

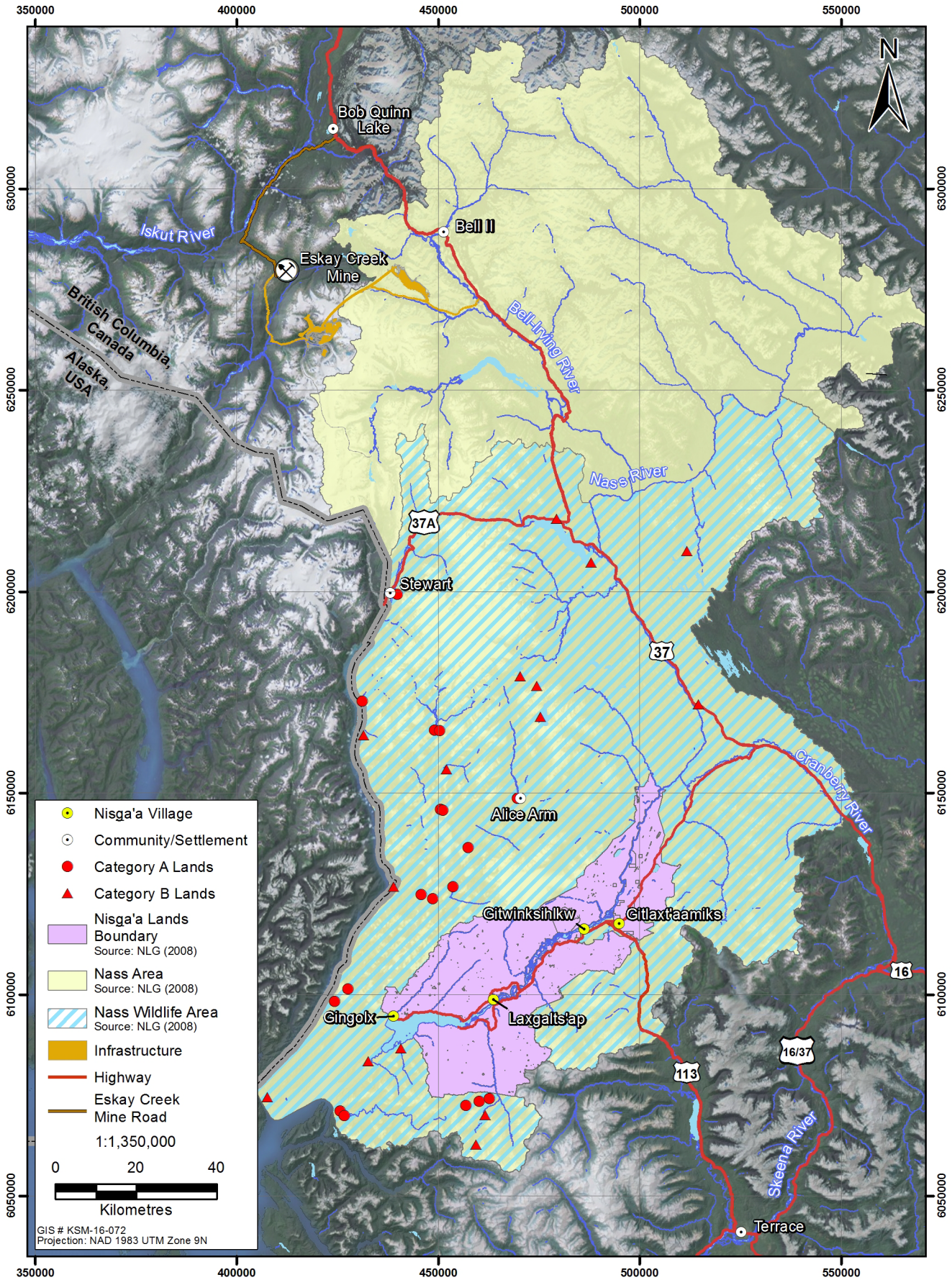
# 29 Nisga'a Nation Rights and Interests

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## 29.1 Introduction

Components of the KSM Project (the Project) fall within the Nass Area as defined by the Nisga'a Final Agreement (NFA) and confirmed in the Section 11 Order issued for the Project by the British Columbia (BC) Environmental Assessment Office (BC EAO) on November 6, 2009 (Figure 29.1-1). The NFA, signed by the Government of BC, the Government of Canada and Nisga'a Lisims Government (NLG), came into effect on May 11, 2000. Accordingly, BC and Canada, in undertaking the environmental assessment (EA) of the Project, are required to comply with Chapter 10 of the NFA. Specific provisions of Chapter 10 applicable to the conduct of the EA are:

6. *If a proposed project that will be located off Nisga'a Lands may reasonably be expected to have adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands or Nisga'a interests set out in this Agreement, Canada or British Columbia, or both, as the case may be, will ensure that the Nisga'a Nation:*
  - (a) *receives timely notice of, and relevant available information on, the project and the potential adverse environmental effects;*
  - (b) *is consulted regarding the environmental effects of the project; and*
  - (c) *receives an opportunity to participate in any environmental assessment under federal or provincial laws related to those effects, in accordance with those laws, if there may be significant adverse environmental effects.*
  
8. *All environmental assessment processes referred to in this Agreement will, in addition to the requirements of applicable environmental assessment legislation:*
  - (e) *assess whether the project can reasonably be expected to have adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests set out in this Agreement and, where appropriate, make recommendations to prevent or mitigate those effects;*
  - (f) *assess the effects of the project on the existing and future economic, social and cultural well-being of Nisga'a citizens who may be affected by the project; and*
  - (i) *take into account any agreements between the project proponent and the Nisga'a Nation or a Nisga'a village concerning the effects of the project.*



Proposed KSM Project in Relation to the Nass Area, the Nass Wildlife Area, Nisga'a Lands, and Nisga'a Fee Simple Lands

Figure 29.1-1

- 11. In exercising decision-making authority for projects that may have adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands or Nisga'a interests set out in this Agreement, the decision maker will take into account, but will not be bound by, any agreement between the Nisga'a Nation or a Nisga'a village and the project proponent concerning the project (NLG, Province of BC, and Government of Canada 1998).*

The Application Information Requirements (AIR), issued by the BC EAO in January 2011, outline the role of Seabridge Gold Inc. (Seabridge or the Proponent) in satisfying Chapter 10 of the NFA. To assist the Crown in meeting its obligations under paragraphs 8 and 10 of Chapter 10, Seabridge is required to implement and report on its own consultations with Nisga'a Nation, and provide information on potential Project effects on Nisga'a interests and rights (including the existing and future economic, social and cultural well-being of potentially affected Nisga'a citizens), on measures to prevent or mitigate adverse effects on residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests, and on any agreements between Seabridge and Nisga'a Nation or a Nisga'a village concerning potential effects. To meet AIR requirements related to 8(f), a separate process was undertaken and a separate report (the Economic, Social, Cultural Impact Assessment [ESCIA]) was prepared to meet this requirement in the AIR. This process is briefly described in Section 29.3.

The federal and provincial governments have instructed Seabridge to ensure that it conducts its EA responsibilities for the Project in compliance with all relevant Nisga'a treaty rights, including those dealing with economic, social, cultural and environmental interests. In addition to taking EA decisions under their respective EA statutes, both provincial and federal governments will make separate recommendations with respect to whether requirements set under paragraphs 8(e) and 8(f) of the NFA have been met by Seabridge with respect to the Project.

## **29.2 Location of the Project in Relation to Nisga'a Lands, Nass Wildlife Area and Nass Area as defined in the Nisga'a Final Agreement**

The Mine Site and CCAR are situated outside of the Nass watershed. The PTMA is located in the Nass Area, including roads and infrastructure in the Mitchell-Treaty Saddle Area, Process Plant, TMF, TCAR, and transmission line (Figure 29.1-2 and Figure 29.1-3). Only the eastern portion of the MTT falls within the Nass Area. At its closest point the straight line distance from the NWA to the PTMA is 31 km.

Highways 37 and 37A will carry mine-related traffic through the Nass Area and northern portions of the NWA. The PTMA is located approximately 200 km upstream of the lower Nass River and Nisga'a Lands as defined in the NFA.

The NWA is 16,101 km<sup>2</sup>, covering the lower half of the Nass watershed, bordered by portions of the Skeena River to the east and the BC-Alaska border to the west. The northern limit of the NWA is around the lower Bell-Irving River and crosses Highway 37 at a point about halfway between Meziadin Junction and Bowser Lake. The Nass Area is approximately 27,000 km<sup>2</sup>, encompasses the NWA, and takes in the upper reaches of the Nass watershed.

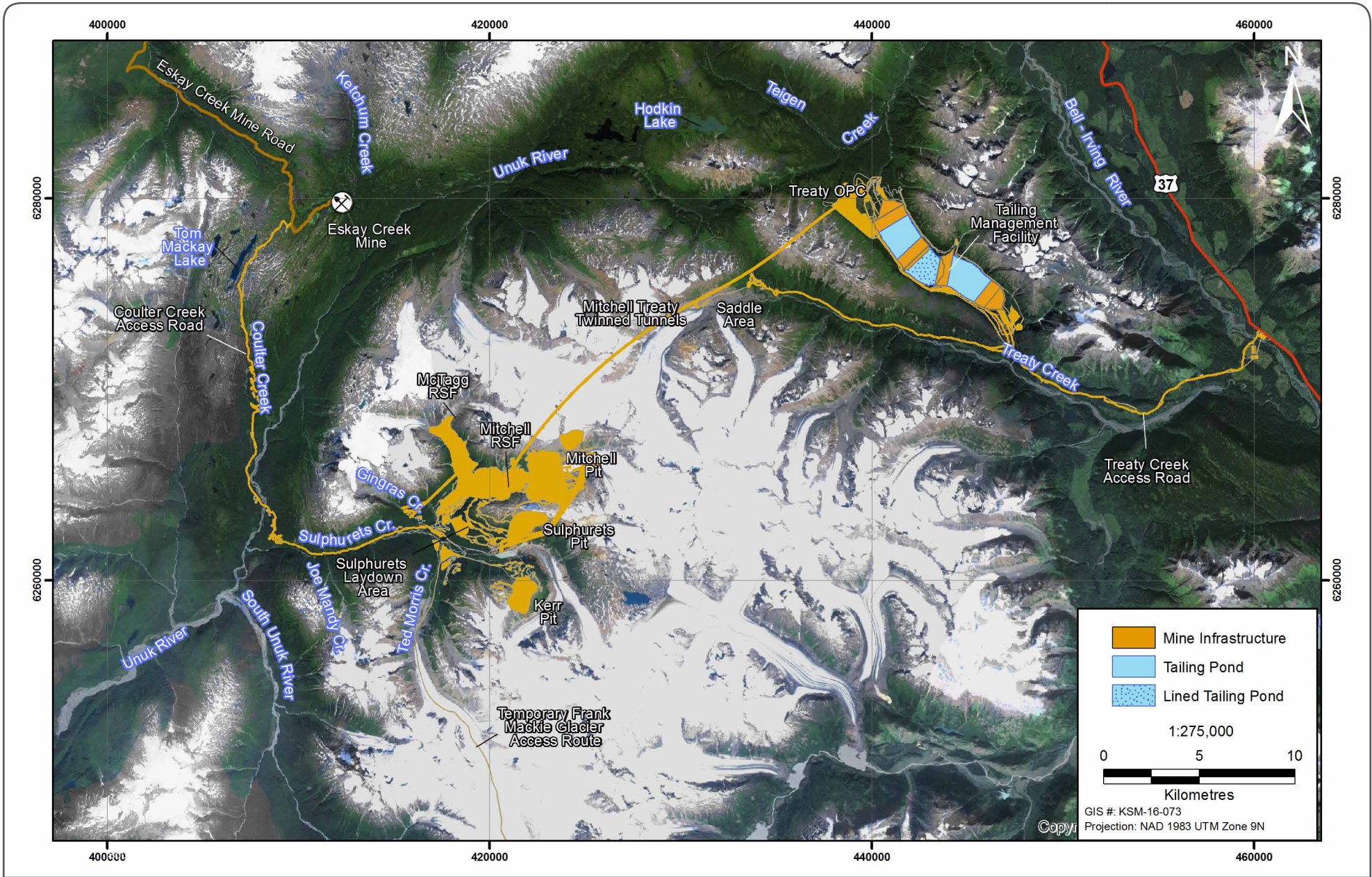
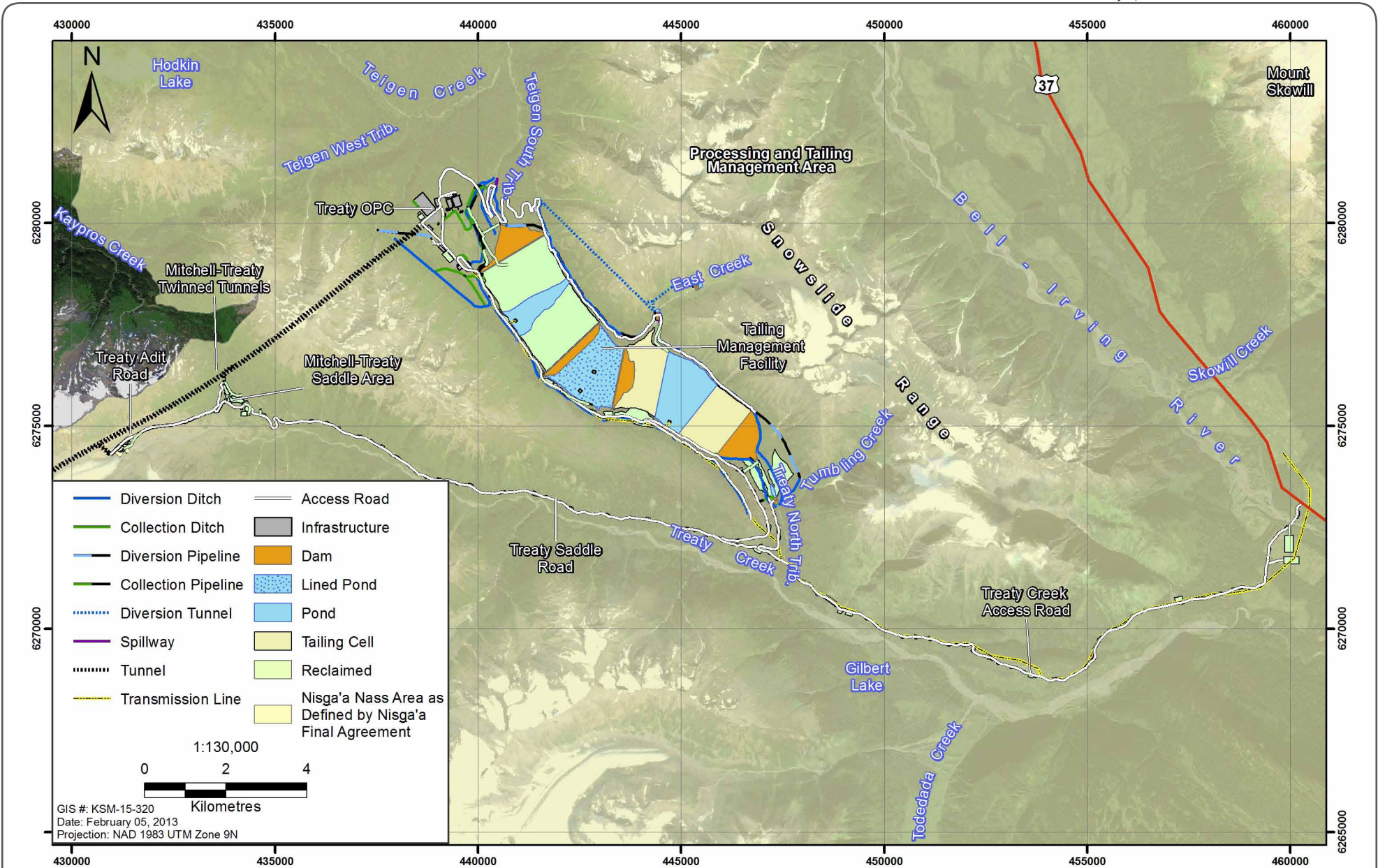


Figure 29.1-2

Figure 29.1-2



GIS #: KSM-15-320

Date: February 05, 2013

Projection: NAD 1983 UTM Zone 9N

During the initial years of construction, materials to support the construction of camps and the CCAR will be transported over the temporary Frank Mackie Glacier access route during the winter months. A portion of the temporary Frank Mackie Glacier access route is within the Nass Area.

Nisga'a Lands are situated around the lower reaches and estuary of the Nass River and include the four Nisga'a villages of Gitlaxt'aamiks (New Aiyansh), Gitwinksihlkw (Canyon City), Laxgalts'ap (Greenville), and Gingolx (Kincolith). Nisga'a villages are located about 150 km southeast of both the Mine Site and the PTMA. By road it is about 210 km from Gitlaxt'aamiks, the closest Nisga'a community, to the turn-off for the proposed TCAR off of Highway 37.

### 29.3 Information Sources

This chapter is a summary of information drawn from other chapters in the Application / EIS, from Nisga'a ESCIA, and from other completed EAs in the region, such as the NTL and the Kitsault Mine Project. The chapter provides an overview of Nisga'a cultural practices, resource use, and other activities that are constantly changing, and is based on Seabridge's current understanding of Nisga'a.

To assist Canada and BC to comply with the requirements of Chapter 10, paragraph 8(f) of the NFA, Seabridge prepared the Nisga'a ESCIA based on NLG Guidelines (November 2010) and a subsequent workplan (July 2011; ESCIA Workplan) approved by NLG, the BC EAO, and the Canadian Environmental Assessment Agency (CEA Agency). The ESCIA report included findings and analysis based on socio-economic data produced from two surveys and twelve semi-structured focus group interviews carried out with a broad cross-section of Nisga'a citizens. The two surveys—the Social, Economic, Resource Use, and Culture (SERC) Survey, and the Nisga'a Business Survey—were conducted in the summer and fall of 2011. The surveys were developed collaboratively with significant input from NLG, the BC EAO, and the CEA Agency over several months. The focus group interviews, which also involved input from NLG, were carried out in March 2012 in the four Nisga'a villages. The survey reports, and focus group report summarizing the interview results, are appended to this chapter ([Appendices 29-A, 29-B, and 29-C](#)).

NLG Guidelines and the ESCIA Workplan also applied to Avanti Mining Ltd. (Avanti)'s Kitsault Mine Project. As a result, NLG, the CEA Agency, the BC EAO, Seabridge, and Avanti agreed that Seabridge and Avanti would jointly undertake and share the ESCIA research and data collection required by the ESCIA Workplan. Seabridge and Avanti have each prepared separate ESCIA reports for their respective projects. The detailed findings of the economic, social, and cultural impacts of the Project on Nisga'a Nation are found in the ESCIA report that has been provided to NLG, the CEA Agency, and the BC EAO (Rescan 2012).

### 29.4 Nisga'a Treaty Rights and Interests under the Nisga'a Final Agreement

The NFA establishes a variety of rights in regards to use and management of natural resources in the NWA and Nass Area (NLG, Province of BC, and Government of Canada 1998). These rights are protected under the *Constitution Act* (1982).

### 29.4.1 Harvesting Rights

#### 29.4.1.1 Fish and Aquatic Plants

Chapter 8 of the NFA stipulates the right of Nisga'a citizens to harvest fish and aquatic plants in the NWA and the Nass Area, subject to conservation objectives (including achievement of minimum escapement levels), and public health and safety needs. It sets out Nisga'a allocations of Pacific salmon and steelhead trout returning to Canadian waters each year, stated in terms of an annual percentage of the overall allowable catch (OAC). The NFA also describes Nisga'a rights to participate in commercial fisheries.

#### 29.4.1.2 Wildlife

Chapter 9 of the NFA addresses Nisga'a wildlife interests. Nisga'a citizens have the right to harvest wildlife throughout the NWA, subject to conservation objectives, and public health and safety needs. Under the NFA, Nisga'a are allocated wildlife harvesting rights to "designated species," calculated as a percentage of the total allowable harvest for each species. Nisga'a harvesting rights have equivalent priority to recreational and commercial harvesting rights. The initially designated species are moose, grizzly bear and mountain goat, and Nisga'a currently have annual allocations of 25 bull moose, 33 mountain goats and 7 grizzly bears (of which no more than two can be female) in the NWA (NLG 2012).

Chapter 9 of the NFA provides for Nisga'a rights to harvest migratory birds within the Nass Area for domestic purposes, subject to conservation and public health and safety requirements.

### 29.4.2 Other Interests

Chapter 6 of the NFA affords Nisga'a citizens the right to reasonable access to and onto Crown lands that lie outside Nisga'a Lands, including streams and highways, for the exercise of Nisga'a rights and interests. Where a disposition of Crown land would have the effects of denying reasonable access or use of resources, the Crown must ensure that alternative reasonable access is provided.

The NFA defines other Nisga'a interests, including forestry tenures, commercial recreation tenures, guide-outfitting and angling licenses and traplines. These interests are located well south of the Project area, and it is not expected that they will be affected by the Project.

## 29.5 Background Information and Setting

Nisga'a people have inhabited the region of the Nass drainage for thousands of years. The contemporary Nisga'a Nation is a constitutionally recognized government with constitutionally protected rights and interests as defined by the NFA, which came into effect as of May 2000 under the *Constitution Act* (1982; NLG, Province of BC, and Government of Canada 1998).

This section provides background information related to Nisga'a political, social, cultural, economic, and heritage settings, as well as the environmental setting as it relates to current use of lands and resources by Nisga'a people for traditional purposes.

**29.5.1 Political Structure**

Nisga’a Nation operates within the *Constitution Act* (1982) and the *Canadian Charter of Rights and Freedoms* (NLG, Province of BC, and Government of Canada 1998). Nisga’a government consists of NLG and the four Nisga’a village governments. NLG comprises executive and legislative branches, as well as a Council of Elders. NLG President, Chairperson, Secretary-Treasurer, and Chairperson of the Council of Elders are elected by Nisga’a citizens. Village government members are directly elected. The remaining members of the Council of Elders are appointed by NLG. The executive also includes one representative of each Nisga’a Urban Local, to represent Nisga’a citizens who do not live in the Nass Valley. The government’s legislative assembly, Wilp Si’ayuukhl Nisga’a, is responsible for enacting laws within its jurisdiction (NLG 2002b, n.d.-a).

**29.5.2 Social and Cultural Setting**

Nisga’a Nation comprises approximately 5,900 members, more than 2,000 (34%) of whom reside in one of the four Nisga’a villages (AANDC 2012b), while most Nisga’a citizens living outside the Nass Valley live in Terrace, Prince Rupert, or Vancouver (described in the NFA as “Nisga’a Urban Locals”) and have official representation within NLG.

Table 29.5-1 summarizes the populations of the four Nisga’a villages in comparison to those living outside of Nisga’a Lands.<sup>1</sup>

**Table 29.5-1. Nisga’a Nation Community Populations: July 2012<sup>1</sup>**

<b>Community</b>	<b>Community Population 2012</b>	<b>Population on other Reserves</b>	<b>Population off Nisga’a Lands</b>	<b>Total Population</b>
Gitlaxt’aamiks	858	51	906	1,815
Gitwinksihlkw	182	28	182	392
Laxgalts’ap	566	54	1,110	1,731
Gingolx	408	68	1,491	1,966
<b>Total</b>	<b>2,014</b>	<b>201</b>	<b>3,689</b>	<b>5,904</b>

Source: AANDC (2012a).

<sup>1</sup> AANDC population data is provided by an administrator from each community on a monthly basis and is based on total membership on and off Nisga’a Lands.

Nisga’a people organize themselves into four *pdeek* (clans). Each pdeek is associated with two crests which identify families (NTC, Fiegehen, and Rose 1993; Table 29.5-2). Pdeek are made up of many *huwilp* (houses), each of which has its own chiefs, rights, history, traditions, songs, dances, stories (*adaawak*), and territory (*ango’osxw*). The members of a *wilp* (house) are all descended from a common female ancestor (NTC, Fiegehen, and Rose 1993; SD 92 1996).

<sup>1</sup> Figures reported from the 2011 Census are slightly below those compiled by Aboriginal Affairs and Northern Development Canada. For instance, Statistics Canada reports 1,728 residents in the four Nisga’a villages and 1,909 residents on Nisga’a Lands (Statistics Canada 2012).



**Table 29.5-2. Nisga’a Kinship Structure**

<b><i>Pdeek</i></b> (clans)	<b><i>Ayukws</i></b> (crests, two per clan)
<i>Gisk’aast</i>	Killer Whale and Owl
<i>Laxgibuu</i>	Wolf and Bear
<i>Ganada</i>	Raven and Frog
<i>Laxsgiik</i>	Eagle and Beaver

Source: NTC, Fiegehen, and Rose (1993)

Rights are passed down through matrilineal succession; title and ownership of resources or particular sites is formalized through the settlement feast or *yukw*. The highest-ranking woman in the wilp is the *sigidimnak’* (matriarch) who makes the ultimate decisions regarding names and inheritance (NTC, Fiegehen, and Rose 1993; SD 92 1996). The highest ranking man in a wilp is the *sim’oogit* (chief).

Nisga’a people are governed by their traditional laws, customs and practices known collectively as *Ayuukhl Nisga’a*, with guidance and interpretation by the Council of Elders (NLG 2002b). The *Ayuukhl Nisga’a* covers areas of respect, education, chieftainship and matriarchy, property rights, death, marriage, divorce, conflict resolution, and trade (NTC, Fiegehen, and Rose 1993). The *adaawak* encapsulates oral history and stories that, among other things, describe the activities of a wilp’s ancestors, its rights, the identity of its members, and the locations of its properties, including fishing sites, berry patches, hunting grounds, and forest resources. (NTC, Fiegehen, and Rose 1993; SD 92 1996). According to the Proponent’s 2011 Social, Economic, Resource Use, and Culture (SERC) survey (see [Appendix 29-A](#) of the Application / EIS for statistical findings), 65% of respondents have very limited ability to speak, read or write *nisga’amk*, the Nisga’a language, although almost 25% ranked their ability to understand the language highly. Language revitalization efforts are underway.

A shortage of adequate housing has led to overcrowding in Nisga’a villages, and much of the current housing stock is in need of repair. Nisga’a villages and village-based housing committees are responsible housing management, construction and financing, and some housing subdivisions with serviced lots have been developed. NLG and Nisga’a villages are responsible for the provision of community utilities, infrastructure and related services such as water, sewer, and garbage collection/landfill within Nisga’a Lands. Most of these services would have the capacity to accommodate a modest increase in community population. Nisga’a villages are connected to the provincial electricity grid, and Internet service is provided by enTel Communications Inc., a Nisga’a-owned corporation.

### 29.5.2.1 Education

Nisga’a village schools fall within School District (SD) 92. Each village has an elementary school, and one secondary school is located in Gitlaxt’aamiks. Enrolment in Nisga’a village schools has declined over the past five years. SD 92 and Nisga’a villages are currently implementing initiatives to restructure and improve the Nisga’a education system. Wilp Wilxo’oskwhl Nisga’a Institute (WWNI) is a post-secondary institute located in Gitwinksihlkw. It jointly offers some programs with the University of Northern British Columbia (UNBC),

Northwest Community College (NWCC), and Royal Roads University. According to the 2006 Census, high-school non-completion rates in Nisga'a villages were notably higher than that of the province as a whole. The proportion of Nisga'a village members with an apprenticeship or trades certificate was higher than the provincial average (Statistics Canada 2007), most likely a result of the need for trained employees in the resource extraction industries in the region.

According to the SERC Survey ([Appendix 29-A](#)), nearly 75% of respondents had at least a high school diploma or equivalency certificate, while about 40% had a college diploma or higher. Two-thirds of respondents reported general labour skills, and 50% reported vocational skills; 25% reported technical or professional skills, and the same number reported management skills<sup>2</sup>. The SERC Survey also showed that most Nisga'a survey respondents (90%) do not have any experience in the mining industry. Of the 7% who reported having worked in the industry, 40% had worked in the construction or operation of a mine. Of these, 70% had less than five years of experience.

### 29.5.2.2 Health and Community Well-being

#### 29.5.2.2.1 Community Well-being

AANDC produces a community well-being index (CWBI) for Aboriginal communities based on an aggregate of income, education, housing conditions, and labour force activity. The four Nisga'a communities had an average CWBI rating of 65 in 2006 (AANDC 2011),<sup>3</sup> which was slightly above the national average of 62 for Aboriginal communities, although lower than the national average for CWBI of 80 for non-Aboriginal communities.

Provincially, BC Stats data ranks overall CWB for Local Health Area (LHA) 92, which includes the four Nisga'a villages, as the fifth-lowest in the province.<sup>4</sup> LHA 92 scored highest in education concerns, and second-highest in crime. However, it was closer to the median of LHAs across the province in terms of economic hardship and children (less than 15 years) at risk (BC Stats 2011b).

BC Stats uses a variety of indicators to measure and report on crime at the LHA scale, including total serious crime rate per thousand population, the number of serious crimes per police officer, the rate of violent crime per thousand, and percentage of serious crime committed by juveniles (age 12 to 17). LHA 92 generally has a poorer ranking than provincial averages for rates in all crime statistics categories. One notable exception is the rate of serious crime which in recent years has enjoyed a substantial decline in LHA 92 (-23.5%) equivalent to that seen across BC (BC Stats 2011c).

In 2011, Nisga'a LHA 92 reported life expectancy in the area at 75.2 years, compared to 78.0 years for the Regional District of Kitimat-Stikine (RDKS) and 82.0 years for the province

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<sup>2</sup> Respondents in the survey could select more than one skill.

<sup>3</sup> Except for Laxgalts'ap, which did not register a CWB index rating in 2006 due to data suppression by Statistics Canada. The index is out of 100; theoretically, the higher the number, the greater the community's well-being.

<sup>4</sup> The boundaries of LHA 92 correspond to Nisga'a Lands, as does Nisga'a SD 92.

as a whole. In terms of potential years of life lost (PYLL), LHA 92 is comparable to the RDKS as a whole according to most indicators, except for PYLL due to suicide, which was nearly quadruple that of the RDKS, and ten times that of the province in the 2006-2010 period (BC Stats 2011c).<sup>5</sup>

The infant mortality rate reported for LHA 92 is zero, likely because there are no hospitals in the LHA, and women usually travel to Terrace for maternity care and childbirth. The rate of children in care for the LHA (19.8/1,000 children) was more than double the provincial rate (9.1/1,000 children); the percentage of lone parents in the Nisga'a LHA was 32.9%, compared to the provincial rate of 25.7% (BC Stats 2011c).

The percentage of young adults who did not graduate in LHA 92 (72.1%) was more than double that of the province (27.9%). LHA 92 had the highest number of teenage pregnancies<sup>6</sup> at 138.7 per 1,000, more than double, and in a few cases triple, the number of teenage pregnancies in other LHAs (BC Stats 2011c).

### 29.5.2.3 Community Health Facilities and Services

The Nisga'a Valley Health Authority (NVHA) manages healthcare services and delivery in Nisga'a villages, through a primary health centre in Gitlaxt'aamiks, and satellite clinics in the other Nisga'a villages. For more complex, long-term care, the nearest full-service health facility is Mill Memorial Hospital in Terrace.

### 29.5.2.4 Emergency and Social Services

The RCMP Lisims/Nass Valley detachment provides policing services to the Nisga'a villages and is based in Gitlaxt'aamiks. Emergency services are provided by the Volunteer Fire Department in Gitlaxt'aamiks and by community-run Fire and Rescue Services in Laxgalts'ap. For ambulance, Nisga'a communities are serviced by the northern region of BC Ambulance, and the NVHA operates an emergency phone service ([Appendix 22-A](#)).

Nisga'a Child and Family Services (NCFS) provides family support and development programs. Each Nisga'a village government also has its own social development department, which provides programs at the community level, including day care and pre-school facilities and youth programs (NLG N.d.-d).

Each Nisga'a village has a recreation centre with a gymnasium and various activity rooms that house community-based recreation programs organized and funded by NCFS (NLG 2009, [Appendix 22-A](#)).

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<sup>5</sup> Potential years of life lost (PYLL) is the sum, over all persons dying from a particular cause, of the years that these persons would have lived had they experienced normal life expectation.

<sup>6</sup> Average 2008-2010 for women aged 15 to 19.

### 29.5.3 Economic Setting

Until recent decades, the Nisga'a economy, like most of northwest BC, was tied to resource-based industries, especially forestry and commercial fishing. The dominance of forestry and fishing has now declined. Tourism, construction and mining-related activities have grown somewhat, although the current Nisga'a economy is especially dependent on the public sector, and many Nisga'a citizens are employed by either NLG or one of the local village governments. Private sector employment is more limited, and is typically associated with resource extraction industries such as commercial fishing or forestry, and to a lesser degree, construction, mining, retail trade and services. Within Nisga'a Lands, hunting, fishing and non-timber forest products such as berries are an important component of household livelihoods, and help to support the local economy and sustain community well-being (CWB).

According to the most recent publically available, audited financial statement, the operating revenue of NLG was slightly over \$73 million, with an accumulated budget surplus of almost \$187 million for the fiscal year 2010 to 2011 (NLG 2011)

#### 29.5.3.1 Employment

While unemployment in Nisga'a villages is high, most of those who do have jobs are employed in the public sector, generally with either NLG or one of the local village governments. Private sector employment is more limited and typically associated with resource extraction industries such as commercial fishing or forestry, and to a lesser degree in construction, mining, retail trade, and services (SNDS 2007; Statistics Canada 2007).

As discussed in the *KSM Project: 2012 Economic Baseline Report* ([Appendix 20-A](#)), there is considerable variation in the estimated rates of unemployment, employment participation, and employment among the four Nisga'a communities. Employment statistics also vary sharply across a number of different sources of data. The key message is that labour participation in Nisga'a villages (i.e., the number of people either working or available to work) is generally equal to or higher than the provincial average, which hovers around two-thirds of the population 15 years and older. Unemployment, as noted, is persistently high in Nisga'a villages, ranging from about 18% to over 50%, well above the provincial average (currently around 6 to 7%; SNDS 2007; Statistics Canada 2007).

Recent research (e.g., SNDS 2007, SERC Survey [Appendix 29-A](#)) identifies a weak economic base and the lack of job opportunities as the primary causes of high unemployment. Other contributing factors include lack of education, skills, and training; seasonally restricted employment; limited local funding; nepotism; and lack of incentive due to dependency on social services.

A recent survey of Nisga'a citizens, including both those living in one of the villages or residing outside of the Nass Valley, suggests that the potential size of Nisga'a labour supply is about 1,140, with those living off of Nisga'a Lands outnumbering those living on Nisga'a Lands by a factor of about 2:1. However, this estimate of Nisga'a labour supply includes adults potentially interested in mine-related employment, and does not take into account whether or not the individuals are able to secure employment. Workers will need to have the necessary education,

skills and training for the available positions. Other personal factors and competing commitments may also hinder employment with the Project. Ultimately, the employable Nisga'a labour force that is currently available is likely a small fraction of the total labour supply. Currently, many Nisga'a citizens do not have the appropriate qualifications for many of the more specialized mine construction and operation jobs (Section 29.3.2.2). Part-time workers represent around 40% of the labour force, with almost half of them having worked less than five months during 2010. The largest proportion of Nisga'a labour force (nearly two-thirds) is unemployed or employed only part-time ([Appendix 29-A](#)).

### 29.5.3.2 Income and Earnings

Due to data suppression by Statistics Canada, income and earnings statistics from 2005 are only publically available for the two larger Nisga'a communities of Gitlaxt'aamiks and Gingolx. Community data on income and earnings from the 2011 Census were unavailable at the time of writing. Total median earnings in these two communities for persons over 15 years old, including full-time, seasonal, and part-time workers, were considerably lower than the provincial average (Statistics Canada 2007). Earnings for those working year-round and full-time were notably better and, in fact, higher than the average for Aboriginal people in BC, and only slightly lower than for the province as a whole. While Nisga'a citizens with full-time employment are doing comparatively well, the broader community may need to rely more on non-wage activities and government sources of income in order to meet household livelihood needs.

The SERC survey ([Appendix 29-A](#)), found that about 60% of respondents had total income of less than \$25,000 in 2010; more than three-quarters (78%) had total income of less than \$40,000. In 2005, earnings comprised between 60% and 78% of residents' income, with government transfers amounting to over 37% in Gingolx as compared to less than 11% for the province (Statistics Canada 2007). More than one-third of survey respondents received at least 50% of their total income from government assistance ([Appendix 29-A](#)).

### 29.5.3.3 Nisga'a Nation Businesses

Approximately 32 Nisga'a or NLG-owned businesses are based in Nisga'a villages, Terrace, and Prince Rupert. The Nisga'a Business Survey ([Appendix 29-B](#)) reported that of the 22 businesses surveyed, over half were single proprietorships, and more than a third were owned and operated by one of the four village governments. The majority (75%) reported fewer than five employees, while the top four reported 129, 42, 40, and 21 employees respectively. Over two-thirds (68%) reported that at least half of their earnings came from either or both levels of Nisga'a government.

The Nisga'a Commercial Group (NCG) is a consortium of companies, partnerships and other business ventures that are owned collectively by Nisga'a Nation through NLG, but which operate as independent businesses. The NCG promotes the surrounding wilderness area through a culture and eco-adventure-based-operation known as Lisims Backcountry Adventures Inc. (NLG 2011, n.d.-b). Other enterprises under the NCG umbrella include Nisga'a Fisheries Ltd., enTel Communications Inc. and Lisims Forest Resources LP.

Other business income is generated from forest products (including non-timber forest products such as pine mushrooms), and fish and seafood products (NLG n.d.-b; see also Section 29.4.5.2).

For example, over \$6.6 million has entered the Nisga'a economy through the harvest of salmon since the NFA went into effect (NLG 2009). Some Nisga'a businesses are currently expanding into other sectors such as mining and energy.

### **29.5.3.4 Nisga'a Subsistence Economy and Activities**

The subsistence use of terrestrial and aquatic resources is both a culturally and economically important activity for Nisga'a.

### **29.5.4 Heritage Setting**

The Nisga'a Land Use Plan (NLG 2002a) identifies heritage preservation as a priority for Nisga'a Nation. Sites of heritage interest to Nisga'a Nation include old village sites, trails, gravesites, house sites, oral history landmarks, and culturally modified trees. Nisga'a attach general traditional/heritage value to the land, linked to historical and traditional use and occupation, and place heritage value on the Nass Area.

Treaty Creek, north of Bowser Lake, marks the traditional boundary between the Tahltan and Nisga'a. In the late 19<sup>th</sup> Century, a peace treaty between Nisga'a Nation and the Tahltan Nation was concluded at a spot along the creek (now called "Treaty Rock"). Treaty Rock, a one-hectare site located on the south side of Treaty Creek, is of cultural and historic significance to Nisga'a and Tahltan people, and, is designated a provincial heritage site (Borden Number HdTj-1) under the NFA (NTC/Ayuukhl Nisga'a Department, Aiyansh BC, cited in GeoBC n.d.).

### **29.5.5 Current Use of Lands and Resources for Traditional Purposes**

Traditionally, Nisga'a harvesting of fish, wildlife, birds, and plants followed a seasonal cycle focused on furs in late winter, oolichan in the spring, salmon in the summer, berries in late summer, and large mammals in the fall. Contemporary subsistence resource use remains an important contributor to household livelihoods in Nisga'a communities.

In the Nisga'a villages, just under half of respondents reported in the 2001 SERC survey that they consume wild meat, berries or plants once or more per week, while close to 90% consume fish at least once per week ([Appendix 29-A](#)). Under the NFA, Nisga'a have certain rights to harvest fish, wildlife, birds and plants within the NWA, and certain rights to harvest fish and migratory birds within the Nass Area (Section 20.2). However, most contemporary Nisga'a subsistence resource use is concentrated within or near Nisga'a Lands. According to the 2001 Aboriginal Peoples Survey (Stats Can 2002a), 21% of Nisga'a adults participated in hunting, with 92% of them hunting for food. Half the adult Nisga'a population fished and 88% of these were engaged in subsistence fishing. About 28% of Nisga'a adults gathered wild plants, 82% of which were gathered for subsistence.

#### **29.5.5.1 Land Use Planning**

The Nisga'a Land Use Plan (NLG 2002a) focuses on promoting Nisga'a resource management goals on Nisga'a Lands. It is intended to preserve sustainable resource sharing and ensure that resources are protected against ecological damage, and can be fairly accessed by Nisga'a citizens. NLG contributed to, and is a signatory of, the Nass South Sustainable Resource Management Plan (Nass South SRMP; BC MFLNRO 2012), which covers the southern portion

of the Nass Watershed and includes large portions of the Nass Area and NWA. It establishes resource management objectives for various fish and wildlife species. Further details on the Nass South SRMP are provided in the Land Use Effects Assessment (Chapter 23) and Land Use Baseline Report ([Appendix 23-A](#)).

### **29.5.5.2 Fishing and Fisheries Management**

Nisga'a harvest steelhead and all five species of salmon in the Nass watershed for domestic use and sale under the terms of the NFA. Oil is produced from oolichan harvested in Fishery Bay. Shellfish, halibut, and marine mammals are harvested along the coast and in the Nass estuary, while land-locked fish such as trout and Dolly Varden are harvested further upriver. The Nisga'a Fisheries Management Program utilizes fish wheels on the Nass River for salmon monitoring, tagging, and data collection, and conducts stock assessments on a variety of species throughout the Nass Area.

Under the terms of the NFA, Canada and British Columbia each contributed \$5.9 million to support a Nisga'a commercial fishery (NLG, Province of BC, and Government of Canada 1998). Between the effective date of the NFA (2000) and 2009, approximately \$6.7 million has entered the Nisga'a economy through the harvest of salmon (NLG 2009). Nisga'a Fisheries Ltd. oversees the harvest and sale of Nisga'a fish. It operates three landing sites on the Nass River, and is responsible for grading, counting, and weighing salmon for payment, and for overseeing the transport of salmon to a central depot located in Gitlaxt'aamiks (NLG n.d.-c).

### **29.5.5.3 Wildlife Harvesting and Wildlife Management**

Nisga'a hunt various mammal and bird species, including moose, mountain goats, deer, bear, grouse, ducks and geese. Historically, caribou were a favoured game species; in the last century, however, moose have displaced both caribou and deer populations in the Nass Area. Moose are hunted in the fall and winter, and contribute significantly to the present-day Nisga'a diet (McNeary 1976). Specific areas for moose harvesting were not identified by Nisga'a during baseline studies.

To address recent moose population declines, NLG and BC have reduced moose harvest allocations in the NWA for both Nisga'a citizens and resident/non-resident hunters. NLG has also introduced a five-year moose conservation plan to help the population rebuild itself and mitigate for the impacts of over-harvesting and resource development on moose (NLG 2008).

Nisga'a people have traditionally trapped fur-bearing mammals, including marmot, fisher, marten, mink, and weasel, although the level of trapping activity may be in decline. The Project's Mine Site, PTMA, and access roads do not intersect Nisga'a traplines, most of which are located farther south near Nisga'a Lands.

### **29.5.5.4 Culturally Important Plants**

Nisga'a use a wide variety of berries, plants, and trees for subsistence, medicinal, and utilitarian needs (NTC, Fiegehen, and Rose 1993; SD 92 1996). Pine mushrooms are commercially harvested in many areas throughout Nisga'a Lands. NLG manages and regulates pine mushroom harvesting within Nisga'a Lands by requiring all Nisga'a and non-Nisga'a

harvesters to apply for a permit (Avanti 2012). Lisims Forest Resources LP, a Nisga'a-owned corporation, is engaged in the harvest and sale of non-timber forest products, including pine mushrooms (NLG n.d.-b). In 2008, Nisga'a harvested 11,656 kg of mushrooms, which generated over \$43,000 in revenue (NLG 2009).

### **29.6 Nisga'a Consultation Activities and Identified Issues**

This section provides a summary of information distribution and consultation activities undertaken to date with Nisga'a Nation. A more detailed account of communications and consultation activities is provided in Chapter 3 and [Appendix 3-J](#). The proposed plan for consulting Nisga'a also provided.

#### **29.6.1 Nisga'a Consultation – Pre-Application/Pre-Submission Stage**

Consultations were initiated with NLG in February, 2008, and since then, the Proponent has engaged Nisga'a on an ongoing basis through the KSM Project Working Group, as well as a variety of other activities. Seabridge entered into an agreement with NLG to provide funding to facilitate Nisga'a participation and involvement in the EA process, and also provided funding for various aspects of the ESCIA completed by Seabridge to comply with Chapter 10, paragraph 8(f) of the NFA. Engagement has also included the provision of funds and training for Nisga'a citizens to work as field assistants in a range of studies undertaken for the Application/EIS, including baseline studies and the ESCIA. In September 2011, NLG participated in a helicopter visit to the Project site. NLG is a regular recipient of press releases distributed by Seabridge to provide exploration results and other updates on the Project. In June 2011, Seabridge and NLG hosted four community meetings in Nisga'a villages to provide information on the Project and answer questions.

Nisga'a reviewers have provided comments on various EA matters, including proposed environmental baseline study workplans, baseline study results, the contents of the AIR, the selection of VCs, notably the fish and aquatic habitat, ecosystem and plant communities, wildlife and wildlife habitat, and heritage valued components, and impact assessment findings and proposed mitigation measures. Nisga'a concerns played a major role in the decision to conduct a quantitative assessment of the potential increase in moose mortality due to increased traffic along Highway 37. Nisga'a input also influenced the scope of the tailing disposal alternatives assessment that formed the basis for selecting the Teigen/Treaty TMF option.

For the EA process, NLG represents Nisga'a Nation in consultations related to the Project. Information distribution and consultation activities for Nisga'a Nation undertaken by, or involving, Seabridge during the pre-Application/pre-submission-stage may be summarized as follows:

- Seabridge held meetings with NLG in February 2008 to introduce itself and the Project;
- Seabridge provided EA process participant funding to Nisga'a within the framework of an agreement reached in October 2012;
- Seabridge participated in all meetings of the KSM Project Working Group set up by the BC EAO and the CEA Agency to oversee the EA, providing responses to NLG



comments on proposed studies, potential Projects effects, proposed mitigation measures and various Project-related reports;

- Seabridge responded to comments from NLG with respect to the draft AIR in 2009 and 2010, before they were finalized in January 2011;
- Seabridge arranged for a “Mining 101: Mining for Non-miners” workshop for Nisga'a Nation in 2009, and made a financial contribution to the BC Aboriginal Mine Training Association, a portion of which was made available for Nisga'a related training initiatives focused on mining;
- Seabridge employed Nisga'a citizens in baseline field studies for the Project between 2008 and 2011;
- Seabridge arranged a helicopter site visit to the Project area in which Nisga'a representatives participated in September 2011;
- Seabridge and NLG hosted community meetings in all four Nisga'a Villages in June 2011 and 2013 (Gitwinksihlkw [June 20, 2013], Laxgalts'ap [June 26, 2013], Gingolx [June 27, 2013], and Gitlaxt'aamiks [July 16, 2013]);
- Seabridge participated in the Nisga'a Prosperity Forum in March 2012 in Laxgalts'ap;
- Seabridge made donations to several Nisga'a cultural and business-oriented events;
- Per Chapter 10, paragraph 8(f) of the NFA, Seabridge completed a Nisga'a Economic, Social, Cultural Impact Assessment (ESCIA), based on November 2010 NLG Guidelines and a subsequent July 2011 work plan; and

Seabridge completed a *Nisga'a Nation Consultation and Issues Summary Report* in January 2013, summarizing Seabridge's information distribution and consultation efforts during the pre-Application stage of the EA process.

### **29.6.2 Proposed Nisga'a Consultation- Application/EIS Review Stage**

Consultation planned with Nisga'a Nation during the Application review stage is intended to meet the requirements of the BC EAO Section 11 and Section 13 orders, as well as the CEEA 1992. During the Application review stage, Seabridge will:

- distribute copies of the Application/EIS to Nisga'a Nation for information and consultation purposes (Section 19.1 of the Section 11 Order);
- provide electronic and/or hard copies of the Application/EIS to each Nisga'a Village Government office;
- write to Nisga'a Village governments and NLG to identify dates of the BC EAO/CEA Agency public comment period on the Application/EIS, and the dates, times and locations of BC EAO and CEA Agency open houses;
- within time limits set by the BC EAO, provide a written report to Nisga'a Nation and the BC EAO and CEA Agency on the results of consultation activities with Nisga'a Nation (Section 19.5 of the Section 11 Order);

- within any time limits set by the BC EAO, consider and respond to issues that are identified in comments submitted by Nisga'a Nation during the review of the Application/EIS (Section 23.1 of the Section 11 Order);
- where requested by, and within any time limits set by, the BC EAO, provide specified additional information in relation to, or to supplement, the information provided in the Application / EIS (Section 23.2 of the Section 11 Order);
- provide, to the BC EAO and the CEA Agency, a written summary report of any agreements reached with Nisga'a Nation or a Nisga'a Village within the meaning of paragraphs 8(i) and 10 of Chapter 10 of the NFA (Section 19.6 of the Section 11 Order);
- attend working group meetings organized by the BC EAO and the CEA Agency to provide information related to the Application / EIS, and respond to questions on the Application / EIS;
- prepare a table to track issues raised by Nisga'a Nation during the Application review stage and responses to those issues;
- consider and prepare written responses to key issues raised by Nisga'a Nation during the Application review stage;
- by mutual agreement, arrange consultation meetings with Nisga'a Nation to discuss issues related to the review of the Application / EIS and, the Project (Section 19.3 of the Section 11 Order);
- use these meetings to present the results of the Nisga'a ESCIA report; and
- undertake further consultations with Nisga'a Nation as directed by the BC EAO (per Sections 16.3 and 19.7 of the Section 11 Order) and the CEA Agency.

Based on issues and concerns raised by NLG during the Application review stage, and based on input from NLG, Seabridge will consider other measures to respond to issues and concerns raised by NLG.

## **29.7 Summary of Adverse Effects on Relating to Nisga'a Treaty Rights and Interests**

This section summarizes and assesses whether the Project is expected to have adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests set out in the NFA and, where appropriate, makes recommendations to prevent or mitigate those effects. This section also identifies the issues raised by Nisga'a to date and changes that have been made to the design of the Project to minimize potential environmental effects and impacts on Aboriginal rights.

### **29.7.1 Issues Identified by Nisga'a to Date**

During the pre-Application/pre-submission stage, NLG and Nisga'a citizens raised specific issues with respect to the topics listed in Table 29.7-1.

**Table 29.7-1. Issues Identified by Nisga'a Nation and Nisga'a Citizens**

Topic	Issue
Consultation and EA process	<ul style="list-style-type: none"> <li>- compliance with the NFA (Chapter 10);</li> <li>- extending biophysical study area to coast;</li> <li>- inclusion of a marine component in the Project scope;</li> <li>- inclusion of effects on oolichan in the scope of the assessment;</li> <li>- making Nisga'a Villages a primary assessment focus;</li> <li>- broadening the range of future projects and activities considered in cumulative effects assessments;</li> <li>- need for mining companies to be responsible for past impacts;</li> <li>- US role in EA; and</li> <li>- independence of EA.</li> </ul>
Project Design and Operation	<ul style="list-style-type: none"> <li>- capacity of TMF to store water;</li> <li>- use of tunnel rock for TMF dam construction;</li> <li>- long-term risks associated with TMF;</li> <li>- design of RSFs;</li> <li>- assessment of seismic hazards;</li> <li>- monitoring of Mine Site and TMF dams (operation, closure, post-closure);</li> <li>- camp operations and sustainability;</li> <li>- cold weather contingencies;</li> <li>- status of Mitchell Glacier;</li> <li>- handling and storage of chemicals; and</li> <li>- plans for sludge disposal during construction, operation and closure.</li> </ul>
Alternatives Assessment	<ul style="list-style-type: none"> <li>- option of keeping all Project infrastructure in one valley outside Nass system</li> <li>- consideration of flood events in TMF alternatives assessment</li> <li>- option of combining West Teigen Lake/Unuk Valley TMF alternatives</li> <li>- option of dry-stacking tailing</li> </ul>
Air Quality and Climate	<ul style="list-style-type: none"> <li>- effects of climate change</li> <li>- effects of air emissions from carbon-regeneration process</li> </ul>
Water Quality and Quantity	<ul style="list-style-type: none"> <li>- ML/ARD characterization</li> <li>- ML/ARD mitigation</li> <li>- management of PAG material in RSFs</li> <li>- TMF operation, closure and post-closure plans (seepage, contingencies)</li> <li>- potential for MTT seepage</li> <li>- management of PAG material during ore tunnel construction</li> <li>- management of PAG material during access road construction</li> <li>- incorporation of sludge geochemistry into water quality modeling</li> <li>- presence of hazardous materials in tailing</li> <li>- volume of water to be discharged, and criteria for treating water</li> <li>- effects of sludge on TMF water quality</li> <li>- quantity of material to be stored at TMF from tunnel development</li> <li>- length of time PAG material will be stockpiled at TMF before transfer to RSFs</li> <li>- estimate of groundwater flow into tunnels</li> <li>- health of [Nass] River and possible pollution</li> <li>- contaminant concentrations in excess of water quality guidelines</li> <li>- TMF water quality</li> <li>- management of total suspended solids (TSS)</li> <li>- efficiencies of diversions and flow direction</li> </ul>

(continued)

**Table 29.7-1. Issues Identified by Nisga'a Nation and Nisga'a Citizens (completed)**

<b>Topic</b>	<b>Issue</b>
Fish and Aquatic Habitat	<ul style="list-style-type: none"> <li>- fish sampling effort in lower Teigen and lower North Treaty creeks</li> <li>- effects on productive capacity of Teigen and Treaty creeks</li> <li>- fish habitat compensation issues</li> </ul>
Terrestrial Ecosystems and Wetlands	<ul style="list-style-type: none"> <li>- scope of wetland compensation</li> </ul>
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> <li>- effects on disruption of wildlife movement</li> <li>- presence of mineral licks</li> <li>- effects on goats and grizzly bears in Nass drainage headwaters</li> <li>- nature of grizzly bear DNA studies</li> <li>- scope of bird studies</li> <li>- potential adverse effects on western toad habitat linked to fish habitat compensation works in wetlands</li> <li>- effects on tailed frogs</li> <li>- effects on migratory birds</li> <li>- wildlife habitat losses</li> </ul>
Social	<ul style="list-style-type: none"> <li>- interest in training and apprenticeships</li> <li>- pressures on Nisga'a infrastructure and services</li> <li>- safety concerns linked to mine-related work and female workers in camp</li> </ul>
Economic	<ul style="list-style-type: none"> <li>- interested in employment and Nisga'a businesses opportunities</li> <li>- hiring practices</li> <li>- revenue sharing/economic benefits</li> </ul>
Cultural	<ul style="list-style-type: none"> <li>- effects on Nisga'a harvesting</li> <li>- accommodation of cultural obligations</li> <li>- nature of camp diet</li> </ul>
Heritage and Archaeology	<ul style="list-style-type: none"> <li>- damage and disruption of sites</li> </ul>
Land Use	<ul style="list-style-type: none"> <li>- fishing and hunting pressure</li> </ul>
Human Health	<ul style="list-style-type: none"> <li>- effects on country foods</li> <li>- human health effects of contamination of water and air</li> </ul>
Project Traffic	<ul style="list-style-type: none"> <li>- effects on public safety, and need for heavy road users to collaborate</li> <li>- vehicle collision and risk prediction methods, and specific risks to moose and flocking bird species (e.g. crossbills and siskins)</li> <li>- concern about WARS data base, recommending that compulsory inspection database be reviewed for data on mortality sinks</li> </ul>
Accidents, Malfunctions and Geohazards	<ul style="list-style-type: none"> <li>- potential for dam failure</li> </ul>
Closure and Reclamation	<ul style="list-style-type: none"> <li>- TMF closure and reclamation planning, and TMF dam spillway capacity and diversions at Closure</li> </ul>

**29.7.2 Project Design Changes to Mitigate Effects on Nisga'a Concerns**

Based on comments from NLG and other Working Group members, Seabridge has made several substantive Project design changes to minimize the potential environmental effects of the Project including:

- Changing access to the PTMA from Highway 37 due to First Nations and Nisga'a concerns related to potential effects on wildlife, fish and fish habitat, and wetlands, Seabridge assessed two access options (Assessment of Alternatives for the KSM Project Tailing Management Facility [Appendix 33-B]), finding a net environmental benefit if the access went up the Treaty Creek Valley rather than the Teigen Creek Valley (see Table 29.7-2 for summary of benefits). Access to the PTMA is now proposed along the Treaty Creek Valley.
- Changing the Saddle portal design due to First Nations and Nisga'a concerns about potential wildlife effects. The Saddle portal original cut-and-cover design (1.1 ha surface disturbance) has been changed to be underground with only the portal remaining at surface after construction.
- Changing the TM design due to Nisga'a Nation and First Nations about potential impacts on fish and fish habitat as follows:
  - redesign of the non-contact diversion ditches on both valley walls to flow north into the Teigen Creek watershed to supplement altered flows as a result of the TMF footprint;
  - change to direction of the TMF discharge to flow into Treaty and North Treaty creeks during TMF operation in order to protect fisheries values in Teigen Creek; and
  - discharge schedule designed to mimic the natural hydrograph of Treaty Creek to avoid low-flow periods and ensure receiving environment water quality standards will be met.

**Table 29.7-2. Summary of Benefits from Changing the Access Route from Highway 37 to the Processing and Tailing Management Area**

<b>Issue and Related Design Concern</b>	<b>Teigen Creek Valley</b>	<b>Treaty Creek Valley</b>
<u>Fish Habitat</u> Number of road crossings affecting fish-bearing streams	24 crossings	13 crossings
<u>Fish</u> Number of fish species affected	8 species: Dolly Varden, rainbow trout, coastal cutthroat trout, bull trout, chinook salmon, sockeye salmon, and whitefish	1 species: Dolly Varden
<u>Wildlife Habitat</u> Area of affected mountain goat habitat	279 ha	97 ha
<u>Western Toad Habitat</u> Number of potential breeding ponds affected	> 30 potential breeding ponds	7 potential breeding ponds
<u>Wetlands</u> Area of wetland affected	42.6 ha	22.6 ha
<u>Heritage</u>	Avoided 11 archaeological sites in Teigen Creek area	

### **29.7.3 Social Effects**

Chapter 22 of the Application/EIS assesses the potential effects of the Project on community demographics and infrastructure, education, skills development and training, and community well-being within both a local and regional study area (LSA and RSA). Nisga'a villages were included as part of the social LSA. This section assesses the potential effects of the Project as it relates to Nisga'a village housing and infrastructure; Nisga'a education, emergency, health and social services; and Nisga'a community well-being.

It is expected that the employment and other opportunities generated by the Project may encourage or enable Nisga'a citizens to migrate to (or back to) Nisga'a Lands. Nisga'a villages are small, and local infrastructure and services may be affected by even a small increase in village population. Housing is the most vulnerable component of community infrastructure, should an influx of people occur. Most other facets of community infrastructure have sufficient capacity to adequately absorb additional demand. Nisga'a education services are well resourced and have recently been restructured to better meet the needs of Nisga'a citizens.

The Nisga'a ESCIA Report (Rescan 2012) explored the possibility that, while in-migration as a result of the Project is anticipated, it may be partially offset by the out-migration of Nisga'a citizens from Nisga'a villages. Respondents in the Nisga'a SERC Survey were asked about their intentions, and the reasons for their intentions, to leave the Nass Area within the next five years. One of the reasons identified for possibly leaving the Nass Area were concerns about pollution and/or environmental hazards related to mining activity. The assessment of social effects in this chapter is based on a population scenario of "high net influx", meaning that in-migration into the Nisga'a villages exceeds by a wide margin the out-migration of Nisga'a citizens (for any number of reasons, and not necessarily because of the construction of the mine) during construction and operation.

Some adverse social effects, linked to mine closure and anticipated loss of employment in the future, are anticipated although dependent on the state of the regional economy at the time. Nisga'a workers should have an enhanced skill-set as a result of Project-related work, which will better enable them to obtain alternate employment or pursue other opportunities at closure.

#### **29.7.3.1 Housing and Community Infrastructure**

Nisga'a citizens are concerned about the limited supply of housing and lack of capacity to meet any increase in demand. Commentary in both the SERC survey ([Appendix 29-A](#)) and Nisga'a focus group interviews ([Appendix 29-C](#)) indicates housing in all of the villages is already at or near capacity, and that over-crowding in some residences is already a problem. NLG expressed concern that mine employment may induce some Nisga'a to move to (or back to) one of the villages, which would put additional strain on housing and other community infrastructure, such as recreation facilities, that currently do not meet existing demand.

#### Effects of Population Influx on Housing and Community Infrastructure

Survey results suggest that a net influx of Nisga'a citizens to the Nass Valley, on the order of about 10 to 23 people per year, may occur over the first 10 years of the Project (Rescan 2012).

In at least one of the Nisga'a villages, the land base limits the capacity of the community to increase its housing stock to meet growing needs. In other villages, subdivisions have been established or are well into the planning stages, but little in the way of new housing has been developed (Rescan 2012). Meeting the demand for housing that could be created by in-migration over the medium to long term appears feasible. In the short-term — that is, until additional housing can be constructed — the Nisga'a villages are likely to experience adverse social impacts associated with over-crowding and inadequate accommodations.

Costs may be incurred by NLG and the village governments to supply new housing in Nisga'a villages as a result of in-migration. For example, population estimates based on projections of mine-induced in-migration suggest potential costs to develop new housing in the range of approximately \$700,000 to \$1.7 million per year (Rescan 2012)<sup>7</sup>. However, this cost burden could be ameliorated through adjusted fiscal financing arrangements with Canada and BC. Furthermore, the mine and associated employment, business, and NLG revenues that will be generated are also a potential source of capital, which could trigger investment in construction and development to upgrade and increase local housing stock in some or all of the Nisga'a villages. In the long-run, the beneficial effects of Project-related income may outweigh the adverse effects of migration and increased demand on Nisga'a village housing (Rescan 2012).

The Project is not expected to place direct demands on Nisga'a community services and infrastructure during construction, operation, closure, and post-closure, since Project activities occur well outside of the Nisga'a villages and will rely on well-equipped on-site facilities. Even at relatively high levels of net in-migration, it is predicted that most elements of Nisga'a community infrastructure, including water, sewage, solid waste, and electricity, will be able to absorb the additional demand (Rescan 2012).

### Proposed Mitigation

The Proponent is committed to working with communities to mitigate and manage Project-related concerns related to potential pressures on community housing and infrastructure. The Proponent will work broadly with all communities in the region to share information and help them plan for (and manage) potential growth and change. Specific plans and initiatives with the Nisga'a villages could potentially be the subject of a Benefits Agreement (BA).

### **29.7.3.2 Education, Emergency, Health, and Social Services**

NLG expressed an interest in training and apprenticeships for Nisga'a citizens. Nisga'a citizens are concerned about the impact of the Project on local services, especially health services which are widely viewed as already insufficient ([Appendix 29-C](#)). There is concern that social impacts of mining due to increased income, such as increased drug and alcohol abuse may result in an increased strain on local policing, emergency and social services.

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<sup>7</sup> Based on an average cost of \$250,000 per dwelling and 3.4 persons per household (Rescan 2012; [Appendix 29-A](#)).

### Effects of Population Influx and Increased Income on Education, Emergency, Health, and Social Services

Due to the trend of declining enrolment and a currently high teacher-to-student ratio, there is not expected to be an immediate strain on education services in the Nisga'a villages in relation to any mine-related influx of people. Mine-related in-migration and/or increased demand for additional education may counter the recent decline in the student population in Nisga'a villages, thereby increasing Nisga'a school completion rates (Rescan 2012).

Increased disposable income can lead to both beneficial and adverse social effects. Nisga'a emergency, health, and social services could experience increases in demand on several types, although actual demand cannot be reliably predicted, since in addition to increased population, demand will be influenced by personal behaviour and choices with respect to drugs and alcohol use. Additional income could also reinforce a growing trend among Nisga'a citizens who choose to travel to Terrace for health care and other services, leading to a net decrease in demand on local Nisga'a services.

Nisga'a emergency services could face additional demand in the event they are called upon to assist with mine-related traffic accidents along highways 37 and 37A (Rescan 2012).

### Proposed Mitigation

The Proponent will work broadly with communities in the region to share information and help them plan and manage potential growth and change. Specific plans and initiatives with specific communities, such as the Nisga'a villages, could potentially be the subject of a BA. Impacts on local services will also be achieved in part through implementation of worker health and safety policies, and the provision of employee support and counseling through an employee assistance program.

### **29.7.3.3 Community Well-being**

Community well-being in the Nisga'a villages may be affected by migration, changes in individual and household income, and mine related work schedules. Social changes and effects linked to the Project are likely to have a mixture of beneficial and adverse impacts.

Nisga'a citizens and NLG raised concerns about the potential negative effects of a substantial increase in household incomes associated with mine-related employment and business, and note existing social problems related to unemployment, substance abuse, crime, and/or family dysfunction (Rescan 2012). Nisga'a are also concerned that the extended shift rotation system used at modern fly-in/fly-out mining camps is not conducive to family and community life, and may also affect cultural activities and practices.

### Effects of Population Influx, Increased Income and Change in Work Schedules on Community Well-being

The social effect of increased population in Nisga'a villages is expected to benefit for CWB on balance. Most in-migrants are likely to have pre-existing relationships and family connections in the community to which they move, which should facilitate community integration and improve feelings of connectedness for residents and newcomers. There may be some limited adverse



effects in the beginning as residents and newcomers get to know each other (Rescan 2012). Other adverse effects of increased population are likely to be linked to pressures on community infrastructure and services, as previously described in this section.

Higher incomes related to Project employment could have both beneficial and adverse effects on CWB. Negative behaviors such as substance abuse linked to more disposable income may adversely affect CWB, Project-related incomes could also accentuate the gap between rich and poor in the Nisga'a villages. Increased household incomes could also enhance CWB. Investment in housing improvements or expansion, pursuit of training or higher education, or investment and saving for the future would benefit the individuals and households, and should also provide a material and psychological benefit for the broader community. Employment and the income generated through employment may give rise to a sense of responsibility and purpose that boosts self-reliance, pride, and self-esteem (Rescan 2012). Mining-related incomes could also accentuate the gap between the rich and poor in the Nisga'a villages, which in turn could potentially lead to friction between groups and individuals in the community (NAHO 2008).

The work schedule and shift rotations typical of modern mine employment are known to place a strain on families and communities (NAHO 2008). Workers are separated from their families and are away from their home communities for weeks at a time. Effects on family life depend on multiple factors such as children's ages, social status of the family within the community, and stability of the parental relationship. Effects on relationships could include increased rates of family violence and dissolution. Other potential effects on family dynamics include increased rates of substance abuse and loneliness associated with separation from family (InterGroup 2005).

Some Nisga'a mine workers may spend less time on the land as a result of Project employment, while others will take advantage of off-shift periods to spend more time on the land with family members, with such activities enhanced by increased income. Such activities may help support community resilience and offset potential adverse social effects.(Rescan 2012, [Appendix 29-A](#)).

### Proposed Mitigation

The Proponent's strategies for labour recruitment and retention and for workforce training will provide additional opportunities, services, and programs to assist both individual Nisga'a workers and Nisga'a communities to cope with the potential challenges to CWB. In particular, the Proponent's proposed Labour Recruitment and Retention Strategy outlines some specific provisions that are intended to promote worker retention, and that should also mitigate impacts on CWB, such as:

- provision of on-site recreational facilities and activities for workers;
- flexibility for the cultural and familial commitments and responsibilities of Aboriginal workers;
- provision of financial management and life skills training opportunities for workers; and
- provision of an Employee Assistance Program to provide support to Nisga'a employees experiencing stress or breakdowns in family relationships due to existing work schedules.

There will also be a zero tolerance drug and alcohol policy for mine employees and suppliers.

### Effects of Mine Closure on Community Well-being

Nisga'a citizens and NLG expressed concern about potential adverse effects over potential adverse social effects linked to mine closure and anticipated loss of employment in the future. Estimating the social effects of mine closure is problematic as it is heavily dependent on the state of the regional economy at the time. If few alternative resource development employment opportunities exist in the local region at that time, Nisga'a citizens may suffer a loss of employment and income, and may migrate from the Nisga'a villages to find employment elsewhere.

Enhanced skills and training acquired by Nisga'a over the course of the Project life should provide post-Project benefits in that many of these skills will be transferable, making it easier for Nisga'a workers to obtain alternate employment or pursue other opportunities at closure.

### Proposed Mitigation

With respect to mitigation of the CWB effects of mine closure, one objective of the Proponent's Workforce Transition Program is to minimize negative social and economic impacts (such as unemployment and out-migration) by implementing measures to enhance Nisga'a workers' abilities to secure suitable alternative employment upon closure of the Project. This will be achieved mainly through assisting employees in identifying job opportunities that require complementary skills and opportunities, and to retrain to take advantage of the demands of trades and professions that exist at the time of closure and post-closure.

In mitigating the social effects of mine closure, the Proponent proposes a Workforce Transition Program, to be implemented prior to closure. The objective of the program will be to help workers secure suitable employment elsewhere, thereby minimizing the adverse effects of employment loss. Employees will be assisted in identifying job opportunities that require complementary skills and opportunities to retrain to take advantage of the demands of trades and professions that exist at the time of closure and post-closure. The Proponent will also coordinate with post-secondary training institutions to promote specific retraining initiatives in response to industry demand at the time of closure and the level of interest of Project workers (see Chapter 20, Section 20.7.2.1).

## **29.7.4 Cultural Effects**

Nisga'a are concerned about how, and the extent to which, the Project will affect Nisga'a cultural vitality. But to consider cultural effects in isolation from other local and/or broader societal forces runs the risk of either understating, or overstating, the potential effects of the Project. Perceptions will vary considerably among individuals and families as to the impact of this or any other project on Nisga'a culture (Rescan 2012). Nevertheless, from the perspective of Nisga'a citizens and NLG, almost all potential Project effects include considerations or concerns about culture.

Nisga'a citizens and NLG raised various cultural effects concerns. Nisga'a are especially concerned about potential adverse effects on culturally important traditional foods, and on cultural activities related to hunting, fishing and the gathering of plants for food and medicine. Such effects could be linked to direct disturbance of Nisga'a use areas, restrictions on access to

such areas due to safety-related access restrictions, and over-use or over-harvesting of fish, wildlife and other cultural resources as the backcountry is opened up by Project-related roads and rights-of-way. Project-related noise and traffic disturbances could also adversely affect use of subsistence resources and harvesting practices. Indirect effects on culturally important resources could also derive from direct environmental effects, such as contamination of country foods.

Other cultural concerns include the reduced ability of Nisga'a workers to participate in cultural activities and practices due to shift schedules, and possible adverse effects on efforts to increase the use of the Nisga'a language.

Concerns were also cited due to the potential over-use or over-harvesting of resources enabled by increased access to the backcountry via Project-related roads and rights-of-way (Chapter 23, Land Use). This section focuses on summarizing the Project's potential effects on pursuing these cultural activities, whereas Section 29.5.5 summarizes the potential effects on the resources harvested by Nisga'a.

Effects to culturally important resources may also potentially come about as a result of environmental effects, such as the potential contamination of country foods. Chapter 25 (Human Health) of the Application/EIS assesses potential effects on country foods within the human health RSA and is summarized in Section 29.7.7 (Health Effects).

Nisga'a concerns about the effects of Project-related employment on culture also pertain to potential limitations on Nisga'a workers' ability to participate in cultural activities and practices due to shift schedules, as well as the compatibility of camp food with Nisga'a dietary preferences. Nisga'a also identified potential adverse effects on the use of the Nisga'a language as a concern related to mine employment ([Appendices 29-A](#) and [29-C](#)).

### **29.7.4.1 Hunting, Fishing and Plant Harvesting**

Nisga'a citizens are concerned that there will be cultural impacts on subsistence harvesting from a variety of Project effects and interactions. First, Nisga'a mine workers will not be able to participate in these seasonal activities while on shift at the mine, for up to weeks at a time. Second, Nisga'a citizens are concerned that the Project, especially the access roads associated with it, may attract and/or enable more people to access the backcountry, adding to existing pressures on hunting and fishing resources within the Nass Area. Conversely, they are also concerned that their ability to harvest may be affected by altered or restricted access due to the operation's industrial presence and associated potential safety hazards (Rescan 2012). Similarly, there is concern that the Project infrastructure may degrade other areas within the Nass Area that are currently suitable for harvesting. Finally, there is concern that noise and traffic disturbances will also have an adverse effect on subsistence resources and harvesting practices.

#### Effects of Change in Work Schedules and Income on Hunting, Fishing and Plant Harvesting

Many of the resources that are traditionally used by Nisga'a members are available for harvest only at certain times of year, or have specific seasonal windows when quality, quantity, and/or accessibility are optimal. Nisga'a mine workers may be at some risk of missing out on key harvesting times if they happen to be on shift at the time. The effect may be nominal for species

that have longer harvest seasons, but workers may have to make choices when they are at home between participating in harvesting activities and spending time with their families. In the case of resources that are only seasonally available for very short periods of time (such as pine mushrooms), mine workers may miss the harvest seasons entirely (Rescan 2012).

Mine work may also lead to less time spent on the land hunting, fishing and practicing other culturally related activities which may lead mine workers, especially younger ones, to lose out on opportunities to learn traditional skills and knowledge from their family members and Elders. Some Nisga'a note that over time, lack of exposure and opportunity to practice traditional activities can undermine or weaken Nisga'a culture.

Conversely, Nisga'a citizens who work shifts at the mine may find ways to adapt their resource harvesting and other land-based cultural practices to fit around their work schedule. Also, higher incomes from mine work could enable individuals to purchase needed equipment and supplies (e.g., boats, motors, firearms, fuel, ammunition, traps, fishing gear, and all-terrain vehicles) which would enhance their capacity to engage in resource harvesting activities (Rescan 2012).

### Mitigation

Mitigation measures available to reduce the potential effects of mine shift work on land-based cultural activities and subsistence harvesting are included as part of the Labour Recruitment and Retention Strategy (Section 20.7.2). The objective of the strategy is to maximize employment benefits within Nisga'a communities and focus on the engagement of Nisga'a and Aboriginal workers for direct employment. With respect to cultural land-based activities, the strategy includes the following components:

- creation of a work environment of openness, respect, and support, including Aboriginal culture awareness training;
- flexibility for cultural and familial commitments and responsibilities of workers; and
- provision of an Employee Assistance Program.

### Effects of Increased Access to Lands on Hunting, Fishing and Plant Harvesting

The Project may open up resources to increased pressures through the development of new roads, as well as the development of new rights-of-way, in parts of the Nass Area with little existing infrastructure. Within the Nass Area, the proposed Project design includes the development of the TCAR from Highway 37. Project-related service and maintenance roads will also connect to this corridor. Each new road may facilitate access to proposed Project development areas as well as other regions within the Nass Area. Further, the development of a transmission line right-of-way will also involve clearing a forest corridor from Highway 37, potentially facilitating access via snowmobiles, ATVs, or on foot (Chapter 23, Land Use). The opening up of resources to increased pressures may also occur during construction and operation phases due to the presence of Project staff and contractors in formerly remote areas, as well as non-licensed or non-registered land users who may choose to ignore Project signs and bypass barriers in order to gain entrance. The opening up of resources is predicted to continue during closure and post-closure as the TCAR will be permanent. The opening up of resources during all

phases could affect harvest resources in remote areas, as well as land users who harvest them, by facilitating hunting, trapping, and fishing pursuits.

### Mitigation

A number of inter-related management plans, as well as monitoring and adaptive management, will be implemented to mitigate potential changes in the quantity of resources. Mitigation measures will include locked gates on Project roads and rights-of-way; monitoring and management of road users to ensure only authorized access; and enforcement of a “no hunting or fishing” policy for employees in camp (Chapter 4, Project Description). During the construction, operation, and closure phases, increased Project-related presence along rights-of-way will help reduce unauthorized access, although such access may still occur during periods of reduced activity.

Potential effects from increased access as a result of Project development and traffic on wildlife, fish, and aquatic resources will be mitigated through the Wildlife Management Plan (Section 26.21), as well as the Fish and Aquatic Habitat Management Plan (Section 26.18), a Noise Management Plan (Section 26.22; Section 23.7.2.2), and the Vegetation Clearing Management Plan (Section 26.20.1). Potential added pressures on harvest resources (fish, vegetative, and wildlife) from an increase in harvester access will be mitigated through the Access Management Plan (Section 26.25.2), as well as the Traffic and Access Management Plan (Section 26.25.1).

Access during the Project's post-closure phase may likely occur despite mitigation efforts, in areas such as along the transmission line right-of-way. Some unauthorized access may also occur as some individuals may choose to traverse terrain adjacent to rights-of-way. However, given the relative remoteness of the area, it is expected that such incidents will be infrequent, and are likely not to have a significant effect on subsistence harvest resources and their availability to Nisga'a users.

### Effects of Restricted Access to Lands on Hunting, Fishing and Plant Harvesting

Direct effects to subsistence users could occur if access is restricted to prevent harvest activities from taking place during construction, operation and closure. Effects may include diminished harvestable resources due to the presence of proposed Project components, and the requirement to avoid certain areas due to barriers or safety hazards. Some of these restrictions are necessary to control increased pressure on wildlife and other subsistence resources as noted above. Nevertheless, Nisga'a expressed some concern that such restrictions would curtail or eliminate their rights to carry out subsistence activities and traditional customs and practices.

The PTMA does not overlap with any part of Nisga'a Lands, or the NWA. The area occupied by the PTMA in the Nass Area, including a 500-m buffer, amounts to about 12,465 ha. The Nass Area covers 2,700,000 ha in total. The proportion of prohibited area in and around the Project footprint, to which Nisga'a would lose access for traditional harvesting and subsistence activities, amounts to considerably less than one percent of the Nass Area (0.005%). Further, baseline studies did not reveal activities related to subsistence or traditional customs and practices by Nisga'a citizens within the land use RSA, although activities could occur in the future ([Appendix 23-A](#)).

### Mitigation

Mitigation measures, including monitoring and adaptive management, will help to reduce potential adverse effects on subsistence users. Baseline studies did not identify any Nisga'a land users currently using the portion of the Nass Area overlapped by the PTMA.

### Effects of Noise and Traffic Disturbances on Hunting, Fishing and Plant Harvesting

The presence of road and helicopter traffic, including heavy equipment, haul trucks, and personnel transportation vehicles necessary for the construction, operation, and maintenance of Project components will produce considerable, but localized, noise (Chapter 19, Noise Effects Assessment). Noise and traffic disturbances may affect Nisga'a citizens when utilizing areas in the vicinity of the project footprint and buffer, as well as the behaviour of a number of different species (including moose, grizzly bears, black bears, mountain goats, small fur-bearing mammals, and wetland, forest, and alpine birds). This section focuses on potential effects to Nisga'a harvesters.

Effects of helicopter, heavy equipment and road traffic noise will be concentrated during the construction and closure phases and focused around specific components such as the TCAR, tunnels, and the TMF, which overlap the Nass Area (Chapter 4, Project Description). Supply vehicles and trucks hauling concentrate will be the main source of noise and traffic disturbances during the operation phase. Noise and visual disturbances from haul and maintenance road traffic that may affect Nisga'a harvesters would occur mainly along the TCAR (Chapter 23, Land Use).

Nisga'a citizens pursuing harvesting activities are not anticipated to be affected by regular Project-related noise within the Project footprint and buffer, as they will no longer have access to this area. Within the land use RSA, human receptors will not be affected by continuous Project noise related to vehicles and equipment since the levels are equivalent to the assumed baseline noise levels (Chapter 19, Noise). However, helicopter and blasting events are expected to be audible off-site and within the land use RSA, though noise levels are predicted to be below the 120 dB  $L_{peak}$  guideline during both the construction and operation phases.

### Mitigation

Management plans, monitoring, and adaptive management will be implemented to mitigate the adverse effects due to changes in sensory disturbances, including a Noise Management Plan (Section 26.22), Traffic and Access Management Plan (Section 26.25), and visual quality mitigation.

All of the noise that may affect Nisga'a land users within the land use RSA will be produced by transportation activities along Highway 37 and 37A and access roads. Noise reduction is directly related to the operation and type of vehicles used for the Project as noise concerns are mainly attributable to engine type and size. Potential noise effects from the Project will be mitigated by:

- minimizing the number of trips required;
- adhering to a truck maintenance program;
- following maintenance procedures and schedules provided by vehicle manufacturers;

- using vehicle noise suppression technologies where possible;
- avoiding the use of engine brakes and reversing alarms near communities; and
- providing noise awareness training for Project transportation personnel.

Access to the Project site and the immediate area will also be restricted; therefore, Nisga'a citizens should not experience effects from noise created by mining activities. More details on the elements contained as part of the Traffic and Access Management Plan are provided in Section 26.25.

### **29.7.4.2 Nisga'a Cultural Events, Diet, and Language**

Nisga'a have raised concerns that mine employment can have an adverse effect on Nisga'a culture by restricting the ability of Nisga'a workers to pursue or participate in culturally important practices, activities, and events. Nisga'a have also expressed some concerns about the potential lack of access to traditional Nisga'a diet and/or ability to use Nisga'a language at the mine camp.

#### Effects of Change in Work Schedules on Cultural Events, Diet, and Nisga'a Language

The nature of mine work involves being at the Project site for a period of two to three weeks, followed by an equivalent period of time at home. Shift work may interfere with Nisga'a workers' availability for certain cultural events ([Appendix 29-C](#)). Some Nisga'a members are concerned about the negative cultural effects of people missing key events (Rescan 2012), and some Nisga'a employees could perceive a dilemma in choosing between staying on site and neglecting their responsibilities at home, or placing their employment in jeopardy by leaving camp prematurely and/or without authorization.

Nisga'a employees may have less access and opportunity to consume the foods that they would normally eat in their community, such as wild meat, fish, and plants/berries (also known as country foods). Nisga'a are concerned that the degree to which mine employment reduces access to country foods could have an adverse effect on Nisga'a workers' connection to the land and their identity as Nisga'a (Rescan 2012).

Similarly, some Nisga'a are concerned about the adverse effect of working at a mine camp on their ability to use the Nisga'a language. The mine camp will not provide an environment within which to work on, learn, or practice the Nisga'a language, even in the unlikely event that some Nisga'a workers are fluent. Nevertheless, there are many other, exogenous factors that have, and will continue to have, a much greater influence on the fate of Nisga'a language than securing employment with this Project.

Conversely, opportunities to increase the use of the Nisga'a language may arise if there is more time spent on the land with family members during off-shift periods. These opportunities, either on the land or in the community, may be supported by an increase in income and/or economic growth that is generated through mine-related employment and community economic development (Rescan 2012).

### Mitigation

Mitigation to minimize employment effects on Nisga'a culture will be addressed by human resources policies which are culturally sensitive to Nisga'a employees. For example, the Labour Recruitment and Retention Strategy (Chapter 20, Section 20.7.2) will have special policies to address bereavement, work schedule options, and social and cultural programs such as country food preferences, and language/culture course offerings. The Labour Recruitment and Retention Strategy will also include:

- creation of a work environment of openness, respect, and support, including Aboriginal culture awareness training;
- flexibility for cultural and familial commitments and responsibilities of workers;
- provision of an Employee Assistance Program.

### **29.7.4.3 Cultural Residual Effects**

The cultural effects related to shift work and increased income may be either positive or negative and will depend on the number of Nisga'a workers that obtain mine employment, their ability to balance their current cultural activities and obligations, and the availability of family and community support. For example, increased income from employment at the Project is a **beneficial** effect in that it will increase Nisga'a workers' and their families' ability to purchase needed equipment and supplies for harvesting activities. On the other hand, change in work schedules may have an adverse effect by preventing Nisga'a workers from harvesting within certain key times, or reducing the amount of time they spend on the land. Following mitigation measures included as part of the Labour Recruitment and Retention Strategy, residual adverse effects to Nisga'a workers and residents of Nisga'a Lands with respect to pursuing traditional harvesting activities is anticipated to be **negligible**.

Project design (including restricted access and gated roads), as well as adaptive management measures, are anticipated to limit the potential for increased access along the TCAR and attendant pressure on harvest resources within the land use RSA (Chapter 23, Land Use). Further, any potential increase in access is anticipated to be limited to areas adjacent to the TCAR. Consequently, the potential increased pressure on harvest resources is assessed as **not significant (minor)** within the land use RSA. Given the relative remoteness of the land use RSA, it is expected that such incidents will be infrequent and are likely not to have a significant effect on subsistence harvest resources and their availability to Nisga'a users within the broader Nass Area. As such, the residual effects on residents of Nisga'a Lands due to the opening up of resources are expected to be **negligible**.

Conversely, Project infrastructure and access restrictions may restrict access within the Project footprint and buffer for Nisga'a citizens wishing to pursue cultural harvesting activities. However, the proportion of area where access would be restricted amounts to roughly 0.005% of the Nass Area. Overall, the residual effect is expected to be **negligible** for residents of Nisga'a Lands or Nisga'a interests.



Direct noise effects on Nisga'a cultural harvesters outside of the Project footprint and buffer are not predicted, as individuals will be exposed to noise levels equivalent to the assumed baseline noise levels (Chapter 19, Noise; Section 19.7). Helicopter and road traffic necessary during all Project phases, though concentrated during the construction and operation phases, will be focused around specific components. Event noise levels associated with blasting and helicopter fly-bys were not shown to significantly increase the noise levels to the extent that off-site human receptors are likely to become annoyed or complain (Chapter 19, Section 19.7). Further, due to the large area in which subsistence users may harvest, as well as the temporary nature of their activities, a residual adverse effect from direct exposure to noise is **not anticipated**.

The effects of mine-related employment on Nisga'a language use is expected to be **negligible**. Although mine employment and mining environments are notably not conducive to the current language preservation efforts of Nisga'a, there was a strong sentiment among Nisga'a participants in focus group interviews ([Appendix 29-C](#)) that maintaining the Nisga'a language was an internal, Nisga'a matter.

With effective mitigation implemented, effects of employment on Nisga'a diet and ceremony attendance are expected to be **negligible**. Accommodating the cultural needs of Nisga'a employees will benefit both parties by reducing employee turnover and maintaining a satisfied workforce.

### 29.7.5 Economic Effects

Chapter 20 of the Application/EIS assesses potential effects of the Project on employment and income, and business opportunities and economic development within an Economic LSA and RSA. This section specifically assesses the effects of the Project as it relates to Nisga'a employment, skills/capacity training, as well as Nisga'a business capacity development and revenue.

There is an expectation among Nisga'a members that the Project will deliver near- and long-term economic benefits to their citizens and communities through employment, contracting, and business opportunities. Nisga'a interest in these potential opportunities was raised on numerous occasions during consultations with Nisga'a citizens and NLG during ESCIA surveys and focus groups. Many respondents cited the perception that other projects in and around the Nass Valley have resulted in little, if any, direct or spin-off (i.e., indirect and/or induced) economic benefits in the past.

The economic impact model (Section 20.7-1; [Appendix 20-B](#)) predicts that during construction, a total of approximately 1,497 person-years of direct, indirect, and induced employment for residents of the economic RSA, and a total of approximately 31,094 person-years for BC residents. Averaged over the five-year duration of the phase, the average number of jobs over any one year is approximately 272 for the region and 5,653 for BC.

During operation, the economic impact model predicts a total of approximately 21,810 person-years of employment for residents of the economic RSA, and a total of approximately 194,313 person-

years for BC residents. Averaged over the 51.5-year duration of the phase, the average number of jobs over any one year is approximately 423 for the region and 3,773 for BC.

Nisga'a citizens also expressed an interest in sharing resource revenues at various consultation events and in focus group sessions. The Province is responsible for negotiating revenue sharing agreements with Aboriginal groups. To date, the Province has negotiated seven Economic and Community Development agreements with Aboriginal groups to share mineral tax revenue- one with the New Afton Mine Project; two separate agreements to share tax revenue from the Mt. Milligan Project; one agreement to share revenues from new coal mines in southeast BC; one agreement to share revenues (with two bands) from the Copper Mountain Mine; and two agreements to share revenue from the expansion of the Mt. Polley Mine (The New Relationship n.d.).

### **29.7.5.1 Employment and Skills/Capacity Training**

Nisga'a citizens have expressed a strong interest in working at the Project. The hiring of Nisga'a citizens and the implementation of strategies to maximize meaningful Nisga'a employment is viewed as a key benefit of the Project and an important way to gain community support. Nisga'a raised concerns over potential discrimination in hiring policies, and the use of quotas or targets for hiring for Nisga'a citizens were recommended. Education and training were consistently mentioned as an integral part of maximizing employment opportunities in terms of increasing and diversifying skill sets. The accessibility of training programs was also viewed as important ([Appendix 29-C](#)).

#### Effects of Project Construction and Operation on Employment and Skills/Capacity Training

It is estimated that up to 120 Nisga'a citizens could potentially find work during the construction of the Project, while as many as 70 Nisga'a workers could work at the mine during the operation phase (Rescan 2012). Decommissioning and closure, likely to begin in the early 2070s, is projected to provide about 24 jobs for regional employees. Given that decommissioning and closure are far into the future, it is difficult to predict the profile of those employed, but it is reasonable to expect that some would be Nisga'a workers (Rescan 2012).

The actual number of Nisga'a citizens who obtain employment will depend to a large degree on the level of skills among Nisga'a citizens and individuals' willingness and availability to work at the mines. A BA with Nisga'a would also influence Nisga'a employment.

Employment at the Project will likely create a positive effect for education, skills, and training. Employment positions requiring a range of skill levels will be available, particularly during operation. The change in employment is expected to create an incentive for residents of Nisga'a Lands to pursue additional education, skills development, and training in order to obtain Project-related employment or advance to a higher position.

The level of qualifications required for these occupations will vary, but it can be safely assumed that the vast majority of jobs will require candidates to have at least completed their secondary education. NLG and Nisga'a citizens at large are aware that graduation from high school is a key barrier to overcome if their communities are to fully realize a meaningful share of the available jobs related to the Project.

### Effects of Mine Closure on Employment and Skills/Capacity Training

At closure an adverse economic effect is anticipated, as most Project related income from jobs, contracts and business opportunities come to an end. There will continue to be beneficial employment effects, but there will be a loss of total direct employment during the transition from operation. Decommissioning, reclamation, and ongoing operation/maintenance activities during closure and post-closure will provide employment opportunities, although these specific workforce requirements have yet to be determined. There are also expected to be a relatively small number of jobs associated with long-term environmental engineering, monitoring, and management. Long-term, post-closure effects are difficult to estimate based on the uncertainty in predicting the state of the regional economy at that time. However, many of the skills gained at the mine are transferable and will have benefits beyond the life of the mine, enabling Nisga'a workers to apply at other mines or similar resource development or heavy industrial projects in the region.

### Enhancement and Mitigation Measures

Measures will be implemented to enhance benefits and mitigate potential adverse effects of the Project on Nisga'a employment and skills/capacity training. Key strategies include the Labour Recruitment and Retention Strategy (Chapter 20, Section 20.7.2), and Workforce Training Strategy during construction and operation. A Workforce Transition Program will be developed to help Nisga'a workers find new employment, or otherwise adapt to the reduction in employment opportunities, during closure and post-closure. Seabridge is also committed to negotiating a Benefits Agreement with Nisga'a Nation to help fulfil employment goals on the Project.

### Labour Recruitment and Retention Strategy

The Labour Recruitment and Retention Strategy will focus on communication, ensuring that Nisga'a workers are aware of opportunities including hiring schedules, skill/certification requirements, and other expectations of employment. The Proponent will develop a strategy based on an understanding of the regional labour market, including potential Nisga'a workers, in order that employment policies and programs take into account the needs of workers from regional communities including Nisga'a communities. The strategy will entail a range of policies and practices designed to ensure the health, safety, and well-being of Nisga'a workers. It will include clearly defined workplace benefits and commitments, provision of internal training and career development opportunities and other measures to ensure long term job satisfaction.

During construction, Project activities will be overseen and managed by an Engineering, Procurement, and Construction Management (EPCM) contractor. Although the Proponent will not have direct control of labour practices during construction, the EPCM will be expected to adhere to the strategies defined by the Proponent. Seabridge or its operator will directly implement the strategies for operation, closure and post-closure, including preceding work to prepare for operation.

The success of the Labour Recruitment and Retention strategy will hinge on ensuring Nisga'a have a) adequate secondary education credentials such that they are prepared and qualified to pursue a range of post-secondary programs, and b) access to a variety of higher education,

training, and skill development programs that will enable them to effectively compete in the regional job market for direct and indirect Project-related employment.

### Workforce Training Strategy

Potential Nisga'a workers will be targeted within a broader Workforce Training Strategy intended to optimize the work experience, education, and skill levels of the regional workforce. The strategy will include strategic partnerships with post-secondary education institutions to deliver appropriate training and as well as in-house training and career development opportunities.

Nisga'a have identified training and skill development as a key barrier to maximizing Nisga'a employment at the Project. In order to overcome this barrier, the Proponent is committed to developing co-operative working relationships with regional post-secondary educational institutions, including with WWNI (the Nisga'a post-secondary education institution based in Gitwinksihlkw) and with NWCC.

The Workforce Training Strategy applies principally to the operation phase, including preparatory work prior to the start of operation. Many construction phase positions require specialised training and experience in heavy engineering construction, and typically involve a mobile workforce drawn from other regions; furthermore, the shorter time period for construction minimizes the role of training and education in developing a local workforce.

### Workforce Transition Program

The Workforce Transition Program will be developed and implemented prior to closure. The objective of the program will be to help Project workers secure suitable employment elsewhere and, thus, minimize adverse effects of employment loss associated with the eventual completion of the KSM Project. Specifics of the strategy will depend somewhat on prevailing socio-economic conditions at the time, but will likely include a variety of measures aimed at understanding contemporary labour requirements, and assisting with retraining and skill enhancement, as required.

### **29.7.5.2 Business Capacity Development and Revenue**

In addition to the prospect of jobs directly and indirectly linked to the Project, Nisga'a members are interested in pursuing a range of supply, service and contracting needs associated with each phase of mine development. Research conducted in support of the ESCIA process ([Appendices 29-B](#) and [29-C](#)) identified strong interest on behalf of Nisga'a businesses in supplying the Project. The Nisga'a business community asserts that it currently has the capacity to meet additional demand, primarily offering support services and basic supplies, having less capacity to deliver specialized services, specialized equipment, or high volume materials.

The Nisga'a business survey identifies a number of specific concerns and barriers that could work against Nisga'a businesses, some of which were echoed during consultation and engagement. Nisga'a businesses and contractors raised concerns about potential barriers related to business capacity; the need for, and limited access to, investment capital; the nature of the

Proponent's procurement policies; and competition from potentially larger and more established businesses, located in regional centres such as Smithers and Terrace.

### Effects of Project Construction and Operation on Business Capacity Development and Revenue

It is estimated that businesses in northwest BC should realize approximately 7% of the Project's construction-related spending and 12% from its expenditures during operation (Chapter 20, Economics Effects Assessment). Roughly 10% of this regional business expenditure should accrue to Nisga'a-owned businesses operating in the region, based on the assumption that 30% of the expected regional expenditures of the Project will go to Aboriginal businesses, and that Nisga'a business should be able to secure about a third of this total. In terms of actual dollar value, this translates to about \$1.1 million in 2014, which increases annually to a peak estimate of \$10.5 million in revenues for Nisga'a businesses by 2021 (Rescan 2012).

Local business benefits from the Project are expected to accrue mainly during the operation phase. Supply requirements during construction can be highly specialized and are required for a relatively short period of time. It is often difficult for small, local suppliers to provide a competitive response to procurement requests. During the operation phase, it is expected that there will be more opportunity for local businesses to develop working relationships with the Proponent. There is also greater incentive to make the capital investments, and take the requisite risk, to tailor a local business to service the longer term demand of an operating mine. During construction, demand is short-term, and construction firms often have established supplier relationships and may be less connected or committed to local business development.

Nisga'a commercial activities, including fishing, forestry, and tourism will likely experience some increase in competition for labour, particularly with the number of development projects being planned or anticipated in the near future ([Appendix 20-A](#)). The increase in demand for regional labour is expected to result in some wage inflation pressures. The average wage paid by the Project is predicted to be greater than the average wage currently paid in the region (Statistics Canada 2007; BC Stats 2011a), although it will likely not differ markedly from the earnings of skilled and experienced Nisga'a workers currently active in the fishing and forestry sectors (Rescan 2012).

Some service-based businesses, operating in sectors such as tourism, may face challenges in trying to compete for qualified staff with higher mining industry wages. This may have an adverse effect on the viability of certain Nisga'a businesses (Rescan 2012). Other local businesses, while they may experience growing pains in losing some portion of their labour force, may benefit in the long run from the increased skill base of Nisga'a citizens working at the mine, and from the new sources of income flowing into the community, possibly leading to investment in locally-provided goods and services.

### Effects of Mine Closure on Business Capacity Development and Revenue

With closure, a loss of business opportunities is expected, potentially resulting in a decrease in the prosperity of Nisga'a communities. The extent of the changes experienced by Nisga'a businesses will depend on a number of factors, including the size of supplier contracts, the overall condition of the economy at the time of closure, business flexibility and adaptability, and

the presence of other businesses opportunities (e.g., demands for goods and services by other local projects). There will be local business opportunities associated with closure and post-closure activities, focusing on removal of infrastructure, site reclamation, and environmental engineering, monitoring, and management; however, an estimate of the employment and expenditures is not yet available.

### Enhancement and Mitigation Measures

It will be important for Nisga'a businesses to understand procurement requirements and expectations. To assist Nisga'a businesses to take advantage of both direct and indirect opportunities to supply the Project, the Proponent will develop a Procurement Strategy (Chapter 20, Section 20.7.2) with specific elements to enhance the competitive position of local businesses, including Nisga'a businesses. The strategy will include measures and information on qualification requirements, health and safety requirements, current and future supply opportunities, quality and business conduct expectations, and required technical standards.

## **29.7.6 Heritage Effects**

### **29.7.6.1 Heritage Sites**

Nisga'a Nation is concerned about the protection of its cultural heritage, not only on Nisga'a Lands, but anywhere that it claims to have a heritage interest (e.g., at Treaty Rock [Section 29.3.3]). In particular, Nisga'a Nation is concerned about the potential destruction or degradation of heritage sites and objects exposed in the course of Project construction and operation. Impacts to archaeological and heritage sites are addressed in more detail in Chapter 21, Heritage, of this Application/EIS.

In compliance with the terms of the *Heritage Conservation Act* (HCA; 1996d), the Archaeology Branch corresponded with NLG throughout the archaeological investigation permitting process, including sending copies of the HCA permit applications and any permit amendments for the Project to NLG for its review and comments between March 2008 and May 2012. On June 19, 2012, the Archaeology Branch issued HCA Heritage Inspection Permit 2012-0192 and forwarded a copy to NLG. Copies of the final permit reports were also sent to NLG, and members of Nisga'a Nation participated in archaeological fieldwork during baseline studies. Effects of Project Construction and Operation on Heritage Sites Archaeological sites HdTk-4 and HdTl-1, located in the Nass Area, could potentially be affected by the Project. These are all small, non-stratified lithic scatter sites, and mitigation through data recovery and/or monitoring is expected to offset any potential loss of archaeological data.

The location of Treaty Rock (Borden Number HdTj-1) is a sufficient distance from the Project (25 km southeast of the TMF, and 20 km southeast of the TCAR) that no adverse effects to the site are anticipated.

### Proposed Mitigation

Management recommendations for the recorded archaeological sites in and around the Project footprint area are designed to reduce Project effects to negligible levels. While the preferred management option is avoidance, mitigation measures will be used to reduce residual effects to

negligible levels where avoidance is not possible. Mitigation measures, if necessary, will be determined in consultation with the BC Archaeology Branch. Possible mitigation measures may include systematic data recovery, construction monitoring, and/or site capping. Any alteration to an archaeological site will require a Section 12 Site Alteration Permit issued by the Archaeology Branch under the HCA.

### 29.7.7 Health Effects

Nisga'a raised concerns during consultation and engagement about the potential health effects on country foods, including fish and seafood, berries and wild plants, and species of game such as moose. Respondents to the SERC Survey ([Appendix 29-A](#)) and focus group participants ([Appendix 29-C](#)) expressed a range of perspectives on the perceived linkages between human health and mine related environmental impacts. Nisga'a also expressed concerns about employee safety, especially with respect to female workers, and about occupational and non-occupational health and safety issues in general.

Specific, potential Project effects to human health are addressed in Chapter 25, Human Health, of the Application/EIS, drawing from data and analysis provided in Chapter 7, Air Quality; Chapter 14, Surface Water Quality; and Chapter 19, Noise. These chapters provide data and analysis that consider how the Project may impact human health through effects on air, water, and noise levels, and attempt to quantify the degree to which they may or may not pose an environmental health hazard. This section summarizes these potential effects of the Project on Nisga'a physical health and, in accordance with the AIR, also looks at issues related to the mental health of employees.

#### 29.7.7.1 Country Foods

Nisga'a members are concerned about the potential impact of the Project on the quality of country foods for two reasons. First, contamination of country foods would expose Nisga'a citizens to potentially negative health effects. Second, contamination of country foods can undermine food security, forcing Nisga'a citizens to substitute with store-bought food, which is generally higher in cost and lower in nutritional value.

##### Effects of Project Construction and Operation on Country Foods

The main sources of potential contamination of country foods in the Nass Area would be from elevated metals in both soil (sediment) and the water stored in the TMF. At closure, potential sources of contamination of country foods would remain, associated with metals in the water and submerged sediments in various parts of the decommissioned mine infrastructure, and in wetland vegetation and aquatic invertebrates that could establish themselves in the TMF.

In the *2009 Country Foods Baseline Report* ([Appendix 25-A](#)), moose, snowshoe hare, grouse, and berries were identified as indicators of country foods that may uptake metals. The quality of non-migratory edible fish (Dolly Varden, [Appendices 25-B](#) and [C](#)) may also change due to metal concentration in water downstream of the proposed TMF and the Mine Site.

The assessment found that the quality of country foods did not change substantially between baseline conditions and modelled conditions for operation and closure. Based on consumption

patterns of country foods, at rates and frequencies similar to baseline, the magnitude of health effects due to the Project is considered **negligible** (Chapter 25, Human Health).

### Mitigation

Mitigation to reduce effects to human health from the consumption of country foods relies on measures that will be implemented to reduce effects to water quality, air quality, soil quality, fish, wildlife and vegetation. In addition to these mitigation measures, access management to the Project area will mitigate some of the effects to human health, since harvesters of country foods will be restricted from harvesting near the Project footprint (and hence near areas most likely to be affected through contamination) during the life of the Project.

Monitoring activities in soils, water, and vegetation in these areas will be carried out during the construction, operation, closure, and post-closure phases of the Project, in order to confirm the effectiveness of mitigation measures outlined in the aforementioned chapters of the Application/EIS. The need for further country foods risk assessments will be investigated should metal concentrations be shown to increase over time in water, soils and/or vegetation due to mine activities. Adaptive management practices will be implemented if monitoring and modelling indicate an unacceptable level of risk to human health.

### **29.7.7.2 Air Quality**

Nisga'a expressed concern about the potential health effects resulting from air contaminants associated with the Project.

#### Effects of Project Construction and Operation to Air Quality

Project activities associated with Project component will act as sources of Criteria Air Contaminant (CAC) emissions, and will have the potential to affect ambient air quality during the construction and operation phases. There will be very little air quality impact during the closure and post-closure phases.

During the construction phase, main sources of emissions will be generators (Saddle and adit areas, PTMA, Mine Site construction and camps) and incinerators (camps), vehicle tailpipe emissions from Highway 37, and TCAR, fugitive dust emissions from land clearing and burning debris, CAC emissions from explosives used in blasting, fugitive dust on unpaved roads from vehicles travelling to PTMA and Saddle Area, and fugitive dust on paved road from vehicles travelling on Highway 37.

During the operation phase, main sources of emissions will be from camp incinerators, vehicular tailpipe emissions from the TCAR and Highway 37, emissions from MTT exhaust, dust emissions from baghouses in the Treaty OPC, emissions from blasting, and fugitive dust on unpaved roads and paved roads.

Air dispersion modelling was done to estimate the downwind concentration of air pollutants emitted from sources for the Project. During the construction phase, exceedance over the 1-hour NO<sub>2</sub> NAAQO (National Ambient Air Quality Objective) was predicted by the Saddle Area (5% in one year) and an area approximately 200 m west of the PTMA fenceline (2% in one year). Aggregate total suspended particulates (TSP), which include both fugitive and non-



fugitive TSP, was predicted to exceed the 24-hour NAAQO east of the PTMA fenceline (1.6% in one year). Total PM<sub>10</sub> exceeded the 24-hour BC objective immediately north of the Saddle Area and east of the PTMA fenceline (0.5% in one year) while total PM<sub>2.5</sub> exceeded the 24-hour BC objective on the Saddle Area fenceline (2.5% in one year).

During the operation, exceedance over the 24-hour TSP NAAQO was predicted in areas north and west of the McTagg RSF, and also east of the PTMA fenceline (0.8% in one year). Total PM<sub>10</sub> was predicted to exceed BC objective north and west of the McTagg RSF, and west and east of the PTMA fenceline 0.5% of the time. Exceedances were not predicted by Treaty Creek Access Road and Highway 37.

Nisga'a citizens will not have access to the PTMA, TCAR, or Saddle Area during construction, operation or post closure for traditional harvesting or recreations purposes due to safety concerns. Nisga'a workers, as with all employees, will be provided with suitable protection per the BC *Mines Act* (1996e) Health Safety and Reclamation Code for Mines (BC MEMPR 2008) in British Columbia.

### Mitigation

Mitigation will be applied at the source of the emissions. Source mitigation will be applied with the goal of reducing emission of dust and CACs due to Project activities. An Emissions Management Plan and a Fugitive Dust Emissions Management Plan (See Air Quality Management Plan in Chapter 26, Section 26.11) will be implemented to meet Canada-wide standards and BC ambient air quality objectives.

### **29.7.7.3 Drinking Water Quality**

Concern about effects to domestic and recreational drinking water through upstream environmental contamination was raised by Nisga'a representatives in focus groups and at various working group meetings and other consultation events. Health effects from drinking water sources for workers were scoped out of the human health assessment because workers living in camp will receive water treated to meet drinking water guidelines that will also be monitored regularly for chemical and bacteriological quality. In addition, bottled water will be made available to workers in areas away from the main facilities. As such, effects to drinking water quality as it relates to Nisga'a interests will focus on potential effects to water in watercourses draining into the Nass Area.

### Effects of Project on Drinking Water Quality

Recreational users of areas within the drainages downstream of Project sites are unlikely to encounter bacterial contamination due to treatment and disinfection of wastewater prior to effluent being discharged into recreational waterbodies. The EA Certificate holder will conduct regular monitoring and maintenance, which will reduce the likelihood that bacteria will enter the environment and affect human health due to ingestion of, or contact with, surface water.

Seasonal, short-to-medium-term, users of the region will likely obtain drinking water from surface water sources potentially downstream of the Project. Health Canada recommends that water collected from waterbodies always be treated before using it for drinking. However,

based on water modelling results and based on the temporary and seasonal nature of the land use, there is no concern for human health effects from the consumption of metals in surface water from the Teigen and Treaty creeks downstream of the PTMA during the operation, closure, and post-closure phases. Therefore, people who drink surface water in these areas are unlikely to experience human health effects.

### Mitigation

The Project has been designed with the goal of minimizing negative effects on water quality downstream of the Project area. Mitigation measures to protect water quality that are additional to those outlined later in the chapter, and the Application/EIS more generally, are not anticipated to be required. All contact and waste water as well as tailing slurry water will be treated before discharge, and will meet discharge criteria. Access to the operating and closed TMF will be controlled.

### **29.7.7.4 Mental Health**

While mental health was not raised as a specific concern by Nisga'a citizens during consultation, the Project AIR identify the need to address mental health issues as part of the summary of potential effects of the proposed Project on Nisga'a Nation. The discussion of effects that follows is based on literature review and not on data or observations related to Nisga'a Nation specifically.

#### Effects of Change in Work Schedules on Mental Health

In line with potential increases in stress and substance misuse, the Project may have an effect on worker mental health. Gibson and Klick (2005), in a study of the impact of mining on health and well-being in northern Aboriginal communities in Canada, found a number of linkages between mine work and mental health. Potential effects are found to arise from mental stress and anxiety created by the nature of the work itself, for example, due to the risks involved in the operation of heavy machinery, and also from the long shifts, isolation from family and community, and physical and mental exhaustion.

#### Effects of Mine Closure on Mental Health

In the long-term, effects of mine closure on the mental health of workers could potentially be adverse, as workers used to the high wages of mine employment find themselves out of a job and looking for new work opportunities (Gibson and Klick 2005).

#### Proposed Mitigation

Employee support and counselling will be provided through the Proponent's Employee Assistance Program to address strain on employee mental health due to long work hours and resulting physical and mental fatigue. Being attentive to the mental health needs of employees will also be part of the Project's Labour Recruitment and Retention Strategy (Section 20.7.2). Specific measures which contribute to a healthy work environment and mitigate effects on mental health also include:

- clearly defined and delivered workplace benefits and commitments;
- provision of internal training and career development opportunities;

- creation of a work environment of openness, respect, and support, including Aboriginal culture awareness training;
- recognition of employee performance;
- creation of a safe working environment;
- provision of on-site recreational facilities and activities for workers;
- flexibility for cultural and familial commitments and responsibilities of workers;
- provision of financial management and life skills training opportunities for workers;
- pre-screening of workers for drug and alcohol use; and
- implementation of zero-tolerance policies for drug and alcohol use, including clear communication and commitment to the policies by workers.

A Workforce Transition Program will be developed and implemented prior to closure. The objective of the program will be to help workers secure suitable employment elsewhere and, thus, minimize adverse effects of employment loss. This will be achieved mainly through assisting employees in identifying job opportunities that require complementary skills and opportunities to retrain to take advantage of the demands of trades and professions that exist at the time of closure and post-closure.

### **29.7.7.5 Nisga'a Worker Safety**

Nisga'a citizens in focus groups ([Appendix 29-C](#)) and various consultation events expressed concern around the safety of mine-related work and the potential for work-related injury. There was also concern about the difficulties and potential time delays associated with emergency transportation of sick or injured workers from the Project site to a location where they could receive the necessary health care. The safety of Nisga'a female workers at camps was also raised as an issue, in particular the risk to their safety or well-being posed by male workers at the mine. Concerns were also raised regarding explosives, dangerous goods and hazardous materials at the Project site.

Injury and health risks are included in the overall assessment of potential risks associated with the Project due to accidents and malfunctions in Chapter 35 (Environmental Effects of Accidents and Malfunctions), although no specific reference is made to Nisga'a-specific impact potential, or to Aboriginal rights or interests in general.

#### Effects of Project Construction and Operation to Worker Safety

The Mining Association of BC (MABC) collects statistics on lost time injury across 24 active mines in BC. For 2011, the frequency of lost time injuries was 1.15 per 100 person-years (MABC 2011). In other words, for every 100 people working for a full year at a mine in BC, slightly more than one injury was recorded that led to a loss of work time.

WorkSafeBC statistics on injury rates across all industries shows that in 2009, the mineral resources sector averaged only 2 claims per 100 person-years of employment. This was the lowest of any industry in the goods sector<sup>8</sup> (WorkSafeBC 2009). There is no reason to expect that Nisga'a citizens would be at any greater or lesser risk of job site injury or death than the general population. (Rescan 2012, [Appendix 29-A](#)).

### Proposed Mitigation

Health and safety at mine sites is governed by the British Columbia *Mines Act* (1996e) Health and Safety Code for Mines in BC (2008). The Proponent's Labour Recruitment and Retention Strategy includes provisions to create and maintain a safe working environment.

To ensure vehicle and employee safety, transport haulage load and dimensions will conform to prescribed limits and to bulletins on seasonal axle weight restrictions. Appropriate traffic control and vehicle maintenance measures will be implemented according to BC's Occupational Health and Safety Regulation (BC Reg. 296/97) for the protection of workers and the public. Mitigation of adverse effects associated with Project-related changes in traffic is described in more detail in the *Highways 37 and 37A Traffic Effects Assessment* ([Appendix 22-C](#)).

Employee support and counselling services will be delivered through an Employee Assistance Program. While the objective of this is to minimize demand on Nisga'a emergency and health services, it would also minimize impacts to the safety of mine workers, including Nisga'a workers.

The Proponent is required to put in place a plan to manage the handling and storage of dangerous goods and hazardous materials in order to protect the health and safety of employees and the public. Explosives, which require a special license from Natural Resources Canada (NRCAN) are addressed separately in the Proponent's proposed Explosives Management Plan (Chapter 26) in accordance with the *Explosives Act* (1985a).

Measures regarding the handling of dangerous goods and hazardous materials are laid out in the Proponent's Dangerous Goods and Hazardous Materials Management Plan (Section 26.7) to address various conditions encountered during transport and during the construction, operation, and closure phases of the Project. The plan is required to comply with a range of federal and provincial legislation and regulations and standards including the:

- *Environmental Management Act* (2003) and its regulations;
- *Health Act* (1996c);
- *Fisheries Act* (1985b);
- *Water Act* (1996f);

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<sup>8</sup> In comparison to other goods sector industries (in claims per person-years of employment): agriculture (4); forestry (5); food and beverage products (7); metal and non-metallic mineral products (5); wood and paper products (3); general construction (5); heavy construction (4); road construction and maintenance (3); warehousing (6); and transportation (5).

- *Mines Act* (1996e);
- Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008);
- *Environment and Land Use Act* (1996b);
- *Canada Transportation Act* (1996a);
- *Canadian Environmental Protection Act, 1999* (1999);
- *Hazardous Products Act* (1985c);
- Controlled Products Regulations (SOR/88-66); and
- *Transportation of Dangerous Goods Act, 1992* (1992).

The stated objectives of the Dangerous Goods and Hazardous Materials Management Plan (Chapter 26) include to “protect the health and safety of employees and the public.”

### 29.7.8 Current Use of Lands and Resources for Traditional Purposes

#### 29.7.8.1 Fisheries

Nisga'a treaty rights to harvest fish apply to the five species of salmon, steelhead, and other non-salmon species that originate or live in the Nass Area. Nisga'a are concerned about the potential effects of the Project on fish and aquatic habitat and have identified Teigen Creek and, potentially South Teigen Creek, as important Chinook habitat. Nisga'a stated that after hatching chinook fry migrate almost immediately to the Bell-Irving River to rear.

Portions of the Project are located in the northern reaches of the Nass Area over 220 kilometres upstream from Gitlaxt'aamiks and quite far removed from the principal Nisga'a fishing areas on the lower Nass River. Nisga'a also raised concerns about the effects of the Project on surface water quantity and quality, groundwater quantity and quality, and the health and function of wetlands, which is linked to their fundamental concern about the health of fish.

Baseline studies also found that Teigen Creek has a higher productive capacity than Treaty Creek. Teigen Creek has greater diversity in fish species and habitat, as well as greater population abundance when compared to Treaty Creek (see Chapter 15). The main differences between the two systems are related to factors such as water temperature and turbidity, and channel stability. Treaty Creek has a greater glaciated watershed than Teigen Creek, therefore tends to have lower temperatures, highly turbid water, and the high sediment load related to upstream glaciation causes highly unstable channel morphology. The unstable channel morphology creates a dynamic and constantly changing fish habitat conditions in Treaty Creek.

During baseline studies, Dolly Varden was the only fish species found to be present in North Treaty Creek and in South Teigen Creek (upstream of the falls) within the TMF footprint. Other species that were captured downstream of the proposed TMF footprint in South Teigen Creek (downstream of the falls) included, bull trout (*S. confluentus*), rainbow trout (*O. mykiss*), and mountain whitefish (*Prosopium williamsoni*). Pacific salmon species (Coho, Chinook,

Sockeye) were present in Teigen and Treaty creeks, but not present in South Teigen or North Treaty creeks.

Pink and Chum salmon are not present in upstream areas near the PTMA and therefore, the Project will have no effects on these species. Potential effects on fish health and habitat (which ultimately may affect downstream fishing of Sockeye, Chinook, Coho and steelhead, as well as upstream fishing of bull trout and Dolly Varden) are summarized below, and are discussed in further detail in Chapter 15 (Fish and Aquatic Habitat).

Sediment quality in the PTMA during baseline studies was generally better than downstream of the Mine Site, but metal concentrations (e.g., arsenic, chromium, copper, iron, manganese, and nickel) in the Teigen and Treaty creek watersheds were often elevated above sediment quality guidelines (see Section 15.1.5 in Chapter 15). Some areas, particularly those downstream of the wetlands (e.g., South Teigen Creek), had relatively high organic carbon content and favourable particle size distributions that would provide a better range of suitable habitat to support more diverse benthic populations. There were some areas that supported more abundant and diverse aquatic communities (e.g., Teigen Creek), while other areas had periphyton and benthic invertebrate communities that were less abundant and diverse (e.g., Treaty Creek).

### Effects of Project Construction, Operation, Closure, and Post-closure on Fisheries

Potential effects on fish and aquatic habitat within the Project footprint and buffer, and within fish and aquatic habitat RSA are anticipated during the construction, operation, closure and post-closure of the TMF and roads. Potential effects were grouped into five categories:

- direct mortality;
- noise;
- erosion and sedimentation;
- water quality degradation (e.g., petroleum product spills, blasting residues, sewage effluent, metals and other chemical toxicity); and
- habitat loss.

Potential causes of direct mortality to fish include construction equipment crossing streams for access road and transmission line right-of-way clearing if crossing structures are not used, accidents during bridge and culvert construction, and associated rock blasting for roads close to watercourses. Another form of direct mortality is increased angler pressure and harvesting of fish species from increased road access. The effects of noise on fish by construction machinery and blasting include: changes in fish behavior and physical damage to fish eggs, larvae, juveniles, and adults. The effects of erosion and sedimentation include: physical alterations to habitat in the form of increased turbidity, smothering of fish life stages, diminished feeding efficiency, and physical damages to fish.

TMF development may result in a number of downstream effects on fish and aquatic habitat. These include:

- degradation of surface water quality in the Treaty and Teigen watersheds due to TMF discharge during operation, closure and post-closure;
- increase/decrease of annual, peak, and low flow volumes on streamflows during TMF construction, operation, closure and post closure; and
- increase in surface water temperature downstream of the TMF.

Surface water quality could also be impacted during access road and transmission line construction in the PTMA, due to the onset of metal leaching/acid rock drainage (ML/ARD), and nitrogen loading. Water quality could also be affected by petroleum product spills during the normal Project activities, particularly those involving the use of machinery in or around water.

The Project will lead to the loss of habitat under the federal *Fisheries Act* (1985b) of Dolly Varden habitat beneath the TMF seepage dams, access road and transmission line crossings, and as a result of changes to surface water flows in North Treaty and South Teigen creeks downstream of the TMF dams. The habitat loss will almost exclusively affect Dolly Varden although there will be a minor effect on Pacific salmon species at selected access road bridge crossings (e.g., Bell-Irving River). Pacific salmon species will not be affected by the TMF footprint or its operation.

Dolly Varden habitat will be lost within the proposed TMF due to the deposit of deleterious substances within fish bearing water courses. Compensation for the loss of fish habitat within the TMF is governed by the federal Metal Mining Effluent Regulations (MMER; SOR/2002-222). The habitat lost in the TMF will not affect Pacific salmon species, as they are not present within the proposed TMF footprint.

Although water diversions will maintain some water flow in the creeks within and downstream of the PTMA, nutrient inputs from the wetland areas surrounding these creeks (beneath the TMF footprint) will be lost, and there will likely be some habitat degradation in North Treaty and South Teigen creeks (Chapter 15, Fish and Aquatic Habitat, and Chapter 16, Wetlands). However, water management in the PTMA is not expected to have significant downstream impacts on baseline discharge rates within Teigen and Treaty Creeks.

Predictive water quality modeling was used to determine metal concentrations of the TMF discharge in to the receiving environment. An operation, closure, and post-closure phase water quality model for the PTMA was developed for the period of operation from the mill start-up (time = 0 years) to 100 years in the future (approximately 50 years into the post-closure phase). The modelled parameters are presented in Chapter 14, Surface Water Quality.

Model results indicate that discharges from the TMF are predicted to meet BC water quality guidelines for the protection of freshwater aquatic life or receiving environment water quality standards (Chapter 14, Surface Water Quality). **No significant effects** on fish, fish habitat, or aquatic resources (e.g., benthic invertebrates, periphyton) within the fish and aquatic habitat RSA were predicted as a result of TMF discharge. Although water quality guidelines or receiving environment targets are being met, a monitoring program will be implemented to ensure the protection of fish and other freshwater aquatic life (Chapter 26.18.2, Aquatic Effects Monitoring Plan).

Potential changes to productive capacity in areas downstream of the TMF were also assessed (Chapter 15), due to water quality model predictions indicating the potential for increased nitrogenous compounds (relative to baseline concentrations) in areas receiving discharge from the TMF. The loading of phosphorus into waterways downstream of the TMF was predicted to decrease, or be unchanged relative to baseline levels. Changes in productive capacity, such as increased biomass due to increased nitrogen availability, are possible but can also be controlled by other factors such as the amount of time between flood events, top-down grazing by instream invertebrates, temperature, light, and water quantity, which can hamper prediction of potential effects (Chapter 15). A program will be implemented to monitor for changes in (non-fish) aquatic life biomass and community structure (Chapter 26.18.2, Aquatic Effects Monitoring Plan).

### Mitigation

To minimize potential effects on fish and aquatic habitat in the Nass Area as defined in the NFA, the Proponent will follow best management practices identified in guidelines and operational statements to avoid impacts to fish and aquatic resources, including:

- *Land Development Guidelines for the Protection of Aquatic Habitat* (DFO 1993);
- *Standards and Best Practices for Instream Works* (BC MOE 2004);
- *Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters* (Wright and Hopky 1989);
- *Fish-Stream Crossing Guidebook* (BC MOF 2002); and
- Fisheries and Oceans Canada's operational statements for temporary ford stream crossings, clear-span bridges, and overhead line construction (DFO 2010).

The Proponent will implement the following environmental management plans for the protection of fish and aquatic habitat (Chapter 26 except where noted):

- Erosion Control Plan – This plan identifies measures to control erosion.
- Fish and Aquatic Habitat Management Plan – This plan describes measures to; (a) minimize, where possible, fish habitat loss due to the Project; (b) where not possible, to acquire the permits necessary to achieve Fisheries and Oceans Canada's "no net loss" of fish habitat requirements; and (c) protect species at risk.
- Aquatic Effects Monitoring Plan – Under this Plan, water quality and temperature downstream of the TMF will be monitored, as will potential effects of TMF discharges on downstream productive capacity; a chinook salmon monitoring program will also be implemented in Teigen Creek for the first 10 years of the operation of the TMF.
- Fish Salvage Plan – As required by the *Fisheries Act* (1985b), the Proponent will conduct a fish salvage program on watercourses to be impacted prior to development. Under this plan, Dolly Varden from the TMF will be relocated to nearby suitable habitats.



- HADD Fish Habitat Compensation Plan and MMER Fish Habitat Compensation Plan ([Appendices 15-R](#) and [15-Q](#)) – Two plans associated with the loss of fish habitat in the TMF footprint are proposed.
- Wetlands Habitat Compensation Plan ([Appendix 16-B](#)) – This plan was developed to meet the federal policy on wetland conservation policy to minimize adverse effects on wetland extent and function.
- ML/ARD Management Plan – This plan describes the protocol for dealing with PAG rock.
- Water Management Plan – This plan addresses the regulation of the movement of water in and around the area of the Project in order to ensure long-term environmental protection.
- Groundwater Management Plan – This plan incorporates standard mitigation and best management practices to be applied during construction, operation, closure and post-closure.

### Residual Effects on Fisheries

The Project-related residual effects on fish and aquatic habitat in the PTMA were assessed as **not significant (minor)** for all potential effects considered including direct mortality, noise, erosion and sedimentation, water quality degradation, and habitat loss and alteration. Similarly, the Project-related residual effects on fish and aquatic habitat along the access roads were assessed as **not significant (minor)** for all potential effects considered including direct mortality, noise, erosion and sedimentation, water quality degradation, and habitat loss and alteration.

### **29.7.8.2 Hunting**

Nisga'a highly value wildlife and wildlife habitat for both subsistence and cultural purposes. Nisga'a citizens have treaty rights, defined under the NFA, to harvest migratory birds year round for domestic purposes, throughout the Nass Area and the right to harvest wildlife throughout the Nass Wildlife Area (NWA). For the purposes of conservation, three species — moose, grizzly bear, and mountain goat — are defined in the NFA as “Designated Species.”

Nisga'a citizens expressed concern, through focus groups and during other consultation opportunities, that the environmental effects of Project construction and operation have the potential to affect wildlife health, survival, habitat, and movement across the landscape. Effects to mountain goats, moose and grizzly bears in the upper Nass watershed, as well as impacts on the population of western toads and migratory birds, were noted as particular concerns.

The potential effects of the Project on wildlife, including migratory birds, and wildlife habitat along with mitigation and potential residual effects are summarized below and discussed in further detail in Chapter 18 (Wildlife and Wildlife Habitat) of the Application/EIS.

### Effects of Project Construction, Operation, Closure and Post-closure on Wildlife and Migratory Birds

There were 11 VCs identified for wildlife, including: moose, mountain goat, grizzly bear, black bear, American marten, hoary marmots, bats, raptors, wetland birds, forest and alpine birds, and western toads.

Potential effects on wildlife include: (1) habitat loss and alteration; (2) disruption of movement; (3) sensory disturbance; (4) direct mortality; (5) indirect mortality; (6) attractants; and (7) chemical hazards.

The wildlife effects assessment (Chapter 18) concludes that no significant Project-specific or cumulative residual effects are predicted for black bear, American marten, hoary marmots, bats, raptors, and western toad. Therefore the Project is not expected to affect Nisga'a right to harvest these species.

### Mitigation

The Proponent will implement the following environmental management plans for the protection of wildlife and wildlife habitat:

- Wildlife Management Plan (Section 26.21) – This plan focuses on the reducing the risk of direct wildlife mortality, mitigating the potential for human-wildlife conflicts, and minimizing the level of disturbance to wildlife during Project construction and operation phases. It addresses all wildlife VCs.
- Traffic and Access Management Plan (Section 26.25). The objectives of this plan are to ensure that Project access roads are:
  - designed and maintained in a manner that assures the safety of road users and minimizes adverse effects on the environment; and
  - used in a manner that avoids adverse worker and public health and safety effects and minimizes adverse social and environmental effects.

### Residual Effects on Moose

Project-related residual effects for habitat loss, disruption of movement, direct mortality, indirect mortality, and chemical hazards are predicted for moose.

Approximately 2,765 ha of high-quality winter habitat for moose will be lost or altered over the life of the Project. The effect on moose winter habitat amounts to 6.8% of that available in the Wildlife RSA and is assessed as **not significant (minor)**.

The TCAR, transmission line, Saddle Area, infrastructure in the PTMA, and increased traffic along the TCAR may impede movement of moose between valley systems. These effects will begin during the construction phase. However, design changes in the Saddle Area to replace an aboveground conveyor system with an underground system (See Table 29.7-2) will facilitate movement through this area to help mitigate disruption of moose movement. The moose populations in the Unuk and Bell-Irving valleys will remain connected via the Teigen Valley.

After mitigation, the residual effect of disruption of moose movements is expected to be **not significant (minor)**.

Traffic levels during the construction and operation phases of the Project along Highway 37 and access roads within the Project footprint are expected to produce a residual effect on moose from direct mortality due to vehicle collisions. With mitigation and monitoring this residual effect will be reduced to **not significant (minor)**; estimate of 1.3 vehicle-moose collisions per year along access roads and Highway 37 within the wildlife RSA), as it will likely remain within the natural variation of the local population.

The effect of indirect mortality is predicted to result in a residual effect on moose. The TCAR could open up access to moose habitat, and increase hunting pressure on moose in the area, although the road will be gated to control access and prevent unauthorized entry, thereby reducing unauthorized access into the PTMA. The TCAR gate will be located on the Bell-Irving River bridge crossing. Post-closure, limiting unauthorized entry will be more difficult leading to a potentially adverse residual effect for moose, which has been assessed as **not significant (minor)**.

Bio-accumulation of potential chemical hazards, such as molybdenum and mercury, may occur in moose from consumption of aquatic vegetation in the TMF at post-closure. The results of a food chain model indicate that residual effects of chemical hazards on moose will be **not significant (minor)**, because chemical concentrations are expected to be below the threshold for effects for all chemicals of potential concern (COPCs).

Although effects were individually rated as not significant, these effects may interact, and are evaluated for the potential to create additive or synergistic effects that have a different magnitude or extent for the local moose population within the wildlife RSA. Interactions among various factors - habitat loss due to the Project, functional loss of habitat due to noise disturbance, and activities in the wildlife RSA (i.e., forestry, roads, and hunting) - have been considered. Taken together, combined with a cautionary approach to predicting the outcome on moose, a rating of **not significant (moderate)** is predicted for the moose population within the wildlife RSA.

Even though the PTMA is located outside of the NWA, the low populations of moose in the Nass Area indicate that the Project's contribution to cumulative effects for moose, as well as the ability of moose to move in and out of the NWA, may affect Nisga'a rights and interests with respect to moose. However, due to the distance of the PTMA from the NWA, Project-specific effects to moose populations in the NWA will be less. Overall a **not significant (minor)** impact on moose populations in the NWA is anticipated.

### Residual Effects on Mountain Goats

Project-related residual effects for habitat loss and alteration, disruption of movement, sensory disturbance, direct mortality, indirect mortality, and chemical hazards were predicted for mountain goats. Although the Project was predicted to result in **not significant (moderate)** effects on mountain goat for sensory disturbance, habitat loss and alteration, and overall additive effects, these effects are largely confined to the Mine Site, and located outside of both the Nass Area and the NWA. Mountain goats generally migrate vertically (i.e., up and down mountains)

and less so horizontally across valleys (i.e., across landscapes), and mountain goats are not expected to migrate through the Nass Area or into the NWA from the Mine Site. Hence, effects on mountain goat populations in the wildlife RSA are unlikely to affect populations outside of this area.

### Residual Effects on Grizzly Bears

Project-related residual effects for habitat loss, disruption of movement, direct mortality, indirect mortality, and attractants are predicted for grizzly bears.

The overall loss or alteration of 10,886 ha (6.3% of habitat in the wildlife RSA) of high-quality grizzly bear habitat is roughly equivalent to the loss or alteration of 58% of the home range of a single male grizzly bear in the interior of BC, or up to two female coastal grizzly bear home ranges. Based on the estimated super-population of 58 grizzly bears in the wildlife RSA ([Appendix 18-C](#)) approximately 188 ha of high-quality habitat per bear will be lost or altered due to the Project. Important habitat for grizzly bears in the wildlife RSA includes the proposed grizzly bear Wildlife Habitat Area (WHA) and the salmon-foraging streams along the Bell-Irving River. Approximately 3.8% (1,807 ha) of the proposed WHA will be lost or altered as a result of development of the PTMA, TCAR and transmission line.

The Project design has incorporated provisions to minimize effects to salmon resources in Teigen Creek (Table 29.7.2; Chapter 15). With no significant effects predicted for the salmon resource, and hence on this food resource for bears, the only habitat-related effects predicted are the removal and alteration of vegetation resources, particularly where Project infrastructure is located in valley bottoms. The habitat loss represents a small percentage of a grizzly bear's range within the wildlife RSA and is considered to be a **not significant (minor)** effect as it falls well below the accepted threshold of 25% for the modification of grizzly bear habitat (Hargis and Bissonette 1997; Hargis, Bissonette, and Turner 1999; Potvin, Courtois, and Belanger 1999; Poole et al. 2004).

Roads and infrastructure may act as barriers to grizzly bear movements, reducing connectivity between seasonal habitats. When traffic volume rises above a threshold of about ten vehicle per hour (over 10 vehicles per hour for grizzly bears; Waller and Servheen 2005), bears tend to avoid them and the road becomes an effective barrier to movement. During operation, the average traffic volume associated with the KSM Project will be 3.5 vehicles per hour along Highway 37, and 3.4 per hour along the TCAR. The typically very large home range of grizzly bears in combination with mitigation efforts intended to reduce barriers to movement (e.g., minimizing infrastructure in the Saddle Area) has resulted in a predicted **not significant (minor)** residual effect on grizzly bear movement.

Direct grizzly bear mortality due to vehicle collisions is a potential residual effect because of traffic during the construction and operation phases of the Project along access roads and Highway 37. Bears may be at elevated risk of vehicle collision in areas with higher speed limits and in high-quality habitats, as identified by the habitat suitability mapping ([Appendix 18-B](#)). The Treaty Creek Valley is considered high-quality habitat and bears are likely to occupy this valley and be at risk of vehicle-bear collisions ([Appendix 18-B](#); McElhanney 2007). However,

the rate of vehicle-wildlife collisions is heavily dependent on the speed of vehicles involved, with mortality rate increasing above 70 km/hr (Seiler 2005). Hence, vehicle-related mortality along the TCAR and other road in the PTMA is expected to be lower than on Highway 37. Potential Project-related vehicle interactions with bears will be mitigated through adhering to speed limits, road and traffic signs, cutting vegetation low at locations where bears tend to cross roads to ensure visibility of animals, and removal of carrion that may attract bears to Project roads. With mitigation and monitoring, the residual effect of direct mortality on grizzly bears is predicted to be **not significant (minor)**.

The potential source of indirect mortality identified for grizzly bears in association with Project development is an increase in hunting pressure and human activity resulting from greater accessibility. Mortality for grizzly bears can increase through a combination of unregulated hunting, incidental mortality when hunters defend their catches, poaching, and increased numbers of problem bears caused by increased bear-human contact. The eastern part of the wildlife RSA, portions of which overlap the Nass Area, contains approximately 10 bears ([Appendix 18-C](#)), which is 1.3% of the estimated bear population in the Upper Skeena-Nass management unit. Given that sustainable harvesting can be carried out at 3% of the total bear population, virtually all of the bears in the wildlife RSA could be removed before a threshold was exceeded for this management unit. The potential residual effect for grizzly bear indirect mortality is **not significant (minor)**. Mitigation will include access control on all Project access roads for the life of the Project and into post-closure.

Grizzly bears will be attracted to the odours from human activity within the PTMA, such as camps, waste, or carrion along roads. To minimize the effects of attractants to bears, mitigation measures will be implemented, including storing and removing all food wastes and wildlife attractants (e.g., liquid solvents, lubricants), erecting bear fences in appropriate areas, removing carrion from roads, educating employees and contractors in wildlife awareness, and monitoring waste management. With mitigation, the residual effects of attractants will be **not significant (minor)**.

While no individual residual effect is assessed as having significant residual effects on grizzly bear, these individual effects are assessed for their potential to interact, creating additive or synergistic effects that would have a different nature or extent for the local grizzly bear population as a whole. The overall potential Project-related residual effect on the local grizzly bear population may cause a shift from baseline conditions but is not expected to adversely affect the viability of the local population. The overall residual effect for grizzly bear is **not significant (moderate)**.

The PTMA is isolated from the NWA, and the majority of the grizzly bears in the wildlife RSA congregate around the Unuk River, where there is an abundance of salmon. As well, the grizzly bear population in the wildlife RSA is considered to be healthy and stable.

### Residual Effect on Migratory Birds

Migratory birds were divided into three VC groups for the KSM assessment; forest and alpine birds (predominantly passerines), raptors and wetland birds. The assessment evaluated the potential for project-related effects to alter the population of migratory birds in the wildlife RSA.

If no significant effects were predicted for this population, then no effects would be expected outside of the wildlife RSA and thus to the Nass Area.

Both forest and alpine birds and raptors were predicted to have residual effects due to habitat loss and alteration, primarily within the footprint area of the mine, TMF, roads and ancillary infrastructure. A 300 m buffer was added around the project footprint to account for additional effects from disturbance, dust, windthrow and other forms of habitat alteration. This area was also considered as lost habitat. Mitigation was directed at the timing of the clearing activities to reduce any direct effects on birds.

The amount of available nesting habitat within this footprint and buffer area was compared to the total amount within the wildlife RSA—this totaled 7.4% for raptors and 4% for forest and alpine birds. Since these are a relatively small proportion of the nesting area in the wildlife RSA, the significance determinations for these effects were rated as **not significant (minor)**. Thus, the Project will not have significant impacts on migratory forest and alpine birds, and Nisga'a rights to harvest migratory birds in the Nass Area will not be affected.

With regard to migratory wetland birds, residual effects were predicted for habitat loss and alteration during construction and for chemical hazards during operation. Wetland habitat was measured in the footprint and buffer area and amounted to 3.9% of the available area in the wildlife RSA. Consequently, this potential effect was rated as **not significant (minor)** with the exception of chemical hazards.

The potential for wetland birds to come into contact or ingest and accumulate chemicals of potential concern (COPCs) when consuming vegetation and aquatic insects in North Treaty Creek, and from the TMF at post-closure was evaluated in the wildlife chapter (Section 18.7.7.8.2). Chemicals in water were evaluated first for their total concentration to evaluate if the concentrations were above any guidelines. COPCs were then evaluated for their potential to cause effects through bioaccumulation. Chemicals were chosen as COPCs if they were known to bioaccumulate in a VC, cause adverse effects in that VC, and if they were predicted to exceed baseline conditions. One COPC was evaluated for its potential wetland birds – selenium. A food web model was constructed that predicted that uptake of selenium by waterfowl would be small (Chapter 26, Section 26.18).

If water quality did not meet guidelines in the two evaluated areas, a monitoring program would be initiated to examine water, benthic and vegetation and evaluate any potential uptake by wetland birds. If migratory birds are observed during monitoring to use these Project facilities, adaptive management will be conducted to prevent birds from accessing these areas. Thus, exposure to water with elevated concentrations of COPCs in these areas is anticipated to be minimal. With mitigation and monitoring, the residual effects of chemical hazards on wetland birds will have a medium magnitude, as it is anticipated to differ from the average value for baseline conditions. Chemical hazards are predicted to result in a **significant (moderate)** residual effect for migratory wetland birds.

Even though the PTMA is in the Nass Area, wetlands within the PTMA cover a very small portion of the total wetlands in the Nass Area, are relatively isolated and are not known to be wetland bird harvesting areas for Nisga'a.

### 29.7.8.3 Culturally Important Plants

Potential effects on terrestrial ecosystems are discussed Chapter 17 and [Appendix 17-C](#). In particular, [Appendix 17-C](#) summarizes findings on the distribution of culturally important plants within the ecosystems surrounding the Project. For the purposes of this Chapter, “culturally important plants” refers to those plant species or groups identified by Nisga'a Nation as having social, economic or traditional use importance, including cedar (*Thuja plicata* and *Chamaecyparis nootkatensis*), pine mushrooms (*Tricholoma nauseosum*), medicinal plants, and various edible berries. Cedar is excluded as a VC because it is relatively uncommon in the Project area (Pojar, Klinka, and Demarchci 1991; Banner et al. 1993). Pine mushroom habitat is assessed as a separate VC in Chapter 17.

#### Effects of Project Construction and Operation on Culturally Important Plants

Approximately 4,361 ha of vegetation will be lost or degraded as a result of Project construction and operation in the Nass Area. The proportion of lost and degraded vegetation that is thus unavailable for traditional harvesting and subsistence activities amounts to less than a fifth of one percent of the Nass Area.

#### Mitigation

The effects will be further minimized through mitigation measures, which include:

- avoiding vegetation loss through Project design choices, facility location, or road alignments that minimize disturbance of ecosystems containing culturally sensitive plants;
- minimizing impact where avoidance is not possible, e.g., through post-closure reclamation of impacted areas; use of low-impact clearing practices, implementation of erosion control and prevention measures, use of techniques to reduce wind throw along forest edges, and invasive species management.

The Proponent will implement the following environmental management plans for the protection of culturally important plants:

- Terrestrial Ecosystems Management and Monitoring Plans (Section 26.20): This plan addresses vegetation clearing, invasive plant management, transmission line management, and monitoring for terrestrial plant tissue metal concentrations.

#### Residual Effects on Culturally Important Plants

Even without effective mitigation, the amount of forest and plant resources lost or degraded that could currently support culturally important plants is minimal compared to the total suitable habitat available to Nisga'a harvesters, and the Project is expected to have a negligible impact on culturally important plants and a similarly **negligible** effect on Nisga'a rights to harvest culturally important plants in the PTMA.

### 29.7.8.4 Navigable Waters

The *Navigable Waters Protection Act* (NWPA; 1985d) states that “navigable water” includes “a canal and any other body of water created or altered as a result of the construction of any work”. In Canada, the definition of a navigable water has also been developed by jurisprudence applicable under common law. A detailed description, methodology, and effects assessment is provided in Chapter 31, Navigable Waters. Streams, river systems, and lakes within the fish and aquatic habitat RSA were also characterized as part of the *Fish and Fish Habitat Baseline Report* ([Appendix 15-I](#)).

Nisga'a raised concerns with respect to a variety of potential effects in Portland Canal and Observatory Inlet due to anticipated Project-related increase in shipping traffic (e.g., carrying capacity (cumulative effects), increased risks of collisions, fuel spills, interaction with fishing vessels, marine animals, and effects of shipping wakes on shoreline properties). The BC EAO and CEA Agency determined that the Pacific Ocean, including shipping in the Portland Canal and Observatory Inlet, is outside the scope of the Project's environmental assessment. No issues with respect to potential impacts to navigation in the navigable waters RSA were raised by NLG (Chapter 3, Information Distribution and Consultation).

The navigable waters assessment considered portions of the Unuk and Bell-Irving river systems (including tributaries); however, only the latter interacts with Nisga'a interests given its overlap within the Nass Area. Project infrastructure that may affect navigability within the Bell-Irving River system includes the TCAR and the TMF.

Within the Nass Area, baseline studies indicate that 11 crossings (i.e., bridges, culverts, and overhead transmission lines) along the TCAR, affecting nine unnamed waterbodies, North Treaty Creek, and the Bell-Irving River are potentially navigable. Further, within the TMF, 14 stream reaches represent unnamed South Teigen watershed tributaries and mainstem, and unnamed North Treaty Creek watershed tributaries and mainstem—all of which are tributaries to the Bell-Irving River, which are potentially navigable. Finally, fish habitat compensation sites identified along Teigen Creek, Glacier Creek, Treaty Creek, and Taft Creek may affect navigation at these sites.

#### Effects of Project Construction and Operation on Navigable Waters

Restricted or lost access to navigable waters will occur as a result of the elimination of a stream or stream reaches due to the presence of Project infrastructure or significant diversion of water flows. Waterbodies will be completely or partially eliminated within the PTMA.

Construction of the TCAR bridge crossing over the Bell-Irving River is expected to create residual effects on navigation related to access and safety. However, as this crossing will be permanent once built, residual effects will be temporary and limited to construction. Nisga'a harvesters may be adversely affected by any temporary changes in navigation at this crossing. However baseline studies and consultation during pre-Application indicate that Nisga'a Nation do not currently use these waters for navigation (*Non-traditional Land Use Baseline Report*, [Appendix 23-A](#); Information Distribution and Consultation, Chapter 3).



### Mitigation

Project mitigation measures to minimize any potential adverse indirect effects on navigational safety or access are planned prior to Project commencement through engineering design and during the life of the Project through management practices (e.g., control and/or reduction techniques such as temporary access restrictions and signage).

### Residual Effects on Navigable Waters

Overall, no residual effects to resident of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests are expected due to Project interactions with navigable waters.

## 29.8 Potential for Residual Effects to Impact Nisga'a Treaty Rights and Interests

### 29.8.1 Social Residual Effects

The social effects of the Project will be influenced by the number of Nisga'a citizens who obtain mine employment and where they choose to live. The assessment assumes that social impacts on residents of Nisga'a Lands and Nisga'a communities will stem from the potential influx of people and money during the mine construction and operation phases, and the potential loss of these in the wake of mine closure.

Following mitigation, the Project is predicted to contribute to a net increase in Nisga'a village populations during construction and operation. A net influx of approximately 10 to 23 people per year at the beginning of the construction phase (planned for 2015) is anticipated. The rate of migration will level off and likely decline, once the mine is fully operational (Rescan 2012).

Demand from population increases may initially outpace the villages' capacity to meet the demand for housing; however, housing is anticipated to improve and expand over time with the influx of revenues. The effect of the Project on Nisga'a housing, therefore, is rated as **not significant (minor)**.

**No residual effects** are anticipated for Nisga'a health, social and emergency services as well as other community infrastructure, as these currently have sufficient capacity to meet a moderate increase in demand.

With respect to the Nisga'a education system, a residual **beneficial** effect is anticipated from an increase in the student population and/or demand for educational services to help fill some of the existing over-capacity within the system. This residual beneficial effect is anticipated to be **not significant (minor)**.

The social impacts of increased income and work schedules are likely to have both positive and negative outcomes that will be influenced by multiple, interacting factors, including individual choices, the Proponent's policies and actions, and the level of response and support from NLG. For example, the increase in income earned by Nisga'a workers employed at the Project will have a **beneficial** residual effect in terms of anticipated increased investment in housing, education, and household finances, leading to increased self-reliance, pride and self-esteem. On the other hand, it could also have an adverse effect by increasing incidences of

substance abuse, crime and family dysfunction within Nisga'a villages. This residual effect, however, was rated as **not significant (minor)** with appropriate mitigation.

Changes in work schedules due to employment at the Project could result in a mix of both residual **beneficial and adverse** effects. Shift-work, for instance, may facilitate Nisga'a workers' ability to focus efforts and increase time spent on the land or with family during off-shift periods; however, it could also have an adverse effect by increasing strain on families. Both residual effects, however, are predicted to be **not significant (minor)** with appropriate mitigation.

CWB effects from the closure of the mine are difficult to predict due to the anticipated life-cycle of the Project, and should be offset by the transferability of skills acquired through employment with the Project. The residual effect on CWB due to mine closure is anticipated to be **not significant (minor)**.

The Proponent is committed to working cooperatively with NLG to find ways to manage these potential impacts should they should arise.

### 29.8.1.1 Heritage Residual Effects

Potential residual effects on known and unknown archaeological sites following mitigation were assessed as being **negligible**.

### 29.8.1.2 Economic Residual Effects

The Project is predicted to have a long-term, **beneficial** effect on direct, indirect, and induced employment during the construction and operation phases that will have a net economic benefit for Nisga'a citizens, businesses, and government. At closure, a residual adverse economic effect is anticipated as most Project related income from employment comes to an end. Long-term, post-closure effects are difficult to estimate based on the number of variables involved in the economy of the region. Training and skills development will produce significant **beneficial** effects for Nisga'a citizens employed at the mine in terms of transferability to other industries with similar wage levels. Both the residual beneficial effect during construction and operation, as well as the residual adverse effect at closure, is predicted to be **not significant (minor)**.

With respect to business capacity, the Project is predicted to positively contribute to investment in, and growth of, Nisga'a businesses during construction and operation. Expected revenues to Nisga'a businesses are estimated to reach a peak of about \$12 million per year (with an estimated peak contribution from the Project of about \$10.5 million per year), again depending on the number of projects approved, the project phase, and the level of involvement of Nisga'a businesses in providing goods or services to the mine. Due to the notable increase in potential annual revenue, this beneficial effect is predicted to be **not significant (moderate)**.

Following mitigation, the residual effect on Nisga'a businesses due to competition for labour and wage inflation pressures is determined to be **not significant (minor)**. At closure a residual adverse effect is anticipated as most Project-related contracts and business opportunities come to

an end. Due to the difficulty in predicting the regional economy so far into the future, the residual effect on Nisga'a businesses at closure is anticipated to be **not significant (minor)**.

### 29.8.1.3 Health Residual Effects

With regards to country foods, effective mitigation and monitoring programs will be undertaken to protect soil, water, and air quality and to measure any changes in toxicity risk. Adaptive management practices will be implemented if monitoring and modelling indicate an unacceptable level of risk to human health. With these measures in place, the safety of country foods should be maintained throughout the life of the Project and **no residual effects** are predicted.

The Proponent is required to maintain the quality of air and drinking water based on established guidelines and legislation, therefore few if any residual effects are anticipated on these indicators of human health. The residual effect of the Project on these indicators is rated as **negligible**.

While occupational accidents can never be eliminated entirely, work health and safety policies established for the Project, and the Health, Safety and Reclamation Code for Mines in BC (BC MEMPR 2008), will provide a safe working environment. Potential residual effects to worker safety are therefore predicted to be **negligible**.

Finally, on-site employee support and counselling should minimize incidents of mental health changes due to work stress. The residual effect of the Project on the mental health of employees is rated at **not significant (minor)** for operation. Effects to mental health at closure may vary based on the number of Nisga'a workers employed at the time. Due to the uncertainty of the regional economic outlook so far into the future, this residual adverse effect following mitigation is predicted to be **not significant (minor)**.

## 29.9 Conclusions Related to Potential Impacts on Residents of Nisga'a Lands, Nisga'a Lands and Nisga'a Interests

A summary of residual and cumulative residual effects to Nisga'a interests is presented below in Table 29.9-1. These residual effects are discussed in further detail below.

The Project has the potential to affect residents of Nisga'a Lands (by providing employment and income, and potentially increasing community well-being). It could also affect Nisga'a economic development interests and current Nisga'a use of lands and resources in the Nass Area, as well as Nisga'a services and infrastructure, including those provided in the four Nisga'a Villages.

### Impacts on Fishing Rights

Aquatic species of importance to Nisga'a will be affected by the Project. Pink salmon and Chum salmon are not present in the Bell-Irving watershed, nor are other species subject to the provisions of Chapter 8 of the NFA, including Dungeness crab, tanner crab and king crab, halibut, prawns and shrimp, herring, aquatic plants used in the herring roe-on-kelp fishery, oolichan and intertidal bivalves

### Impacts on Wildlife Rights

Project development could potentially affect Nisga'a rights to harvest migratory birds within the Nass Area, although there specific wetland bird allocations are not stipulated in the current (2012-2013) Nisga'a Wildlife Management Plan. The wildlife effects assessment (Chapter 18) evaluates the potential for the Project to alter the population of migratory birds, including forest and alpine birds, raptors and wetland birds, in the Project's wildlife Regional Study Area (RSA). If no significant effects were predicted for this population, then no effects would be expected outside of the wildlife RSA and thus to the Nass Area.

NLG holds trapline TR0616T014, located 137 km from the PTMA. Nisga'a did not identify species trapped along this trapline; therefore, it is difficult to assess whether the Project will affect Nisga'a trapping. Moreover, the trapline is located a distance away from the Project site.

During pre-Application/pre-submission-stage consultations, Nisga'a citizens have expressed concern regarding potential Project effects on wildlife health, survival, habitat and movement across the landscape, including effects on mountain goats and grizzly bears in the upper Nass watershed, and on western toads and migratory birds.

### Access Rights

Within the Nass area, Nisga'a will not have access to the PTMA component of the Project footprint for health and safety reasons.

### Impacts on Hunting Rights

Moose are the most important wildlife species harvested by Nisga'a hunters for food in the NWA. At present, the estimated moose population is below optimal levels, and NLG is developing a moose recovery plan with the goal of returning the moose population levels that will support a sustainable harvest (NLG 2012).

The PTMA is located 137 km to the north of the NWA, and direct effects on Nisga'a rights to harvest wildlife or operate a trapline within northern parts of the NWA are not expected to be significant. However, wildlife species may move between the Project area and the NWA, so the Project could potentially exert indirect effects on Nisga'a rights to harvest wildlife.

## **29.9.1 Summary of Residual Social Effects**

The social impacts of the Project primarily relate to Nisga'a workers and residents of Nisga'a Lands and will depend largely on the number of Nisga'a citizens who obtain mine employment and whether or not mine employment leads to a net increase in population in the Nisga'a villages. It is projected that there will be a modest increase in population on Nisga'a Lands beginning during the construction period and likely levelling off once the mine is fully operational (Rescan 2012).

Community infrastructure such as roads, sewers, water supply and power are not expected to be adversely effected by the population influx. Education, social and emergency services and infrastructure are, similarly, not expected to experience residual adverse effects. Even under the cumulative effect of several more or less simultaneous projects, migration is not expected to

increase substantially, therefore these aspects of Nisga'a social conditions are not expected to experience significant adverse effects.

Housing, by contrast, is already limited in the Nisga'a villages and thus is susceptible to being adversely affected by an influx of people, at least in the short term. Over-crowding is a pre-existing condition that could be exacerbated in some households and in some communities, until such time as new housing could be constructed. Some of the Nisga'a communities have building lots and subdivisions waiting to be developed, thus mine employment and business activity could have the beneficial effect of helping to finance new housing.

The Project is expected to contribute to an overall improvement in the education and skills profile of communities in the region including Nisga'a villages. The significance of this effect on Nisga'a citizens depends on how many Nisga'a seek out and obtain education and skills training with a view to securing Project related employment. Some beneficial effect is anticipated for Nisga'a citizens but it is not projected to be significant.

The social impacts of increased income and work schedules are likely to have both positive and negative outcomes resulting from individual choices, the Proponent's policies and actions, and the level of response and support from NLG. Potential negative effects such as domestic disturbance, substance abuse, or mental health issues may arise. Conversely, there are many well-documented positive social outcomes that flow in whole or in part from employment and a good income. While beneficial, these effects are not projected to be significant.

In conclusion, the Project is predicted to contribute individually and cumulatively to a mix of positive and adverse **not significant (minor)** residual social effects for residents of Nisga'a Lands. Cumulatively, in the unlikely scenario of multiple projects in the vicinity of Nisga'a Lands occurring simultaneously, the adverse effects to CWB is increased to **not significant (moderate)**.

### 29.9.2 Summary of Residual Cultural Effects

The cultural effects related to shift work and increased income may be either positive or negative and will depend on the number of Nisga'a that obtain mine employment, their ability to balance their current cultural activities and obligations, and the availability of family and community support.

Restrictions on access to land and resources within areas of the land use RSA which overlap with the Nass Area are anticipated to result in **no residual effect** on Nisga'a land users as current traditional practices could not be identified. However, potential effects also relate to the possibility that such customs and practices may be pursued at some point in the future.

Direct noise effects on Nisga'a land users are not predicted as individuals in the land use RSA and Nass Area will be exposed to noise levels equivalent to the assumed baseline noise levels (Chapter 19, Noise). Event noise levels associated with blasting and helicopter flybys were not shown to increase significantly the noise levels to the extent that off-site human receptors in the land use RSA are likely to become annoyed or complain (Section 23.7.3.3). Further, due to the large area in which cultural or traditional practices may occur, as well as the temporary nature of their activities, a residual adverse effect from change in sensory disturbances, including noise and aesthetic, is **not predicted**.

The cultural effects of mine related employment on Nisga'a language use are not expected to be substantial or severe. Although mine employment and mining environments are notably not conducive to the current language preservation efforts of Nisga'a, there was a strong sentiment among Nisga'a participants in focus group interviews that maintaining the Nisga'a language was an internal, Nisga'a matter.

Residual effects of employment on Nisga'a diet, ceremony attendance, and opportunity to harvest will be mitigated sufficiently so as to accommodate the cultural needs of Nisga'a employees. **No residual effect** is expected.

The potential effect of external harvesting pressure from outsiders enabled by Project access roads and rights-of-way, is not expected to have adverse residual effects due to effective control of back country access during construction and operation. During closure and post-closure there is expected to be some residual effect, however, it is not projected to be significant.

### 29.9.3 Summary of Residual Economic Effects

The Project is predicted to have a long-term, positive effect on direct, indirect, and induced employment during construction and operation phases that will have a net economic benefit for residents of Nisga'a Lands, Nisga'a businesses, and government. At closure an adverse economic effect is anticipated as most Project related income from jobs, contracts and business opportunities come to an end. Long-term, post-closure effects are difficult to estimate based on the number of variables involved in the economy of the region. Training and skills development will produce significant benefits for Nisga'a citizens employed at the mine in terms of transferability to other industries with similar wage levels which may mitigate some of the adverse effects of closure.

Similarly, the Project is projected to contribute to investment in, and growth of, Nisga'a businesses during construction and operation through the significant infusion of business revenue. The cumulative effects of other Projects will enhance business growth and development and depending on the timing of the life-cycle of different projects, may off-set the adverse effects of closure of the KSM Project. Depending on how many and at what time projects come on line and how successful Nisga'a businesses are in securing contracts the potential revenues to Nisga'a businesses from the KSM Project are anticipated to be about \$1.1 million per year at the start of the Project construction, growing to a potential peak of about \$10.5 million in 2021. Depending on the number and timing of projects approved and the level of success Nisga'a businesses have in securing supplier contracts, the cumulative benefit to Nisga'a businesses is projected to reach up to \$12.0 million per year by the 2021.

Overall, the Project is predicted to positively contribute to employment, skills and business capacity for residents of Nisga'a Lands during construction and operation, whereas **not significant (minor)** residual adverse economic effects are anticipated at closure for residents of Nisga'a Lands.

### 29.9.4 Summary of Residual Heritage Effects

Treaty Rock (Borden Number HdTj-1) is located 27.3 km from the TMF and 19.2 km southeast of the TCAR. Thus, it was assessed as sufficiently remote from Project components

and activities such that no adverse effects to the site are anticipated. Further, throughout construction and operation the Proponent will comply with its permits as well as the requirements of the Archaeology Branch under the HCA. **No residual direct or cumulative effects** on heritage resources are expected over the course of the Project life for residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests.

### **29.9.5 Summary of Residual Health Effects**

The Proponent is required to preserve the quality of air and drinking water based on established guidelines and legislation, therefore few if any residual effects are anticipated on these indicators of human health. The safety of country foods will be maintained through mitigation and monitoring of potential changes in soil, water, and air quality. Adaptive management practices will be implemented if monitoring and modelling indicate an unacceptable level of risk to human health. These measures are designed to ensure that the safety of country foods is maintained throughout the life of the Project. No residual effects to drinking water, air, or country foods from Project-related contamination are anticipated.

Health and safety policies have been established for the Project in compliance with government regulations. Furthermore, mitigation measures to minimize accidents related to handling and use of dangerous goods and hazardous materials, including explosives will be implemented. With these measures in place no significant residual effects are anticipated.

On-site employee support and counselling services will ensure that there are no residual effects due to mental health linked to work stress.

Overall, no significant, residual adverse health effects on Nisga'a residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests are anticipated.

### **29.9.6 Summary of Residual Effects on Current Use of Land and Resources for Traditional Purposes**

The assessment of Nisga'a current use of land and resources in this chapter considers potential effects on resources for which Nisga'a have defined rights in the NFA.

Effects on fish and aquatic resources were assessed by considering potential effects on surface and groundwater quantity and quality, and on wetlands. Potential residual effects on surface water quality in the TMF and linked to access road construction were assessed as not significant (minor). Potential residual effects on groundwater quantity and quality related to the TMF were assessed as not significant (moderate). Potential residual effects for surface water quantity related to the TMF were assessed as not significant (moderate). Potential residual effects on loss of wetland function and extent are assessed as not significant (moderate) during construction. After mitigation, which includes fish habitat and wetland compensation, no significant Project or cumulative residual effects are predicted for fish or aquatic habitat in the PTMA. Consequently, no significant Project or cumulative residual effects are predicted for residents of Nisga'a Lands, Nisga'a Lands, and Nisga'a fisheries interests in the Nass Area.

The wildlife effects assessment concludes that no significant Project-specific or cumulative residual effects are predicted for black bear, American marten, hoary marmots, bats, raptors, and western toad. Overall a low to moderate impact on moose populations in the NWA is anticipated. The cumulative effects on moose of future industrial development along the Highway 37 corridor are uncertain. Under the Likely/Moderate Traffic scenario the cumulative effects on moose were assessed as not significant (moderate). Under the Unlikely/High Traffic scenario, however, the cumulative effects on moose are predicted to be significant (major).

Any Project-related effects on mountain goats will be experienced outside the Nass Area and NWA. The cumulative effect of habitat loss and alteration, disruption of movement, sensory disturbance, direct mortality, and indirect mortality on mountain goats due to all potential projects in the cumulative effects assessment area is rated not significant (moderate).

No individual residual effects on grizzly bear were assessed as significant. The combined potential Project-related residual effects on the local grizzly bear population may cause a shift from baseline conditions, but are not expected to adversely affect the viability of the local population. The overall residual effect for grizzly bear is rated not significant (moderate).

The overall cumulative effect of habitat loss and alteration, disruption of movement, direct mortality, indirect mortality, and attractants on grizzly bears due to all potential projects in the cumulative effects assessment area is considered to have a not significant (moderate).

The PTMA is isolated from the NWA, and the majority of the grizzly bears in the wildlife RSA congregate around the Unuk River, where there is an abundance of salmon. As well, the grizzly bear population in the wildlife RSA is considered to be healthy and stable.

Project-related residual effects associated with habitat loss and alteration, and also chemical hazards are predicted for migratory wetland birds, and residual effects of habitat loss and alteration are predicted for migratory forest and alpine birds. However, after mitigation all residual effects, including cumulative effects, to migratory forest and alpine birds are predicted to be not significant (minor). Thus, the Project will not have significant impacts on migratory forest and alpine birds.

Approximately 4,361 ha of vegetation will be lost or degraded as a result of Project construction and operation in the Nass Area. The proportion of lost and degraded vegetation that will be unavailable for traditional harvesting and subsistence activities amounts to less than one-fifth of 1% of the Nass Area. The effects will be further minimized through mitigation measures.

Even without effective mitigation, the amount of forest and plant resources lost or degraded that could currently support culturally important plants is minimal compared to the total suitable habitat available to Nisga'a harvesters, and the Project is expected to have a negligible impact on culturally important plants.

In accordance with the AIR, Table 29.9-1 below identifies the specific commitments of the Proponent to address the potential effects of the Project on Nisga'a treaty rights and interests discussed in this chapter.



**Table 29.9-1. Summary of Commitments to Address Potential Effects on Nisga'a Rights and Interests**

<b>Discipline</b>	<b>Nisga'a Rights &amp; Interests,</b>	<b>Summary of Effects (D=direct; C=cumulative) [Project Phase<sup>1</sup>]</b>	<b>Commitment</b>
Social	Demographic change	Impact of in-migration on housing (D, C) [Cn, Op]	Management practices, monitoring and adaptive management Employee Assistance Program community communications plan
Social	Education, skills development, and training	Overall improvement in education and skills levels (D, C) [Cn, Op]	Management practices, monitoring and adaptive management Labour Recruitment & Retention Strategy Labour Relations Strategy Procurement Strategy Workforce Training Strategy
Social	Community well-being	Improvements due to jobs & higher incomes (D, C) [Cn, Op] Potential adverse effects related to higher incomes (e.g. substance abuse, domestic issues, stress, mental health issues) (D) [Cn, Op] Potential adverse effects due to loss of employment at closure (D, C) [CI]	Management practices, monitoring and adaptive management Labour Recruitment and Retention Strategy includes financial management and general life skills development training programs to enhance the income benefits Workforce Training Strategy Workforce Transition Strategy
Cultural	Participation in traditional activities & practices	Increased access – depletion of traditional resources and/or heritage/cultural value of the land (D, C) [Cn, Op, CI] Restricted access (D) [Cn, Op] Noise & traffic (D, C) [Cn, Op] Mine related shift work (D, C) [Cn, Op]	Traffic and Access Management Plan Noise Management Plan Wildlife Management and Monitoring Plan Aquatic Effects Monitoring Plan Fish & Aquatic Habitat Effects Protection and Mitigation Plan Wetland Management Plan Terrestrial Ecosystems Management Plan Access Management Plan
Economic	Employment & income	Jobs for Nisga'a citizens (D, C) [Cn, Op] Loss of jobs for Nisga'a (D, C) [CI]	Labour Recruitment & Retention Strategy Procurement Strategy Workforce Training Strategy Workforce Transition Program
Economic	Business opportunities & economic development	Nisga'a business development (D, C) [Cn, Op] Supply contracts (D, C) [Cn, Op]	Procurement Strategy: assist businesses in securing supplier contracts (direct & indirect); assist compliance with procurement requirements & expectations, includes specific focus on Aboriginal-owned businesses

(continued)

**Table 29.9-1. Summary of Commitments to Address Potential Effects on Nisga'a Rights and Interests (completed)**

<b>Discipline</b>	<b>Nisga'a Rights &amp; Interests,</b>	<b>Summary of Effects (D=direct; C=cumulative) [Project Phase<sup>1</sup>]</b>	<b>Commitment</b>
Heritage	Archaeological and heritage sites	Potential for disruption or damage to sites (D) [Cn, Op]	Heritage Management Plan
Health	Individual and community health and wellbeing.	Mine traffic (D, C) [Cn, Op] Potential Project effects on the health of country foods, drinking water quality, and air quality (D, C) [Cn, Op] Project employment stress (D, C) [Cn, Op] Occupational and non-occupational hazards (D, C) [Cn, Op]	Air Quality Management Plan Noise Management Plan Traffic and Access Management Plan Access Management Plan Water Management Plan Dangerous Goods and Hazardous Materials Management Plan Emergency Response Plan Explosives Manufacture, Storage, handling, and Use Management Plan
Current Land & Resource Use	Fish and aquatic resources	Changes in groundwater quantity (TMF) (D) [Cn, Op, PC] Changes groundwater quality (TMF) (D) [Cn, Op] Changes in surface water quality (TMF) (D) [Cn, Op, C, PC] Changes in surface water quantity (TMF) (D) [Cn, Op, C, PC] Habitat loss and alteration (TMF) (D) [Cn] Loss of wetlands (TMF)(D) [Cn]	Fish habitat compensation plans Wetlands compensation plan Aquatic effects monitoring plan Fish salvage plan Fish and Aquatic Habitat Effects Protection and Mitigation Plan ML/ARD Management Plan Groundwater Management Plan Water Management Plan
Current Land & Resource Use	Wildlife and migratory birds:	Habitat loss and alteration (D) [Cn] Disruption of movement (D) [Cn, Op] Sensory disturbance [Cn, Ops, Cl] Direct mortality (D) [Cn, Ops] Indirect mortality [Cn, Ops] Attractants [Cn, Ops, C, PC] Chemical hazards [Cn, Ops, Cl, PC]	Wildlife Management Plan

**Notes:**

<sup>1</sup> Project Phases: Cn=construction, Op=operation, Cl=closure, PCI=post-closure

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