

## 17. SOCIO-ECONOMIC EFFECTS ASSESSMENT

### 17.1 INTRODUCTION

#### 17.1.1 Project Overview

Harper Creek Mining Corporation (HCMC) proposes to construct and operate the Harper Creek Project (the Project), an open pit copper mine approximately 10 kilometres (km) southwest of the unincorporated community of Vavenby, British Columbia (BC) along the Southern Yellowhead Highway (Highway 5; Figure 17.1-1). The Project is located in Electoral Areas A (Wells Gray Country) and O (Lower North Thompson) of the Thompson-Nicola Regional District (TNRD), and is approximately 150 km northeast of Kamloops along Highway 5.

Figure 17.1-2 illustrates access to the Project Site. During the Operations phase, access to the Project will be from Highway 5 via the Vavenby Bridge Road. During the Construction phase, oversized loads will use an alternate access route that will cross the North Thompson River via the Birch Island Lost Creek Road (BILCR) bridge, which has been designed for heavier loads. No upgrades to the Vavenby bridge are proposed.

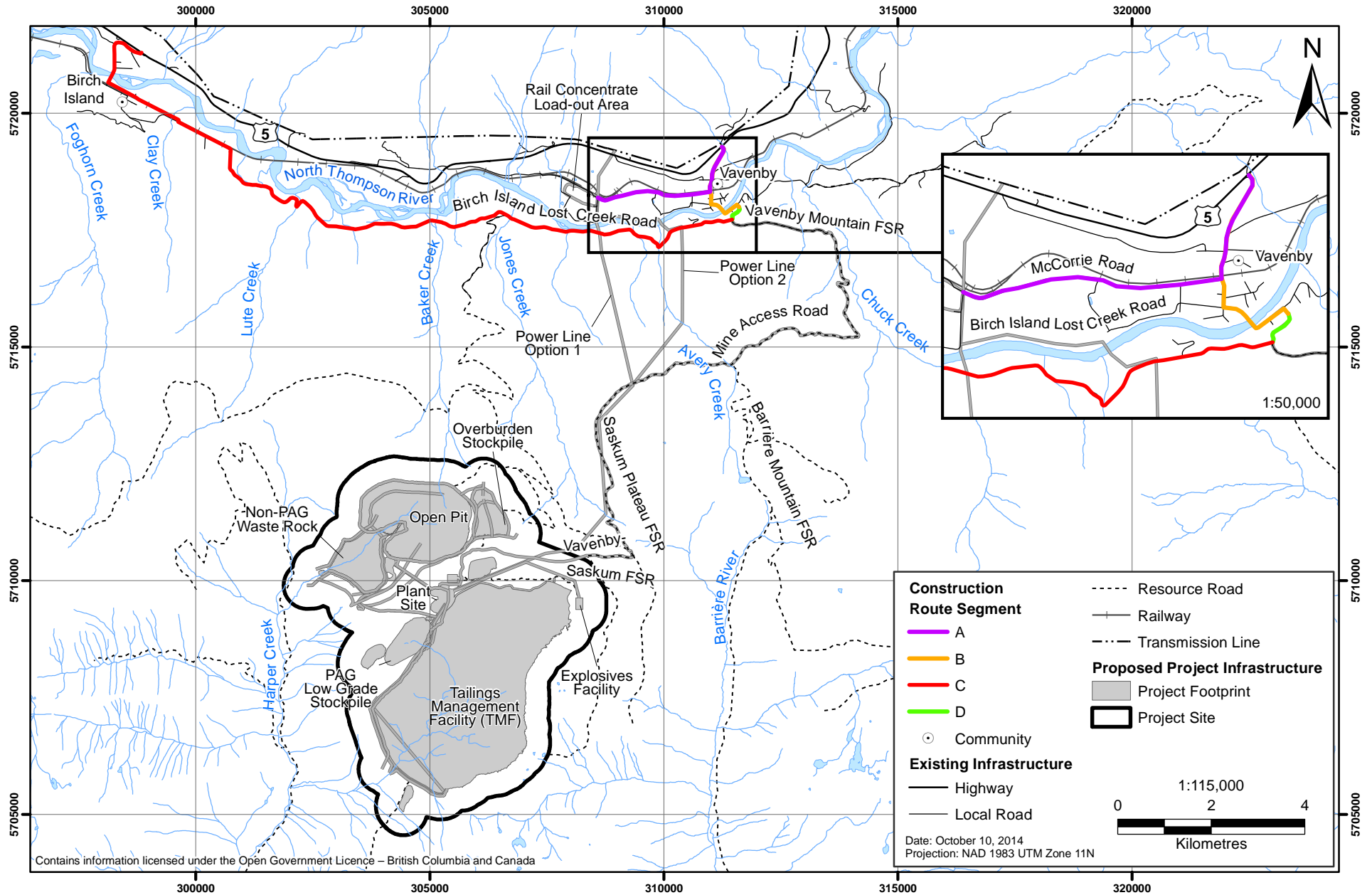
This chapter presents the socio-economic baseline conditions in the Project area, summarized in [Appendices 17-A](#) (Socio-economic Context) and [5-E](#) (Traffic Impact Assessment), and undertakes a scoping and effects assessment to characterize potential socio-economic effects as a result of the Project. The chapter follows the effects assessment methodology described in Chapter 8 of the Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS).

### 17.2 REGULATORY AND POLICY FRAMEWORK

The Project is subject to the BC *Environmental Assessment Act* (2002) and the *Canadian Environmental Assessment Act* (1992). The requirements for the socio-economic effects assessment are defined in the Application Information Requirements (AIR) for the Project, approved by the British Columbia Environmental Assessment Office (BC EAO) on October 21, 2011, and in the Background Information Document issued by the Canadian Environmental Assessment Agency (CEA Agency) in April 2011. The BC *Environmental Assessment Act* requires social and economic effects to be assessed. Under the definitions in the *Canadian Environmental Assessment Act* (1992), the definition of “environmental effect” in respect of a project includes any effect of any change that may be caused to the environment on socio-economic conditions.



**Figure 17.1-2**  
**Access to Project Site**



### 17.2.1 Social

There is currently no federal or provincial legislation that stipulates socio-economic requirements for mine developments. Social conditions are often the responsibility of one or more of the three levels of government (local, provincial, and federal). Community services are largely the responsibility of local governments as empowered through the *Local Government Act* (1996a) and the *Community Charter*. Key community services under local jurisdiction include fire protection (under the *Fire Services Act*); engineering services (including water supply, waste management, and transportation); parks and recreation; and housing as affected by zoning, Official Community Plans (OCPs), and other plans. Local governments are also empowered to form committees and task forces to address specific community issues. Several community services are the responsibility of regional-level local governance, including health care services (Health Authorities under the *Health Authorities Act*), education (School Districts under the *School Act*), services provided by a regional district in the absence of a municipality, and housing as affected by regional planning initiatives.

Provincial ministries maintain responsibility for province-wide service delivery and specific areas of provincial jurisdiction. The BC Ministry of Health is responsible for health services to all BC residents (key pieces of legislation include the *Ministry of Health Act*, the *Medicare Protection Act*, and the *Pharmaceutical Services Act*). The BC Ambulance Service, under BC Emergency Health Services, provides ambulance services on a provincial level. The BC Ministry of Education supervises the administration of school districts, administers provincial funding of the districts, and supervises finances under the *School Act*. The BC Ministry of Advanced Education provides funding to post-secondary institutions under the *University Act* and the *College and Institute Act*. The BC Ministry of Forests, Lands and Natural Resource Operations is responsible for wildfire suppression on Crown land. Social and family services are principally the responsibility of the BC Ministry of Children and Family Development.

The federal government is responsible for police services for municipalities with populations under 5,000 people (under the *Royal Canadian Mounted Police Act* and specific Municipal Police Unit Agreements). The federal government is also responsible for Aboriginal services under the *Constitution Act, 1867*, including health care, housing, education and social development programs, and land management and economic development. Under the *Indian Act*, Aboriginal communities have the authority to enact bylaws and to create boards, societies, commissions, and committees on Indian reserves.

Legislation and regulations relating to social areas generally do not set out specific objectives, standards, or guidelines for the measurement of social conditions. However, BC ministries outline performance metrics in their service plans and report progress in their annual reports, as required under the *Budget Transparency and Accountability Act*. Some of these metrics are applicable to the assessment of social effects. In addition, the *Community Charter*, section 98(2)(f), requires local governments to specify objectives and measures in their annual reports. Local government planning documents, including land and resource management plans, OCPs, and regional growth strategies also specify objectives that may be relevant. Where regulatory guidance is lacking, a variety of other bodies, such as professional associations and academic research institutions, provide relevant

standards, benchmarks, and best practices. Broad direction may be found in provincial ministries' policies, initiatives, and plans.

### 17.2.2 Economic

Although there is no federal or provincial legislation that specifically applies to the management of adverse economic effects, several government institutions, as enabled by legislation and policies, set out specific objectives, standards, or guidelines for the enhancement of economic conditions and the overall management of development to, indirectly, avoid adverse economic effects.

The Economic Development Division of BC, under the Ministry of Jobs, Tourism, and Skills Training, works with communities, industry, economic development agencies, and other ministries to promote regional economic growth and diversification in BC (BC Ministry of Jobs Tourism and Skills Training 2014). The BC Jobs Plan is a government strategy launched in 2011 to develop the BC economy; the plan focuses on BC's unique competitive advantages and identifies a series of targets and government actions to help drive new investments and job opportunities (Government of BC 2014). Further, the BC Economic Development Association (BC EDA) is an association of economic development practitioners in BC which provides services to help member communities grow and expand new and existing businesses; attract new business investments; and work towards strategic infrastructure investment, land use planning, and community enhancement (BC EDA 2014).

In the North Thompson region, a five-year strategic plan (*North Thompson Economic Development Strategic Plan 2005 - 2010*), developed by Community Futures Development Corporation of Thompson County in partnership with the Barriere Chamber of Commerce, Clearwater Chamber of Commerce, North Thompson Economic Development Society, Province of BC, Ministry of Small Business and Revenue, Interior Savings Credit Union, and the Thompson Nicola Regional District, which identifies actions to build and diversify the economy in the North Thompson Valley over the next 10 to 15 years (Community Futures Thompson Country 2009a).

At the local level, incorporated municipalities and Regional Districts may prepare an Official Community Plan (OCP) (pursuant to section 875 of the *Local Government Act* (1996a)) to guide decisions on planning and land use management, within the area covered by the plan. The TNRD currently has 11 OCPs covering approximately 5% of TNRD unincorporated lands (Thompson-Nicola Regional District 2014). Among the local study area (LSA) communities, OCPs have been developed for Clearwater (District of Clearwater 2011b) and Barriere (TNRD 2011b). Among the regional study area (RSA) communities, OCPs have been developed for Blue River (TNRD 2011c), Avola (TNRD 2011a), and Kamloops (City of Kamloops 2014). The Project is located in an unincorporated area and does not fall within an OCP.

## 17.3 SCOPING THE EFFECTS ASSESSMENT

The steps taken to establish the scope of the socio-economic assessment are described below.

### 17.3.1 Valued Components

The BC EAO and CEA Agency define valued components (VCs) as components “that are considered important by the proponent, public, First Nations, scientists, and government agencies involved in the assessment process” (BC EAO 2013). To be included in the Application/EIS, there must be a perceived likelihood that the VC will be affected by the proposed Project. VCs proposed for assessment were identified in the AIR (BC EAO 2011) and in the CEA Agency Background Information (2011) document.

#### 17.3.1.1 Consultation Feedback on Proposed Valued Components

A preliminary list of proposed VCs was drafted early in project planning based on the expected physical works and activities of the reviewable project; the type of project being proposed; the local and regional area of the project site; and consultation feedback with Aboriginal groups, federal, provincial, and local governments, and the public. Table 17.3-1 summarizes the feedback provided during consultations on subject areas related potential socio-economic effects. The AIR (BC EAO 2011) identified the following economic and social VCs:

- economic:
  - employment and income;
  - business opportunities;
  - revenues and taxes;
  - community growth (i.e., local labour competition);
- social:
  - community health and well-being;
  - water use (navigation, water licences, and recreation);
  - visual quality; and
  - traffic.

The first three economic VCs (employment and income, business opportunities, and revenues and taxes) relate to the benefits of the Project. Current best practices in environmental assessment and BC EAO requirements are to focus the effects assessment on potential adverse effects. Therefore the Project’s anticipated positive economic effects (i.e., employment and income, business opportunities, and revenues and taxes VCs) are discussed in the Project Overview chapter of the Application/EIS. There is not further discussion of these VCs in this chapter.

Two of the social VCs (water use and visual quality) are linked to land and resource use. Water use is discussed in Chapter 18 (Commercial and Non-commercial Land Use Effects Assessment) and visual quality is discussed in Chapter 19 (Visual Quality Effects Assessment).

**Table 17.3-1. Consultation Feedback on Proposed Valued Component(s)**

Subject Areas	Feedback by*				Issues Raised	Proponent Response
	AG	G	P/S	O		
Community Growth	X		X		The Project has the potential to compete for local labour resources.	HCMC will prepare and implement a local hiring and training policy, and will collaborate with Clearwater and Barriere Employment Services Centre-WorkBC on recruitment needs. HCMC will also work cooperatively with local sawmills in the North Thompson.
	X		X		Construction and operation of the Project could increase demand on community services, thereby decreasing access to and the quality of community services for local residents.	Population in-migration during the Construction and Operations phases (phases one and two) are anticipated to have a positive effect for communities as a result of increased tax revenue
				X	Ability of nearby communities (e.g., Clearwater) to supply an expanded population with sufficient housing during construction and operations	Camp accommodation will be provided at the Project Site for workers during the Construction phase. During the Operations phase, worker accommodation will not be provided at the Project Site. Workers are expected to reside within daily commuting distance of the Project.
				X	Ability of nearby communities (e.g., Clearwater), to provide services and community infrastructure during construction and operations	First-aid facilities will be provided at the Project Site. An Emergency Response Plan has been developed (Section 24.4). HCMC health and safety policies will apply to both employees and contractors. A fully equipped and trained Mine Rescue Team will be established. HCMC will also establish an Occupational Health and Safety Committee. HCMC will communicate Project schedules to the Interior Health Authority (IHA) to facilitate planning and coordination of services. HCMC will work with individuals at Dr. Helmcken Hospital to establish and maintain effective communications.
Mine Closure	X		X		Closure of the Project has the potential to impact local and regional employment and economic benefits.	In consultation with affected communities and government agencies, HCMC will prepare an adjustment strategy in readiness for mine closure

*(continued)*

**Table 17.3-1. Consultation Feedback on Proposed Valued Component(s) (continued)**

Subject Areas	Feedback by*				Issues Raised	Proponent Response
	AG	G	P/S	O		
Economic Development	X				The Project has the potential to result in economic opportunities as well as job and income stability for Aboriginal people employed with the Project.	HCMC supports providing economic benefits to local and regional businesses, and plans to procure goods and services from Aboriginal and non-Aboriginal-owned suppliers, based on competitive quality and price.
	X				Aboriginal groups are interested in establishing an agreement or services contract with HCMC.	General Services Agreements were signed with SFN and ALIB in June 2011 to support their participation in the collection of baseline information and field work, including terrestrial vegetation, wildlife, fisheries, and archaeology studies.
Training and Employment	X				Barriers to accessing employment and training opportunities (e.g., community capacities and skills levels).	HCMC is interested in having further discussions with Aboriginal groups regarding potential employment opportunities and training needs. HCMC is interested in maximizing employment benefits within local Aboriginal and non-Aboriginal communities, the region (Regional District of Thompson-Nicola Electoral Areas A, B, P, and O), and the province as a whole. To help achieve this goal, HCMC will communicate the Project development schedule (e.g., timing of major activities and key milestones), workforce requirements, and the hiring schedule (e.g., experience and qualifications) (in particular once it enters the Operations phase). HCMC will also prepare and implement a local hiring and training policy which will identify labour requirements by trade/competency and educational qualifications, prior to commencement of hiring operational personnel, other than senior staff positions. Consideration for employment will be afforded to residents of the Thompson-Nicola Regional District Electoral Areas A, B, P, and O, followed by the province, subject to availability of appropriately skilled persons. Hiring practices will follow BC and federal legislation and regulations with a focus on hiring local and regional residents, where possible.

*(continued)*



**Table 17.3-1. Consultation Feedback on Proposed Valued Component(s) (completed)**

Subject Areas	Feedback by*				Issues Raised	Proponent Response
	AG	G	P/S	O		
Training and Employment	X				Training and employment opportunities.	HCMC is interested in having further discussions with Aboriginal groups regarding potential employment opportunities and training needs. HCMC is interested in maximizing employment benefits within local Aboriginal and non-Aboriginal communities. HCMC will host a careers and mining workshop for SFN, NIB, ALIB, and LSIB members, and residents and students residing in the region.
<b>Social</b>						
Community Health and Well-being	X		X		Potential effects of project traffic on public health and safety	At the peak of the Operations phase, a total of 85 two-way trips per day are projected. Forty-five of these trips will be light vehicles (e.g. buses and passenger vehicles) and 21 will be concentrate trucks. The remaining traffic will support mine operations. During the Operations phase, there will be approximately 21 two-way, daily truckloads along the Vavenby Mountain FSR, between the Project Site and the rail load-out near Vavenby (McElhanney 2014; <a href="#">Appendix 5-E</a> , Traffic Impact Assessment). During the Closure phase, Project-related traffic will decline considerably and therefore so too will the potential for interactions with the public or other vehicles. Upgrading of sections of forest service roads that will be used for the Project will improve the overall road condition and safety for public users. Potential traffic effects will be mitigated by the Transportation and Access Management Plan (Section 24.16).
Training and Employment	X		X		During construction and operations, Project-related employment opportunities are expect to increase the demand for skilled labour. However, the region has a shortage of skilled labour and consequently the Project may result in increased demand for education and training.	Schools located in the vicinity of the Project presently have availability for new students. Providers of education and training services in the region (and elsewhere) are expected to respond to increased demand over time, resulting in an overall positive effect due to the increased capacity and range of education and training opportunities provided.

\*AG = Aboriginal Group; G = Government; P/S = Public/Stakeholder; O = Other.

### 17.3.1.2 Selecting Valued Components

Table 17.3-2 identifies the Project components and activities that may interact with proposed economic and social VCs. Potential interactions between Project components and activities and the water use and visual quality VCs are considered in Chapter 18, Commercial and Non-commercial Land Use Effects Assessment (Section 18.3.1.2), and Chapter 19, Visual Quality Effects Assessment (Section 19.3.1.1). Potential traffic effects are considered within the community health and well-being VC.

**Table 17.3-2. Interaction of Project Components and Activities with Proposed Socio-economic Valued Components**

Phase	Category	Project Components and Activities	Community Growth	Housing	Community Services and Infrastructure	Community Health and Well-being	Training and Employment
Construction	Procurement and labour	Employment and labour	X	X	X	X	X
	Procurement and labour	Procurement of goods and services	X				
	Traffic	Traffic delivering equipment, materials and personnel to site				X	
Operations 1/2	Procurement and labour	Employment and labour	X	X	X	X	X
	Procurement and labour	Procurement of goods and services	X				
	Traffic	Traffic delivering equipment, materials and personnel to site				X	
Closure	Procurement and labour	Employment and labour	X	X	X	X	
	Procurement and labour	Procurement of goods and services	X				
Post-Closure	Procurement and labour	Procurement of goods and services	X				

*Note: a column is marked with an X when it has been determined that the Project component or activity could potentially interact with the VC. Only those Project components and activities that have the potential to interact with a social or economic VC are included.*

### 17.3.1.3 Valued Components Selected for Assessment

The selection of VCs was informed by feedback provided by the EA Working Group (Aboriginal groups, government agencies and local governments) and the public on the draft AIR, environmental assessments of comparable projects, federal policy requirements and professional judgement. The VCs proposed for assessment were scoped into the EA and identified in the AIR

(October 2011) and Background Information (CEA Agency 2011) documents. Additional scoping was undertaken in 2014 to finalize the VCs selected for assessment.

Table 17.3-3 identifies the economic and social VCs that are included in the effects assessment. The rationale for including and excluding a VC is provided below.

**Table 17.3-3. Valued Components Selected for Assessment**

Assessment Category	Valued Components	Subcomponents
Socio-economic	Community growth	Competition for skilled labour Housing Community service and infrastructure Loss of employer due to mine closing
	Community health and well-being	

Community growth is included as a VC as it will interact with the Project. The following subcomponents are considered as part of this VC:

- competition for skilled labour as the Project has the potential to create competition for local labour
- housing demand as there is potential for population in-migration into local communities to work at the mine:
- community infrastructure and services as there is potential for increased pressure due to population in-migration; and
- mine closure as there is potential to impact local and regional employment and economic benefits.

Community health and well-being is included as a VC in the assessment as federal policy requires consideration of impacts to individual and community health, including healthy living (Health Canada 2014). Further, Aboriginal groups have raised concerns about potential impacts on community health and well-being. The public expressed concerns relating to potential effects of project traffic and public safety.

Section 8.1 of the AIR identifies several health-related valued components including healthy living, worker safety and health, and level of physical activities in the region.

#### Valued Components Excluded from the Assessment

Population growth is not included as a VC because it is considered to be a driver of changes to other VCs, rather than an end-point VC itself. Change in population as a result of the Project is considered as a potential driver of effects on housing, and community services and infrastructure.

Education and training is not included as a VC because the Project's workforce needs during the Construction and Operations phases will create an increase in the demand for workers in the region. This may result in a greater uptake of skills training opportunities within the labour force and,

therefore, training attainment levels in the LSA and RSA. Providers of education and training services in the region (and elsewhere) are also expected to respond to the increased demand, resulting in an overall positive effect due to the increased capacity and range of education and training available, further contributing to the training and skill level of the labour force. Given that interactions with education and training are primarily positive, the VC has not been carried forward into the effects assessment.

Another effect that is not assessed is the potential effect of the Project on the cost of living in regional and local communities because the Project is not expected to increase the cost of living. The community of Clearwater and the District of Barriere are considered to have a low cost of living compared to the rest of BC (Discover Thompson-Nicola 2005a, 2005b). An effect that can impact the cost of living is an increase in the demand for goods and services in the region. Therefore the development of the Project has the potential to increase the number of newcomers to the communities who, in turn, can increase the demand for housing as well as goods and services. The potential effect on housing is assessed in Section 17.5.2 (Increase in Housing Demand). A general increase in the demand for goods and services (other than housing) is considered as a positive effect as higher demand for goods and services will contribute to business prosperity in the region. With higher consumer spending, business will experience an increase in the revenue. As a response, businesses will hire more workers and provide more goods and services to meet the higher demand. It is not expected that the Project will increase consumer prices in the region or that the Project will create inflationary pressures on permanent residents. Most businesses operate below their capacity or have the potential to expand. If marginal increases in the cost of living occur, they are not expected to exceed the provincial averages. Further, an increase in the cost of living is more likely to occur in northern, remote communities that have little competition from large urban centres. This is not the case for the LSA communities, as these communities are located near Kamloops. For example, Clearwater and Barriere are located 134 km and 81 km from Kamloops, respectively. Consequently, potential newcomers may increase the demand for goods and services in the region. However, this is expected to have a positive effect on local business and it is not expected to increase the cost of living. As a result, the effect of the Project on the cost of living in regional and local communities is not assessed.

### **17.3.2 Defining Assessment Boundaries**

Assessment boundaries define the maximum limit within which the effects assessment and supporting studies (e.g., predictive models) are conducted. Boundaries encompass the areas within, and times during which, the Project is expected to interact with the VCs, as well as any constraints due to political, social, and economic realities, and limitations in predicting or measuring changes. Temporal and spatial boundaries relevant to the socio-economics effects assessment are described below.

#### *17.3.2.1 Temporal Boundaries*

Temporal boundaries are the time periods considered in the assessment for various Project phases and activities, and are shown in Table 17.3.4. Temporal boundaries reflect periods during which planned Project activities are reasonably expected to potentially affect a VC. Potential effects will be

considered for each phase of the Project, as described in Table 17.3-4; however, for the purposes of this assessment, the Operations phases 1 and 2 as referred to as the “Operations phase.”

**Table 17.3-4. Temporal Boundaries used in the Assessment for Socio-economics**

Phase	Length of Phase	Description of Activities
Construction Phase	2 years	Pre-construction and construction activities
Operations 1 Phase	23 years	Active mining in the open pit from Year 1 through to Year 23
Operations 2 Phase	5 years	Low-grade ore processing from the end of active mining through to the end of Year 28
Closure Phase	7 years	Active closure and reclamation activities while the open pit and TMF are filling
Post-Closure Phase	50 years	Steady-state long-term closure conditions following active closure, with ongoing monitoring

#### 17.3.2.2 Spatial Boundaries

The spatial boundaries include the following local and regional study area communities. Figure 17.3-1 identifies the local and regional study area communities, and Electoral Areas A, B, O and P. The Project falls in Electoral Area A (Wells Gray Country).

##### Local Study Area Communities

Section 4.3 of the AIR proposes the LSA extend along the North Thompson and Barrière River valleys from Barriere to Vavenby. The LSA is intended to capture communities that could reasonably be expected to experience immediate direct and indirect effects from the Project. The LSA extends along the North Thompson and Barrière River valleys and includes the following communities:

- Incorporated communities of Clearwater and Barriere.
- Unincorporated communities: Blackpool, Birch Island, Vavenby, Little Fort, and Darefield.
- Indian reserves: North Thompson IR#1 [“Chu Chua,” or Neqwéqwelsten, the most populous reserve community for the Simpcw First Nation (SFN)].

##### Regional Study Area Communities

The Regional Study Area (RSA) (Figure 17.3-1) is intended to represent the geographic area which could reasonably be expected to experience indirect impacts from Project components or activities. Baseline information relevant to the effects assessment is drawn from this area. The RSA is inclusive of additional communities that may experience indirect effects as a result of the development of the Project. Section 4.3 of the AIR proposes the RSA include Electoral Areas A, B, O and P (Figure 17.3-1). In addition to the local study area communities identified above, the RSA includes the following:

- Incorporated communities: Sun Peaks, Chase, Blue River, Avola, and Kamloops.
- Electoral Areas: Thompson Headwaters Electoral Area B, Rivers and the Peaks Electoral Area P, Wells Gray Country Electoral Area A, and Lower North Thompson Electoral Area O.

- Indian Reserves: Sahhalkum IR#4 [Adams Lake Indian Band (ALIB)], Quaaout IR#1 [Little Shuswap Indian Band (LSIB)], and Neskonlith IRs#1 and 2 [Neskonlith Indian Band (NIB)].

## 17.4 BASELINE CONDITIONS

This section summarizes socio-economic baseline conditions including population and demographics; infrastructure and services, and housing; education, skills development, and training; and community health and well-being. Additional baseline data tables are provided in [Appendix 17-A](#).

### 17.4.1 Regional and Historical Setting

The Project is located in the North Thompson within the TNRD, which is one of 59 regional districts within the province of BC as per the 2011 Census boundaries. The Regional District has a population of 128,473 (Statistics Canada 2011a). Kamloops is the principal community in the region and is located approximately 150 km southwest of the Project.

Within the TNRD, there are 11 municipalities and 10 Electoral Areas (Thompson-Nicola Regional District 2014). Project components and activities are located within the Districts of Clearwater and Barriere. One representative from each of the municipalities and Electoral Areas sits on the Regional District board; elections for these positions occur every three years. Incorporated and unincorporated communities and Aboriginal communities within the vicinity of the Project are discussed in further detail below.

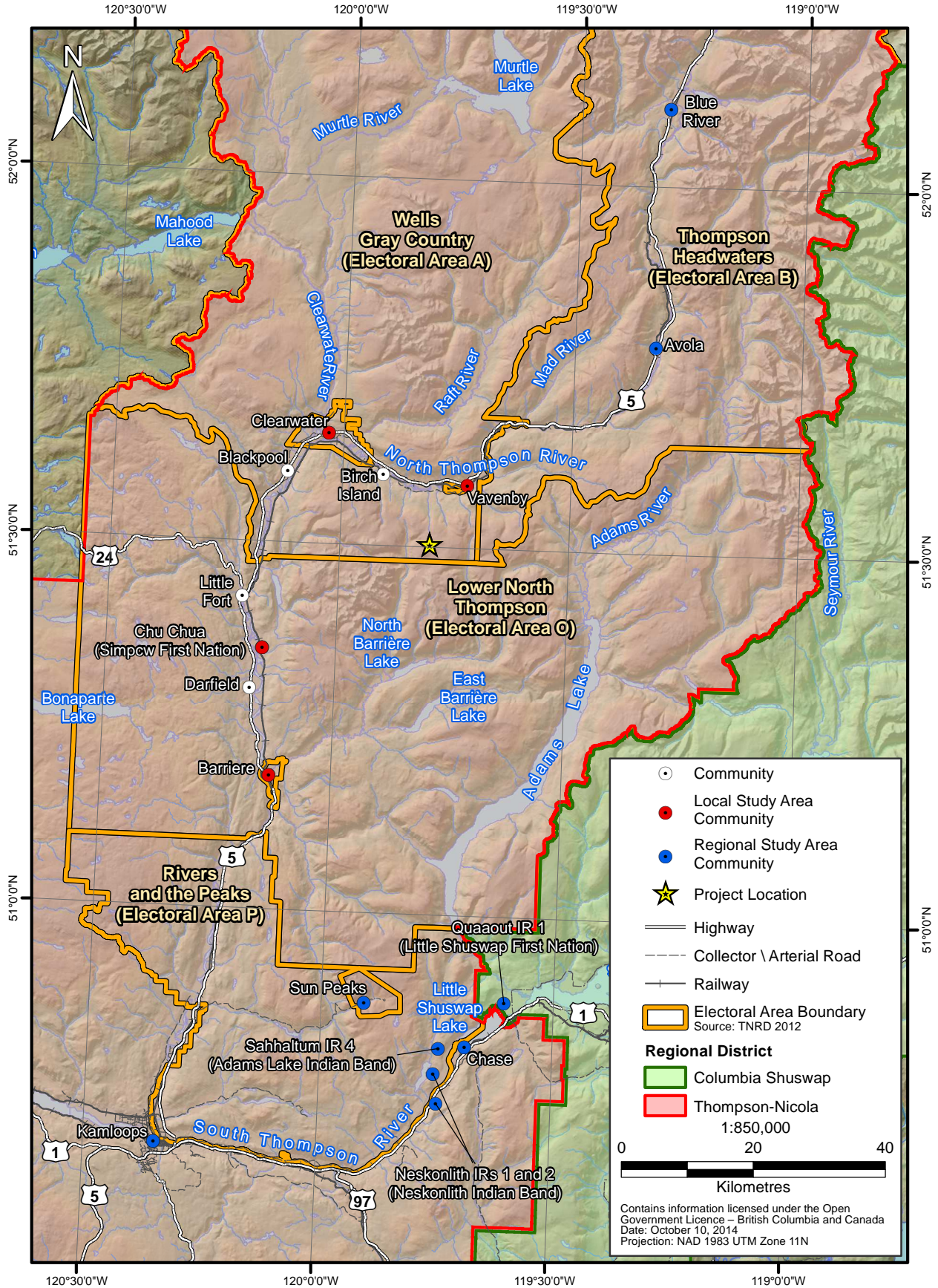
The TNRD has historically experienced significant swings in economic growth and employment in resource sectors, namely mining, forestry, and cattle-based agriculture (Urban Futures 2012). Mineral exploration and mining was historically important. Tourism has expanded in recent years as forestry contracted. There has been a substantial increase in tourism-based businesses and increasingly the area is recognized as a vacation destination. Wells Gray Provincial Park attracts a large number of visitors, especially in the summer.

#### 17.4.1.1 *District of Barriere*

Barriere is located south of the Project along Highway 5 (Figure 17.1-1), at the confluence of the Barrière and North Thompson rivers. The community was named by French fur traders in 1828, for rocks in the nearby river which posed a barrier to navigation. The District was incorporated as a municipality on December 4, 2007 and has a mayor along with six councillors. The 2011 Census population was 1,773 (Statistics Canada 2011a). Forestry and lumber milling, tourism, and some agriculture have been the economic mainstay of the community. Barriere is also an important service centre to rural areas and small communities in the southern half of the North Thompson Valley, extending from north of Kamloops to Little Fort. The town has an elementary school and a high school, a health care centre, emergency services, recreational facilities, and a wide range of services for both residents and travellers. Barriere is known as the site of the devastating McLure fire of 2003 which burned for 75 days, destroyed 72 houses and nine businesses, and forced the evacuation of 3,000 residents (Kulig et al. 2010).

Figure 17.3-1

Socio-economic Study Area Communities



#### 17.4.1.2 *District of Clearwater*

The Clearwater River was first noted in a journal in 1862 by French fur traders who called the river “Fourche L’eau Clair.” During the early 1930s, families began to homestead around Clearwater and a road to Kamloops was completed in 1932. The population grew as a result of new access to the region. In late 2007, the District of Clearwater was established, which encompasses the community of Clearwater and (as a satellite) the industrial site located immediately west of the main Vavenby residential area. The 2011 Census population was 2,331 (Statistics Canada 2011a). Clearwater has an elected Council comprised of a mayor and six councillors.

Clearwater is the largest community in the North Thompson Valley and is the centre for business and financial and government (educational, health, etc.) services in the area (District of Clearwater 2011a). Today, as well as being the main service centre for residents, the community is an important hub for providing services and supplies to those travelling on Highway 5. Tourism, and specifically eco-tourism, has become increasingly important as Clearwater is considered the “gateway” to Wells Gray Provincial Park. The economy of Clearwater has traditionally been centred on the forest industry, particularly logging, and the railway.

#### 17.4.1.3 *Village of Chase*

Chase is located on Little Shuswap Lake in the mountainous eastern region of the South Thompson River Valley and was established in 1908 following the construction of the Chase Mill (Adams River Lumber Company). Chase was incorporated in 1969 and is located within the TNRD (Village of Chase 2007).

#### 17.4.1.4 *Sun Peaks Resort Municipality*

Sun Peaks Resort Municipality is governed by a mayor and four councillors. It was established in June 2010 and has a year-round population base (approximately 500) as well as 7,000 tourist beds. Within Sun Peaks Resort Municipality, the Sun Peaks Mountain Village has a recreation centre, a day lodge, a golf course, conference facilities, and over 1,500 dwelling units (including nine hotels, 16 townhomes, and 180 single family homes). The construction of the Sun Peaks Mountain Village core was recently completed (Sun Peaks Mountain Municipality n.d.).

#### 17.4.1.5 *Aboriginal Communities*

There are four Aboriginal groups located in the vicinity of the Project, including the ALIB, NIB and LSIB within the RSA, and the SFN within the LSA. These groups represent four of the seventeen First Nations that comprise the Secwepemc Nation. All are members of the Shuswap Nation Tribal Council except LSIB. Provided below is a summary of socio-economic information related to the SFN, ALIB, NIB and LSIB, More detailed socio-economic information for each group is provided in Section 23.5 and [Appendices 23-B](#) and [23-C](#).

#### Simpcw First Nation

The Simpcw has five Indian reserves totalling 1,500.7 ha (AANDC n.d.). The main community is located at North Thompson IR #1 (“Chu Chua”) on the east side of the Thompson River and



Highway 5, 45 km north of Kamloops. As of May 2014, the SFN had 698 registered members, nearly 65% of whom live off-reserve (AANDC 2014d; Simpcw First Nation 2014). The Simpcw traditional territory encompasses approximately 5,000,000 ha in the North Thompson Region, from north of McLure to the headwaters of the Fraser River near McBride, to Tete Jeune Cache, to Jasper and south to the headwaters of the Athabasca River (Simpcw First Nation 2014).

The SFN is governed by a chief and five councillors under a custom electoral system. Elections are held every three years and the next election will occur in May 2015 (AANDC 2014d).

#### Adams Lake Indian Band

The ALIB (Sexqeltqín) is a member of the Shuswap Nation Tribal Council and has seven Indian reserves. The main community is located at Sahhaltkum IR#4 on the north side of the Thompson River adjacent to the village of Chase at the mouth of Little Shuswap Lake. As of May 2014, the ALIB had a population of 760 people; 45% of whom reside off-reserve (AANDC 2014a).

The ALIB is governed by the custom electoral system consisting of a chief and five councillors elected for a three-year term. The next election will be held in February 2015 (AANDC 2014a).

#### Neskonlith Indian Band

The NIB has three Indian reserves including Neskonlith IRs#1 and 2, on either side of the lower Thompson River, and Switsemalph IR#3. The first two reserves have been amalgamated and now form the NIB's main community. As of May 2014, the NIB had a population of 649 people; more than 50% the Neskonlith members live off-reserve (AANDC 2014c).

The NIB is governed by the custom electoral system and a Band Council which consists of a chief and six councillors elected for a three-year term. The next election will be held in January 2015 (AANDC 2014c).

#### Little Shuswap Indian Band

The LSIB has five Indian reserves located near Chase BC, including Quaaout IR#1, Chum Creek IR#2, Meadow Creek IR#3, Scotch Creek IR#4, and North Bay IR#5. The main community resides on Quaaout IR#1, the largest reserve. The LSIB has 337 registered members, approximately 50% of whom reside off-reserve (AANDC 2014b).

The LSIB is governed by a custom electoral system; there is a chief and one councillor. The next election for Chief will be held in 2017 and the next election for councillor will be held in 2016 (AANDC 2014b).

The LSIB is not affiliated with a tribal council or treaty group. It participates in independent discussions with the Government of British Columbia outside of the treaty process (AANDC 2014a).

#### *17.4.1.6 Unincorporated Communities*

The TNRD encompasses several unincorporated communities, including, Birch Island, Blackpool, Upper Clearwater Valley, and Vavenby (in Electoral Area A); Blue River and Avola (in Electoral

Area B); and Little Fort and Darfield (in Electoral Area O). Electoral Areas A and B and the District of Clearwater are commonly referred to as the Upper North Thompson, while Electoral Areas O and P and the District of Barriere are known as the Lower North Thompson (Figure 17.3-1).

### Birch Island

Birch Island is a small residential community in Electoral Area A. It is located off of Highway 5 about 19 km southwest of Vavenby, and has a population of about 250 (Harper Creek Mining Corp. 2013). The community has a local store, gas station, a campground adjacent to the North Thompson River, and farms. The majority of Birch Island's residents are either retired, have home businesses, or commute to work in Clearwater. A one-lane concrete bridge over the North Thompson River from Vavenby provides access to the southern portion of Birch Island, connecting to Birch Island-Lost Creek Road.

### Blackpool

Blackpool borders on the District of Clearwater on the east and North Thompson River Provincial Park on the west. The community consists primarily of small farming properties with clusters of houses located between the North Thompson River and Highway 5. It has a community hall, a golf course, and three trailer courts. The provincial park includes a campground and is situated at the confluence of the Clearwater and North Thompson Rivers. Blackpool is within Electoral Area A and has a population of approximately 550 (Harper Creek Mining Corp. 2013).

### Upper Clearwater Valley

The Upper Clearwater Valley is a dispersed rural settlement in Electoral Area A along the main access road, extending some 36 km between Highway 5 at Clearwater and the main entrance to Wells Gray Provincial Park. The population, estimated to number up to 300, live in country residences and acreages (Harper Creek Mining Corp. 2013). There are rental cottages, bed and breakfasts, and a guest ranch, as well as facilities belonging to outdoor recreation businesses. Nearby attractions include the Trophy Meadows Trail, which is renowned for its views of wildflower meadows.

### Vavenby

Vavenby is the closest community to the Project, located 27 km east of Clearwater. The community was the end of the line for steamboats which plied the North Thompson River from Kamloops. These boats stopped operating in about 1914 when the Canadian National Railway (CNR) was completed. The community is sited on both sides of the North Thompson River and is joined together by a one-lane wooden bridge. Interviewees estimated the mid-2011 population at about 400, pending a resumption of mill operations in September 2011 (Harper Creek Mining Corp. 2013). Vavenby is in Electoral Area A; however, the present industrial site comprising the Canfor mill and the area of the former Weyerhaeuser mill is a satellite of the District of Clearwater.

At the west end of the community is an industrial site where the present Canfor mill is situated, and where Weyerhaeuser formerly operated a sawmill until 2003. Until the mill closed in the summer of 2009, Canfor was the primary employer in the community. The company employed approximately

200 people in the mill, in contract logging, or in the trucking industry. There are a number of cattle and sheep ranching operations in the area, with further details found in Chapter 18, Commercial and Non-commercial Land Use Effects Assessment.

The community has a general store, a liquor outlet, a gas station, a community club and recreation Centre, a church, and an elementary school with kindergarten to grade 3 classes. Several tourism operators offer horseback riding and trail rides on a working cattle ranch and a heritage sheep ranch offers a wide variety of tours and farm holidays.

### Avola

Avola has a population of about 50 people, and is located 43 km south of Blue River and 19 km north of Vavenby, in Electoral Area B (Harper Creek Mining Corp. 2013). It is situated on Highway 5 and alongside the CNR mainline and the North Thompson River. Its population grew with a forestry camp and two sawmills, a rail station and, subsequently, highway traffic. The local economy is currently focused on providing highway-related services and recreational activities such as sport fishing and dog sledding.

### Blue River

Blue River is the northernmost community in the RSA, approximately 62 km north of Vavenby, in Electoral Area B. It is surrounded by the Monashee and Cariboo Mountain ranges which rise from the North Thompson River Valley to over 3,000 metres. Highway 5 and the CNR mainline pass through the community. Non-Aboriginal trappers first settled in the area around 1890. By the time the CNR mainline was finished, a small community with a store and hotel were established. In recent times the community has provided important highway-related and tourism services and has become internationally known for deep powder heli-skiing. Facilities include the Mike Wiegele Helicopter Skiing resort, four motels, gas stations, and a restaurant. The year-round population of about 200 grows to almost 400 during the winter season (Harper Creek Mining Corp. 2013).

### Little Fort

Little Fort is situated on the west bank of the North Thompson River, 31 km south of Clearwater and 58 km from Vavenby. Located at the junction of Highway 24 and Highway 5, the community has been referred to as the “Hub of the North Thompson.” It was named for a small fort on the east side of the North Thompson River which was established in the 1840s as a stopping point on the Hudson’s Bay Company Brigade Trail from the Cariboo to Kamloops. The economy of Little Fort is made up of businesses which rely heavily on highway traffic, together with nearby hay and cattle farms, guest ranches, and fishing resorts. Little Fort is in Electoral Area O and has a population of about 350 (Harper Creek Mining Corp. 2013).

### Darfield

Darfield is a small rural residential community made up of farms, ranches, and small acreages situated along either side of Highway 5, halfway between Little Fort and Barriere in Electoral Area O. Residents rely primarily on Barriere for services. Children are bussed to school in Barriere.

## 17.4.2 Baseline Studies

Socio-economic baseline studies included:

- Baseline data collected between June and December 2011 with statistical updates in March 2013 (Laurie McNeil and Associates; Harper Creek Mining Corp. 2013).
- Updated socio-economic statistics as presented in Section 17.4.3, Existing Conditions, and [Appendix 17-A](#), from May through June 2014 (ERM Consultants Canada).

A discussion of the data sources and methods for both studies are described below.

Baseline data collection conducted between June and December 2011 and March 2013 relied on two principal methods: collection and analysis of secondary documentation and subject matter expert interviews. Laurie McNeil and Associates carried out interviews to validate desktop research and assist with identification of issues, definition of study area boundaries, and selection of VCs. Altogether, 79 subject matter experts in the RSA communities, as well as in Kamloops (the latter with Regional District, Interior Health Authority [IHA] and other provincial government representatives), were interviewed between June and November 2011.

Subject matter experts were chosen on the basis of special knowledge of the RSA gained through their professional responsibilities, length of residence in the area, and familiarity with resource development issues. Such individuals were broadly representative of key stakeholder groups and included representatives of all levels of government, and chambers of commerce and economic development and special interest groups.

Interviews were semi-structured in format and were mostly conducted face-to-face in the RSA. Interviews generally took the form of conversations guided by a small number of questions. Important insights were also gleaned from attendance at the HCMC/BC EAO open house held in Clearwater on June 1, 2011.

Key secondary data sources used between June 2011 and March 2013 included recent census materials, surveys, and reports prepared by regional, provincial, and federal levels of government. Examples of these are the Statistics Canada 2006 Census Profiles (Statistics Canada 2007), the BC Stats website (notably the Socio Economic Profiles available at BC Stats (BC Stats 2010a), the TNRD and community-specific websites, local newspapers, OCPs, economic development plans/strategies, and community reports.

Information was also obtained from the March 2011 report completed by the Community Development Institute at the University of Northern BC, entitled *A Community for People of all Ages and Stages of Life: District of Clearwater Community Economic Development Plan* (UNBC 2011), and the April 2009 Community Profiles for Clearwater and the Upper North Thompson Valley, and for the Lower North Thompson (Community Futures Thompson Country 2009a, 2009c).

Additional secondary data was collected by ERM Consultants Canada Ltd. (ERM), including 2011 Census and National Household Survey data which is provided in [Appendix 17-A](#). Table 17.4-1 outlines the key indicators and data sources used to update socio-economic information.

**Table 17.4-1. Secondary Information and Data Sources**

Indicators*	Sources
<ul style="list-style-type: none"> <li>• Aboriginal identity population</li> <li>• Age</li> <li>• Gender</li> <li>• Language</li> <li>• Cultural identity</li> <li>• Migration</li> </ul>	<ul style="list-style-type: none"> <li>• Statistics Canada Census Profile (2006, 2011)</li> <li>• Statistics Canada Aboriginal Population Profile (2006)</li> <li>• Statistics Canada National Household Survey (NHS) Aboriginal Population Profiles (2011)</li> <li>• Aboriginal Affairs and Northern Development Canada (AANDC): First Nation Profiles (2012)</li> <li>• BC Stats website: Population Estimates (2012), Socio-economic Profiles (2013)</li> <li>• Regional District websites</li> <li>• Local government websites (Terrace, Smithers, etc.)</li> </ul>
<ul style="list-style-type: none"> <li>• Educational attainment, skill level and training</li> <li>• Access to education facilities and programs</li> </ul>	<ul style="list-style-type: none"> <li>• Statistics Canada Census Profile (2006, 2011)</li> <li>• National Household Survey (2011)</li> <li>• Northwest Community College website</li> <li>• BC Stats website (College Region)</li> </ul>
<ul style="list-style-type: none"> <li>• Housing availability and conditions</li> <li>• Accessibility to and quality of local and regional infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Statistics Canada Census Profile (2006, 2011)</li> <li>• Statistics Canada Aboriginal Population Profile (2006)</li> <li>• National Household Survey (2011)</li> <li>• Local government websites</li> </ul>
<ul style="list-style-type: none"> <li>• Provision of emergency services</li> <li>• Provision of health care facilities and services</li> <li>• Provision of social services</li> </ul>	<ul style="list-style-type: none"> <li>• BC Stats website (Indicators of Crime, Socio-economic Profiles)</li> <li>• HealthLinkBC website</li> <li>• Canada Health website</li> </ul>
<ul style="list-style-type: none"> <li>• Community well-being index</li> <li>• Indicators of population's general health</li> <li>• Crime rates and types</li> <li>• Prevalence of substance misuse</li> </ul>	<ul style="list-style-type: none"> <li>• BC Stats website: Socio-economic Profiles (2013)</li> <li>• BC Stats website: Indicators of Crime (2009)</li> <li>• Statistics Canada Low Income Cut-Offs, Market Basket Measures, and Low Income Measures (2010-2011)</li> </ul>

\* The availability of information varies and may not be available for all communities in the LSA.

A number of data limitations must be noted relative to data collected by Laurie McNeil and Associates (Harper Creek Mining Corp. 2013) and by ERM in 2014. These limitations relative to Census data are summarized as follows.

- Reliable population estimates are unavailable for unincorporated communities. Numbers used in this chapter are based on estimates provided by interviewees, as well as data obtained from community-based websites providing population estimates.
- With respect to reliability and completeness, tabulations of census information reflect Statistics Canada conventions on rounding and suppression of small numbers for the protection of privacy.
- ERM has provided information at the community level, as available. Where information is unavailable at the community level, larger areas such as Electoral Areas are utilized to

provide context as to the socio-economic characteristics of the area and communities relevant to the Project. Regional-level information is also presented for the TNRD and BC.

National Household Survey (NHS) data were collected by Statistics Canada in 2011 and are presented herein. This data is characterized by a Global Non-response Rate (GNR) which is used as an indicator of data quality and combines complete non-response (household) and partial non-response (question) into a single rate. Statistics Canada indicates that a smaller GNR indicates a lower risk of non-response bias and as a result, lower risk of inaccuracy. The threshold used for estimates' suppression is a GNR of 50% or more. That is, data for communities with a GNR higher than 50% is suppressed by Statistics Canada as it is not considered to be representative of that population. GNR rates for study area communities are summarized in Table 17.4-2.

### 17.4.3 Existing Conditions

This section summarizes community population and demographics; community infrastructure, services, and housing; education, skills development, and training; and community well-being. Detailed information is provided in [Appendix 17-A](#), Socio-economic Baseline Data.

**Table 17.4-2. Global Non-Response Rates of Study Area Communities**

Community/Area	GNR	Community/Area	GNR
Clearwater District Municipality	46.4%	Sun Peaks Mountain Village	48.1%
Barriere District Municipality	Suppressed	Chase Village	45.0%
Simpcw First Nation	20.8%	Kamloops	26.8%
Wells Gray Country	47.3%	Thompson Headwaters	Suppressed
Lower North Thompson	Suppressed	Adams Lake First Nation	22.9%
		Little Shuswap First Nation	34.4%
		Neskonlith Indian Band	24.1%
		Rivers and the Peaks	33.5%

Source: Statistics Canada (2011c)

#### 17.4.3.1 Population and Demographics

##### Population Change within the Regional Study Area and Local Study Area

The population of the North Thompson has experienced some decline in population in recent decades. Rural population losses have been a reflection of contracting local economies, especially where these have been tied to the forestry sector, re-organization of government offices, and staff reductions in sectors such as rail transportation. However, the results of the 2011 Census show that most communities within the RSA increased in population between 2006 to 2011 (Table 17.4-3; Statistics Canada 2011a).

**Table 17.4-3. Population Change within the Regional Study Area**

	2006	2011	% Change
Sun Peaks Mountain Village <sup>1</sup>	426	371	-13%
Chase Village	2,409	2,495	4%
Thompson Headwaters <sup>2</sup>	269	283	5%
Adams Lake Indian Band <sup>3</sup>	310	320	3%
Little Shuswap Indian Band <sup>4</sup>	345	379	10%
Neskonlith Indian Band	206	237	15%
Rivers and the Peaks <sup>5</sup>	4,081	3,620	-11%
City of Kamloops	80,379	85,678	6.6%
Province of British Columbia	4,113,487	4,400,057	7.0%

Sources: Statistics Canada

Notes:

- <sup>1</sup> Sun Peaks Resort Municipality was formed in 2010; prior to that it was included in Rivers and the Peaks (Electoral Area P). For 2011, data for Electoral Area P do not include the data for the Sun Peaks Mountain Village.
- <sup>2</sup> Statistics Canada refers to Thompson Headwaters as Thompson Nicola Electoral Area B.
- <sup>3</sup> Statistics Canada refers to Adams Lake Indian Band as Sahhalkum 4, IR#4.
- <sup>4</sup> Statistics Canada data for Quaaout 1, IR#1, Chum Creek 2, IR#1, Scotch Creek 4, IR#4, and North Bay 5, IR#5 have been compiled to represent the Little Shuswap Indian Band.
- <sup>5</sup> Statistics Canada refers to the Rivers and the Peaks as Thompson Nicola Electoral Area P.

The community nearest to the Project is Vavenby, located approximately 10 km north of the Project; it has approximately 700 residents (Invest in Thompson-Nicola 2014). Table 17.4-4 shows the population change within the LSA between 2006 and 2011. Over this period, there was a notable population increase in the District of Barriere (24%) but the area also experienced overall population decline in Wells Gray Country and Lower North Thompson (Statistics Canada 2011a).

**Table 17.4-4. Population Change within the Local Study Area, 2006 to 2011<sup>1</sup>**

	2006	2011	% Change
Barriere District Municipality	1,432	1,773	24%
Clearwater District Municipality	2,225	2,331	5%
Simpcw First Nation <sup>2</sup>	236	252	7%
Wells Gray Country <sup>3</sup>	1,672	1,536	-8%
Lower North Thompson <sup>4</sup>	1,546	1,335	-14%
TNRD	122,286	122,286	5.1%

Sources: Statistics Canada (2006, 2011a)

Notes:

- <sup>1</sup> Statistics Canada has revised the 2006 populations for Electoral Areas A and O as previously these areas included the District Municipalities of Barriere and Clearwater, respectively. In the 2011 census, population for the District Municipalities of Barriere and Clearwater is provided as separate from the electoral areas. The 2006 population data was updated to reflect this change.
- <sup>2</sup> Data provided for Simpcw First Nation represents the community at North Thompson 1, IR#1 as reported by Statistics Canada.
- <sup>3</sup> Statistics Canada refers to Wells Gray Country as Thompson Nicola Electoral Area A.
- <sup>4</sup> Statistics Canada refers to Lower North Thompson as Thompson Nicola Electoral Area O.

### Aboriginal Population within the Regional Study Area and Local Study Area

In 2011, approximately 11.5% of the TNRD's population were of Aboriginal identity, as compared to 5.4% provincially (Statistics Canada 2011a). For Wells Gray Country and River and the Peaks, the Aboriginal population represented approximately 9.9 and 11.4%, respectively (Statistics Canada 2011a). Expectedly, the majority of the population of SFN, ALIB, NIB and LSIB identify as Aboriginal (see [Appendix 17-A](#), Table A.1).

### Age and Gender

Age characteristics of RSA communities vary. Chase Village, Thompson Headwaters, and River and the Peaks have older populations in comparison to Kamloops and BC. The populations of SFN, NIB and LSIB are notably younger than the population of Kamloops and BC (see Table A.4, [Appendix 17-A](#)).

Similarly, the LSA is characterized by older populations and a median age that is approximately 10 years older in comparison to BC (41.9 years; see [Appendix 17-A](#), Table A.5). The median age within the District Municipalities of Clearwater and Barriere are also high (45.6 and 52.1 years, respectively) in comparison to the average for the TNRD (44.0 years). The SFN has the youngest population within the LSA (24% under 15 years of age; see Table A.5, [Appendix 17-A](#); Statistics Canada 2011a).

Communities and areas within the RSA tend to have slightly more males than females. This trend contradicts the male to female ratio observed in both Kamloops and BC (see Table A.6, [Appendix 17-A](#)). Male to female ratios within communities and areas in the LSA are more balanced (see Table A.7, [Appendix 17-A](#); Statistics Canada 2011a).

### Forecasted Population Change

According to the sub-provincial population projections available for up to 2036 (see [Appendix 17-A](#), Table A.8), the population for the North Thompson Local Health Authority (LHA) Region is expected to gradually increase. For the period of 2015 to 2035, the population is expected to increase by 5.1% (BC Stats 2013). Further detail is provided in [Appendix 17-A](#).

#### *17.4.3.2 Regional Economic Trends*

The following sections provide a summary of regional economic trends in the following sectors: forestry, tourism, agriculture, mining, energy, construction, and the public sector. The section also provides some insights as to future economic trends.

### Forestry

Forestry remains an important aspect of the economy within the RSA and has been a driving force since the 1990s (District of Clearwater 2011b). In recent years, a number of economic conditions (e.g., reductions in the United States' demand for lumber and the mountain pine beetle epidemic) have affected the forestry industry. As of late 2011, following the Tolko and Weyerhaeuser mill closures in 2003, there were only two industrial-scale sawmills operating in the North Thompson (Harper Creek Mining Corp. 2013). In July 2009, the Canfor mill in Vavenby shut down temporarily



and subsequently underwent a \$27 million facility upgrade. The mill was reopened in September 2011 with a smaller workforce (D. Thiessen, pers. comm.; Harper Creek Mining Corp. 2013). In 2014, forestry remains the primary industry in Vavenby with a large portion of its residents working for the Weyerhaeuser or Slocan lumber mills (North Thompson Valley 2014). Further information relative to forestry interests is contained in Chapter 18, Commercial and Non-Commercial Land Use.

### Tourism

Since 2003, there has been increased focus on tourism in the Upper North Thompson area including the development of Tourism Wells Gray, a destination marketing organization in Clearwater. Tourism Wells Gray has commissioned studies to determine whether Wells Gray Provincial Park can attain UNESCO World Heritage Site status and Geopark status (H. Steere, pers. comm.; Harper Creek Mining Corp. 2013). Tourism Wells Gray estimates that 100,000 people visit Wells Gray Provincial Park between May and October each year, and about half of all visitors are from Europe (H. Steere, pers. comm.; Harper Creek Mining Corp. 2013). Recreation activities in the park include a wide range of all-season outdoor sports, alpine hiking and skiing, white water rafting, river trips, wildlife viewing, mountain biking, fishing and photography. There are 67 tourism-related small businesses supporting activities within the park (T. Briggs, pers. comm.; Harper Creek Mining Corp. 2013).

### Agriculture

Ranching is an economic contributor in the North Thompson Valley. Barriere is a ranching community and there is an abattoir in Lower North Thompson. The Mitchell Ranch runs approximately 300 head of cattle bordering the northern end of the Project Site on the North Thompson River within the LSA (Harper Creek Mining Corp. 2013). Further details on ranching interests are provided in Chapter 18, Commercial and Non-commercial Land Use Effects Assessment.

### Mineral Exploration and Mining

HCMC operates an office and core storage area in the residential section of Vavenby and has an exploration camp approximately 2 km south of Vavenby on the Jones Creek Forest Service Road (FSR). However, the exploration camp is currently not operating. This camp comprises trailers and has accommodation capacity for 38, as well as dining facilities. In mid-2011, HCMC's exploration and development program involved over 20 on-site staff and contractors and between 25 and 30 drillers (C. Naas, pers. comm.).

Other mineral exploration and mining in the region includes a proposed underground lead-zinc project (the Ruddock Creek property) proposed by Imperial Metals Corporation which acquired Selkirk Metals Corp. in 2009 (Imperial Metals 2009). The Ruddock Creek project is located southeast and 2.5 hours by road from Blue River and has an estimated capital cost of \$100 million (BC Ministry of Jobs Tourism and Innovation 2011) and it is currently in the environmental assessment process. If approvals are granted and the mine is built, workers will be housed at an on-site camp during both construction and operations (Harper Creek Mining Corp. 2013).

Within the RSA, Commerce Resources is exploring for rare earth minerals in the Blue River area. Other mineral exploration projects include: the Newmac Resources molybdenum-tungsten-gold property near Little Fort (called the Crazy Fox Mine); the International Ranger Corp. Foghorn

Polymetallic project (up to 2009, known as the Rexpar Foghorn uranium project) close to Birch Island; and the Reva Resources Corp. (formerly Minnova Inc.) Chu Chua Massive Sulphide Deposit, northeast of Barriere (Harper Creek Mining Corp. 2013).

Within the RSA, the Samatosum gold mine at Johnson Lake, 40 km east of Barriere, began operations in 1989 and closed in 1992. The operation was short-lived due to the presence of arsenic in the deposit; reclamation at the site began in 1996 and is continuing (C. Hannigan and T. Buchanan, pers. comm.; Harper Creek Mining Corp. 2013).

### Energy

Kinder Morgan operates the 1,150-km heavy oil Trans Mountain Pipeline between Edmonton and Burnaby, which was built in 1953. The pipeline passes through the RSA and is roughly parallel to Highway 5. Kinder Morgan has applied to the National Energy Board to expand the capacity of the pipeline. In 2011, TransAlta Utilities completed construction of a \$49 million run-of-the-river hydro-electric facility at Bone Creek, near Blue River (Harper Creek Mining Corp. 2013).

### Construction

The RSA maintains an active construction industry, with most building projects taking place in the residential and public sectors. Examples of recent or ongoing public sector projects are upgrades to community water systems in Blue River, Vavenby, and Darfield, and improvements to Highway 5. Borrow Enterprises, a heavy equipment and construction company, is one of several such companies in the Clearwater area. A number of contractors were engaged in Canfor's mill upgrading project and HCMC's exploration and development program in the Vavenby area. CNR is continuing to make efficiency improvements to the mainline passing through the North Thompson Valley (Harper Creek Mining Corp. 2013).

### Public Sector

Public sector employment comprises the second most important source of basic community income in the North Thompson (BC Stats 2009). Public sector employers include municipal, Aboriginal, provincial, and federal governments. Government downsizing has included: 1) the closure of the Bear Creek minimum security prison, 2) closures and downsizing of forestry operations, 3) closure of schools, and 4) downsizing of the provincial Ministry of Social Services and Housing (Harper Creek Mining Corp. 2013). Each of these events has resulted in the loss of regional employment.

### Forecasted Change in Economic Activity

There is an absence of reliable forecasting for economic activity in the RSA. As of late 2011, economic prospects in the North Thompson were linked to the re-commencement of operations at the Vavenby Canfor mill, and to a return to growth in the tourism sector (Harper Creek Mining Corp. 2013).

There are few studies that analyze the economic impact of specific economic sectors on the provincial economy. There is some research documenting the economic contributions of the mining industry to BC's economy which notes the estimated economic impacts of the mining industry

indicate that each dollar spent by the mining industry generates \$1.73 (Mining Association of British Columbia 2011b; PWC 2014).

### 17.4.3.3 Labour Force and Economy

The following section describes the labour force and economy in the socio-economic RSA and LSA and includes comparative provincial information to provide context. Specifically, labour force participation and experience, income, and business are explored.

#### Labour Force

The potential labour force (i.e., 15 years of age and older) within the RSA was approximately 4,000 in 2011 (Statistics Canada 2011c). The level of participation in the labour force in most communities and areas within the RSA is lower in comparison to the provincial rate, with the exception of Sun Peaks Mountain Village (Table 17.4-5; Statistics Canada 2011c). In Chase, a notable 51% of residents were not in the labour force in 2011, meaning they were students, had retired, or choose not to work for some other reason. In 2006, the unemployment rate in Rivers and the Peaks (Electoral Area P) was slightly lower (6.4%) than the 2011 rate of 9.3% (Statistics Canada 2011c).

**Table 17.4-5. Participation and Employment Rates in the Regional Study Area, 2011 (National Household Survey)<sup>1</sup>**

Community/Region	Total Population Aged 15 Years and Over	Participation Rate	Employment Rate	Unemployment Rate
Sun Peaks Mountain Village	350	78.7%	73.8%	0.0%
Chase Village	2,145	48.7%	45.9%	5.7%
Thompson Headwaters (Blue River and Avola)	-	-	-	-
Adams Lake Indian Band <sup>2</sup>	235	48.9%	40.4%	13.0%
Little Shuswap Indian Band <sup>3</sup>	185	56.8%	45.9%	19.0%
Neskonlith Indian Band <sup>4</sup>	-	-	-	-
Rivers and the Peaks <sup>5</sup>	3,195	62.4%	56.8%	9.3%
City of Kamloops	70,390	66.4%	60.8%	8.5%
Province of British Columbia	3,646,840	64.6%	59.5%	7.8%

Source: Statistics Canada (2011c)

Notes:

1- Data for Thompson Headwaters and Neskonlith Indian Band is not available for 2011.

2 - Statistics Canada refers to Adams Lake Indian Band as Sahhalkum 4, IR#4.

3- Statistics Canada data for Quaaout 1 IR#1 represents the Little Shuswap Indian Band, as Statistics Canada has suppressed data for Chum Creek, Scotch Creek IR#4, and North Bay IR#5.

4- Data for the Neskonlith Indian Band is not available for 2011.

5- Statistics Canada refers to Rivers and the Peaks as Thompson Nicola Electoral Area P. Data for TN Electoral Area P does not include the data for Sun Peaks Mountain Village but does include the Village of Chase.

Labour force participation within the LSA is, on average, similar to the provincial participation rate (64.6%; Table 19.4-5). The participation rate for Wells Gray Country is somewhat lower (54.8%) in comparison to the province and the TNRD. By comparison, the District Municipality of Clearwater had a higher participation rate in 2011 (61.8%). Unemployment is highest in Simpcw and Wells Gray Country (Table 17.4-6).

### Employment Sectors in the Regional Study Area

The labour force in the RSA communities is varied. In Sun Peaks Mountain Village, almost half of the labour force worked in accommodations and food services and arts, entertainment, or recreation; in Chase Village, however, over two-thirds of the labour force was engaged in the retail and health service industries (Figure 17.4-1). Over one-third of the LSIB's labour force is engaged in the accommodation and food services industry (see [Appendix 17-A](#), Table A.11; Statistics Canada 2011c). In Kamloops, approximately one quarter of the population is engaged in education, health services, and other professional, scientific, and technical services (see [Appendix 17-A](#), Table A.11). Notably, 3% of the labour force resident in Rivers and the Peaks are engaged in mining, quarrying, or oil and gas industries (Statistics Canada 2011c).

**Table 17.4-6. Participation and Employment Rates in the Local Study Area, 2011 (National Household Survey)<sup>1</sup>**

Community/Region	Total Population Aged 15 Years and Over	Participation Rate	Employment Rate	Unemployment Rate
Barriere District Municipality	-	-	-	-
Clearwater District Municipality	2,040	61.8%	52.9%	14.3%
Simpcw First Nation <sup>2</sup>	190	65.8%	50.0%	24.0%
Wells Gray Country <sup>3</sup>	1,295	54.8%	42.9%	21.8%
Lower North Thompson	-	-	-	-
TNRD	106,330	63.4%	57.3%	9.6%

Source: Statistics Canada (2011c)

Notes:

1- Data for Lower North Thompson and the District of Barriere is not available for 2011.

2- Data provided for Simpcw First Nation represents the community at North Thompson 1, IR#1 as reported by Statistics Canada.

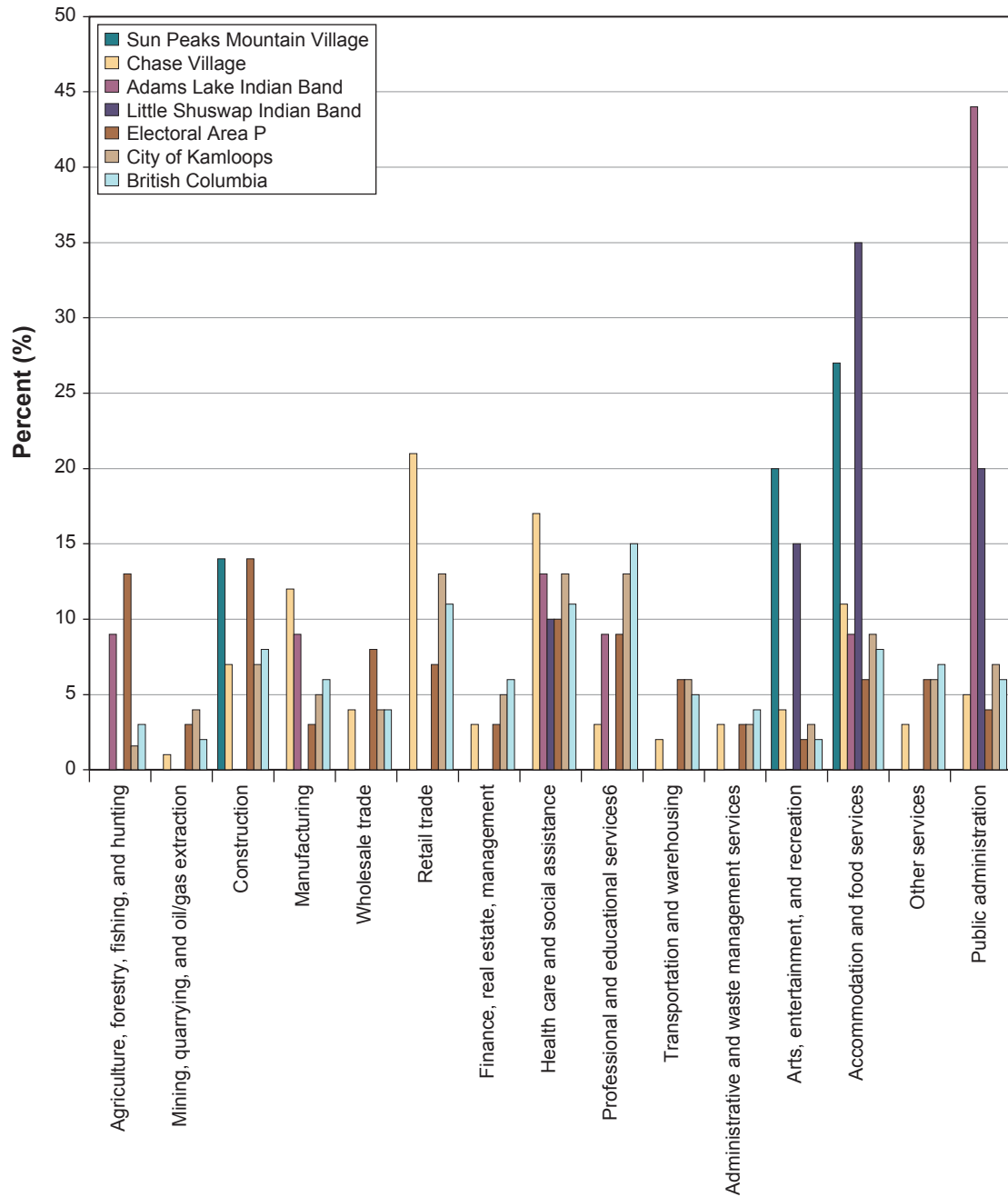
3- Statistics Canada refers to Wells Gray Country as Thompson Nicola Electoral Area A.

Data for TNRD's Electoral Area A does not include the data for the District of Clearwater.

### Employment Sectors in the Local Study Area

The labour force in the District of Clearwater is employed in construction (13%), health care (13%), accommodation and food services (15%) industries, retail trade (10%), and professional and education services (19%; [Appendix 17-A](#), Table A.12; Statistics Canada 2011c).

**Figure 17.4-1**  
**Labour Force Experience**  
**in the Regional Study Area, 2011**



Source: Statistics Canada (2013).

Notes: Data for TN Electoral Area B and Neskonlith Indian Band is not available for 2011.

Like other Aboriginal communities within the RSA, a greater proportion of the SFN's labour force was employed in public administration in comparison to nearby communities (Figure 17.4-2). In 2011, approximately one-fifth (20%) of the Wells Gray Country labour force was engaged in industries related to agriculture, forestry, fishing, and hunting; while retail trade (10%), accommodation, and food services (11%; see [Appendix 17-A](#), Table A.12). Industries related to retail (12%), health care (12%), and professional and education services (12%) employed over a third of the labour force within the TNRD (Statistics Canada 2011c).

### Income

Average and median income is varied within the RSA. Overall, average incomes were on par with BC in 2010, with the exception of the ALIB and Chase Village which were slightly lower. Average family incomes in the RSA ranged from a low of approximately \$65,000 in Chase Village to highs of approximately \$84,000 in Rivers and the Peaks and \$89,000 in Kamloops. In 2010, median incomes in the RSA were consistently higher for males in comparison to females (see [Appendix 17-A](#), Table A.13; Statistics Canada 2011c).

Household income in the LSA communities in 2010 ranged from approximately \$66,000 in Wells Gray Country to approximately \$78,000 in Clearwater, varying only slightly in comparison to provincial household income which was \$71,861 (see [Appendix 17-A](#), Table A.14). In 2010, average incomes in the LSA were slightly lower in comparison to the TNRD (\$37,876) with \$32,720 in Wells Gray Country and \$35,218 in Clearwater (Statistics Canada 2011c).

In comparison to the TNRD, residents of the LSA communities derive a lower portion of their income from employment and a larger portion of their income from government transfer payments such as Canada Pension Plan and Old Age Security pensions (see [Appendix 17-A](#), Table A.16). Other notable trends include higher than average investment incomes in Wells Gray Country and Clearwater District Municipality and higher than average<sup>1</sup> incomes from retirement, pension and annuities in Wells Gray Country (see [Appendix 17-A](#), Table A.16; Statistics Canada 2011c). Further characterization of income in the RSA and LSA is provided in [Appendix 17-A](#).

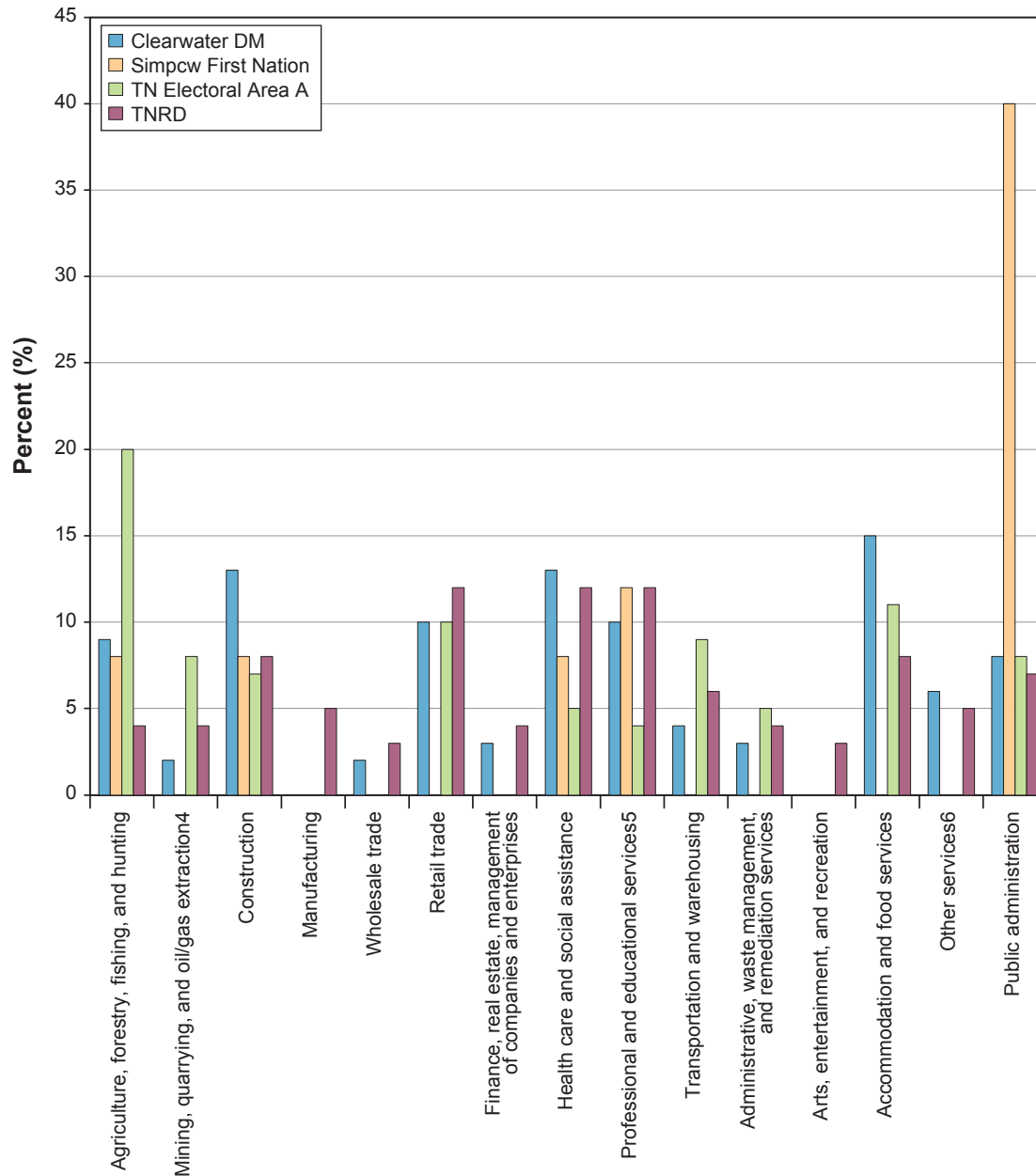
### Forecasted Change in Employment

A report by the Mining Industry Human Resources Council in 2011 warns that even with a projected contraction in mining employment, the mining industry across Canada will have to hire tens of thousands of workers to avoid labour shortages the workforce and the looming retirement of the baby boom generation. In BC, the study foresees the greatest hiring requirements in 2021 occurring in the categories of heavy-equipment operators, production clerks, and truck drivers.

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<sup>1</sup> In comparison to the Thompson Nicola Regional District.

**Figure 17.4-2**  
**Labour Force Experience**  
**in the Local Study Area, 2011**



Source: Statistics Canada (2013).

Notes: Statistics Canada has suppressed the data for the DM of Barrier and TN Electoral Area O for data quality or confidentiality reasons.

A study by BC Stats (BC Stats 2010b) provides a forecast of trades employment to the year 2019 based on the British Columbia Labour Market Scenario Model. The heaviest demand for specific trades in the Thompson-Okanagan Region will be in the categories of carpenters and cabinetmakers, chefs and cooks, heavy equipment operators, machinery and transportation equipment mechanics, other construction trades, and electrical trades and telecommunication. With the exception of chefs and cooks, all of these trades are heavily dominated (i.e., over 90%) by males. With demand pressures for many skilled trades existing across Canada, there appear to be limited opportunities for additional in-migration of skilled trades workers or apprentices to the province. The biggest potential for meeting localized skilled labour shortages is through attracting new entrants into the trades, notably females and Aboriginals (Mining Association of British Columbia 2011a).

#### 17.4.3.4 *Housing and Accommodation*

Housing characteristics in the RSA are fairly consistent with that of the province. The average number of persons per household ranges from two to three and most housing is owned rather than rented (see [Appendix 17-A](#), Table A.17). A notable number of homes require major repair within the Neskonlith Indian Band community. Most people in Rivers and the Peaks, including Chase Village, and Adams Lake Indian Band are home owners (see [Appendix 17-A](#), Table A.17; Statistics Canada 2011c).

Similarly, housing conditions in the LSA are comparable to provincial housing characteristics. The average number of persons per household ranged from 2.2 to 2.6 and the majority of residents are home owners rather than renters. There is a slightly higher portion of multi-family homes in Simpcw First Nation in comparison to the provincial average and other areas and communities within the LSA (Table 17.5-18). There is also a higher proportion (i.e., approximately double) of housing within the LSA that requires major repairs in comparison to the provincial rate (Statistics Canada 2011c).

Housing costs in the RSA varied in 2011, from the highest average value in Sun Peaks Village (\$502,932), which neared the provincial average of \$543,635, to the lowest average value in Chase Village (\$274,758; see [Appendix 17-A](#), Table A.19; Statistics Canada 2011c). Housing values also varied within the LSA in 2011 and were highest in Clearwater (\$445,900) and lowest in Wells Gray Country (\$212,689; see [Appendix 17-A](#), Table A-20). Within the LSA, fewer home owners and tenants spent 30% or more of their income on housing in 2011, in comparison to the RSA.

New home construction within the RSA has declined since 2008 and there is adequate short-term accommodation (e.g., motels, cabins, hotels, guest houses) available to house seasonal employees and tourists ([Appendix 17-A](#); Harper Creek Mining Corp. 2013).

A recent report describing the Clearwater, Wells Gray Country Electoral Area, and the Thompson Headwater Electoral Area, reported a vacancy rate of under 1% in 2009. Average rental costs for a three bedroom home, also in 2009, were estimated between \$800 and \$850 per month (Community Futures Thompson Country 2009b). An internet search for rental housing in Clearwater conducted on September 10, 2014 produced two results for accommodation that ranged from \$800 to \$1,200 per month (Kijiji 2014). A similar search for rental accommodation in Vavenby did not produce any results for rental accommodation.



### 17.4.3.5 *Community Infrastructure*

#### Power, Water, and Sewage

The North Thompson Valley is serviced by the BC Hydro grid system and although there is no natural gas service in the region, propane, electricity, fuel oil, wood and other sources are used to supply heat (L. Groulx, pers. comm.; Harper Creek Mining Corp. 2013). Residents within the districts of Clearwater and Barriere rely on well-based water systems while Blue River, Vavenby, and Avola have piped water systems and Birch Island and Blackpool use privately drilled wells. Sewage services in the RSA are mostly septic systems with the exception of a limited sewage system that services some residents in Clearwater. There is currently no municipal sewer system in the District of Barriere (C. Hannigan, pers. comm.; Harper Creek Mining Corp. 2013).

#### Landfills and Garbage Collection

All of the communities in the RSA, except Birch Island and Blackpool, have curbside collection of solid waste and recyclable materials. Many of the smaller communities, including Vavenby, have solid waste transfer stations. Currently, all recycled materials are transferred to Kamloops. There are landfills in both Clearwater and Barriere (Harper Creek Mining Corp. 2013).

#### Industrial Land

There are approximately 60 acres of privately owned industrial land in the District of Barriere (Harper Creek Mining Corp. 2013). There is one 100-acre partially serviced industrial park in Clearwater with office space available (District of Clearwater 2013a). Industrial zoned land was transferred from the Province to the District of Barriere and the Simpcw First Nation in April 2014. The land transfer fulfills a provincial commitment to support economic development in the North Thompson following the 2003 wildfire. The land transfer includes 116 acres, divided into 13 lots of varying size. Nine lots have been allocated to the District of Barriere, two lots to the Simpcw First Nation, and two lots retained by the BC Ministry of Transportation and Infrastructure (BC MOTI; BC Newsroom 2014).

### 17.4.3.6 *Transportation and Communications*

#### Highway and Road Infrastructure

Within the RSA, the southern section of Highway 5 passes through or near many communities within the vicinity of the Project: McLure, Louis Creek, Barriere, Little Fort, Blackpool, Clearwater, Birch Island, Vavenby, Avola, and Blue River (Figure 17.1-1). It is the main highway between Kamloops in the south and Tête Jaune Cache in the northeast and generally parallels the North Thompson River. Highways are the responsibility of the BC MOTI, with maintenance contracts held by Argo Road Maintenance (Thompson) Inc. (Harper Creek Mining Corp. 2013).

Highway 5 is heavily used by transport trucks carrying a large variety of goods between Edmonton and Vancouver, by local residents who travel between the communities, and by tourists—particularly during the summer months. Peak traffic flows occur between 9:00 a.m. and 3:00 p.m., although many trucks pass through this area at night travelling between Edmonton and Vancouver

(BC Ministry of Transportation and Infrastructure 2011; B. Chenuz, pers. comm.). The results of the Traffic Impact Assessment, including traffic volumes for the Project, are presented in [Appendix 5-E](#).

There are many secondary rural roads and FSRs, some of which require four-wheel-drive capability. Some are used by service and fuel delivery trucks and school buses, as well as by locals and tourists engaged in outdoor recreation. There is a small ferry located at McLure, south of Barriere, that crosses the North Thompson River in the RSA. The ferry operates daily depending on river conditions (Harper Creek Mining Corp. 2013).

### Transportation Services

The Jasper-Kamloops-Vancouver link of the CNR mainline runs parallel to Highway 5 through the North Thompson Valley. There are no scheduled passenger stops in the North Thompson Valley, although Via Rail provides flag stops at Clearwater and Blue River (Harper Creek Mining Corp. 2013).

The closest scheduled air services are provided at the Kamloops Airport. Regular flights are available to Vancouver, Kelowna, Prince George, and Calgary (Kamloops Airport 2014). Blue River has the only airstrip in the North Thompson. Chartered flights and helicopter services regularly use the airstrip during the winter for heli-skiing and during the summer for back country sightseeing and mountaineering (Harper Creek Mining Corp. 2013).

Greyhound Bus Lines provide regular scheduled passenger with stops in Barriere, Little Fort, Clearwater, Vavenby, Avola, and Blue River. A local area transit system provides daily bus service between Clearwater, Blackpool, Birch Island, and Vavenby (Yellowhead Community Services 2011). A bus that operates one day per week is available to take residents of the North Thompson Valley to Kamloops, with priority being given to passengers with medical appointments. Taxi services are available in both Clearwater and Barriere (Harper Creek Mining Corp. 2013).

### School Bus Transportation

The majority of LSA students are bussed to and from school. Students from grades 8 to 12 from Blue River, for example, ride 1.5 hours one way to Clearwater. In June 2011, School District No. 73 transported 275 students daily to Barriere Secondary and Barriere Elementary School. Of the six routes the buses travelled, three utilized the Yellowhead Highway for a portion of their route (School District No. 73 2011).

### Communications

Land line and cellular telephone service is available through much of the RSA, as are internet services. However, cellular coverage is currently lacking along northern stretches of Highway 5 and in the communities of Vavenby, Avola, and Blue River. Telus has proposed construction of a new cellular tower close to Vavenby (Harper Creek Mining Corp. 2013). High-speed internet services are available in Clearwater, Barriere, and their surrounding areas. Effort is being made to improve the quality of high-speed internet service and to extend coverage to all of the RSA communities (Harper Creek Mining Corp. 2013).

### 17.4.3.7 *Government Revenues and Taxes*

#### Government Finances

The creation of two new municipalities in the North Thompson—the District of Clearwater and the District of Barriere—is the most important baseline feature with respect to public administration in the RSA. Responsibilities previously handled by the TNRD have been transferred to the two districts (Harper Creek Mining Corp. 2013). For taxation purposes, the Canfor industrial area at Vavenby has been incorporated into the District of Clearwater. Under an agreement with the District, a portion of Canfor’s property tax payments is set aside in a trust account for use in Vavenby (Harper Creek Mining Corp. 2013).

Municipal taxes are calculated for different property classes on the basis of assessed value (established by BC Assessment) multiplied by the mill rate (set by the District). Data for 2011 indicate major differences between the Districts of Clearwater and Barriere, including tax roll taxable values and residential and total municipal taxes. While residential municipal taxes per capita are similar for Clearwater and Barriere (\$284 versus \$281), total municipal taxes per capita are much greater for Clearwater (\$529 versus \$358). This is a reflection of the make-up of the total assessment or “tax base,” especially that Clearwater’s non-residential properties (the categories of utilities plus major and light industry plus business/other) comprise a larger proportion of the total (16%) than Barriere’s (7%). This characteristic makes it possible for non-residential properties in Clearwater to assume a more prominent share of total taxes or the “tax burden” (46%) than occurs in Barriere (21%; Harper Creek Mining Corp. 2013).

Annual revenues in 2012 were approximately \$4 million in the District of Clearwater (District of Clearwater 2013a) and \$3.4 million in the District of Barriere (District of Barriere 2013). Both the District of Clearwater and the District of Barriere supplement property tax revenues with revenues from a range of other sources, including transfers and grants from senior levels of government. Examples of the latter are funding under the Federal Gas Tax Agreement, and federal and provincial grants in support of fuel management programs.

#### Regional and Community Planning Initiatives

Major planning initiatives have focused on renewal and economic diversification in both the Upper North Thompson and the Lower North Thompson from 2003, spurred by the Weyerhaeuser mill closure in Vavenby and the effects of the McLure fire in Barriere and Louis Creek. The TNRD undertakes regional planning initiatives across the North Thompson (Harper Creek Mining Corp. 2013). For example, the Regional Solid Waste Management Plan (TNRD 2008) was designed to achieve a 30% reduction in waste disposal over three years.

### 17.4.3.8 *Health Services*

#### Medical Services

Communities within the RSA have access to various levels of medical services and health care in Barriere, Clearwater, Blue River, and Chase. Table 17.4-7 highlights the specific health services, facilities, and personnel available within the RSA. For more serious injuries and emergencies,

patients are transferred to the Royal Inland Hospital in Kamloops which provides high-level, specialty medical care. Health facilities and services within the RSA are administered by the IHA (headquartered in Kamloops).

**Table 17.4-7. Type of Health Services Available**

Service	Barriere	Clearwater	Blue River	Chase
Hospital	-	√	-	-
Community Health Centre	√	-	√	√
Number of Doctors	2	2	-	2+1 specialist
Nurse Practitioner	-	-	√	1
Emergency Room	√	√	-	√
Emergency Room Visits (2009/2010)	1,741	3,319	-	6,076
Beds available	0	6	-	0
Hours of Operation	8:00 a.m.-5:00 p.m.	24/7	-	8:00 a.m.-5:00 p.m.
Distance to Nearest Hospital (km)	67 (Kamloops)	124 (Kamloops)	-	58 (Kamloops)
BC Ambulance Service	√	√	-	√
Air Ambulance	√	√	-	√
Lab Services	√	√	-	√
Blood Bank	No	No	-	No
X-ray, Imaging, ECG Services	√	√	-	√
In-hospital Pharmacy	No	-	-	No
Community Pharmacy	√	√	-	√
Extended Care Services	-	√	-	-
Beds	-	19	-	-
Home Care Nursing Services	√	√	√	√
Diabetic Nurse Educator	√	√	-	√
Physiotherapy	No	√	-	No
Occupational Therapy	No	No	-	No
Mental Health and Addictions	√	√	-	√
Outreach Clinic	√	-	-	No
Social Worker	-	√	√	√

Source: Rural Coordination Centre of BC (2014) and Interior Health (2014)

Health facilities in the RSA include the Dr. Helmcken Memorial Hospital in Clearwater, the Barriere and District Health Centre in Barriere, see Table 17.4-8.

**Table 17.4-8. Health Facilities in the Regional Study Area**

Community	Health Centres
Barriere	Barriere Health Centre, Interior Health Simpco Health Centre Barriere Medical Clinic
Clearwater	Dr. Helmcken Memorial Hospital Clearwater Medical Centre Clearwater Health Centre
Blue River	Blue River Health Centre
Chase	Chase Medical Clinic Sexqeltqin Health Centre
Sun Peaks Mountain Village	Sun Peaks Health Centre

Source: Rural Coordination Centre of BC (Rural Coordination Centre of BC 2014).

Dr. Helmcken Hospital serves the area from Blue River to Little Fort and has a staff of approximately 100 and provides 24-hour emergency services.<sup>2</sup> The hospital has 28 beds and an outpatient clinic (District of Clearwater 2013b). As in many rural communities in British Columbia, doctor recruitment and retention has been challenging. At the time of writing there were two full-time doctors and one half-time doctor in the community and efforts were being made to recruit another full-time doctor (B. Easson, pers. comm.; Harper Creek Mining Corp. 2013).

Barriere has a Community Health Centre and after-hours emergency patients are transferred by ambulance to Kamloops, a drive of approximately 45 minutes. Blue River has a nursing outpost that is open on an irregular basis, depending upon staffing; however a nurse is available on call 24 hours/day (B. Easson, pers. comm.). Chase Health Centre is associated with the Chase Wellness Centre and Chase Medical Clinic (including laboratory). The health centre provides an emergency room, walk-in services, blood work, x-ray, nursing, and counselling (Chase 2011).

#### 17.4.3.9 Social Services

Social services include community support services, children and family protection, and early childhood education. Social services of sufficient quality and breadth of coverage are viewed as essential by RSA residents. Yellowhead Community Services (YCS) provides an array of programming for area residents including an Aboriginal sharing centre; services for adults with developmental disabilities; child care programs; programs for children, youth, and parents; women's services; transit (bus shuttle to Kamloops); employment services; and many others.

#### Community Support Services

YCS is a non-profit, charitable organization that develops and delivers an extensive range of social support programs and services to individuals and families in the North Thompson Valley from McLure

<sup>2</sup> 24-hour emergency services vary due to recent lower levels of volumes of patient days and cases (B. Easson, pers. com., July 2011).

to Blue River (Yellowhead Community Services 2011). YCS maintains two offices—one in Clearwater and one in Barriere—and has approximately 43 full- and part-time staff (J. Keough, pers. comm.) that provide employment services, transit services, community support services (e.g., the Bike Shop, Good Food Box, Community Gardens and Kitchens, Literacy Initiatives), Aboriginal Sharing Centre, counselling and early childhood education, and programs for adults with special needs (Yellowhead Community Services 2014). The Clearwater Food Bank also serves the Upper North Thompson Valley from Blue River to Little Fort (S. Joubert, pers. comm.; Harper Creek Mining Corp. 2013).

### Children and Family Protection

The BC Ministry of Children and Family Development provides child, family, and other social services to ensure child protection, prevent abuse, and respond to needs of children and families. These services are provided through a local office in Clearwater and a satellite office in Barriere. Between the offices there are five social workers and a team leader (S. Murray, pers. comm.; Harper Creek Mining Corp. 2013).

YCS also provides prevention and protection services to families and youth in both Barriere and in Clearwater. In July 2011 the counsellor in Barriere had approximately 20 open files and the counselor in Clearwater had between 30 and 40 open files (I. Crick, pers. comm. 2011). The Society delivers a Stopping the Violence program, a Children Who Witness Abuse program, and a Safe Home Service Response program (I. Crick, pers. comm.; Harper Creek Mining Corp. 2013).

### Early Childhood Development

In the North Thompson Valley YCS offers a wide range of early childhood development programs that help build parental capacity to support the healthy development of children to six years of age. Examples of such programs include: Kids Summer Fun Daze, Licenced Group Daycare Services, Parent-Child Mother Goose Program®, Prenatal and Postpartum Home Visiting, and Success by 6.

Another child development program, supported by the Ministry of Education and offered in the North Thompson, is StrongStart BC. There are two StrongStart centres in the North Thompson: one is located at Raft River Elementary School and the other is at the Barriere Elementary School (BC MOE 2011). In Barriere, Interior Community Services (a non-profit social service agency based in Kamloops) also offers early childhood education programs for families and children (Interior Community Services 2011).

### Mental Health Services

The BC Ministry of Children and Family Development has a local office in Clearwater and a satellite office in Barriere; both provide part-time mental health and addiction services (S. Murray, pers. comm.; Harper Creek Mining Corp. 2013). The counsellor in Clearwater serves residents from Blue River to Little Fort. Yellowhead Community Services, which has offices in both Clearwater and Barriere, provides a number of services to area residents including mental health and addictions counselling (Yellowhead Community Services 2014).

### 17.4.3.10 Education

Education and technical training are valued by residents within the North Thompson for their central role in opening up opportunities for employment.

#### Public Schools

Public education from kindergarten to grade 12 in the North Thompson is provided by the Kamloops Thompson School District No. 73. There are six schools within the LSA – four elementary schools and two high schools. Table 17.4-9 shows the location, grades offered, number of students, and each school’s capacity to accommodate additional students. During 2010 to 2011, the schools had a combined student population of 1,018. Except for Raft River Elementary, which is near capacity, all of the schools have space for additional students.

**Table 17.4-9. School Locations and Enrollments, 2010 to 2011**

School	Location	Grades	# of Students	Capacity for Growth
Vavenby Elementary	Vavenby	K-3	91	Yes
Raft River Elementary	Clearwater	K-7	3181	Limited
Clearwater Secondary	Clearwater	8-12	2502	Yes
Barriere Elementary	Barriere	K-7	248	Yes
Barriere Secondary	Barriere	8-12	184	Yes
Blue River Elementary	Blue River	K-7	91	Yes
<b>Total students</b>			<b>1,018</b>	

Sources: <sup>1</sup> M. Bowden, pers. comm.; <sup>2</sup> A. Stel, pers. comm.; BC Ministry of Education, Student Statistics 2010/2011, 2011

School enrollment in LSA schools, as in many rural schools in BC, has declined over the past decade (School District No. 73 2011). Graduation rates at Barriere Secondary School (86%) and Clearwater Secondary School (85%) were higher than the provincial graduation rate (78%) for the 2010/2011 school year. Between 2008 and 2011, graduation rates at Barriere Secondary School remained fairly consistent while rates at Clearwater Secondary School notably improved (see [Appendix 17-A](#), Table A.22).

#### Educational Attainment

Educational attainment in the RSA varies in comparison to provincial education levels (see [Appendix 17-A](#), Table A.23). The portion of the population with a high school certificate within the RSA (29-32%) was generally similar to the provincial rate (28%) with the exceptions of Sun Peaks Village and Rivers and the Peaks, which were notably higher with 36 and 39%, respectively. Similarly, the portion of the population that reported having a trades certificate or diploma was higher in Sun Peaks Village and River and the Peaks (29 and 31%) in comparison to the rest of the province (19%).

Educational attainment within the LSA is in line with that of the TNRD with a few exceptions. In 2011, just less than one quarter of the population did not have a high school diploma; 30 to 40% had a high school diploma; and 39 to 46% had a post-secondary certificate, diploma, or degree. In comparison, half of TNRD residents had a post-secondary certificate, diploma, or degree in 2011

(Statistics Canada 2011c). In comparison to the TNRD, there are higher rates of post-secondary completion within Clearwater and a notable portion of residents with apprenticeship or trades certificates (33%; see [Appendix 17-A](#), Table A.24; Statistics Canada 2011c).

#### 17.4.3.11 *Technical Training*

Given the existing skilled labour shortage, technical training is viewed as extremely important in the region. Further characterization of technical training available in the RSA is provided in [Appendix 17-A](#).

#### Secondary Schools

Industrial training and apprenticeship programs are available at both Clearwater Secondary School and Barriere Secondary School. Students who have completed grade 10 are eligible to apply for work-based training combined with post-secondary education, including a two-way contract between the employer and the apprentice (School District No. 73 2011).

A partnership between School District No. 73 and Thompson Rivers University (TRU) bridges secondary and post-secondary education and training while enhancing transition to the workforce. Entry-level trades training occurs during grade 12 and can be one semester or two semesters in length. Trades training programs that are available include: Heavy Duty Mechanic, Welding - Level C, and Industrial Electrician/ Instrumentation (School District No. 73 2011).

#### Post-secondary Education and Training

There are several post-secondary institutions in the North Thompson and nearby areas that provide certified post-secondary training in academic, technical, and trades programs. In Clearwater, the Community Resource Centre for the North Thompson and TRU provide a variety of post-secondary programs including Adult Basic Education, undergraduate and diploma programs, some trades, apprentice and safety programs (e.g., welding, first aid), and other general interest courses (e.g., basic computer skills). TRU also provides a satellite campus in Barriere which serves residents from McLure to Little Fort (Thompson River University Regional Centres 2013).

In Barriere, a number of local First Nations members have acquired skills relevant to mine employment through Barriere Employment Services. Others have accessed training through the British Columbia Aboriginal Mine Training Association, a Kamloops-based organization (AMTA 2014). Interested students are sometimes referred to the Northwest Community College School of Mining and Exploration located in Smithers and Terrace (Northwest Community College 2014).

#### Employment Services

Currently, regional residents obtain assistance with accessing job readiness and technical training and educational upgrading at Clearwater Employment Services and Barriere Employment Services. Courses include H<sub>2</sub>S Alive, Occupational First Aid, Transportation Endorsement, and Workplace Hazardous Material Information Systems (Harper Creek Mining Corp. 2013).



#### 17.4.3.12 Recreation Facilities and Services

The principal recreational facility in the RSA is the North Thompson Sportsplex in Clearwater, which offers hockey, figure skating, and curling. Clearwater also has a community ski hill, golf course, tennis courts, a skateboard park, ballparks, and a basketball court. Barriere has a golf course, curling rink, ballparks, tennis courts, a bandstand, and district parks (District of Clearwater 2013b).

Parks and recreation areas in the North Thompson area include two provincial parks (Wells Gray Provincial Park and North Thompson Provincial Park), eight district parks, and Dutch Lake Park in the heart of Clearwater. There is a combination of tourism and recreational facilities and multiple outdoor recreational opportunities in the North Thompson (Harper Creek Mining Corp. 2013). Chapter 18, Commercial and Non-commercial Land Use Effects Assessment, details the various outdoor recreational activities, facilities, and uses within the local and regional study areas.

#### 17.4.3.13 Community Well-being

RSA residents report an interest in safeguarding community and family well-being. Statistics on community and family well-being are available from the IHA and other provincial government agencies. For the purpose of this report, community well-being is defined to include health status, health-related behaviours, alcohol consumption, crime and youth crime, child and youth well-being, and volunteerism.

##### Health Status

Life expectancy is a good indicator of a population's general health and the quality of health care available (The Conference Board of Canada 2014). Life expectancy in the North Thompson (LHA 26) is slightly lower (77.9 years) as compared to the TNRD (80.1 years) and BC (82.3 years; BC Stats 2012). In the North Thompson, death as a result of chronic lung disease and motor vehicle accidents occurred more often than expected (Interior Health 2013), whereas death related to diabetes or endocrine nutritional metabolic occurred less than expected. Notably, median age at death in the North Thompson was 66 (Interior Health 2013). In 2011, the leading chronic disease in the North Thompson region was depression/anxiety (see [Appendix 17-A](#), Table A.25; Interior Health 2013).

In the North Thompson in 2011, the infant mortality rate was lower (0) in comparison to BC (3.7) and the potential years of life lost due to suicide or homicide was higher (11.8 years) than BC (4.0; Interior Health 2012). Finally, the majority of North Thompson LHA residents had a regular medical doctor (Interior Health 2013).

##### Health Behaviours

Five indicators that characterize health behaviors are weight, alcohol consumption, smoking, fruit and vegetable consumption, and frequency of physical activity. A higher portion of residents of the Thompson/Caribou are overweight or obese (53.7%) in comparison to the provincial average (46.5%), and a notably high percentage of residents smoke (25.6% in Thompson/Caribou, in comparison to 14.5% provincially). Thompson/Caribou residents also had the highest rate of fruit and vegetable consumption (Statistics Canada 2012). Frequency of alcohol consumption was the highest in the IHA region (20.8%), followed by the Thompson/Caribou Health Region (17.9%), and BC (16.1%; see [Appendix 17-A](#), Table A.27; Harper Creek Mining Corp. 2013).

An individual's perspective on his or her own mental health is an important indicator of personal wellness. In the Thompson Cariboo Shuswap Health Service Area, 68.1% of residents reported their perceived mental health as very good or excellent, close to the levels reported by other residents of BC (71.0%; Harper Creek Mining Corp. 2013).

### Crime and Juvenile Crime

Crime rates in the North Thompson LHA were generally lower than provincial rates (2009 to 2011 average); however, the number of serious crimes per police officer was similar. The serious crime rate for juveniles in the North Thompson was at 0, compared to 3.5 for BC (Table 17.4-10), however, juveniles in the North Thompson were five times more likely to commit a drug offence compared to the provincial average (Interior Health 2012) and serious drug crime offences were higher in the North Thompson (104.0 per 100,000 population) compared to the rest of the province (170.3 per 100,000). Motor vehicle theft (2.5 per 1,000) was lower than the provincial rate of 3.6 (Interior Health 2012; Harper Creek Mining Corp. 2013).

**Table 17.4-10. Serious Crime Rate (Offenses per 1,000 Population), 2009 to 2011 Average**

Average 2009-2011	Serious Crime Rate		Serious Juvenile (Age 12-17) Crime Rate		Change in Serious Crime Rate (2006/08-2009/11)	
	North Thompson	BC	North Thompson	BC	North Thompson	BC
Violent	1.4	3.1	0.0	2.3	-35.1%	-13.1%
Property	6.2	7.0	0.0	1.2	-23.0%	-30.1%
Total Serious	7.7	10.1	0.0	3.5	-25.5%	-25.7%
Number of Serious Crimes per Police Officer	6.9	7.0	-	-	-	-

Notes:

Source: Interior Health (2012)

### Child and Youth Well-being

BC had the highest child poverty rate in Canada in 2011 (18.6%), up from 14.3% in 2010 (Statistics Canada 2011a). Child poverty may be considered less prevalent in the North Thompson as the portion of children and youth receiving income assistance (1.6%) was approximately half of the provincial rate (3.1%) in 2012 (see [Appendix 17-A](#), Table A.29; Interior Health 2012). The incidence of youth receiving income assistance (1.7%) is similar to the rest of the province (1.8%); however, the data indicate that 2.4% of youth in the North Thompson received employment insurance in September of 2012, a rate that is over three times higher than the provincial rate of 0.7% (Interior Health 2012). This trend may be linked to the seasonal nature of regional employment opportunities.

### Poverty

Canada is somewhat unique among developed nations in that it has no official, government mandated, poverty line. Rather, poverty in Canada is defined as the intersection of low-income and other social indicators such as access to adequate housing, essential goods and services, health, community well-being, and community participation (Statistics Canada 2004). To this end, Statistics

Canada employs three measures to show a complete picture of low income in Canada: low income cut-offs (LICOs), low income measures (LIMs), and the market basket measure (MBM). While these measures do not intend to measure poverty, this characterization is useful when considered with other data provided in this setting (housing, community services, and health) and can contribute to a more in-depth understanding of social circumstances within the RSA. Table 17.4-10 characterizes each community as per these three measures.

First, and generally, LICOs represent the income level at which a family must spend a greater proportion of its income on necessities than the average family of similar size. This measure provides a cut-off level for seven family sizes characterized by a variety of community types (e.g., rural areas, census agglomerations, and census metropolitan areas).<sup>3</sup> Within the RSA, most communities fall under the rural areas outside the census metropolitan areas or the census agglomeration category;<sup>4</sup> average household size was 2.4 in the RSA and 2.3 in the LSA. LICO methodology directs analysts to after-tax income.<sup>5</sup> LICO data is calculated for all of Canada (Statistics Canada 2011b).

The LIM allows for international comparisons and is the most commonly used measure of low income. LIM is defined simply as being much lower than the average, specifically one-half the median income of an equivalent household. The MBM calculates the amount of income required for a family to meet its needs, which are defined as relative to the average standard of living or community norms, rather than in terms of bare subsistence. The MBM is calculated by province.

Table 17.4-11 draws on information provided in Sections 17.5.3.4 and 17.5.3.3 which presents the average number of people per household (loosely representing family size) and household income, respectively. Subsequently, the relevant LICO for that family size is provided for comparison. Table 17.4-11 includes only those communities for which income data are available and those for which LICO data are pertinent (e.g., Regional Districts are not included). All LSA and RSA communities and areas are above national LICOs.

LIMs are also measured at the national level and are provided based on market income, before-tax income, and after-tax income. The most recent data available are for 2010 and are based on a family of two as follows: market income: \$26,544, before-tax income: \$30,481, and after-tax income: \$26,825. In comparison to the before and after tax incomes of communities within the LSA and RSA, the LIMs are notably lower. However, like LICOS, LIMs are national measures and may not adequately capture regional differences (e.g., between the Maritimes, the Prairies, and the western provinces). The following considers MBMs which are calculated for each province and may provide greater insight as to the social circumstances of LSA/RSA residents in comparison to their counterparts in other part of the province.

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<sup>3</sup> LICO methodology is not specific at the level of Regional Districts or the province. As such, comparable information for the TNRD or the province is not provided in Table 17.4-10.

<sup>4</sup> Statistics Canada indicates that census agglomerations have populations of at least 10,000.

<sup>5</sup> After-tax income is used as it partially reflects the redistributive impact of Canada's tax transfer system, better characterizing social circumstances and enabling more rigorous comparison between groups.

**Table 17-4-11. Low Income Cut-offs in the Regional Study Area and Local Study Area Communities (2011)**

	Median After-tax Household Income (2010) (Two-or-more Person Households)	Average After-tax Income (2010) (Two-or-more Person Households)	LICO (2011) Two Person Household	LICO (2011) Three Person Household	Above/Below 2011 LICOs
<b>Communities and Areas Defined as Rural Areas for the LICO (&gt; 10,000 Population)</b>					
Sun Peaks Mountain Village	\$49,285	\$59,528			Above
Chase Village	\$55,600	\$58,583			Above
Adams Lake Indian Band	\$36,452	\$44,859			Above
Clearwater DM	\$60,953	\$66,221	\$15,371	\$19,141	Above
Wells Gray Country (Area A)	\$55,084	\$57,828			Above
Rivers and the Peaks (Area P)	\$68,874	\$74,944			Above
<b>Census Agglomeration with between 30,000 and 99,999 Population</b>					
City of Kamloops	\$69,353	\$76,874	\$19,625	\$24,437	Above

*Notes:*

<sup>1</sup> Income data for Thompson Headwaters, Neskonlith Indian Band, Little Shuswap Indian Band, District Municipality of Barriere, Simpcw First Nation, and Lower North Thompson are not available for 2011.

<sup>2</sup> Statistics Canada refers to Adams Lake Indian Band as Sahhalkum 4, and has suppressed income data for Little Shuswap Band.

<sup>3</sup> Data for Wells Gray Country does not include the data for the District of Clearwater. Statistics Canada refers to Wells Gray Country as Electoral Area A.

Statistics Canada provides MBMs for BC for rural areas, areas with less than 30,000 population, areas with 30,000 to 99,999 population, areas with 100,000 to 499,999 population, and Vancouver. The year for which data are most recently available is 2010. MBMs are calculated for a family of two adults and two children. Most communities within the LSA and RSA would be considered rural communities, with the exception of Kamloops which falls in the 30,000 to 99,999 population category. In 2010, the MBM for rural areas in BC was \$29,849, for 30,000 to 99,999 population areas was \$28,973, and for Vancouver the 2010 MBM was \$31,789 (Statistics Canada 2013). As shown in Table 17.4-10 above, residents of communities within the LSA/RSA have before- and after-tax income (2010) that is higher than the 2010 MBM.

Overall, while economic circumstances and unemployment are noted issues in many LSA/RSA communities, most would not be considered impoverished based on the standard measures used in Canada to better understand the social circumstances of various community types and family sizes.

## Law Enforcement

The Royal Canadian Mounted Police (RCMP) detachment in Clearwater is responsible for policing services from Blue River to Little Fort, approximately 20 km west on Highway 24, and throughout Wells Gray Provincial Park. The detachment comprises one sergeant, four constables, and an administrative staff person. As well as serving the resident population of approximately 5,000, the detachment provides service to approximately 100,000 tourists who visit the region annually (Sgt. S. Seib, pers. comm.). According to the RCMP, the closure of the Canfor mill in 2008 resulted in a rise in social stress related to increased alcohol abuse. Alcohol abuse continues to be the major contributing factor in incidents requiring policing services.

Additionally, the Clearwater RCMP detachment houses the Central Interior Traffic Services, which has three employees (C. Newell, pers. comm.), as well as a Victim Services Program that provides services to victims of crime and their families in Clearwater and Barriere. The Program Manager reported there are approximately 6 to 10 open files per month (K. Strickland, pers. comm.).

The RCMP detachment in Barriere oversees a large area from approximately 5 km south of Little Fort, east to the north end of Adams Lake, west to Heffley Creek, and north to Bonaparte Lake. The detachment is staffed by a corporal, three constables, and a public service clerk; in 2010 the detachment processed 1200 files (M. Mucha, pers. comm.). Between January and July 2011, 780 files were opened. General policing issues include impaired driving and domestic assaults, as well as other alcohol and drug-related incidents. Some assistance is provided from the Kamloops Traffic Unit which patrols Highway 5 between Kamloops and Tête Jaune Cache.

The work load for serious crimes per police officer in the North Thompson is slightly lower than the provincial average, with each office handling on average 7.7 serious crimes over the 2007 to 2009 period.

## Fire Protection

Vavenby, Clearwater, Barriere, Little Fort, Blackpool, and Blue River all have volunteer fire departments. The TNRD is working on an assisted aid plan with both the Vavenby and Clearwater fire departments to provide service to Birch Island. The Vavenby Volunteer Fire Department provides services to Vavenby residents. The service area includes the proposed Project Site via the Jones Creek Road. The department is well-equipped with two pumper trucks, a tanker truck, an MSA breathing apparatus, and an imaging camera. Although the department has a core of 12 volunteers, about half of the members work out of town, leaving six members available at any one time (S. Dawson, pers. comm.).

The Clearwater Volunteer Fire Department provides a comprehensive fire prevention and suppression service. The department has a part-time fire chief, a deputy fire chief, captains, two safety officers, and 11 firefighters and is equipped with two engines (pumpers), a bush truck, and two tanker trucks. During 2010, the department attended to 25 incidents including false alarms, grass/brush/timber fires, BC ambulance assists, and motor vehicle accidents (District of Clearwater 2013a).

The Barriere Volunteer Fire Department has 17 volunteer members including a captain. The department is currently in the process of training several first responders. The Little Fort Volunteer

Fire Department has approximately 18 volunteer members who are trained or are undertaking training for Basic First Aid, Live Fighting, and Driver Training (Harper Creek Mining Corp. 2013).

### Emergency Services

In BC, local authorities such as municipalities and regional districts are responsible for planning and operating emergency responses to disasters such as fires, floods, and earthquakes. In the North Thompson Region, the TNRD provides emergency planning. After incorporation, Clearwater and Barriere entered into agreements with the TNRD to continue to manage their Emergency Management Programs. The region and the communities have up-to-date emergency plans which include Emergency Social Services (R. Storie, pers. comm.).

BC Ambulance Service provides public ambulance services in BC under the authority of the Emergency and Health Services Commission of the Ministry of Health. Three ambulance stations are located in the RSA: Clearwater, Barriere, and Blue River (the latter manned only part-time). Rural stations typically have part-time primary care paramedics who may be assisted by Emergency Medical Responders on an on-call, part-time basis. Both stations are operated 24 hours a day and have adequate staff. In more serious situations, trauma patients are transferred to Kamloops, as the Dr. Helmcken Hospital is not a trauma hospital. The Barriere station provides service north to Little Fort; east to the SFN community of Chu Chua; and from Agate Bay Road to Adams Lake and south to Vinsula, which is just north of Kamloops (Harper Creek Mining Corp. 2013).

### Volunteerism

The numbers of community groups and civil society organizations serve as an important indicator of community well-being. Interviews revealed a wide variety of active, volunteer-run, and supported organizations in the North Thompson. The Wells Gray Community Forest Corporation, relies on volunteer time for management, and enables a logging contractor with 11 employees to stay busy (T. Richardson, pers. comm.). The North Thompson Community Foundation is another volunteer-run body which invests in the communities of the North Thompson.

Other volunteer-run organizations include various TNRD advisory committees, community associations, volunteer fire departments, and the YCS (with its various community support programs and special projects). Small businesses are represented by the 70-member Clearwater and District Chamber of Commerce and the 90-member Barriere and District Chamber of Commerce. There is also a variety of service clubs, seniors' societies, sports associations, and churches.

Interviews in Clearwater and Barriere provided insights into the vigorous contributions to community life being made by organizations in each of these categories. Citizen initiatives were instrumental in the recovery of Barriere from the Louis Creek wildfire. Several interviewees in Birch Island and Clearwater spoke about the pivotal role which grass-roots protest and the Yellowhead Ecological Association played in halting the Rexpax Foghorn uranium project in 1978 and precipitating the province-wide moratorium on mining for uranium (Harper Creek Mining Corp. 2013).

The availability of volunteers is dependent to some extent on the health of the local economy. In Vavenby, for example, closure in 2009 of the community's primary employer meant that many people who had lost jobs experienced hardships or left to work elsewhere. During the temporary

closure, it was difficult to find able-bodied volunteers to carry out projects such as improvements at the community park or to operate the volunteer fire department (T. Pennell, pers. comm.).

## 17.5 EFFECTS ASSESSMENT AND MITIGATION

### 17.5.1 Screening and Analyzing Project Effects

The relationship between Project components and activities and potential Project effects is established using an impact matrix. The impact matrix applies a risk-based approach to filter potential effects into low, moderate, or high risk ratings as a result of Project-VC interactions. This process serves to focus the effects assessment on the Project components and activities that are likely to have the most influential effects on each VC, in accordance with the methodology described by BC EAO (2013). The impact matrix results below evaluate the risk of effects on each VC being assessed. When data are lacking, professional judgement is used to inform this evaluation. Attention was given to establishing causal linkages between Project activities and VCs, in order to delineate the associated risks and potential effects. Risk ratings for each of the VCs as to low, moderate, or high risks associated with key activities of interaction are described in Table 17.5-1.

### 17.5.2 Potential Socio-economic Effects

This section identifies the potential effects resulting from interactions between socio-economic VCs and Project components and activities during the four phases of the Project.

#### Community Growth VC

##### Increased Competition for Skilled Labour

During construction and operations, the Project may contribute to increased competition for skilled workers within the RSA due to an increase in the overall demand for workers and the higher wage rates paid by the Project. A forest sector mill owner in Barriere and forest sector workers in Vavenby suggested that people might leave their current jobs to work on the Project to earn higher incomes. Presently, some people living in Clearwater commute approximately 1.5 hours to Teck Resource's Highland Valley Copper mine near Logan Lake to work a 12-hour shift (Section 17.4.3.2). Some of these workers may decide to change jobs to work on the Project in order to reduce their commute time.

Higher than average salaries will be paid to the Project's construction labour force, estimated to be 600 workers. The average labour rate paid to tradespersons, excluding benefits, will be in the order of \$85 per hour (on a work rotation that works out to 100 hours every two weeks). As a group, these individuals will be among the highest paid workers in the North Thompson region.

The average salary paid to direct employees during operations is anticipated to be \$65,000 (excluding benefits), which is above the average employment income of \$35,218 in Clearwater in 2010 (see Section 17.4.3.3 and [Appendix 17-A](#)). In comparison, average incomes in 2010 varied from \$37,876 in the TNRD to \$32,720 in Wells Gray Country (Statistics Canada 2011c).

**Table 17.5-1. Risk Ratings of Project Effects on Socio-economics Valued Components**

Project Component/Activity and Potential Effects	Community Growth	Community Health and Well-being
<b>Construction</b>		
Employment and labour	●	●
Procurement of goods and services	●	
Traffic delivering equipment, materials, and personnel to site		●
<b>Operations 1 and 2</b>		
Employment and labour	●	●
Procurement of goods and services	●	
Traffic delivering equipment, materials, and personnel to site		●
<b>Closure</b>		
Employment and labour	●	●
Procurement of goods and services	●	
Traffic delivering equipment, materials, and personnel to site		●
<b>Post-Closure</b>		
Traffic delivering equipment, materials, and personnel to site		●

*Notes:*

- = Low risk interaction: a negligible to minor adverse effect could occur; no further consideration warranted.
- = Moderate risk interaction: a potential moderate adverse effect could occur; warrants further consideration.
- = High risk interaction: a key interaction resulting in potential significant major adverse effect or significant concern; warrants further consideration.

This effect has the potential to occur during the Construction and Operations phases, and no effects are anticipated during the Closure and Post-Closure phases due to reduced workforce requirements.

#### Loss of a Local Employer

The closure of the Project will result in the loss of an employer in the RSA. The magnitude of this effect will depend on the percentage of the local labour force that become employed by the mine and the level of local contracting. The Project workforce is anticipated to fall at the end of the Operations phase (Year 28). It is expected that much of the decommissioning work will be carried out by some of the operational personnel who will be asked to stay on until closure is completed.

The realization of this effect will depend on other employment opportunities available for skilled workers within the RSA at the time of closure. The mining industry in BC is expected to attract 7,400 new entrants to meet hiring needs of 10,325 by 2022 (Mining Industry Human Resources Council 2012). As such, there is potential for this effect to be minimized due to mining and other industrial projects in BC. An induced effect of losing an employer is a potential decrease in employment



income in the RSA. However, this will depend on available employment alternatives and whether families choose to continue residing within the RSA.

#### Increase in Housing Demand

The Project could cause an increase in housing demand due to people moving to the region to work at the mine, in particular communities situated along Highway 5 from Vavenby to Barriere. As of 2014 there were over 117 listings in Clearwater (REMAX 2014). As noted in Section 17.4.3.4, vacancy rates in Clearwater and surrounding areas are relatively low. The most recent data available (2009) indicate a vacancy rate of less than 1% in Clearwater. In 2011, a new subdivision was under construction in Clearwater and proposals are in hand for developing new subdivisions in both Barriere and Clearwater (I. Hadford, pers. comm.).

It is not expected that workers moving to the area during the Project's Construction phase will place undue stress on the housing supply, resulting in higher housing costs or a more expensive rental market. During the Construction phase, HCMC estimates that approximately 30% of the 600-person workforce will be residents of the North Thompson Valley, with the remainder of the workforce being housed in camp accommodation close to the Project (Harper Creek Mining Corp. 2013). Current housing available in Clearwater will be sufficient to meet demand for workers who are not housed in camp accommodation.

During the Operations phases, there is potential for an increase in housing demand. The Project's average workforce size is anticipated to be 11,248 person years (or approximately 450 jobs) during Project Operations (over 28 years). Approximately 12 to 15% of the workforce is expected to come from the region and the remainder of the workforce will come from other areas of BC. With over 117 houses listed in 2014 for sale in Clearwater and a workforce of approximately 450 (85% anticipated to be from outside the region) seeking housing, demand will likely outweigh the current supply. As noted above, new subdivisions are being planned in Clearwater and Barriere in anticipation of the Project proceeding.

There is potential for increased demand for housing in other communities resulting from an influx of people who perceive there may be opportunities for indirect or induced employment as a result of Project activity. Communities in the North Thompson Valley from Avola to Barriere are within daily commuting distance of the Project.

#### Increased Pressure on Community Infrastructure and Services

**Health Care and Social Services:** There may be an increase in use of community services and infrastructure, including hospitals, health clinics, and health services, due to accidents related to the Project during Construction and Operations, or more generally due to the presence of more workers and their families in the region. This could strain the existing facilities.

The hospital in Clearwater is well equipped and currently underutilized (Harper Creek Mining Corp. 2013). The hospital, built in 2002, is equipped with six acute care beds, and a six stretcher emergency room. It has a staff of approximately 100 people with 2 doctors and provides 24-hour emergency care (Harper Creek Mining Corp. 2013). More serious medical cases arising in the North Thompson are sent to the Royal Inland Hospital in Kamloops.

There may be increased pressure on the health care system and social services from use by Project employees, contractors, and their families. The effect of increased income may trigger increases in the use of alcohol and illicit drugs and gambling, which in turn can result in adverse effects on family relationships resulting in increased demands for counselling services (such as mental health and addiction services). Some RSA residents and health-care providers in interviews expressed concern about the possibility of high-paying jobs leading to increased substance abuse or gambling that might jeopardize the positive potential effects of steady employment and financial security. These behaviours can result in dysfunctional activities such as spousal and child abuse and neglect. Interviews conducted in 2011 revealed that family counselling services in the North Thompson are currently used to capacity, with clients experiencing long wait times to see a counsellor. This effect would primarily be realized in the Operations phases when the Project estimates up to 85% of the workforce will be hired from outside the RSA, with families moving to Clearwater and surrounding communities to take up Project-related work opportunities. This effect is unlikely during Construction as workers will be housed in a camp, will typically work 12-hour shifts, and will likely return to their home communities during time away from work.

Any increase in demand for mental health or addictions services may stress the part-time services available, which are currently at capacity. The BC Ministry of Children and Family Development has a local office in Clearwater and a satellite office in Barriere. Both provide part-time mental health and addiction services, with one part-time councillor available (S. Murray, pers. comm.). However, this effect is not expected to overshadow or negate the positive effects that the majority of individuals and families will gain from employment, steady incomes, and being able to work where they live because of the Project.

There may also be pressure on social services during Closure when individuals and families have to adjust to loss of employment, possibly leaving the community, and other changes.

This effect is dependent on other VCs which play a role in the complex and indirect relationships between Project activities, service provision, and family well-being. The positive aspects of employment have the potential to outweigh negative social consequences. The adequacy of social services is clearly important to the analysis, but consideration of other aspects such as education services, public safety and protection services, recreational opportunities, and governance arrangements are also important.

**Police, Fire, and Emergency Medical Services:** The Project may generate increased demand for law enforcement, traffic control, and emergency services in the LSA. For example, additional policing may be needed to deal with social disruption that could occur if construction workers elect to remain in the LSA during time off or as a result of other social stressors on family well-being that could arise during the Operations phases when the majority of the workforce (80%) will be residing in the LSA. According to the RCMP, the closure of the Canfor mill in 2008 resulted in increased

alcohol use (Section 17.4.13). Alcohol use continues to be the major contributing factor in incidents requiring policing services (Harper Creek Mining Corp. 2013). The RCMP detachment in Clearwater comprises one sergeant, four constables, and an administrative staff person. As well as serving the resident population of 5,000, the detachment provides service to approximately 100,000 tourists who visit the region annually. The detachment is presently understaffed and members often work up to 50 hours (excluding on-call time) per week (Sgt. S. Seib, pers. comm.). As such, any increases in anti-social behaviour, primarily during the Operations phases when workers are residing locally, may become an issue for the current capacity of protection services.

Emergency service providers in LSA communities may also experience increased pressure as a result of a potentially larger population. Interviews in First Nation communities (Chu Chua and Sahhalkum) highlighted the potential need for additional volunteers to support the fire department as a result of induced population effects. If band members move back to Chu Chua to seek Project-related employment and the increases in population may place stress on existing emergency services.

Pressure on protection and safety services may also spike during Closure and decommissioning when individuals and families have to adjust to loss of employment, possibly leaving the community, and other changes. As above, the RCMP noted a rise in social stress during the Canfor mill closure (Section 17.4.3.13), which may be replicated during the closure of the Project. Participatory planning in advance of closure with relevant levels of government, HCMC, and the local communities will help workers make smooth transitions.

### Community Health and Well Being VC

#### Change in Family Life

During consultations, community members and leaders noted that potential employment at the mine could stress some families due to increased disposable income related to Project employment. This effect, if realised, would occur primarily during the Operations phases when the largest number of LSA/RSA workers would be engaged in Project-related employment. Conversely, the Project also has the potential to result in job and income stability.

Rotational shift work can also cause some workers and families difficulty. During Operations the rotation of hourly personnel will be four days on and four days off, with 12-hour shifts. Families can resent the amount of work they have to do in their spouses' absence. Workers may want to relax during their four days off, but their spouses, having managed the household, child rearing, or elder care without spousal support, look forward to sharing these responsibilities with the workers during their time off. The outcomes of these issues can include loneliness, family and community support isolation, depression, mistrust, anxiety, stress, and conflicts.

Community leaders argued, however, that the income produced by working was important to the families, as was the pride in having a job. On balance it was thought that it was better to have the choice of working at the mine than not having a job. Employment opportunities were also considered to be important to the overall well-being of the community. As such, increased income and job prospects can improve a family's lifestyle with more money for food, better accommodation, holidays, and generally a better quality of life. Community leaders have also commented, that

currently in the Clearwater area many families have at least one spouse that travels outside of the region to work (eg. Alberta oil sands, or other new mining projects in the BC). One of the benefits of the Project will be that families may be re-united as workers move back to the community and find work with the Project.

This effect is difficult to analyze as it is dependent on several other VCs which play a role in the complex and indirect relationships between Project activities and community and family well-being. The adequacy of health services and social services is clearly important to the analysis, but consideration of other aspects such as education services, public safety and protection services, recreational opportunities, and governance arrangements are also important.

#### Increased Public Health and Safety Risks on Highway 5 and Local Roads

The construction and operation of the Project will result in some increases to traffic on Highway 5, in Vavenby, and on local roads due to the addition of Project-related trucks and passenger vehicles (e.g., project workforce-related traffic). As a result there is the potential for increased public health and safety risks associated with these traffic increases.

At the peak of operations, a total of 85 two-way trips per day are projected. Approximately 45 of these trips will be light vehicles (e.g., buses and passenger vehicles) and approximately 21 daily trips of side-dump B-train vehicles, carrying 40 tonnes of concentrate payloads (McElhanney 2014; [Appendix 5-E](#), Traffic Impact Assessment). During the Closure and Post-closure phases, there will be reduced Project traffic (McElhanney 2014; [Appendix 5-E](#)).

In response to concerns raised by the public, the BILCR Bridge will be used to transport oversized loads that cannot be supported by the Vavenby Bridge. During construction, traffic on local roads will consist of trucks carrying equipment and materials.

As noted in the Traffic Impact Assessment ([Appendix 5-E](#)), the logging industry is currently the primary industrial user of the Vavenby Bridge Road and the BILCR. Existing logging traffic on the Vavenby Bridge Road is between 12 and 25 truck trips per day or 24 to 50 vehicles crossing the bridge per day (McElhanney 2014; [Appendix 5-E](#)). However, local traffic levels have been lower since the closure of the Weyhaeuser Mill (McElhanney 2014; [Appendix 5-E](#)).

During the Closure phase, Project-related traffic will decline considerably and therefore so too will the potential for interactions with the public or other vehicles. Volumes are anticipated to be significantly less in terms of worker vehicles and may include some larger vehicles removing materials from the site.

In interviews, Birch Island residents expressed concern about the possibility that speeding and mine-related traffic could negatively impact the quality of life in the community. They drew attention to HCMC appearing to be concentrating its exploration phase traffic on the Jones Creek FSR, the entry to which is further west (i.e., closer to Birch Island) than the start of Vavenby Mountain FSR. They also noted the poor quality and winding nature of sections of the “back road” between the Jones Creek FSR turnoff and Birch Island. The Technical Report and Feasibility Study commissioned by HCMC (Merit 2014) has subsequently indicated that the most viable option for the mine access road would incorporate Vavenby Mountain FSR and not Jones Creek FSR. Vavenby Mountain FSR will be

the main access route to and from the Project Site. Both construction and operations traffic will access Vavenby Mountain FSR through Vavenby via the Vavenby Bridge Road. However, it is anticipated oversized loads will be routed to site via the Birch Island Bridge and along the Birch Island Lost Creek Road. These loads will be “one time” loads, and limited in number.

Project traffic is not anticipated to replicate the increased traffic that has occurred as a result of the resumption of operations at the Vavenby Canfor mill. When the mill was active prior to its temporary closure in 2009, it was normal for 50 loads of logs per day to arrive in the summer and 100 per day in the winter, from various directions depending on the location of cutblocks. In rough terms, about one-quarter of arriving loads would come into the Vavenby mill from the Jones Creek and Vavenby Mountain FSRs. Hours of operation for forestry truck traffic usually extend to 12 to 14 hours per day, beginning as early as 3:00 or 4:00 a.m. (D. Poole, pers. comm.).

#### Increased Risks to Worker Health and Safety Resulting from Unsafe Conditions

During all project phases, there is the potential for accidents and injuries to occur among the workforce and contractors. Accidents and injuries stem from unsafe workplace conditions or practices, traffic accidents, equipment failures, or natural disasters. Any lost time injuries have the potential for long-term consequences on individual employees’ health. HCMC is committed to a safe and healthy workforce and will be tasked with the maintenance of procedures and policies as well as contract management. HCMCs relevant policies and procedures are detailed in Section 17.5.3.

### 17.5.3 Mitigation Measures

Table 17.5-2 identifies mitigation measures to address potential socio-economic effects. The table also includes an assessment of the anticipated effectiveness of each mitigation measure based on the following criteria, which are defined in Chapter 8, Effects Assessment Methodology:

- Low effectiveness: After implementation of the mitigation measure, there is still a major change in the parameter, VC, or discipline from the baseline and a permanent effect.
- Moderate effectiveness: After implementation of the mitigation measure, there is a measurable change in the parameter, VC, or discipline from the baseline but no permanent effect.
- High effectiveness: After implementation of the mitigation measure, there is no change in the parameter, VC, or discipline from the baseline (e.g., it returns to its original condition before the construction of the Project) or an environmental enhancement is evident.
- Unknown effectiveness: The suggested mitigation measure has not been tried elsewhere in similar circumstances and the response of the parameter, VC, or discipline compared to the baseline is unknown.

**Table 17.5-2. Proposed Mitigation Measures and their Effectiveness**

Potential Effect	Proposed Mitigation Measure	Means of Mitigation (Avoid/Minimize/Control/Restore On Site/Compensate/Offset)	Effectiveness (Low/Moderate/High/Unknown)	Residual Effect (Y/N)
Increased competition for skilled labour and wage inflation	Work collaboratively with local sawmills to address employment needs in the North Thompson; collaborate with employment service agencies; establish local employment and supply policies.	Avoid and Minimize	Moderate	Yes
Loss of local employer during Closure	In consultation with affected communities and government agencies, HCMC will prepare an adjustment strategy in readiness for mine closure.	Minimize	Moderate	No
Increase in demand for housing	Provision of camp accommodation for workers during the construction phase; publicize the decision to proceed with the Project and communicate key information on schedule and workforce requirements.	Avoid and Minimize	Moderate	No
Increase in use of hospitals, health facilities and services	As per the <i>Health, Safety, and Reclamation Code for Mines in BC</i> , HCMC is required to provide: first aid facilities at site (Section 3.6.4); an Emergency Response Plan (Section 3.7.1; Chapter 24, Section 4); an occupational Health and Safety Committee (Section 1.6.1); establish and maintain a fully equipped Mine Rescue Team (Section 3.7.7). In addition, HCMC will communicate Project schedules for all phases to the Interior Health Authority to facilitate planning and coordination of services and will establish health and safety policies.	Avoid and Minimize	High	No
Increased pressure on health care delivery system	Establish an effective dialogue in order to facilitate early identification of health issues related to Project workers and their families with local health and social service agencies.	Minimize	Moderate	No

(continued)

**Table 17.5-2. Proposed Mitigation Measures and their Effectiveness (continued)**

Potential Effect	Proposed Mitigation Measure	Means of Mitigation (Avoid/Minimize/Control/Restore On Site/Compensate/Offset)	Effectiveness (Low/Moderate/High/Unknown)	Residual Effect (Y/N)
Increased pressure on social service agencies by Project employees, contractors and their families	No camp during Operations such that local employees remain embedded in the family structure; work with local health and social service agencies to establish effective communications in order to facilitate early identification of social issues related to Project workers and their families.	Minimize	Moderate	No
Increased pressure on public safety and protection services	Implementation of the Emergency Response Plan (Chapter 24, Section 4); on-site fire-fighting and first aid services; establish Mine Rescue Team; coordinate and maximize the availability of manpower and equipment for emergencies which might arise in the region; maintain dialogue with relevant social and protection services agencies.	Minimize	High	No
Increased public health and safety risks on Highway 5 and local roads	Implement a Traffic and Access Management Plan (Section 24.16); provide employee orientation including traffic safety; provide parking for workers and contractors at staging area in Vavenby and shuttle workers to Project Site; instruct operators of HCMC and contractor vehicles, as well as Project workers and contractors who are not residents of Birch Island to avoid using the Birch Island Lost Creek Road.	Avoid and minimize	High	No
Change in family life	Maintain dialogue with Aboriginal leadership and local governments and communicate key information on project activities, schedule and workforce requirements.	Minimize	Moderate	No

*(continued)*

**Table 17.5-2. Proposed Mitigation Measures and their Effectiveness (completed)**

Potential Effect	Proposed Mitigation Measure	Means of Mitigation (Avoid/Minimize/Control/Restore On Site/Compensate/Offset)	Effectiveness (Low/Moderate/High/Unknown)	Residual Effect (Y/N)
Increased risks to worker health and safety resulting from unsafe conditions	Orientation program; safety training; first aid facilities at site; health and safety policies; Emergency Response Plan (Chapter 24, Section 4); establish Occupational Health and Safety Committee; establish and maintain a fully equipped Mine Rescue Team	Minimize	High	No

Further details relative to mitigation measures in the above table are provided in the sections below for each VC.

#### 17.5.3.1 Mitigation Measures for Community Growth

Measures to mitigate potential impacts due to increased competition for skilled labour and wage inflation and increased pressure on housing, community, infrastructure and services, and mine closure are provided below.

##### Increased Competition of Skilled Labour

- HCMC will work cooperatively with local sawmills to address employment needs in the North Thompson;
- HCMC will prepare and implement a local hiring and training policy prior to commencement of construction;
- HCMC will collaborate with Clearwater and Barriere Employment Services Centre-WorkBC on recruitment needs and processes with respect to the Construction and Operations phases; and
- HCMC will prepare and implement a policy on procurement of materials and services from BC and regional suppliers.

##### Increased Housing Demand

- During construction, workers will be housed in camp accommodation at the Project Site.
- HCMC will publicly announce the decision to proceed with the Project to provide a clear signal of its intent to regional governments, developers and others involved in the provision of housing and infrastructure.

##### Community Infrastructure and Services

- As per the Health, Safety, and Reclamation Code for Mines in BC (BC MEMPR 2008), HCMC will provide: first aid facilities at the site (Section 3.6.4); an Emergency Response Plan



(Section 3.7.1; Chapter 24, Section 4); an occupational Health and Safety Committee (Section 1.6.1); establish and maintain a fully equipped Mine Rescue Team (Section 3.7.7).

- As per the Emergency Response Plan (Chapter 24, Section 4), if victim(s) require facilities and services beyond that which can be given at the Project Site, the victim(s) will be transported to receive further medical treatment. A specific procedure will be developed for summoning either a road ambulance or provincial air ambulance.
- HCMC will work with the Canfor Vavenby Mill and local government officials to coordinate and maximize the availability of manpower and equipment for emergencies which might arise in the region.
- HCMC will communicate Project schedules for Construction, Operations, and Closure to the IHA to facilitate planning and coordination of services.

HCMC will work with the IHA's responsible authority at Dr. Helmcken Hospital to maintain effective communications for all phase of the mine life, including communicating relevant details about its health and safety and emergency plans. Given that the Dr. Helmcken Hospital in Clearwater is currently underutilized and in combination with the proposed mitigation measures, no residual effects are anticipated for increased use of hospitals and health facilities/services.

#### Mine Closure

- In consultation with affected communities and government agencies, HCMC will prepare an adjustment strategy in readiness for mine closure.

Given the many positive effects associated with increased income on family livelihood and in combination with the above measures, no residual effect is anticipated on community infrastructure and services.

With the implementation of the mitigation measures outlined above, no residual effects are anticipated on:

- housing given the proactive planning being undertaken by local governments;
- community infrastructure and services given the Dr. Helmcken Hospital in Clearwater is currently underutilized and HCMC's commitment to work with local health and social service agencies to facilitate early identification of health issues related to Project workers and their families; and
- mine closure given HCMC's commitment to consult affected communities on its adjustment strategy.

There is potential for a residual effect relating to competition of skilled labour.

#### 17.5.3.2 *Mitigation for Community Health and Well-being*

Measures to mitigate potential effects on public safety due to increased traffic on Highway 5 and local roads include the following.

- HCMC will implement a Traffic and Access Management Plan as outlined in Section 24.16. The Plan describes access controls that will be implemented during construction and operations.
- HCMC will, as part of its orientation and site safety training, provide personnel operating HCMC vehicles with traffic safety instruction.
- HCMC will encourage informal car sharing and car-pooling arrangements to be organized and implemented during the Operations phases as seen on other sites within the RSA. It is projected that within six months of Operations, the number of passenger cars travelling to the mine could decrease by up to 50% as car-sharing and carpooling is organized and implemented.
- HCMC is working with a road engineer to determine the transportation details related to oversize loads with a focus on minimizing potential impacts on the existing infrastructure, and traffic use along Birch Island Lost Creek Road.
- HCMC will provide parking facilities for its workers and contractors at its staging area in Vavenby (the former Weyerhaeuser industrial site) and shuttle transportation for workers and contractors to the Project Site.
- HCMC will instruct operators of HCMC and contractor vehicles, as well as Project workers and contractors to avoid unnecessary use of the “back road” west of the mine access road.

Residual adverse effects associated with public health and safety on Highway 5 and local roads are not anticipated with the implementation of proposed mitigation measures.

With respect to potential changes in family life, this effect is expected to be outweighed by the positive aspects of local employment and, therefore, no residual effects are anticipated. HCMC will maintain a dialogue with Aboriginal and local governments, service providers and major employers in the region to review socio-economic effects. An important aspect of the mitigation will be the communication of key information on project activities, schedule and workforce requirements to facilitate planning for changes that may occur in the communities. It will also provide a mechanism for local governments and service providers to identify any impacts that arise on community health and well-being. If any issues arise, HCMC will work collaboratively with the key stakeholders to identify additional mitigation that may be required.

#### **17.5.4 Predicted Residual Effects and Characterization**

Residual effects on socio-economics associated with the Project are those effects that remain after mitigation measures are applied (see Section 17.5.3, Mitigation Measures). There is one anticipated residual effect remaining from the identified potential interactions between Project activities and socio-economic VCs. This residual effect relates to the community growth VC, specifically the subcomponent related to increased competition for skilled labour.

#### 17.5.4.1 *Residual Effects on Community Growth*

##### Increased Competition for Skilled Regional Study Area Workers

Post-mitigation, it remains probable that the Project will continue to be a competitive workplace attracting local and regional workers. Above-average salaries and local residential arrangements will provide attractive options for skilled workers in the RSA. After mitigations, it is still inevitable that workers will seek out Project employment opportunities and this may result in increasing levels of competition within the RSA for skilled workers. This residual effect is anticipated in both the Construction and Operations phases; however, the longer-term positions available during the Operations phases may be considered more appealing for local residents.

Skilled RSA workers departing their existing employment for Project-related work will likely create increased competition for skilled labour. This will be experienced to the greatest extent by local millworks at Vavenby and Barriere, who have already expressed concern in this regard. Recruiting, training, and maintaining a skilled workforce requires investment over time and the loss of even a small percentage of workers has the potential to result in challenges for the millworks to maintain their existing level of operation and productivity. The Canfor mill in Vavenby has seen recent attempts to improve efficiency, in the face of stiff competition from modern operations such as the Interfor mill at Adams Lake. The mill reduced its workforce to 125 skilled hourly employees and 15 staff (D. Thiessen, pers. comm.).

The geographic extent of this residual effect is within the RSA, with effects likely to be experienced to a greater extent within the LSA (i.e., Vavenby and Barriere). As of 2014, forestry remains the primary industry in Vavenby with a large portion of its approximately 700 residents working for Weyerhaeuser or Slocan lumber mills in Vavenby (North Thompson Valley 2012). In Barriere, the family-owned Gilbert Smith Forrest Products mill employs 50 mill workers and provides work for three logging contractors (G. Smith, pers. comm.).

#### 17.5.4.2 *Characterization of Increased Competition for Skilled Regional Study Area Workers on Community Growth*

The characterization of the effect of increased competition for skilled RSA workers is guided by the definitions provided in Table 17.5-3 and Table 8.6-2 as presented in Chapter 8, Effects Assessment Methodology. This effect is expected to occur during the Construction phase, and during Operations phases one and two. The magnitude of the effect is expected to be medium; the geographic extent is community level, as it is limited to primarily Barriere and Vavenby; the duration is medium-term; and the frequency is continuous. The effect is expected to be reversible and the resiliency is neutral.

**Table 17.5-3. Definitions of Specific Characterization Criteria for Socio-economics**

Timing	Magnitude	Socio-economic	Duration	Frequency	Reversibility	Resiliency
Construction phase	Negligible: differs from baseline conditions but is within natural levels of variation	Individual/ Household: an effect is limited to individuals, families and/or households	Short term: an effect that lasts approximately 1 to 5 years	One time: an effect occurs once during any phase of the Project	Reversible: an effect that can be reversed relatively quickly	Low: the receptor is considered to be of low resiliency following disturbances
Operations 1 and 2 phases	Low: differing from the average value for baseline conditions to a small degree, but within the range of natural variation and well below guideline or threshold	Community: an effect extends to the LSA community level	Medium term: an effect that lasts between 6 to 25 years	Sporadic: an effect occurs at sporadic or intermittent intervals during any phase of the Project	Partially reversible: an effect that can be reversed after many years	Neutral: the receptor is considered to be moderately resilient following disturbances
Closure phase	Medium: Differing from the average value for baseline conditions and approaching the limits of natural variation, but below or equal to a guideline or threshold value	Regional/ Aboriginal: an effect extending across the broader regional community or economy, or an effect extending to one or more Aboriginal groups	Long term: an effect that lasts between 26 and 50 years	Regular: an effect occurs regularly during any phase of the Project	Irreversible: an effect that cannot be reversed (i.e., is permanent)	High: the receptor is considered to be highly resilient following disturbances
Post-Closure phase	High: differing from baseline conditions and exceeding guideline or threshold values so that there will be a detectable change beyond the range of natural variation	Beyond Regional: an effect extends possibly across or beyond the province	Future: an effect that lasts more than 50 years	Continuous: an effect occurs constantly during any phase of the Project		

17.5.4.3 Likelihood of Increased Competition for on Community Growth

The likelihood of residual effects relative to increased competition for skilled labour in the RSA materializing is considered of **Moderate Probability**. Despite mitigations, above-average salaries and local residential arrangements will remain attractive options for skilled workers in the RSA. As such, it is inevitable that some workers in the RSA will seek out Project employment opportunities and this may result in increasing levels of competition within the RSA for skilled workers.

Residual effects for socio-economics are summarized in Table 17.5-4.

**Table 17.5-4. Summary of Residual Effects on Socio-economics**

Valued Component	Project Phase (Timing of Effect)	Project Component / Physical Activity	Description of Cause-Effect <sup>1</sup>	Description of Mitigation Measure(s)	Description of Residual Effect
Community growth	Construction and Operations	Construction of mine infrastructure; employment associated with operation of the Project	Increased local employment opportunities with high wage offerings for skilled workers.	Practice of no-solicitation at local millworks; collaborate with employment service agencies; establish local employment and supply policies.	Increased competition for skilled workers

<sup>1</sup> "Cause-effect" refers to the relationship between the Project Component/physical activity that is causing the change or effect in the condition of the intermediate component, and the actual change or effect that results.

**17.5.5 Significance of Residual Effects**

The significance determination follows a two-step process: first, the severity of residual effects is ranked according to a minor, moderate, and major scale. Then, consideration of whether minor, moderate, or major effects are significant or not is made, as per the following definitions.

- Not significant: Residual effects have low or moderate magnitude, local to regional geographic extent, short- or medium-term duration, could occur at any frequency, and are reversible or partially reversible in either the short or long term. The effects on the VC (e.g., at a species or local population level) are either indistinguishable from background conditions (i.e., occur within the range of natural variation as influenced by physical, chemical, and biological processes), or distinguishable at the individual level. Land and resource management plan objectives will likely be met, but some management objectives may be impaired.
- Significant: Residual effects have high magnitude, regional or beyond regional geographic extent, long-term or far-future duration, and occur at all frequencies. Residual effects on VCs are consequential (i.e., structural and functional changes in populations, communities, and ecosystems are predicted) and are irreversible. The ability to meet land and resource management plan objectives is impaired. The significance determination is also illustrated in Figure 8.6-1 in Chapter 8, Effects Assessment Methodology.

Overall, the residual effect associated with increased competition for skilled labour is considered **Not Significant**. On the significance scale, the effect was considered moderate, due to the medium magnitude and the ability for the receptor communities to adapt in part by the change brought on by the Project.

### 17.5.6 Confidence and Uncertainty in Determination of Significance

The residual effect of increased competition for skilled labour in the RSA has been assigned a **Moderate Confidence** rating. While the cause-effect relationship is understood, there are a number of unknown variables such as transferability of skills between local millworks and those required for Project employment. As well, individuals working in the forestry industry possess the required skills sets needed at the Project. HCMC is committed to maintaining a practice of no-solicitation at local millworks, but this will not prevent individuals from seeking out Project employment opportunities.

### 17.5.7 Summary of the Assessment of Residual Effects for Socio-economics

Residual effects for socio-economics are summarized in Table 17.5-5. This includes the associated characterization criteria, significance determination, likelihood, and confidence evaluations.

## 17.6 CUMULATIVE EFFECTS ASSESSMENT

### 17.6.1 Scoping Cumulative Effects

#### 17.6.1.1 Valued Components and Project-related Residual Effects

The cumulative effects assessment (CEA) considers the VCs for which residual effects were predicted in the Application/EIS. This section assesses potential cumulative effects on the VC community growth.

#### 17.6.1.2 Defining Assessment Boundaries

Similar to the Project-related effects, assessment boundaries define the maximum limit within which the CEA is conducted. Boundaries relevant to socio-economics are described below.

The temporal boundaries for the identification of physical projects and activities have been categorized into past, present, and reasonably foreseeable projects and are defined as follows.

- **Past:** no longer operational projects and activities that were implemented in the past 50 years. This temporal boundary enables to take into account any far-future effects from past projects and activities.<sup>6</sup>
- **Present:** active and inactive projects and activities.

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<sup>6</sup> Future effects are defined as effects that last more than 37 years, as per Table 8.6-2: Attributes for Characterization of Residual Effects.

**Table 17.5-5. Summary of Key Effects, Mitigation, Residual Effects, Likelihood, Significance, and Confidence for Socio-economics**

Key Effect	Mitigation Measures	Summary of Residual Effects Characterization Criteria <i>(Magnitude, Geographic Extent, Duration, Frequency, Reversibility, Resiliency)</i>	Likelihood <i>(High, Moderate, Low)</i>	Significance of Adverse Residual Effects		Confidence <i>(High, Moderate, Low)</i>
				Significance Scale <i>(Minor, Moderate, Major)</i>	Significance Rating <i>(Not Significant; Significant)</i>	
Increased Competition for skilled workers	Practice of no-solicitation at local millworks; collaborate with employment service agencies; establish local employment and supply policies.	Medium magnitude; Regional extent; Medium-term duration; Continuous frequency; Reversible; Neutral resiliency.	Moderate	Moderate	Not Significant	Moderate

- **Future:** certain projects and activities that will proceed, and reasonably foreseeable projects and activities that are likely to occur. These projects are restricted to those that 1) have been publicly announced with a defined project execution period and with sufficient project details for assessment; and/or 2) are currently undergoing an environmental assessment, and/or 3) are in a permitting process.

The spatial boundaries for the identification of other physical projects and activities for the assessment of cumulative effects have been identified in the AIR as the Kamloops Land and Resource Management Plan boundary, and are illustrated in Figures 8.7-1 and 17.6-1 below. These boundaries are referred to as the CEA area.<sup>7</sup>

### 17.6.1.3 *Projects and Activities Considered*

Past, present, and reasonably foreseeable future projects and activities within the CEA area, identified in the AIR as the Kamloops Land and Resource Management Plan area (BC ILMB 1995), were considered in the CEA. The project list was developed from a wide variety of information sources, including municipal, regional, provincial, and federal government agencies; other stakeholders; and companies' and businesses' websites. The projects and activities considered in the cumulative effects assessment are presented in Chapter 8, Tables 8.7-1 and 8.7-2, respectively. The projects and activities considered within the CEA study area are categorized as:

- past (no longer operational) projects and activities;
- present (active and inactive) projects and activities; and
- future (reasonably foreseeable) projects and activities that are likely to occur.

The methodology used in the CEA is provided in Chapter 8, Section 8.7. Project-related residual effects were considered for their potential to interact with the projects and activities within the CEA boundary. A map indicating the location of past, present, and reasonably foreseeable future projects is provided in Figure 17.6-1.

### 17.6.2 **Screening and Analyzing Cumulative Effects**

Table 17.6-1 presents the projects and activities with the potential to interact cumulatively with the predicted residual effects for socio-economics identified in Table 17.5-5.

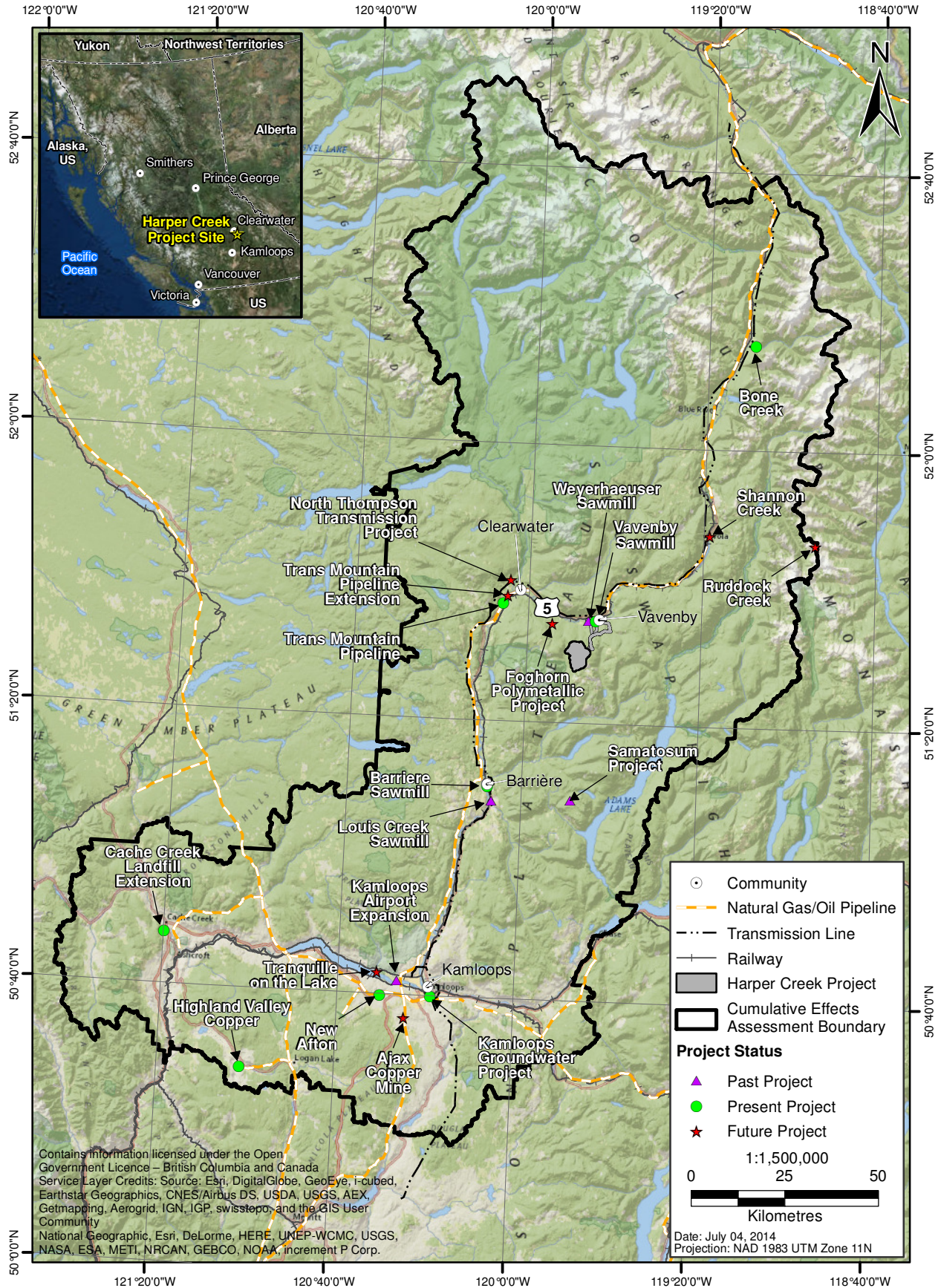
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<sup>7</sup> Note that the CEA area only refers to the spatial boundaries for the identification of other physical projects and activities, i.e., the Kamloops Land and Resource Management Plan boundary. Each assessment chapter will define its own spatial and temporal boundaries.



Figure 17.6-1

Cumulative Effects Assessment Scoping Harper Creek Project



**Table 17.6-1. Impact Matrix for Screening and Ranking Potential Cumulative Effects**

Residual Effect of the Harper Creek Project	Past Projects and Activities	Current Projects and Activities	Reasonably Foreseeable Future Projects and Activities
		Weyerhaeuser Sawmill Samatosum Project Louis Creek Sawmill	Highland Valley Copper Bone Creek Trans Mountain Pipeline Kamloops Groundwater Project New Afton Cache Creek Landfill Extension Vavenby Sawmill Barriere Sawmill
Increased competition for skilled workers	● ● ●	● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●

Notes:

- = Negligible to minor risk of adverse cumulative effect; will not be carried forward in the assessment.
- = Moderate risk of adverse cumulative effect; will be carried forward in the assessment.
- = Major risk of adverse cumulative effect or significant concern; will be carried forward in the assessment.

The potential for increased competition for the limited numbers of RSA residents who possess the skills and/or work experience relevant to the Project was noted. No interactions are anticipated with past projects; however, interactions with current and future projects are possible. Interviews with managers at the Barriere and Vavenby sawmills identified this as an issue which they wished to work on jointly with HCMC. HCMC will work with different levels of government and other major employers in the monitoring of labour shortages in the North Thompson through a mechanism to be set up for that purpose.

Beyond interactions with sawmills, interactions with other existing projects are considered to be of negligible to moderate risk levels. Of moderate risk is the Bone Creek hydroelectric project due to its proximity near Blue River. Bone Creek was active in engaging SFN in employment through its construction in 2011 and subsequent operations through 2031 (TransAlta 2014).

Negligible level risks have been predicted relative to interactions with the Trans Mountain pipeline, Cache Creek Landfill Extension, and the City of Kamloops Water Project (see Table 17.6-1). The Trans Mountain Pipeline employees over 100 staff in BC across 10 communities; of these, two pump stations are within the RSA at Blue River and Blackpool (near Clearwater) and a terminal in Kamloops (Kinder Morgan 2010). The Cache Creek Landfill Extension began in 2009 and is anticipated to be operational by 2015; the landfill and associated operations directly employ more than 120 people at Cache Creek (234 km from Vavenby; Belcorp Environmental Services 2010). Given the landfill will be operational in the coming year and the distance to the Project Site, interactions with the Project are considered negligible. The City of Kamloops groundwater facility has also been installed; therefore, no interactions with the ongoing maintenance of this facility are anticipated.

A small number of residents in the RSA are employed at the two currently operating mines (see Table 17.6-1): New Afton and Highland Valley Copper. Highland Valley Copper employs over 1,200 personnel primarily from the communities of Logan Lake, Merrit, and Ashcroft, as well as a small number from the Project RSA communities of Clearwater and Kamloops. New Afton employs close to 500 personnel (BC Ministry of Energy Mines and Natural Gas 2012) and is located in proximity to Kamloops (15 km) within the Project RSA. The Highland Valley Copper and New Afton operations are between 2 to 2.5 hours by vehicle from Vavenby and 1.5 to 2 hours from Clearwater. As such, employees who reside in Clearwater may be attracted to the potential for skilled employment opportunities which are closer to their current residence.

Relative to future projects, there is a possibility that residents in the northern part of the RSA, in the small communities of Blue River and Avola, will seek employment with the Ruddock Creek Mine project if, it proceeds. A few residents in these communities are already involved in the Ruddock Creek exploration program, making use of camp accommodation at the site. The opening up of employment opportunities at the Ruddock Creek Mine, with its remoteness and its status as an underground mine (requiring very specific skill sets), is not expected to worsen the shortage of skilled labour in places such as Clearwater, Vavenby, and Barriere.

The Ajax copper project, if developed in 2016 and operating through 2036, may interact with the Project's demand on skilled labour resources in the region. Ajax, located outside of Kamloops (1.5 hours transit from Clearwater) will employ approximately 500 individuals when operational (KGHM International). Given the transit distance and the low number (in comparison with other mines) of workers needed, interactions are considered of moderate risk level.

Interactions with the Foghorn Polymetallic Project are considered of low risk as there has been a no registration reserve under the *Mineral Tenure Act* (1996b) for uranium and thorium since 2008. As a result, there is a high level of uncertainty as to the timing for the development of this project and whether the project would be constructed during the life of the Harper Creek Project.

It is anticipated that construction of the Trans Mountain Pipeline expansion would occur after the Project's Construction phase. Pipeline construction would generate interest among skilled workers in the North Thompson; however, with only a two or three year window of activity, it is not likely to challenge the attractiveness of steady employment (initially in Construction and subsequently in Operations) at the Project. There is potentially very little operations employment associated with the pipeline expansion and existing staff would be in a position to cover most operational tasks.

Given the status of the Shannon Creek hydroelectric Project, North Thompson Transmission Project, and the Tranquil on the Lake agri-community developments are currently unknown, interactions with these projects are considered for negligible risk.

### 17.6.3 Mitigation Measure

The mitigation measures that can be implemented by HCMC to ameliorate their contribution to the cumulative effect were identified and considered for their effectiveness in accordance with the methodology described in Chapter 8, Section 8.7.3. Table 17.6-2 outlines the means by which mitigation of cumulative effects was considered in the assessment.

**Table 17.6-2. Proposed Mitigation Measures for Potential Cumulative Effects and their Effectiveness**

Potential Cumulative Effect	Proposed Mitigation Measure	Means of Mitigation (Avoid/Minimize/Control/ Restore on Site/ Compensate/Offset)	Effectiveness (Low/Moderate/ High/Unknown)	Residual Cumulative Effect (Y/N)
Increased competition for skilled workers	Collaborate with Clearwater and Barriere Employment Services on recruitment.	Minimize	Moderate	Yes

#### 17.6.4 Residual Cumulative Effects and Characterization

##### 17.6.4.1 Cumulative Residual Effect on Community Growth

###### Increased Competition for Skilled Regional Study Area Workers

A cumulative residual effect is expected relative to increased competition for skilled workers in the RSA. The effect is expected to be experienced to the greatest extent by the sawmills at Barriere and Vavenby. The development of new projects, such as Ruddock Creek and the North Thompson Transmission Project, has the potential to put pressure on the already strained existing pool of skilled labour.

##### 17.6.4.2 Characterization of Increased Competition for Skilled Regional Study Area Workers on Community Growth

This residual cumulative effect has been characterized and evaluated using the same criteria and definition thresholds established for the Project-specific effects (see Table 17.5-3). The effect is considered of **medium magnitude** and the geographic extent is considered to be at the community level as consequences will be most likely be experienced at Vavenby and Barriere. The duration will be of **medium term** with a number of potential mine developments lasting from 2 to 28 years. The frequency would be **sporadic** with the commencement of future project phases resulting in increased demand for skilled workforces. The effect is considered **reversible** and the communities of neutral resiliency with the ability to adapt to changes brought on by the Project.

**Table 17.6-3. Summary of Cumulative Residual Effects on Socio-economics**

Cumulative Residual Effect	Description of Cause-Effect <sup>1</sup>	Mitigation Measure(s)	Cumulative Residual Effect
<i>VC: Community Growth</i>			
Increased competition for skilled workers	Increased local employment opportunities with high wage offerings for skilled workers.	Collaborate with Clearwater and Barriere Employment Services on recruitment.	Yes

<sup>1</sup> "Cause-effect" refers to the relationship between the project/activity and the residual effect; describe what is causing the change or effect in the condition of the VC, indicator or discipline.

#### 17.6.4.3 *Likelihood of Increased Competition for Skilled Regional Study Area Workers on Community Growth*

The likelihood of a cumulative residual effect of increased competition for skilled labour in the RSA materializing is considered of **moderate probability**. Despite mitigations, above average salaries of the Project will remain attractive options for skilled workers in the RSA. Some RSA workers will seek out alternative employment opportunities which may result in an increased level of competition for employees within the RSA.

#### 17.6.5 **Significance of Cumulative Residual Effects**

As noted in Section 17.5.5, the significance determination followed a two-step process: first, the severity of residual effects is ranked according to a minor, moderate, and major scale. Then, consideration of whether minor, moderate, or major effects are significant or not is made, as per the significance definition and determination provide in Section 17.5.5 and Chapter 8, Effects Assessment Methodology.

Overall the residual cumulative effect associated with increased competition for skilled labour is considered **Not Significant** (Table 17.6-4). On the significance scale, the cumulative effect was considered moderate, due to the medium magnitude and the ability for the receptor communities to adapt in part by the change brought on by the Project.

#### 17.6.6 **Confidence and Uncertainty in Determination of Significance**

The residual cumulative effect of increased competition for skilled labour in the RSA has been assigned a Moderate Confidence rating. While the cause-effect relationship is understood, the number of reasonably foreseeable future projects is questionable and there are a number of other unknown variables such as transferability of skills between local millworks and those required for Project employment. HCMC is committed to maintaining a practice of no-solicitation at local millworks, but will not, and cannot, prevent individuals from seeking out Project employment opportunities.

### 17.7 **CONCLUSIONS FOR SOCIO-ECONOMICS**

Up to 12 potential effects were considered relative to social and economic consequences of the Project development. The subsequent planning by HCMC to address these effects in collaboration with stakeholders through effective mitigation measures has resulted in the finding of one resulting residual effect. This residual effect relative to increased competition for skilled workers in the region has the potential to magnify as a result of future project developments and has therefore been considered as a residual cumulative effect (Table 17.7-1).

**Table 17.6-4. Summary of Key Cumulative Effects, Mitigation, Cumulative Residual Effects Characterization Criteria, Likelihood, Significance, and Confidence**

Key Cumulative Effect	Mitigation Measures	Summary of Cumulative Residual Effects Characterization Criteria (Magnitude, Geographic Extent, Duration, Frequency, Reversibility, Resiliency)	Likelihood (High, Moderate, Low)	Significance of Adverse Cumulative Residual Effects		Confidence (High, Moderate, Low)
				Scale (Minor, Moderate, Major)	Rating (Not Significant; Significant)	
Increased competition for skilled workers	Practice of no-solicitation at local millworks; participate in regional discussions on labour supply/ demand issues; local employment and supply policies.	The effect is considered of medium magnitude; community level geographic extent; medium-term duration; sporadic frequency; reversible and neutral resiliency	Moderate	Moderate	Not-Significant	Moderate

**Table 17.7-1. Summary of Project and Cumulative Residual Effects, Mitigation, and Significance for Socio-economics**

Residual Effects	Project Phase	Mitigation Measures	Significance of Residual Effects	
			Project	Cumulative
<i>Employment and Income</i>				
Increased competition for skilled RSA workers	Construction and Operations (Operations phases one and two)	Practice of no-solicitation at local millworks; participate in regional discussions on labour supply/ demand issues; local employment and supply policies.	Not Significant	Not Significant

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