultural and Spiritual Sites

Small, seasonal settlements, each housing a small number of cabins and outbuildings were formerly used as base camps for the Kelly Lake Métis trapping season. These Trapping Community Sites were at Poona 'Tik See Pee (Rhubarb Flats), Calahaison (Calahasen) Flats, Hambler Cabins, Five Cabins and Monkman Cabins (all within or just on the edge of the LSA; Figure 17.4-11). There were 18 to 20 cabins collectively in these five communities. A further four sites – Joker Flats (just outside the LSA), Wapiti Lake Camp, Belcourt Lake Camp, and Wapiti River Cabins – were also within the larger Kelly Lake trapping region. These communities were occupied seasonally between 1900 and 1960 (Michael Robinson 1983). However, they are no longer occupied, being either dilapidated or containing no evidence of the earlier cabin structures. Gravel roads, pick-up trucks, and skidoos have all contributed to much-improved access to the Kelly Lake Trapping Region. Because of this, there has been a shift in winter residence patterns, with harvesters remaining in Kelly Lake over the winter. Many trappers can now drive out to check their line and return home to Kelly Lake in the same day (Davison and Danda 2012).

A settlement referred to by the KLMSS as the Redwillow Métis Settlement is located near the Redwillow River (in the RSA). The Settlement consists of multiple cabins, a barn and a sawmill. A possible burial associated with the settlement was located in a 2008 in connection with field work for the Thunder Mountain Wind Project (TMW 2009). Additional TK/TU research conducted for the Northern Gateway Project identified community camps in the RSA at Hook Lake, Gunn Lake, Imperial Creek, Honeymoon Creek, and Calliou Flats (ENGP 2010).

There are also burials at Gunn Lake (Big Slough; one), Five Cabins (one, possibly three; at the edge of the LSA); Calahasen Flats (six; in the LSA); Flatbed Creek (one; in the LSA); and Calliou Flats

(possibly three; Davison and Danda 2012). Hambrook Lake (at the edge of the LSA) is a KLMSS spiritual site, utilized for the healing property of the water (TMW 2009).

The Thunder Creek Trail (in the RSA) is a well-known trail used by the Kelly Lake communities to access the mountains (Michael Robinson 1983). Another pack trail associated with the Hambler family consists of at least 206 blazed trees may correspond to the "main trail to the mountains which came down from Thunder Mountain" (Michael Robinson 1983) This trail likely connects to trails located along the Kiskatinaw River at the edge of the LSA.

17.4.10 Métis Nation BC Current Use of Lands and Resources

Information summarized in this section is based on secondary information sources (see Section 17.4.2 and Appendix 17A: Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report). Consultation efforts with MNBC are described in Section 17.4.1 and Chapter 2: Information Distribution and Consultation. Key secondary materials reviewed include the Site C Clean Energy Project EA Application (Traditions Consulting Services 2013d). Places identified in the following subsections can be found on the map in Figure 17.4-6.

MNBC assert rights over the entire province, with documented traditional land use in 95% of the provincial watersheds (MNBC 2010).

17.4.10.1 Current Fishing

MNBC indicate the Métis fish for lake trout and other fish in a stretch of the Peace River near Hudson's Hope and west of Bear Flats and the eastern end of the Williston Reservoir. Dolly Varden are harvested from Dunlevy Creek (outside of the RSA). They also fish in Charlie Lake (outside of the RSA) and Moberly Lake for a variety of fish species (Traditions Consulting Services 2013d).

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.10) and consultation efforts with MNBC (Section 17.4.10 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify MNBC fishing sites or areas within the LSA.

17.4.10.2 Current Hunting and Trapping

The MNBC indicate they harvest deer, elk, moose, caribou, bison (where available), sheep, small game, and birds. The Peace River and Pine River watersheds were identified by MNBC as important wildlife harvesting areas (Traditions Consulting Services 2013d). Lower Dunlevy Creek (outside the RSA) was identified as a moose hunting area, and caribou are hunted along Butler Ridge (just north of the RSA). Moose, bear, and rabbit are hunted on the south side of the lower Pine River, while grouse are harvested south of Monias Lake. Moose and beaver are also harvested along Highway 29 between West Moberly Lake IR 168A and the Peace River. These areas are within the RSA and outside of the LSA (Traditions Consulting Services 2013d).

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.10) and consultation efforts with MNBC (Section 17.4.10 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify MNBC hunting or trapping sites or areas within the LSA.

17.4.10.3 Current Gathering

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.10) and consultation efforts with MNBC (Section 17.4.10 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify MNBC plant gathering sites or areas within the LSA or RSA.

17.4.10.4 Current Use of Habitations, Trails, Cultural and Spiritual Sites

MNBC indicated they have camp sites from Hudson's Hope to the mouth of Pine River along the Peace River, and have cabins on the south side of the lower Pine River, and between West Moberly Lake IR 168A and the Peace River along Highway 29 (Traditions Consulting Services 2013d). There are also camp sites at Dunlevy Creek and Butler Ridge (both outside of the Current Aboriginal Use baseline RSA). MNBC indicated there are burial sites around Hudson's Hope. Moberly Lake was identified as a cultural landscape (Traditions Consulting Services 2013d).

Review of secondary source materials (Section 17.4.1.1 and Section 17.4.10) and consultation efforts with MNBC (Section 17.4.10 and Section 2.4.3 of Chapter 2, Information Distribution and Consultation) did not identify MNBC habitations, trails, cultural or spiritual sites within the LSA.

17.4.11 Doig River First Nation Current Use of Lands and Resources

Information summarized in this section is based on secondary information sources (see Section 17.4.2 and Appendix 17A: Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report). Consultation efforts with DRFN are described in Section 17.4.1 and Chapter 2: Information Distribution and Consultation. Key secondary materials reviewed include R. Ridington (1968); Weinstein (1979); UBCIC (1980); Brody (1981); R. Ridington (1981); DRFN (2007); Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative (2012); BC Hydro and Power Authority (2013a); MWE (2013); Stantec (2013b); and WCGT (2014).

Figure 17.2-1 identifies DRFN traditional and current use locations in relation to DRFN reserves and the LSA and RSA.

17.4.11.1 Current Fishing

Information sources reviewed did not identify current DRFN fishing locations and practices. Should information regarding DRFN current fishing locations and practices be provided, it will be considered during the Application/EIS review period.

17.4.11.2 Current Hunting and Trapping

DRFN members continue to hunt and trap throughout their asserted traditional territory, mainly during August and September, in order to stock food for the winter. Moose is the most hunted and consumed animal, followed by elk, and deer (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012). Wolf, bear, porcupine, coyote, lynx, squirrel, rabbit, and beaver are hunted and trapped in lesser numbers (Stantec 2013a).

Brody (1981) depicted DRFN hunting as being located north and east of Fort St. John. The eastern limit of hunting is in the area of the Clear Hills in Alberta, the southern limit is north of the Peace River around Goodlow and Cecil Lake, the western limit is the Beatton River, and the northern limit is the Milligan Hills (all outside of the RSA). Snare Hill was an area traditionally used for hunting large numbers of moose during the winter; it is still used today for hunting and trapping. Seasonal hunting camps were also located at Sweeney Creek, just east of the BC-Alberta border, at Big Camp, Aledze Creek, and Osborne River (DRFN 2007). The areas are all north of the Peace River and outside of the RSA. More recently, the Peace River valley and Del Rio area (in the RSA), Farrell Creek and the Alaska Highway north of the Halfway Reserve (outside the RSA), are also used.

In the 1980 UBCIC report, the areas depicted on a map of "Doig trapping areas" (UBCIC 1980) largely mirror those on the map of hunting areas depicted by Brody. Two other maps by Brody depict Doig River Reserve Berry Picking Areas and Doig River Reserve Camping Sites. Both activities fall within the general area depicted on the hunting map. Doig River Reserve Fishing Areas are depicted along the Peace River, lower Pine River and lower Moberly River (which are within the RSA), as well as Farrell Creek, Charlie Lake, and up the Beatton River (outside the RSA). Dolly Varden, lake trout, rainbow trout, whitefish and jackfish (WCGT 2014), grayling and suckers (Stantec 2013a) are commonly fished species.

In 2011, DRFN declared a 90,000 hectare area east of their Reserve that is bisected by the British Columbia/Alberta border (known as K'ihtsaa? Dze, meaning "old spruce") as a Tribal Park. DRFN consider this area less impacted by industrial development than other areas and as a preferred harvesting area. The area is located approximately 50 km east of Fort St. John and was created to preserve it for continued traditional hunting, trapping and cultural practices (BC Hydro and Power Authority 2013a; WCGT 2014). Other preferred areas identified as currently used by DRFN members are: north of the Reserve to Fontas River, including Chinchaga Lakes; near the Doig and Beatton Rivers; and toward and across the Alberta border including Boundary Lake and Ole Lake (all outside the RSA).

17.4.11.3 Current Gathering

Plant harvesting plays an essential role within DRFN culture, with much of this taking place on the south-facing banks of the Peace River. Wild onion, berries and medicinal plants are gathered along the Peace River (WCGT 2014).

17.4.11.4 Current Habitations, Trails, and Cultural and Spiritual Sites

Places where DRFN traditionally resided included the present-day Doig River Reserve, as well as Montney and at Petersen's Crossing (DRFN 2007). Large gatherings for ceremonies and other "essential social, economic and cultural activities" would occur in the areas around Montney, Taylor and Fort St. John, BC (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012). Bear Flat, Attachie, Cache Creek, Farrell Creek and Lynx Creek are all areas used by DRFN for gatherings and camping. North Bank has also been identified as a culturally and historically important site for gathering, grazing and camping. There are also spiritual sites and grave sites in the vicinity of North Bank (Stantec 2013a; WCGT 2014). These areas are all outside the RSA.

17.4.12 Prophet River First Nation Current Use of Lands and Resources

Information summarized in this section is based on secondary information sources (see Section 17.4.2 and Appendix 17A: Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report). Consultation efforts with PRFN are described in Section 17.4.1 and Chapter 2: Information Distribution and Consultation. Key secondary materials reviewed include Weinstein (1979); UBCIC (1980); Brody (1981); (Bannister 2006); Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative (2012); BC Hydro and Power Authority (2013a); and Stantec (2013a).

Figure 17.2-1 identifies PRFN traditional and current use locations in relation to PRFN reserves and the LSA and RSA.

17.4.12.1 Current Fishing

PRFN members fish in the Prophet, Minaker, and Sikanni Chief Rivers, all of which support Arctic grayling. PRFN also report fishing in Klua Lake (Stantec 2013a), said to be the primary fishing lake for PRFN members (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012). All of these areas are located outside the RSA.

17.4.12.2 Current Hunting and Trapping

PRFN continue to hunt moose, deer, elk and caribou for subsistence (Stantec 2013a). Brody (Brody 1981) depicted PRFN hunting north and west of the Sikanni Chief River. In 2006, PRFN identified 36 areas of harvesting importance, as well as a number of areas of environmental concern, during an ethnobotany study (Bannister 2006). The sites were located within an area roughly 90 km south of the PRFN Reserve to 50 km north of the Reserve (BC Hydro and Power Authority 2013a). The PRFN primary traditional use area is located north of the Sikanni Chief River and Pink Mountain. All of these areas are located outside the RSA.

17.4.12.3 Current Gathering

PRFN hold gatherings where berry picking, social events, and hunting take place. Areas of cultural significance specifically mentioned by PRFN are the north side of the Buckinghorse River, east of the Buckinghorse campground, Mason Lake, and north and south of the Sikanni Chief River (Stantec 2013a). PRFN members have close connections to the people of Halfway River and continue to travel to the Peace River valley for harvesting and annual gatherings held at Attachie and Bear Flats (BC Hydro and Power Authority 2013a). All of these areas are located outside the RSA.

17.4.12.4 Current Use of Habitations, Trails, and Cultural and Spiritual Sites

Information sources reviewed did not identify current PRFN use of habitations, trails, and cultural and spiritual sites locations or practices. Should information regarding PRFN current use of habitations, trails, and cultural and spiritual sites locations or practices be provided, it will be considered during the Application/EIS review period.

17.4.13 Halfway River First Nation Current Use of Lands and Resources

Information summarized in this section is based on secondary information sources (see Section 17.4.2 and Appendix 17A: *Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report*). Consultation efforts with HRFN are described in Section 17.4.1 and Chapter 2: Information Distribution and Consultation. Key secondary materials reviewed include Weinstein (1979); UBCIC (1980); Brody (1981); Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative (2012); BC Hydro and Power Authority (2013a); and WCGT (2014).

Figure 17.2-1 identifies HRFN traditional and current use locations in relation to HRFN reserves and the LSA and RSA. The HRFN administrative boundary is bounded to the south by the Peace River, and encompasses the Halfway River drainage. The northern boundary of the territory extends approximately to the Sikanni Chief River.

17.4.13.1 Current Fishing

In the 1980 UBCIC report, a map of HRFN fishing areas depicts a concentration of fishing areas along the Halfway River and the western tributaries including the Graham River, Chowade River and Cypress River (UBCIC 1980). Various species of trout including brook, Dolly Varden and rainbow, in addition to whitefish and northern pike are harvested from the confluence of the Halfway and Peace rivers (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012). All of these areas are located outside the RSA.

17.4.13.2 Current Hunting and Trapping

Brody (1981) depicted HRFN hunting as being located largely on the north side of the Peace River from Williston Reservoir to Bear Flats (outside the RSA), with a small section along the south shore of the Peace River from opposite Hudson's Hope to opposite Bear Flats, and north to the Sikanni Chief River. The western boundary is the Rocky Mountains and the eastern boundary is the height of land between the Blueberry and Cameron Rivers. The north side of Peace Reach is noted as an area currently preferred by the HRFN to exercise their treaty and Aboriginal rights (BC Hydro and Power Authority 2013a). The Farrell Creek area is also identified as an important harvesting area (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012).

Areas of current highest use and value by HRFN members include the Halfway Reserve and down the Halfway River to Attachie, Crying Girl Prairie, Chowade River, Farrell Creek between Hudson's Hope and the upper Halfway River, Christina Falls, and the Graham River watershed (BC Hydro and Power Authority 2013a). The main hunting areas are at the confluence of the Cameron and Halfway rivers, and around the Chowade River.

These areas are all outside the RSA.

17.4.13.3 Current Gathering

Information sources reviewed did not identify current HRFN gathering locations or practices. Should information regarding HRFN current gathering sites locations or practices be provided, it will be considered during the Application/EIS review period.

17.4.13.4 Current Use of Habitations, Trails, and Cultural and Spiritual Sites

The Halfway River was a major transportation route in the Peace Valley for Halfway River First Nation members (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012). Traditional use trails crossed and were located on either side of the Peace River.

Attachie (outside the RSA at the confluence of the Halfway and Peace rivers) is an important gathering and burial place, named after the Chief buried there in 1919 along with many other influenza victims. Burial sites are also present on the south side of the Peace River, and downstream of Bear Flats. Multiple other unmarked burial sites are present throughout the Peace Valley. Bear Flats (outside the RSA) was historically and remains and important gathering site (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012; BC Hydro and Power Authority 2013a).

A sacred site exists at the confluence of the Halfway and Chowade rivers, and a sweat lodge is located near Bear Flats. The Peace River islands are important historically, and are associated with certain dreamers and spiritual power. A rock of cultural importance to HRFN is located on a hill north of Butler Ridge. This "spirit rock" has many associated stories, including one story that says the rock points to where a hunter will find moose. There are also stories of the rock moving, and of people hearing singing near the rock (Treaty 8 First Nations Community Assessment Team and The Firelight Group Research Cooperative 2012; BC Hydro and Power Authority 2013a).

All of these areas are located outside the RSA.

17.4.14 Fort Nelson First Nation Current Use of Lands and Resources

Information summarized in this section is based on secondary information sources (see Section 17.4.2 and Appendix 17A: Desk-based Ethnographic Overview and Traditional Knowledge / Traditional Use Report). Consultation efforts with FNFN are described in Section 17.4.1 and Chapter 2: Information Distribution and Consultation. Key secondary materials reviewed include (Honigmann 1946; Asch 1981; Brody 1981) and other EA Applications, including:

- Site C Clean Energy Project (BC Hydro and Power Authority 2013b);
- Fort Nelson Electrical Generation Project;
- Fortune Creek Gas Project;
- Jedney Gas Plant Project;
- Jedney Gas Processing Plant and Pipeline Expansion Project;

- Maxahamish Project;
- Meikle Wind Energy Project (MWE 2013)'
- Northern Rockies Secure Landfill Project; and
- Peejay Secure Landfill Project.

Figure 17.2-1 identifies FNFN traditional and current use locations in relation to FNFN reserves, FNFN traditional territory Project (BC Hydro and Power Authority 2013b), and the LSA and RSA.

17.4.14.1 Current Fishing

Information sources reviewed did not identify current FNFN fishing locations or practices. Should information regarding FNFN current fishing sites locations or practices be provided, it will be considered during the Application/EIS review period.

17.4.14.2 Current Hunting and Trapping

Brody (1981) depicted FNFN hunting territories in the wooded river valleys of northeastern British Columbia, including sections of Fort Nelson River, Liard River, Fontes River, Prophet River and Muskwa River. Hunting areas are also depicted in the areas of surrounding muskeg. These areas are all outside of the RSA.

17.4.14.3 Current Gathering

Information sources reviewed did not identify current FNFN gathering locations or practices. Should information regarding FNFN current gathering sites locations or practices be provided, it will be considered during the Application/EIS review period.

17.4.14.4 Current Use of Habitations, Trails, and Cultural and Spiritual Sites

In its 2012 Strategic Land Use Plan (FNFN 2012), FNFN included a map of the habitation sites (cabins and camps) in their traditional territory. These habitation sites are likely associated with FNFN harvesting activities, and are all far north of the RSA. These areas are all outside of the RSA.

17.4.15 Sucker Creek First Nation Current Use of Lands and Resources

The Proponent wrote to SCFN on April 25, 2014 to provide members with a plain language summary of the proposed Project and to summarize the types of information that will be included in the Application/EIS. The summary outlined the Proponent's understanding of SCFN's Aboriginal and treaty rights and related interests as related to the Project, VCs of potential interest to SCFN, and the Proponent's proposed approach to assess potential impacts of the Project on Treaty 8 First Nations' Aboriginal and treaty rights and related interests. To date, SCFN has not provided a response to the Proponent or information regarding its members' current use of the Project area. The Proponent is committed to follow up with SCFN to discuss any TK/TU information provided during the Application review or permitting stages.

The Proponent has made efforts to research publically available secondary source information, as well as other EA applications, to document SCFN current use of lands and resources. Sources researched include:

- The BC EAO Project Information Centre (e-PIC): http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_home.html
- The CEA Agency's Canadian Environmental Assessment Registry: https://www.ceaa-acee.gc.ca/050/index-eng.cfm
- The National Energy Board's Major Applications and Projects: http://www.neb-one.gc.ca/clf-nsi/rthnb/pplctnsbfrthnb/pplctnsbfrthnb-eng.html
- The BC Oil and Gas Commission Major Projects list: http://www.bcogc.ca/public-zone/major-projects-centre/list; and
- The Alberta Ministry of Environment and Sustainable Resource Development-Environmental Assessments Online: https://external.sp.environment.gov.ab.ca/DocArc/EIA/Pages/default.aspx

The Proponent is also aware that SCFN has completed a Traditional Land Use Study funded by Shell Canada for the Carmon Creek Project (CTQ Consultants Ltd. 2014). SCFN also acknowledge this study on their website (SCFN 2011). A copy of this study is not publically available.

Despite the Proponent's research efforts, no publically available information has been found to characterize SCFN's traditional or current use of lands and resources, including their use of the LSA or RSA.

Figure 17.2-1 shows the location of SCFN in relation to the Project.

17.5 ESTABLISHING THE SCOPE OF THE EFFECTS ASSESSMENT FOR CURRENT ABORIGINAL USE

The following section describes the scoping process used to: a) identify potentially affected VCs; b) select VC assessment boundaries; and c) identify potential effects that are likely to arise from the Project's interaction with an intermediate component or receptor VC. Scoping is fundamental to focusing the Application/EIS on those issues where there is the greatest potential to cause significant adverse effects. The scoping process for the assessment of effects to Current Aboriginal Use consisted of the following four steps:

- *Step 1:* undertaking an issues scoping process to select Current Aboriginal Use receptor VC subcomponents and indicators based on a consideration of the Project's potential to interact;
- *Step 2:* consideration of feedback on the results of the scoping process from technical experts and the EA Working Group;
- *Step 3:* definition of assessment boundaries for Current Aboriginal Use; and
- *Step 4*: identification of key potential effects on Current Aboriginal Use.

Each of these steps is described below.

17.5.1 Selecting Receptor Valued Components

VCs are components of the natural and human environment that are considered to be of scientific, ecological, economic, social, cultural, or heritage importance (CEAA 2006; EAO 2013). To be included in the environmental assessment (EA), there must be a perceived likelihood that the VC will be affected by the proposed Project. VCs are scoped into the EA based on issues raised during consultations on the draft Application Information Requirements (dAIR) and EIS Guidelines with Aboriginal communities, government agencies, the public and stakeholders. Consideration of certain VCs may also be a legislated requirement, or known to be a concern because of experience with other proposed mine projects.

Consultation activities relating to Current Aboriginal Use have included meetings and discussions related to the EA review process for the Project (e.g., AIR review, open houses, working group meetings), as well as consultations with Aboriginal groups related to the Murray River bulk sample *Mines Act* application. Communication, in the form of update letters, with Aboriginal groups potentially affected by the Project, has taken place. The information from these consultations has been used to focus the scope of the assessment on issues of interest or importance to Aboriginal groups.

VCs were included in the assessment due to one or more of the following:

- there is an occurrence of spatial and temporal overlaps between the Project and the VC such that interactions are possible;
- there is a clear and measurable relationship between the effects of the Project and the VC so that an accurate characterization of the Project's direct and indirect effects can be made; or
- there is a perceived, reasonable likelihood that the VC could be affected by the Project.

17.5.1.1 Fishing Opportunities and Practices

The Construction, Operation, and Decommissioning and Reclamation phases of the Project have the potential to affect Aboriginal fishing opportunities and practices. SFN and HLFN members report fish harvesting within the vicinity of the Project (Section 17.4.5, Section 17.4.8, and Appendix 17-B). Consultation efforts and the review of secondary information has not identified evidence of current fishing use of the baseline LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

During an April 16, 2013 community meeting with SFN, WMFN and MLIB (facilitated by the three Aboriginal groups' third party reviewer; see Chapter 2: Information Distribution and Consultation), community members raised concerns about:

- potential changes in water quantity and quality and subsequent fish habitat impacts;
- impacts on spawning; and
- health impacts from eating contaminated fish.

The *Saulteau First Nations Knowledge and Use Study* (Appendix 17-B) states that "the Project is anticipated to have important and potentially significant impacts on SFN harvesting rights, and other related rights, associated with water and fish…" (pp. 46-47). Concerns relating to water and fish raised by SFN members include the following:

- Potential contamination or perceived contamination of rivers and water courses, particularly due to coal dust but also other contaminants entering the water from mine operations. These impacts would potentially also be felt for considerable distances downstream from the Project.
- Potential contamination or perceived contamination of fish due to coal dust and other contaminants. These impacts would potentially also be felt for considerable distances downstream from the Project.
- Potential physical disturbance of water courses and fish habitat along the Murray River.
- Cumulative impacts of the mine together with other industrial operations on contamination or perceived contamination of water and fish downstream of the Project, through the Murray River, Pine River and into the Peace River.

MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN have not raised concerns related to potential impacts of the Project on their members' current fishing use of the Project area. Should these groups identify current fishing activities that might be impacted by the Project during the Application/EIS review, the Proponent is committed to further consultation on, and consideration of, the matter.

17.5.1.2 Hunting and Trapping Opportunities and Practices

The Construction, Operation, and Decommissioning and Reclamation phases of the Project have the potential to affect Aboriginal groups hunting and trapping opportunities and practices. SFN, MLIB, WMFN, BRFN, HLFN, and KLMSS report wildlife harvesting activities within the vicinity of the Project (Section 17.4 and Appendix 17-B). Consultation efforts and the review of secondary information has not identified evidence of current hunting and trapping use of the LSA or RSA for MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

The SFN Knowledge and Use Study (Appendix 17-B) states that the Project "is anticipated to have important and potentially significant impacts on SFN harvesting rights." Key SFN concerns include the following:

- Disturbance of animals during project construction and operation, causing them to move away from the area – particular concern was expressed over caribou, as their numbers are already low and they are sensitive to disturbance; and moose, as they are a particularly important resource for SFN members;
- Habitat fragmentation from land clearing for mine operations and road construction, limiting animal movement and reducing the size of habitat areas available to animals;

- Dust from the coal mine being inhaled by animals, or other chemicals from the mine being ingested by animals, leading to contamination of their meat and consequent impacts on human health;
- Linear disturbances (roads or rail) improving hunting success rates for predators such as wolves and bears, leading to reduced numbers of prey species such as moose, elk, and caribou – this in turn leads to increasing numbers of bears and wolves, adding further pressure to prey species;
- Linear disturbances (roads or rail) improving access for hunters, and increasing their success rates due to long lines of sight, adding to hunting pressures on wildlife populations; and
- Construction work on the mine bringing increasing numbers of people into the area, and familiarizing them with good hunting locations, adding hunting pressure to wildlife populations.

During its review of a draft version of this chapter, SFN added the following bullet to the above list:

- Degradation of Treaty Rights through cumulative impacts on the land.

Cumulative effects are assessed in Section 17.10.

During a May 17, 2013 meeting with the Proponent, WMFN raised concerns that the Project could adversely affect caribou (Appendix 2-D). During a June 6, 2013 open house with WMFN community members, attendees raised concerns about the potential of the Project to adversely affect the ability of members to hunt elk and to contribute to cumulative effects on water quality and, consequently, wildlife. Attendees noted that the Project's course coal rejects area is a current hunting area and described the Project site in general as 'good elk country' (Appendix 2-D).

During an April 16, 2013 community meeting with WMFN, SFN, and MLIB (facilitated by the three Aboriginal groups' third party reviewer), community members raised concerns about:

- potential impacts to caribou habitat;
- potential impacts on migration patterns, sensitive lifecycle periods, and health of wildlife; and
- potential impacts of the Project's conveyor belt on wildlife[3];

MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN have not raised concerns related to potential impacts of the Project on their members' current hunting and trapping use of the Project area. Should these groups identify current hunting or trapping activities that might be impacted by the Project during the Application/EIS review, the Proponent is committed to further consultation on, and consideration of, the matter.

[3] Based on these concerns and comments from the Working Group, the Proponent changed the Project design, replacing the overland conveyor that would cross the Murray River with a second underground decline under Murray River. This change will reduce potential effects to wildlife movement associated with linear developments.

17.5.1.3 Gathering Opportunities and Practices

The Construction, Operation, and Decommissioning and Reclamation phases of the Project have the potential to affect Aboriginal gathering opportunities and practices. SFN members report plant gathering sites within the vicinity of the Project. HLFN identifies the Tumbler Ridge area as a place where members collect medicinal plants such as "rat root." Consultation efforts and the review of secondary information has not identified evidence of current gathering practices in the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4 and Appendix 17-B).

During an April 16, 2013 community meeting with SFN, WMFN, and the MLIB (facilitated by the three Aboriginal groups' third party reviewer), community members raised concerns about potential impacts of contaminants on plant health. Members suggested "plant health" as a VC.

The SFN Knowledge and Use Study (Appendix 17-B) states that "the Project is anticipated to have important and potentially significant impacts on SFN harvesting rights, and other related rights, associated with food plants and medicinal plants". Concerns relating to berries, medicines, and other plants raised by SFN members include the following:

- direct removal of plants, and destruction of habitat, during the construction of the mine, particularly medicines;
- replacement of native species with non-native species during reclamation; and
- contamination or perceived contamination of plant picking sites due to coal dust or due to spaying of herbicides around the mine or along roads and access routes used for mine construction, operations, and maintenance.

MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN have not raised concerns related to potential impacts of the Project on their members' current gathering in the Project area. Should these groups identify current gathering activities that might be impacted by the Project during the Application/EIS review, The Proponent is committed to further consultation on, and consideration of, the matter.

17.5.1.4 Use of Habitations, Trails, and Cultural and Spiritual Sites

The Construction, Operation, and Decommissioning and Reclamation phases of the Project have the potential to affect the use of habitations trails, cultural and spiritual sites by Aboriginal groups. SFN identified a camping site, a sacred site, a spiritual area, and a trail in the vicinity of the Project (Section 17.4.5 and Appendix 17-B). Consultation efforts and the review of secondary information has not identified evidence of current use of habitations trails, cultural and spiritual sites in the LSA for MLIB, WMFN, BRFN, HLFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

During an April 16, 2013 community meeting with SFN, WMFN, and the MLIB (facilitated by the three Aboriginal groups' third party reviewer), community members raised concerns about potential

impacts of the Project on spiritual and ceremonial sites (Chapter 2 and Appendix 2-D). Specific concerns related to sacred mountains, sacred animals, and sites used to transmit culture.

According to the *Saulteau First Nations Knowledge and Use Study* (Appendix 17-B), "SFN members state that the Murray River Coal Project, with its impacts on the look and feel of the landscape, as well as on the quality and quantity of animals and other resources in the area, would discourage them from visiting or teaching their children in the area, with a consequent reduction in cultural continuity" (p. 56). Key SFN concerns with respect to cultural continuity, as summarized on p. 57 of the report, include the following:

- Direct disturbance and reduced access to areas adjacent to the Murray River that are used for a range of cultural activities, including harvesting of wildlife, teaching of children, and related practices;
- Changes in sense of place, due to changes in the character and feel of the Project footprint and LSA due to landscape disturbance and increased pressure from traffic, light, noise, and non-Aboriginal hunters, leading to reduced ability of SFN members to maintain connections to nearby land and waters and exercise their SFN treaty rights; and
- Reduced opportunities for teaching how to use resources and associated cultural protocols due to reductions in wildlife populations or contamination or perceived contamination of resources in the project footprint, LSA, and downstream along the Murray River.

MLIB, WMFN, BRFN, HLFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, SCFN have not raised concerns related to potential impacts of the Project on their members' current use of habitations, trails, cultural or spiritual sites in the Project area. Should these groups identify use of habitations, trails, cultural and spiritual sites in the Project area that might be impacted by the Project during the Application/EIS review, The Proponent is committed to further consultation on, and consideration of, the matter.

17.5.1.5 Summary of Receptor Valued Components Included and Excluded in the Application/EIS

The Current Aboriginal Use VCs are presented on Table 17.5-1 along with the rationale for including them in the assessment.

17.5.2 Selecting Assessment Boundaries

Assessment boundaries define the maximum limit within which the effects assessment is conducted. They encompass the areas within, and times during which, the Project is expected to interact with the VCs. The definition of these assessment boundaries is an integral part in scoping for Current Aboriginal Use, and encompasses possible direct, indirect, and induced effects of the Project on Current Aboriginal Use, as well as the trends in processes that may be relevant.

Table 17.5-1. Current Aboriginal Use: Receptor Valued Components Included in the Application/EIS

Valued Component	AG	G	P/S	Rationale for Inclusion
Fishing opportunities and practices	X	X		Potential for change in access to fishing areas and the ability to access or use fishing areas. Potential for change in quality of the natural experience for Aboriginal harvesters. Potential for change to harvesting success due to changes in the abundance and distribution of fish species. Potential for change in the perceived quality of fished species.
Hunting and trapping opportunities and practices	X	X		Potential for change in access to hunting and trapping areas and ability to access or use hunting and trapping areas. Potential for change in quality of the natural experience for Aboriginal harvesters. Potential for change to harvesting success due to changes in the abundance and distribution of wildlife species. Potential for change in the perceived quality of hunted species.
Gathering opportunities and practices	X	X		Potential for change in access to gathering areas and the ability to access or use gathering areas. Potential for change in quality of the natural experience for Aboriginal harvesters. Potential for change in harvesting success due to changes in the abundance and distribution of plant species. Potential for changes in the perceived quality of plant resources.
Use of habitations (e.g., camps and cabins), trails, cultural and spiritual sites[4]	X	X		Potential for change in access to habitations, trails, cultural and spiritual sites and ability to access or use habitations, trails, cultural and spiritual sites. Potential for change in quality of the natural experience for Aboriginal groups using habitations, trails, cultural and spiritual sites.

**AG = Aboriginal Group; G = Government; P/S = Public/Stakeholder*

17.5.2.1 Spatial Boundaries

Three study areas were used to assess potential effects on Current Aboriginal Use:

- **Project Assessment Footprint –** Encompasses project components and activities that overlap the Aboriginal groups' current land and resource use areas. The majority of effects to habitations, trails, cultural and spiritual sites are expected to occur in this area.
- **Local Study Area –** The LSA is approximately 2,276 km^2 and surrounds the Project (Figure 17.4-1). The LSA was delineated to encompass the area where Project components and

[4] "Cultural and Spiritual Sites", for the purposes of this chapter, include places that have been identified by Aboriginal groups that may or may not have evidence of human modification. This includes spirit questing sites, puberty ritual sites, Dreamer sites, other sacred sites, important landscape features referred to in oral histories, or landscape features ties to a particular historic event.

activities are likely to interact with current Aboriginal uses. The LSA captures the area where the majority of direct and indirect effects to lands and fish, wildlife and plant resources utilized by Aboriginal groups are anticipated. Ecological factors such as height of land and watershed boundaries, which can act as barriers to movement, were considered when selecting the LSA boundary. Species information, such as home range, habitat use, and seasonal movement patterns, were also considered. The LSA also captures potential Project interactions with access routes and the sensory environment for current Aboriginal uses. Potential access routes with which the Project may interact include sections of the Murray River and the Murray River Forest Service Road. The sensory environment for current Aboriginal use includes the extent of the area where visual and auditory interactions with land users are likely, as defined in Chapter 18: Assessment of Health Effects. The effects assessment LSA is identical to the baseline LSA.

- **Regional Study Area –** The RSA is approximately 42,913 km^2 and is bounded in the north by the Peace River, in the east by the Alberta border, and in the south and west by the Continental Divide (the height of land separating the Pacific and Arctic drainages). The boundary of the RSA is based on the broad traditional migration, travel, and settlement patterns of Aboriginal people throughout the Peace River region of British Columbia (Figure 17.4-1).This area is intended to capture broad potential effects on current Aboriginal use patterns that may occur outside of the local study area. The effects assessment RSA is identical to the baseline RSA.

17.5.2.2 Temporal Boundaries

The temporal boundaries for the land use effects assessment include the following phases:

- **Construction:** 3 years
- **Operation**: 25 years
- **Decommissioning and Reclamation:** 3 years (includes project decommissioning, abandonment and reclamation activities as well as temporary closure and care and maintenance); and
- **Post Closure:** 30 years (includes ongoing reclamation activities and post-closure monitoring).

17.5.3 Identifying Potential Effects on Current Aboriginal Use

Potential project-related effects on Current Aboriginal Use VCs were identified through issues and concerns raised by Aboriginal groups, the *Saulteau First Nations Knowledge and Use Study*, reviews of relevant literature (e.g., ethnographic reports, scientific literature, government documents, and publically available data associated with relevant adjacent projects), and professional judgement and experience (see Section 17.4, Chapter 2: Information Distribution and Consultation, and Appendix 17-A, and Appendix 17-B).

Four potential effects were identified: : (1) change in access or ability to access and use land and resource areas; (2) change in quality of experience of the natural environment; (3) change in harvesting success; and (4) change to the perceived quality of resources. These effects may result in

changes to Current Aboriginal Use patterns (e.g., the location, duration, effort, and timing of use), and are discussed in more detail below:

- **Change in access or ability to access or use land and resource areas –** Construction, operation, and decommissioning and reclamation of the Project may change access to Aboriginal use areas. Potential adverse effects stemming from a change in access include restricted ability to carry out current uses in preferred locations and changes to patterns of current use (e.g., effort, timing, harvest pressure) resulting from relocation of use activities.
- **Change in the quality of experience of the natural environment –** Noise and visual effects from the Project during construction, operation, and decommissioning and reclamation may adversely affect the quality of experience for Aboriginal peoples undertaking current uses.. Change quality of experience may result in decreased desire and ability of Aboriginal peoples to carry out Aboriginal uses in preferred locations, avoidance of the area (either for harvesting or for cultural transmission), and the relocation of use activities from one area to another, resulting in effects to associated patterns of current use (e.g., effort, timing, harvest pressure)
- **Change in harvesting success –** Construction and operation of the Project may change the abundance and distribution of resources harvested by Aboriginal groups, adversely affecting the ability of Aboriginal peoples to collect sufficient resources. Changes in harvesting success may result in broader changes to current use, including timing, location, and effort.
- **Change in the perceived quality of resources —** Construction and operation of the Project may affect the quality of resources harvested by Aboriginal people due to water contamination from accidental spills, and bioaccumulation of contaminants of potential concern (COPCs) through the food chain. Fishing, hunting, trapping and gathering by Aboriginal people in the Project area may be curtailed due to perceptions that the quality of harvested resources in the Project area has changed. Changes in the perceived quality of resources may result in decreased desire and ability of Aboriginal peoples to carry out Aboriginal uses in preferred locations, avoidance of the area (either for harvesting or for cultural transmission), and the relocation of use activities from one area to another, resulting in effects to associated patterns of current use (e.g., effort, timing, harvest pressure)

Potential interactions between Project components/activities and Current Aboriginal Use VCs are identified in Table 17.5-2, based on professional judgement and consideration of other coal mining projects in the area (e.g., Roman Coal Mine project). The table classifies interactions by ranking potential effects on Current Aboriginal Use VCs as none (grey), negligible to minor (green), potentially moderate (yellow) or potentially significant (red). Potential effects identified as moderate or significant are assessed in Section 17.6. Effects with no predicted interaction, and negligible to minor effects, are not assessed further.

Table 17.5-2. Ranking Potential Effects on Current Aboriginal Use

Project Activities		Potential Effects on Current Aboriginal Use			
		Change in Access or Ability to Access or Use Lands and Resources	Change in Quality of Experience of the Natural Environment	Change in Harvesting Success	Change in the Perceived Quality of Resources
Construction	**Underground Mine**				
	Construction of Big Decline (2 headings - surface and underground)	L	M	L	M
	Haul of waste rock from Big Decline portal to North Site	O	M	L	M
	Ventilation during construction	O	L	O	M
	Development mining of underground service (bays, sumps, conveyor headings, etc.)	O	M	O	M
	Construct underground conveyor system	O	L	O	M
	Coal Processing Site				
	Surface Preparation				
	Establish site drainage and water management	O	L	M	L
	Site clearing and stripping (CPP site, CCR #1)	O	M	M	M
	Soil salvage for reclamation	O	L	M	M
	Upgrade access roads, parking and laydown areas	O	M	M	M
	Heavy machinery use	O	M	M	M
	Buildings and Services				
	Install domestic water system	O	L	L	L
	Install sanitary sewer system	O	L	M	L
	Install natural gas and electricity distribution network	O	L	L	L
	Construct main fuel station	O	M	L	M
	Construct buildings (e.g., maintenance, administration, warehouse)	O	M	L	M
	Construct raw coal and clean coal stockpile areas	O	M	L	M
	Construct coal preparation plant buildings and install/commission equipment	O	M	L	M
	Construct surface conveyor system	O	M	L	M
	Construct rail load-out facilities	O	M	M	M

(continued)

Table 17.5-2. Ranking Potential Effects on Current Aboriginal Use (continued)

Project Activities		Potential Effects on Current Aboriginal Use			
		Change in Access or Ability to Access or Use Lands and Resources	Change in Quality of Experience of the Natural Environment	Change in Harvesting Success	Change in the Perceived Quality of Resources
Construction *(cont'd)*	**Shaft Site**				
	Upgrades to infrastructure within existing site	O	M	L	L
	Addition of waste rock within existing storage area	O	L	L	M
	Management of runoff from waste rock pile and release to receiving environment (M20 Creek)	O	L	M	M
	Decline Site				
	Upgrades to infrastructure within existing site	O	M	L	L
	Management of water from underground activities and release by exfiltration to ground	O	L	M	M
	Traffic and Transportation				
	Transportation of materials to and from site	L	M	M	M
	Recycling and solid waste disposal	O	L	L	M
	Shuttling workforce to and from site	O	M	L	M
	Workforce and Administration				
	Hiring and management of workforce	O	O	O	O
	Taxes, contracts and purchases	O	O	O	O
Operation	**Underground Mine**				
	Longwall panel mining, and development mining	O	L	O	M
	Ventilation from underground	O	O	L	M
	Methane management	O	O	L	M
	Secondary shaft construction	O	M	L	L
	Underground seepage collection and water management	O	O	M	L
	Surface subsidence	O	O	M	O

(continued)

Table 17.5-2. Ranking Potential Effects on Current Aboriginal Use (continued)

Project Activities		Potential Effects on Current Aboriginal Use			
		Change in Access or Ability to Access or Use Lands and Resources	Change in Quality of Experience of the Natural Environment	Change Harvesting Success	Change in the Quality of Resources
Operation (*cont'd*)	**Coal Processing Site**				
	Coal Processing Plant				
	Stockpiles of raw coal	O	O	O	M
	Operation of coal preparation plant and conveyor system	O	M	M	LM
	Stockpiles of clean coal and middlings	O	O	O	M
	Operation of rail loadout	O	M	M	M
	CCR				
	CCR Pile development	O	O	M	M
	Site clearing and stripping (expansion of CCR #1, construction of CCR #2)	O	M	M	M
	Seepage collection system	O	O	M	L
	Water Management				
	Management of water brought to surface from underground	O	O	O	L
	Management of seepage from CCR	O	O	M	
	Management of other site contact water	O	O	M	M
	Maintenance of site ditching and water management infrastructure	O	L	M	M
	Release of excess contact water to receiving environment	O	O	M	M
	Shaft Site				
	Maintenance of infrastructure within existing site	O	L	L	L
	Progressive reclamation of waste rock pile	O	M	L	M
	Management of runoff from waste rock pile and release to receiving environment (M20 Creek)	O	O	M	M
	Decline Site				
	Maintenance of infrastructure within existing site	O	L	O	L

(continued)

Table 17.5-2. Ranking Potential Effects on Current Aboriginal Use (continued)

Project Activities		Potential Effects on Current Aboriginal Use			
		Change in Access or Ability to Access or Use Lands and Resources	Change in Quality of Experience of the Natural Environment	Change in Harvesting Success	Change in the Quality of Resources
Operation *(cont'd)*	**Secondary Shafts Site**				
	Site preparation and construction of shafts	O	M	M	M
	Maintenance of infrastructure within existing site	O	L	L	L
	Utilities, Power, and Waste Handling				
	Electrical power use	O	O	O	O
	Natural gas use	O	O	O	M
	Domestic water use	O	O	O	L
	Domestic sewage handling	O	O	O	L
	Recycling and solid waste disposal	O	O	O	L
	Heavy Machinery, Traffic, and Transportation				
	Shuttling workforce to and from site	O	M	M	M
	Transportation of materials to and from site	L	M	M	M
	Surface mobile equipment use	O	M	L	M
	Road maintenance	O	M	M	M
	Fuel storage	O	O	L	L
	Workforce and Administration				
	Hiring and management of workforce	O	O	L	O
	Taxes, contracts and purchases	O	O	L	O
Closure	**Infrastructure Removal and Site Reclamation**				
	Facility tear down and removal	O	M	O	M
	Reclamation of plant site	O	M	O	M
	Reclamation of on-site roads and rail lines	O	M	O	M
	Recycling and solid waste disposal	O	M	O	M

(continued)

Table 17.5-2. Ranking Potential Effects on Current Aboriginal Use (completed)

Project Activities		Potential Effects on Current Aboriginal Use			
		Change in Access or Ability to Access or Use Lands and Resources	Change in Quality of Experience of the Natural Environment	Change in Harvesting Success	Change in the Quality of Resources
Closure *(cont'd)*	**Heavy Machinery, Traffic, and Transportation**				
	Shuttling workforce to and from site	O	M	M	M
	Transportation of materials to and from site	L	M	M	M
	Surface mobile equipment use	O	M	O	M
	Fuel storage	O	O	O	L
	CCR				
	Reclamation of CCR	O	M	O	M
	Seepage collection system	O	O	O	L
	Site water management and discharge to receiving environment	O	O	M	M
	Underground Mine				
	Infrastructure tear down and removal	O	O	M	M
	Geotechnical and hydrogeological assessment and bulkhead installation	O	O	O	O
	Groundwater monitoring	O	O	O	O
	Workforce and Administration				
	Hiring and management of workforce	O	O	O	O
	Taxes, contracts and purchases	O	O	O	O
Post Closure	**Shaft Site**				
	Waste rock pile seepage monitoring	O	O	O	O
	CCR				
	Seepage collection system	O	O	O	L
	Site water management and discharge to receiving environment	O	O	M	L
	Underground Mine				
	Groundwater monitoring	O	O	O	O

O *Spatial and temporal overlap, but no interaction anticipated; no further consideration warranted.*

L *Negligible to minor adverse effect expected; implementation of best practices, standard mitigation and management measures; no monitoring required; no further consideration warranted.*

M *Potential moderate adverse effect requiring unique active management/monitoring/mitigation; warrants further consideration.*

H *Key interaction resulting in potential significant major adverse effect or significant concern; warrants further consideration.*

17.6 EFFECTS ASSESSMENT AND MITIGATION FOR CURRENT ABORIGINAL USE

Sections 17.6.1 to 17.6.4 assess the Project's potential effects on Current Aboriginal Use during Construction, Operation, Decommissioning and Reclamation, and Post Closure. This assessment is based on:

- information provided by Aboriginal groups to date;
- rights and interests under Treaty 8 relating to fish and wildlife resources; and
- the effects assessments presented in the Assessment of Surface Water Quality Effects (Chapter 8), Assessment of Fish and Fish Habitat Effects (Chapter 9), Assessment of Terrestrial Ecology Effects (Chapter 11), Assessment of Wildlife Effects (Chapter 13), Assessment of Health Effects (Chapter 18), and Assessment of Heritage Effects (Chapter 19), where appropriate.

17.6.1 Key Effects on Fishing Opportunities and Practices

The Construction, Operation, and Decommissioning and Reclamation phases of the Project have the potential to affect Aboriginal fishing opportunities and practices. These effects would be associated with heavy equipment operating near water, site clearing and stripping, construction of infrastructure, and upgrading of access roads.

Several chapters are of particular relevance to the assessment of impacts on fishing opportunities and practices as they provide information on project effects on harvested fish species including Chapter 8 (Surface Water Quality and Aquatic Resources), Chapter 9 (Fish and Fish Habitat), and Chapter 16 (Assessment of Non-traditional Land Use Effects).

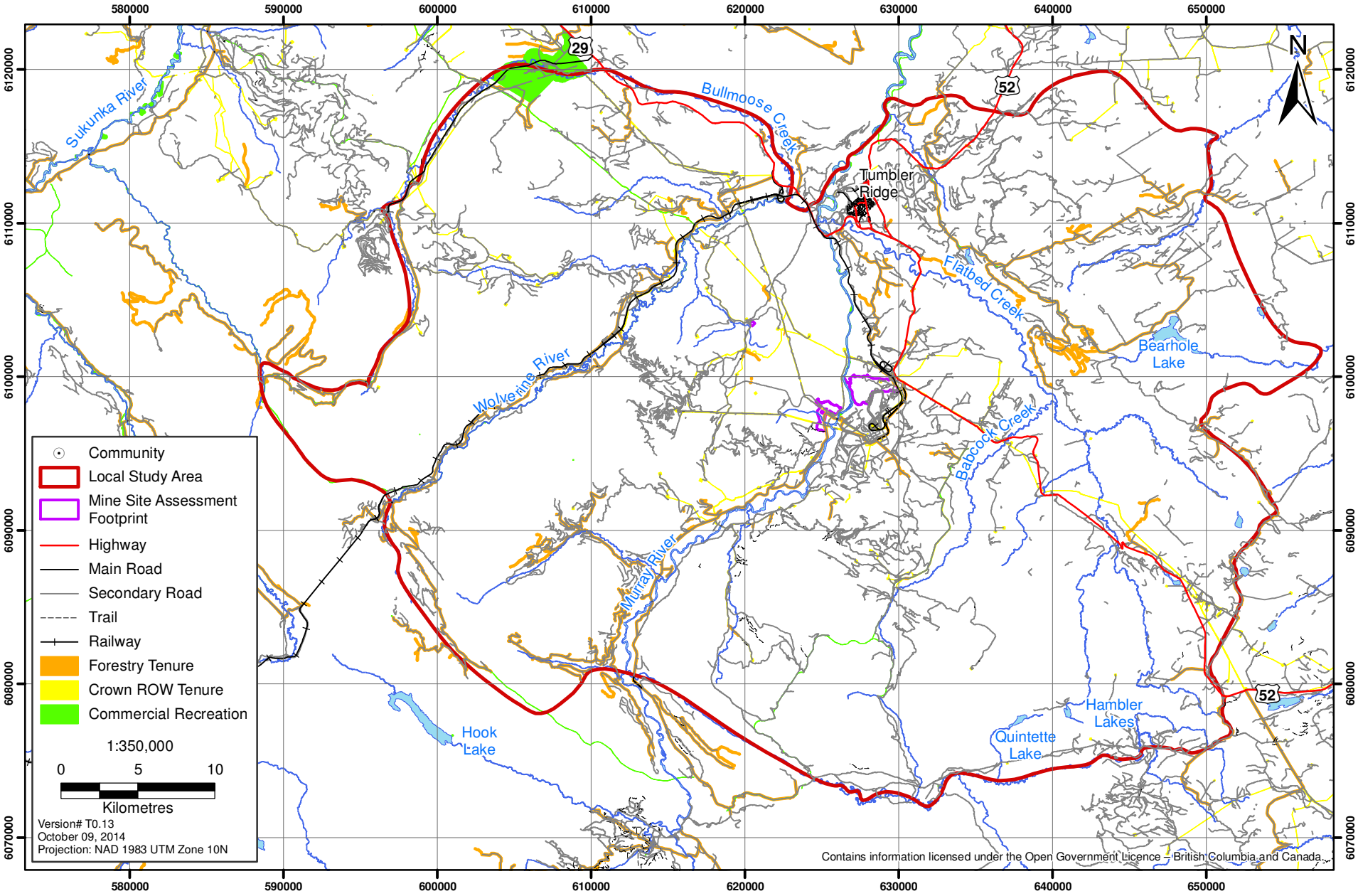
17.6.1.1 Change in Access and Ability to Access or Use Land and Resource Areas

The Murray River, from Tumbler Ridge up to Kinuseo Falls, is utilized as a water route by SFN members to access fishing areas. SFN members also use the Murray River Forest Service Road (FSR) and other roads in the area to access fishing locations. SFN members identified a trail heading northwest from the Murray River in the southwest section of the Project footprint (Appendix 17-B). This trail follows M20 Creek to its headwaters and then down Mast Creek. HLFN members fish near Kinuseo Falls and along the Murray River. Specific access routes have not been identified for HLFN. Consultation efforts and the review of secondary information has not identified evidence of current fishing use of the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4.1).

The Project is not expected to impact navigation of the Murray River (Chapter 16, Section 16.7.7.1). The Project site and site roads will be restricted for safety reasons and to comply with the *Mines Act.* The Proponent may need to temporarily close the Murray River FSR during construction to move mine equipment to the Project site. The road closures will be isolated incidences. Moreover, alternate access roads are available for SFN and HLFN to access fishing locations along the Murray River (Figure 17.6-1). SFN and HLFN preferences with regard to access routes to fishing locations along the Murray River are not currently known. Aboriginal groups will continue to be able to access fishing areas from the Murray River FSR, Highway 52 and other roads in the region.

Figure 17.6-1

Access Roads and Trails in Relation to the Local Study Area



SFN and HLFN members' access to fishing sites may be temporarily affected through isolated and temporary closures of the Murray River FSR.

17.6.1.2 Change in Quality of Experience of the Natural Environment

Project noise and visual quality changes during the Construction, Operation, and Decommissioning and Reclamation phases have the potential to impact the quality of fishing experience for Aboriginal peoples fishing within visual and auditory range of the Project. SFN members report fish harvesting within 250 metres of the Project (Section 17.4.1 and Appendix 17-B). HLFN members fish along the Murray River. Specific fishing locations have not been identified for HLFN. Consultation efforts and the review of secondary information has not identified evidence of current fishing in the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4.1).

During Construction and Operation, changes to baseline daytime and nighttime noise levels are expected to occur primarily in the vicinity of the Project Assessment Footprint and along the rail line (Appendix 18-C, Noise Modelling Report). Noise sources include vehicle traffic, vegetation clearing, and infrastructure development. Project-related noise is not predicted to result in residual noise effects, measured in terms of sleep disturbance, interference with speech, and noise-induced hearing loss, for human receptors identified within the boundary defined for the noise assessment (Ch. 18). Aboriginal peoples engaging in Current Aboriginal Uses may have different thresholds for noise disturbance than those defined in Chapter 18.

A visual quality baseline study (Appendix 16-C), undertaken in accordance with the Dawson Creek LRMP management direction for visual quality (Dawson Creek LRMP Working Group 1999) for the Murray River/Murray FSR Corridor Scenic Area (Ministerial Order No. M 259), determined that the Coal Processing Site may be visible during construction and operation at higher elevations from the east side of the Murray River. Visual effects are not anticipated at lower elevations as Project infrastructure is mostly shielded by vegetation.

During the Decommissioning and Reclamation and Post Closure phases, Project noise will decrease and visual effects of the Project will diminish as the site is reclaimed and infrastructure is removed.

Ground-truthing has not been undertaken to identify specific fishing locations around Tumbler Ridge. However, the distance of Tumbler Ridge from the Project (approximately 12 km downstream) suggests that the quality of experience for SFN fishers will not be affected at those locations. The quality of experience at HLFN fishing locations at Kinuseo Creek and Falls will also not be affected due to their distance upstream from the Project.

SFN fishing locations have not been ground-truthed to determine if the Project is visible or audible from these locations. HLFN fishing locations along the Murray River have not been ground-truthed to determine if the Project is visible or audible from these locations. Should these fishing locations occur between the Project footprint and Trapline Cabin 5 (the closest measured human receptor site to the Project footprint; see Ch. 18, Fig. 18-6-4), SFN and HLFN fishers may experience decreased quality of fishing experience due to noise effects. Should the fishing locations occur at higher elevations from the east side of the Murray River, SFN and HLFN fishers may experience decreased quality of fishing experience due to visual effects.

The quality of fishing experience for SFN and HLFN fishers may be adversely affected by noise and changes to visual quality, depending on the specific location of their fishing sites.

17.6.1.3 Change in Harvesting Success

The Construction, Operation, Decommissioning and Reclamation, and Post Closure phases of the Project have the potential to affect the ability of Aboriginal fishers to harvest sufficient amounts of fish at locations along the Murray River and other locations downstream of the Project. This may occur due to changes in the abundance and distribution of fish due to loss of fish habitat, changes in water quality, or erosion and sedimentation of streams.

SFN members report fish harvesting within the vicinity of the Project. SFN members report catching bull trout, grayling, rainbow trout, and whitefish within 250m of the Project. Members also report multiple fishing sites for bull trout, grayling, and rainbow trout downstream from the Project on the Murray River, particularly around Tumbler Ridge. Some SFN fishers report that they no longer fish in the Murray River due to water quality concerns related to the Quintette Mine (Section 17.4.5 and Appendix 17-B).

HLFN members fish near Kinuseo Falls and along the Murray River. Wapiti River and Red Deer Creek are also identified as fishing spots (Bouchard and Kennedy 2012; The JLS Report 2013). HLFN members fish for trout (bull trout and other species of trout), northern pike, walleye, whitefish, and grayling. (Section 17.4.8).

Consultation efforts and the review of secondary information has not identified evidence of current fishing use of the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

According to the fish and fish habitat effects assessment (Chapter 9), activities during the Construction, Operation, Decommissioning and Reclamation, and Post Closure phases of the Project may result in changes to fish and fish habitat as follows.

<u>Construction and Operation</u>

- Upgrading of access roads and development of the Coal Processing Site and effluent discharge site may result in fish habitat loss.
- Upgrading of the access road, and site clearing and stripping may cause erosion and sedimentation into streams and watercourses.
- Use of heavy equipment around water may result in minor hydrocarbon spills.
- Construction and use of the sanitary sewer system and associated discharge, as well as CCR water management may affect fish due to changes in water quality.

<u>Decommissioning and Reclamation, and Post Closure</u>

- Use of heavy equipment around water may result in sedimentation in streams during access road decommissioning and hydrocarbon spills.

- Site water management activities metals and discharge to the receiving environment may affect fish due to changes in water quality.

The Project is not predicted to result in a residual effect on fish and aquatic resources in the Murray River or other watercourses, including M20 or Camp Creek, Twenty Creek, M17 Creek, and M19 Creek, based on the conclusions in Chapter 8 (Surface Water Quality) and Chapter 9 (Fish and Fish Habitat). Fish do not inhabit the upper reaches (i.e., upstream of the barrier) of M19 Creek, and thus will not be affected by the proposed road crossing M19 Creek.

No residual effects on fish due to direct mortality are anticipated. Based on the fish and fish habitat effects assessment, effects of fish mortality on fish VC sub-components (Arctic grayling and bull trout) will be mitigated by implementing best management practices (BMPs) such as adhering to timing windows during instream works. No residual effects to fish due to erosion and sedimentation are anticipated with the implementation of mitigation measures (Section 9.9.1.1 of Chapter 9). No residual effect is anticipated to fish VCs due to changes in water quality on M19A Creek.

The Project is not predicted to adversely affect Aboriginal fishing success as a result of changes to the abundance and distribution of fish harvested by Aboriginal peoples.

17.6.1.4 Change in the Perceived Quality of Resources

Construction and operation of the Project may affect the quality of fish resources harvested by Aboriginal people due to water contamination from accidental spills, and bioaccumulation of COPCs through the food chain. Fishing by Aboriginal people in the Project area may be curtailed due to perceptions that the quality of harvested resources in the Project area has changed.

SFN members report fish harvesting within the vicinity of the Project. SFN members report catching bull trout, grayling, rainbow trout, and whitefish within 250m of the Project. Members also report multiple fishing sites for bull trout, grayling, and rainbow trout downstream from the Project on the Murray River, particularly around Tumbler Ridge. Some SFN fishers report that they no longer fish in the Murray River due to water quality concerns related to the Quintette Mine (Section 17.4.5 and Appendix 17-B).

HLFN members fish near Kinuseo Falls and along the Murray River. Wapiti River and Red Deer Creek are also identified as fishing spots (Bouchard and Kennedy 2012; The JLS Report 2013). HLFN members fish for trout (bull trout and other species of trout), northern pike, walleye, whitefish, and grayling (Section 17.4.8).

Consultation efforts and the review of secondary information has not identified evidence of current fishing use of the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

Based on the Human Health effects assessment, no residual effects are predicted on country foods during the Operation phases (Section 18.8.3). Surface water quality within the area of the Shaft Site, Decline Site, Coal Processing Site and Murray FSR is predicted to remain similar to background conditions (Section 18.8.3.3 and Chapter 8, Assessment of Surface Water Quality Effects) during all

Project phases, and hence the quality of fish from these water bodies is expected to be similar to that measured in baseline studies (Chapter 18, Human Health).

Despite the fact that no residual effects are predicted on country foods, Aboriginal use may be adversely affected due to perceived adverse effects to country foods (e.g., Pufall et al. 2011). Some SFN members indicated they avoid fishing in the Murray River due to concerns about the impacts of the Quintette mine (Appendix 17-B). As noted in Appendix 2-D, during an April 16, 2013 community meeting with SFN, WMFN and MLIB, community members raised concerns about health impacts from eating contaminated fish. Potential contamination or perceived contamination of rivers and water courses, as well as fish, in the Project footprint and LSA, particularly due to coal dust but also other contaminants entering the water from mine operations, were among the concerns expressed by SFN (Appendix 17-B). The SFN are concerned that these impacts would potentially also be felt for considerable distances downstream, beyond the LSA and RSA.

SFN and HLFN members may perceive reduced quality of fish harvested in the LSA, despite a prediction of no residual effects on country foods.

17.6.1.5 Mitigation Measures for Fishing Opportunities and Practices

Change in Access or Ability to Access or Use Lands and Resource Areas

SFN and HLFN members' access to fishing sites may be temporarily affected through isolated and temporary closures of the Murray River FSR.

The Proponent will provide advanced notice to SFN and HLFN (and other Aboriginal groups) about temporary road closures and also publish notices to advise the public of road closures. Given that access to fishing sites in the LSA will remain virtually unimpeded, except for isolated and temporary road closures, this mitigation measure is expected to be sufficient to avoid creating a residual effect to access to fishing sites.

Change in Quality and Experience of the Natural Environment

SFN and HLFN members who fish within visual and auditory range of the Project, if any, may experience adverse effects to the quality of their experience due to auditory and visual changes associated with the Project.

A Noise Management Plan (Chapter 24, Section 24.3) has been developed to provide measures to control the noise sources (i.e., to reduce the overall noise from the Project). A monitoring program will be undertaken to make sure that noise levels propagated from the Project will meet the Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008), and the Environmental Code of Practice for Metal Mines (Environment Canada 2009) (Chapter 24, Section 24.3). Periodic noise monitoring will be performed to assess noise levels at sensitive receptor locations and should include monitoring of overnight noise, instantaneous noise, vehicle pass-by noise, and interior noise levels at production facilities. The mitigation measures are considered reasonable to manage and monitor noise from the Project and no residual effects due to noise are predicted for measured human receptor sites (Chapter 18, Section 18.10).

Should SFN and HLFN fishing occur within closer range than the closest measured human receptor site (Trapline Cabin 5; see Ch. 18, Fig. 18-6-4) , SFN and HLFN fishers may experience reduced quality of fishing experience due to noise. The Proponent will work with SFN and HLFN prior to construction to determine if members utilize fishing areas from which the Project may result in noise effects. Should this be the case, and where concern exists, the Proponent will provide SFN and HLFN with information about expected noise characteristics and timing so as to enable fishers to choose when and where to fish. The Proponent will consult with SFN and HLFN to develop other appropriate mitigation measures. SFN and HLFN fishers may experience residual effects to the quality of the fishing experience due to noise, despite these mitigation measures.

The Proponent will work with SFN and HLFN prior to construction to determine if members utilize fishing areas from which the Project would be visible. Should this be the case, and where concern exists, the Proponent will manage visual quality in the Murray River/Murray FSP Scenic Area, per Section 3.6 of the Dawson Creek LRMP, by: undertaking a visual impact assessment ("visual simulation"); developing visual quality objectives with SFN and HLFN; and engaging in monitoring. Depending on the success of the visual simulation exercise, SFN and HLFN members may experience residual effects to the quality of the fishing experience due to visual changes.

Change in Harvesting Success

The Project is not predicted to adversely affect Aboriginal peoples' fishing success, due to mitigation measures for fish and fish habitat. Mitigation measures proposed by the Proponent to address potential impacts on fish and fish habitat during the Construction, Operation, Decommissioning and Reclamation, and Post Closure phases of the Project include:

- adhering to DFO's operational statements;
- adhering to timing windows during instream works, where possible;
- following best management practices to minimize fish mortality and sediment entry;
- employing an Environmental Monitor to ensure best management practices are implemented during Construction and Post Closure; and
- implementing environmental management plans including a Noise Management Plan, (Section 24.3), Erosion and Sediment Control Plan (Section 24.5), Selenium Management Plan (Section 24.10), and Spill Response Plan (Section 24.18).

Change in Perceived Quality of Resources

SFN and HLFN members may perceive reduced quality of fish harvested in the LSA, despite a prediction of no residual effects on country foods.

The Proponent will continue to consult with Aboriginal groups to address any concerns regarding country foods contamination, including sharing the results of the proposed environmental monitoring programs. Regular communication and sharing of information has been shown in other studies to provide increased certainty about the Aboriginal groups' ability to safely harvest resources (Poirier and Brooke 2000). The Proponent will also work to include SFN and HLFN members in ongoing monitoring so that members will be able to assess fish quality first hand and

report back to other SFN and HLFN members. The capacity and framework around this reporting mechanism will be established through consultation with SFN and HLFN. Despite these mitigation measures, SFN and HLFN fishers may continue to perceive reduced fish quality as a result of the Project.

The Proponent will continue to consult with Aboriginal groups involved in the review of the Project regarding mitigation measures and will consider new mitigation measures proposed by Aboriginal groups during the Application/EIS review stage.

Conclusion

The Project may result in residual adverse effects to Aboriginal groups' fishing opportunities and practices, including: reduced quality of fishing experience due to noise and visual changes (SFN and HLFN); and reduced perceived quality of fishing resources (SFN and HLFN).

17.6.2 Key Effects on Hunting and Trapping Opportunities and Practices

The Construction, Operation, and Decommissioning and Reclamation phases of the Project have the potential to affect Aboriginal groups hunting and trapping opportunities and practices. Potential effects include wildlife habitat loss in the Project footprint, and habitat alteration in cleared areas surrounding the Project and the subsidence zone. The Project may also affect wildlife movement along the Murray River valley.

Several chapters are of particular relevance to the assessment of impacts on hunting and trapping opportunities and practices as they provide information on potential Project effects on hunted wildlife species including Chapter 8 (Assessment of Surface Water and Aquatic Resources Effects), Chapter 13 (Assessment of Wildlife Effects), and Chapter 18 (Assessment of Health Effects).

17.6.2.1 Change in Access and Ability to Access or Use Land and Resource Areas

The Murray River, from Tumbler Ridge up to Kinuseo Falls, is utilized as a water route by SFN members to access hunting areas. SFN members also use the Murray River FSR and other roads in the area to access hunting and trapping locations (Appendix 17-B). Members report the existence of roads and trails used for hunting sheep and elk within 250m of the Project.

WMFN indicate hunting elk in the Coarse Coal Rejects area of the Project footprint. WMFN hunting areas have been identified in the Monkman Pass and Trail region, including areas north of Roman Mountain. The MLIB, WMFN, BRFN and HLFN indicate that they harvest moose in the Tumbler Ridge area, at the northern boundary of the Wildlife RSA. The KLMSS identifies hunting and trapping areas on the east side of the Murray River around Quintette and Hambler lakes. Specific access routes for these hunting areas have not been identified (Section 17.4).

Consultation efforts and the review of secondary information has not identified evidence of current hunting and trapping use of the LSA or RSA for MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

The Project is not expected to impact navigation of the Murray River (Chapter 16, Section 16.7.7.1). Access to the Project site by Aboriginal groups and the public will be restricted for safety reasons and to comply with the *Mines Act*. The Proponent may need to temporarily close the Murray River FSR during construction to move mine equipment to the Project site. The road closures will be isolated incidences. Moreover, alternate access roads are available throughout the LSA for SFN and WMFN to access hunting locations (Figure 17.6-1). Access to hunting and trapping areas outside of the Project Assessment Footprint will not be affected.

MLIB, WMFN, BRFN and HLFN hunting for moose in the Tumbler Ridge area will not be affected due to the area's distance (approximately 12km) from the Project. KLMSS access to hunting areas on the east side of the Murray River will not be impacted. Aboriginal groups will continue to be able to access hunting and trapping areas from the Murray River FSR, Highway 52 and other roads in the region.

Aboriginal groups' access to hunting and trapping sites may be temporarily affected through isolated and temporary closures of the Murray River FSR.

17.6.2.2 Change in Quality of Experience of the Natural Environment

Project noise and visual changes during the Construction, Operation, and Decommissioning and Reclamation phases have the potential to impact the quality of experience for Aboriginal peoples hunting and trapping within visual and auditory range of the Project.

SFN members report wildlife harvesting activities within 250m and within 5km of the Project, including a general trapping area within the Project footprint (Section 17.4.5 and Appendix 17-B).

WMFN indicate hunting elk in the Coarse Coal Rejects area of the Project footprint. WMFN hunting areas have been identified in the Monkman Pass and Trail region, including areas north of Roman Mountain. The MLIB, WMFN, BRFN and HLFN indicate that they harvest moose in the Tumbler Ridge area, at the northern boundary of the Wildlife RSA. The KLMSS identifies hunting and trapping areas on the east side of the Murray River around Quintette and Hambler lakes (Section 17.4).

Consultation efforts and the review of secondary information has not identified evidence of current hunting and trapping use of the LSA or RSA for MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

During Construction and Operation, changes to baseline daytime and nighttime noise levels are expected to occur primarily in the vicinity of the Project Assessment Footprint and along the rail line (Appendix 18-C, Noise Modelling Report). Noise sources include vehicle traffic, vegetation clearing, and infrastructure development. Project-related noise is not predicted to result in residual noise effects, measured in terms of sleep disturbance, interference with speech, and noise-induced hearing loss, for human receptors identified within the boundary defined for the noise assessment (Chapter 18).

A visual quality baseline study (Appendix 16-C), undertaken in accordance with the Dawson Creek LRMP management direction for visual quality (Dawson Creek LRMP Working Group 1999) for the

Murray River/Murray FSR Corridor Scenic Area (Ministerial Order No. M 259), determined that the Coal Processing Site may be visible during construction and operation at higher elevations from the east side of the Murray River. Visual effects are not anticipated at lower elevations as Project infrastructure is mostly shielded by vegetation

No changes in the quality of experience of the natural environment are anticipated for MLIB, WMFN, BRFN, and HLFN wildlife harvesting in the Tumbler Ridge area for moose, given the distance of these hunting areas from the Project.

SFN and KLMSS hunting locations in the vicinity of the Project have not been ground-truthed to determine if the Project is visible or audible from these locations. Should these hunting locations occur in similar or closer proximity to the Project footprint as Trapline Cabin 5 (the closest measured human receptor site to the Project footprint; see Ch. 18, Fig. 18-6-4), SFN and KLMSS hunters may experience decreased quality of hunting experience due to noise effects. Should the hunting locations occur at higher elevations from the east side of the Murray River, SFN and KLMSS hunters may experience decreased quality of hunting experience due to visual effects.

The quality of hunting and trapping experience for SFN, WMFN, and KLMSS hunters and trappers may be adversely affected by noise and changes to visual quality, depending on the specific location of their hunting and trapping sites.

17.6.2.3 Change in Harvesting Success

The Construction, Operation, Decommissioning and Reclamation, and Post Closure phases of the Project have the potential to affect the ability of Aboriginal hunters and trappers to harvest sufficient amounts of wildlife in the LSA. This may occur due to changes in the abundance and distribution of wildlife species harvested by Aboriginal hunters and trappers. Potential effects on wildlife include habitat loss or alteration, sensory disturbance, direct mortality, disruption of movement, attractants and chemical hazards.

SFN members report harvesting moose, elk, deer, wolf, grouse, rabbit, and porcupine within 250m of the Project. Additional species, including caribou, goat, and sheep, have been harvested within 5km of the Project. SFN indicates a general trapping within the Project footprint (Section 17.4.5 and Appendix 17-B).

WMFN indicate hunting elk in the Coarse Coal Rejects area of the Project footprint. WMFN hunting areas have been identified in the Monkman Pass and Trail region, including areas north of Roman Mountain. The MLIB, WMFN, BRFN and HLFN indicate that they harvest moose in the Tumbler Ridge area, at the northern boundary of the Wildlife RSA. The KLMSS identifies hunting and trapping areas on the east side of the Murray River around Quintette and Hambler lakes (Section 17.4).

Consultation efforts and the review of secondary information has not identified evidence of current hunting and trapping use of the LSA or RSA for MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

The Assessment of Wildlife Effects (Chapter 13) assessed effects of the Project on caribou, moose, mountain goat, elk, grizzly bear, furbearers, bats, raptors, songbirds, waterbirds, and amphibians. The Project is not predicted to result in residual effects to caribou, as caribou are a high elevation species and the Project is located at a low elevation in a valley. No residual effects on elk are predicted, as the Project will result in a relatively small direct and functional (i.e. sensory disturbance-related) loss of habitat and/or disruption to movement for elk.

Residual effects were predicted for moose, grizzly bear and fisher (proxy for furbearers).

Moose habitat will be lost or altered due to site clearing and subsidence (Chapter 13, Section 13.7.3.1). The presence of infrastructure and subsidence near the Murray River, through the Wolverine River valley are expected to disrupt and partially limit moose movement through these areas (Section 13.7.3.3). These effects are not predicted to be significant.

Grizzly bear movement is expected to be affected. When accounting for all types of disturbance, approximately 12%, 25%, and 31% of available spring, summer, and fall grizzly bear habitat in the Murray River RMZ portion of the LSA will potentially be affected (Section 13.7.9.3). These effects are not predicted to be significant.

Clearing for the Project during Construction will result in the loss of 304 ha of high-quality fisher habitat, while subsidence may result in up to 528 ha of habitat alteration for fisher. This combined area is equivalent to the home range size of a female fisher or half the home range size of a male fisher (Section 13.7.11.1). A total of 197 ha of high-quality fisher habitat will be lost within this corridor due to the construction of the Shaft and Decline Site Project Assessment Footprint. An additional 144 ha of high-quality fisher habitat within this corridor may be altered due to the effects of subsidence, although these effects are uncertain. A total of 9.5 ha of high-quality fisher habitat will be disturbed due to continuous Project noise during Operation within the Murray River riparian corridor (Section 13.7.11.3). These effects are not predicted to be significant.

Predicted Project effects on the abundance and distribution of moose, grizzly bear, and fisher may adversely affect the success of Aboriginal peoples' harvesting effort with respect to moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), and grizzly bear and fisher (SFN and KLMSS). Reduced hunting and trapping success in preferred areas may indirectly affect Aboriginal harvesters by increasing the amount of time and effort expended in acquiring wildlife resources, and also changing the locations of hunts to follow wildlife away from the Project site, even into the RSA.

17.6.2.4 Change in the Perceived Quality of Resources

Construction and operation of the Project may affect the quality of wildlife resources harvested by Aboriginal people due to water contamination from accidental spills, and bioaccumulation of COPCs through the food chain. Hunting and trapping by Aboriginal people in the Project area may be curtailed due to perceptions that the quality of harvested resources in the Project area has changed.

SFN members report harvesting moose, elk, deer, wolf, grouse, rabbit, and porcupine within 250m of the Project. Additional species, including caribou, goat, and sheep, have been harvested within

5km of the Project. SFN indicate general trapping within the Project footprint, however no information was provided on the species trapped (Section 17.4.5 and Appendix 17-B).

WMFN indicate hunting elk in the Coarse Coal Rejects area of the Project footprint. WMFN hunting areas have been identified in the Monkman Pass and Trail region, including areas north of Roman Mountain. The MLIB, WMFN, BRFN and HLFN indicate that they harvest moose in the Tumbler Ridge area, at the northern boundary of the Wildlife RSA. The KLMSS identifies hunting and trapping areas on the east side of the Murray River around Quintette and Hambler lakes (Section 17.4).

Consultation efforts and the review of secondary information has not identified evidence of current hunting and trapping use of the LSA or RSA for MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

During Construction and Operation phases, no COPCs were identified for inclusion in the country foods effects assessment, based on predicted soil or water quality (Chapter 18, Human Health, Section 18.8.3.2). No effects to soil quality (or vegetation via root uptake of contaminants) are expected during any phase of the Project since no significant changes in soil quality are anticipated during the Operation phase.

M19 and M19A creeks and the wetland habitat between the Coal Processing Site and the Murray River are anticipated to exceed water quality guidelines for the protection of wildlife for selenium. However, little high-quality wildlife habitat is located in these areas. The human health effects assessment assumed no effects to the quality of wildlife country foods are predicted, and no effects to human health are predicted (Chapter 18: Assessment of Health Effects).

Despite the fact that no residual effects are predicted on country foods,Aboriginal use may be adversely affected due to perceived adverse effects to country foods (e.g., Pufall et al. 2011). SFN members raised concerns about contaminant transmission in the food chain, as well as human health impacts due to the consumption of wildlife that have inhaled coal dust, eaten plants covered by coal dust or chemicals, or ingested contaminated water (Appendix 17-B).

SFN and WMFN members may perceive reduced quality of wildlife harvested in the LSA, despite a prediction of no residual effects on country foods.

17.6.2.5 Mitigation Measures for Hunting Opportunities and Practices

Change in Access or Ability to Access or Use Land and Resource Areas

SFN, WMFN, and KLMSS members' access to hunting and trapping sites may be temporarily affected through isolated and temporary closures of the Murray River FSR (Section 17.6.2.1).

The Proponent will provide advanced notice to Aboriginal groups about temporary road closures and also publish notices to advise the public of road closures. Given that access to hunting and trapping sites in the LSA will remain virtually unimpeded, except for isolated and temporary road closures, this mitigation measure is expected to be sufficient to avoid creating a residual effect to access to hunting and trapping sites.

Change in Quality and Experience of the Natural Environment

The quality of hunting and trapping experience for SFN, WMFN, and KLMSS hunters and trappers may be adversely affected by noise and changes to visual quality, depending on the specific location of their hunting and trapping sites (Section 17.6.2.2).

A Noise Management Plan (Chapter 24, Section 24.3) has been developed to provide measures to control the noise sources (i.e., to reduce the overall noise from the Project). A monitoring program will be undertaken to make sure that noise levels propagated from the Project will meet the Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008), and the Environmental Code of Practice for Metal Mines (Environment Canada 2009) (Chapter 24, Section 24.3). Periodic noise monitoring will be performed to assess noise levels at sensitive receptor locations and should include monitoring of overnight noise, instantaneous noise, vehicle pass-by noise, and interior noise levels at production facilities. The mitigation measures are considered reasonable to manage and monitor noise from the Project and no residual effects due to noise are predicted for measured human receptor sites (Chapter 18, Section 18.10).

Should SFN, WMFN, and KLMSS members' hunting and trapping sites occur within closer range than the closest measured human receptor site (Trapline Cabin 5; see Chapter 18, Fig. 18-6-4), Aboriginal harvesters may experience reduced quality of hunting and trapping experience due to noise. The Proponent will work with SFN, WMFN, and KLMSS prior to construction to determine if members utilize hunting and trapping areas where noise effects may occur. Should this be the case, and where concern exists, the Proponent will provide SFN, WMFN, and KLMSS with information about expected noise characteristics and timing so as to enable harvesters to choose when and where to hunt and trap. The Proponent will consult with SFN, WMFN, and KLMSS to develop other appropriate mitigation measures. SFN, WMFN, and KLMSS harvesters may experience residual effects to the quality of the hunting and trapping experience due to noise, despite these mitigation measures.

The Proponent will work with SFN, WMFN, and KLMSS prior to construction to determine if members utilize hunting and trapping areas from which the Project would be visible. Future discussions with SFN, WMFN, and KLMSS will be undertaken to develop an appropriate workplan. Should this be the case, and where concern exists, the Proponent will manage visual quality in the Murray River/Murray FSP Scenic Area, per Section 3.6 of the Dawson Creek LRMP, by: undertaking a visual impact assessment ("visual simulation"); developing visual quality objectives with SFN and HLFN; and engaging in monitoring. Depending on the success of the visual simulation exercise, SFN, WMFN, and KLMSS members may experience residual effects to the quality of the hunting and trapping experience due to visual changes.

Change in Harvesting Success

Predicted Project effects on the abundance and distribution of moose, grizzly bear, and fisher may adversely affect the success of Aboriginal peoples' harvesting effort with respect to moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), and grizzly bear and fisher (SFN and KLMSS). Reduced hunting and trapping success in preferred areas may indirectly affect Aboriginal harvesters by increasing the amount of time and effort expended in acquiring wildlife resources, and also

changing the locations of hunts to follow wildlife away from the Project site, even into the RSA (Section 17.6.2.3).

Residual effects are predicted for moose, grizzly bear, and fisher after the application of a number of mitigation measures, including the Wildlife Mitigation and Management Plan (Section 24.12), the Noise Management Plan (Section 24.3), and the Subsidence Management Plan (Section 24.15).

With respect to moose and furbearer habitat loss and alteration, measures include:

- avoiding important habitat where practical alternatives are available (e.g., habitat loss and alteration was minimized through Project design);
- maintaining known and potential mineral licks in a natural state and ensure ungulates have access to them during the season when they are most used;
- minimizing the destruction or disruption of areas that contain known wallows, particularly during the ungulate breeding season during site clearing in the construction phase and during Construction and Operation; and
- minimizing the destruction or disruption of active fisher or marten dens during site clearing in the construction phase and during Construction and Operation.

With respect to disruption of movement for moose, grizzly bear and fisher, measures include:

- giving wildlife the right-of-way along access roads and the highway; and
- enforcing speed limits along on-site Project roads.

The Proponent will inform Aboriginal groups about expected effects to moose, grizzly bear, and fisher in the vicinity of the Project, so that harvesters can adjust harvesting plans and methods to ensure overall harvesting success. Despite this mitigation measure, Aboriginal groups may experience a residual effect with respect to hunting and trapping success in preferred locations, where these locations are affected by the Project.

Change in Perceived Quality of Resources

SFN and WMFN members may perceive reduced quality of wildlife harvested in the LSA, despite a prediction of no residual effects on country foods (Section 17.6.2.4)

The Proponent will continue to consult with Aboriginal groups to address any concerns regarding country foods contamination, including sharing the results of the proposed environmental monitoring programs. Regular communication and sharing of information has been shown in other studies to provide increased certainty about the Aboriginal groups' ability to safely harvest resources (Poirier and Brooke 2000). The Proponent will also work to include Aboriginal group members in ongoing monitoring so that members will be able to assess wildlife resource quality first hand and report back to other SFN and HLFN members. Despite these mitigation measures, Aboriginal harvesters may continue to perceive reduced wildlife resources quality as a result of the Project.

The Proponent will continue to consult Aboriginal groups involved in the review of the Project regarding proposed mitigation measures and will consider new mitigation measures proposed during the Application/EIS review stage.

Conclusion

The Project may result in residual adverse effects to Aboriginal groups' hunting and trapping opportunities and practices, including reduced quality of hunting and trapping experience due to noise and visual changes in the LSA (SFN, WMFN, and KLMSS); reduced hunting and trapping success in preferred areas affected by the Project, for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), and grizzly bear and fisher (SFN and KLMSS); and reduced perceived quality of wildlife resources harvested in the LSA (SFN, WMFN and KLMSS).

17.6.3 Key Effects on Gathering Opportunities and Practices

The Construction, Operation, and Decommissioning and Reclamation of the Project have the potential to affect Aboriginal gathering opportunities and practices. These effects include loss and alteration of harvestable plant habitat through soil loss, contamination, subsidence and acidification.

Several chapters are of particular relevance to the assessment of impacts on gathering opportunities and practices as they provide information on potential Project effects on harvested plant species, including Chapter 8 (Assessment of Surface Water and Aquatic Resources Effects), Chapter 11 (Assessment of Terrestrial Ecology Effects) and Chapter 18 (Assessment of Health Effects).

17.6.3.1 Change in Access and Ability to Access or Use Land and Resource Areas

The Murray River, from Tumbler Ridge up to Kinuseo Falls, is utilized as a water route by SFN members to access gathering areas. SFN members also use the Murray River FSR and other roads in the area to access gathering locations. SFN members report gathering blueberries and firewood within 250m of the Project. The Tumbler Ridge area (in the LSA) was identified by the HLFN as a place where they collect medicinal plants such as "rat root". Specific access routes have not been identified for HLFN. Consultation efforts and the review of secondary information has not identified evidence of current gathering use of the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

The Project is not expected to impact navigation of the Murray River (Chapter 16, Section 16.7.7.1). Access to the Project site by Aboriginal groups and the public will be restricted for safety reasons and to comply with the *Mines Act.* The Proponent may need to temporarily close the Murray River FSR during construction to move mine equipment to the Project site. . The road closures will be isolated incidences. Moreover, alternate access roads are available throughout the LSA for SFN and HLFN to access gathering locations (Figure 17.6-1). Access to gathering areas outside of the Project Assessment Footprint will not be affected.

HLFN gathering of "rat root" in the Tumbler Ridge area will not be affected due to the area's distance (approximately 12km) from the Project. Aboriginal groups will continue to be able to access gathering areas from the Murray River FSR, Highway 52 and other roads in the region.

SFN members' access to blueberry and firewood gathering sites within the Project footprint, if any, will be restricted. SFN members' access to gathering sites accessed via the Murray River FSR may be temporarily affected through isolated and temporary closures of the Murray River FSR.

17.6.3.2 Change in Quality of Experience of the Natural Environment

Project noise and visual changes during the Construction, Operation, and Decommissioning and Reclamation phases have the potential to impact the quality of experience for Aboriginal peoples gathering within visual and auditory proximity to the Project. SFN members report plant gathering sites within 250m and within 5km of the Project. The Tumbler Ridge area (in the LSA) was identified by the HLFN as a place where they collect medicinal plants such as "rat root". Consultation efforts and the review of secondary information has not identified evidence of current gathering use of the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

During Construction and Operation, changes to baseline daytime and nighttime noise levels are expected to occur primarily in the vicinity of the Project Assessment Footprint and along the rail line (Appendix 18-C, Noise Modelling Report). Noise sources include vehicle traffic, vegetation clearing, and infrastructure development. Project-related noise is not predicted to result in residual noise effects, measured in terms of sleep disturbance, interference with speech, and noise-induced hearing loss, for human receptors identified within the boundary defined for the noise assessment (Chapter 18).

A visual quality baseline study (Appendix 16-C), undertaken in accordance with the Dawson Creek LRMP management direction for visual quality (Dawson Creek LRMP Working Group 1999) for the Murray River/Murray FSR Corridor Scenic Area (Ministerial Order No. M 259), determined that the Coal Processing Site may be visible during construction and operation at higher elevations from the east side of the Murray River. Visual effects are not anticipated at lower elevations as Project infrastructure is mostly shielded by vegetation.

HLFN gathering of "rat root" in the Tumbler Ridge area will not be impacted by a change in quality of experience due to the area's distance (approximately 12km) from the Project.

SFN members' gathering locations in the vicinity of the Project have not been ground-truthed to determine if the Project is visible or audible from these locations. Should these gathering locations occur in similar or closer proximity to the Project footprint as Trapline Cabin 5 (the closest measured human receptor site to the Project footprint; see Ch. 18, Fig. 18-6-4), SFN members may experience decreased quality of gathering experience due to noise effects. Should the gathering locations occur at higher elevations on the east side of the Murray River, SFN members may experience decreased quality of gathering experience due to visual effects.

The quality of gathering experience for SFN members may be adversely affected by noise and changes to visual quality, depending on the specific location of their gathering sites.

17.6.3.3 Change in Harvesting Success

The Construction, Operation, and Decommissioning and Reclamation phases of the Project have the potential to affect the ability of Aboriginal gatherers to harvest sufficient amounts of plant resources in the LSA. This may occur due to changes in the abundance and distribution of plant species harvested by Aboriginal gatherers. Potential effects to plant resources include the loss and alteration of plant habitat.

SFN members report plant gathering sites within the vicinity of the Project (Appendix 17-B). Members report gathering blueberries and firewood within 250m of the Project, and huckleberries and cranberries within 5km of the Project. Medicinal plant gathering also occurs within 250m of the Project. The Tumbler Ridge area (in the LSA) was identified by the HLFN as a place where they collect medicinal plants such as "rat root". Consultation efforts and the review of secondary information has not identified evidence of current gathering use of the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

According to the terrestrial ecosystem effects assessment (Chapter 11), activities during the Construction, Operation, and Decommissioning and Reclamation phases related to the Project are anticipated to result in residual effects to harvestable plants in the LSA, including:

- Effects on harvestable plants are anticipated as a result of clearing activities in the Project Assessment Footprint. Clearing will remove approximately 287 ha of potential harvestable plant habitat.
- Ecosystems that support harvestable plants may be affected by land subsidence due to changes in the edaphic conditions that influence botanical composition and species diversity.
- Fugitive dust emissions could affect up to 778 ha of potential harvestable plant habitat.
- The potential loss and alteration of harvestable plants is not predicted to be significant, primarily due to the limited magnitude and extent of ecosystem removal caused by Project site clearing.

HLFN's gathering of "rat root" is not expected to be affected as it occurs outside of the boundaries where effects to plants are expected.

Conclusion: The success of SFN's gathering activities in the LSA may be adversely affected due to loss and alteration of harvestable plants in the LSA. Change in the Perceived Quality of Resources

Construction and operation of the Project may affect the quality of resources gathered by Aboriginal people due to water contamination from accidental spills, dust, and bioaccumulation of COPCs through the food chain. Gathering by Aboriginal people in the Project area may be curtailed due to perceptions that the quality of harvested resources in the Project area has changed.

SFN members report gathering blueberries and firewood within 250m of the Project, and huckleberries and cranberries within 5km of the Project (Section 17.4.5 and Appendix 17-B). Medicinal plant gathering also occurs within 250m of the Project (Section 17.4.5 and Appendix 17-B). The Tumbler Ridge area (in the LSA) was identified by the HLFN as a place where they collect

medicinal plants such as "rat root". Consultation efforts and the review of secondary information has not identified evidence of current gathering use of the LSA for MLIB, WMFN, BRFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

During Construction and Operation phases, no COPCs were identified for inclusion in the country foods effects assessment, based on predicted soil or water quality (Chapter 18, Human Health, Section 18.8.3.2). No effects to soil quality (or vegetation via root uptake of contaminants) are expected during any phase of the Project since no significant changes in soil quality are anticipated during the Operation phase.

Despite the fact that no residual effects are predicted on country foods,Aboriginal use may be adversely affected due to perceived adverse effects to country foods (e.g., Pufall et al. 2011). SFN has expressed concerns over existing contaminants in plants in the LSA due to the existing Quintette Mine. SFN also reports concerns about coal dust on plants near coal mines and along transportation corridors, which would stop members from gathering berries or medicines. SFN members are also concerned that cleared areas and roads are often sprayed with herbicides and therefore they would not pick berries or medicines in these areas (Appendix 17-B).

SFN members may perceive reduced quality of resources gathered in the LSA, despite a prediction of no residual effects on country foods.

17.6.3.4 Mitigation Measures for Gathering Opportunities and Practices

Change in Access or Ability to Access or Use Land and Resource Areas

SFN members' access to blueberry and firewood gathering sites within the Project footprint, if any, will be restricted. SFN members' access to gathering sites via the Murray River FSR may be temporarily affected through isolated and temporary closures of the Murray River FSR (Section 17.6.3.1).

The Proponent will provide advanced notice to Aboriginal groups about temporary road closures and also publish notices to advise the public and Aboriginal groups of road closures. This measure is expected to be sufficient to mitigate temporary restrictions to access along the Murray River FSR. The Proponent will engage in discussions with SFN to provide access to gathering sites in the Project Footprint, subject to ensuring their safety. After the implantation of these mitigation measures, no residual effects to SFN access to gathering sites are expected.

Change in Quality of Experience of the Natural Environment

The quality of gathering experience for SFN members may be adversely affected by noise and changes to visual quality, depending on the specific location of their gathering sites (Section 17.6.3.2).

A Noise Management Plan (Chapter 24, Section 24.3) has been developed to provide measures to control the noise sources (i.e., to reduce the overall noise from the Project). A monitoring program will be undertaken to make sure that noise levels propagated from the Project will meet the Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008), and the

Environmental Code of Practice for Metal Mines (Environment Canada 2009) (Chapter 24, Section 24.3). Periodic noise monitoring will be performed to assess noise levels at sensitive receptor locations and should include monitoring of overnight noise, instantaneous noise, vehicle pass-by noise, and interior noise levels at production facilities. The mitigation measures are considered reasonable to manage and monitor noise from the Project and no residual effects due to noise are predicted for measured human receptor sites (Chapter 18, Section 18.10).

Should SFN members' gathering sites occur within closer range than the closest measured human receptor site (Trapline Cabin 5; see Ch. 18, Fig. 18-6-4), Aboriginal harvesters may experience reduced quality of gathering experience due to noise. The Proponent will work with SFN prior to construction to determine if members utilize gathering areas where noise effects may occur. Should this be the case, and where concern exists, the Proponent will provide SFN with information about expected noise characteristics and timing so as to enable harvesters to choose when and where to gather. The Proponent will consult with SFN to develop other appropriate mitigation measures. SFN members may experience residual effects to the quality of the gathering experience due to noise, despite these mitigation measures.

The Proponent will work with SFN prior to construction to determine if members utilize gathering areas from which the Project would be visible. Should this be the case, and where concern exists, the Proponent will manage visual quality in the Murray River/Murray FSP Scenic Area, per Section 3.6 of the Dawson Creek LRMP, by: undertaking a visual impact assessment ("visual simulation"); developing visual quality objectives with SFN; and engaging in monitoring. Depending on the success of the visual simulation exercise, SFN members may experience residual effects to the quality of the gathering experience due to visual changes.

Change in Harvesting Success

The success of SFN's gathering activities in the LSA may be adversely affected due to loss and alteration of harvestable plants in the LSA (Section 17.6.3.3).

Residual effects are predicted for harvestable plants after the application of a number of mitigation measures, including (Chapter 11, Terrestrial Ecology):

- limiting the extent of vegetation clearing during Construction activities to the required minimum;
- minimizing soil degradation (i.e., erosion) by salvaging soil during appropriate weather conditions, transporting to stockpiles in a timely manner, and establishing and implementing erosion control procedures early during the salvage process;
- carrying out dust suppression on roads to prevent fugitive dust from impacting plants and soils;
- providing appropriate education and training for employees and contractors outlining how to minimize effects on ecosystems, soils, and vegetation. This information will be prepared and made available to all employees on-site (e.g., through the Project Safety Office or other designated location) in the form of fact sheets and/or handbooks; and

- conducting follow-up monitoring of cleared sites to monitor erosion and sediment control.

The SFN Knowledge and Use Assessment (Appendix 17-B) states that as SFN knowledge holders are concerned about potential disturbance to rare or hard-to-find medicinal plants in the footprint area, a separate field visit with SFN knowledge holders should be considered, ideally in the spring or early summer. The Proponent will work with SFN to identify the location of these gathering areas. The Proponent will work with SFN to relocate any identified harvestable plants to other suitable locations, if this is deemed acceptable and feasible to SFN.

SFN members are concerned about the use of non-native plant species during reclamation activities (Appendix 17-B). The Proponent will promptly re-vegetate exposed soil surfaces during the appropriate growing season and conditions using seeds (and/or plants) suitable for the local area and ecosystems to avoid erosion and sedimentation, introduction of invasive plants, and to facilitate the re-establishment of ecological functions in the affected areas (Chapter 11, Terrestrial Ecology). If proposed mitigation measures are not deemed acceptable to SFN, then SFN members may experience a residual effect with respect to gathering success in preferred locations, where these locations are affected by the Project.

Change in Perceived Quality of Resources

SFN members may perceive reduced quality of resources gathered in the LSA, despite a prediction of no residual effects on country foods (Section 17.6.3.4).

The Proponent will continue to consult with Aboriginal groups to address any concerns regarding country foods contamination, including sharing the results of the proposed environmental monitoring programs. Regular communication and sharing of information has been shown in other studies to provide increased certainty about the Aboriginal groups' ability to safely harvest resources (Poirier and Brooke 2000). The Proponent will also work to include Aboriginal group members in ongoing monitoring so that members will be able to assess wildlife resource quality first hand and report back to other SFN members. Despite these mitigation measures, SFN harvesters may continue to perceive reduced wildlife resources quality as a result of the Project.

The Proponent will continue to consult Aboriginal groups involved in the review of the Project regarding proposed mitigation measures and will consider new mitigation measures.

Conclusion

The Project may result in residual adverse effects to Aboriginal groups' gathering opportunities and practices, including: reduced quality of the gathering experience due to noise and visual changes in the LSA (SFN); reduced gathering success for blueberries, firewood, and medicinal plants in preferred gathering areas affected by the Project (SFN); and reduced perceived quality of resources gathered in the LSA (SFN).

17.6.4 Key Effects on the Use of Habitations, Trails, Cultural and Spiritual Sites

The Construction, Operation, and Closure of the Project have the potential to affect the use of habitations trails, cultural and spiritual sites by Aboriginal groups. Potential effects include changes

in the ability to access or use these areas, and reduced enjoyment of these areas due to Project noise or visibility.

Chapters of particular relevance to the assessment of impacts on habitations and trails Chapter 19 (Assessment of Heritage Effects) and Chapter 16 (Assessment of Non-traditional Land Use Effects).

17.6.4.1 Change in Access and Ability to Access or Use Land and Resource Areas

SFN identifies a camping site and a sacred site in the Project footprint. The area of Flatbed Creek adjacent to the highway (in the LSA) is identified as a spiritual area containing graveyards. SFN members identify a trail heading northwest from the Murray River in the southwest section of the Project footprint. This trail follows M20 Creek to its headwaters and then down Mast Creek (Section 17.4.5 and Appendix 17-B). SFN habitations and sacred site have not been ground-truthed to confirm their exact location in the Project Assessment Footprint. Consultation efforts and the review of secondary information has not identified evidence of current gathering use of the LSA for MLIB, WMFN, BRFN, HLFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

Access to the Project site will be restricted for safety reasons and to comply with the *Mines Act*. The Proponent may need to temporarily close the Murray River FSR during construction to move mine equipment to the Project site. The road closures will be isolated incidences.

Access to SFN camping sites outside of the Project Assessment Footprint will not be affected by the Project. Use of the SFN trail along Mast Creek in the LSA, outside of the Project Assessment Footprint, is not anticipated to be affected.

SFN members' access to habitations and a sacred site may be affected if these sites are located within the area of the Project site where public access will be restricted.

17.6.4.2 Change in Quality of Experience of the Natural Environment

Project noise and visual changes during the Construction, Operation, and Decommissioning and Reclamation phases have the potential to impact the quality of experience for Aboriginal peoples using habitations, trails, and cultural and spiritual sites within visual and auditory range of the Project.

SFN identifies a camping site and a sacred site in the Project footprint. The area of Flatbed Creek adjacent to the highway (in the LSA) is identified as a spiritual area containing graveyards. SFN members identify a trail heading northwest from the Murray River in the southwest section of the Project footprint. This trail follows M20 Creek to its headwaters and then down Mast Creek (Section 17.4.5 and Appendix 17-B). Consultation efforts and the review of secondary information has not identified evidence of current gathering use of the LSA for MLIB, WMFN, BRFN, HLFN, KLMSS, MNBC, DRFN, PRFN, HRFN, FNFN, and SCFN (Section 17.4).

During Construction and Operation, changes to baseline daytime and nighttime noise levels are expected to occur primarily in the vicinity of the Project Assessment Footprint and along the rail line (Appendix 18-C, Noise Modelling Report). Noise sources include vehicle traffic, vegetation clearing,

and infrastructure development. Project-related noise is not predicted to result in residual noise effects, measured in terms of sleep disturbance, interference with speech, and noise-induced hearing loss, for human receptors identified within the boundary defined for the noise assessment (Chapter 18).

A visual quality baseline study (Appendix 16-C), undertaken in accordance with the Dawson Creek LRMP management direction for visual quality (Dawson Creek LRMP Working Group 1999) for the Murray River/Murray FSR Corridor Scenic Area (Ministerial Order No. M 259), determined that the Coal Processing Site may be visible during construction and operation at higher elevations from the east side of the Murray River. Visual effects are not anticipated at lower elevations as Project infrastructure is mostly shielded by vegetation.

SFN members' habitations, trails, and cultural and spiritual sites in the vicinity of the Project have not been ground-truthed to determine if the Project is visible or audible from these locations. Should these sites occur in similar or closer proximity to the Project footprint as Trapline Cabin 5 (the closest measured human receptor site to the Project footprint; see Ch. 18, Fig. 18-6-4), SFN members may experience decreased quality of experience at these sites due to noise effects. Should these sites occur at higher elevations on the east side of the Murray River, SFN members may experience decreased quality of experience at these sites due to visual effects.

The quality of experience for SFN members using habitations, trails, and cultural and spiritual sites may be adversely affected by noise and changes to visual quality, depending on the specific location of these sites.

17.6.4.3 Mitigation Measures for Use of Habitations, Trails, Cultural and Spiritual Sites

Change in Access or Ability to Access or Use Land and Resource Areas

SFN members' access to habitations and a sacred site may be affected if these sites are located within the area of the Project site where public access will be restricted (Section 17.6.4.1).

The Proponent will provide advanced notice to Aboriginal groups about temporary road closures and also publish notices to advise the public of road closures. This measure is expected to be sufficient to mitigate temporary restrictions to access along the Murray River FSR. The Proponent will engage in discussions with SFN to provide access to the camping site and sacred site in the Project Footprint, subject to ensuring their safety. After the implantation of these mitigation measures, no residual effects to SFN access to habitations, trails, and cultural and spiritual sites are expected.

Change in Quality of Experience of the Natural Environment

The quality of experience for SFN members using habitations, trails, and cultural and spiritual sites may be adversely affected by noise and changes to visual quality, depending on the specific location of these sites (Section 17.6.4.3).

A Noise Management Plan (Chapter 24, Section 24.3) has been developed to provide measures to control the noise sources (i.e., to reduce the overall noise from the Project). A monitoring program will be undertaken to make sure that noise levels propagated from the Project will meet the Health,

Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008), and the Environmental Code of Practice for Metal Mines (Environment Canada 2009) (Chapter 24, Section 24.3). Periodic noise monitoring will be performed to assess noise levels at sensitive receptor locations and should include monitoring of overnight noise, instantaneous noise, vehicle pass-by noise, and interior noise levels at production facilities. The mitigation measures are considered reasonable to manage and monitor noise from the Project and no residual effects due to noise are predicted for measured human receptor sites (Chapter 18, Section 18.10).

Should SFN members' camping site, sacred site, spiritual area, or trail occur within closer range than the closest measured human receptor site (Trapline Cabin 5; see Ch. 18, Fig. 18-6-4), SFN members may experience reduced quality of experience at these sites due to noise. The Proponent will work with SFN prior to construction to determine if these sites are located where noise effects may occur. Should this be the case, and where concern exists, the Proponent will provide SFN with information about expected noise characteristics and timing so as to enable SFN members to choose when and where to use these sites. The Proponent will consult with SFN to develop other appropriate mitigation measures. SFN members may experience residual effects to the quality of the experience at these sites due to noise, despite these mitigation measures.

The Proponent will work with SFN prior to construction to determine if SFN's camping site, sacred site, spiritual area, or trail are located in areas from which the Project would be visible. Should this be the case, and where concern exists, the Proponent will manage visual quality in the Murray River/Murray FSP Scenic Area, per Section 3.6 of the Dawson Creek LRMP, by: undertaking a visual impact assessment ("visual simulation"); developing visual quality objectives with SFN; and engaging in monitoring. Depending on the success of the visual simulation exercise, SFN members may experience residual effects to the quality of the experience at these sites due to visual changes.

During a meeting to discuss the results of the *Saulteau First Nations Knowledge and Use Study* (Appendix 17-B), the SFN Lands and Sustainable Resource Management Office suggested that prior to Construction, The Proponent could work with the individual(s) who supplied information regarding cultural, spiritual, and ceremonial values to inquire how the individual(s) would like to protect the values. Such work may include ground-truthing the location of the value and developing site-specific mitigation measures. The Proponent will work with SFN prior to construction to develop further mitigation measures.

The Proponent will continue to consult Aboriginal groups involved in the review of the Project regarding proposed mitigation measures and will consider new mitigation measures proposed during the Application/EIS review stage.

Conclusion

The Project may result in residual adverse effects to Aboriginal groups' use of habitations, trails, and cultural and spiritual sites, including reduced quality of the experience at these sites due to noise and visual changes in the LSA (SFN).

17.7 RESIDUAL EFFECTS ON CURRENT ABORIGINAL USE

After considering proposed mitigations, the Project may result in residual effects to Aboriginal groups':

- fishing opportunities and practices, including: reduced quality of fishing experience due to noise and visual changes (SFN and HLFN); and reduced perceived quality of fishing resources (SFN and HLFN) (Section 17.6.1.5);
- hunting and trapping opportunities and practices, including: reduced quality of hunting and trapping experience due to noise and visual changes in the LSA (SFN, WMFN, and KLMSS); reduced hunting and trapping success in preferred areas affected by the Project, for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), and grizzly bear and fisher (SFN and KLMSS); and reduced perceived quality of wildlife resources harvested in the LSA (SFN, WMFN and KLMSS) (Section 17.6.2.5);
- gathering opportunities and practices, including: reduced quality of the gathering experience due to noise and visual changes in the LSA (SFN); reduced gathering success for blueberries, firewood, and medicinal plants in preferred gathering areas affected by the Project (SFN); and reduced perceived quality of resources gathered in the LSA (SFN) (Section 17.6.3.5); and
- use of habitations, trails, and cultural and spiritual sites, including reduced quality of the experience at these sites due to noise and visual changes in the LSA (SFN) (Section 17.6.4.5).

Table 17.7-1 summarizes the timing, Project causes, cause-effect pathway, and mitigation for these residual effects.

17.8 CHARACTERIZING RESIDUAL EFFECTS, SIGNIFICANCE, LIKELIHOOD, AND CONFIDENCE ON CURRENT ABORIGINAL USE

The following section characterizes the residual effects on Current Aboriginal Use by using the following criteria: magnitude, geographic extent, duration, frequency, reversibility, and context. Each of these terms is defined in Table 17.8-1.

Each identified residual effect (Section 17.7) is characterized and a significance conclusion of "not significant (minor)", "not significant (moderate)", or "significant (major)" is assigned. The following definitions are applied:

- **Not Significant (Minor)**: The residual effect has: no or low magnitude; local geographic extent; short- or medium-term duration; and occurs sporadically if at all.
- **Not Significant (Moderate)**: The residual effect has: low to medium magnitude; landscape or regional geographic extent; short-term to chronic duration (i.e., may persist into the far future); and occurs at all frequencies.
- **Significant (Major)**: The residual effect has: high magnitude; regional geographic extent; chronic duration (i.e., persist into the far future); and occurs at all frequencies.

Table 17.7-1. Summary of Residual Effects on Current Aboriginal Use

Valued Component	Project Phase	Project Component / Physical Activity	Description of Cause-Effect[1]	Description of Mitigation Measure(s)	Description of Residual Effect
Fishing, Hunting/Trapping, and Gathering Opportunities and Practices, and Use of Habitations, Trails, and Cultural and Spiritual Sites	Construction, Operation, Decommissioning and Reclamation	Construction of underground mine, coal processing site, shaft site, decline site, and traffic and transportation; operation of underground mine, coal processing site, shaft site, secondary shaft site, and heavy machinery, traffic and transportation; infrastructure removal and site reclamation, and heavy machinery, traffic and transportation during decommissioning	Noise and visual changes causing sensory disturbance	Noise Management Plan; Provision of information about expected noise characteristics and timing to Aboriginal groups; Commitment to undertake a visual impact assessment ("visual simulation"), develop visual quality objectives with Aboriginal groups, and engage in monitoring	Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)
Hunting/Trapping and Gathering Opportunities and Practices	Construction, Operation. Decommissioning and Reclamation	Construction of underground mine, coal processing site, shaft site, decline site, and traffic and transportation; operation of underground mine, coal processing site, shaft site, secondary shaft site, utilities, and heavy machinery, traffic and transportation; infrastructure removal and site reclamation, and heavy machinery, traffic and transportation during decommissioning	Wildlife habitat loss and alteration and disruption of wildlife movement, causing a change in the abundance and distribution of harvested wildlife resources; removal of harvestable plants resulting in change in harvestable plant abundance	Wildlife Mitigation and Monitoring Plan, Noise Management Plan, Subsidence Management Plan; Provision of information regarding expected effects to harvestable resources in the vicinity of the Project to Aboriginal groups	Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)
Fishing, Hunting/Trapping, and Gathering Opportunities and Practices	Construction, Operation, Decommissioning and Reclamation	Construction of underground mine, coal processing site, shaft site, decline site, and traffic and transportation; operation of underground mine, coal processing site, shaft site, secondary shaft site, utilities, and heavy machinery, traffic and transportation; infrastructure removal and site reclamation, CCR, underground mine, and heavy machinery, traffic and transportation during decommissioning	Perception of change in resource quality despite prediction of no effect	Regular communication and sharing of information, including results of the proposed environmental monitoring programs; Inclusion of Aboriginal groups in ongoing monitoring programs	Reduced perceived quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)

[1] *"Cause-effect" refers to the relationship between a Project component or activity that may causes the change or effect in the condition of the receptor VC, and the actual change or effect that results.*

Table 17.8-1. Characterization of Residual Effects Related to a Change in Current Aboriginal Use

Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Context
Minor: Little to no alteration of behaviour is required to carry out the current Aboriginal use	*Short:* occurs for less than 3 years	*Once:* single event	*Local:* limited to a specific current Aboriginal use site	*Reversible short-term:* ceases immediately after removal of causative factor(s)	*Low:* Ability of engage in Current Aboriginal Uses at historic levels
Medium: At least some behaviours are altered at least some of the time while carrying out the current Aboriginal use	*Medium:* occurs for up to 30 years	*Sporadic:* occurs at unpredictable intervals	*Landscape:* occurs in more than one current Aboriginal use site	Reversible long-term: ceases after a delay after removal of causative factor(s)	*Moderate:* Ability of engage in Current Aboriginal Uses somewhat diminished from historic levels
Major: The current Aboriginal use can no longer be carried out in preferred locations and ways	*Long:* occurs for longer than 30 years	*Regular:* occurs at predictable intervals	*Regional:* effect(s) in one or more specific current Aboriginal use sites result in indirect effects in one or more other current Aboriginal use sites	*Irreversible:* continues even after removal of causative factor(s)	*High:* Ability of engage in Current Aboriginal Uses highly diminished from historic levels
	Far future: occurs without a foreseeable end	*Continuous:* occurs without interruption			

The likelihood of a residual effect occurring is a measure of probability. The likelihood of a residual effect does not influence the determination of significance; rather, it influences the risk of an effect occurring. Likelihood is considered in keeping with the most recent guidance issued in September 2013 by the BC EAO's (2013b) *Guideline for the Selection of Valued Components and Assessment of Potential Effects.*

Confidence is a measure of how well residual effects are understood. The predicted residual effects were assessed for their reliability to portray the certainty in the predicted outcome, based on the acceptability of the data inputs and analytical methods used in the characterization. If necessary, a more detailed risk assessment (e.g., additional sensitivity analyses) may also be necessary for those effects where there is greater uncertainty associated with the significance conclusions.

Confidence ratings of low, moderate or high are defined as follows:

- *Low:* based on limited quantity and quality of Project-specific and non-Project-specific information and/or minimal overlap between the Aboriginal interest and VC assessments. No TK/TU information provided.

- *Medium:* based on moderate quantity and quality of Project-specific and non-Project-specific information and/or moderate overlap between Aboriginal interest and VC assessments. TK/TU information provided.
- *High:* based on high quantity and quality of Project-specific and non-Project-specific information and/or strong overlap between VC and VC assessments. Detailed TK/TU information provided.

17.8.1 Residual Effects Characterization for Fishing Opportunities and Practices

The residual effect of reduced quality of fishing experience (SFN and HLFN) is predicted to be of **minor magnitude**. Noise from the Project may be audible to Aboriginal peoples at fishing sites, and might result in annoyance (as at Trapline Cabin 5, the closest measured human receptor site to the Project footprint), but noise is not expected to be sufficiently loud (e.g. speech disruption) to prompt Aboriginal fishers to alter their behaviour (e.g. wearing ear plugs or avoiding the fishing sites.) Visual quality changes are also not expected to result in alteration of fishing behaviour. The residual effect is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (**landscape extent**). Effects related to noise will cease immediately upon removal of factors causing noise, while effects related to visual quality will cease after reclamation is complete (**reversible long-term**). The ability of SFN and HLFN to engage in fishing practices is highly diminished from historic levels (**high context**).

The residual effect of perceived reduced quality of fish harvested in the LSA (SFN and HLFN) is predicted to be of **minor magnitude**. It is expected that some SFN and HLFN fishers will alter fishing behaviours in the LSA due to perceived changes in fish quality, on the basis of comparable projects (SFN avoidance of fishing sites near the Quintette mine; Section 17.4.5 and Appendix 17-B). However, given the limited footprint of the Project in comparison with the Quintette mine, and given mitigation measures including ongoing communication and Aboriginal participation in ongoing monitoring, it is expected that perceptions of reduced fish quality will result in limited changes in fishing behaviour. The residual effect is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (**landscape extent**). The residual effect is expected to diminish to baseline conditions after decommissioning and reclamation is complete. The ability of SFN and HLFN to engage in fishing practices is highly diminished from historic levels (high context)

17.8.1.1 Significance of Residual Effects on Fishing Opportunities and Practices

Residual effects on fishing opportunities and practices (SFN and HLFN) are assessed as **not significant (moderate)**. The residual effects are of low magnitude, landscape extent, medium duration, and occur continuously.

17.8.1.2 Characterization of Likelihood and Confidence for Residual Effects Conclusions on Fishing Opportunities and Practices

The likelihood that a residual effect on quality of fishing experience will occur is **medium**. While an established literature on the quality of harvesting experience supports prediction of the effect on

Aboriginal fishers, auditory and visual interactions constitute one of several dimensions affecting quality of experience. The likelihood that a residual effect on perceived quality of fish resources will occur is **high**. Comparable projects (e.g. Quintette) have established the cause-and-effect relationship.

The confidence in the prediction of a residual effect on perceived quality of fishing experience is **medium**. While Aboriginal groups have expressed concerns about potential effects on the quality of fishing experience, little data exists on Aboriginal fishers' specific fishing sites or Aboriginal fishers' current quality of fishing experience. The confidence in the prediction of a residual effect on perceived quality of fish resources is **medium**. While Aboriginal groups have expressed concerns about potential effects on perceived quality of fishing resources, little data exists on Aboriginal fishers' specific fishing sites or Aboriginal fishers' current perception of fish resource quality in the vicinity of the Project.

17.8.2 Residual Effects Characterization for Hunting and Trapping Opportunities and Practices

The residual effect of reduced quality of hunting and trapping experience (SFN, WMFN, and KLMSS) is expected to be of **minor magnitude**. Noise from the Project may be audible to Aboriginal peoples at hunting and trapping sites, and might result in annoyance (as at Trapline Cabin 5, the closest measured human receptor site to the Project footprint), but noise is not expected to be sufficiently loud (e.g. speech disruption) to prompt Aboriginal hunters and trappers to alter their behaviour (e.g. wearing ear plugs or avoiding the hunting and trapping sites.) Visual quality changes are also not expected to result in alteration of hunting and trapping behaviour. The residual effect is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (**landscape extent**). Effects related to noise will cease immediately upon removal factors causing noise, while effects related to visual quality will cease after reclamation is complete (**reversible long-term**). The ability of SFN, WMFN, and KLMSS to engage in hunting and trapping practices is highly diminished from historic levels (high context).

The residual effect of reduced hunting success for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS)is expected to be of **minor magnitude**. The Project is not expected to significantly affect the abundance and distribution of moose due to habitat loss and alteration and disruption of movement. Moose habitat loss will be minor, localized in extent and reversible over time. Moose are considered to be resilient to disturbed and fragmented habitat and are common throughout BC. The residual effect of reduced hunting success is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (landscape extent). The effect will cease after decommissioning and reclamation (**reversible long-term**). The potentially-affected hunting sites are known to be preferred sites for moose.The ability of MLIB, WMFN, BRFN, HLFN, SFN and KLMSS to engage in hunting and trapping practices is highly diminished from historic levels (high context).

The residual effect of reduced hunting and trapping success for grizzly bear (SFN and KLMSS) is expected to be of **minor magnitude**. The Project is not expected to significantly affect the abundance and distribution of grizzly bear due to habitat loss and alteration and disruption of movement.

Grizzly bears have large home ranges and have a variety of habitats that they use for movement and the effect will be reversible once operations cease. The residual effect of reduced hunting and trapping success is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (landscape extent). The effect will cease after decommissioning and reclamation (**reversible long-term**). The LSA has not been identified by Aboriginal groups as a preferred grizzly hunting site. The ability of SFN and KLMSS to engage in hunting and trapping practices is highly diminished from historic levels (high context).

The residual effect of reduced hunting and trapping success for fisher (SFN and KLMSS) is expected to be of **minor magnitude**. The Project is not expected to significantly affect the abundance and distribution of fisher due to habitat loss and alteration and disruption of movement. The loss and alteration of fisher habitat is small enough (equivalent to approximately one female fisher or half a male fisher's home range) to maintain sufficient habitat to support regional furbearer populations. Some riparian habitat is anticipated to be undisturbed within the Mine Site Assessment Footprints that would continue to allow furbearer movement past the Project area. The residual effect of reduced hunting and trapping success is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (landscape extent). The effect will cease after decommissioning and reclamation (**reversible long-term**). The potentially-affected hunting and trapping sites are known to be preferred sites for furbearers. The ability of SFN and KLMSS to engage in hunting and trapping practices is highly diminished from historic levels (high context).

The residual effect of perceived reduced quality of harvested wildlife resources (SFN, WMFN and KLMSS) is expected to be of **minor magnitude**. It is expected that some Aboriginal memebrs will alter hunting and trapping behaviours in the LSA due to perceived changes in wildlife resources quality, on the basis of comparable projects (SFN avoidance of hunting and trapping sites near the Quintette mine; Section 17.4.5 and Appendix 17-B). However, given the limited footprint of the Project in comparison with the Quintette mine, and given mitigation measures including ongoing communication and Aboriginal participation in ongoing monitoring, it is expected that perceptions of reduced wildlife resources quality will result in limited changes in hunting and trapping behaviour. The residual effect is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (**landscape extent**). The residual effect is expected to diminish to baseline conditions after decommissioning and reclamation is complete. The ability of SFN, WMFN and KLMSS to engage in hunting and trapping practices is highly diminished from historic levels (high context).

17.8.2.1 Significance of Residual Effects on Hunting and Trapping Opportunities and Practices

Residual effects on hunting and trapping opportunities and practices (SFN, WMFN, MLIB, BRFN, HLFN, KLMSS) are assessed as **not significant (moderate)**. The residual effects are of low magnitude, landscape extent, medium duration, and occur continuously.

17.8.2.2 Characterization of Likelihood and Confidence for Residual Effects Conclusions on Hunting and Trapping Opportunities and Practices

The likelihood that a residual effect on quality of hunting and trapping experience will occur is **medium**. While an established literature on the quality of harvesting experience supports prediction of the effect on Aboriginal hunters and trappers, auditory and visual interactions constitute one of several dimensions affecting quality of experience. The likelihood that a residual effect on hunting and trapping success will occur is **medium**. While the abundance and distribution of harvested resources is a key factor affecting hunting and trapping success, other factors which may also contribute to success (e.g. hunter skill and quality of trapping equipment) have not been considered in the assessment. The likelihood that a residual effect on perceived quality of hunting and trapping resources will occur is **high**. Comparable projects (e.g. Quintette) have established the cause-and-effect relationship.

The confidence in the prediction of a residual effect on quality of hunting and trapping experience is **medium**. While Aboriginal groups have expressed concerns about potential effects on the quality of hunting and trapping experience, little data exists on Aboriginal harvesters' specific hunting and trapping sites or Aboriginal harvesters' current quality of hunting and trapping experience. The confidence in the prediction of a residual effect on hunting and trapping success is **medium**. While information is available about predicted effects on the abundance and distribution of harvestable resources, little data exists on current Aboriginal harvesters' success rates. The confidence in the prediction of a residual effect on perceived quality of wildlife resources is **medium**. While Aboriginal groups have expressed concerns about potential effects on perceived quality of wildlife resources, little data exists on Aboriginal harvesters' specific hunting and trapping sites or Aboriginal harvesters' current perception of wildlife resource quality in the vicinity of the Project.

17.8.3 Residual Effects Characterization for Gathering Opportunities and Practices

The residual effect of reduced quality of gathering experience (SFN) is expected to be of **minor magnitude**. Noise from the Project may be audible to Aboriginal peoples at gathering sites, and might result in annoyance (as at Trapline Cabin 5, the closest measured human receptor site to the Project footprint), but noise is not expected to be sufficiently loud (e.g. speech disruption) to prompt Aboriginal gatherers to alter their behaviour (e.g. wearing ear plugs or avoiding the gathering sites.) Visual quality changes are also not expected to result in alteration of gathering behaviour. The residual effect is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (**landscape extent**). Effects related to noise will cease immediately upon removal factors causing noise, while effects related to visual quality will cease after reclamation is complete (**reversible long-term**). The ability of SFN to engage in gathering practices is highly diminished from historic levels (high context).

The residual effect of reduced gathering success for blueberries, firewood, and medicinal plants (SFN) is expected to be of **minor magnitude**. The Project footprint is not known to contain blueberry plants, firewood and medicinal plants in any great abundance. The residual effect of reduced hunting and trapping success is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current

Aboriginal use location (**landscape extent**). The effect will cease after decommissioning and reclamation (**reversible long-term**). The ability of SFN to engage in gathering practices is highly diminished from historic levels (high context).

The residual effect of perceived reduced quality of gathered resources (SFN) is expected to be of **minor magnitude**. It is expected that some Aboriginal members will alter gathering behaviours in the LSA due to perceived changes in plant and berry quality, on the basis of comparable projects (SFN avoidance of hunting and trapping sites near the Quintette mine; Section 17.4.5 and Appendix 17-B). However, given the limited footprint of the Project in comparison with the Quintette mine, and given mitigation measures including ongoing communication and Aboriginal participation in ongoing monitoring, it is expected that perceptions of reduced plant and berry quality will result in limited changes in gathering behaviour. The residual effect is expected to occur throughout the life of the Project (**medium duration**), occur continuously, and will affect more than one current Aboriginal use location (**landscape extent**). The residual effect is expected to diminish to baseline conditions after decommissioning and reclamation is complete. The ability of SFN to engage in gathering practices is highly diminished from historic levels (high context).

17.8.3.1 Significance of Residual Effects on Gathering Opportunities and Practices

Residual effects on gathering opportunities and practices (SFN) are assessed as **not significant (moderate)**. The residual effects are of low magnitude, landscape extent, medium duration, and occur continuously.

17.8.3.2 Characterization of Likelihood and Confidence for Residual Effects Conclusions on Gathering Opportunities and Practices

The likelihood that a residual effect on quality of gathering experience will occur is **medium**. While an established literature on the quality of harvesting experience supports prediction of the effect on Aboriginal gatherers, auditory and visual interactions constitute one of several dimensions affecting quality of experience. The likelihood that a residual effect on gathering success will occur is **medium**. While the abundance of harvested resources is a key factor affecting gathering success, other factors which may also contribute to success (e.g. gatherer knowledge and time) have not been considered in the assessment. The likelihood that a residual effect on perceived quality of plant and berry resources will occur is **high**. Comparable projects (e.g. Quintette) have established the cause-and-effect relationship.

The confidence in the prediction of a residual effect on quality of gathering experience is **medium**. While Aboriginal groups have expressed concerns about potential effects on the quality of gathering experience, little data exists on Aboriginal harvesters' specific gathering sites or Aboriginal gatherers' current quality of gathering experience. The confidence in the prediction of a residual effect on gathering success is **medium**. While information is available about predicted effects on the abundance of harvestable resources, little data exists on current Aboriginal harvesters' success rates. The confidence in the prediction of a residual effect on perceived quality of plant and berry resources is **medium**. While Aboriginal groups have expressed concerns about potential effects on perceived quality of plant and berry resources, little data exists on Aboriginal harvesters' specific

gathering sites or Aboriginal harvesters' current perception of plant and berry resource quality in the vicinity of the Project.

17.8.4 Residual Effects Characterization for Use of Habitations, Trails, Cultural and Spiritual Sites

The residual effect of reduced quality of experience while using habitations, trails, and cultural and spiritual sites (SFN) is expected to be of **minor magnitude**. Noise from the Project may be audible to Aboriginal peoples at these sites, and might result in annoyance (as at Trapline Cabin 5, the closest measured human receptor site to the Project footprint), but noise is not expected to be sufficiently loud (e.g. speech disruption) to prompt Aboriginal users to alter their behaviour (e.g. wearing ear plugs or avoiding the sites.) Visual quality changes are also not expected to result in alteration of behaviour at these sites. The residual effect is expected to occur throughout the life of the Project (**medium duration**), occur without interruption (**continuous frequency**), and will affect more than one current Aboriginal use location (**landscape extent**). Effects related to noise will cease immediately upon removal factors causing noise, while effects related to visual quality will cease after reclamation is complete (**reversible long-term**). The potentially-affected sites are assumed to be preferred habitation, trails, and cultural and spiritual sites. The ability of SFN to engage in uses of habitations, trails, and cultural and spiritual sites is highly diminished from historic levels (high context).

17.8.4.1 Significance of Residual Effects on Use of Habitations, Trails, Cultural and Spiritual Sites

Residual effects on use of habitations, trails, and cultural and spiritual sites are assessed as **not significant (moderate)**. The residual effects are of low magnitude, landscape extent, medium duration, and occur continuously.

17.8.4.2 Characterization of Likelihood and Confidence for Residual Effects Conclusions on Use of Habitations, Trails, Cultural and Spiritual Sites

The likelihood that a residual effect on quality of experience while using habitations, trails, and cultural and spiritual sites will occur is **medium**. While an established literature on the quality of experience while on the land supports prediction of the effect on Aboriginal users, auditory and visual interactions constitute one of several dimensions affecting quality of experience.

The "confidence" in the characterization of the effect is defined in Section 17.8.1.3. The confidence of the assessment of the residual effect to SFN use of the habitation site and sacred site due to a change in access or ability to access is **medium**, due to the lack of information provided by SFN regarding the nature and use of the sacred site.

Table 17.8-2 is a summary of anticipated residual effects of the Project on Current Aboriginal Use.

17.9 SUMMARY OF RESIDUAL EFFECTS AND SIGNIFICANCE FOR CURRENT ABORIGINAL USE

Table 17.9-1 summarizes the anticipated residual effects of the Project on Current Aboriginal Use. Three residual effects have been carried forward into the cumulative effects assessment (CEA).

17.10 CUMULATIVE EFFECTS ASSESSMENT FOR CURRENT ABORIGINAL USE

17.10.1 Introduction

Cumulative effects are defined in this EA as "effects which are likely to result from the designated project in combination with other projects and activities that have been or will be carried out". This definition follows that in section 19(1) of CEAA (2012a) and is consistent with the IFC Good Practice Note on Cumulative Impact Assessment which refers to consideration of other existing, planned and/or reasonably foreseeable future projects and developments. Cumulative effects assessment (CEA) is a requirement of the AIR and the EIS Guidelines and is necessary for The Proponent to comply with CEAA (2012a) and the BC EAA (2002).

The CEA Agency issued an Operational Policy Statement in May 2013 entitled *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act 2012* which provides a method for undertaking CEA. Recently, the BC EAO also released the updated *Guideline for the Selection of Valued Components and the Assessment of Potential Effects* (BC EAO 2013), which includes advice for determining the need for a cumulative impact assessment. The CEA assessment methodology adopted in this Application/EIS therefore follows the guidance of the CEA Agency as outlined above, as well as the selection criteria in BC EAO (2013).

The method for assessing cumulative effects generally follows the same steps as the Project-specific effects assessment, as described in Sections 17.6 to 17.9: (1) scoping and identification of potential effects, (2) description of potential effects and mitigation measures, with subsequent identification of residual cumulative effects, and (3) identification and characterization of residual cumulative effects. However, because of the broader scope and greater uncertainties inherent in CEA (e.g., data limitations associated with some human actions, particularly future actions); there is greater dependency on qualitative methods and expert judgment. This framework for the CEA facilitates comparison between the two levels of assessment (project-specific and CEA) and between assessment categories, and is tailored to how much information is available.

Table 17.8-2. Characterization of Residual Effects, Significance, Confidence and Likelihood on Current Aboriginal Use

Residual Effects	Residual Effects Characterization Criteria						Significance of Adverse Residual Effects	Likelihood and Confidence	
	Magnitude (minor, moderate, major)	Duration (short, medium, long, far future)	Frequency (once, sporadic, regular, continuous)	Geographic Extent (local, landscape, regional)	Reversibility (reversible short-term; reversible long-term; irreversible)	Context (low, moderate, high)	Not significant (minor, moderate); Significant (major)	Probability (low, medium, high)	Confidence (low, medium, high)
Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	Minor	Medium	Continuous	Landscape	Reversible long-term	High	Not significant (moderate)	Medium	Medium
Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	Minor	Medium	Continuous	Landscape	Reversible long-term	High	Not significant (moderate)	Medium	Medium
Perceived reduction in quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	Minor	Medium	Continuous	Landscape	Reversible long-term	High	Not significant (moderate)	High	Medium

Table 17.9-1. Summary of Residual Effects, Mitigation, and Significance on Current Aboriginal Use

Residual Effects	Project Phase	Mitigation Measures	Significance
Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	Construction, Operation, Decommissioning and Reclamation	Noise Management Plan; Provision of information about expected noise characteristics and timing to Aboriginal groups; Commitment to undertake a visual impact assessment ("visual simulation"), develop visual quality objectives with Aboriginal groups, and engage in monitoring	Not significant (moderate)
Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	Construction, Operation, Decommissioning and Reclamation	Wildlife Mitigation and Monitoring Plan, Noise Management Plan, Subsidence Management Plan; Provision of information regarding expected effects to harvestable resources in the vicinity of the Project to Aboriginal groups	Not significant (moderate)
Perceived reduction in quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	Construction, Operation, Decommissioning and Reclamation	Regular communication and sharing of information, including results of the proposed environmental monitoring programs; Inclusion of Aboriginal groups in ongoing monitoring programs	Not significant (moderate)

17.10.2 Establishing the Scope of the Cumulative Effects Assessment

The following two criteria for the relevance of evidence pertaining to other human actions are considered in the scoping of the CEA:

- a residual effect of the Project must be demonstrated to operate cumulatively with the effects of another human action; and
- the other human action must be known to have been carried out, or it must be probable (using best professional judgement) that it *will be* carried out. [5]

[5] These criteria are based on the report of the Joint Review Panel for the Express Pipeline Project (National Energy Board 1996). The Joint Panel specifically excluded consideration of "hypothetical" human actions from CEA. However, the CEA Agency's Practitioner's Guide states, "best practice suggests that effort should be made in identifying actions if there is reason to believe they may occur, yet are not overly hypothetical" (Hegmann et al. 1999). Further, the CEAA's more recent Operational Policy Statement added, "the Agency position has evolved to include 'certain' and 'reasonably foreseeable' projects and, where appropriate those projects that are 'hypothetical'" (CEA Agency 2007). Therefore, in accordance with best practices, future human actions that are hypothetical but are still judged to be probable are considered in this assessment.

As stipulated in the AIR (BC EAO 2013a), only residual effects are carried forward from the Project-specific effects assessment into the CEA. The VCs included in the CEA for Current Aboriginal Use are:

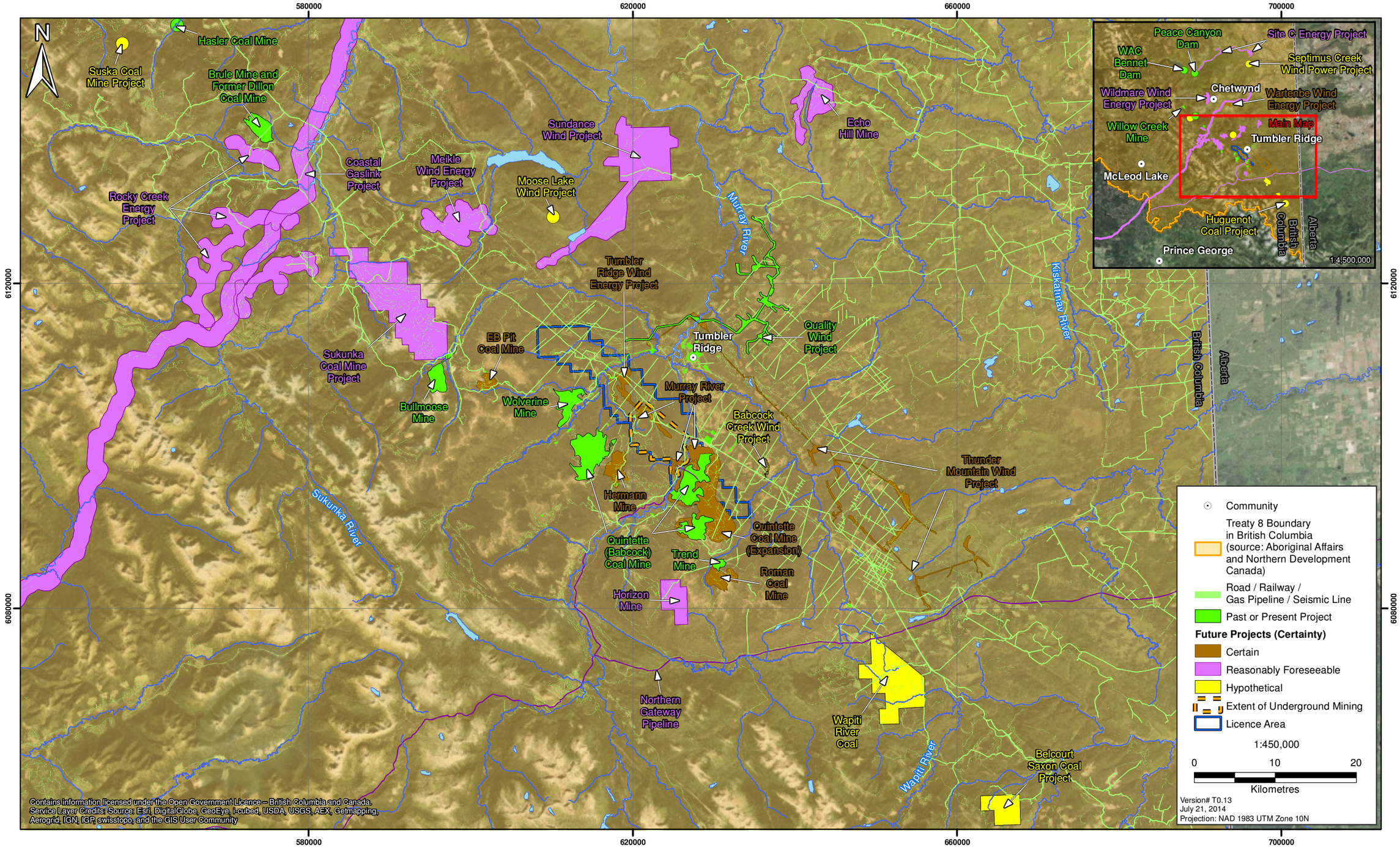
- Fishing opportunities and practices
  - Two residual effects were identified, including 1) the change in quality of experience and 2) change in perceived quality of fish resources. Both residual effects were rated as not significant (moderate), with a medium likelihood (quality of experience) to high likelihood (for perceived quality of resources) and medium confidence (Section 17.8.1).
- Hunting and trapping opportunities and practices:
  - Three residual effects was identified, including 1) change in quality of experience, 2) change in harvesting success due to Project changes to the abundance and distribution of wildlife resources, and 3) change in the perceived quality of wildlife resources. These residual effects were rated as not significant (moderate), with a medium likelihood (for quality of experience and harvesting success) to high likelihood (for perceived quality of resources) and medium confidence (Section 17.8.2).
- Gathering opportunities and practices:
  - Three residual effects was identified, including 1) change in quality of experience, 2) change in harvesting success due to Project changes to the abundance and distribution of plant resources, and 3) change in the perceived quality of plant resources. These residual effects were rated as not significant (moderate) rating, with a medium likelihood (for quality of experience and harvesting success) to high likelihood (for perceived quality of resources) and medium confidence (Section 17.8.3).
- Use of habitations, trails, cultural and spiritual sites :
  - One residual effect was identified relating to the change in quality of experience at an SFN habitation and sacred site. This residual effect was rated as not significant (moderate) rating, with a high likelihood and a medium confidence in the rating (Section 17.8.4).

17.10.2.1 Spatial Boundaries

Spatial boundaries for the CEA comprise the area within which the VCs affected by the Project could also be affected by past, present, or future human actions (as defined in Section 5.10.2.2). It is not necessary for the spatial extent of the Project's effects to physically overlap with that of another human action, only for the Project to affect *the spatial extent of the same VC* affected by another human action.

The spatial boundary for the Current Aboriginal Use CEA corresponds to the boundary of Treaty 8 within British Columbia (Figure 17.10-1), since the Application/EIS can only assess effects within British Columbia, and the MLIB, SFN, WMFN, BRFN, and HLFN are all Treaty 8 First Nations. The total area of the CEA spatial boundary is 278,688 km^2.

Figure 17.10-1
Current Aboriginal Use: Cumulative Effects Assessment Spatial Boundary



17.10.2.2 Temporal Boundaries

The temporal boundaries for the CEA go beyond the phases of the Project, beginning before major human actions were undertaken in the region, and extending into the future.

- **Construction Phase:** 3 years;
- **Operation Phase:** 25 years;
- **Decommissioning and Reclamation:** 3 years; and
- **Post Closure:** 30 years.

In addition, the following temporal phases are included:

- **Past:** 1940 (to capture the early non-Aboriginal human activities in the region) to 2010 (when baseline studies at the Murray River Coal Project began);
- **Present:** 2010 (from the start of the Project baseline studies) to 2014 (completion of the environmental assessment); and
- **Future:** 2014 to the end of the Post Closure phase of the Project- the estimated for Current Aboriginal Use VCs to recover to baseline conditions (taking into account natural cycles of ecosystem change).

Other human actions considered in the CEA (described in Section 5.10.5) fall into the following temporal categories:

- **Past** (closed) human actions;
- **Present** (continuing and active) human actions; and
- **Future** human actions, which may be:
  - **certain actions:** those actions that have received regulatory authorizations but are not as yet built or operating;
  - **reasonably foreseeable actions:** those actions that are currently in some stage of a regulatory authorization process, and for which a general concept is available from which potential cumulative effects may be anticipated; and
  - **hypothetical actions:** those actions that are conjectural but probable, based on best professional judgement of currently available information, including leases, licences, and extrapolations from historical development patterns; the potential cumulative effects of such actions are discussed on a conceptual basis only in this CEA.

17.10.2.3 Identification of Potential Cumulative Effects

Residual effects carried forward from the Project-specific assessment are considered in combination with the residual effects of past, present, and future human actions, where some spatial and temporal overlap occurs (as described in Sections 5.10.2.1 and 5.10.2.2). Unless there is a spatial overlap, temporal overlap is considered irrelevant.

The results are presented in an impact matrix, as shown in Table 17.10-1. If there is no spatial and temporal overlap between the residual effects of the Project and those of another human action, the relevant cell is marked with a dash (-). Where there is spatial and temporal overlap, but no interaction is anticipated, the cell is marked grey (■), and a rationale as to why no interaction is predicted is given in the accompanying text. If there is overlap, and an interaction is anticipated, the cell is marked with green (■), yellow (■), or red (■), as described in Section 5.6.3 and summarized in the footnotes to Table 17.10-1. Supporting rationale for the rankings assigned to interactions is then provided in the text.

As in the Project-specific effects assessment, only potential adverse effects ranked as moderate or major (yellow or red) before the application of mitigation measures will be carried forward in the CEA.

"Aboriginal harvest (hunting/trapping/gathering)" cannot interact with the Project since these activities are the VC being assessed in the chapter. Project effects to the VC cannot interact with the VC itself.

Past and present projects and activities, including forestry and oil and gas, have already altered the visual and auditory landscape. Past projects may have already reclaimed areas utilized during project operations or ceased producing noise. Any visual quality or auditory impacts created by these Projects and activities have already occurred or are already occurring. Although they may be part of an ongoing effect, they currently contribute to baseline conditions against which the effects of the Project were assessed. Therefore it is not possible for these projects to interact cumulatively with the Murray River Project.

Past and present projects and activities, including forestry and oil and gas, have already altered the perceived quality of resources by Aboriginal groups. For example, some SFN members already avoid the area around the Project due to perceived impacts from the Quintette Mine (Appendix 17-B). Although these Projects may be part of an ongoing effect, they currently contribute to baseline conditions against which the effects of the Project were assessed. Therefore it is not possible for these projects to interact cumulatively with the Murray River Project.

17.10.2.4 Cause-Effect Pathways for Cumulative Effects

Cumulative effects to Current Aboriginal Use can manifest through a number of cause-effect pathways, including:

- **Nibbling loss** – The gradual disturbance and loss of land and habitat (e.g., clearing of land for new roads into a forested area).
- **Spatial or temporal crowding** – Cumulative effects can occur when there are too many projects or activities within an area in too brief a period of time. A threshold may be exceeded and the environment may not be able to recover to pre-disturbance conditions. This can occur quickly or gradually over a long period of time before the effects become apparent. Spatial crowding results in an overlap of effects among actions (e.g., noise from a highway near multiple mines). Temporal crowding may occur if effects from different actions overlap or occur before a VC has had time to recover.
- **Growth-inducing potential** – Each new action can stimulate further actions to occur. The effects of these "spin-off" actions (e.g., increased vehicle access into a previously remote area lacking roads) may add to the cumulative effects already occurring in the vicinity of the proposed action, creating a "feedback" effect. Such actions may be considered "reasonably-foreseeable actions."

Table 17.10-1. Potential for Residual Effects to Interact Cumulatively with Effects of Other Human Actions on Current Aboriginal Use

Murray River Coal Project Residual Effect	Potential for Cumulative Effect with Other Human Actions																	
	Time Frame																	
	Past						Present						Future					
	Historic		Recent										Certain					
	Hasler Coal Mine	Sukunka (Bullmoose) Mine	Bullmoose Mine	Dillon Coal Mine	Quintette (Babcock) Mine	Willow Creek Mine	Brule Mine	Trend Mine	Quality Wind Project	Peace Canyon Dam	Wolverine Mine (Perry Creek) and EB Pit	WAC Bennett Dam	Hermann Mine	Quintette Mine	Roman Mine Project	Thunder Mountain Wind Park	Tumbler Ridge Wind Project	Wartenbe Wind Project
Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	O	O	O	O	O	O	O	O	O	O	O	O	M	M	M	N	N	O
Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	O	O	O	O	O	O	M	M	N	M	M	M	M	M	M	N	N	O
Perceived reduction in quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	O	O	O	O	O	O	O	O	O	O	O	O	M	M	M	O	O	O

Murray River Coal Project Residual Effect	Potential for Cumulative Effect with Other Human Actions *(cont'd)*																
	Time Frame *(cont'd)*																
	Future *(cont'd)*																
	Reasonably Foreseeable										Hypothetical						
	Echo Hill Mine	Coastal Gaslink Project	Horizon Mine	Meikle Wind Energy Project	Northern Gateway Pipeline	Rocky Creek Energy Project	Site C Clean Energy Project	Sukunka Coal Mine Project	Sundance Wind Project	Wildmare Wind Energy Project	Babcock Creek Wind Project	Belcourt Saxon Coal Project	Huguenot Mine	Moose Lake Wind Power	Septimus Creek Wind Power Project	Suska Mine	Wapiti River Coal Project
Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	N	N	M	N	N	N	N	M	N	O	N	N	N	O	O	N	N
Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	M	M	M	N	N	N	M	M	N	O	N	M	M	O	O	M	M
Perceived reduction in quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	M	M	M	O	M	O	N	M	O	O	O	O	N	O	O	N	N

(continued)

Table 17.10-1. Potential for Residual Effects to Interact Cumulatively with Effects of Other Human Actions on Current Aboriginal Use (completed)

Murray River Coal Project Residual Effect	Potential for Cumulative Effect with Other Human Actions *(cont'd)*								
	Other Land Use Activities								
	Aboriginal Harvest	Agriculture and Range	Forestry and Manufacturing	Industrial Roads	Coal and Mineral Exploration	Oil and Gas Drilling and Exploration	Other Fishing and Trapping	Recreation and Tourism	Transportation
Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	N/A	N	M	N	M	M	O	O	N
Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	N/A	M	M	M	M	M	M	O	N
Perceived reduction in quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	N/A	M	N	O	N	M	O	O	N

Notes:
- = no spatial or temporal overlap; O = no interaction anticipated; N = negligible to minor; M = moderate; H = key interaction
N/A = Not applicable
Colour legend:
□ = *No spatial or temporal overlap.*
■ = *No interaction anticipated*
■ = *Negligible to minor adverse effect expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.*
■ = *Potential moderate adverse effect requiring unique active management/monitoring/mitigation; warrants further consideration.*
■ = *Key interaction resulting in potential significant major adverse effect or significant concern; warrants further consideration.*

Interacting projects and activities may combine to create additive, synergistic, or induced effects. An additive effect increases the effect in a linear way (e.g., two projects both remove foraging habitat for the same wildlife species). A synergistic effect may result in an effect greater than the sum of the two actions (e.g., two projects remove escape habitat for mountain goat, shifting their foraging activities to an area where they are susceptible to increased predation). An induced effect may result when an effect stimulates another effect (e.g., construction of road access can stimulate "tie-in" roads for forestry or other projects, which may result in additional environmental effects).

Table 17.10-2 summarizes the anticipated cumulative interactions of other past, present and future projects and other land use activities with the Project, and the type of potential cumulative effect predicted.

Table 17.10-2. Summary of Cumulative Interactions of Past, Present, and Future Projects and Other Human Activities with Residual Effects to Current Aboriginal Use

	Murray River Coal Mine Project	Past Project or Activity	Existing Project or Activity	Reasonably Foreseeable Future Project or Activity	Type of Potential Cumulative Effect
Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	X	N/A	N/A	Hermann Mine, Quintette Mine, Roman Mine Project, Horizon Mine, Sukunka Coal, Forestry, Coal and Mineral Exploration, Oil and gas drilling and exploration	Spatial/ Temporal crowding
Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	X	N/A	Brule Mine, Trend Mine, Peace Canyon Dam, Wolverine/ EB Pit, WAC Bennett Dam	Hermann Mine, Quintette Mine, Roman Mine Project, Echo Hill Mine, Coastal Gaslink Project, Horizon Mine, Site C Clean Energy Project, Sukunka Coal, Suska Mine, Wapiti River Coal Project, Belcourt Saxon Coal Project, Huguenot Mine, Agriculture and Range, Forestry, Industrial roads, Coal and Mineral Exploration, Oil and gas drilling and exploration	Nibbling loss, additive, growth-inducing
Perceived reduction in quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	X	N/A	N/A	Hermann Mine, Quintette Mine, Roman Mine Project, Echo Hill Mine, Coastal Gaslink Project, Horizon Mine, Northern Gateway Project, Sukunka Coal, Agriculture and Range, Oil and gas drilling and exploration	Nibbling loss, additive

17.10.2.5 Cumulative Effects to Fishing Opportunities and Practices

The Project may result in residual adverse effects to Aboriginal groups' fishing opportunities and practices, including: reduced quality of fishing experience due to noise and visual changes (SFN and HLFN); and reduced perceived quality of fishing resources (SFN and HLFN).

Change in Quality of Experience of the Natural Environment

SFN and HLFN members who fish within visual and auditory range of the Project, if any, may experience adverse effects to the quality of their experience due to auditory and visual changes associated with the Project.

Other foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively with the Project by adding to the visual and auditory changes in the LSA. This is a spatial/temporal crowding effect in that it reduces the number of fishing locations in the LSA considered to be free of auditory or visual disturbances.

Change in Perceived Quality of Resources

SFN and HLFN members may perceive reduced quality of fish harvested in the LSA, despite a prediction of no residual effects on country foods.

Other foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively with the Project by reducing the number of streams or watercourses thought to be free of contamination by Aboriginal groups. This is a nibbling loss effect in that it reduces the number of fishing locations perceived to be available for use, and potentially putting additional strain on the fish resources available in those water courses.

17.10.2.6 Cumulative Effects to Hunting and Trapping Opportunities and Practices

Change in Quality and Experience of the Natural Environment

The quality of hunting and trapping experience for SFN, WMFN, and KLMSS hunters and trappers may be adversely affected by noise and changes to visual quality, depending on the specific location of their hunting and trapping sites (Section 17.6.2.2).

Other foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively with the Project by adding to the visual and auditory changes in the LSA. This is a spatial/temporal crowding effect in that it reduces the number of hunting and trapping locations in the LSA considered to be free of auditory or visual disturbances.

Change in Harvesting Success

MLIB, SFN, WMFN, BRFN, HLFN and KLMSS hunters and trappers rely on wildlife to hunt and trap. Development of the Project is expected to result in residual effects to wildlife populations of moose,

grizzly bear, and fisher (as a proxy for furbearers) in the LSA as a result of habitat loss and alteration and disruption of wildlife movement. No residual effects are predicted on direct mortality.

Habitat loss will occur in the Project footprint, while habitat alteration will occur in the cleared areas surrounding the Project and may occur in the subsidence zone. Subsidence is predicted to have little effect on wildlife habitat, largely mediated by effects on hydrology and the drying or creation of wetland areas that are important for wildlife. It should be noted that the area evaluated for habitat loss includes the entire footprint, and was not reduced to account for reclamation at closure. This results in a conservative assessment of the Project effects.

Disruption of movement was evaluated by examining the habitat loss in the Murray River Resource Management Zone (MRRMZ), which defines the riparian area and a buffer surrounding the Murray River. Wildlife, particularly those species with a preference for low elevation habitat during some parts of the year, are likely using the MRRMZ as a movement corridor. The proportion of habitat lost to the Project and other human activities was used as a metric for determining disruption of movement.

Other present and foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively on wildlife, resulting in a nibbling loss of habitat and disruption of movement in the RSA.

The cumulative effects assessment for wildlife included three wildlife VCs (moose, grizzly bear, and fisher). Two potential effects were evaluated for these VCs (habitat loss and disruption of movement). These residual effects are predicted because the Project is situated in low elevation valley-bottom habitat, which is preferred by moose and fisher, and because the Project occurs in the MRRMZ, which is likely a movement corridor for wildlife species. Grizzly bear were also included as a VC with residual effects due to disruption of movement because they preferentially use low elevation habitat in the spring and their movements are sensitive to human disturbance and infrastructure.

These residual effects were incorporated into Section 17.6.2: Key effects on hunting and trapping opportunities. This section evaluated the overall effect of change in the abundance and distribution of wildlife resources, which was rated as a residual effect for the potential to affect harvesting success (Section 17.6.2.4). The justification for a residual effect is detailed in the following sections for each wildlife VC evaluated in the wildlife cumulative effects assessment.

Moose

The cumulative effects assessment for moose evaluated two potential effects: 1) habitat loss and alteration; and 2) disruption of movement (Section 13.11.2). Habitat loss was given a minor magnitude rating because of the relatively small area of late winter habitat lost to human activities (5.9%) of that available in the RSA. This is an area equivalent to the home range of 3.5 moose.

Disruption of movement along the Murray River corridor was also given minor magnitude rating. All projects combined will remove approximately 9.8% of late winter habitat for moose, with an additional 14.2% altered by forestry operations and the subsidence due to the Project. Note that low elevation habitats that have been altered from closed canopy conifer forest, are typically converted

to an earlier successional stage of a more open canopy and more shrub and herbaceous vegetation, which is a benefit to moose and through which moose will readily travel.

The wildlife cumulative effects assessment rated each of these two potential cumulative effects on moose as not significant (Table 13.11-9 in Section 13.11.6.4).

Moose are currently hunted in the Murray River corridor and around Tumbler Ridge, where forestry roads and boats give access into the high quality moose range in the Murray River valley. Given the conclusions of the wildlife cumulative effects chapter, and the mitigation planned by the Project, the potential cumulative effects on moose in CEA spatial boundary, and therefore on the harvesting success of MLIB, SFN, WMFN, BRFN, HLFN and KLMSS harvesters is predicted to be a residual, but small effect.

Grizzly Bear

One potential effect on grizzly bear was evaluated in the wildlife cumulative effects assessment, disruption of movement. Disruption of movement was evaluated by examining the amount of high quality spring habitat removed and altered by the Project, and other human activities in the Murray River Resource Management Zone (MRRMZ), which is likely a movement corridor for grizzly bear.

The wildlife cumulative effects assessment evaluated this effect as a residual cumulative effect and provided a medium magnitude rating because a relatively large proportion of spring bear habitat would be affected by human activities; both lost (17%) by road networks and mining, and altered (42%) by forestry. Note, though, that early spring habitat altered by forestry may not be an entirely negative effect for grizzly foraging in the spring, since they are looking for herbaceous and wetland plants at this time of year. These areas altered by forestry also do not necessarily represent a barrier to movement by grizzly bears. This potential cumulative effect was rated as not-significant in the wildlife cumulative effects assessment.

Hunting and trapping opportunities and practices are unlikely to be affected in the CEA spatial boundary because the grizzly bear population is considered large and robust in this area, potential effects of cumulative development were evaluated as non-significant, and there is little evidence of MLIB, SFN, WMFN, BRFN, HLFN and KLMSS harvesting grizzly bears in the Project LSA.

Fisher

The effects assessment identified two potential residual effects for fisher; habitat loss and alteration and disruption of movement (Section 13.7.12). Additional future activities include habitat loss from other proposed mines (109 ha) and habitat alteration by wind projects (123 ha) and oil and gas projects (100 ha). This loss of habitat is not considered a residual cumulative effect for fisher.

Disruption of movement was evaluated against other past, present or reasonably foreseeable future Project along the Murray River movement corridor. Habitat loss causing disruption of movement is concentrated at or near the Murray FSR bridge over the Murray River. However, past, present and future developments plan to leave a 400 to 500 m buffer between project footprints and the river. This 1-km wide corridor is likely able to satisfy the movement requirements of fisher along the Murray River. As a consequence, this effect is not rated as a residual effect for fisher.

There is no evidence that fisher are actively harvested by MLIB, SFN, WMFN, BRFN, HLFN or KLMSS in the Project LSA. With a conclusion that cumulative effects from multiple projects would not have a cumulative residual effect on the population of fisher in the CEA spatial boundary, no residual effect was predicted for the harvest of fisher by these Aboriginal groups.

Change in Perceived Quality of Resources

SFN and WMFN members may perceive reduced quality of wildlife harvested in the LSA, despite a prediction of no residual effects on country foods (Section 17.6.2.4)

Other foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively with the Project by reducing the number of wildlife harvesting areas thought to be free of contamination by Aboriginal groups. This is a nibbling loss effect in that it reduces the number of hunting and trapping locations perceived to be available for use, and potentially putting additional strain on the wildlife resources available in those areas.

17.10.2.7 Cumulative Effects to Gathering Opportunities and Practices

Change in Quality and Experience of the Natural Environment

The quality of gathering experience for SFN members may be adversely affected by noise and changes to visual quality, depending on the specific location of their gathering sites (Section 17.6.3.2).

Other foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively with the Project by adding to the visual and auditory changes in the LSA. This is a spatial/temporal crowding effect in that it reduces the number of gathering locations in the LSA considered to be free of auditory or visual disturbances.

Change in Harvesting Success

The success of SFN's gathering activities in the LSA may be adversely affected due to loss and alteration of harvestable plants in the LSA (Section 17.6.3.3).

Other present and foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively on harvestable resources, resulting in a nibbling loss and alteration of habitat. This could in impact the location and effort involved in seeking out new locations to collect harvestable plants.

The assessment of effect to Terrestrial Ecology (Section 11.12.2.2) states that the cumulative loss and alteration to harvestable plant habitat is difficult to accurately characterize because the location, type and quantity of harvestable plants within the region is unknown. Many of the ecosystems within the region can provide suitable habitat for harvestable plants and as such harvestable plant habitat was assessed in relation to effects on forested ecosystems. However, the effects to harvestable plant habitat are expected to be considerably less in extent than the loss and alteration reported for

forested ecosystem. Furthermore, in certain cases, human derived alteration will increase the amount of harvestable plant habitat.

Loss and alteration of harvestable plants are considered not significant (Section 11.12.5.4). The magnitude of the direct effects to harvestable plants is considered moderate because although 33.7% of the available habitat could be lost or altered by cumulative effects, some of the human derived alteration will increase the amount of harvestable plants. Development activities such as timber harvesting can favour berry production by increasing the light available to plants and by reducing competing vegetation. Other cumulative effects to harvestable plants include nibbling loss of relevant habitat, physical transport of invasive plant propagules, spatial and temporal crowding in areas where multiple project effects intersect with harvestable plant habitat as well as additive effects from the accumulation of metals in some soils and subsequent plant uptake as well as growth inducing effects due to the creation of new edges. All of the effects are considered regional in extent and reversible in the long term. The duration of effects are expected to occur over the medium to long term depending on the relevant plant and its associated habitat requirements. In an ecological context, harvestable plants are considered neutral as they have some unique attributes, particularly to the local communities (discussed further in Chapter 16, Land Use). There is a medium level of confidence in the analyses because the effects to harvestable plants are generally well understood; however, uncertainty exists regarding the magnitude of alteration.

Change in Perceived Quality of Resources

SFN members may perceive reduced quality of resources gathered in the LSA, despite a prediction of no residual effects on country foods (Section 17.6.3.4).

Other foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively with the Project by reducing the number of plant harvesting areas thought to be free of contamination by Aboriginal groups. This is a nibbling loss effect in that it reduces the number of plant harvesting locations perceived to be available for use, and potentially putting additional strain on the harvestable plant resources available in those areas.

17.10.2.8 Cumulative Effects to Use of Habitations, Trails, Cultural and Spiritual Sites

Change in Quality and Experience of the Natural Environment

The quality of experience for SFN members using habitations, trails, and cultural and spiritual sites may be adversely affected by noise and changes to visual quality, depending on the specific location of these sites (Section 17.6.4.3).

Other foreseeable future mining, hydroelectric, and other commercial activities, such as oil and gas exploration have the potential to act cumulatively with the Project by adding to the visual and auditory changes in the LSA. This is a spatial/temporal crowding effect in that it reduces the number of locations in the LSA considered to be free of auditory or visual disturbances.

17.10.3 Mitigation Measures to Address Cumulative Effects on Current Aboriginal Use

17.10.3.1 Change in Quality and Experience of the Natural Environment

A Noise Management Plan (Chapter 24, Section 24.3) has been developed to provide measures to control the noise sources (i.e., to reduce the overall noise from the Project). A monitoring program will be undertaken to make sure that noise levels propagated from the Project will meet the Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008), and the Environmental Code of Practice for Metal Mines (Environment Canada 2009) (Chapter 24, Section 24.3). Periodic noise monitoring will be performed to assess noise levels at sensitive receptor locations and should include monitoring of overnight noise, instantaneous noise, vehicle pass-by noise, and interior noise levels at production facilities. It is assumed any future projects will also develop similar noise mitigation measures and adhere to established guidelines.

The Proponent will manage visual quality in the Murray River/Murray FSP Scenic Area, per Section 3.6 of the Dawson Creek LRMP. It is assumed any future projects will take into consideration the goals and objectives outlined in the Dawson Creek LRMP.

17.10.3.2 Change in Harvesting Success

<u>Hunting and Trapping Opportunities and Practices</u>

Management plans, monitoring, and adaptive management will be implemented to mitigate impacts of the Project on hunting and trapping opportunities and practices as outlined in Section 17.6.2.6 including:

- Section 24.3, Noise Management Plan;
- Section 24.12, Wildlife Management Plan; and
- Section 24.15, Subsidence Management Plan

With respect to moose and furbearer habitat loss and alteration, measures include:

- avoiding important habitat where practical alternatives are available (e.g., habitat loss and alteration was minimized through Project design);
- maintaining known and potential mineral licks in a natural state and ensure ungulates have access to them during the season when they are most used;
- minimizing the destruction or disruption of areas that contain known wallows, particularly during the ungulate breeding season during site clearing in the construction phase and during Construction and Operation; and
- minimizing the destruction or disruption of active fisher or marten dens during site clearing in the construction phase and during Construction and Operation.

With respect to disruption of movement for moose, grizzly bear and fisher, measures include:

- giving wildlife the right-of-way along access roads and the highway; and

- enforcing speed limits along on-site Project roads.

No additional Project mitigation has been identified other than measures discussed in Section 17.6.2.6, to address cumulative effects to hunting and trapping opportunities and practices due to change in harvesting success. It is expected that other large resource development projects would adopt mitigation and management measures similar to those of the Murray River Coal Project.

Gathering Opportunities and Practices

Ecosystem management and mitigation plans are designed to avoid and minimize adverse effects to ecosystems and plants resulting from project activities within the feasible limits of project design and activities. It is assumed any present and future projects will take into consideration the goals and objectives outlined in the Dawson Creek LRMP. It is also assumed that the following general mitigation measures will be common amongst any present and future projects or activities:

- avoid and minimize detrimental effects to terrestrial ecosystems and wetlands through strategic planning;
- minimize all clearing dimensions during any construction activities;
- minimize soil degradation through best management practices for soil stripping, handling and stockpiling;
- minimize soil loss and degradation (i.e., compaction, erosion, and soil horizon mixing);
- avoid the introduction and spread of invasive plants;
- avoid and minimize detrimental effects to rare plants and lichens, including rare plant and lichen habitat;
- avoid and minimize loss or alteration of ecosystem functions due to clearing activities, dust deposition, fragmentation, edge effects, windthrow, and altered hydrology;
- ensure clearing activities are coordinated with other management plans; and
- maintain natural levels of plant and lichen biodiversity through avoidance, offsetting, and other mitigation strategies;
- avoid direct harm to rare plant and lichen populations through realignment of footprint boundaries when possible;
- avoid use of all herbicide sprays within 200 m of rare plant and lichen populations and limit such use to direct application rather than broadcast sprays; and
- create exclusion zones around priority rare plant and lichen (e.g., red-listed and globally rare species) habitats to avoid direct disturbance and to minimize effects related to fugitive dust transport, weed invasion, and vehicular activities.

Collaborative approaches to address cumulative effects to the terrestrial ecology receptor VC have been initiated through data sharing agreements between some proponents regionally. Further

collaborative efforts with additional proponents, and to maximize the effectiveness of monitoring programs and other biodiversity initiatives should be pursued.

17.10.3.3 Change in Perceived Quality of Resources

The Proponent will continue to consult with Aboriginal groups to address any concerns regarding country foods contamination, including sharing the results of the proposed environmental monitoring programs. Regular communication and sharing of information has been shown in other studies to provide increased certainty about the Aboriginal groups' ability to safely harvest resources (Poirier and Brooke 2000). The Proponent will also work to include Aboriginal group members in ongoing monitoring so that members will be able to assess wildlife resource quality first hand and report back to other SFN and HLFN members.

It is expected that other large resource development projects would adopt mitigation and management measures similar to those of the Murray River Coal Project.

17.10.4 Cumulative Residual Effects for Current Aboriginal Use

Cumulative residual effects are those effects remaining after the implementation of all mitigation measures and are summarized in Table 17.10-3.

The residual cumulative effects to VCs are next characterized using the same criteria described in Section 17.9 (e.g., Magnitude, Geographic Extent, Duration, Frequency, Reversibility, Context). Significance, probability and confidence are also assessed using the same criteria described in Section 17.9.

The cumulative residual effects for each VC were characterized by considering the Project's incremental contribution to the cumulative residual effect under two scenarios:

- Future case without the Project: a consideration of residual effects from all other past, existing, and future projects and activities on a subcomponent without the Murray River Coal Project.
- Future case with the Project: a consideration of all residual effects from past, existing, and future projects and activities on a subcomponent with the Murray River Coal Project.

This approach helps predict the relative influence of the Project on the residual cumulative effect for each intermediate component or VC, while also considering the role of other projects and activities in causing that effect.

In keeping with BC EAO (2013b), likelihood of cumulative effects was considered prior to significance for effects on Current Aboriginal Use. Once a significance determination is made, the confidence in the significance prediction is evaluated to assess scientific certainty in the result.

Table 17.10-4 summarizes the assessment of cumulative residual effects for Current Aboriginal Use. The lack of data on the timing and design of reasonably foreseeable future projects has required a

conservative approach to assessing significance to cumulative residual effects. In other words, the assessment is based on a scenario of high development versus low development.

17.10.4.1 Cumulative Residual Effects Characterization for Fishing Opportunities and Practices

Change in Quality and Experience of the Natural Environment

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in fishing opportunities and practices as a result of the activities of these projects will increase the magnitude and geographic extent of the effect on fishing opportunities and practices. The amount of Project traffic anticipated, or the amount of wilderness opened up by the Project is small compared to the total amounts of each anticipated by the development scenario predicted in this assessment. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Change in Perceived Quality of Resources

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in fishing opportunities and practices as a result of the activities of these projects will increase the geographic extent of the effect on fishing opportunities and practices. The potential incremental contribution of the Project to this effect is expected to be small, given the relatively small footprint and underground nature of the Project design. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Significance

Cumulative residual effects on fishing opportunities and practices (SFN and HLFN) are assessed as **not significant (moderate)**. The residual effects are of minor magnitude, regional extent, medium duration, and occur continuously. The residual effects will result in discernible, but not consequential, changes in Aboriginal groups' overall fishing practices.

Probability

The likelihood that a cumulative residual effect on quality of fishing experience will occur is **medium**. While an established literature on the quality of harvesting experience supports prediction of the effect on Aboriginal fishers, auditory and visual interactions constitute one of several dimensions affecting quality of experience.

The likelihood that a cumulative residual effect on perceived quality of fish resources will occur is **high**. Comparable projects (e.g. Quintette) have established the cause-and-effect relationship.

Confidence

The confidence in the prediction of a cumulative residual effect on quality of fishing experience is **medium**. While Aboriginal groups have expressed concerns about potential effects on the quality of fishing experience, little data exists on Aboriginal fishers' specific fishing sites or Aboriginal fishers' current quality of fishing experience.

Table 17.10-3. Summary of Cumulative Residual Effects on Current Aboriginal Use

Valued Component	Murray River Activity	Other Human Activity	Description of Potential Cumulative Effect	Description of Mitigation Measure(s)	Description of Residual Cumulative Effect
Fishing, Hunting/Trapping, and Gathering Opportunities and Practices, and Use of Habitations, Trails, and Cultural and Spiritual Sites	Construction of underground mine, coal processing site, shaft site, decline site, and traffic and transportation; operation of underground mine, coal processing site, shaft site, secondary shaft site, and heavy machinery, traffic and transportation; infrastructure removal and site reclamation, and heavy machinery, traffic and transportation during decommissioning	Hermann Mine, Quintette Mine, Roman Mine Project, Horizon Mine, Sukunka Coal, Forestry, Coal and Mineral Exploration, Oil and gas drilling and exploration	Cumulative noise and visual changes causing sensory disturbance	Noise Management Plan; Adhere to Visual Quality Objectives	Cumulative reduction in quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)
Hunting/Trapping and Gathering Opportunities and Practices	Construction of underground mine, coal processing site, shaft site, decline site, and traffic and transportation; operation of underground mine, coal processing site, shaft site, secondary shaft site, utilities, and heavy machinery, traffic and transportation; infrastructure removal and site reclamation, and heavy machinery, traffic and transportation during decommissioning	Brule Mine, Trend Mine, Peace Canyon Dam, Wolverine/EB Pit, WAC Bennett Dam, Hermann Mine, Quintette Mine, Roman Mine Project, Echo Hill Mine, Coastal Gaslink Project, Horizon Mine, Site C Clean Energy Project, Sukunka Coal, Suska Mine, Wapiti River Coal Project, Belcourt Saxon Coal Project, Huguenot Mine, Agriculture and Range, Forestry, Industrial roads, Coal and Mineral Exploration, Oil and gas drilling and exploration	Cumulative wildlife habitat loss and alteration and disruption of wildlife movement, causing a change in the abundance and distribution of harvested wildlife resources; cumulative removal of harvestable plants resulting in change in harvestable plant abundance	Wildlife Mitigation and Monitoring Plan, Noise Management Plan, Subsidence Management Plan;	Cumulative reduction in harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)
Fishing, Hunting/Trapping, and Gathering Opportunities and Practices	Construction of underground mine, coal processing site, shaft site, decline site, and traffic and transportation; operation of underground mine, coal processing site, shaft site, secondary shaft site, utilities, and heavy machinery, traffic and transportation; infrastructure removal and site reclamation, CCR, underground mine, and heavy machinery, traffic and transportation during decommissioning	Hermann Mine, Quintette Mine, Roman Mine Project, Echo Hill Mine, Coastal Gaslink Project, Horizon Mine, Northern Gateway Project, Sukunka Coal, Agriculture and Range, Oil and gas drilling and exploration	Perception of change in resource quality at additional locations	Regular communication and sharing of information, including results of the proposed environmental monitoring programs; Inclusion of Aboriginal groups in ongoing monitoring programs	Reduced perceived quality of resources harvested in additional locations in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)

1 Refers to the Project phase or other timeframe during which the effect will be experienced by the intermediate receptor or VC.
2 "Cause-effect" refers to the relationship between the Project component/physical activity that is causing the change or effect in the condition of the receptor VC. Characterizing Cumulative Residual Effects, Likelihood, Significance, and Confidence for Current Aboriginal Use

Table 17.10-4. Characterization of Residual Cumulative Effects, Significance, Likelihood, and Confidence

Residual Cumulative Effect	Effects Characterization						Significance	Probability	Confidence
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Context			
Cumulative reduction in quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	Minor	Medium	Continuous	Regional	Reversible long-term	Moderate	Not significant (moderate)	Medium	Medium
Cumulative reduction in harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	Minor	Medium	Continuous	Regional	Reversible long-term	Moderate	Not significant (moderate)	Medium	Medium
Reduced perceived quality of resources harvested in additional locations in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	Minor	Medium	Continuous	Regional	Reversible long-term	Moderate	Not significant (moderate)	High	Medium

The confidence in the prediction of a cumulative residual effect on perceived quality of fish resources is **medium**. While Aboriginal groups have expressed concerns about potential effects on perceived quality of fishing resources, little data exists on Aboriginal fishers' specific fishing sites or Aboriginal fishers' current perception of fish resource quality in the vicinity of the Project.

17.10.4.2 Cumulative Residual Effects Characterization for Hunting and Trapping Opportunities and Practices

Change in Quality and Experience of the Natural Environment

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in hunting and trapping opportunities and practices as a result of the activities of these projects will increase the magnitude and geographic extent of the effect on hunting and trapping opportunities and practices. The amount of Project traffic anticipated, or the amount of wilderness opened up by the Project is small compared to the total amounts of each anticipated by the development scenario predicted in this assessment. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Change in Harvesting Success

The wildlife CEA concluded that low level effects on the population of moose, grizzly bears, furbearers and other wildlife hunted by MLIB, SFN, WMFN, BRFN, HLFN, and KLMSS. These changes may or may not be detectible through wildlife monitoring, since wildlife monitoring activities often have large uncertainties. In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in harvesting success as a result of the activities of these projects will increase the magnitude and geographic extent of the effect on hunting and trapping opportunities and practices. Much of the change in magnitude is based on increased habitat loss and fragmentation and disruption of movement of wildlife in the Murray River corridor, resulting in a reduction of harvesting areas available to Aboriginal harvesters and the displacement of harvesting activity into other areas of Treaty 8. The amount of Project traffic anticipated, or the amount of wilderness opened up by the Project is small compared to the total amounts of each anticipated by the development scenario predicted in this assessment. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Change in Perceived Quality of Resources

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in hunting and trapping opportunities and practices as a result of the activities of these projects will increase the geographic extent of the effect on hunting and trapping opportunities and practices. The potential incremental contribution of the Project to this effect is expected to be small, given the relatively small footprint and underground nature of the Project design. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Significance

Cumulative residual effects on hunting and trapping opportunities and practices (SFN, WMFN, MLIB, BRFN, HLFN, KLMSS) are assessed as **not significant (moderate)**. The residual effects are of minor magnitude, regional in extent, medium duration, and occur continuously. The residual effects will result in discernible, but not consequential, changes in Aboriginal groups' overall hunting and trapping practices.

Probability

The likelihood that a cumulative residual effect on quality of hunting and trapping experience will occur is **medium**. While an established literature on the quality of harvesting experience supports prediction of the effect on Aboriginal hunters and trappers, auditory and visual interactions constitute one of several dimensions affecting quality of experience. The likelihood that a cumulative residual effect on hunting and trapping success will occur is **medium**. While the abundance and distribution of harvested resources is a key factor affecting hunting and trapping success, other factors which may also contribute to success (e.g. hunter skill and quality of trapping equipment) have not been considered in the assessment. The likelihood that a cumulative residual effect on perceived quality of hunting and trapping resources will occur is **high**. Comparable projects (e.g. Quintette) have established the cause-and-effect relationship.

Confidence

The confidence in the prediction of a cumulative residual effect on quality of hunting and trapping experience is **medium**. While Aboriginal groups have expressed concerns about potential effects on the quality of hunting and trapping experience, little data exists on Aboriginal harvesters' specific hunting and trapping sites or Aboriginal harvesters' current quality of hunting and trapping experience. The confidence in the prediction of a cumulative residual effect on hunting and trapping success is **medium**. While information is available about predicted effects on the abundance and distribution of harvestable resources, little data exists on current Aboriginal harvesters' success rates. The confidence in the prediction of a cumulative residual effect on perceived quality of wildlife resources is **medium**. While Aboriginal groups have expressed concerns about potential effects on perceived quality of wildlife resources, little data exists on Aboriginal harvesters' specific hunting and trapping sites or Aboriginal harvesters' current perception of wildlife resource quality in the vicinity of the Project.

17.10.4.3 Cumulative Residual Effects Characterization for Gathering Opportunities and Practices

Change in Quality of Experience of the Natural Environment

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in gathering opportunities and practices as a result of the activities of these projects will increase the magnitude and geographic extent of the effect on gathering opportunities and practices. The potential incremental contribution of the Project to this effect is expected to be small, given the relatively small footprint and underground nature of the Project design. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Change in Harvesting Success

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in harvesting success as a result of the activities of these projects will increase the magnitude and geographic extent of the effect on gathering opportunities and practices. The potential incremental contribution of the Project to this effect is expected to be small, given the relatively small footprint and underground nature of the Project design. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Change in Perceived Quality of Resources

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in perceived quality of resources as a result of the activities of these projects will increase the geographic extent of the effect on gathering opportunities and practices. The potential incremental contribution of the Project to this effect is expected to be small, given the relatively small footprint and underground nature of the Project design. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Significance

Cumulative residual effects on gathering opportunities and practices (SFN) are assessed as **not significant (moderate)**. The residual effects are of minor magnitude, regional in extent, medium duration, and occur continuously. The residual effects will result in discernible, but not consequential, changes in Aboriginal members' overall gathering practices.

Probability

The likelihood that a cumulative residual effect on quality of gathering experience will occur is **medium**. While an established literature on the quality of harvesting experience supports prediction of the effect on Aboriginal gatherers, auditory and visual interactions constitute one of several dimensions affecting quality of experience. The likelihood that a cumulative residual effect on gathering success will occur is **medium**. While the abundance of harvested resources is a key factor affecting gathering success, other factors which may also contribute to success (e.g. gatherer knowledge and time) have not been considered in the assessment. The likelihood that a cumulative residual effect on perceived quality of plant and berry resources will occur is **high**. Comparable projects (e.g. Quintette) have established the cause-and-effect relationship.

Confidence

The confidence in the prediction of a cumulative residual effect on quality of gathering experience is **medium**. While Aboriginal groups have expressed concerns about potential effects on the quality of gathering experience, little data exists on Aboriginal harvesters' specific gathering sites or Aboriginal gatherers' current quality of gathering experience. The confidence in the prediction of a cumulative residual effect on gathering success is **medium**. While information is available about predicted effects on the abundance of harvestable resources, little data exists on current Aboriginal harvesters' success rates. The confidence in the prediction of a cumulative residual effect on perceived quality of plant and berry resources is **medium**. While Aboriginal groups have expressed concerns about potential effects on perceived quality of plant and berry resources, little data exists

on Aboriginal harvesters' specific gathering sites or Aboriginal harvesters' current perception of plant and berry resource quality in the vicinity of the Project.

17.10.4.4 Cumulative Residual Effects Characterization for Use of Habitations, Trails, Cultural and Spiritual Sites

Change in Quality and Experience of the Natural Environment

In the event that all reasonably foreseeable future projects commence on time and as designed, the cumulative change in quality and experience of the natural environment as a result of the activities of these projects will increase the magnitude and geographic extent of the effect on use of habitations, trails, and cultural and spiritual sites. The potential incremental contribution of the Project to this effect is expected to be small, given the relatively small footprint and underground nature of the Project design. Consequently, the future case for this residual effect is expected to be substantially similar with and without the Project.

Significance

Residual effects on use of habitations, trails, and cultural and spiritual sites are assessed as **not significant (moderate)**. The residual effects are of minor magnitude, regional in extent, medium duration, and occur continuously. The residual effects will result in discernible, but not consequential, changes in Aboriginal members' overall use of these sites.

Probability

The likelihood that a cumulative residual effect on quality of experience while using habitations, trails, and cultural and spiritual sites will occur is **medium**. While an established literature on the quality of experience while on the land supports prediction of the effect on Aboriginal users, auditory and visual interactions constitute one of several dimensions affecting quality of experience.

Confidence

The confidence of the assessment of the cumulative residual effect to SFN use of the habitation site and sacred site due to a change in access or ability to access is **medium**, due to the lack of information provided by SFN regarding the nature and use of the sacred site.

17.11 EFFECTS ASSESSMENT CONCLUSIONS FOR CURRENT ABORIGINAL USE

The results of the Project effects assessment and CEA for Current Aboriginal Use are summarized in Table 17.11-1.

Table 17.11-1. Summary of Project and Cumulative Residual Effects, Mitigation, and Significance for Current Aboriginal Use

Residual Effects	Project Phase(s)	Mitigation Measures	Significance of Residual Effects	
			Project	Cumulative
Reduced quality of experience while fishing (SFN and HLFN), hunting (SFN, WMFN, and KLMSS), gathering (SFN), and while using habitations, trails, and cultural and spiritual sites (SFN)	Construction, Operation, Decommissioning and Reclamation	Noise Management Plan; Provision of information about expected noise characteristics and timing to Aboriginal groups; Commitment to undertake a visual impact assessment ("visual simulation"), develop visual quality objectives with Aboriginal groups, and engage in monitoring	Not significant (moderate)	Not significant (moderate)
Reduced harvesting success in preferred areas for moose (MLIB, WMFN, BRFN, HLFN, SFN and KLMSS), grizzly bear (SFN and KLMSS) and fisher (SFN and KLMSS), and blueberries, firewood, and medicinal plants (SFN)	Construction, Operation, Decommissioning and Reclamation	Wildlife Mitigation and Monitoring Plan, Noise Management Plan, Subsidence Management Plan; Provision of information regarding expected effects to harvestable resources in the vicinity of the Project to Aboriginal groups	Not significant (moderate)	Not significant (moderate)
Perceived reduction in quality of resources harvested in the LSA, including fish (SFN and HLFN), wildlife (SFN, WMFN and KLMSS), and plants and berries (SFN)	Construction, Operation, Decommissioning and Reclamation	Regular communication and sharing of information, including results of the proposed environmental monitoring programs; Inclusion of Aboriginal groups in ongoing monitoring programs	Not significant (moderate)	Not significant (moderate)

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