

7. ASSESSMENT OF POTENTIAL ECONOMIC EFFECTS

During Project-related consultation, a number of different economic topics were raised for consideration as Valued Components (VCs). In order to be included in the Environmental Assessment Certificate/Environmental Impact Statement for a Comprehensive Survey (Application/EIS), there must be a perceived likelihood that the VC will be affected by the Project. Scoping of potential economic VCs took into account issues and concerns raised during Project consultation with the public, Aboriginal Groups and stakeholders (see Sections 4.6 and 4.7), discussions with the British Columbia Environmental Assessment Office (BC EAO) and other government agencies, and the experience of other recent projects in British Columbia (BC). Discussions with the Project Working Group, comprising representatives from federal, provincial and local governments and Aboriginal Groups also helped to frame the VCs.

Table 7-1 provides a summary of the rationale and justification for choosing and assessing Economic Growth as a VC.

Table 7-1. Rationale for Including Economic Growth in the Application/EIS

Valued Components	Identified by*				Rationale for Inclusion
	AG	G	P/S	SK	
Economic Growth	X	X	X	X	The Project will have an effect on economic growth through direct impacts (e.g., contract expenditures by the proponent), indirect impacts (expenditures by industries supplying goods and services to the Project) and induced impacts (e.g., additional spending in the community by Project workers). Tax revenues will also contribute to this growth. Concerns have been raised that there will be a decline in economic growth at the end of Project operations.

*AG = Aboriginal Group; G = Guideline Requirement; P/S = Public/Stakeholder; SK = Scientific/professional knowledge

7.1 ECONOMIC GROWTH

7.1.1 Rationale

The topic of Economic Growth was raised during Project consultation with the public and stakeholders, discussions with the BC EAO and other government agencies. It is also a standard component of other recent environmental assessments for mining projects in BC, although it may be described using different terminology. The primary intent of the Economic Growth assessment is to present the larger-scale contributions of the Project to the provincial economy.

Economic Growth describes the economic contributions that the Project is expected to bring to the province of BC, the rest of Canada, and to the extent feasible, the Regional Study Area (RSA) and Local Study Area (LSA). The primary tool used in this assessment is the Statistics Canada input-output model, supplemented by qualitative descriptions of effects on the RSA and LSA.

The Project will have an effect on economic growth through direct impacts (e.g., contract expenditures by the proponent), indirect impacts (e.g., expenditures by industries supplying goods and services to the Project) and induced impacts (e.g., additional spending in the community by Project workers). Key components of these economic benefits include contributions to industry output, Gross Domestic Product (GDP), employment (in full-time equivalents [FTE]), and government tax revenue (i.e., federal, provincial and local taxes).

The assessment of effects to Economic Growth is largely related to Project expenditures and the expenditures by other parties in the supply chain. These economic inputs are largely drawn from the input-output model run by Statistics Canada (see Appendix 7.1-B for details), which was based on expenditures supplied by KGHM Ajax Mining Inc. (KAM) for the construction and operations phases. The information developed to support the analysis of this VC also contributes to other analyses for other VCs (Figure 7.1-1).

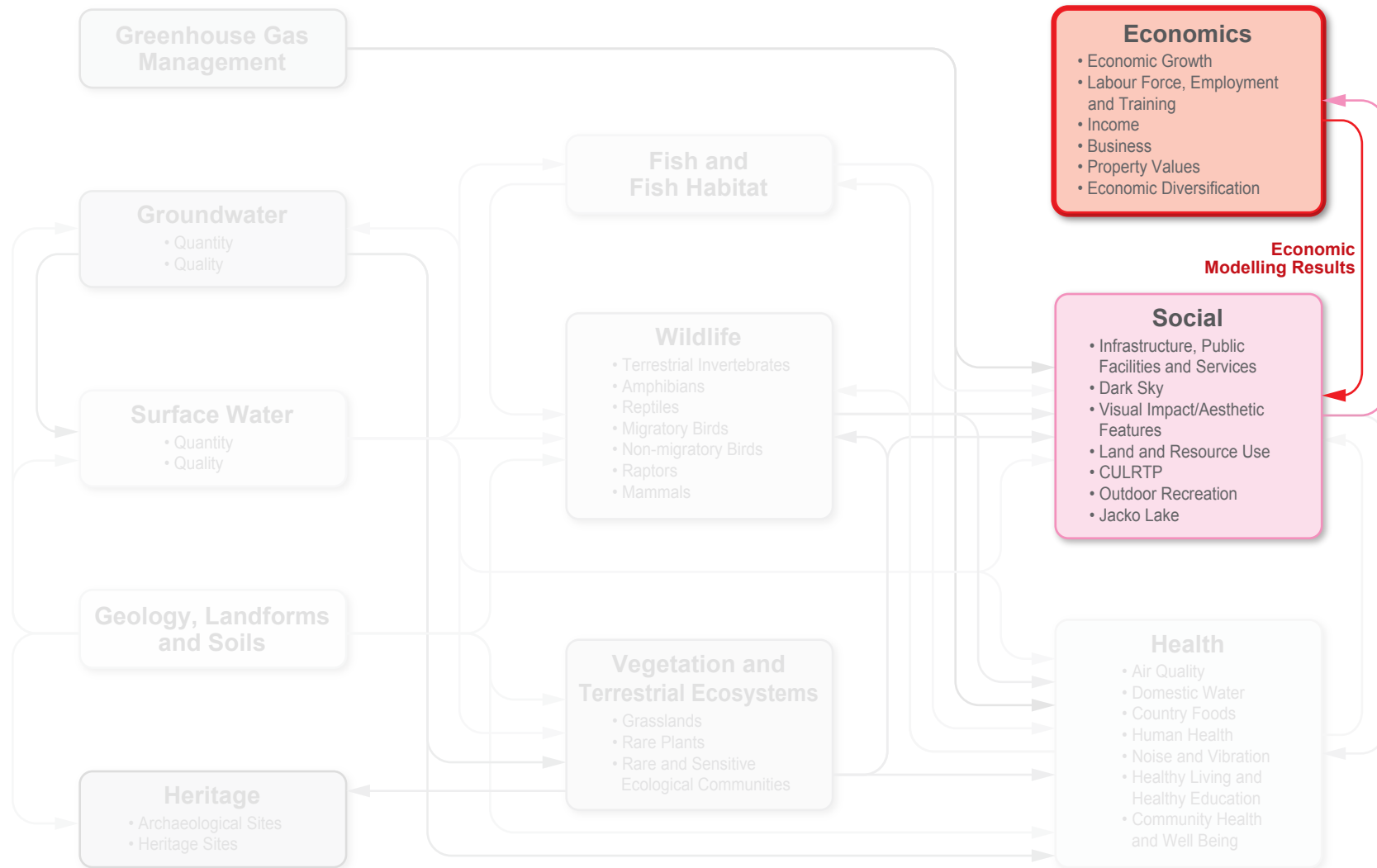
7.1.2 Background

7.1.2.1 Regional Overview

The RSA is the Thompson-Nicola Regional District (TNRD), which covers more than 45,000 km² from Merritt and Lytton to north of Blue River (Figure 7.1-2). Included in the RSA are three Aboriginal Groups designated by either the BC EAO or the Canadian Environmental Assessment Agency (CEA Agency) for inclusion in the Application/EIS. These three Aboriginal Groups are the Lower Nicola Indian Band (LNIB), Ashcroft Indian Band (AIB), and Whispering Pines/Clinton Indian Band (WP/CIB). The LSA includes the City of Kamloops (Kamloops), the TNRD-J Copper Desert Country Census subdivision (TNRD-J), and the populated reserve parcels for which Statistics Canada provides data for the Tk'emlúps te Secwépemc (TteS) (Kamloops 1 Indian Reserve), and the Skeetchestn Indian Band (SIB) (Skeetchestn Indian Reserve). Together the TteS and SIB form the Stk'emlupsemc te Secwépemc Nation (SSN).

Much of the economy of the RSA is based on public services, including health care and education. Tourism has become an increasingly important aspect of the regional economy, but is still a relatively small contributor to the overall economy (Horne 2009). Mining has historically been an important sector within the RSA and continues to be so. Each of these industries provides opportunities for economic growth in the RSA and LSA.

Figure 7.1-1
Inputs to Economic Valued Components

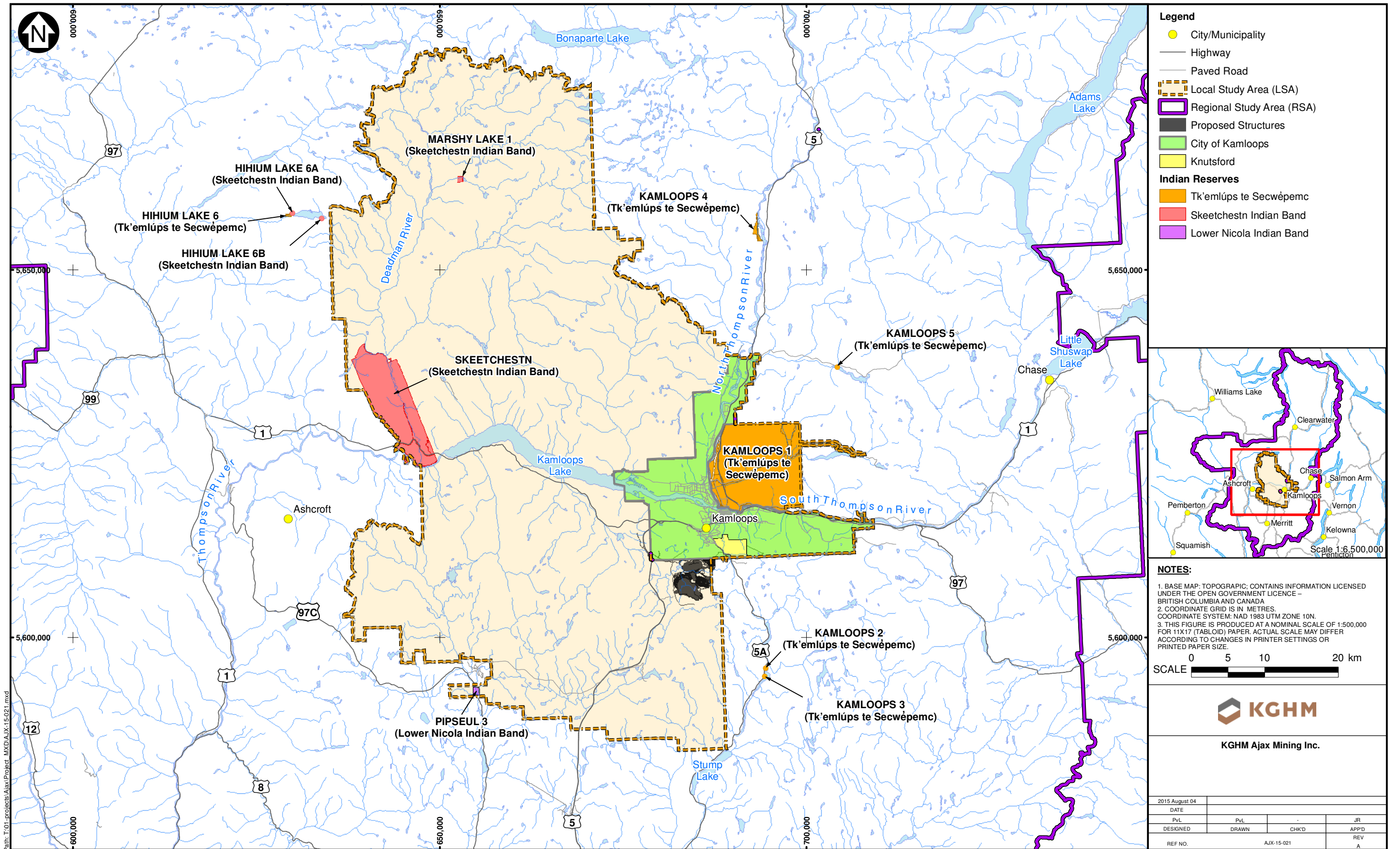


7.1.2.2 *Historical Activities*

A more complete description of historical activities that have helped to shape the Kamloops area economy is provided in Appendix 7.1-A. Highlighted activities include:

- **Mining Development:** Mining has historically been a key economic driver in the Kamloops area. Mining activity in the area can be traced back over 100 years with exploration within the LSA and immediate vicinity of the LSA beginning in the 1880s. The former Afton Mine included the Ajax east and west pits (located within the Project footprint), as well as the Afton pit (approximately 8 km northwest of the Project). Operations on the Afton pit began in 1977, and operations on the Ajax East and Ajax West pits were initiated in 1989; activities at the Afton pit and Ajax East and West pits were subsequently suspended in 1991 due to depressed metal prices. Currently, the New Afton Mine, which utilizes the historic Afton pit and infrastructure, can process up to 12,500 tonnes of ore per day (New Gold 2014; Ajax KPI Program 2011-2012). Other mines in the area include Highland Valley Copper (HVC) (50 km from Kamloops), Copper Mountain (170 km from Kamloops), and Gibraltar (about 330 km from Kamloops), and there are exploration activities and proposed mines throughout the RSA.
- **The SSN and Mining:** The Cultural Heritage Study (Ignace 2014) notes that ethnographers (e.g., James Teit) have noted the use of copper by the Secwépemc. He noted that copper tube beads were common as were copper earrings. While Teit assumes that most of the copper used was European-made, other ethnographers observed that there were some copper deposits that were mined by the Secwépemc. Among these were Copper Creek, which is located on the north shore of Kamloops Lake (Ignace 2014). The SSN was also involved in gold mining before the 1858 Fraser Canyon gold rush. According to Ignace (2014), maps from the beginning of the 1858 gold rush confirm early Aboriginal involvement in gold mining as some maps show “Indian Diggings” on the north shore of Kamloops and Shuswap lakes. Hudson’s Bay Company journals and accounts also show trading for gold dust by Aboriginal persons who likely engaged in placer mining. Gold panning continued into the twentieth century.
- **Transportation and Infrastructure Development:** Kamloops has served as an important transportation hub since the 1890s through railway development and subsequent highway construction during the 1950s. Other notable developments have included the Kamloops airport expansion in 2009 (Venture Kamloops 2014).
- **Forestry Sector Development:** Forestry has been an important driver in the local economy despite periodic (and recent) industry downturns. Weyerhaeuser established their pulp mill operations in 1965. Domtar purchased the mill in 2007 and is currently running the facility at a reduced capacity having closed one pulp machine at the plant, which affected 125 workers (Klassen 2014; Domtar 2012; Ajax KPI Program 2011-2012).

Figure 7.1-2
Local Study Area



- **Education and Technology Development:** These sectors have become areas of increasing focus for Kamloops in recent years. Thompson Rivers University was incorporated in 2005 (and formerly operated as the University College of the Cariboo) and offers a wide variety of academic degrees as well as trades-oriented programming. In 2011, the TRU's Law Faculty opened (TRU n.d.). As a whole, employment associated with the professional, scientific and technical services sector within the Thompson/Okanagan Development Region (excluding Kelowna) has been on an upward trend since 2001 and Kamloops is actively working towards expanding the technology sector (Venture Kamloops 2014; Ajax KPI Program 2011-2012). BC Aboriginal Mentoring and Training Association, which helped First Nations people gain employment in the mining sector, closed in 2014. The closure removes one support for First Nations people looking for training to secure employment in the mining industry (Stueck 2014).
- **Other Development:** The Kamloops economy has also been shaped by the increasing role of tourism, the City's designation as "The Tournament Capital of Canada" (2001), and the development of the Sun Peaks Resort.
- **Notable recent economic challenges:** Recent challenges have included the closure of Pollard Banknote (2010) and Convergys (2010) and more recently, the closure of one production line at the Domtar plant (2013) and the closure of Kamloops Daily News in 2014 (Klassen 2014; Venture Kamloops 2014).

7.1.2.3 *Baseline Studies*

The objective of the baseline research was to understand existing economic conditions within the LSA, RSA, and BC.

Data Sources

A variety of data sources were consulted to understand and describe the current situation in the LSA and RSA in connection with economic growth. Among the data sources consulted were the Census of Canada and National Household Survey by Statistics Canada; reports published by Venture Kamloops, an arm's-length economic development corporation for Kamloops; the Cultural Heritage Study (Ignace 2014) by SSN; publicly available information from First Nations businesses; and Horne's studies (2004, 2009) on economic diversity in BC. In addition to looking at secondary sources, interviews were conducted as part of a Key Person Interview (KPI) program. These interviews included individuals who are involved in various industry sectors (e.g., forestry, mining, tourism) at different levels (e.g., direct involvement in the private sector, government officials). Where possible, information and concerns from Aboriginal Groups were considered and included. This information came from publicly available sources (e.g., annual reports, websites) and records from interactions (e.g., meeting notes, written comments for the regulator and/or KAM).

Consultation activities undertaken with the Aboriginal Groups during the pre-application period included capacity building and funding, TK/TLU (Traditional Knowledge/Traditional Land Use) studies, community meetings, site tours, and meetings with Aboriginal Group representatives (see Section 4.3). Multiple attempts have been made to engage each Aboriginal Group to seek the baseline data required for the Application/EIS including the circulation of baseline documentation for review and comment. The information gathered through this engagement has been incorporated in the Application

and considered in the assessments. In some cases, the requested information was not available from Aboriginal Groups at the time of writing or from secondary sources. Where appropriate, additional information made available by Aboriginal Groups will be considered in Project development plans.

Methods

The approach to understanding baseline conditions focused primarily on a review of secondary data. Information was also gleaned from discussions and interviews with individuals who have knowledge regarding general economic circumstances in the LSA and RSA to help inform the baseline discussion. This included discussions with representatives from the City of Kamloops and Thompson Rivers University (TRU). Typically, characterization of baseline economic conditions for topics related to economic growth consists of discussion regarding trends in economic output (gross domestic product [GDP]), employment, and government revenues.

Characterization of Baseline Conditions

Table 7.1-1 provides a summary of economic activity for BC from 2005 to 2013.

Table 7.1-1. Gross Domestic Product (GDP) and Total Employment in British Columbia (2005 to 2013)

Year	GDP at Market Prices		Total Employment	
	\$ Million	Change from Previous Year (%)	Number of People (000's)	Change from Previous Year (%)
2005	173,641	-	2,089.7	-
2006	186,772	7.6%	2,140.8	2.4%
2007	197,072	5.5%	2,206.0	3.0%
2008	203,951	3.5%	2,241.9	1.6%
2009	195,966	-3.9%	2,191.9	-2.2%
2010	205,996	5.1%	2,223.0	1.4%
2011	217,460	5.6%	2,227.8	0.2%
2012	222,565	2.3%	2,262.5	1.6%
2013	229,685	3.2%	2,265.6	0.1%

Source: BC Stats 2015a; BC Stats 2015b; percentages calculated by InterGroup Consultants.

From 2005 to 2008, the provincial economy experienced growth, in terms of both GDP and employment. The global economic downturn led to a decrease in GDP (decrease of 3.9%) from 2008 into 2009. A decrease in employment is also apparent during the same period (decrease of 2.2% or about 50,000 jobs). Since then, the provincial economy has exhibited moderate growth through to 2013. Total employment has also increased on a yearly basis, although at a lower rate than experienced prior to the downturn.

From 2001 to 2011, the province of BC experienced an increase in total employment of approximately 15%. During the same 2001 to 2011 time period, the LSA noted a 15.7% increase and the RSA an estimated 9.3% increase in total employment (Statistics Canada 2002; Statistics Canada 2013).

Table 7.1-2 provides a synopsis of government revenues for BC, the RSA (i.e., TNRD revenues) and the LSA (i.e., Kamloops revenues) from 2005 to 2013. With the exception of 2008 and 2009, which correspond with the global economic downturn, the province has experienced growth in revenue since 2005. Kamloops government revenues did experience reductions prior to 2008 but did not appear to have been as affected by the economic downturn. City revenues have increased at varying rates annually since that time, from 0.11% to over 6%. The TNRD government revenues have fluctuated widely from 2009 through 2013.

Table 7.1-2. Government Revenue - British Columbia, TNRD and City of Kamloops (2005 to 2013)

Year	BC		City of Kamloops		TNRD	
	\$ Million	Change from Previous Year (%)	\$ Million	Change from Previous Year (%)	\$ Million	Change from Previous Year (%)
2005	38,448.0	-	167.0	-	-	-
2006	38,434.0	-0.04	154.6	-7.43	-	-
2007	39,738.0	3.39	154.3	-0.19	-	-
2008	38,711.0	-2.58	163.9	6.22	26.8	-
2009	37,978.0	-1.89	174.0	6.16	31.4	17.16
2010	40,688.0	7.14	180.4	3.68	30.6	-2.55
2011	41,808.0	2.75	182.5	1.16	29.5	-3.59
2012	42,049.0	0.58	182.7	0.11	35.4	20.00
2013	43,728.0	3.99	192.9	5.58	32.2	-9.04

Sources: British Columbia. Ministry of Finance, Office of the Comptroller. Public Accounts; City of Kamloops. Annual Reports; TNRD. Consolidated Financial Statements.

The topic of economic growth is closely related to other economic VCs addressed in this Application/EIS, including Labour Force, Employment and Training (Section 7.2); Income (Section 7.3); Business (Section 7.4); and Economic Diversification (Section 7.6).

With respect to income distribution, the LSA and the RSA showed similar distribution of various personal income categories in 2010 compared to BC. This represents total personal income, which includes employment income, income from self-employment, income from government sources, pension income, income from investment sources, other sources of cash income such as child support payments (Statistics Canada 2013). The under-\$10,000, \$10,000-19,999, and \$20,000-\$29,999 categories represented approximately 16%, 18%, and 13% respectively for the LSA, RSA, and BC. Approximately 19% of the LSA, RSA, and BC populations reported annual incomes over \$60,000 (Statistics Canada 2013).

Provincial employment trends over recent years are described above. With respect to business and employment, public services and resource industries are important business sectors in Kamloops and provide large amounts of employment. The largest employers in Kamloops are the Interior Health Authority, School District no. 73, HVC, New Gold Inc. and Thompson Rivers University (Venture Kamloops 2015). Primary industry, which includes mining and oil and gas extraction, agriculture, logging and forestry, fishing, and trapping (Statistics Canada 2006) provides a substantial proportion of employment in the LSA, especially as HVC and New Gold are two of the

top five employers in Kamloops (Venture Kamloops 2015). According to Statistics Canada (2013), employment in mining and gas extraction industry employed slightly more people than agriculture, forestry, and hunting. The reverse is true of the RSA (i.e., the TNRD), where slightly more individuals are employed in agriculture, forestry, and hunting.

Forestry in the region includes the Kamloops Timber Supply Area (TSA), as well as parts of the Merritt and 100 Mile House TSAs. Forestry in the Kamloops TSA has been in decline in recent years. While Domtar has invested approximately \$120 million in their pulp mill over the last couple of years to improve its competitiveness (Adams *pers. comm.* 2012), the pulp mill closed one of its two production lines in 2013, reducing its workforce by 125 workers (Venture Kamloops 2014). Despite the downturn in the forestry industry, the sector is still an important regional economic activity.

Agriculture, ranching in particular, is an important economic driver in the LSA and RSA. Cattle ranching is the primary agricultural activity in proximity to the Project. Within the RSA, cattle ranching and horse keeping accounted for most of the agricultural activity. In the RSA, roughly one third of farms are engaged in cattle ranching and farming, which includes farms that focus on raising, milking, and fattening cattle. Operations engaged in raising horses, mules, donkeys, and other equines made up over 20% of the agricultural operations in the RSA (Statistics Canada 2011a). The majority of farmland in the RSA is unmanaged pastures used in ranching operations (Invest in Thompson-Nicola 2015). The total gross farm receipts for the RSA, which include receipts from all agricultural products sold and program payments and custom work receipts, in 2010 was \$72.6 million (Statistics Canada 2011b).

Tourism has become an increasingly important component of the LSA economy. The tourism market is both domestic and international. The international market is structured around the fact that the Kamloops has traditionally been an overnight stop-over for tourists travelling and experiencing the Rocky Mountains, typically via Thomas Cook Travel, Brewster Bus Lines or the Rocky Mountaineer rail line. The local market consists of opportunities related to fishing, biking, hiking, snowshoeing, skiing, and various other outdoor opportunities (Ajax KPI Program 2011-2012).

Tourist traffic in Kamloops amounts to approximately 90,000 to 95,000 people per year occupying hotel rooms in the city.¹ Tourism accounts for an estimated \$55 million in revenue through accommodations (Ajax KPI Program 2011-2012). There are about 3,000 hotel and motel rooms in Kamloops (City of Kamloops 2015) and at least 300 campground and RV park sites (a mixture of full hook-up, water, and electricity), excluding provincial parks in the area and sites in other communities in the TNRD (Tourism Kamloops 2015). The accommodation sector has increased local capacity in response to increased demand with initiatives such as the establishment of various hotel chains and with renovations and expansions to existing facilities.

With the weakening of the forestry sector and growing tourism and mining sectors, the RSA has experienced economic change in recent years. Despite the recent decline in commodity prices, gross provincial revenues from the mining sector have been trending upward from approximately

¹ Estimate does not include Sun Peaks but does include corporate travel.

\$4.6 million in 2004 to \$8.5 million in 2013. The number of employees in the mining sector has also steadily risen during that time period (PriceWaterhouseCoopers 2014). Additional mine projects are proposed for future development in the RSA.

Economic diversification is integral to discussion around economic growth in the region. Horne (2009) noted that in the Kamloops Local Area (which corresponds roughly to the LSA but includes Chase and Logan Lake), the public sector has been a dominant income source (Horne, 2009). Dependence on forestry, wood processing, mining, and tourism are well below the scenarios reported for other areas in BC. The diversity index for the Kamloops Local Area in 2006 was 74, making it one of the higher ranked areas in terms of economy diversity in BC. This has remained constant over time. In 1991, 1996 and 2001 these indices were 75, 74 and 72 respectively.

7.1.3 Assessment Boundaries

7.1.3.1 Spatial Boundaries

Local Study Area

As illustrated in Figure 7.1-2, the LSA for the Economic Growth VC consists of Kamloops, the TNRD-J, and two local First Nations: the TteS (based near Kamloops on the Kamloops 1 IR) and the SIB (based near Savona on the Skeetchestn IR). The TteS and SIB are jointly represented by SSN and are both members of the Shuswap Nation Tribal Council (SNTC).

The local study area represents the primary area where Project workers are expected to be sourced from and/or reside in. This area will also be subject to Project expenditures on goods and services and Project employee spending, and where businesses supplying goods and services will be located.

Regional Study Area

As illustrated in Figure 7.1-3, the RSA for the Economic Growth VC is the TNRD and includes communities within a 1.5-hour driving distance of the Project (e.g., Merritt, Logan Lake, Chase). There are numerous skilled workers in this area and the Project may attract workers from Aboriginal and non-Aboriginal communities throughout the RSA. The Project is also expected to generate indirect and induced income opportunities across the RSA.

While there are numerous Indian Reserves throughout the RSA, three Aboriginal Groups have been identified by either the BC EAO or the CEA Agency. The BC EAO has included the LNIB and AIB, both part of the Nlaka'pamux Nation in the Working Group, while the CEA Agency has identified WP/CIB and Métis Nation BC (MNBC). These Aboriginal groups are considered part of the RSA.

7.1.3.2 *Temporal Boundaries*

Temporal boundaries for the assessment of the Economic Growth VC are listed below.

- **Construction:** 3 years;²
- **Operation:** 23 years;
- **Decommissioning and Closure:** 5 years (includes Project Decommissioning, abandonment and reclamation activities, as well as temporary closure, and care and maintenance); and
- **Post Closure:** 5+ years (includes ongoing reclamation activities and post-closure monitoring).

Most of the Project-related economic opportunities—and related effects on economic growth—will be realized in the Construction and Operations phases as this is when most of the Project-related employment and expenditures will occur. Discussion regarding the Decommissioning and Closure and Post Closure phases will focus on the potential for decreased economic growth resulting from the reduction of Project-related economic contributions.

7.1.3.3 *Administrative Boundaries*

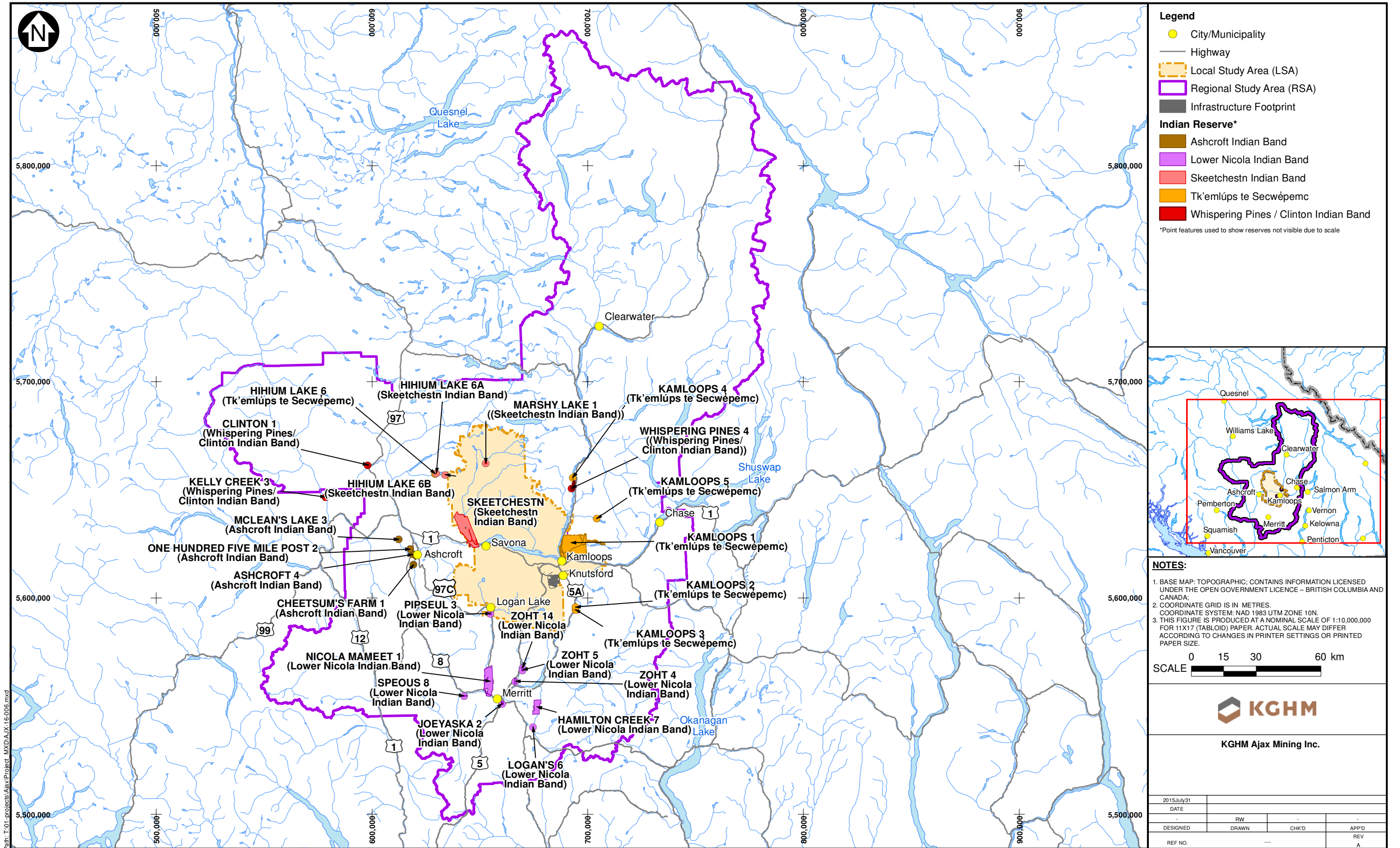
The administrative boundaries of the analysis relate to the abilities of the Statistics Canada input-output model to predict economic growth outcomes as it relates to the communities in the LSA and RSA. As the results of the model are province-wide, there are limitations to the ability to predict changes related to economic growth at the community or regional level. Therefore, the assessment of potential effects at the RSA and LSA levels is largely qualitative.

7.1.3.4 *Technical Boundaries*

The technical boundaries of the analysis relate to the abilities of the Statistics Canada input-output model to describe effects of Project expenditures on the provincial and (to the extent feasible) local economies. The Statistics Canada input-output model is informed by capital and operating expenditures for the Project. As such, the analysis related to economic growth is based upon current estimates of these expenditures, and may not be an exact predictor of Project-related effects. Appendix 7.1-B provides additional explanation of the assumptions and limitations of the modelling technique.

² The Project Construction Phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4). The Construction and Operations phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.

Figure 7.1-3
Regional Study Area



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7.1.4 Project Benefits Related to Economic Growth

Mining is seen by Kamloops officials as an important sector in the economy of Kamloops (Ajax KPI Program 2011-12012), with other important sectors including forestry, manufacturing, agriculture and transportation. In the Thompson Okanagan Development Region (excluding the Kelowna Census Metropolitan Area), in which the TNRD is located, the number of individuals employed in the mining and oil and gas extraction sector has grown at a faster rate than in all other industries between 1997 and 2013 (Venture Kamloops 2014). Beneficial effects on economic growth are anticipated during the Construction and Operations phases of the Project.

7.1.4.1 Construction Phase

During the Construction Phase, all activities associated with site development are expected to contribute positively to economic growth. The largest contributors to the local and regional economy are expected to be direct Project and contracted employment as well as direct Project expenditures.

The total cost of the Construction Phase is estimated at \$1.54 billion (2015 Cdn\$). This is a sum of all wages and benefits paid to mine staff, all purchases of machinery and equipment, all payments to construction companies and other service providers, and all other spending on goods and services, utilities, and taxes. Approximately two-thirds of all direct expenditures are expected to be made within BC and one-third imported from elsewhere in Canada and internationally. The majority of expenditures, estimated at slightly more than \$1 billion, will be made in the Kamloops area and elsewhere in BC. Approximately \$697 million of the total estimated construction costs are expected to be spent on land, buildings and associated equipment.

The total predicted employment impact of the Project's Construction Phase is 9,725 person-years of employment within BC and a further 3,715 person-years of employment in the rest of Canada. Employment extending beyond BC includes 1,700 person-years in Ontario, 1,000 person-years in Alberta, 600 person-years in Québec and about 400 person-years distributed among the other provinces.

The total impacts of the Project are the sum of the direct, indirect and induced impacts, as summarized in Table 7.1-3. In addition to employment, the input-output model also provides estimates of total industry output (analogous to total revenue for all companies in the supply chain), GDP, which is the value-added component of the additional revenue, and tax revenue for all three levels of government. Note that even though the Project is located in BC, the additional demand created for goods and services elsewhere in Canada will lead to additional provincial and local taxes as companies increase sales, expand their buildings and hire more workers in those other provinces.

In general, the Project is expected to result in considerable direct and spin-off employment, income, and GDP impacts that will contribute to economic growth locally and regionally. Direct, indirect and induced Project expenditures will have a positive effect on the growth of the local and regional economy through increased demand for local goods and services. A similar contribution is expected from direct, indirect and induced employment opportunities that will increase personal and household income. Additionally, the Project will contribute to the government tax revenues from the resulting personal income tax, corporate profit tax, sales tax and the rural property tax and revenues

(BC mineral tax); the total contribution to the government tax revenue as a result of Project Construction is estimated at \$354 million.

Table 7.1-3. Total Economic Impacts for Ajax Project Construction Phase (Direct, Indirect, and Induced Impacts)

Impact	Total Construction Phase	
	British Columbia	Rest of Canada
Estimated Construction Expenditure	\$1,000 million	\$522 million
Total Output ¹	\$1,800 million	\$820 million
Gross Domestic Product (GDP) ²	\$873 million	\$409 million
Full Time Equivalent Employment (FTE) ³	9,725	3,715
Government Tax Revenue ⁴	\$354 million (all taxes, Canada-wide)	
• Federal Taxes	\$162 million (Canada-wide)	
• Provincial Taxes	\$115 million	\$40 million
• Local Taxes	\$25 million	\$12 million

Note: Tax revenue figures include estimates from the input-output model as well as personal and corporate income tax estimates generated separately by InterGroup Consultants (see Appendix 7.1-B).

¹ Total Output: The total dollar increase in expenditures in the economy, including the direct, indirect and induced impacts, including the purchase of intermediate inputs used to produce final goods and services.

² GDP: The total "value-added" generated in the economy after the value of intermediate inputs are removed from Total Output. It is consequently smaller than Total Output, but is a better measure of the true dollar impact on the economy.

³ FTE: Expressed as person-years of FTE (assuming 2,000 hours per year). Includes direct employment (including contractors) as well as indirect and induced employment related to goods and services. Estimates for construction are provided for the entire phase.

⁴ Total government tax revenues include tax revenue estimates from the input-output model as well as personal and corporate income tax estimates generated separately by InterGroup Consultants. See Appendix 7.1-B for description of calculation methodology.

At the conclusion of construction and the start of operations, a decrease in Project related spending is expected to reduce the contributions to local and regional economic growth. Although at a reduced level, contributions to economic growth during Operations Phase are still considered as positive and substantial.

7.1.4.2 Operations Phase

During the Operations Phase, activities that involve local and regional expenditures to support ongoing activities, such as materials hauling and mine staffing, are expected to positively contribute to economic growth. Activities that generate ongoing expenditures and/or employment similarly will provide positive contribution to government revenues through increased taxation. However, Project activities developed during the Construction Phase and maintained during operations are expected to contribute to economic growth at a reduced rate given the lower level of spending and employment. Examples of these activities would include operation and maintenance of project lighting or the temporary ore stockpile.

The projected average level of operating expenditures each year is \$299 million (2015 Cdn\$), yielding direct operating expenditures over the projected mine life of \$6.9 billion.

Direct employment at the mine during operations is projected at 453 full-time equivalent (FTE) positions (based on 2,000 hours per year)³. Total direct wages plus benefits will be nearly \$62 million per year and approximately \$1.41 billion over the projected mine life of 23 years. Direct employment composition is expected to include full-time, part-time, and seasonal worker positions, though the majority of positions are expected to be full-time.

The total impacts during Operations, including all direct, indirect and induced impacts, are summarized in Table 7.1-4. Total annual employment supported by the Project is estimated at 1,450 FTE positions in BC and an additional 540 FTE positions in the rest of Canada. The over the life of the mine increase in GDP is estimated at \$5.1 billion for the province (average of \$222 million per year), plus a total of \$1.5 billion in the rest of Canada. Total tax revenue to all levels of government is estimated at \$84 million per year, or a total of \$1.9 billion over the life of the mine.

Table 7.1-4. Total Economic Impacts for Ajax Project Operations Phase (Direct, Indirect, and Induced Impacts; 2015 Cdn\$)

Impact	Total Operating Phase (23 years)		Annual Average	
	British Columbia	Rest of Canada	British Columbia	Rest of Canada
Total Estimated Expenditures	\$6.9 billion		\$299 million	
Total Output ¹	\$11.4 billion	\$3.3 billion	\$495 million	\$143 million
Gross Domestic Product (GDP) ²	\$5.1 billion	\$1.5 billion	\$222 million	\$67 million
Full Time Equivalent (FTE) Employment ³	33,400	12,400	1,450	540
Government Tax Revenue ⁴	\$1.9 billion (all taxes, Canada-wide)		\$84 million (all taxes, Canada-wide)	
• Federal Taxes	\$858 million		\$37 million	
• Provincial Taxes	\$710 million	\$152 million	\$31 million	\$6.6 million
• Local Taxes	\$160 million	\$41 million	\$6.9 million	\$1.8 million

NOTE: Tax revenue figures include estimates from the input-output model as well as personal and corporate income tax estimates generated separately by InterGroup Consultants (see Appendix 7.1-B).

¹ Total Output: The total dollar increase in expenditures in the economy, including the direct, indirect and induced impacts, including the purchase of intermediate inputs used to produce final goods and services.

² GDP: The total "value-added" generated in the economy after the value of intermediate inputs are removed from Total Output. It is consequently smaller than Total Output, but is a better measure of the true dollar impact on the economy.

³ FTE: Expressed as person-years of FTE employment (assuming 2,000 hours per year per position). Includes direct employment (including contractors) as well as indirect and induced employment related to goods and services. Total estimated employment impacts have been divided by the number of years to generate average annual employment estimates.

⁴ Total government tax revenues include tax revenue estimates from the input-output model as well as personal and corporate income tax estimates generated separately by InterGroup Consultants. See Appendix 7.1-B for description of calculation methodology.

³ The economic input-output model has assumed on average 453 FTE positions are required during the operations phase of the project. For the economic modelling and assessment of economy VCs, 453 was considered conservative for the purposes of assessing estimated Project benefits. For social VCs, where projections were made on population and the assessment focused on potential adverse effects, an average annual workforce of 468 FTE positions was used. This figure was based on current workforce estimates and remains conservative. Total workforce levels may fluctuate over the 23-year period and could be as high as 500 positions.

7.1.4.3 Decommissioning and Closure, and Post Closure Phases

The Decommissioning and Closure Phase is expected to occur over a five-year period at a cost of approximately \$195 million⁴. During the Decommissioning and Closure Phase, some site activities that require expenditures to complete are expected to contribute positively to economic growth. Examples of these activities would include the dismantling of building and structures, reclamation of tailings management and mine rock storage facilities. However, the ultimate reduction in site activities and associated expenditures with Decommissioning and Closure will reduce government revenues associated with the Project. A reduction in Project-related economic activity at the local and regional level is also expected. In general, there can be changes to the economic growth in businesses/industries that previously relied to Project spending. Finally, after the site has been decommissioned and enters Post Closure Phase, activity associated with post-closure will be greatly reduced and expected to have negligible contribution to economic growth.

7.1.5 Potential Adverse Effects of the Project and Proposed Mitigation for Economic Growth

This section identifies and analyses potential economic effects on the Economic Growth VC. Economic effects of mine development are generally considered a key benefit of any project as they are seen as a potential engine of economic growth, providing jobs, incomes, tax revenues, and business opportunities that contribute to community, regional, and provincial prosperity; these benefits are described in further detail in Section 2.7, Project Benefits. Potential adverse effects are identified where an interaction with Project components or activities is predicted. Mitigations and enhancement measures are recommended as appropriate (Sections 7.1.4.2-7.1.4.4).

The main drivers of effects on the Economic Growth VC are direct Project spending and employment. Direct Project expenditures and employment are expected to positively contribute to economic growth in the region with additional economic impacts realized through expenditures by industries supplying goods and services to the Project (indirect impacts) and the spending by Project workers (induced impacts). Positive effects on the VC are predicted during Project Construction and Operation where direct Project spending boosts economic growth in the region, contributing to economic activity and government tax revenue.

Potential adverse effects to economic growth could occur during Decommissioning and Closure, and Post Closure as reduced Project activities and spending decrease the level of Project-related economic activity in the region and contributions to federal and provincial governments. This could lead to a potential adverse effect on the VC in terms of a decreased in economic activity (including contributions to government revenues through taxation). This effect is described in the following sections.

⁴ These cost estimates have been prepared for the purpose of the environmental assessment and assume third party costs associated with closure activities. Actual costs for decommissioning and closure could vary by up to 30%.

7.1.5.1 Identifying Potential Adverse Effects on Economic Growth

The Application Information Requirements/EIS Guidelines (AIR/EIS Guidelines) require a consideration of potential Project effects on economic growth. Potential effects on economic growth do not typically result from single Project components or activities, but rather an aggregate of multiple components and activities. Some Project components, such as Contracted Employment, have more pronounced influence on economic growth compared to other Project components. Table 7.1-5 describes the relationship between various aggregated Project components and activities, and the potential effects on economic growth. Only potential adverse interactions are ranked in Table 7.1-5 and only those interactions that are considered “M,” moderate, or “H” key are carried through to the effects assessment.

Table 7.1-5 Identifying Potential Project Interactions and Effects on Economic Growth

Project Activities		Potential Adverse Effects on Economic Growth
		Decrease in Economic Activity and Government Revenues
Construction	Clearing and Grubbing	O
	Earthworks	O
	Overburden/Topsoil Stockpile	O
	Laydown Areas and Storage Yards	O
	Project Lighting	O
	Site Security and Fencing	O
	Fuel Storage and Filling Area	O
	Hazardous Wastes Transport, Storage, and Disposal	O
	Construction Wastes Transport, Storage, and Disposal	O
	Sewage Infrastructure and Disposal	O
	Public Road Realignment, Use, and Maintenance	O
	Site Road Construction, Use and Maintenance	O
	Haul Truck Road Construction, Use, and Maintenance	O
	Site Buildings and Process Plant	O
	Explosives Magazine and Storage Facilities	O
	Open Pit Development	O
	Drilling and Blasting	O
	Crushing Mine Rock	O
	Loading, Hauling, and Deposition of Mine Rock	O
	Temporary Ore Stockpile	O
	Tailing Storage Facility Development	O
	Power Transmission, Distribution	O
	Natural Gas Line	O
	Pipeline Utility Corridor (Potable Water, Sewage, and Site Water)	O

Project Activities		Potential Adverse Effects on Economic Growth
		Decrease in Economic Activity and Government Revenues
Construction (cont'd)	Water Intake from Kamloops Lake	○
	Fire Suppression Infrastructure	○
	Contact Water	○
	Non-contact Water	○
	Haul Truck Road	○
	Water Management Dams	○
	Mine Staffing (Direct Employment)	○
	Contracted Employment	○
	Taxation	○
Operation	Open Pit Development	○
	Drilling and Blasting	○
	Hauling Mine Rock and Ore from Pit	○
	Crushing and Conveying Ore	○
	Temporary Ore Stockpile	○
	Development of Mine Rock Management Facilities	○
	Stripping, Loading, Hauling, Deposition, and Contouring of Topsoil and Overburden	○
	Revegetation through Progressive Reclamation	○
	Process Plant Operation	○
	Deposition to Tailing Storage Facility	○
	Site Road Use and Maintenance (Materials, Personnel, Supplies)	○
	Concentrate Transport and Storage	○
	Explosives Magazine and Storage Facilities	○
	Fire Suppression Infrastructure	○
	Fuel Storage and Filling Area	○
	Hazardous Wastes Transport, Storage, and Disposal	○
	General Wastes Transport, Storage, and Disposal	○
	Sewage Infrastructure and Disposal	○
	Laydown Areas and Storage Yards	○
	Power Transmission, Distribution	○
	Project Lighting	○
	Site Access, Security and Fencing	○
	Water Intake from Kamloops Lake	○
	Contact Water	○
	Non-contact Water	○
Potable Water Treatment and Use	○	

Project Activities		Potential Adverse Effects on Economic Growth
		Decrease in Economic Activity and Government Revenues
Operation <i>(cont'd)</i>	Haul Truck Road	O
	Mine Staffing (Direct Employment)	O
	Contracted Employment	O
	Taxation	O
Decommissioning and Closure	Dismantling of Ancillary Buildings	L
	Pit Lake Planning	L
	Site Road/Bridge Decommissioning	L
	Tailing Storage Facility Decommissioning and Reclamation	L
	Mine Rock Management Facilities Reclamation	L
	Fuel Storage and Filling Area	L
	Hazardous Wastes Transport, Storage, and Disposal	L
	General Wastes Transport, Storage, and Disposal	L
	Sewage Infrastructure and Disposal	L
	Laydown Areas and Storage Yards	L
	Power Transmission, Distribution	L
	Project Lighting	L
	Site Access, Security and Fencing	L
	Contact Water	L
	Non-contact Water	L
	Potable Water Treatment and Use	L
	Haul Truck Road	L
	Road use to the Project (Materials, Personnel, Supplies)	L
	Mine Staffing (Direct Employment)	M
Contracted Employment	M	
Taxation	M	
Post Closure	General Site Inspections and Maintenance	O
	Contact Water	O
	Non-contact Water	O
	Road use to the Project (Materials, Personnel, Supplies)	L
	Mine Staffing (Direct Employment)	O
	Contracted Employment	L

Notes:

- O** No interaction anticipated.
- L** Negligible to minor interaction expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.
- M** Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.
- H** Interaction; warrants further consideration.

Mining is seen by Kamloops officials as an important sector in the economy of Kamloops, which contributes to the diversity of the economy (Ajax KPI Program 2011-12012). In the Thompson Okanagan Development Region (excluding the Kelowna Census Metropolitan Area), in which the TNRD is located, the number of individuals employed in the mining and oil and gas extraction sector has grown at a faster rate than all industries between 1997 and 2013 (Venture Kamloops 2014).

During the Construction Phase, when most activities are associated with site development, all project activities are expected to contribute positively towards economic growth. The largest contributor is expected to be contracted employment, where employment and associated local and regional expenditures are expected to make a substantive contribution to the local economy. Reductions in site activities at the conclusion of construction and the start of operations is expected to have a reduced and positive contribution to economic growth in the region.

During the Operations Phase, activities that involve local and regional expenditures to support ongoing activities, such as the materials hauling and mine staffing, are expected to contribute positively to economic growth. Activities that generate ongoing expenditures and/or employment similarly will provide positive contribution to government revenues through increased taxation. Project activities that have been developed during the construction phase are maintained during operations, are not expected to generate as much contribution to economic growth and have been rated as having a low potential interaction. Examples of these activities would include operation and maintenance of project lighting or the temporary ore stockpile.

During the Decommissioning Phase, site activities that require expenditures to complete are expected to contribute positively to economic growth. Examples of these activities would include the dismantling of building and structures, reclamation of tailings management and mine rock storage facilities. The ultimate reduction in site activity and associated expenditures during the Decommissioning and Closure Phase will reduce the Project's contribution to economic activity, and government revenues associated with these expenditures will also be reduced.

After the site has been decommissioned and enters Post Closure Phase, post-closure activity is greatly reduced and is expected to have negligible contribution to economic growth.

7.1.5.2 Effects on Economic Growth

Effects on economic growth are anticipated to be beneficial during both Construction and Operations phases. However, a potential adverse effect associated with the reduction in Project-related economic contributions during the Decommissioning and Closure phase was identified in terms of a decrease in economic activity and government revenues.

Decrease in Economic Activity and Government Revenues

Decommissioning and Closure Phase

As the Project moves out of Operations and into the Decommissioning and Closure Phase, there will be a decrease in Project-related employment and expenditures. Other economic contributions, including income and GDP will also decrease as a result; this decline can be expected to flow through to indirect and induced effects. Decreased direct and spin-off expenditures and

employment can consequently lead to decreased economic growth. The impacts associated with the decreased economic activity will occur within the LSA and the RSA.

Project expenditures during the Operations Phase are \$299 million per year, an additional \$84 million will be contributed every year to the federal and provincial government tax revenue. An average of 468 people are anticipated to be directly employed at the Project for Operations, while an additional 480 people will be employed through indirect and induced employment. As the Project moves from the Operations Phase into the Decommissioning and Closure Phase, it will transition to a smaller workforce, which will continue to decrease progressively over a five year period. Project expenditures will also decrease, and with it, Project contributions to government tax revenue that were previously generated from personal income taxes, corporate profit taxes, sales taxes and the rural property tax. Potential changes to the economic growth in businesses/industries that previously relied on Project spending are expected as the demand for goods and services from the Project decreases. As a result, a reduction in Project-generated economic activity is expected.

Although Project's contributions to economic activity during Project Construction and Operation are considered as a beneficial effect, the decrease in economic activity as the Project enters the Decommissioning and Closure Phase, given the long term nature of the Project, is considered as an adverse effect.

Post Closure Phase

In the Post Closure Phase, economic activity will be further limited and short term in nature as Project expenditures continue to decrease to eventually dissipate by the end of the Phase. Expenditures are expected to be limited to ongoing restoration, reclamation, maintenance and environmental mitigation and monitoring. Potential adverse effects associated with a reduction in economic activity are not anticipated during this phase as the decline in expenditures and activity would have gradually occurred during the Decommissioning and Closure Phase.

7.1.5.3 Mitigation Measures for Economic Growth

Mitigation of potential adverse effects related to reduced employment and expenditures, and decreased economic growth, includes a commitment to communicate with contractors, employees, and local government regarding the Project's status and schedule as the Project progresses from Operations and into Decommissioning and Closure. Direct employees of the Project and contractors, will be informed of upcoming changes in employment or business contracts in a manner that will allow them to find other employment and/or contracts.

A workforce transition plan will be developed and implemented to support education and training as well as career development opportunities to aid employees in obtaining employment elsewhere. Assistance will be provided on job searches as requested by individual employees. It is anticipated that training and experience gained during Project employment will help facilitate this transition to other related resource opportunities.

7.1.5.4 *Measures to Enhance Project Benefits*

KAM is currently in the process of completing a human resource development plan that will be implemented prior to the start of construction activities. Measures taken to increase the benefits of the Project that are retained locally serve to promote economic growth in the region. Key aspects of KAM's human resource development plan relevant to this discussion include the following:

- A strategic workforce plan will describe workforce requirements for the Project development phase, from construction through to operations. This plan will outline the requirements of both KAM and its contractors and will reflect the fluctuating workforce needs of the Project.
- A Project recruitment strategy will also be developed. The strategy incorporates a commitment to hiring locally (Kamloops and the BC interior) and looking for partnership opportunities with local education and training organizations and institutions to ensure that the expertise required for operations is available. Attention will be given to recruiting potential employees who currently leave the region to work on resource development projects in other parts of the province or elsewhere.
- Efforts will be put in place to maximize recruitment of qualified First Nations candidates, in accordance with any established agreements. A First Nations liaison will facilitate this process.
- Efforts to encourage recruitment of local personnel will include utilization of an applicant tracking database, internet and social media, advertising, associations and institutions, career/job fairs, and agencies.
- With respect to training, federal and provincial programs will be accessed where feasible and appropriate to support workforce development. Efforts will also be undertaken to work with local universities and community partners to develop training programs and/or co-op programs. On-the-job training and apprenticeship programs may also be implemented as required.
- New employee orientation will include a component of cross-cultural training to recognize and support a diverse, multicultural workforce.
- Programming will be in place to facilitate continued training and development of employees, including provision of financial assistance to pursue educational opportunities and professional designations.

The overall intent of these measures is to maximize local employment and procurement, which in turn promotes local economic growth.

7.1.6 **Residual Effects and Their Significance**

7.1.6.1 *Summary of Residual Effects*

The Project has the potential to result in a residual adverse effect related to decreased economic growth at the end of operations. This effect is associated with the decrease in direct and spin-off Project spending and employment that can lead to a decrease in GDP, income and government revenues associated with the Project as it moves from the Operations Phase into the Decommissioning and Closure Phase. Table 7.1-6 summarizes the anticipated residual effects.

Table 7.1-6. Summary of Residual Effects on Economic Growth

Project Effect	Project Phase (timing of effect)	Project Activity	Description of Cause-Effect	Description of Mitigation Measure(s)	Description of Residual Effect
Benefit: Contribution to Economic Growth	Construction & Operations	Project Employment & Spending	Direct, indirect, & induced employment and income, as well as other Project spending and activities contribute to economic growth	Measures to maximize local employment and procurement	Not Applicable (Benefit)
Decrease in Economic Activity and Government Revenues	Decommissioning and Closure	Employment; expenditures	Decrease in Project activity (spending and employment) at the end of Operations will result in reductions in employment and procurement as well as contributions to GDP and government revenues.	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Decrease in Economic Activity and Government Revenues

7.1.6.2 *Criteria for Characterization of Residual Effects*

Residual effects are characterized using the following standard criteria: magnitude, duration, frequency, geographic extent, reversibility, resiliency, and ecological/social context. The definitions of these terms for the assessment of Project effects on Economic Growth is outlined in Table 7.1-7.

7.1.6.3 *Characterization of Residual Effects*

Table 7.1-8 provides a description of the characterization of potential adverse residual effects, significance, likelihood and confidence related to economic growth.

Characterization of residual effects is based primarily on review of secondary sources as well as professional judgement. For the potential effect of decreased economic activity during the Decommissioning and Closure Phase, the following ratings were assigned:

- The magnitude of the potential effect is considered to be medium. For the LSA and RSA, the expected decrease in economic growth during the Decommissioning and Closure Phase will be notable. A number of jobs will be terminated as the workforce is reduced from an average of 468 workers (plus 480 indirect and induced jobs) as the Project enters Decommissioning and Closure. Additionally, Project spending will decrease from an average of \$299 million per year during Operations. Considering the size of the labour force in the LSA and RSA, and the fact that mining has historically been (and continues to be) an important aspect of the local economy, the decrease in jobs and associated income generation is expected to be a notable, but not overwhelming, event within the LSA and RSA. The impact on economic growth will depend on the economic conditions present 25 years in the future, the presence of the other projects, the impact of 25+ years of Project economic benefits, and the diversity of the local and regional economy.
- The duration of the residual adverse effect is expected to be short term, from 1 to 5 years and will be characterized by reduced economic growth during the Decommissioning and Closure Phase.
- The frequency of the effect is rated as once. The notable reduction in Project activities is expected to take place in a relatively limited and well-defined window following the Operations Phase.
- The geographic extent of this effect is regional as the major drivers of economic growth are expected to be RSA and LSA-based. The decrease in economic growth at closure is expected across the RSA.
- The effect is expected to be reversible in the short-term as workers and businesses move on to other opportunities.
- Resiliency to the effect is rated as high. The economies of the LSA and RSA are expected to be able to readily respond and adapt to the effect. With the help of transition planning and the skilled nature of much of mining employment, Project employees during the Operations Phase are expected to secure additional employment, even if future employment is not in the mining sector. Local and regional economies are expected to adapt effectively to changes in expenditures.

Table 7.1-7. Definitions of Characterization Criteria of Residual Effects on Economic Growth

Magnitude	Duration	Frequency	Geographic Extent (Physical/Biophysical)	Reversibility	Resiliency	Social Value	Likelihood of Effects	
							Probability	Confidence Level
<i>How severe will the effect be?</i>	<i>How long will the effect last?</i>	<i>How often will the effect occur?</i>	<i>How far will the effect reach?</i>	<i>To what degree is the effect reversible?</i>	<i>How resilient is the receiving environment or population?</i>	<i>How influential is the effect on the broader socio-economic environment?</i>	<i>How likely is the effect to occur?</i>	<i>How certain is this analysis?</i>
<p>Negligible: No or very little detectable change from baseline conditions</p> <p>Minor: Differs from the average value for baseline conditions to a small degree.</p> <p>Medium: Differs substantially from the average value for baseline conditions and approaches the limits of natural variation.</p> <p>Major: Differs substantially from baseline conditions, resulting in a detectable change beyond the range of natural variation.</p>	<p>Short-term: Effect lasts 1 to 5 years.</p> <p>Medium-term: Effect lasts 6 to 25 years.</p> <p>Long-term: Effect lasts between 26 and 50 years.</p> <p>Far Future: Effect lasts more than 50 years.</p>	<p>Once: Effect is confined to one discrete period in time during the life of the Project.</p> <p>Sporadic: An effect that occurs at sporadic or intermittent intervals during any phase of the Project.</p> <p>Regular: Effect occurs on a regular basis during the life span of the Project.</p> <p>Continuous: Effect occurs constantly during the life of the Project.</p>	<p>Local: Effects extend less than 500 m from Project infrastructure.</p> <p>Landscape: Effect is limited to the LSA (i.e., Sub-area).</p> <p>Regional: Effect extends across the broader region (e.g., RSA).</p> <p>Background: Effect extends beyond the regional scale, and may extend across or beyond the province.</p>	<p>Reversible Short-term: Effect can be reversed relatively quickly.</p> <p>Reversible Long-term: Effect can be reversed within 20 years of Post Closure.</p> <p>Irreversible: Effect cannot be reversed (i.e., is permanent).</p>	<p>Low: The receiving environment or population has a low resilience to imposed stresses, and will not easily adapt to the effect.</p> <p>Neutral: The receiving environment or population has a neutral resilience to imposed stresses and may be able to respond and adapt to the effect.</p> <p>High: The receiving environment or population has a high natural resilience to imposed stresses and can respond and adapt to the effect.</p>	<p>Low: The effect has limited ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>Medium: The effect has some ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>High: The effect has moderate ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p>	<p>High: It is highly likely that this effect will occur.</p> <p>Medium: This effect is likely, but may not occur.</p> <p>Low: This effect is unlikely but could occur.</p>	<p>High: > 80% confidence. There is a good understanding of the cause-effect relationship and all necessary data are available for the Project area. There is a low degree of uncertainty and variation from the predicted effect is expected to be low.</p> <p>Medium: 50 to 80% confidence. The cause-effect relationships are not fully understood, there are a number of unknown external variables, or data for the Project area are incomplete. There is a moderate degree of uncertainty; while results may vary, predictions are relatively confident.</p> <p>Low: < 50% confidence. The cause-effect relationships are poorly understood, there are a number of unknown external variables, and data for the Project area are incomplete. High degree of uncertainty and final results may vary considerably.</p>

Table 7.1-8. Characterization of Residual Effects, Significance, Likelihood and Confidence on Economic Growth

Residual Effect	Residual Effects Characterization Criteria							Significance of Adverse Residual Effects	Likelihood and Confidence	
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Resiliency	Social Value		Probability	Confidence
Decrease in Economic Activity and Government Revenues	Medium	Short-term	Once	Regional	Reversible Short-term	High	Low	Not Significant (minor)	High	Medium

- Social Value is rated as low as the effect has limited ability to alter the economic base, social structure, community stability or the well-being of people in the study area. Social value is not ranked more highly for several reasons. First, the Project is one of a variety of mines in the RSA that are either in operation or development. Second, in addition to these operations, mineral exploration is ongoing (e.g., Cache Creek) in the region. While mining will likely continue in the area, providing workers with other employment opportunities, it should also be noted that the economy around Kamloops was, according to Horne (2009) was one of the more diverse economies in BC according to 2006 census data. Third, there are also well-developed social and economic supports, especially in Kamloops, which has a range of social services similar to those in a major metropolitan centre (Mazzotta, *pers. comm.* 2015).

7.1.6.4 *Significance of Residual Effects*

A determination of significance was based on and is consistent with the guidance provided in Chapter 5, Effects Assessment Methodology (Section 5.2.5.4). The residual effect of decreased economic activity and government revenues is expected to be **Not Significant (Minor)**. A decrease in economic activity is expected to occur with decreased Project employment and expenditures, and the effect is expected throughout the RSA. This residual effect is not expected to be more significant because the regional economy is diverse, the regional economy has historical experience with the mining sector economy, and new employment and business opportunities will likely be easy to secure. The rating is conservative and the actual economic environment at the time of Decommissioning and Closure may not be as significant depending on the broader economic conditions when the Project ceases operations.

7.1.6.5 *Characterization of Likelihood and Confidence*

Since Project operations will undoubtedly come to an end, there is a high probability that there will be decreased economic growth and government revenues. However, considering the wide range of variables that could influence the significance of the effects, there is therefore a moderate degree of uncertainty and the confidence level is considered to be medium. It is difficult to accurately predict economic circumstances in the LSA more than 20 years into the future given the large number of variables that could potentially influence the local economy (e.g., commodity prices, attraction of new businesses in other sectors to the LSA, the development of new mining operations) and the future availability of comparable income-generating employment alternatives at the time of closure.

7.1.6.6 *Summary of Residual Effects Assessment and Significance*

In summary, the residual effect related to decreased economic growth during the Decommissioning and Closure Phase is expected to be Not Significant (Minor; Table 7.1-9). The residual effect is carried forward into the Cumulative Effects Assessment.

Table 7.1-9. Summary of Residual Effects, Mitigation, and Significance on Economic Growth

Residual Effects	Project Phase	Mitigation Measures	Significance
(Benefit) Contribution to Economic Growth	Construction & Operations	Measures to maximize local employment and procurement	Not Applicable (Benefit)
Decrease in economic activity and government revenues	Decommissioning and Closure, and Post Closure	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Not Significant (Minor)

7.1.7 Cumulative Effects Assessment

7.1.7.1 Introduction

This section describes the potential incremental effects of the Project that may occur when the residual effects are combined with those from other past, present or future projects and activities. The intent is to determine whether the residual effects of the Project could interact with those of other past, current and future activities and result in a greater impact on the VC.

Economic growth is closely tied to other economic VCs directly and indirectly, including the Income VC, Business VC, and the Labour Force, Employment, and Training VC. The residual effect on Economic Growth relates to the potential for reduced economic activity following mine closure. These residual effects are relevant only to the Decommissioning and Closure Phase and are expected as a result of the cessation of Project operations and the consequent decrease in employment, business opportunities, and contributions to government revenues. If other projects or activities in the LSA and RSA undergo similar transitions within the same time period the residual effect could be exacerbated, resulting in a cumulative effect.

7.1.7.2 Identification of Other Actions that May Affect Economic Growth

For the Economic Growth VC, the key concern from a cumulative effects perspective is whether other projects or activities in the RSA and LSA are anticipated to undergo a substantive decrease in activities and associated employment (and related expenditures) within a similar time frame of the Project's decreased expenditures.

7.1.7.3 Interactions between Residual Project Effects and Other Project or Activity Effects

Of the projects and activities screened for consideration to interact cumulatively with Project economic growth residual effects, a key concern are projects or activities that contribute substantially to the LSA and RSA economy undergoing a similar transition during the same time frame. The Ajax Project has a current estimated mine life of 23 years. The Project Operations Phase is expected to end in approximately 2042. By the end of the Project's Decommissioning and Closure Phase, over 400 positions will be removed from the local economy. Similarly, Project-related spending will be substantially reduced.

To screen other actions into or out of the CEA, the end of the operations phases for other resource development (mainly mining projects) were considered as these projects are either located near the proposed Project (potential for spatial overlap), or may end their operational period around the same time as the Ajax Project (potential for temporal overlap). Screening results are shown in Table 7.1-10. The four projects considered with respect to potential cumulative effects include:

- **Highland Valley Copper:** The HVC mine is located near Logan Lake and is approximately 50 km by highway from Kamloops. In 2014, HVC was the third largest employer in the LSA with over 1,300 employees. In the past five years, the number of employees has risen from 800 to approximately 1,380. About half of the HVC workforce lives in Kamloops. The remainder of the workforce commutes from other nearby communities in the RSA including Logan Lake and Ashcroft (Ajax KPI Program 2011-2012; Dechert pers. comm. 2014). The mine is currently expected to operate until 2027 based on a new operations plan (Teck 2015).
- **New Afton:** The New Afton Mine is approximately 10 km west of the Ajax Project, and is primarily an underground operation. The mine began commercial production in 2012. As of December 31, 2014, there were 447 employees and 14 contractors (New Gold 2015). Seventy-five to eighty percent of the operation's workforce lives in Kamloops (Ajax KPI Program 2011-2012). The mine is expected to be in operation for a total of 12 years until approximately 2024.
- **Harper Creek Mine Project (proposed):** Located 150 km from the City of Kamloops, this project (if approved) would have a mine life of about 28 years (BC EAO and CEA Agency 2015). The mine is expected to have approximately 600 positions during construction and peak operation employment of 466 positions (ERM Consultants Canada Ltd. 2015). Construction is not expected to start until earliest 2016 which would indicate mine operations would continue until approximately 2046.
- **Bonaparte Mine Project (proposed):** Located 45 km north of the City Kamloops, this project is currently focused on the exploration and drilling stage (WestKam Gold Corp 2015), therefore it is difficult to know with any certainty when it might begin production and for how long operations could last.

In light of the low level of temporal overlap between the Project, Bonaparte Mine, New Afton Mine, HVC, and the low level of spatial overlap with Harper Creek (located 150 km east of Kamloops), the potential interaction between the Project and these activities is rated as low, and no cumulative effects are anticipated.

7.1.7.4 *Proposed Mitigation Measures*

No mitigation is proposed as cumulative effects are not anticipated.

7.1.7.5 *Evaluation of Significance of Residual Cumulative Effects*

No cumulative effects are anticipated.

7.1.8 Conclusion

The Project will largely have positive effects on economic growth in the LSA and RSA. During the Construction and Operations phases, the Project will create employment in the LSA and RSA, both directly (through direct hires) and indirectly (through expenditures on goods and services to support the Project), and through induced economic effects. Employment related to the Project, and the associated employment income, will contribute to economic growth. In total between 1,510 and 1,850 total local positions (i.e., direct, indirect, and induced) are expected to be supported by the Project during the Construction Phase, and 933 total positions during the Operations Phase.

As the Operations Phase ends and the Project begins Decommissioning and Closure, there will be a reduction in employment and Project expenditures at the end of the 23-year Operations Phase. As a result of the decrease in Project-related activities, the Project's contribution to local and regional economic growth will also decrease, as would be expected with the Closure of any economically beneficial operation. Mitigation measures to offset the effect of Closure include a communications strategy and a workforce transition plan. The communications strategy will involve direct employees of the Project and contractors, both of which will be informed of upcoming changes in employment or business contracts in a manner that will allow them to find other employment and/or clients. The transition programming will provide support for education and training and career development. Where feasible, re-assignment will be considered. Following mitigation, the effect is expected to be **Not Significant (Minor)**. No cumulative effects are predicted for the Economic Growth VC. A summary of the assessment is provided in Table 7.1-11.

In addition to recognizing the potential challenges that may arise upon closure of the Project, including implications of reduced employment and income, it is also important to acknowledge the substantial income benefits that the Project will generate over the Construction and Operations phases. This includes \$1.2 billion in direct salaries over 23 years through the employment of, on average, 468 people, plus \$23.8 million through indirect and \$38 million through induced employment. In total, direct, indirect and induced employment is expected to contribute \$1.8 billion through salaries paid to residents of the LSA and RSA. These benefits, among others, are described further in Section 2.7, Project Benefits.

Table 7.1-10. Ranking Potential for Residual Effects to Interact Cumulatively with Effects of Other Human Actions on Economic Growth

Residual Effect	Industrial Projects/Activities														Natural Resources and Land Use			Tourism and Commercial Recreation Activities					Community Infrastructure			Transportation					
	Vidette Lake Mine	Afton Mine (Historical)	Iron Mask Mine	Bonaparte Mine	New Afton Mine (New Gold)	Highland Valley Copper Mine (Teck)	Domtar Kamloops Pulp Mill	Tolko-Hefley Creek Plywood and Veneer	LaFarge Cement Plant	Trans Mountain Pipeline System (Kinder Morgan)	Trans Mountain Pipeline System - Expansion (Kinder Morgan)	Harper Creek	Highland Valley Copper - Bethlehem Expansion	Kamloops Forest District	Agriculture	Ranching	Tranquille on the Lake	Lac Le Jeune Resort	Tobiano Golf Course	Recreational Hunting, Fishing, Foraging	Recreational Trails	City of Kamloops Wastewater Management	Water Treatment Centre	City Expansion and Growth	Lac Le Jeune Road	Highway 1	Highway 5A	Highway 5 (Coquihalla Highway)	Kamloops Airport	Rail Yards and Lines (CP and CN)	
Decrease in economic activity and government revenues	O	O	O	L	L	L	O	O	O	O	O	L	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

Notes:

- (-) No spatial or temporal overlap.
- O Spatial or temporal overlap, but no interaction anticipated OR No change from current condition anticipated, and already captured as part of baseline characterization. No further consideration warranted.
- L Negligible to minor interaction expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.
- M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.
- H Key interaction; warrants further consideration.

Table 7.1-11. Summary of Project and Cumulative Residual Effects, Mitigation, and Significance for Economic Growth

Residual Effects	Project Phase	Mitigation Measures	Residual Effect Significance	Residual Cumulative Effect Significance
Benefit: Contribution to Economic Growth	Construction & Operations	Measures to maximize local employment and procurement	Not Applicable (Benefit)	Not Applicable (Benefit)
Decrease in Economic Activity and Government Revenues	Decommissioning and Closure	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Not Significant (Minor)	Not Applicable

7.2 LABOUR FORCE, EMPLOYMENT AND TRAINING

7.2.1 Rationale

Labour Force, Employment, and Training are standard components of socio-economic impact assessments. Due to the inherent connections between them, they are addressed together in this Application Information Requirements/Environmental Impact Statement (Application/EIS). The majority of effects associated with labour force, employment and training are expected to be positive as the Project will create new jobs during the construction and operations phases, many of which are expected to go to residents of Kamloops and other communities in the area (e.g., Ashcroft and Logan Lake; Table 7.2-1).

Table 7.2-1. Rationale for Including Labour Force, Employment, and Training in Application/EIS

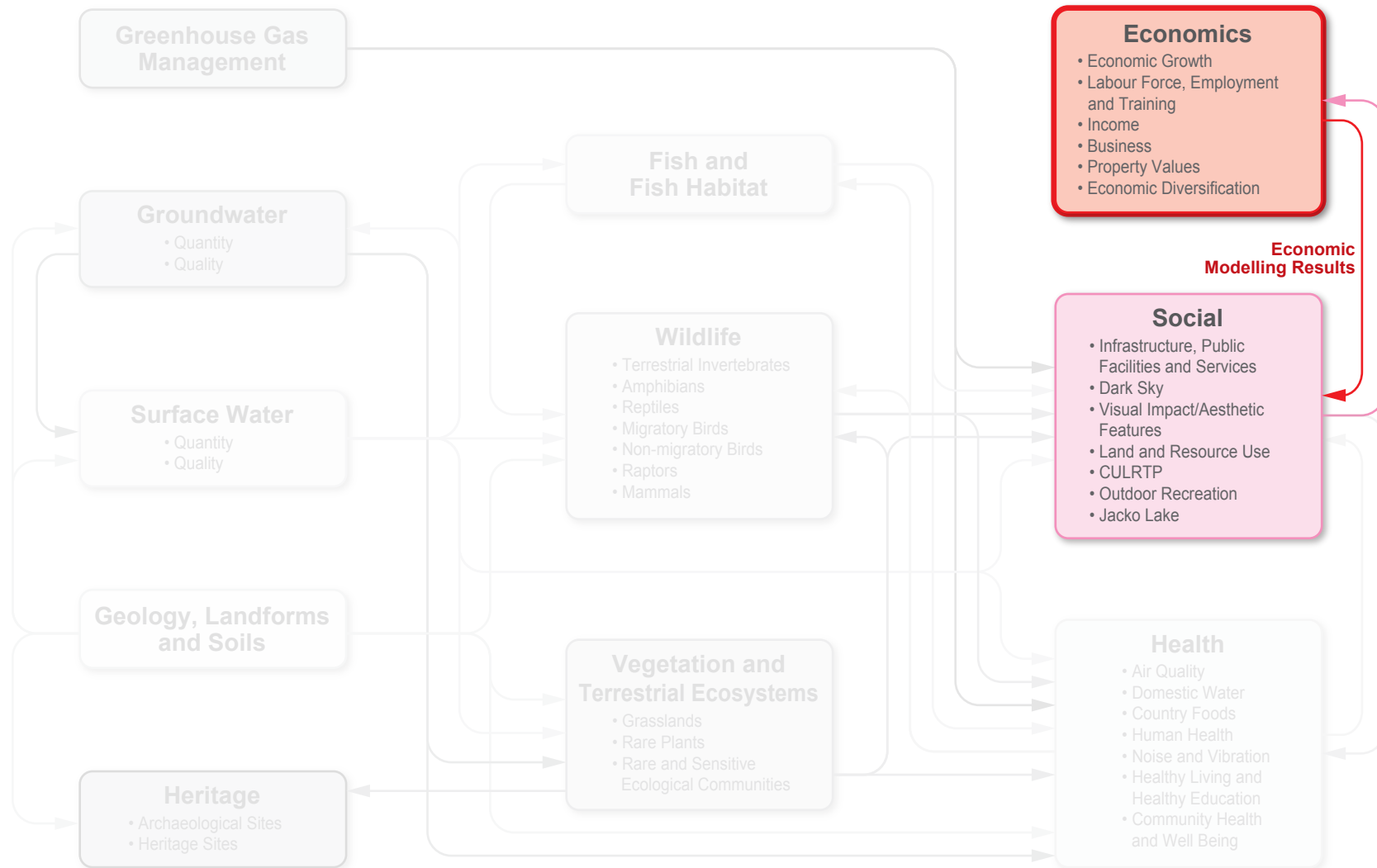
Valued Components	Identified by*				Rationale for Inclusion
	AG	G	P/S	SK	
Labour Force, Employment and Training	X	X	X	X	The key consideration with respect to labour and employment is the ability of the Project to employ local residents and the potential training capacity and opportunities that might be required. Concerns have also been raised regarding decreased employment and training opportunities as the Project moves from Operation Phase into Decommissioning and Closure, pressure for skilled labour and professional services during the Construction Phase, as well as potential out-migration of medical professionals.

*AG = Aboriginal Group; G = Guideline Requirement; P/S = Public/Stakeholder; SK = Scientific/professional knowledge

In addition to assessing labour force, employment and training as standard practice, concerns regarding the topic were raised during Project consultation with Aboriginal Groups, government agencies, the public, and stakeholders. These groups recognized the benefits of local jobs through direct and indirect employment. Some groups expressed concern regarding the potential that some Kamloops residents, particularly those in the medical professional, may move away from the community in response to the Project going forward. Other groups identified specific concern about the potential for increased competition for skilled labour and professional services during the Project construction phase.

The assessment of effects to Labour Force, Employment, and Training is largely related to the Project's use of local workers during the construction and operations phases and the gradual reduction of the workforce during decommissioning and closure and post-closure. The assessment is fed, in part by KGHM Ajax Mining Inc.'s (KAM) workforce needs and hiring policies, as well as the characteristics of the local workforce. The information developed to support the analysis of this VC also contributes to other analyses for other valued components (VCs), as summarized in Figure 7.2-1. For example, estimates of the proportion of the labour force hired locally will influence the extent to which the Project and its workforce uses local infrastructure and services. These effects are assessed in Section 8.1, Infrastructure, Public Facilities, and Services.

Figure 7.2-1
Inputs to Economic Valued Components



7.2.2 Background

Construction, operation, and decommissioning of the Project provide an economic pathway of effects through the creation of employment and training opportunities. The Project will require a large, skilled workforce comprised of a broad array of tradespersons, engineers, heavy equipment operators, administrative staff, and others. Filling the employment opportunities arising from these workforce requirements presents an opportunity to increase employment in the vicinity of the Project. The ability of people to benefit from these effects is linked to their level of education and training, as well as their ability to access the opportunities.

While the Project will create benefits related to increased employment in Kamloops and the surrounding area, concerns have been raised about the presence of the Project, including its workforce and physical infrastructure, possibly altering the characteristics of Kamloops. As a result of this change, individuals in certain professional positions could decide to move away. The concerns raised have typically involved members of the medical community. This topic is considered fully within Section 10.6, Community Health and Well-being. Representatives from the City of Kamloops and the Thompson-Nicola Regional District (TNRD) have also expressed concern that the Project may increase competition and availability for skilled labour and consultants. The increased competition may increase the governments' ability to hire skilled labour and consultants to work on future city and regional projects. This topic is assessed in Section 8.1, Infrastructure, Public Facilities, and Services and is cross-referenced to Section 7.4, Business, as required.

7.2.2.1 Regional Overview

From 2001 to 2011, the labour force in the TNRD (see Figure 7.2-3, Regional Study Area) increased by just over 7%, from 62,885 to 67,415 people. Within the TNRD, Kamloops represents the largest proportion of the population. From 2001 to 2011, the labour force in Kamloops (see Figure 7.2-2, Local Study Area) increased by over 13% from 43,175 to 49,020 people (Statistics Canada 2002, 2013). In comparison, the number of individuals in the labour force in the Province of British Columbia (BC), increased by over 14% during the same timeframe.

Employment by industry for the TNRD population largely reflects that of Kamloops. The top four industries in the TNRD reflected approximately 41% of the labour force and include the retail, health care and social services, construction, accommodation and food service, and public administration sectors (see Table 7.2-3). This labour force distribution of was similar to that observed for BC where approximately 38% of the labour force is represented by the same four sectors.

7.2.2.2 Historical Activities

Historical events and policies that have shaped the Kamloops area and the TNRD economy include the following:

- **Mining development:** Mining has historically been a key economic driver in the Kamloops area. Mining activity in the area can be traced back over 100 years with exploration within the LSA and immediate vicinity of the LSA beginning in the 1880s. The former Afton Mine included the Ajax east and west pits (located within the Project footprint), as well as the

Afton pit (approximately 8 km northwest of the Project). Operations on the Afton pit began in 1977, and operations on the Ajax East and Ajax West pits were initiated in 1989; activities at the Afton pit and Ajax East and West pits were subsequently suspended in 1991 due to depressed metal prices. Currently, the New Afton Mine, which utilizes the historic Afton pit and infrastructure, can process up to 12,500 tonnes of ore per day (New Gold 2014; Ajax KPI Program 2011-2012). Other mines in the area include Highland Valley Copper (HVC) (50 km from Kamloops), Copper Mountain (170 km from Kamloops), and Gibraltar (about 330 km from Kamloops), and there are exploration activities and proposed mines throughout the Regional Study Area (RSA).

- **The Stk'emlupsemc te Secwépemc Nation (SSN) and mining:** The Cultural Heritage Study (Ignace 2014) notes that ethnographers (e.g., James Teit) have noted the use of copper by the Secwépemc. Teit noted that copper tube beads were common as were copper earrings. While Teit assumes that most of the copper used was European-made, other ethnographers observed that there were some copper deposits mined by the Secwépemc. Among these locations were Copper Creek, which is located on the north shore of Kamloops Lake (Ignace 2014). The SSN was also involved in gold mining before the 1858 Fraser Canyon gold rush. According to Ignace (2014), maps from the beginning of the 1858 gold rush confirm early Aboriginal involvement in gold mining as some maps show “Indian Diggings” on the north shore of Kamloops and Shuswap lakes. Hudson’s Bay Company journals and accounts also show trading for gold dust by Aboriginal persons who likely engaged in placer mining. Gold panning continued into the twentieth century.
- **Developments related to transportation and infrastructure:** Kamloops has also served as an important transportation hub since the 1890s through railway development and subsequent highway construction during the 1950s. Other notable developments have included the Kamloops Airport expansion in 2009 (Venture Kamloops 2014a).
- **Forestry sector development:** Forestry has been an important driver in the local economy despite periodic (and recent) industry downturns. Weyerhaeuser established pulp mill operations in 1965. Domtar purchased the mill in 2007 and is currently running the facility at a reduced capacity having closed one pulp machine at the plant, affecting 125 workers (Klassen 2014; Domtar 2012; Ajax KPI Program 2011-2012).
- **Education and technology development:** These sectors have become areas of increasing focus for Kamloops in recent years. Thompson Rivers University (TRU) was incorporated in 2005 (and formerly operated as the University College of the Cariboo) and offers a wide variety of academic degrees, as well as trades-oriented programming. In 2011, TRU opened a Law Faculty (TRU n.d.). As a whole, employment associated with the professional, scientific and technical services sector within the Thompson/Okanagan Development Region (excluding Kelowna) has seen an upward trend since 2001 while Kamloops is actively working towards expanding its technology sector (Venture Kamloops 2014a; Ajax KPI Program 2011-2012). BC Aboriginal Mentoring and Training Association, which helped First Nations people gain employment in the mining sector, closed in 2014. The closure removed one support for First Nations people looking for training to secure employment in the mining industry (Stueck 2014).

- **Tourism and Related:** Additional events that have helped to shape the Kamloops-area economy include the increasing role of Tourism and the City's designation as "The Tournament Capital of Canada" (2001) and development of the Sun Peaks Resort. In addition, the Kamloopa Powwow at the Tk'emlúps te Secwépemc (TteS) powwow grounds is a large tourist draw every year.

Notable recent economic challenges have included the closure of Pollard Banknote (2010) and Convergys (2010); and more recently the closure of one production line at the Domtar plant (2013) and the closure of Kamloops Daily News in 2014 (Klassen 2014; Venture Kamloops 2014a).

In recent years, investment levels with the mining sector in BC have been depressed. The main contributing factor to this decline has been the steady drop in the price of many metals and minerals, including key commodities metallurgical coal and copper, which in turn has reduced overall spending and investment (PricewaterhouseCoopers 2014).

Despite the recent decline of the mining sector, gross provincial revenues for the provincial mining sector trended upward from \$4.584 billion in 2004 to \$8.537 billion in 2013, an increase of over 180%. The number of employees in the mining sector has steadily risen from about 6,000 in 2003 to over 10,000 in 2013 (PricewaterhouseCoopers 2011, 2014). The increase in the BC mining workforce has been accompanied by a decrease in the average salary between 2011 and 2013 (PricewaterhouseCoopers 2014). The recent decline in commodity prices has meant that some operations have temporarily laid off staff or deferred restarting operations. However, many mining operations maintain that the future outlook for industrial metals is bright for several reasons: the United States' gradual economic recovery, the demands for metals by emerging markets such as India and Brazil, and continued strong (though reduced) economic growth in China (PricewaterhouseCoopers 2014).

7.2.2.3 *Baseline Studies*

The objective of the baseline research was to understand existing baseline conditions in the vicinity of the Project. Methods as described in the AIR/EIS Guidelines were followed.

Data Sources

The main sources of information for the baseline included literature from organizations such as Venture Kamloops and the Industry Training Authority BC (ITA BC); statistics from BC Stats and Statistics Canada; key person interviews (KPIs) with individuals who have relevant experience related to employment and training in and around Kamloops; and notes and reports from interactions between KAM and Aboriginal Groups.

Consultation activities undertaken with the Aboriginal Groups during the Pre-Application period included capacity building and funding, TK/TLU (Traditional Knowledge/Traditional Land Use) studies, community meetings, site tours, and meetings with Aboriginal Group representatives (see Section 4.3). Multiple attempts have been made to engage each Aboriginal Group to seek the baseline data required for the Application/EIS including the circulation of baseline documentation for review and comment. The limited information gathered through this engagement has been incorporated in the Application and considered in the assessments. In some cases, the requested

information was not available from Aboriginal Groups at the time of writing or from secondary sources. Where appropriate, additional information made available by Aboriginal Groups will be considered in Project development plans.

It should be recognized that data sources related to Aboriginal Groups have limitations. In connection with Statistics Canada, data specific to Aboriginal Groups is primarily reported by Indian Reserve (IR) and reflects the situation of members who live on-reserve. According to population information collected and reported by Aboriginal Affairs and Northern Development Canada (AANDC), close to half of TteS members lived off-reserve, while the remainder of SIB members lived off-reserve in 2011 (AANDC 2012). Except where qualitative data is available, the ability to describe the social and economic reality specific to members who live off-reserve, is limited. The primary TteS reserve (Kamloops 1 IR) presents another challenge in that a large proportion of the population living on the reserve parcel does not identify as Aboriginal (Statistics Canada 2013). This situation is likely due to the development of Sun Rivers community on-reserve where the majority of the population is not Aboriginal (Aird, pers. comm. 2015).

In connection with the RSA, three Aboriginal Groups are included in the Statistics Canada tables below: the Lower Nicola Indian Band (LNIB), Ashcroft Indian Band (AIB), and Whispering Pines/Clinton Indian Band (WP/CIB). While there are other Indian Reserves in the TNRD, these Aboriginal Groups were either included in the Project Working Group by the BC Environmental Assessment Office (BC EAO) (LNIB and AIB) or were identified by the Canadian Environmental Assessment Agency (CEA Agency) (WP/CIB) as a First Nation to be considered in the effects assessment.

Methods

The approach to understanding baseline conditions focused largely on secondary data, while information obtained through KPIs regarding local economic conditions was also considered.

Characterization of Labour Force, Employment and Training Baseline Conditions

Employment and Unemployment

The Local Study Area (LSA) for Labour Force, Employment and Training includes the City of Kamloops and the TNRD-J, Tk'emlúps te Secwépemc (TteS), and Skeetchestn Indian Band (SIB) Indian Reserves for which Statistics Canada reports data (Kamloops 1 and Skeetchestn, respectively). Together the TteS and SIB have formed SSN. From 2001 to 2011, the total labour force in the LSA increased by over 13% (compared to BC at 14%). As with most of the indicators described in this report, this data primarily reflects Kamloops since it represents the largest proportion of the population in the LSA. Participation rates for the LSA in 2001 (66.6%), 2006 (67.3%), and 2011 (66.1%) were slightly higher than for BC as a whole (65.2% in 2001, 65.6% in 2006, and 64.6% in 2011), but by less than 2%. Employment rates for the LSA have increased between 2001 and 2011 from 59.7% to 60.5%, but decreased between 2006 and 2011, which is similar to the overall trends for BC. Compared to British Columbia, the 2001 unemployment rate for the LSA was about 2 percentage points higher at 10.3%, similar in 2006, and slightly higher in 2011 at 8.5%. The unemployment rate for BC in 2011 was 7.8%. Within the LSA, from 2001 to 2011, the TNRD-J was typically characterized by lower participation and employment rates than for city of Kamloops. For the population living on

the Kamloops 1 reserve (broken out by those who self-identify as Aboriginal¹ and those who do not) and Skeetchestn reserve parcels, the participation rates were generally lower and the unemployment rates were generally higher (Table 7.2-2).

Table 7.2-2. Labour Force Indicators for Select Communities, the LSA, the RSA, and BC, 2001, 2006, 2011^{1, 2}

Location		Participation Rate ³	Employment Rate ⁴	Unemployment Rate ⁵
2001				
Local Study Area	Kamloops	66.7	59.9	10.2
	TNRD-J	63.5	56.2	11.4
	TteS Non-Aboriginal Identity ⁶	60.2	52.6	10.3
	TteS Aboriginal Identity ⁷	66.1	56.0	15.3
	SIB ⁸	65.7	54.6	21.7
	LSA ⁹	66.6	59.7	10.3
Regional Study Area	LNIB ¹⁰	60.6	39.4	32.5
	AIB ¹¹	63.6	45.5	28.6
	WP/CIB ¹²	55.6	55.6	40.0
	RSA ¹³	65.4	58.0	11.3
BC		65.2	59.6	8.5
2006				
Local Study Area	Kamloops	67.5	63.5	6.0
	TNRD-J	60.4	56.5	5.8
	TteS Non-Aboriginal Identity ⁶	68.9	62.9	5.1
	TteS Aboriginal Identity ⁷	65.3	55.1	15.6
	SIB ⁸	n/a	n/a	n/a
	LSA ⁹	67.3	63.3	6.1
Regional Study Area	LNIB ¹⁰	57.6	48.5	15.8
	AIB ¹¹	55.6	44.4	0.0
	WP/CIB ¹²	66.7	55.6	0.0
	RSA ¹³	65.5	61.0	6.8
BC		65.6	61.6	6.0

(continued)

¹ Statistics Canada (2014) defines “total Aboriginal identity population” as composed of those persons who reported identifying with at least one Aboriginal group, that is, North American Indian, Métis or Inuit, and/or those who reported being a Treaty Indian or a Registered Indian, as defined by the *Indian Act* of Canada, and/or those who reported they were members of an Indian band or First Nation.

Table 7.2-2. Labour Force Indicators for Select Communities, the LSA, the RSA, and BC, 2001, 2006, 2011^{1,2} (completed)

Location		Participation Rate ³	Employment Rate ⁴	Unemployment Rate ⁵
2011				
Local Study Area	Kamloops	66.4	60.8	8.4
	TNRD-J	59.1	54.9	6.4
	TteS Non-Aboriginal Identity ⁶	60.8	57.0	7.0
	TteS Aboriginal Identity ⁷	64.6	48.7	23.3
	SIB ⁸	61.0	51.2	16.0
	LSA ⁹	66.1	60.5	8.5
Location		Participation Rate ³	Employment Rate ⁴	Unemployment Rate ⁵
Regional Study Area	LNIB ¹⁰	51.1	37.8	13.3
	AIB ¹¹	46.2	15.4	33.3
	WP/CIB ¹²	66.7	55.6	0.0
	RSA ¹³	63.4	57.3	9.6
BC		64.6	59.5	7.8

Source: Statistics Canada 2002, 2007, 2013.

Notes:

1. Labour force characteristics for the 2001 and 2006 Census were derived from 20% sample data; labour force characteristics for the 2011 NHS were derived from 30% data. However, on Indian reserves and in remote communities, attempts are made to obtain data from 100% of the population for all years. Totals may not add up due to rounding.
2. The global non-response rate (GNR rate) is a data quality indicator; the higher the rate of non-response, the greater the risk of data error. For 2001 and 2006 census, results for any geographic area with a global non-response rate greater than or equal to 25% were suppressed and not available in the standard Statistics Canada products, while for 2011, GNR rate greater than or equal to 50% were suppressed. Caution should be exercised when interpreting and comparing these data sets from Census year to Census year.
3. The "Participation Rate" refers to the number of people in the labour force in the week prior to Census Day, as a percentage of the population 15 years and over.
4. The "Employment Rate" refers to the number of people employed in the week prior to Census Day as a percentage of the total population 15 years and over.
5. The "Unemployment Rate" refers to the number of people unemployed in the week prior to Census Day expressed as a percentage of the labour force.
6. Data for TteS Non-Ab identity population are calculated by InterGroup Consultants as the difference between total population and TteS aboriginal identity population.
7. "Total Aboriginal identity population" is composed of those persons who reported identifying with at least one Aboriginal group, that is, North American Indian, Métis or Inuit, and/or those who reported being a Treaty Indian or a Registered Indian, as defined by the Indian Act of Canada, and/or those who reported they were members of an Indian band or First Nation.
8. Statistics Canada refers to SIB as Skeetchestn Indian Reserve. The SIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.
9. The LSA is the City of Kamloops, the TteS, the SIB, and the TNRD-J.
10. Statistics Canada refers to the LNIB as Nicola Mameet 1 Indian Reserve, Zoht 4 Indian Reserve, Joeyaska 2 Indian Reserve, and Hamilton Lake 7 Indian Reserve. The LNIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. Includes data for Nicola Mameet 1 Indian Reserve and Joeyaska 2 Indian Reserve. Data for Hamilton Lake 7 Indian Reserve and Zoht 4 Indian Reserve were suppressed.
11. Statistics Canada refers to the AIB as Ashcroft 4 Indian Reserve and 105 Mile Post 2 Indian Reserve. The AIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. Includes data for Ashcroft 4 Indian Reserve. Data for 105 Mile Post 2 Indian Reserve were suppressed.
12. Statistics Canada refers to the WP/CIB as Whispering Pines 4 Indian Reserve. The WP/CIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data.
13. The RSA is the TNRD.

The Regional Study Area (RSA) is the Thompson Nicola Regional District (TNRD). The labour force of the RSA increased by approximately 7% between 2001 and 2011, with growth slowing between 2006 and 2011. Participation rates for the RSA for 2001, 2006, and 2011 were 65.4%, 65.5%, and 63.4%, respectively. These rates were slightly lower than those for the LSA but comparable to the rates in BC. Employment rates in the RSA were approximately one to three percentage points lower than those for the LSA and BC at 58.0% in 2001, 61.0% in 2006, and 57.3% in 2011. Compared with the LSA and BC, the unemployment rates in the RSA were slightly higher. The unemployment rates for the LSA, RSA, and BC, respectively, were 10.3%, 11.3%, and 8.5% in 2001; 6.1%, 6.8%, and 6.0% in 2006; and 8.5%, 9.6%, and 7.8% in 2011 (Table 7.2-2).

The unemployment rate in the LSA and the RSA has a seasonal cycle. In general, unemployment is highest in the winter months of January, February, and March. Unemployment declines throughout the spring and summer, reaching a low in the fall before increasing. Data from the fourth quarter of 2011 shows that the unemployment in the LSA fluctuated from a high of near 12% in February to a low of under 6% in November of 2011 (BC Stats 2011f).

Industries and Occupations

Table 7.2-3 presents the labour force distribution by industry for the LSA, RSA, BC, and relevant communities. Within the LSA, over 50% of the labour force was distributed among five industries – construction, the retail trade, educational services, health care and social assistance, and accommodation and food services. This was reflective of the city of Kamloops as well, and was similar to that for the RSA as a whole, with the exception of agriculture, forestry, fishing and hunting, which was three percentage points higher for the RSA than for the LSA. The population on the Kamloops 1 reserve that self-identified as Aboriginal and the population that did not, over 10% of the labour force worked in construction (14% for the non-self-identifying Aboriginal population and 13% for the self-identifying Aboriginal population). Over 10% of the population that did not self-identify as Aboriginal on the TteS reserve parcel worked in professional, scientific, and technical services (12%) and health care and social assistance (13%). Over a quarter of the labour force (28%) of the population that self-identified as Aboriginal on the TteS reserve parcel was employed in public administration. In comparison with the LSA, more SIB members living on-reserve worked in agriculture, forestry, fishing, and hunting (8% compared with 2%) and in public administration (46% compared with 7%). Labour force distribution patterns for the LSA and RSA did not differ notably from those for British Columbia as a whole.

Employment in the mining and oil and gas extraction sector was relatively small for most communities in the LSA. In Kamloops, about 3% of the population was employed in this sector. The rate is higher in the RSA, in which 4% of the population works in the mining and oil and gas extraction sector. For mining-related employment, as of July 2014, the TteS had 36 members employed in the mining sector, while the SIB had 35 members employed in the mining sector (BC AMTA 2014). It should be noted that in 2011, Statistics Canada reported that no on-reserve members in the LNIB, AIB, and WP/CIB were employed in the mining sector.

Table 7.2-3. Labour Force Distribution by Industry, 2011¹

Labour Force Distribution	Kamloops	TNRD-J	TteS non-Aboriginal Identity ²	TteS Aboriginal Identity ³	SIB ⁴	LSA ⁵	LNIB ⁶	AIB ⁷	WP/CIB ⁸	RSA ⁹	BC
Total labour force 15 year and over by industry ¹⁰	46,740	780	1,010	365	125	49,020	235	30	30	67,415	2,354,250
Industry - Not applicable	2%	0%	2%	5%	8%	2%	6%	0%	0%	2%	2%
All industries	98%	97%	98%	93%	96%	98%	91%	83%	117%	98%	98%
Agriculture, forestry, fishing and hunting	2%	19%	2%	3%	8%	2%	28%	0%	0%	5%	3%
Mining and oil and gas extraction	3%	6%	2%	3%	8%	3%	0%	0%	0%	4%	1%
Utilities	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Construction	7%	17%	14%	13%	8%	8%	12%	0%	0%	8%	8%
Manufacturing	5%	7%	3%	0%	0%	5%	0%	0%	0%	5%	6%
Wholesale trade	4%	11%	5%	0%	0%	4%	0%	0%	0%	3%	4%
Retail trade	14%	3%	9%	7%	8%	13%	5%	0%	0%	12%	12%
Transportation and warehousing	6%	3%	9%	3%	0%	6%	5%	0%	0%	6%	5%
Information and cultural industries	2%	0%	3%	0%	0%	2%	0%	0%	0%	1%	3%
Finance and insurance	3%	0%	3%	0%	0%	3%	0%	0%	0%	2%	4%
Real estate and rental and leasing	2%	0%	3%	3%	0%	2%	0%	0%	0%	2%	2%
Professional, scientific and technical services	6%	5%	12%	0%	8%	6%	0%	0%	29%	5%	8%
Management of companies and enterprises	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

(continued)

Table 7.2-3. Labour Force Distribution by Industry, 2011¹ (completed)

Labour Force Distribution	Kamloops	TNRD-J	TteS non-Aboriginal Identity ²	TteS Aboriginal Identity ³	SIB ⁴	LSA ⁵	LNIB ⁶	AIB ⁷	WP/CIB ⁸	RSA ⁹	BC
Administrative and support, waste management and remediation services	4%	3%	4%	7%	0%	4%	0%	0%	0%	4%	4%
Educational services	8%	3%	3%	6%	8%	8%	7%	0%	0%	7%	7%
Health care and social assistance	13%	7%	12%	9%	0%	13%	5%	0%	0%	12%	11%
Arts, entertainment and recreation	3%	0%	2%	3%	0%	3%	0%	0%	0%	3%	2%
Accommodation and food services	9%	5%	3%	7%	0%	9%	5%	40%	0%	8%	8%
Other services (except public administration)	4%	1%	5%	4%	0%	4%	5%	0%	0%	4%	5%
Public administration	7%	6%	9%	28%	46%	7%	19%	0%	43%	7%	6%

Source: Statistics Canada 2013.

Notes:

1. Labour force distribution data for the 2011 NHS were derived from 30% data. However, on Indian reserves and in remote communities, attempts are made to obtain data from 100% of the population for all years. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5, and in some cases, 10. Columns may not add due to rounding.
2. Data for TteS Non-Ab identity population are calculated by InterGroup Consultants as the difference between total population and TteS aboriginal identity population.
3. "Total Aboriginal identity population" is composed of those persons who reported identifying with at least one Aboriginal group, that is, North American Indian, Métis or Inuit, and/or those who reported being a Treaty Indian or a Registered Indian, as defined by the Indian Act of Canada, and/or those who reported they were members of an Indian band or First Nation.
4. Statistics Canada refers to SIB as Skeetchestn Indian Reserve. The SIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.
5. The LSA is the City of Kamloops, the TteS, the SIB, and the TNRD-J.
6. Statistics Canada refers to the LNIB as Nicola Mameet 1 Indian Reserve, Zoht 4 Indian Reserve, Joeyaska 2 Indian Reserve, and Hamilton Lake 7 Indian Reserve. The LNIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. Includes data for Nicola Mameet 1 Indian Reserve and Joeyaska 2 Indian Reserve. Data for Hamilton Lake 7 Indian Reserve and Zoht 4 Indian Reserve were suppressed.
7. Statistics Canada refers to the AIB as Ashcroft 4 Indian Reserve and 105 Mile Post 2 Indian Reserve. The AIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. Includes data for Ashcroft 4 Indian Reserve. Data for 105 Mile Post 2 Indian Reserve were suppressed.
8. Statistics Canada refers to the WP/CIB as Whispering Pines 4 Indian Reserve. The WP/CIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data.
9. The RSA is the TNRD.

With respect to occupational classification (Table 7.2-4), sales and service occupations (25%), in addition to trades, transport and equipment operators (and related occupations) (17%) comprise approximately 45% of the labour force in the LSA. Other notable classifications include business, finance and administration occupations (14%) and occupations in social science, education, government service and religion (12%). This was largely reflective of the Kamloops and was similar to the RSA.

In the case of the population on the Kamloops 1 and Skeetchestn Indian reserves, the labour force was largely comprised of occupations associated with sales and services, as well as trades, transport and equipment operators (and related occupations). The portion of the population on the TteS reserve parcel that self-identifies as Aboriginal employed in business, finance, and administration occupations (17%) was higher than in the LSA. The portion of the population on the TteS reserve parcel that did not self-identify as Aboriginal employed in management occupations was higher at 18% than for the LSA (10%). The percentage of the on-reserve population for the SIB employed in occupations unique to primary industry was higher than for the other census subdivisions in the LSA and for the LSA at 13%.

Primary industries are ones that harvest raw material from nature. They include mining and oil and gas extraction, along with agriculture, logging and forestry, fishing, and trapping (Statistics Canada 2006). According to Statistics Canada (2013), the proportion of the population on the Kamloops 1 reserve that self-identifies as Aboriginal, the SIB reserve, the TNRD-J had the higher proportions of their population working in occupations unique to primary industry than the LSA at 7%, 13%, and 11%, respectively.

Skilled Forestry Workers and Transferable Skills

Forestry is an important regional economic activity, which has implications for direct and indirect employment in the LSA and RSA. Changes in the forestry sector, including the pine beetle outbreak in BC, have led to the reduction of available employment in forestry. In general, many forestry jobs have a high degree of transferability to mining jobs (Ajax KPI Program 2011-2012). Although the activities related to forestry and mining can be quite different, there is an overlap in the fundamental skill sets needed to do many activities in both sectors. Many forestry workers would require a limited amount of additional education and training to be eligible for relatively high-paying jobs in the mining sector.

Professional Services

According to the North American Industry Classification System (Industry Canada 2015), the professional, scientific, and technical sector includes establishments that sell expertise, including engineering and related services, scientific and technical consulting services, and management services. In the Thompson/Okanagan Development Region (excluding the Kelowna census metropolitan area), which includes the LSA and RSA, approximately 8,800 individuals were employed in this sector. The number of employed individuals in this sector has exhibited rapid growth since 1997 (over 40% higher in 2013) in the development region, although the growth in this sector in BC has been more rapid at over 60% (Venture Kamloops 2014a). Although the professional, scientific, and technical sector is expanding, businesses in Kamloops have expressed concern regarding the availability of skilled labour, with particular focus on engineers, staff with professional designations, and those with highly specific technical positions (Venture Kamloops 2013).

Table 7.2-4. Occupation Classification Distributions, 2011¹

Occupation Classification ²	Kamloops	TNRD-J	TteS Non-Aboriginal Identity ³	TteS Aboriginal Identity ⁴	SIB ⁵	LSA ⁶	LNIB ⁷	AIB ⁸	WP/CIB ⁹	RSA ¹⁰	BC
Total labour force 15 years and over by occupation	46,740	775	1,015	360	125	49,015	235	30	30	67,410	2,354,245
Occupation - Not applicable ¹¹	2%	0%	3%	6%	0%	2%	9%	33%	0%	2%	2%
All occupations ¹²	98%	97%	97%	96%	96%	98%	91%	83%	100%	98%	98%
Management occupations	10%	17%	18%	10%	13%	10%	7%	0%	33%	11%	11%
Business, finance and administration occupations	14%	11%	14%	17%	13%	14%	9%	0%	33%	13%	16%
Natural and applied sciences and related occupations	5%	5%	7%	0%	13%	5%	5%	0%	0%	5%	7%
Health occupations	8%	5%	6%	3%	0%	8%	0%	0%	0%	7%	6%
Occupations in social science, education, government service and religion	12%	9%	10%	14%	8%	12%	14%	0%	33%	12%	12%
Occupations in art, culture, recreation and sport	2%	0%	3%	3%	0%	2%	0%	0%	0%	2%	3%
Sales and service occupations	25%	13%	20%	22%	13%	25%	16%	40%	0%	23%	24%
Trades, transport and equipment operators and related occupations	17%	28%	20%	25%	21%	17%	19%	40%	33%	19%	15%
Occupations unique to primary industry	3%	11%	1%	7%	13%	3%	21%	0%	0%	5%	3%
Occupations unique to processing, manufacturing and utilities	3%	3%	0%	0%	0%	2%	5%	0%	0%	3%	3%

Source: Statistics Canada 2013.

(continued)

Table 7.2-4. Occupation Classification Distributions, 2011¹ (completed)

Notes:

1. Occupation classification data for the 2011 NHS were derived from 30% data. However, on Indian reserves and in remote communities, attempts are made to obtain data from 100% of the population for all years. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5, and in some cases, 10. Columns may not add due to rounding.
2. Statistics Canada uses the National Occupational Classification (NOC) for Statistics. Occupations are based on the type of job the person holds and the description of his or her duties; it considers the kind of work done by persons aged 15 and over.
3. Data for the TteS Non-Aboriginal identity population are for Kamloops 1 IR. Data are calculated by InterGroup Consultants as the difference between total population and TteS aboriginal identity population.
4. Data for the TteS Aboriginal identity population are for the Kamloops 1 IR. "Total Aboriginal identity population" is composed of those persons who reported identifying with at least one Aboriginal group, that is, North American Indian, Métis or Inuit, and/or those who reported being a Treaty Indian or a Registered Indian, as defined by the Indian Act of Canada, and/or those who reported they were members of an Indian band or First Nation.
5. Statistics Canada refers to SIB as Skeetchestn Indian Reserve. The SIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.
6. The LSA is the City of Kamloops, the TteS, the SIB, and the TNRD-J.
7. Statistics Canada refers to the LNIB as Nicola Mameet 1 Indian Reserve, Zoht 4 Indian Reserve, Joeyaska 2 Indian Reserve, and Hamilton Lake 7 Indian Reserve. The LNIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. Includes data for Nicola Mameet 1 Indian Reserve and Joeyaska 2 Indian Reserve. Data for Hamilton Lake 7 Indian Reserve and Zoht 4 Indian Reserve were suppressed.
8. Statistics Canada refers to the AIB as Ashcroft 4 Indian Reserve and 105 Mile Post 2 Indian Reserve. The AIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. Includes data for Ashcroft 4 Indian Reserve. Data for 105 Mile Post 2 Indian Reserve were suppressed.
9. Statistics Canada refers to the WP/CIB as Whispering Pines 4 Indian Reserve. The WP/CIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data.
10. The RSA is the TNRD.
11. Refers to Unemployed persons 15 years and over who have never worked for pay or in self-employment or who had last worked prior to January 1, 2010 (2011 NHS). 7. Refers to the experienced labour force population: includes persons who were employed and persons who were unemployed who worked for pay or in self-employment since January 1, 2010 (2011 NHS).
12. Refers to the experienced labour force population: includes persons who were employed and persons who were unemployed who worked for pay or in self-employment since January 1, 2010 (2011 NHS).

Educational Attainment and Facilities

In comparison to British Columbia, the RSA was comparable to the LSA in most categories, although the percentage of population in the “no certificate, diploma or degree” category was three to four percentage points higher in the RSA compared to the LSA and the province. Relatively high proportions of RSA and LSA residents reported their highest level of education to be in the “no certificate, diploma or degree,” “high school diploma or equivalent,” or “apprenticeship or trades certificate or diploma” categories. The percentage of population with university degrees for the LSA (16%) and RSA (14%) was much lower than for BC as a whole, where 22% of the population had earned university degrees.

The largest institution for higher education in Kamloops is TRU, which was founded in 1970 as a community college that delivered two-year academic university transfer programs. As the college developed, the first bachelor’s degrees were awarded in 1998 and the college was established as a university in 2004. TRU now offers a wide variety of academic degrees (e.g., engineering, geology and environmental sciences) but maintains many trades-oriented programs (e.g., electrical, heavy duty mechanic, welding and carpentry) as well. Program numbers and funding are re-adjusted every couple of years based on local, regional, and provincial demand for graduates of different trades programs (Ajax KPI Program 2011-2012).

In addition to TRU, there are also community colleges in Kamloops. Thompson Career College offers health care-related courses and certifications and the Sprott-Shaw Community College offers courses in business and health care as well.

There are nine universities in BC that offer educational programs that are closely associated with mining such as geology, metallurgical engineering, mineral engineering, geomatics engineering, petroleum engineering, environmental and earth sciences, and mining operations. Additional detail is provided in the Ajax Project Socio-economic Baseline (Appendix 7.1-A).

7.2.3 Assessment Boundaries

7.2.3.1 Spatial Boundaries

Local Study Area

The Local Study Area (LSA), as illustrated in Figure 7.2-2, for the Labour Force, Employment, and Training VC consists of the City of Kamloops, the TNRD-J electoral area, the Tk’emlúps te Secwépemc and the Skeetchestn Indian Band. Characterization of the LSA was undertaken through consideration of potential Project effects to socio-economic indicators and is considered as the area where most Project effects are likely to occur. Project workers are expected to be either sourced from this area, or temporarily residing in the area, which is also anticipated to benefit from the creation of indirect and induced employment opportunities.

Regional Study Area

The Regional Study Area (RSA), as illustrated in Figure 7.2-3, for the Labour Force, Employment, and Training VC, consists of the entire TNRD, and includes communities within an hour and a half driving distance of the mine site. This boundary is inclusive of the numerous skilled workers in the area, and includes Aboriginal and non-Aboriginal workers in communities throughout the TNRD in the RSA (including Aboriginal groups such as the LNIB and AIB).

7.2.3.2 *Temporal Boundaries*

Temporal boundaries for the assessment of the labour force, employment and training VC are listed below. Of particular interest to this section will be the first construction and operations phases, where most of the Project employment opportunities are expected to be realized and when other potential Project effects could lead to departure of medical professionals. Discussion is also provided around the availability and subsequent loss of employment opportunities as the Project moves into different phases.

- **Construction:** 3 years;²
- **Operation:** 23 years;
- **Decommissioning and Closure:** 5 years (includes project decommissioning, abandonment and reclamation activities, as well as temporary closure, and care and maintenance); and
- **Post Closure:** 5+ years (includes ongoing reclamation activities and post-closure monitoring).

7.2.3.3 *Administrative Boundaries*

Administrative boundaries influenced the characterization of baseline information. Statistics Canada data is available at the census sub-division level. These boundaries will not align exactly with actual circumstances (e.g., where workers may be sourced from).

7.2.3.4 *Technical Boundaries*

Technical boundaries did not influence the scoping of the assessment on Labour Force, Employment and Training, other than the limited availability of information for Aboriginal communities within the Statistics Canada Census and National Household Survey.

² The Project Construction Phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4). The Construction and Operations phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.

Figure 7.2-2
Local Study Area

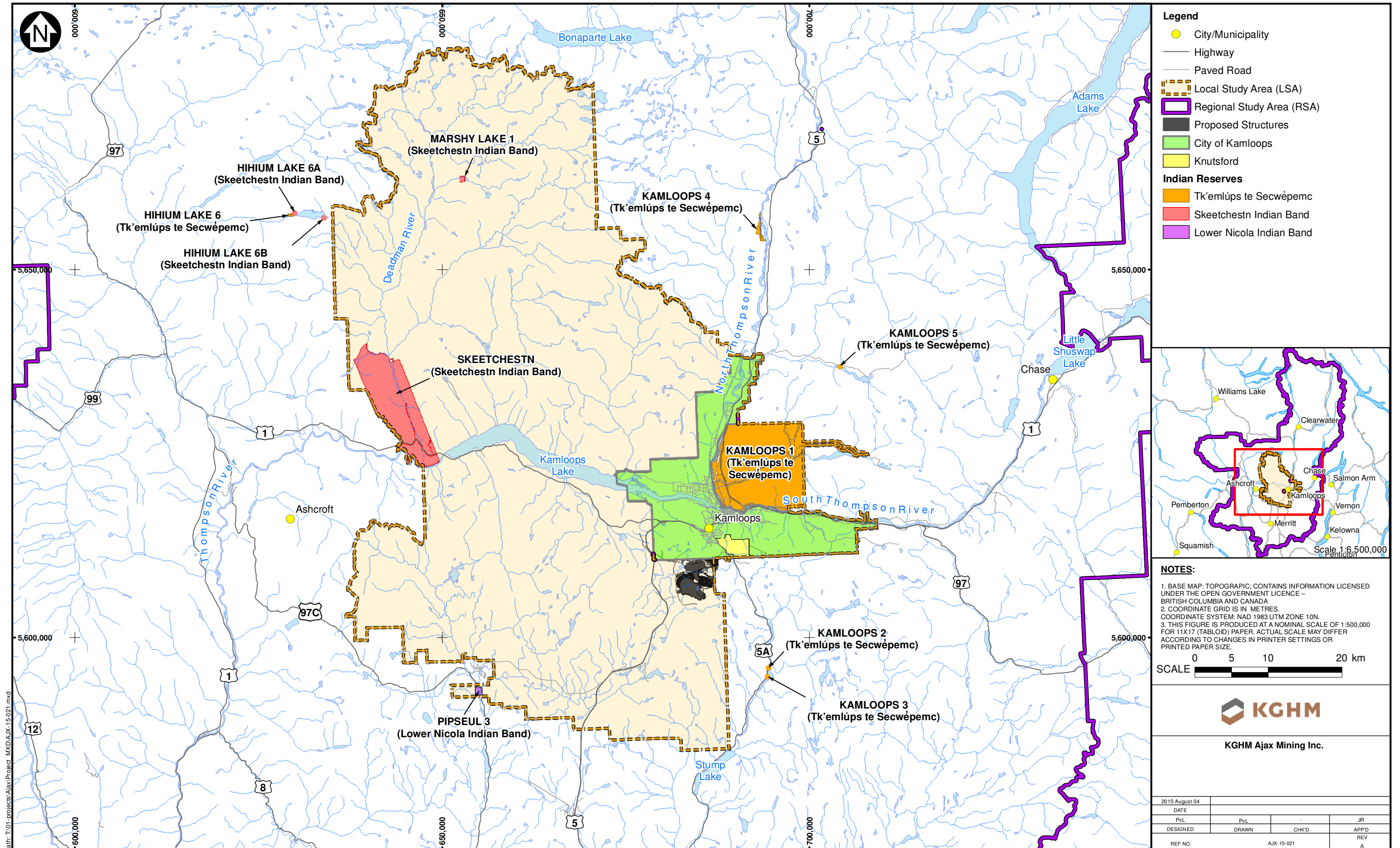
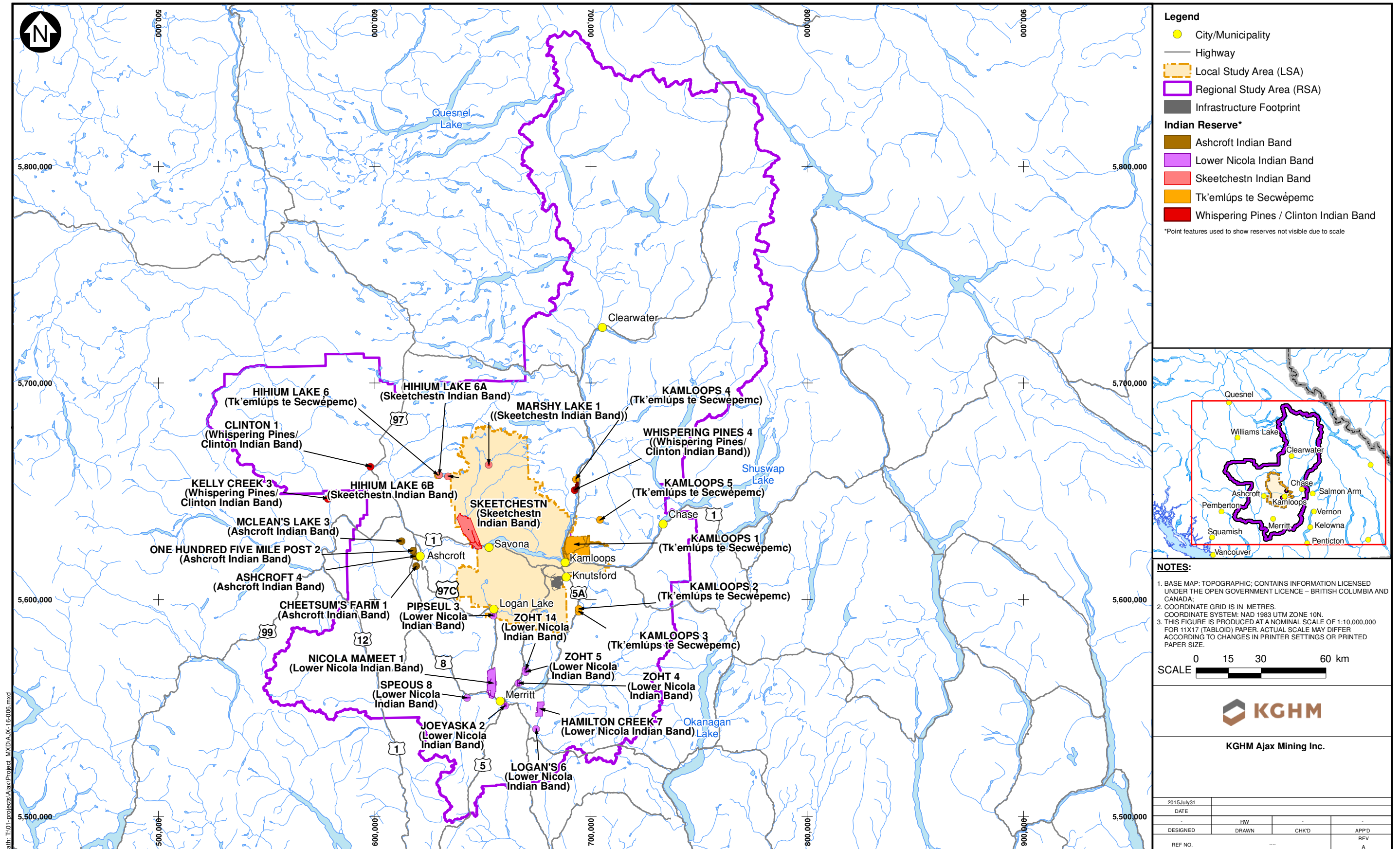


Figure 7.2-3
Regional Study Area



Path: T:\01-projects\Ajax\Project_MXD\AJX-16-006.mxd

7.2.4 Project Benefits Related to Labour Force, Employment and Training

New employment opportunities will be generated in the LSA and RSA during all phases of the Project. This in turn will generate indirect and induced economic activity in retail, hospitality, and other sectors through the spending of wage income. Given the Project's proximity to Kamloops and the well-developed mining supply and service sector, it is expected that a large proportion of Project employment needs will be addressed within the LSA and RSA.

Project construction, operation and, to a lesser extent, decommissioning, closure and post-closure, will require a large workforce made up of a broad range of occupations. This includes positions in trades, engineering and technical, management and supervisory, and administrative and support occupations. The Project is close to Kamloops, which has a long history of resource development, including mining. With this awareness and capacity, much of the anticipated workforce requirement is expected to be provided by local residents.

Employment workforce estimates were developed by KAM based on forecasted workforce requirements during each Project phase (Construction, Operations, Decommissioning and Closure, and Post-Closure). These estimates were further assessed to determine possible local workforce participation, particularly during periods of highest employment (Construction and Operations). Existing local and regional training resources as well as opportunities were considered to identify areas where KAM could consider human resource development strategies to maximize local participation rates.

The estimates provided in this section are for illustration purposes and may differ from actual outcomes for a number of reasons including:

- **Changing labour market circumstances:** The estimates represent the most current knowledge regarding local labour market conditions including the availability of potential workers in specific trades. The circumstances could be different once the Project operations phase begins.
- **Training programs:** Programs may be implemented in advance of operations that could help to increase the local supply of labour in occupations required for the Project.
- **Potential changes to Project workforce requirements:** Specific requirements could change by the time the Project goes into the operations phase.

KAM has identified potential challenges to local hiring for the Operation Phase, based on the current local labour supply, and is developing a human resource development plan to help ensure sufficient operations labour is available locally.

The following summarizes estimated workforce requirements during each Project phase.

7.2.4.1 Construction Phase

Table 7.2-5 illustrates annual peak workforce requirements during the Project's Construction Phase and is divided into five broad occupational categories. These estimates serve as an indication of the size and composition of Project-related employment opportunities. Actual workforce requirements may vary from these estimates, depending on contractor hiring practices and other factors.

The Construction Phase of the Project is expected to last approximately three years (from commencement to plant commissioning³). Employment opportunities represent both direct and indirect benefits associated with construction, particularly in the vicinity of Kamloops and other nearby communities. The intent of this discussion is to characterize the proportion of employment opportunities expected to be filled locally.

Table 7.2-5. Construction Phase Estimated Direct Workforce Requirements for the Ajax Project

Occupational Classification	Estimated Employment Positions		
	Year 1	Year 2	Year 3
Designated Trades	498	1,340	630
Non-designated Trades	565	316	163
Engineering and Technical	28	28	28
Management and Supervisory	66	98	59
Administrative and Support	18	18	18
Total	1,175	1,800	898

Source: Derived from workforce estimate data provided by KGHM Ajax (2014).

Notes: These classifications have been organized as follows:

1. *Designated Trades: These occupations typically require three or more years (levels) of classroom and practical training. Designated trades are expected to include carpenters, concrete finishers, steelworkers, scaffold installers, electricians, millwrights, pipefitters, rebar workers, welders, and crane operators.*
2. *Non-designated Trades: These occupations typically require a less onerous process for certification with respect to classroom and practical training, although they may require substantive work experience. Non-designated trades are expected to include heavy equipment operators, warehouse personnel, truck drivers, and labourers.*
3. *Engineering and Technical: These occupations typically require technical training involving a multi-year college or university program. This classification is expected to include engineering technicians, engineers, and laboratory technicians.*
4. *Management and Supervisory: These occupations are presented separately on the basis of having different skill and experience requirements. Management and supervisory occupations include foremen, managers, and supervisors.*

³ The Project Construction Phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4). The Construction and Operation phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase..

5. *Administrative and Support: These occupations are similar to management and supervisory occupations but typically require less training and experience to undertake the work.*

The largest category of employment opportunities is the designated trades, which will peak in Year 2 at 1,340 positions. This is due to the large numbers of millwrights, steel workers, pipefitters, electricians, and scaffold installers that are expected to be required during this phase. Non-designated trades, which include heavy equipment operators, truck drivers, and labourers peak in Year 1 at 565 positions. Engineering and technical positions (e.g., metallurgists, geologists), as well as administrative and support positions, are expected to remain constant at 28 and 18 positions respectively during each year of construction. Management and supervisory positions will fluctuate depending on the overall workforce requirements, ranging between 59 and 98 positions.

Local Hires

The central consideration with respect to labour force and employment is the capacity of the local labour market to meet the requirements of the Project. The percentage of the workforce expected to be drawn from the local labour pool versus outside of the region influences potential Project effects in other areas (e.g., Infrastructure, Public Facilities, and Services). In addition, the number of employment opportunities and the skill sets that would be required identify potential opportunities for planning with local educational and training institutions. A range of factors was considered in developing local-hire scenarios. These factors included the anticipated Project workforce requirements, local labour supply, local training capacity, and KAM employment policy. Representatives of a local training institution and relevant industry professionals were consulted to refine estimates based on these factors. High and low scenarios were prepared for the number of construction jobs that could be supplied by local residents of the Kamloops area.

Table 7.2-6 presents the estimates derived to describe local and non-local hire scenarios for construction. The ranges presented in this table represent low and high levels of local hiring, based on the total estimated workforce requirements provided in Table 7.2-5.

Table 7.2-6. Estimates of Local and Non-local Hires for Project Construction

Occupational Classification	Local Hires	Non-local Hires
YEAR 1		
Designated Trades	293 to 384	114 to 205
Non-designated Trades	424 to 509	57 to 141
Engineering and Technical	9 to 12	16 to 19
Management and Supervisory	15 to 27	39 to 51
Administrative and Support	9 to 13	5 to 9
Total	750 to 944	231 to 425
YEAR 2		
Designated Trades	573 to 800	540 to 768
Non-designated Trades	237 to 284	32 to 79
Engineering and Technical	9 to 12	16 to 19
Management and Supervisory	23 to 43	55 to 75
Administrative and Support	9 to 13	5 to 9
Total	850 to 1,152	648 to 950
YEAR 3		
Designated Trades	279 to 398	232 to 351
Non-designated Trades	122 to 147	16 to 41
Engineering and Technical	9 to 12	16 to 19
Management and Supervisory	13 to 24	35 to 46
Administrative and Support	9 to 13	5 to 9
Total	433 to 593	305 to 465

Notes: Derived from workforce estimate data provided by KGHM Ajax (2014).

Notes: These classifications have been organized as follows:

1. *Designated Trades: These occupations typically require three or more years (levels) of classroom and practical training. Designated trades are expected to include carpenters, concrete finishers, steelworkers, scaffold installers, electricians, millwrights, pipefitters, rebar workers, welders, and crane operators.*
2. *Non-designated Trades: These occupations typically require a less onerous process for certification with respect to classroom and practical training, although they may require substantive work experience. Non-designated trades are expected to include heavy equipment operators, warehouse personnel, truck drivers, and labourers.*
3. *Engineering and Technical: These occupations typically require technical training involving a multi-year college or university program. This classification is expected to include engineering technicians, engineers, and laboratory technicians.*
4. *Management and Supervisory: These occupations are presented separately on the basis of having different skill and experience requirements. Management and supervisory occupations include foremen, managers, and supervisors.*
5. *Administrative and Support: These occupations are similar to management and supervisory occupations but typically require less training and experience to undertake the work.*

During Year 1 of construction, the Project could hire between 750 and 940 positions locally, out of a total estimated 1,175 positions. This represents a local-hire percentage of about 63% and 80% for the low and high scenarios, respectively. In the high scenario, up to approximately 77% of designated trade positions and up to about 90% of non-designated trades are assumed to be filled locally, as well as approximately 41% of management and supervisory positions.

In Year 2 of construction, local hires are expected to range between 850 and about 1,150 out of a total of up to 1,800 positions. This represents a local-hire percentage of about 47% and 64% for the low and high scenario. The key difference from Year 1 is that the Project will require a larger number of workers in the designated trades (e.g., millwrights, pipefitters). These positions are expected to be more difficult to fill locally. During Year 1, a higher number of positions in the non-designated trades (e.g., truck drivers and heavy equipment operators) will be required.

During Year 3 of construction, the Project is expected to hire 275 to 400 local positions out of a total of almost 900 positions. This represents a local-hire percentage of between 48% and 66% and resembles the percentages for Year 2 due to the higher requirements associated with the higher skilled positions.

During years 2 and 3 of construction, occupational areas with potentially limited local capacity include millwrights, pipefitters, steel workers, and scaffold installers. It is important to note that given the Project schedule, development and implementation of training related to these occupations is unlikely to be effective in addressing local hiring for these positions. Although some on-the-job training may be offered, training programs for these skill areas will not be able to sufficiently address Project needs until the operations phase.

7.2.4.2 Operation Phase

The Operation Phase of the Project is expected to last approximately 23 years. As with the Construction Phase, operations employment opportunities represent both direct and indirect benefits that will contribute to Kamloops and other communities where unemployment is typically higher.

The occupational breakdown during Operation is shown in Table 7.2-7 and mirrors the analysis of the estimated workforce during Construction, although the distribution of occupations is different. The estimates serve as an indication of the size and composition of Project-related employment opportunities. Actual workforce requirements will vary from the estimate presented in the following sections.

Table 7.2-7. Operation Phase Estimated Direct Workforce Requirements (Annual Average) for the Ajax Project

Occupational Classification	Estimated Average Employment Positions
Designated Trades	105
Non-designated Trades	249
Engineering and Technical	50
Management and Supervisory	32
Administrative and Support	32
Total	468

Note: Derived from workforce estimate data provided by KGHM Ajax (2014).

During the Operation Phase, annual employment opportunities range between 400 and 500. Approximately 250 non-designated trade positions are expected to be required on average during an operating year. This is the largest category of employment opportunities and includes haul truck

operators and associated maintenance personnel. Approximately 100 designated trade positions are anticipated including millwrights and pipefitters positions. In addition, 50 engineering and technical positions (e.g., metallurgists, geologists), and between 30 and 40 positions for each of administrative/support and management/supervisory occupations will be required.

Local Hires

The availability and capacity of local labour to supply skilled labour required during the Operation Phase was assessed. Table 7.2-8 presents estimates of local and non-local hires during the Operation Phase. Out of almost 470 positions in an average year, the percentage of local hires could range from 58% to 74% (about 270 and 350 positions, respectively). It is expected that a large proportion of occupations classified as non-designated trades could be filled locally (between 69% and 83%).

Table 7.2-8. Estimates of Local and Non-local Hires for Project Operations (Annual Average)

Occupational Classification	Estimate of Potential Local Hires	Estimate of Potential Non-local Hires
Designated Trades	45 to 67	38 to 60
Non-designated Trades	171 to 207	42 to 78
Engineering and Technical	19 to 29	21 to 31
Management and Supervisory	9 to 15	16 to 22
Administrative and Support	26 to 28	4 to 6
Total	271 to 347	121 to 197

Prospective operations employees will be expected to have at least a Grade 12 diploma or equivalent. The majority of employment opportunities expected to be available during Operations represents occupations in the non-designated trades, which includes a wide range of heavy equipment operators. Haul truck operators make up a substantial proportion of this category. Related training can be accessed through Okanagan University College (Kelowna).

The remainder of Operation Phase employment opportunities are anticipated in the designated trades (e.g., mechanics, electricians and heavy equipment maintenance personnel), engineering and technical positions (e.g., engineers, geologists, metallurgists, technicians), management/supervisory, and administrative and support positions. Depending on the specific occupation, training opportunities can be accessed through TRU, Okanagan University College (Kelowna), and other institutions.

7.2.4.3 *Decommissioning and Closure Phase*

Decommissioning and Closure Phase of the Project would take place over a five year period, with the associated workforce decreasing over that time. The number of employment opportunities would be small compared to Construction and Operation Phase workforces. It is anticipated these positions will be filled by workers from the local area previously employed during the Operation Phase.

7.2.4.4 *Post-Closure Phase*

Post-closure employment opportunities (e.g., environmental monitoring, site maintenance) would be limited and would be relatively short term in nature. These opportunities are expected to be filled by residents of the local area.

7.2.5 **Potential Adverse Effects of the Project and Proposed Mitigation for Labour Force, Employment and Training**

The proposed Project has the potential to result in both positive and adverse effects on labour force, employment, and training locally and regionally. The Project benefits related to labour force, employment, and training were reviewed in Section 7.2.4. The purpose of the assessment is to understand the potential adverse effects of the Project. The following sections provide a discussion and analysis of the potential adverse effects of the Project on the Labour Force, Employment, and Training VC.

7.2.5.1 *Identifying Potential Adverse Effects on Labour Force, Employment and Training*

This section identifies the potential adverse effects of the Project on labour force, employment and training during each phase of the Project. The impact matrix provided in Table 7.2-9 shows how potential interactions between the Project and the VC are screened and ranked. Only potentially adverse interactions that are characterized as “M” (moderate) or “H” (key) are carried forward to the effect assessment for this VC.

The AIR/EIS Guidelines require a consideration of potential Project effects on labour force, employment and training. These do not typically result from single Project components or activities, but rather from an aggregate of multiple components and activities. For example, open pit development or water intake construction activities may be less relevant than the effects associated with Project employment and contracted employment. In addition, not all individuals or communities are likely to be affected to the same extent. As shown in Table 7.2-9, the Project activities that interact with the Labour Force, Employment, and Training VC are 1) mine staffing (direct employment), and 2) contracted employment.

The effects of the Project on the VC are expected to be beneficial during the Construction and Operations phases as the Project will generate opportunities for employment and training during these periods. New employment opportunities are considered a positive effect during all phases, but this effect will be greatest during Construction and Operations when Project-related employment is the highest. No adverse interactions are identified for these phases, and these phases are not assessed further.

A potential adverse interaction is identified for the Decommissioning and Closure Phase, as there will be a reduction in Project-related employment following the end of operations. This moderate interaction is carried forward for further assessment in Section 7.2.5.2. A potential interaction is also identified for the Post-closure Phase, but as the majority of employment and training opportunities will come to an end by the end of the Decommissioning and Closure Phase, the influence of the Post-closure Phase will be minor. The Post-closure Phase is not considered further.

Other concerns raised by stakeholders related to this VC are considered elsewhere in the Application. Specifically:

- Potential effects related to labour market competition amongst businesses in the mining service and supply industry are considered in Section 7.4 (Business);
- Potential effects related to the availability of workers to undertake civil works (to provide local services) are considered in Section 8.1 (Infrastructure, Public Facilities and Services); and
- Potential effects related to the potential outmigration of medical professionals are considered in Section 10.7 (Community Health and Well-being).

Table 7.2-9. Identifying Potential Project Interactions and Effects on Labour Force, Employment and Training

Project Activities		Potential Adverse Effects on Labour Force, Employment and Training
		Reduced Employment and Training Opportunities
Construction	Clearing and Grubbing	○
	Earthworks	○
	Overburden/Topsoil Stockpile	○
	Laydown Areas and Storage Yards	○
	Project Lighting	○
	Site Security and Fencing	○
	Fuel Storage and Filling Area	○
	Hazardous Wastes Transport, Storage, and Disposal	○
	Construction Wastes Transport, Storage, and Disposal	○
	Sewage Infrastructure and Disposal	○
	Public Road Realignment, Use, and Maintenance	○
	Site Road Construction, Use and Maintenance	○
	Haul Truck Road Construction, Use, and Maintenance	○
	Site Buildings and Process Plant	○
	Explosives Magazine and Storage Facilities	○
	Open Pit Development	○
	Drilling and Blasting	○
	Crushing Mine Rock	○
	Loading, Hauling, and Deposition of Mine Rock	○
	Temporary Ore Stockpile	○
	Tailing Storage Facility Development	○
	Power Transmission, Distribution	○
	Natural Gas Line	○
	Pipeline Utility Corridor (Potable Water, Sewage, and Site Water)	○

(continued)

Table 7.2-9. Identifying Potential Project Interactions and Effects on Labour Force, Employment and Training (continued)

Project Activities		Potential Adverse Effects on Labour Force, Employment and Training
		Reduced Employment and Training Opportunities
Construction (cont'd)	Water Intake from Kamloops Lake	○
	Fire Suppression Infrastructure	○
	Contact Water	○
	Non-contact Water	○
	Haul Truck Road	○
	Water Management Dams	○
	Mine Staffing (Direct Employment)	○
	Contracted Employment	○
	Taxation	○
Operation	Open Pit Development	○
	Drilling and Blasting	○
	Hauling Mine Rock and Ore from Pit	○
	Crushing and Conveying Ore	○
	Temporary Ore Stockpile	○
	Development of Mine Rock Management Facilities	○
	Stripping, Loading, Hauling, Deposition, and Contouring of Topsoil and Overburden	○
	Revegetation through Progressive Reclamation	○
	Process Plant Operation	○
	Deposition to Tailing Storage Facility	○
	Site Road Use and Maintenance (Materials, Personnel, Supplies)	○
	Concentrate Transport and Storage	○
	Explosives Magazine and Storage Facilities	○
	Fire Suppression Infrastructure	○
	Fuel Storage and Filling Area	○
	Hazardous Wastes Transport, Storage, and Disposal	○
	General Wastes Transport, Storage, and Disposal	○
	Sewage Infrastructure and Disposal	○
	Laydown Areas and Storage Yards	○
	Power Transmission, Distribution	○
	Project Lighting	○
	Site Access, Security and Fencing	○
	Water Intake from Kamloops Lake	○
	Contact Water	○
	Non-contact Water	○
	Potable Water Treatment and Use	○

(continued)

Table 7.2-9. Identifying Potential Project Interactions and Effects on Labour Force, Employment and Training (completed)

Project Activities		Potential Adverse Effects on Labour Force, Employment and Training
		Reduced Employment and Training Opportunities
Operation <i>(cont'd)</i>	Haul Truck Road	O
	Mine Staffing (Direct Employment)	O
	Contracted Employment	O
	Taxation	O
Decommissioning and Closure	Dismantling of Ancillary Buildings	O
	Pit Lake Planning	O
	Site Road/Bridge Decommissioning	O
	Tailing Storage Facility Decommissioning and Reclamation	O
	Mine Rock Management Facilities Reclamation	O
	Fuel Storage and Filling Area	O
	Hazardous Wastes Transport, Storage, and Disposal	O
	General Wastes Transport, Storage, and Disposal	O
	Sewage Infrastructure and Disposal	O
	Laydown Areas and Storage Yards	O
	Power Transmission, Distribution	O
	Project Lighting	O
	Site Access, Security and Fencing	O
	Contact Water	O
	Non-contact Water	O
	Potable Water Treatment and Use	O
	Haul Truck Road	O
	Road use to the Project (Materials, Personnel, Supplies)	O
	Mine Staffing (Direct Employment)	M
Contracted Employment	M	
Taxation	O	
Post Closure	General Site Inspections and Maintenance	O
	Contact Water	O
	Non-contact Water	O
	Road use to the Project (Materials, Personnel, Supplies)	O
	Mine Staffing (Direct Employment)	L
	Contracted Employment	L

Notes:

- O No interaction anticipated.
- L Negligible to minor interaction expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.
- M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.
- H Interaction; warrants further consideration.

7.2.5.2 *Effects on Labour Force, Employment and Training*

One potential adverse effect is identified and carried forward in the assessment: at the end of the operational life of the Project, there may be a decrease in employment and training opportunities during the Decommissioning and Closure Phase, as Project-related employment comes to an end.

Reduced Employment and Training Opportunities

Decommissioning and Closure Phase

During the Operation Phase, an average of 468 people are anticipated to be directly employed at the Project, while an additional 480 people will be employed through indirect and induced employment. As the Project moves from the Operation Phase into the Decommissioning and Closure Phase, it will transition to a smaller workforce, which will continue to decrease progressively over a five year period. The workforce will continue to decline over the course of the Decommissioning and Closure Phase, and at the end of this phase. Similarly, the need for continued training (and the availability of training opportunities) will decrease alongside the need for workers.

The loss of Project-related employment, and the potential decrease in training opportunities, is considered to be an adverse effect, although it is typical of the finite nature of mining developments. The effect will depend in part on the future economy of the area and employment levels. The impacts associated with the decreased employment and training opportunities are expected to occur within the LSA and RSA.

Overall, the provision of employment and training opportunities during Project Construction and Operations represent the beneficial effects of the Project. The removal of those benefits at Project Decommissioning and Closure, although considered an adverse effect of the Project, is a result of an expected closure that affects all mining activities.

7.2.5.3 *Mitigation Measures for Labour Force, Employment and Training*

Mitigation Measures for Labour Force, Employment and Training

The Project's mitigation of potential adverse effects related to the decline in employment and training opportunities after the Operation Phase will be addressed indirectly (see Section 7.3, Income and Section 7.4, Business) and include a combination of communications efforts and transition programming. KAM will inform direct employees of the Project, as well as contractors (i.e., the employers of the Project's indirect workforce) regarding upcoming changes to employment or business contracts, including status and schedule as the Project progresses from Operations into Decommissioning and Closure. This will allow a period of time for preparation prior to any transitioning that may be required.

A workforce transition plan will be developed and implemented, prior to the end of the Operation Phase, to support education and training and career development opportunities to aid employees in obtaining employment elsewhere. The transition plan may also include support for job searches and re-assignment where possible. Broader communication with local government and residents of Kamloops and surrounding communities also provide information regarding Project activities and

schedule. It is anticipated that training and experience gained during Project employment will help facilitate this transition to other related resource opportunities.

KAM will communicate closure activities to direct employees of the Project and contractors, both of which will be informed of upcoming changes in employment or business contracts in a manner that will allow them to find other employment and/or clients. Broader communication with local governments and residents of Kamloops and surrounding communities will also provide information regarding Project activities and schedule.

Although the proposed mitigation is expected to support the ongoing and alternative employment of Project workers (direct and indirect), residual effects may occur.

Measures to Enhance Project Benefits

KAM Human Resource Development Policy

KAM is currently in the process of completing a human resource development plan that will be implemented prior to the start of construction activities. Key aspects of KAM's human resource development plan relevant to this discussion include the following:

- A strategic workforce plan will describe workforce requirements for the Project development phase, from construction through to operations. This plan will outline the requirements of both KAM and its contractors and will reflect the fluctuating workforce needs of the Project.
- A Project recruitment strategy will also be developed. The strategy incorporates a commitment to hiring locally (Kamloops and the BC interior) and looking for partnership opportunities with local education and training organizations and institutions to ensure that the expertise required for operations is available. Attention will be given to recruiting potential employees who currently leave the region to work on resource development projects in other parts of the province or elsewhere.
- Efforts will be put in place to maximize recruitment of qualified First Nations candidates, in accordance with any established agreements. A First Nations liaison will facilitate this process.
- Efforts to encourage recruitment of local personnel will include utilization of an applicant tracking database, internet and social media, advertising, associations and institutions, career/job fairs, and agencies.
- With respect to training, federal and provincial programs will be accessed where feasible and appropriate to support workforce development. Efforts will also be undertaken to work with local universities and community partners to develop training programs and/or co-op programs. On-the-job training and apprenticeship programs may also be implemented as required.
- New employee orientation will include a component of cross-cultural training to recognize and support a diverse, multicultural workforce.
- Programming will be in place to facilitate continued training and development of employees, including provision of financial assistance to pursue educational opportunities and professional designations.

The overall intent of these measures is to maximize the extent to which the Project can draw upon and support a local labour pool to fill employment needs, including enhancing the opportunities for workforce participation among potentially underutilized local human resources.

Training

With the history and important role of mining in the region, regional mine operators have developed relationships with TRU to help develop the local mining workforce. For example, HVC has sponsored TRU's heavy duty trades program, provided used equipment, and has actively engaged environmental students in co-op programming (Ajax KPI Program 2011-2012). New Gold has similarly worked with TRU to develop its heavy equipment programming. TRU re-evaluates its curriculum every two to three years to ensure it remains current with the needs of the regional economy (Ajax KPI Program 2011-2012).

While there have been training programs in place for many of the potential employment opportunities on the Project, training for many of the more technical/professional and management/supervisory positions is only offered outside the region. Discussions with other mining operations suggest that the region could benefit from more advanced engineering programming. For the purpose of this analysis, it is assumed that occupations for which there are local training programs in place would be more likely to be filled locally.

Although training requirements differ widely depending on occupation, all employment opportunities are expected to require at least a high school diploma or equivalent. The majority of employment opportunities expected to be available during construction are in the designated trades. These typically include multiple years of classroom training accompanied by practical job experience. Example occupations on the Project include carpenters, concrete finishers, steel workers, scaffold installers, electricians, millwrights, pipefitters, and rebar workers. Some of this training (e.g., carpenters, electricians, welders and pipefitters) is available through local and regional institutions, including TRU, Okanagan College and College of the Rockies.

A sizeable number of employment opportunities are also anticipated in the non-designated trades, which include heavy equipment operators, truck drivers, and labourers. These positions typically require less intensive training, although in many cases will still require experience depending on the occupation. Training opportunities are offered through Okanagan College, TRU, and others.

Training for many of the more technical/professional and management/supervisory positions is only offered outside the region. Discussions with other mining operations suggest that the region could benefit from more advanced engineering programming.

7.2.6 Residual Effects and their Significance

7.2.6.1 Summary of Residual Effects

Residual effects are those Project effects that remain after mitigation is applied. This section describes in greater detail the post-mitigation residual effect for the labour force, employment and training VC. A summary of predicted effects on this VC is provided in Table 7.2-10.

Table 7.2-10. Summary of Residual Effects on Labour Force, Employment and Training

Project Effect	Project Phase (timing of effect)	Project Component/ Physical Activity	Description of Cause-Effect ¹	Description of Mitigation Measure(s)	Description of Residual Effect
Benefit: Project Employment and Training Opportunities	Construction and Operations	Project employment & Contracted Employment and Training Opportunities	The development of the Project will require employees from the local and regional areas and beyond. There will be training opportunities associated with employment	Human resource development plan to maximize local employment with the Project.	Not Applicable (Benefit)
Reduced employment and training opportunities	Decommissioning and Closure	Project employment & Contracted Employment and Training Opportunities	Reduced workforce following Operations phase as Project moves into Decommissioning and Closure Phase	Communication and transition programming including a workforce transition plan	Reduced employment and training opportunities due to reductions in workforce.

¹ "Cause-effect" refers to the relationship between the Project component/physical activity that is causing the change or effect in the condition of the VC.

7.2.6.2 *Criteria for Characterization of Residual Effects*

Residual effects are characterized using the following standard criteria: magnitude, duration, frequency, geographic extent, reversibility, resiliency and social value. The definitions of these terms for the assessment of Project effects on labour force, employment and training VC are outlined in Table 7.2-11.

7.2.6.3 *Characterization of Residual Effects*

Table 7.2-12 presents the characterization of residual effects of the Project on labour force, employment and training VC. Characterization of residual effects is based primarily on review of secondary sources as well as professional judgement. For the potential effect of decreased employment and training opportunities during Decommissioning and Closure, the following ratings were assigned:

- The magnitude of the potential effect is considered to be medium. For the LSA and RSA, a number of jobs will be terminated as the workforce is reduced following the Operation Phase. The duration of the effect is short-term and expected to occur as the workforce is reduced over the five-year Decommissioning and Closure Phase. Considering the size of the labour force in the LSA and RSA, and the fact that mining has historically been (and continues to be) an important aspect of the local economy, the decrease in jobs is expected to be a notable, but not overwhelming.

- Decreased income generation is considered to be a short-term effect, from 1 to 5 years. The end of employment will be communicated to employees and contractors in advance to facilitate transitions. Within five years (and likely sooner), it is reasonably expected that employees who previously earned income related to the Project (generated either through direct, indirect or induced employment) will have found other opportunities.
- This effect will have a regional geographic extent as Project-related employment is expected to be sourced throughout the LSA and RSA. As such, the loss of employment at closure is expected to be experienced in the LSA and RSA.
- The effect is expected to occur only once. The notable reduction in Project activities is expected to take place in a relatively limited and well-defined window following the Operation Phase.
- The effect is expected to be reversible in the short-term as workers and businesses move on to other opportunities. Considering the historical and continued involvement of the labour force and businesses in the mining industry, it is reasonably expected that comparable employment opportunities will be available around the time of Project closure.
- Resiliency to the effect is rated as neutral. The region has a long history of mining in addition to a diversified economy and is accustomed to dealing with resource development boom-bust effects. With a number of additional mines expected to be developed in the future, there will be additional opportunities for employment and training.
- Social value is rated as low. The effect has limited ability to alter the economic base, social structure, community stability or the well-being of people in the LSA and RSA. Social value is not ranked higher for several reasons. First, the Project is one of a variety of mines in the RSA that are either in operation or development. Second, mineral exploration in the region is ongoing (e.g., Cache Creek). While mining will likely continue in the area, providing workers with other employment opportunities, it should also be noted that the economy around Kamloops was, according to Horne (2009) one of the more diverse economies in BC according to 2006 census data. Finally, there are also well-developed social and economic supports, especially in Kamloops, which have a range of social services similar to those in a major metropolitan centre (Mazzotta, pers. comm. 2015). It is also important to note that this will represent a highly trained and skilled segment of the population that will be able to take on other new opportunities.

7.2.6.4 *Significance of Residual Effects*

With respect to the decrease in employment and training that will accompany the Project shift from Operation Phase into the Decommissioning and Closure Phase, the effect is conservatively predicted to be Not Significant (Moderate). There will be a substantial decrease in the number of employees required at the Project at the end of the mine's operational life. After mitigation (through communication, transition-planning) it is expected that many employees will gain opportunities elsewhere within the vicinity. The relative diversity of the LSA and RSA economies and future anticipated mining projects will also help to off-set this boom-bust effect.

7.2.6.5 *Characterization of Likelihood and Confidence*

Since Project operations will undoubtedly come to an end, the probability that jobs will come to an end is high, but the overall effect on employment and training opportunities in the LSA and RSA will depend on broader economic and community influences at the time of closure. Considering the wide range of variables that could influence the significance of the effect, there is therefore a moderate degree of uncertainty and the confidence level is considered to be medium. It is difficult to accurately predict economic circumstances in the LSA more than 20 years into the future given the large number of variables that could potentially influence the local economy (e.g., commodity prices, attraction of new businesses in other sectors to the LSA, the development of new mining operations or other industries) and the future availability of comparable employment alternatives at the time of closure.

Table 7.2-11. Characterization of Residual Effects, Significance, Likelihood and Confidence on Labour Force, Employment and Training

Magnitude	Duration	Frequency	Geographic Extent (Physical/Biophysical)	Reversibility	Resiliency	Social Value	Likelihood of Effects	
							Probability	Confidence Level
<i>How severe will the effect be?</i>	<i>How long will the effect last?</i>	<i>How often will the effect occur?</i>	<i>How far will the effect reach?</i>	<i>To what degree is the effect reversible?</i>	<i>How resilient is the receiving environment or population?</i>	<i>How influential is the effect on the broader socio-economic environment?</i>	<i>How likely is the effect to occur?</i>	<i>How certain is this analysis?</i>
<p>Negligible: No or very little detectable change from baseline conditions</p> <p>Minor: Differs from the average value for baseline conditions to a small degree.</p> <p>Medium: Differs substantially from the average value for baseline conditions and approaches the limits of natural variation.</p> <p>Major: Differs substantially from baseline conditions, resulting in a detectable change beyond the range of natural variation.</p>	<p>Short-term: Effect lasts 1 to 5 years.</p> <p>Medium-term: Effect lasts 6 to 25 years.</p> <p>Long-term: Effect lasts between 26 and 50 years.</p> <p>Far Future: Effect lasts more than 50 years.</p>	<p>Once: Effect is confined to one discrete period in time during the life of the Project.</p> <p>Sporadic: An effect that occurs at sporadic or intermittent intervals during any phase of the Project.</p> <p>Regular: Effect occurs on a regular basis during the life span of the Project.</p> <p>Continuous: Effect occurs constantly during the life of the Project.</p>	<p>Local: Project components visible from less than 500 m from Project Infrastructure.</p> <p>Landscape: Effect is limited to the LSA (i.e., Sub-area).</p> <p>Regional: Effect extends across the broader region (e.g., RSA)</p> <p>Background: Effect extends beyond the regional scale, and may extend across or beyond the province.</p>	<p>Reversible Short-term: Effect can be reversed relatively quickly.</p> <p>Reversible Long-term: Effect can be reversed within 20 years of Post Closure.</p> <p>Irreversible: Effect cannot be reversed (i.e., is permanent).</p>	<p>Low: The receiving environment or population has a low resilience to imposed stresses, and will not easily adapt to the effect.</p> <p>Neutral: The receiving environment or population has a neutral resilience to imposed stresses and may be able to respond and adapt to the effect.</p> <p>High: The receiving environment or population has a high natural resilience to imposed stresses and can respond and adapt to the effect.</p>	<p>Low: The effect has limited ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>Medium: The effect has some ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>High: The effect has moderate ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p>	<p>High: It is highly likely that this effect will occur.</p> <p>Medium: This effect is likely, but may not occur.</p> <p>Low: This effect is unlikely but could occur.</p>	<p>High: > 80% confidence. There is a good understanding of the cause-effect relationship and all necessary data are available for the Project area. There is a low degree of uncertainty and variation from the predicted effect is expected to be low.</p> <p>Medium: 50 to 80% confidence. The cause-effect relationships are not fully understood, there are a number of unknown external variables, or data for the Project area are incomplete. There is a moderate degree of uncertainty; while results may vary, predictions are relatively confident.</p> <p>Low: < 50% confidence. The cause-effect relationships are poorly understood, there are a number of unknown external variables, and data for the Project area are incomplete. High degree of uncertainty and final results may vary considerably.</p>

Table 7.2-12. Characterization of Residual Effects, Significance, Likelihood and Confidence on Labour Force, Employment, and Training

Residual Effect	Residual Effects Characterization Criteria							Significance of Adverse Residual Effects	Likelihood of Effects	
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Resiliency	Social Value		Probability	Confidence
Decrease in employment and training opportunities	Medium	Short-term	Once	Regional	Reversible Short-term	Neutral	Low	Not Significant (moderate)	High	Medium

7.2.6.6 *Summary of Residual Effects Assessment and Significance*

Given the above characterization, the residual effect of a decrease in employment and training opportunities during the Decommissioning and Closure Phase is expected to be **Not Significant (Moderate)**. The residual effect is carried forward into the Cumulative Effects Assessment (CEA) and is summarized in Table 7.2-13.

Table 7.2-13. Summary of Residual Effects, Mitigation, and Significance on Labour Force, Employment, and Training

Residual Effects	Project Phase	Mitigation Measures	Significance
Benefit: Project Employment and Training Opportunities	Construction and Operations	Human resource development plan to maximize local employment with the Project.	Not Applicable (Benefit)
Reduced employment and training opportunities due to reductions in workforce	Decommissioning and Closure	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize opportunities for employees to gain employment elsewhere	Not significant (Moderate)

7.2.7 **Cumulative Effects Assessment**

7.2.7.1 *Introduction*

Cumulative effects assessment (CEA) examines how residual effects of multiple projects and/or activities can potentially interact to have an adverse effect on a VC. These interactions can be direct, indirect, additive, and synergistic.

Labour force, employment and training VC is directly and indirectly tied to other economic VCs, including the Income VC and the Business VC. The residual effect on labour force, employment and training VC is a decrease in employment and training opportunities during the Decommissioning and Closure Phase. If other projects or activities in the LSA and RSA experience a sizable decrease in employment during the same time period that the Project is ramping down, then a cumulative effect could occur.

7.2.7.2 *Identification of Other Actions that May Affect Labour Force, Employment, and Training*

Chapter 5 (Assessment Methodology) describes the past, present, and reasonably foreseeable projects and activities that could interact with the effects of the Project. These projects are screened against the residual effects of the Project. For the Labour Force, Employment and Training VC, the key concern from a cumulative effects perspective is whether other projects or activities in the RSA and LSA are anticipated to undergo a substantive decrease in activities and associated employment within a similar time frame of the Project's workforce reductions.

7.2.7.3 *Interactions between Residual Project Effects and Other Project or Activity Effects*

The Ajax Project has a current estimated mine life of 23 years. The Project Operation Phase is expected to end in approximately 2042. Table 7.2-14 screens potential interactions with other projects and activities. Screening considered the end of the operations phases for other resource development (mainly mining) projects, as these projects are also finite in nature and are expected to result in substantial workforce reductions at the end of the operational life of the project.

Potential interactions with the Labour force, Employment and Training VC were considered for five projects with the potential for planned workforce reductions. These projects are either located within the vicinity of the Project (spatial overlap) and/or plan to or are likely to have workforce reductions within a similar timeframe as the proposed Project (temporal overlap):

- The Bonaparte Mine Project is a proposed mine located 45 km north of the City Kamloops. This project is currently focused on the exploration and drilling stage (WestKam Gold Corp 2015), therefore it is difficult to know with any certainty when it might begin production and for how long the operations could last. No interaction is identified.
- The New Afton Mine is approximately 10 km west of the Ajax Project, and is primarily an underground operation. The mine began commercial production in 2012. As of December 31, 2014, there were 447 employees and 14 contractors (New Gold 2015). Seventy-five to eighty percent of the operation's workforce lives in Kamloops (Ajax KPI Program 2011-2012). The mine is expected to be in operation for a total of 12 years until approximately 2024. The closure of the New Afton Mine is planned to occur before closure of the Project, and no interaction is identified.
- The Harper Creek Mine Project is located 150 km from the City of Kamloops. This project (if approved) would have a mine life of about 28 years (BC EAO and CEA Agency 2015). The mine is expected to have approximately 600 positions during construction and 466 positions during peak operation (ERM Consultants Canada Ltd. 2015). Construction is not expected to start until 2016 and would continue through to 2018, which would indicate mine operations would continue until approximately 2046. As the Project is located 150 km from the City of Kamloops it is expected to draw employees from a separate labour pool, limiting the potential for spatial overlap. The interaction is expected to be negligible to minor.
- The HVC mine is located near Logan Lake and is approximately 50 km by highway from Kamloops. In 2014, HVC was the third largest employer in the LSA with over 1,300 employees. In the past five years, the number of employees has risen from 800 to approximately 1,380. About half of the HVC workforce lives in Kamloops. The remainder of the workforce commutes from other nearby communities in the RSA including Logan Lake and Ashcroft (Ajax KPI Program 2011-2012; Dechert pers. comm. 2014). The mine is currently expected to operate until 2027 based on a new operations plan (Teck 2015). Therefore, closure of the HVC mine is planned to occur before closure of the Project, and no interaction is identified. The HVC Bethlehem Expansion Project is not included as it is expected to utilize the workforce associated with the current HVC operation.

Table 7.2-14. Ranking Potential for Residual Effects to Interact Cumulatively with Effects of Other Human Actions on Labour Force, Employment and Training

Residual Effect	Industrial Projects/Activities													Natural Resources and Land Use			Tourism and Commercial Recreation Activities				Community Infrastructure			Transportation							
	Vidette Lake Mine	Afton Mine (Historical)	Iron Mask Mine	Bonaparte Mine	New Afton Mine (New Gold)	Highland Valley Copper Mine (Teck)	Domtar Kamloops Pulp Mill	Tolko-Hefley Creek Plywood and Veneer	LaFarge Cement Plant	Trans Mountain Pipeline System (Kinder Morgan)	Trans Mountain Pipeline System - Expansion (Kinder Morgan)	Harper Creek	Highland Valley Copper - Bethlehem Expansion	Kamloops Forest District	Agriculture	Ranching	Tranquille on the Lake	Lac Le Jeune Resort	Tobiano Golf Course	Recreational Hunting, Fishing, Foraging	Recreational Trails	City of Kamloops Wastewater Management	Water Treatment Centre	City Expansion and Growth	Lac le Jeune Road	Highway 1	Highway 5A	Highway 5 (Coquihalla Highway)	Kamloops Airport	Rail Yards and Lines (CP and CN)	
Reduced employment and training opportunities due to reductions in workforce	O	O	O	O	O	O	O	O	O	L	L	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

Notes:

- (-) No spatial or temporal overlap.
- O Spatial or temporal overlap, but no interaction anticipated OR No change from current condition anticipated, and already captured as part of baseline characterization. No further consideration warranted.
- L Negligible to minor interaction expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.
- M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.
- H Key interaction; warrants further consideration.

- A portion of the Trans Mountain Pipeline (TMPL) Expansion project is located close to Project and the City of Kamloops. For the construction segment identified as the Kamloops construction hub, this project is expected to require an average of 297 workers per month over a 20-month period (2016 to 2018). The actual number will differ from one month to the next, from a low of nine workers per month to nearly 900 workers per month during the summer months. Approximately 10% of the workforce is expected to be sourced from the combined Fraser-Fort George and Thompson-Nicola Regional Districts (TMPL 2013), and the majority of workers will be sourced from elsewhere in Canada (mainly Alberta and British Columbia), limiting the potential for spatial overlap. Given the limited timeframe during which these effects may take place and the limited amount of local hiring for the TMPL Expansion, the interaction between the Project and the TMPL expansion is negligible to minor.

Therefore, with respect to the residual effect of reduced employment and training opportunities during the Decommissioning and Closure Phase, none of the identified projects or activities are expected to enter a period of substantial reduced employment coinciding with that of the Project. , No cumulative effects are anticipated.

Existing industrial projects in the LSA and RSA—including the Domtar pulp mill, LaFarge cement plant, and Tolko-Heffley Plywood and Veneer—also contribute to employment but no interaction is anticipated as these enterprises are considered as part of the baseline conditions of the area. These activities are also not subject to the cyclical, finite nature of mining projects that can result in substantial workforce reductions at the end of mine operations.

7.2.7.4 *Proposed Mitigation Measures*

No mitigation is proposed as cumulative effects are not anticipated.

7.2.7.5 *Evaluation of Significance of Residual Cumulative Effects*

No cumulative effects are anticipated.

7.2.8 **Conclusion**

The Project is expected to have positive effects on labour force employment and training opportunities in the LSA and RSA during all phases of the Project. With respect to the decrease in employment and training that will accompany the Project shift from the Operations Phase into the Decommissioning and Closure Phase, the effect is expected to be **Not Significant (moderate)**. There will be a substantial decrease in the number of employees required on the Project. After mitigation (through communication, transition-planning) it is expected that many employees will gain opportunities elsewhere within the vicinity. The relative diversity of the LSA economy and future anticipated mining projects will also help to off-set this boom-bust effect.

A summary of the assessment is provided in Table 7.2-15 below.

Table 7.2-15. Summary of Project and Cumulative Residual Effects, Mitigation, and Significance for Labour Force, Employment and Training

Residual Effects	Project Phase	Mitigation Measures	Residual Effect Significance	Residual Cumulative Effect Significance
Benefit: Project Employment and Training Opportunities	Construction and Operations	Human resource development plan to maximize local employment with the Project.	Not Applicable (Benefit)	Not Applicable (Benefit)
Reduced employment and training opportunities due to reductions in workforce	Decommissioning and Closure	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Not significant (Moderate)	No residual cumulative effect

7.3 INCOME

7.3.1 Rationale

During Project-related consultation, a number of different economic topics were raised for consideration as valued components (VCs). In order to be identified as VCs for the application there must be a perceived likelihood that the VC will be affected by the Project. Scoping of economic VCs took into account issues and concerns raised during Project consultation with the public and stakeholders (see Sections 4.3 and 4.4), discussions with the British Columbia Environmental Assessment Office (BC EAO) and other government agencies, and the experience of other recent BC projects. Interactions with the Project Working Group, comprised of representatives from federal, provincial and local governments and Aboriginal Groups also helped to frame the VCs.

Table 7.3-1 provides a summary of the rationale and justification for choosing and assessing Income as a VC.

Table 7.3-1. Rationale for Including Income as a Valued Components in the Application

Valued Components	Identified by*				Rationale for Inclusion
	AG	G	P/S	SK	
Income	X	X	X	X	Employment opportunities at the mine typically fall within a relatively high income range, which will benefit the LSA and RSA through direct, indirect and induced economic effects. Concern has been identified regarding the loss of income due to reduction of employment during the transition from Operations to Closure of the Project.

*AG = Aboriginal Group; G = Guideline Requirement; P/S = Public/Stakeholder; SK = Scientific/Professional Knowledge

The topic of Income was raised during Project consultation with government agencies, the public, stakeholders, and the BC EAO. Income is considered a standard assessment component as demonstrated in other recent environmental assessments in British Columbia (BC). During both the Construction and Operation phases, the Project is expected to generate employment, and associated income benefits, for residents of the Local Study Area (LSA) (Kamloops, the TNRD-J, Tk'emlúps te Secwépemc [TteS] reserve Kamloops 1, and Skeetchestn Indian Band [SIB] reserve Skeetchestn) and Regional Study Area (RSA) (the Thompson Nicola Regional District [TNRD]). As the Project shifts to the Decommissioning and Closure Phase, Project-related employment and income will correspondingly decrease.

Income influences the standard of living (e.g., quantity and quality of goods and services) available to both individuals and communities. New income will be generated in two ways as a result of the Project. First, there is the income paid directly to employees of KAM and its contractors. Second, once that income is earned, induced economic activity will occur in the LSA, particularly in the retail and hospitality sectors through the spending of wage income. These effects are expected to be most pronounced during the Construction Phase when the greatest employment levels are realized and will continue, at a lower but more permanent level over a longer term, through the Operation Phase.

Analysis of potential income effects is closely connected to estimates of Project-related expenditures on goods and services, including employment. These estimates are also used to derive estimates on indirect and induced employment and income. It is particularly important to determine how much of the total income generated by the Project will be earned by residents in the LSA and RSA. Direct employment opportunities with the Project are expected to provide relatively high incomes (for more detail on the Project's effects on the labour force, please see Section 7.2). This income is expected to benefit the LSA and RSA through direct, indirect, and induced economic effects.

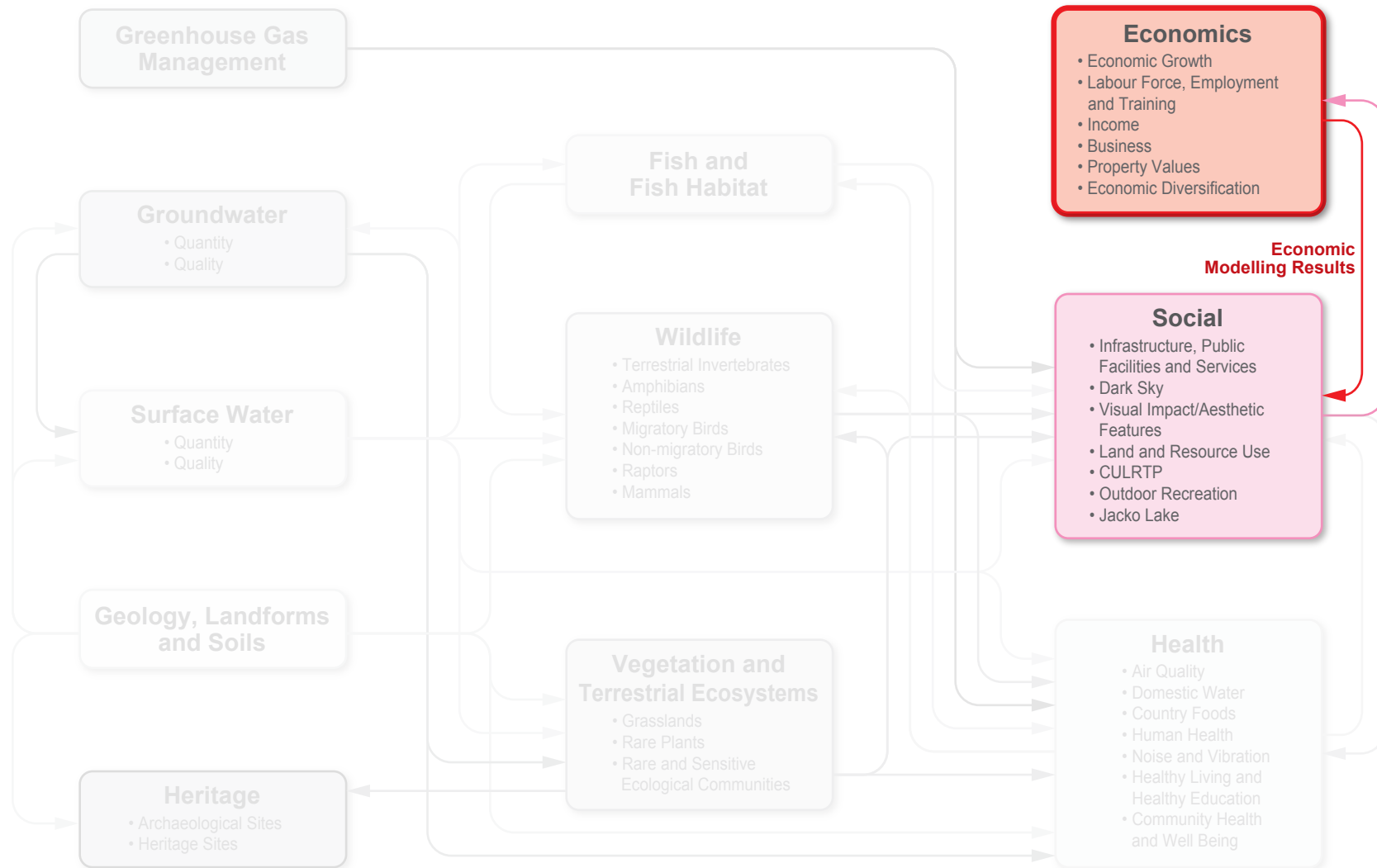
Figure 7.3-1 illustrates the interactions between types of VCs. The primary analysis feeding into the effects assessment on the Income VC is the input-output model that was run by Statistics Canada and the assessment of Labour Force, Employment, and Training, which describes the extent to which the local labour force will be employed on the Project during the Construction and Operation phases. The analysis related to the Income VC provides material for Community Health and Well-being (Section 10.7), which examines the positive and negative impacts of increased income on workers in the LSA and RSA.

7.3.2 Background

This section provides a description of four indicators related to income, which, when considered in combination are useful for identifying variations in employment earnings within and among communities:

- Total personal income, which is income from employment, self-employment, government sources, from employer and personal pension sources, from investment sources, and from regular cash income like child support payments (Statistics Canada 2013). This indicator, combined with sources of income, is useful for identifying variations in employment earnings within and between communities.
- Average family income, which presents the average income for economic families. According to Statistics Canada (2013), and economic family “refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, adoption or a foster relationship. A couple may be of opposite or same sex”
- Household income provides information on private households, which “refers to a person or a group of persons (other than foreign residents) who occupy the same private dwelling and do not have a usual place of residence elsewhere in Canada. Household members who are temporarily absent on May 10, 2011 (e.g., temporarily residing elsewhere) are considered as part of their usual household. Every person is a member of one and only one household” (Statistics Canada 2013).
- Composition of income indicates the source of personal income. For example, how proportion of personal income is from employment earnings, government transfers, or other sources.

Figure 7.3-1
Inputs to Economic Valued Components



7.3.2.1 *Regional Overview*

Much of the economy of the RSA (i.e., the TNRD) is based on public services, including health care and education. Other important industries include mining, forestry, agriculture, retail, and manufacturing. The nation-wide economic downturn in 2008 was also experienced in the region, with effects most notable in the forestry industry, which was also impacted by the mountain pine beetle (Ajax KPI Program 2011-2012). Mining has historically been (and continues to be) an important sector within the RSA as there are two active mines (Highland Valley Copper [HVC] and New Afton) and at least three proposed mines (the Project, Harper Creek, and Ruddock Creek) in the RSA (Invest in Thompson-Nicola 2015). Tourism, especially centred in Kamloops, has become an increasingly important component of the regional economy. Each of these economic sectors provides opportunities for income for individuals participating in direct, indirect, and induced employment opportunities tied to each sector.

In 2010, the average total income by individuals in the RSA was \$37,876, which was similar to the provincial average, which was \$39,415. Similarly, the distribution of income into different brackets was proportionally similar in all categories. The average family income earned in the RSA in 2010 was \$84,242, which is lower than the BC average of \$91,967. Similarly, the average household income was lower in the RSA (\$71,861) than the province as a whole (\$77,378). In the RSA, 71.4% of all income came from employment, 14.0% from government transfer payments, and the remaining 14.6% from other sources (Statistics Canada 2013).

7.3.2.2 *Historical Activities*

A description of historical activities that have helped to shape the Kamloops area economy is provided in Appendix 7.1-A (Socio-economic Baseline for the Ajax Project) including the following:

- **Mining has historically been a key economic driver in the Kamloops area:** Mining activity in the area can be traced back over 100 years with exploration within the LSA and immediate vicinity of the LSA beginning in the 1880s. The former Afton Mine included the Ajax east and west pits (located within the Project footprint), as well as the Afton pit (approximately 8 km northwest of the Project). Operations on the Afton pit began in 1977, and operations on the Ajax East and Ajax West pits were initiated in 1989; activities at the Afton pit and Ajax East and West pits were subsequently suspended in 1991 due to depressed metal prices. Currently, the New Afton Mine, which utilizes the historic Afton pit and infrastructure, can process up to 12,500 tonnes of ore per day (New Gold 2014; Ajax KPI Program 2011-2012). Other mines in the area include Highland Valley Copper (HVC) (50 km from Kamloops), Copper Mountain (170 km from Kamloops), and Gibraltar (about 330 km from Kamloops), and there are exploration activities and proposed mines throughout the RSA.
- **The Stk'emplupsemc te Secwépemc Nation (SSN) and Mining:** The Cultural Heritage Study (Ignace 2014) notes that ethnographers (e.g., James Teit) have noted the use of copper by the Secwépemc. Teit noted that copper tube beads were common as were copper earrings. While Teit assumes that most of the copper used was European-made, other ethnographers observed that there were some copper deposits that were mined by the Secwépemc. Among these were Copper Creek, which is located on the north shore of Kamloops Lake (Ignace

2014). The SSN was also involved in gold mining before the 1858 Fraser Canyon gold rush. According to Ignace (2014), maps from the beginning of the 1858 gold rush confirm early Aboriginal involvement in gold mining as some maps show “Indian Diggings” on the north shore of Kamloops and Shuswap lakes. Hudson’s Bay Company journals and accounts also show trading for gold dust by Aboriginal persons who likely engaged in placer mining. Gold panning continued into the twentieth century.

- **Transportation and Infrastructure Development:** Kamloops has served as an important transportation hub since the 1890s through railway development and subsequent highway construction during the 1950s. Other notable developments have included the Kamloops airport expansion in 2009 (Venture Kamloops 2014).
- **Forestry Sector Development:** Forestry has been an important driver in the local economy despite periodic (and recent) industry downturns. Weyerhaeuser established their pulp mill operations in 1965. Domtar purchased the mill in 2007 and is currently running the facility at a reduced capacity having closed one pulp machine at the plant, which affected 125 workers (Klassen 2014; Domtar 2012; Ajax KPI Program 2011-2012).
- **Education and Technology Development:** These sectors have become areas of increasing focus for Kamloops in recent years. Thompson Rivers University was incorporated in 2005 (and formerly operated as the University College of the Cariboo) and offers a wide variety of academic degrees as well as trades-oriented programming. In 2011, the TRU’s Law Faculty opened (TRU n.d.). As a whole, employment associated with the professional, scientific and technical services sector within the Thompson/Okanagan Development Region (excluding Kelowna) has been on an upward trend since 2001 and Kamloops is actively working towards expanding the technology sector (Venture Kamloops 2014; Ajax KPI Program 2011-2012). BC Aboriginal Mentoring and Training Association, which helped First Nations people gain employment in the mining sector, closed in 2014. The closure removes one support for First Nations people looking for training to secure employment in the mining industry (Stueck 2014).
- **Other Development:** The Kamloops economy has also been shaped by the increasing role of tourism, the City’s designation as “The Tournament Capital of Canada” (2001), and the development of the Sun Peaks Resort.

7.3.2.3 *Baseline Studies*

The objective of the baseline research was to understand existing baseline conditions related to personal, family, and household income, including income levels and sources of income in the LSA and RSA.

Data Sources

Data sources for the baseline focused on Statistics Canada 2011 National Household Survey (NHS) as the most reliable source of publicly available data related to income. Literature related to the provincial economy, including publications by BC Stats, was also considered. Additional detail is provided in the Ajax Project Socio-economic Baseline Report (Appendix 7.1-A).

It should be recognized that data sources related to Aboriginal Groups have some limitations. In connection with Statistics Canada, data specific to Aboriginal Groups is primarily reported by Indian Reserve and reflects the situation of Aboriginal members who live on-reserve. According to population information collected and reported by Aboriginal Affairs and Northern Development Canada (AANDC), close to half of TteS members lived off reserve, while over half of SIB members lived off-reserve in 2011 (AANDC 2012). Except where qualitative data is available, the ability to describe the social and economic situation specific to members of these Aboriginal Groups who live off-reserve is limited. In addition, the primary TteS reserve (Kamloops 1 Indian Reserve [IR]) presents another difficulty in that a large proportion of the population living on the reserve parcel does not self-identify as Aboriginal (Statistics Canada 2013). This situation is likely due to the development of Sun Rivers on-reserve where the majority of the population is not Aboriginal (Aird, *pers. comm.* 2015). Therefore, data for the Kamloops 1 IR is presented broken out by Aboriginal identity where available. Similar breakdowns were not available for average family income (Table 7.3-2). While the total population on the Kamloops 1 IR that self-identifies as Aboriginal does not correspond exactly with the number of TteS members living on-reserve since these population counts also include individuals who belong to other Aboriginal Groups or identify as Inuit or Metis, it provides additional data regarding the on-reserve population for Kamloops 1 IR.

Consultation activities undertaken with the Aboriginal groups during the Pre-Application period included capacity building and funding, TK/TLU studies, community meetings, site tours, and meetings with Aboriginal group representatives (see Section 4.3). Multiple attempts have been made to engage each Aboriginal group to seek the baseline data required for the Application/EIS including the circulation of baseline documentation for review and comment. The limited information gathered through this engagement has been incorporated in the Application and considered in the assessments. In some cases, the requested information was not available from Aboriginal Groups at the time of writing or from secondary sources. Where appropriate, additional information made available by Aboriginal groups will be considered in Project development plans.

Methods

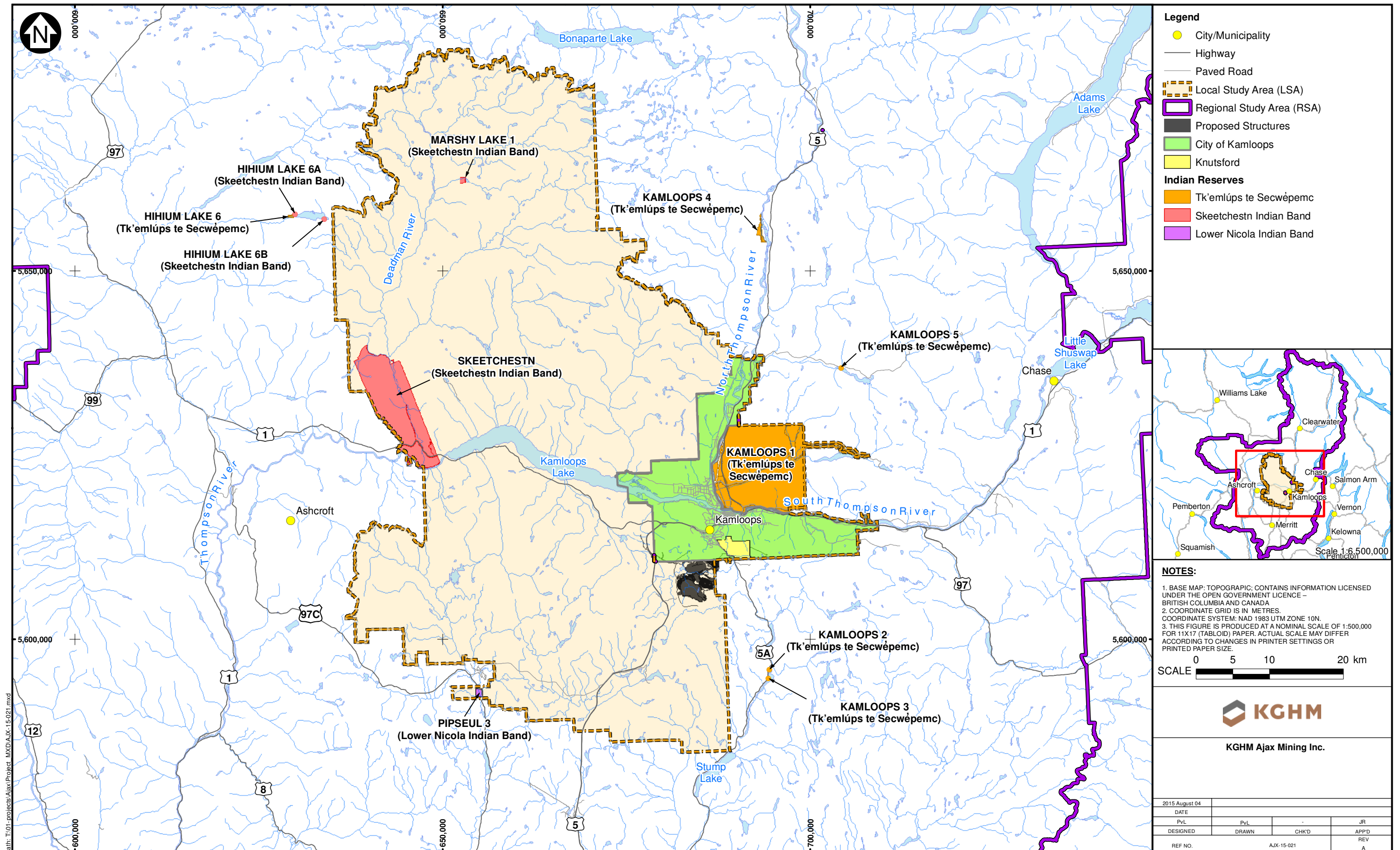
The approach to understanding baseline conditions was based largely on a review of secondary data, including census statistics.

Characterization of Income Baseline Conditions

Total personal income levels for Kamloops, the LSA (Figure 7.3-2), the RSA (Figure 7.3-3) and the province all showed a similar distribution across income categories (Table 7.3-2). Corresponding average total personal incomes approximated just under \$40,000 per year. Of these areas, the highest average personal income was reported among residents of the TNRD-J (electoral district that includes Savona) at over \$41,000, while the average total personal income was \$39,286 for Kamloops and \$37,876 for the RSA.

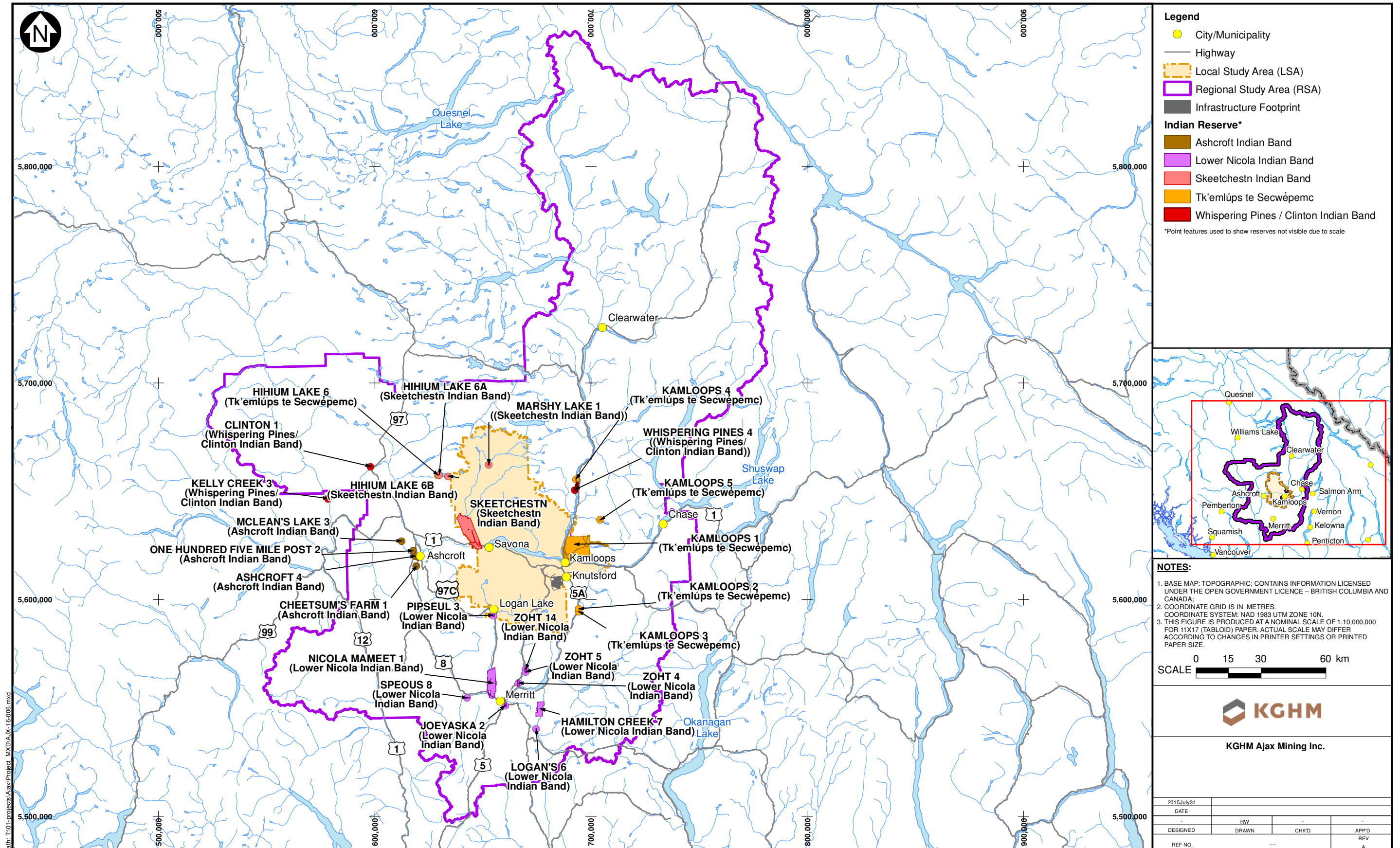
The LSA also includes the two First Nations: the TteS, about half of whose members live on the Kamloops 1 IR near Kamloops, and the SIB, about half of whose members live on the Skeetchestn IR near Savona (AANDC 2012). One-third of residents on the Kamloops 1 IR who self-identify as Aboriginal had a total income of less than \$10,000, while just over one quarter of SIB members living on-reserve did. The average total personal income was at least \$14,000 less than for the LSA.

Figure 7.3-2
Local Study Area



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Figure 7.3-3
Regional Study Area



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Table 7.3-2. Total Personal Income for the LSA, RSA, and BC, 2011¹

Personal Income ²	Kamloops	TNRD-J	TteS Non-Aboriginal Identity ³	TteS Aboriginal Identity ⁴	SIB ⁵	LSA ⁶	RSA ⁷	BC
Total number of individuals with income over 15 years of age	70,385	1,320	1,655	565	205	74,130	106,330	3,646,835
Under \$10,000	16%	15%	14%	33%	27%	16%	16%	18%
\$10,000 - \$19,999	18%	14%	12%	19%	20%	18%	18%	18%
\$20,000 - \$29,999	12%	19%	11%	12%	12%	12%	13%	13%
\$30,000 - \$39,999	13%	11%	9%	12%	17%	13%	13%	11%
\$40,000 - \$49,999	10%	5%	10%	5%	10%	9%	9%	9%
\$50,000 - \$59,999	8%	9%	10%	4%	0%	8%	7%	7%
\$60,000 and over	19%	25%	27%	11%	5%	19%	18%	19%
Average income	\$39,286	\$41,857	N/A	\$25,210	\$23,857	\$39,433	\$37,876	\$39,415

Source: Statistics Canada 2013.

Notes:

1. Income data for the 2011 NHS were derived from 30% data. However, on Indian reserves and in remote communities, attempts are made to obtain data from 100% of the population for all years. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5, and in some cases, 10. Columns may not add due to rounding.
2. Total income is before income taxes and deductions, during calendar year 2010. It includes "employment income from wages, salaries, tips, commissions and net income from self-employment (for both unincorporated farm and non-farm activities); income from government sources, such as social assistance, child benefits, employment insurance, old age security pension, Canada or Quebec pension plan benefits and disability income; income from employer and personal pension sources, such as private pensions and payments from annuities and RRIFs; income from investment sources, such as dividends and interest on bonds, accounts, GICs and mutual funds; and other regular cash income, such as child support payments received, spousal support payments (alimony) received and scholarships" (Statistics Canada 2013).
3. Data for TteS non-self-identifying Aboriginal population are for the Kamloops 1 IR. The TteS have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. Data for TteS Non-Ab identity population are calculated by InterGroup Consultants as the difference between total population and Ttes aboriginal identity population. Average household income data for TteS Non-Ab are not available.
4. Data for the population that self-identifies as Aboriginal on the TteS reserve are for the Kamloops 1 IR. The TteS have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. "Total Aboriginal identity population" is composed of those persons who reported identifying with at least one Aboriginal group, that is, North American Indian, Métis or Inuit, and/or those who reported being a Treaty Indian or a Registered Indian, as defined by the Indian Act of Canada, and/or those who reported they were members of an Indian band or First Nation.
5. Data for the SIB are for the Skeetchestn IR. The SIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.
6. The LSA is the City of Kamloops, the TNRD-J, Kamloops 1 IR, and Skeetchestn IR.
7. The RSA is the TNRD.

In 2010, the average family income in the LSA was \$89,139 and in the RSA it was \$84,242. Both averages were lower than the provincial average of \$91,967 (Table 7.3-3). The median income for the LSA (\$77,608) was higher than either the median income of the RSA or BC (Table 7.3-3). Family income statistics for Kamloops closely mirrored the reported income information for the LSA, with Kamloops residents also having a higher median family income (\$77,718) than either the RSA or BC.

Table 7.3-3. Average Family Income for the LSA, RSA, and BC, 2011¹

Family Income ²	Kamloops	TNRD-J	TteS ³	SIB ⁴	LSA ⁵	RSA ⁶	BC
Total number of families with income	24,260	500	830	70	25,660	37,315	1,205,255
Median family income	\$77,718	\$66,608	\$83,598	\$47,034	\$77,608	\$72,154	\$75,797
Average family income	\$89,103	\$85,402	\$95,566	\$52,016	\$89,139	\$84,242	\$91,967

Notes:

1. Income data for the 2011 NHS were derived from 30% data. However, on Indian reserves and in remote communities, attempts are made to obtain data from 100% of the population for all years. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5, and in some cases, 10. Columns may not add due to rounding.
2. Family income is the total income for economic families. An economic family "refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, adoption or a foster relationship. A couple may be of opposite or same sex" (Statistics Canada 2013). Total income includes "employment income from wages, salaries, tips, commissions and net income from self-employment (for both unincorporated farm and non-farm activities); income from government sources, such as social assistance, child benefits, employment insurance, old age security pension, Canada or Quebec pension plan benefits and disability income; income from employer and personal pension sources, such as private pensions and payments from annuities and RRIFs; income from investment sources, such as dividends and interest on bonds, accounts, GICs and mutual funds; and other regular cash income, such as child support payments received, spousal support payments (alimony) received and scholarships" (Statistics Canada 2013).
3. Data for the TteS is for the Kamloops 1 IR. The TteS have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.
4. Data for the SIB is for the Skeetchestn IR. The SIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.
5. The LSA is the City of Kamloops, the TteS, the SIB, and the TNRD-J.
6. The RSA is the TNRD.

The TNRD-J and the population living on the SIB reserve had median family incomes and average family incomes lower than those for the LSA, RSA, and BC. Data were not available for the Kamloops 1 IR broken out by Aboriginal identity (self-identified), therefore data for the entire population living on-reserve is included in Table 7.3-3. For the entire population living on the Kamloops 1 IR, the median and average family income was larger than those for the LSA, RSA, and BC.

In 2010, the average household income in the LSA was \$75,581, which was derived by using a weighted average of the average household incomes provided by Statistics Canada (2013) for Kamloops, the TNRD, Kamloops 1 IR, and Skeetchestn IR (Table 7.3-4). The LSA average is lower than the average household income in BC (at \$77,378), but higher than the average household income for the RSA (at \$71,861). The TNRD-J had the highest average household income of all the census sub-divisions in the LSA at \$81,890, with 29% of households earning \$100,000 or more per year. Overall, the LSA had very similar household income distributions as the RSA and the province. In all three geographic divisions, approximately one quarter of the households had an income over \$100,000. About 42% of households on the Kamloops 1 that did not self-identify as Aboriginal had an income of \$100,000 or more.

Kamloops had an average household income similar to that of the LSA, with the same percentage distributions in all the other income categories. The population on the Kamloops 1 reserve that self-identifies as Aboriginal had almost even distributions across all household income categories and the on-reserve population of the SIB reserve reported comparatively lower average household incomes.

Table 7.3-4. Household Income, 2011¹

Household Income ²	TteS Non-Aboriginal		TteS Aboriginal		SIB ⁵	LSA ⁶	RSA ⁷	BC
	Kamloops	TNRD-J	Identity ³	Identity ⁴				
Total number of households with income	35,025	650	785	340	100	36,900	53,375	1,764,630
Under \$10,000	4%	0%	6%	13%	20%	4%	4%	5%
\$10,000 - \$19,999	9%	2%	5%	13%	20%	9%	9%	9%
\$20,000 - \$29,999	8%	5%	6%	12%	10%	8%	9%	9%
\$30,000 - \$39,999	11%	18%	7%	13%	20%	11%	12%	9%
\$40,000 - \$49,999	8%	5%	6%	13%	15%	8%	9%	9%
\$50,000 - \$59,999	8%	15%	8%	7%	0%	8%	8%	8%
\$60,000 - \$79,999	15%	16%	12%	9%	20%	15%	15%	14%
\$80,000 - \$99,999	11%	7%	7%	12%	10%	11%	11%	11%
\$100,000 and over	26%	29%	42%	12%	0%	26%	24%	25%
Average household income	\$75,357	\$81,890	N/A	\$48,298	\$43,661	\$75,581	\$71,861	\$77,378

Source: Statistics Canada 2013.

Notes:

1. Income data for the 2011 NHS were derived from 30% data. However, on Indian reserves and in remote communities, attempts are made to obtain data from 100% of the population for all years. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5, and in some cases, 10. Columns may not add due to rounding.
2. Total household income in "The total income of a household is the sum of the total incomes of all members of that household" (Statistics Canada 2013). Statistics Canada (2013) defines a private household as "a person or a group of persons (other than foreign residents) who occupy the same private dwelling and do not have a usual place of residence elsewhere in Canada. Household members who are temporarily absent on May 10, 2011 (e.g., temporarily residing elsewhere) are considered as part of their usual household." Total income includes "employment income from wages, salaries, tips, commissions and net income from self-employment (for both unincorporated farm and non-farm activities); income from government sources, such as social assistance, child benefits, employment insurance, old age security pension, Canada or Quebec pension plan benefits and disability income; income from employer and personal pension sources, such as private pensions and payments from annuities and RRIFs; income from investment sources, such as dividends and interest on bonds, accounts, GICs and mutual funds; and other regular cash income, such as child support payments received, spousal support payments (alimony) received and scholarships" (Statistics Canada 2013).
3. Data for TteS non-self-identifying Aboriginal population is for the Kamloops 1 IR. The TteS have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. Data for TteS Non-Ab identity population are calculated by InterGroup Consultants as the difference between total population and TteS aboriginal identity population. Average household income data for TteS Non-Ab are not available.

(continued)

Table 7.3-4. Household Income, 2011¹ (completed)

4. Data for the population that self-identifies as Aboriginal on the TteS reserve is for the Kamloops 1 IR. The TteS have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. "Total Aboriginal identity population" is composed of those persons who reported identifying with at least one Aboriginal group, that is, North American Indian, Métis or Inuit, and/or those who reported being a Treaty Indian or a Registered Indian, as defined by the Indian Act of Canada, and/or those who reported they were members of an Indian band or First Nation.
5. Data for the SIB is for the Skeetchestn IR. The SIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.
6. The LSA is the City of Kamloops, the TNRD-J, Kamloops 1 IR, and Skeetchesn IR.
7. The RSA is the TNRD.

With respect to composition of income in the LSA, about 73.9% of all income came from employment, 12.4% from government transfer payments, and the remaining 13.7% from other sources in 2010 (Table 7.3-5). When compared with data from the 2006 Census of Canada (2007), the percent of total income from employment decreased from 75.0%, as did the percentage of income from government transfer payments and other sources. The LSA, RSA and Kamloops displayed very similar results (between one and two percentage points) in terms of **composition of income** in 2010. The median income of LSA residents was slightly higher than the median income of RSA and provincial residents for both 2010 and 2005. The percentage of income from employment was comparable between Kamloops, the population living on the Skeetchestn IR, and the population living on the Kamloops 1 IR, with SIB being the highest at 77%. The TNRD-J population had the lowest percentage of income coming from employment at about 64%. The TNRD-J and SIB also reported comparatively higher contributions to total income from government transfers at 16.9% and 16.5%, respectively in 2010.

Table 7.3-5. Composition of Income, 2006 and 2011^{1,2}

Composition of Income ³	Kamloops	TNRD-J	TteS ⁴	SIB ⁵	LSA ⁶	RSA ⁷	BC
2006							
Persons 15 years and over with earnings	63,185	1,330	1,410	n/a	65,925	96,325	3,230,565
Composition of total income	100	100	100	n/a	100	100	100
Employment income% ⁸	75.1	66.9	79.1	n/a	75.0	73.4	75.1
Government transfer payments	11.9	14.2	12.3	n/a	12.0	13.3	10.7
Other	13	18.9	8.5	n/a	13.0	13.2	14.2
Average income	\$33,533	\$30,952	\$28,293	n/a	\$33,369	\$31,947	\$34,519
Median Income	\$26,075	\$26,104	\$19,942	n/a	\$25,944	\$24,247	\$24,867
2011							
Persons 15 years and over with earnings	70,385	1,320	2,220	205	74,130	106,330	3,646,835
Composition of total income	100	100	100	100	100	100	100
Employment income% ⁸	74.2%	63.5%	70.7%	77%	73.9%	71.4%	73.7%
Government transfer payments	12.3%	16.9%	19.6%	16.5%	12.4%	14.0%	11.7%
Other	13.4%	19.8%	9.7%	1.5%	13.7%	14.6%	14.7%
Average income	\$39,286	\$41,857	\$25,210	\$23,857	\$39,433	\$37,876	\$39,415
Median Income	\$31,380	\$30,048	\$16,806	\$19,724	\$31,367	\$29,408	\$28,765

(continued)

Table 7.3-5. Composition of Income, 2006 and 2011^{1,2} (completed)

Source: Statistics Canada 2007, 2013.

Notes:

1. *Income data for the 2011 NHS were derived from 30% data. However, on Indian reserves and in remote communities, attempts are made to obtain data from 100% of the population for all years. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5, and in some cases, 10. Columns may not add due to rounding.*
2. *The global non-response rate (GNR rate) is a data quality indicator; the higher the rate of non-response, the greater the risk of data error. For 2011 NHS, GNR rate greater than or equal to 50% were suppressed.*
3. *Statistics Canada refers to “sources of income of a population group or a geographic area” as “the relative share of each income source or group of sources, expressed as a percentage of the aggregate total income of that group or area.” Three groups of sources are used to determine total income: employment income, including wages, salaries, and income from farm and non-farm self-employment; government transfer payments, including all transfers or payments received from any level of government and recorded as a separate income source; and other income, including investment income, retirement pension income, and other money income. Percentages may not add to 100% due to rounding.*
4. *Data for the TteS is for the Kamloops 1 IR. The TteS have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted.*
5. *Data for the SIB is for the Skeetchestn IR. The SIB have additional reserve parcels that are either not populated or for which Statistics Canada does not report data. These reserve parcels are omitted. Data for the SIB were suppressed for 2006.*
6. *The LSA is the City of Kamloops, the TteS, the SIB, and the TNRD-J.*
7. *The RSA is the TNRD.*
8. *Earnings or employment income refers to total income received by persons 15 years and over during calendar year 2005 as wages and salaries, net income from a non-farm unincorporated business and/or professional practice, and/or net farm self-employment income.*

Generally, from 2001 through 2011 personal, family and household incomes in the LSA and RSA increased at levels comparable to those observed elsewhere within the province. Personal and family income increases for BC were only slightly higher over the period. With respect to composition of income, from 2001 to 2006, the percentage of income associated with employment (for Kamloops, TNRD and BC) decreased slightly from 2001 to 2006 and then increased from 2006 to 2011. Corresponding increases in the proportion of income gained from government revenues were observed for each of the City, TNRD and BC as well from 2006 to 2011 (Statistics Canada 2002; Statistics Canada 2007; Statistics Canada 2013).

Detailed information regarding labour force distribution is provided in Section 7.2, Labour Force, Employment, and Training. Within the LSA, sales and service occupations, in addition to health care and social services, make up just over one quarter of the occupations (Table 7.2-4). Other notable classifications include accommodation and food services, education and construction. The occupational trends in the LSA were reflective of the occupational trends within Kamloops and the RSA as well as the province as a whole, with the highest levels of employment being the retail and health and social service sectors. Over one quarter of the occupations within the Aboriginal population of TteS and nearly one-half of the occupations of individuals living on the SIB reserve were employed in the public administration field. Nearly 20% of the population of TNRD-J was employed in the mining sector, and over 10% worked in the wholesale trade sector. The non-Aboriginal population of TteS was mostly employed in the health care and social services field, or the professional, scientific, and technical services sector.

7.3.3 Assessment Boundaries

7.3.3.1 Spatial Boundaries

Local Study Area

As illustrated in Figure 7.3-2, the LSA for the Income VC consists of the City of Kamloops, the TNRD-J electoral area, and two First Nations: the TteS (based near Kamloops on the Kamloops 1 IR) and the SIB (based near Savona on the Skeetchestn IR). Characterization of the LSA was undertaken through consideration of potential socio-economic effects and this is considered to be the area where most Project effects are likely to accrue. Project workers are expected to be sourced from within the LSA, or to temporarily reside in the LSA.

Regional Study Area

As illustrated in Figure 7.3-3, the RSA for the Income VC is the TNRD and includes communities within a 1.5-hour driving distance of the Project (e.g., Merritt, Logan Lake, Chase). There are numerous skilled workers in this area and the Project may attract workers from Aboriginal and non-Aboriginal communities throughout the RSA. The Project is also expected to generate indirect and induced income opportunities across the RSA. The RSA also includes the LNIB and AIB, WP/CIB and Métis Nation BC (MNBC).

7.3.3.2 Temporal Boundaries

Temporal boundaries for the assessment of the Income VC are listed below. Most of the Project-related income opportunities are expected to be realized in the Construction and Operation phases. As the Project moves into the Decommissioning and Closure Phase through to the Post-Closure Phase, there will be a notable reduction in employment opportunities and associated income.

- **Construction:** 3 years;¹
- **Operation:** 23 years;
- **Decommissioning and Closure:** 5 years (includes project decommissioning, abandonment and reclamation activities, as well as temporary closure, and care and maintenance); and
- **Post-Closure:** 5+ years (includes ongoing reclamation activities and post-closure monitoring).

¹ The Project Construction Phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4). The Construction and Operations phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.

7.3.3.3 *Administrative Boundaries*

The administrative boundaries that affected the effects assessment relate primarily to data collected and reported by Statistics Canada as part of the Census and the National Household Survey (NHS) and the local areas defined in Horne (2009) for income dependencies, which are based on Statistics Canada census divisions and sub-divisions. Data for the Census and the NHS are collected and reported by census divisions and subdivisions, which means that some communities in the LSA (e.g., Savona), do not have discrete data sets but are included in larger census subdivisions and data are not collected for First Nations, but for Indian reserves. The latter distinction is especially important for the First Nations discussed here because according to Aboriginal Affairs and Northern Development Canada (2012), roughly half of each First Nation lived on reserve.

Horne (2009) examines economic dependencies in British Columbia. This data provides employment multiples for indirect and induced employment, which informs much of the discussion around Project-generated income. Horne discusses the Kamloops Local Area, which is geographically larger than the Local Study Area; it includes the following Census subdivisions: District Municipality of Logan Lake; two additional electoral districts, Thompson-Nicola P and Thompson-Nicola; the Village of Chase; and the following additional First Nations reserves, Spatsum 11, Neskonlith 1 (Neskainlith 1), Sahhalkum 4, and Neskonlith 4. Of these census subdivisions, the City of Kamloops comprises the highest proportion of the population in the local area (Statistics Canada 2013).

7.3.3.4 *Technical Boundaries*

The technical boundaries of the assessment relate to the capacity of the Statistics Canada input-output model to predict income outcomes as they relate to communities in the LSA and RSA. The input-output model only produces results at the provincial, national, and international level. As such there are limitations to the ability to predict how income will change at a community or regional level. In addition, income rates, including direct, indirect, and induced income, are based upon the outcomes of the Statistics Canada input-output model with information supplied by capital and operating expenditures for the Project.

7.3.4 **Project Benefits Related to Income**

New income will be generated in the LSA and RSA during all phases of the Project. This in turn will lead to indirect and induced economic activity in retail, hospitality, and other sectors through the spending of wage income. The generation of income is a positive effect during all phases of the Project; this benefit will be greatest during the Construction and Operation phases when Project-related employment is at its highest levels.

The analysis of income effects is based on workforce estimates along with application of a multiplier-based approach to estimate the amount of income expected to be generated locally. Statistics Canada's Input-Output Model predicts the total indirect and induced employment for BC as a whole. A separate analysis from BC Stats provides an indication of how much indirect and induced employment can be

expected in the Kamloops Local Area (Horne 2009).² The beneficial effects of the Project are further discussed in Section 2.7, Project Benefits.

7.3.4.1 Construction Phase

High and low scenarios were prepared for the number of construction jobs that could be filled by local residents of the Kamloops area. Detailed estimates are provided in Section 7.2 Labour Force Employment and Training; Table 7.3-6 presents a summary. During peak construction, between 850 and 1,150 local residents are expected to be employed at the Project. The higher level of local hiring during the Construction Phase will contribute to direct, indirect and induced income effects. The direct income effect represents an increase in individual and household income as a result of wages and salaries paid to Project employees and contracted employees. The indirect income effect comes from the hiring of employees by businesses that supply goods and services to the Project, and the induced income effect measures the impact that spending by workers (those employed by the project, or by direct and indirect supplier industries) has on the economy. The level of construction employment sourced locally does not change the indirect effect because local purchases of goods and services during the construction phase are not affected by the origin of the workforce.

Table 7.3-6. Estimates of Local Hires for Project Construction¹

	Year 1		Year 2		Year 3	
	Low	High	Low	High	Low	High
Total Local Hires, including direct, indirect, and induced	1,205	1,425	1,510	1,850	765	950

Note:

1. The Project construction phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4 for further detail). The Construction and Operation phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.

Table 7.3-7 shows the estimated regional employment earnings during the Construction Phase. According to Statistics Canada’s National Household Survey, full-time employees in BC in the engineering construction industry in 2010 had an average income of \$83,600 while those in building construction earned an average of \$56,900. The Statistics Canada economic model results for the Project suggest that 96% of construction employment will be in engineering construction and 4% in building construction. Average full-time earnings across all of the industries that are included in indirect and induced employment was \$51,200.³

² The Kamloops Local Area differs slightly from the LSA/RSA as it includes the municipalities of Kamloops, Logan Lake, Chase and Sun Peaks, plus Electoral Areas J, P and L and all First Nations Reserves contained within these boundaries

³ A separate analysis of average employment earnings from 2012 tax returns for Kamloops and BC showed that average employment earnings, including part-time workers, are slightly higher in Kamloops (\$41,000) compared to the provincial average (\$40,300). Average BC earnings by industry are therefore considered to be a reasonable estimate for earning levels by sector in the Kamloops area.

Table 7.3-7. Estimated Regional Employment Earnings during Project Construction¹ under Low and High Local Employment Scenarios (2015 \$Cdn millions)

Employment Earnings	Year 1		Year 2		Year 3		Total	
	Low	High	Low	High	Low	High	Low	High
Local construction employment earnings	\$67	\$85	\$76	\$103	\$39	\$53	\$183	\$242
Indirect employment earnings	\$20	\$20	\$30	\$30	\$15	\$15	\$65	\$65
Local induced employment earnings	\$6	\$7	\$7	\$9	\$3	\$5	\$16	\$21
Total local employment earnings	\$93	\$112	\$113	\$143	\$58	\$73	\$264	\$328

Note:

1. The Project construction phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4 for further detail).see Section 2.2.4). The Construction and Operation phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.

Hourly earnings in BC have increased by about 9% from 2010 to 2015 (8.8% increase in construction, 9.4% increase across all industries). Applying these inflated earnings to the local employment data summarized in Table 7.3-7 yields the estimates in Table 7.3-8 for the local income impacts of Project construction. As above, there are low and high scenarios depending on the number of construction positions that are filled by local residents. In total, the Construction Phase will generate local employment earnings in the range of \$264 million to \$328 million.

7.3.4.2 Operation Phase

Once operational, average annual employment for the Project will be 468 jobs. It is estimated that between 271 (low scenario) and 347 (high scenario) of these jobs can be filled from the local labour market. Details on how these estimates were derived is found in Section 7.2, Labour Force, Employment, and Training and a summary is provided in Table 7.3-8. Additionally, Table 7.3-9 provides the estimated average and total employment earnings for direct, indirect, and induced employment in the local area during the Operations Phase. High and low income scenarios were not calculated for the Operation Phase because the expected operating life of the mine is 23 years. Any non-local residents who take jobs at the mine will become local residents, so the induced impact of their household expenditures will be captured in the local area. The extended life of the Project also means that the appropriate BC Stats multipliers for regional impacts are from the “migration (no safety net/no public sector)” scenario.

Table 7.3-8. Estimates of Local Hires for Project Operations

Local Hires	Average Year	Total Over 23 Years
Total ¹ (Direct, Indirect, and Induced) Local Jobs (FTE, estimated)	933	21,459 person-years

Note:

1. Derived from 453 FTE. The average mine employment of 468 jobs are slightly less than full-time on average, which explains the adjustment to 453 FTE for purposes of calculating indirect and induced employment and local employment income.

The expected operating life of the Project is 23 years. Total wages (excluding benefits) paid to the Project's Operation Phase workforce is expected to be \$53 million per year, which is an average of \$117,000 per full-time equivalent (FTE) job. In addition to direct earnings at the mine, local indirect workers will earn an estimated \$10 million per year and local induced workers will earn an estimated \$17 million per year. Average annual earnings for indirect and induced workers are estimated at \$56,000 (based on the National Household Survey average of \$51,200 in 2010, inflated by 9.4%). In total, local employment earnings generated by Project operations will be \$80 million per year, or a total of more than \$1.83 billion over the 23-year Operation Phase.

Table 7.3-9. Estimated Employment Earnings during Project Operations under Low and High Local Employment Scenarios (2015 Cdn\$ millions)

Employment Earnings	Average Year	Total (23 Years)
Local construction employment earnings	\$53	\$1,219
Local indirect employment earnings	\$10	\$238
Local induced employment earnings	\$17	\$380
Total local employment earnings	\$80	\$1,837

7.3.4.3 Decommissioning and Closure Phase, and Post-Closure Phase

Decommissioning and closure of the Project will take place over a five-year period, and will require a decrease in employment (and associated employment income) compared to the Operation Phase. Employment during this phase is expected to progressively decrease. Post-closure activities would be small scale and sporadic in nature, mainly related to ongoing monitoring and maintenance activities, and resulting in a corresponding small contribution to income.

Due to the small workforce and limited expenditures during these phases, predicted employment earnings for these phases have not been estimated.

7.3.5 Potential Adverse Effects of the Project and Proposed Mitigation for Income

Many economic effects of the Project are considered to be beneficial, including potential effects related to the generation of income through employment. A summary of these benefits is provided above and described in further detail in Section 2.7, Project Benefits. However, the purpose of the assessment is to understand the potential adverse effects of the Project. The following sections provide a discussion and analysis of the potential adverse effects of the Project on the Income VC.

7.3.5.1 Identifying Potential Adverse Effects on Income

Potential effects on income are not typically considered to result from single Project components or activities, but the aggregate of multiple components or activities. For example, open pit development or water intake construction activities are less relevant to potential income effects than Project employment. Table 7.3-10 identifies the potential contribution of each component and activity in relation to income. Only interactions that are characterized as "M" (moderate) or "H" (key) are carried forward to the effect assessment on this VC.

Table 7.3-10. Identifying Potential Project Interactions and Effects on Income

Project Activities		Potential Adverse Effects on Income
		Decreased income generation as a result of decreased employment
Construction	Clearing and Grubbing	O
	Earthworks	O
	Overburden/Topsoil Stockpile	O
	Laydown Areas and Storage Yards	O
	Project Lighting	O
	Site Security and Fencing	O
	Fuel Storage and Filling Area	O
	Hazardous Wastes Transport, Storage, and Disposal	O
	Construction Wastes Transport, Storage, and Disposal	O
	Sewage Infrastructure and Disposal	O
	Public Road Realignment, Use, and Maintenance	O
	Site Road Construction, Use and Maintenance	O
	Haul Truck Road Construction, Use, and Maintenance	O
	Site Buildings and Process Plant	O
	Explosives Magazine and Storage Facilities	O
	Open Pit Development	O
	Drilling and Blasting	O
	Crushing Mine Rock	O
	Loading, Hauling, and Deposition of Mine Rock	O
	Temporary Ore Stockpile	O
	Tailing Storage Facility Development	O
	Power Transmission, Distribution	O
	Natural Gas Line	O
	Pipeline Utility Corridor (Potable Water, Sewage, and Site Water)	O
	Water Intake from Kamloops Lake	O
	Fire Suppression Infrastructure	O
	Contact Water	O
	Non-contact Water	O
	Haul Truck Road	O
	Water Management Dams	O
	Mine Staffing (Direct Employment)	O
	Contracted Employment	O
Taxation	O	
Operation	Open Pit Development	O
	Drilling and Blasting	O
	Hauling Mine Rock and Ore from Pit	O
	Crushing and Conveying Ore	O
	Temporary Ore Stockpile	O

(continued)

Table 7.3-10. Identifying Potential Project Interactions and Effects on Income (continued)

Project Activities		Potential Adverse Effects on Income
		Decreased income generation as a result of decreased employment
Operation (cont'd)	Development of Mine Rock Management Facilities	O
	Stripping, Loading, Hauling, Deposition, and Contouring of Topsoil and Overburden	O
	Revegetation through Progressive Reclamation	O
	Process Plant Operation	O
	Deposition to Tailing Storage Facility	O
	Site Road Use and Maintenance (Materials, Personnel, Supplies)	O
	Concentrate Transport and Storage	O
	Explosives Magazine and Storage Facilities	O
	Fire Suppression Infrastructure	O
	Fuel Storage and Filling Area	O
	Hazardous Wastes Transport, Storage, and Disposal	O
	General Wastes Transport, Storage, and Disposal	O
	Sewage Infrastructure and Disposal	O
	Laydown Areas and Storage Yards	O
	Power Transmission, Distribution	O
	Project Lighting	O
	Site Access, Security and Fencing	O
	Water Intake from Kamloops Lake	O
	Contact Water	O
	Non-contact Water	O
	Potable Water Treatment and Use	O
	Haul Truck Road	O
	Mine Staffing (Direct Employment)	O
Contracted Employment	O	
Taxation	O	
Decommissioning and Closure	Dismantling of Ancillary Buildings	O
	Pit Lake Planning	O
	Site Road/Bridge Decommissioning	O
	Tailing Storage Facility Decommissioning and Reclamation	O
	Mine Rock Management Facilities Reclamation	O
	Fuel Storage and Filling Area	O
	Hazardous Wastes Transport, Storage, and Disposal	O
	General Wastes Transport, Storage, and Disposal	O
	Sewage Infrastructure and Disposal	O
	Laydown Areas and Storage Yards	O
	Power Transmission, Distribution	O
	Project Lighting	O

(continued)

Table 7.3-10. Identifying Potential Project Interactions and Effects on Income (completed)

Project Activities		Potential Adverse Effects on Income
		Decreased income generation as a result of decreased employment
Decommissioning and Closure (cont'd)	Site Access, Security and Fencing	O
	Contact Water	O
	Non-contact Water	O
	Potable Water Treatment and Use	O
	Haul Truck Road	O
	Road use to the Project (Materials, Personnel, Supplies)	O
	Mine Staffing (Direct Employment)	M
	Contracted Employment	M
	Taxation	O
	Post Closure	General Site Inspections and Maintenance
Contact Water		O
Non-contact Water		O
Road use to the Project (Materials, Personnel, Supplies)		O
Mine Staffing (Direct Employment)		L
Contracted Employment		L

Notes:

O No interaction anticipated.

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

M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.

H Interaction; warrants further consideration.

The potential adverse effect of the Project on the Income VC is related to the loss of employment during the Decommissioning and Closure Phase (i.e. at the end of the 23-year operational life of the mine). As a result, the Project could contribute to decreased income generation as a result of decreased employment.

As shown in Table 7.3-10, the effect of the decreased income generation as a result of decreased employment is only expected during Decommissioning and Closure. The provision of employment and income during Project Construction and Operations represent the beneficial effects of the Project. The removal of those benefits at Project Decommissioning and Closure, although considered an adverse effect of the Project, is a result of an expected closure typical of the mining industry.

The consideration of Project activities in relation to the income VC revealed that the interaction between income and direct and contractor employment for the Decommissioning and Closure Phase is rated as "M", representing a moderate interaction. This is because while some of the Project employment and income will continue during the Decommissioning and Closure and Post-closure Phases, most Project-related jobs will cease following Operations. For the Post-closure Phase, this interaction is rated an "L," which is a negligible to minor interaction. While Post-closure will represent reduced income in the LSA and RSA, the majority of changes to employment levels, and therefore income (direct, indirect, and induced), will have occurred throughout the Decommissioning and Closure Phase.

7.3.5.2 *Effects on Income*

As noted above, many economic effects on the Project are considered to be beneficial. As the Project moves into the Decommissioning and Closure Phase however, the workforce and related employment income will be reduced.

Decreased Income Generation as a Result of Decreased Employment

Decommissioning and Closure Phase

During the Operation Phase, an average of 468 people are anticipated to be directly employed at the Project, while an additional 480 people will be employed through indirect and induced employment. As the Project moves into the Decommissioning and Closure Phase, it will transition to a smaller workforce, which will continue to decrease progressively over a five year period. Project-related income generation (through direct, indirect, and induced employment) will also decrease during this time period. These effects will occur within the LSA and RSA. The loss of Project-related employment as a source of income is considered to be a potential adverse effect during the Decommissioning and Closure Phase, although it is typical of the finite nature of mining developments. Further, the loss of employment and income at the end of the operational life of the mine does not negate the benefits that the Project will have contributed over the Construction and Operation phases.

7.3.5.3 *Mitigation Measures for Income*

The effect of decreased income following the Operation Phase is relevant to Project employees and their families. Wider implications for local and regional economies as a result of decreased employment and income following operations are discussed in Chapter 7.1 Economic Growth.

The Project's mitigation of potential adverse effects related to the decline in income generation after the Operation Phase includes a workforce transition plan and communications with employees and contractors in advance of closure.

KAM will develop a workforce transition plan near the end of the Operation Phase, with the goal of supporting education and training and career development opportunities to aid direct employees in obtaining employment elsewhere. The transition plan may also include supports for job searches and re-assignment where possible.

KAM will communicate the transition plans and the schedule for mine closure with direct employees of the Project. Contractors (i.e., the employers of the Project's indirect workforce) will be informed regarding upcoming changes to employment or business contracts, including status and schedule, as the Project progresses from Operation into Decommissioning and Closure. This will allow them to prepare for any transitioning that may be required. Broader communication with local government and residents of Kamloops and surrounding communities will also provide information regarding Project activities and schedule.

Although the above mitigation is expected to support the ongoing and alternative employment of Project workers (direct and indirect), the effect of the loss of Project-related employment income will also depend on broader economic conditions at the time of closure, and the availability of

comparable employment in the LSA and RSA. If the economy is in a downturn and alternative employment is hard to find, there may be a residual adverse effect. As it is not possible to predict these conditions more than 20 years in the future, this assessment takes a conservative (i.e., worst-case) view and residual effects are predicted.

7.3.5.4 Measures to Enhance Project Benefits

Over the Construction and Operation phases, KAM will support local benefits related to employment (and related income) by maximizing local hiring and procurement for the Project. A human resource development plan for the Project will be implemented prior to the start of construction activities. Key aspects of KAM's human resource development plan will include local and First Nations recruitment strategies, and strategies for workforce training and education. The overall intent of these measures is to maximize the extent to which the Project can draw upon and support a local labour pool to fill employment needs, including enhancing the opportunities for workforce participation among potentially underutilized local human resources.

7.3.6 Residual Effects and Their Significance

7.3.6.1 Summary of Residual Effects

The Project is expected to result in residual adverse effects related to the end of Project-related income generation. This effect is associated with the decrease in Project expenditures and employment and therefore a decrease in associated direct, indirect and induced income as the Project moves into Decommissioning and Closure. The following residual effects are anticipated (Table 7.3-11).

Table 7.3-11. Summary of Residual Effects on Income

Potential Effect	Project Phase (timing of effect)	Project Component/ Physical Activity	Description of Cause-Effect	Description of Mitigation Measure(s)	Description of Residual Effect
Benefit: Project-related Employment Income	Construction and Operation	Employment (direct, indirect, and induced)	Project employment and expenditures, increase the amount of income generated in local and regional areas	Human resources development plan to maximize local employment with the Project.	Not Applicable (Benefit)
Decreased income generation as a result of decreased employment	Decommissioning and Closure	Employment (direct, indirect, and induced)	Decreased Project activity at the end of mine operation will result in reduced employment and expenditures, therefore reducing the amount of income generated through direct, indirect and induced employment	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Decreased income generation due to reductions in workforce and expenditures

7.3.6.2 *Criteria for Characterization of Residual Effects*

Table 7.3-12 provides a description of the characterization of residual effects, significance, likelihood and confidence related to income.

7.3.6.3 *Characterization of Residual Effects*

Table 7.3-13 presents the characterization of residual effects. Characterization of residual effects is based primarily on review of secondary sources as well as professional judgement. For the potential effect of decreased income during the Decommissioning and Closure Phase, the following ratings were assigned:

- The magnitude of the potential effect is considered to be medium. For the LSA and RSA, a number of jobs will be terminated and the income generated by the Project reduced as the workforce is reduced from an average of 468 workers (plus 480 indirect and induced jobs) at the end of the Operation Phase. Over the course of the 5-year Decommissioning and Closure Phase, the workforce will be reduced further. Considering the size of the labour force in the LSA and RSA, and the fact that mining has historically been (and continues to be) an important aspect of the local economy, the decrease in jobs and associated income generation is expected to be a notable, but not overwhelming, event within the LSA and RSA.
- Decreased income generation is considered to be a short-term effect, from 1 to 5 years. The end of employment will be communicated to employees and contractors in advance to facilitate transitions. Within 5 years (and likely sooner), it is reasonably expected that employees who previously earned income related to the Project (generated either through direct, indirect, or induced employment) will have found other opportunities.
- This effect will have a regional geographic extent as Project-related employment is expected to be sourced throughout the LSA and RSA. As such, the loss of income generation at closure is expected to be felt across the RSA.
- The effect is expected to occur only once. The reduction in Project activities is expected to take place in a relatively limited and well-defined window following the Operation Phase.
- The effect is expected to be reversible in the short-term as workers and businesses move on to other opportunities. Considering the historical and continued involvement of the labour force and businesses in the mining industry, it is reasonably expected that comparable income earning opportunities will be available around the time of Project closure.
- Resiliency to the effect is rated as neutral. The LSA and RSA, where the Project-related income (direct, indirect, and induced) will be earned, are expected to be able to respond and adapt to the effect. With the help of transition planning and the skilled nature of much of mining employment, Project employees during the Operation Phase are expected to secure additional employment, in the mining sector and other industries.

Table 7.3-12. Definitions of Characterization Criteria for Residual Effects on Income

Magnitude	Duration	Frequency	Geographic Extent (Physical/Biophysical)	Reversibility	Resiliency	Social Value	Likelihood of Effects	
							Probability	Confidence Level
<i>How severe will the effect be?</i>	<i>How long will the effect last?</i>	<i>How often will the effect occur?</i>	<i>How far will the effect reach?</i>	<i>To what degree is the effect reversible?</i>	<i>How resilient is the receiving environment or population?</i>	<i>How influential is the effect on the broader socio-economic environment?</i>	<i>How likely is the effect to occur?</i>	<i>How certain is this analysis?</i>
<p>Negligible: No or very little detectable change from baseline conditions</p> <p>Minor: Differs from the average value for baseline conditions to a small degree.</p> <p>Medium: Differs substantially from the average value for baseline conditions and approaches the limits of natural variation.</p> <p>Major: Differs substantially from baseline conditions, resulting in a detectable change beyond the range of natural variation.</p>	<p>Short-term: Effect lasts 1 to 5 years.</p> <p>Medium-term: Effect lasts 6 to 25 years.</p> <p>Long-term: Effect lasts between 26 and 50 years.</p> <p>Far Future: Effect lasts more than 50 years.</p>	<p>Once: Effect is confined to one discrete period in time during the life of the Project.</p> <p>Sporadic: An effect that occurs at sporadic or intermittent intervals during any phase of the Project.</p> <p>Regular: Effect occurs on a regular basis during the life span of the Project.</p> <p>Continuous: Effect occurs constantly during the life of the Project.</p>	<p>Local: Effects extend less than 500 m from Project infrastructure.</p> <p>Landscape: Effect is limited to the LSA.</p> <p>Regional: Effect extends across the broader region (e.g., RSA).</p> <p>Background: Effect extends beyond the regional scale, and may extend across or beyond the province.</p>	<p>Reversible Short-term: Effect can be reversed relatively quickly.</p> <p>Reversible Long-term: Effect can be reversed within 20 years of Post-Closure.</p> <p>Irreversible: Effect cannot be reversed (i.e., is permanent).</p>	<p>Low: The receiving environment or population has a low resilience to imposed stresses, and will not easily adapt to the effect.</p> <p>Neutral: The receiving environment or population has a neutral resilience to imposed stresses and may be able to respond and adapt to the effect.</p> <p>High: The receiving environment or population has a high natural resilience to imposed stresses and can respond and adapt to the effect.</p>	<p>Low: The effect has limited ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>Medium: The effect has some ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>High: The effect has moderate ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p>	<p>High: It is highly likely that this effect will occur.</p> <p>Medium: This effect is likely, but may not occur.</p> <p>Low: This effect is unlikely but could occur.</p>	<p>High: >80% confidence. There is a good understanding of the cause-effect relationship and all necessary data are available for the Project area. There is a low degree of uncertainty and variation from the predicted effect is expected to be low.</p> <p>Medium: 50 to 80% confidence. The cause-effect relationships are not fully understood, there are a number of unknown external variables, or data for the Project area are incomplete. There is a moderate degree of uncertainty; while results may vary, predictions are relatively confident.</p> <p>Low: < 50% confidence. The cause-effect relationships are poorly understood, there are a number of unknown external variables, and data for the Project area are incomplete. High degree of uncertainty and final results may vary considerably.</p>

Table 7.3-13. Characterization of Residual Effects, Significance, Likelihood and Confidence on Income

Residual Effect	Residual Effects Characterization Criteria							Significance of Adverse Residual Effects	Likelihood and Confidence	
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Resiliency	Social Value		Probability	Confidence
Decreased income generation due to reductions in workforce and expenditures	Medium	Short-term	Once	Regional	Reversible Short-term	Neutral	Neutral	Not Significant (moderate)	High	Medium

- Social value is rated as neutral as the effect has some ability to alter the economic base, social structure, community stability or the well-being of people in the study area. Social value is not ranked more highly for several reasons. First, the Project is one of a variety of mines in the RSA that are either in operation or development. Second, mineral exploration in the region is ongoing (e.g., Cache Creek). While mining will likely continue in the area, providing workers with other employment opportunities, it should also be noted that the economy around Kamloops was, according to Horne (2009) one of the more diverse economies in BC according to 2006 census data. Finally, there are also well-developed social and economic supports, especially in Kamloops, which have a range of social services similar to those in a major metropolitan centre (Mazzotta, *pers. comm.* 2015).

7.3.6.4 *Significance of Residual Effects*

A determination of significance was based on and is consistent with the guidance provided in Chapter 5, Effects Assessment Methodology (Section 5.2.5.4). The residual effect is expected to be **Not Significant (Moderate)**, primarily due to the geographic extent of the effect, which is expected to be felt throughout the RSA. However, this residual effect is not expected to be more significant because the changes in income due to decreased employment will likely be notable, but not overwhelming since the regional economy is diverse and new employment opportunities will likely be easy to locate. It should be noted that this rating is conservative and the situation during the Closure and Decommissioning Phase may not be as significant due to the economy when the Project ceases operations.

7.3.6.5 *Characterization of Likelihood and Confidence*

Since Project Operation will undoubtedly come to an end, the probability of the effect occurring is high. However, considering the wide range of variables that could influence the significance of the effect, there is therefore a moderate degree of uncertainty and the confidence level is considered to be medium. It is difficult to accurately predict economic circumstances in the LSA more than 20 years into the future given the large number of variables that could potentially influence the local economy (e.g., commodity prices, attraction of new businesses in other sectors to the LSA, the development of new mining operations) and the future availability of comparable income-generating employment alternatives at the time of closure.

7.3.6.6 *Summary of Residual Effects Assessment and Significance*

In summary, the residual effect related to decreased income generation during the Decommissioning and Closure Phase is expected to be Not Significant (Moderate). This prediction is conservative and may be less significant when the Decommissioning and Closure Phase begins. The residual effect (Table 7.3-14) is carried forward into the Cumulative Effects Assessment (CEA).

Table 7.3-14. Summary of Residual Effects, Mitigation, and Significance on Income

Residual Effects	Project Phase	Mitigation Measures	Significance
Benefit: Project-related employment income	Construction and Operation	Human resource development plan to maximize local employment with the Project	Not Applicable (Benefit)
Decreased income generation due to reductions in workforce and expenditures.	Decommissioning and Closure	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Not Significant (Moderate)

7.3.7 Cumulative Effects Assessment

7.3.7.1 Introduction

Cumulative effects assessment (CEA) examines how residual effects of multiple projects and/or activities can potentially interact to have a combined effect on a VC. This section describes the potential incremental effects that may result from the Project in combination with those from other past, present or future projects and activities. The intent is to determine whether the residual effects of the Project could interact with those of other past, current and future activities and result in a greater impact on the VC.

Income is closely tied to other economic VCs directly and indirectly, including the Labour Force, Employment, and Training and Business. The residual effect on income during the Decommissioning and Closure Phase relates to the potential for reduced earnings as a result of the cessation of Project operations and the consequent decrease in employment and procurement. If other projects or activities in the LSA and RSA undergo similar transitions within the same time period the residual effect could be exacerbated.

7.3.7.2 Identification of Other Actions that May Affect Income

Chapter 5 (Assessment Methodology) describes the past, present, and reasonably foreseeable projects and activities that could interact with the effects of the Project. These projects are screened against the residual effects of the Project. For the Income VC, the key concern from a cumulative effects perspective is whether these projects or activities will contribute income to the RSA and LSA during the same period as the Project, and whether they are anticipated to undergo a substantive decrease in activities and associated employment (and related income generation) within a similar time frame.

7.3.7.3 Interactions between Residual Project Effects and Other Project or Activity Effects

The Ajax Project has a current estimated mine life of 23 years. The Project Operation Phase is expected to end in approximately 2042. Table 7.3-15 screens potential interactions with other projects and activities. Screening considered the end of the operational phases for other resource development (mainly mining projects) as these projects are also finite in nature and are expected to result in substantial workforce reductions at the end of the operational life of the project.

Table 7.3-15. Ranking Potential for Residual Effects to Interact Cumulatively with Effects of Other Human Actions on Income

Residual Effect	Industrial Projects/Activities											Natural Resources and Land Use			Tourism and Commercial Recreation Activities			Community Infrastructure			Transportation										
	Vidette Lake Mine	Afton Mine (Historical)	Iron Mask Mine	Bonaparte Mine	New Afton Mine (New Gold)	Highland Valley Copper Mine (Teck)	Dontar Kamloops Pulp Mill	Tolko-Hefley Creek Plywood and Veneer	LaFarge Cement Plant	Trans Mountain Pipeline System (Kinder Morgan)	Trans Mountain Pipeline System - Expansion (Kinder Morgan)	Harper Creek	Highland Valley Copper - Bethlehem Expansion	Kamloops Forest District	Agriculture	Ranching	Tranquille on the Lake	Lac Le Jeune Resort	Tobiano Golf Course	Recreational Hunting, Fishing, Foraging	Recreational Trails	City of Kamloops Wastewater Management	Water Treatment Centre	City Expansion and Growth	Lac le Jeune Road	Highway 1	Highway 5A	Highway 5 (Coquihalla Highway)	Kamloops Airport	Rail Yards and Lines (CP and CN)	
Decreased income generation due to reductions in workforce and expenditures	O	O	O	O	O	O	O	O	O	O	L	L	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

Notes:

(-) No spatial or temporal overlap.

O Spatial or temporal overlap, but no interaction anticipated OR No change from current condition anticipated, and already captured as part of baseline characterization. No further consideration warranted.

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

M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.

H Key interaction; warrants further consideration.

Potential interactions with the Income VC were considered for five projects with the potential for planned workforce reductions. These projects are either located within the vicinity of the Project (spatial overlap) and/or plan to or are likely to have workforce reductions within a similar timeframe as the proposed Project (temporal overlap):

- The Bonaparte Mine Project is a proposed mine located 45 km north of the City Kamloops. This project is currently focused on the exploration and drilling stage (WestKam Gold Corp 2015), therefore it is difficult to know with any certainty when it might begin production and for how long the operations could last. No interaction is identified.
- The New Afton Mine is approximately 10 km west of the Ajax Project, and is primarily an underground operation. The mine began commercial production in 2012. As of December 31, 2014, there were 447 employees and 14 contractors (New Gold 2015). Seventy-five to eighty percent of the operation's workforce lives in Kamloops (Ajax KPI Program 2011-2012). The mine is expected to be in operation for a total of 12 years until approximately 2024. The closure of the New Afton Mine is planned to occur before closure of the Project, and no interaction is identified.
- The Harper Creek Mine Project is located 150 km from the City of Kamloops. This project (if approved) would have a mine life of about 28 years (BC EAO and CEA Agency 2015). The mine is expected to have approximately 600 positions during construction and 466 positions during peak operation (ERM Consultants Canada Ltd. 2015). Construction is not expected to start until 2016 and would continue through to 2018, which would indicate mine operations would continue until approximately 2046. As the Project is located 150 km from the City of Kamloops it is expected to draw employees from a separate labour pool, limiting the potential for spatial overlap. The interaction is expected to be negligible to minor.
- The HVC mine is located near Logan Lake and is approximately 50 km by highway from Kamloops. In 2014, HVC was the third largest employer in the LSA with over 1,300 employees. In the past five years, the number of employees has risen from 800 to approximately 1,380. About half of the HVC workforce lives in Kamloops. The remainder of the workforce commutes from other nearby communities in the RSA including Logan Lake and Ashcroft (Ajax KPI Program 2011-2012; Dechert pers. comm. 2014). The mine is currently expected to operate until 2027 based on a new operations plan (Teck 2015). Therefore, closure of the HVC mine is planned to occur before closure of the Project, and no interaction is identified. The HVC Bethlehem Expansion Project is not included as it is expected to utilize the workforce associated with the current HVC operation.
- A portion of the Trans Mountain Pipeline (TMPL) Expansion project is located close to Project and the City of Kamloops. For the construction segment identified as the Kamloops construction hub, this project is expected to require an average of 297 workers per month over a 20-month period (2016 to 2018). The actual number will differ from one month to the next, from a low of nine workers per month to nearly 900 workers per month during the summer months. Approximately 10% of the workforce is expected to be sourced from the combined Fraser-Fort George and Thompson-Nicola Regional Districts (TMPL 2013), and the majority of workers will be sourced from elsewhere in Canada (mainly Alberta and British Columbia), limiting the potential for spatial overlap. Given the limited timeframe during

which these effects may take place and the limited amount of local hiring for the TMPL Expansion, the interaction between the Project and the TMPL expansion is negligible to minor.

None of the identified projects or activities are expected to enter a period of substantial reduced employment coinciding with that of the Project. Therefore, no cumulative effects are anticipated.

Existing industrial projects in the LSA and RSA—including the Domtar pulp mill, LaFarge cement plant, and Tolko-Heffley Plywood and Veneer—also contribute to income but no interaction is anticipated as these enterprises are considered as part of the baseline conditions of the area. These activities are also not subject to the cyclical, finite nature of mining projects that can result in substantial workforce reductions at the end of mine operations.

7.3.7.4 *Proposed Mitigation Measures*

No mitigation is proposed as cumulative effects are not anticipated.

7.3.7.5 *Evaluation of Significance of Residual Cumulative Effects*

No cumulative effects are anticipated.

7.3.8 **Conclusion**

The Project will have largely positive effects on income generation in the LSA and RSA during the Construction and Operation Phases. During these phases, the Project will create employment in the LSA and RSA, both directly (through direct hires) and indirectly (through expenditures on goods and services to support the Project), and through induced economic effects. Employment related to the Project will generate incomes for workers. Over the entire Construction Phase, the Project will generate local employment earnings in the range of \$264 million to \$328 million. During Project operations, local employment earnings generated will be \$80 million per year, or a total of more than \$1.83 billion over the 23-year Operation Phase.

While the Project will largely have positive effects on income generation in the LSA and RSA, as the Operation Phase ends and the Project begins Decommissioning and Closure, there will be a loss of income-generating jobs at the end of the 23-year Operation Phase. The primary pathway to this effect is through the reductions in the workforce, as described in the Labour Force, Employment and Training VC (Section 7.2). The reductions in employment will be accompanied by similar reductions in Project-related expenditures. As such, incomes generated by the Project's direct, indirect, and induced employment will also decline.

To mitigate the influence of this effect on workers and communities in the LSA and RSA, the Project will devise a communications strategy and transition programming. The communications strategy will involve direct employees of the Project and contractors, both of which will be informed of upcoming changes in employment or business contracts in a manner that will allow them to find other employment and/or clients. The transition programming will provide support for education and training and career development. Where feasible, re-assignment will be considered. Following

mitigation, the effect is expected to be **Not Significant (Moderate)**. A summary of the assessment is provided in Table 7.3-16 below.

Table 7.3-16. Summary of Project and Cumulative Residual Effects, Mitigation, and Significance for Income

Residual Effects	Project Phase	Mitigation Measures	Residual Effect Significance	Residual Cumulative Effect Significance
Benefit: Project-related Employment Income	Construction and Operations	Human resource development plan to maximize local employment with the Project.	Not Applicable (Benefit)	Not Applicable (Benefit)
Decreased income generation due to reductions in workforce and expenditures	Decommissioning and Closure	Communication and transition programming including a workforce transition plan	Not Significant (Moderate)	No residual cumulative effect

In addition to recognizing the potential challenges that may arise upon closure of the Project, including implications of reduced employment and income, it is also important to acknowledge the substantial income benefits that the Project will generate over the Construction and Operation phases. This includes \$1.2 billion in direct salaries over 23 years through the employment of, on average, 468 people, plus \$23.8 million through indirect and \$38 million through induced employment. In total, direct, indirect and induced employment is expected to contribute \$1.8 billion through salaries paid to residents of the LSA and RSA. These benefits, among others, are described further in Section 2.7, Project Benefits.

7.4 BUSINESS

7.4.1 Rationale

During Project-related consultation, a number of different economic topics were raised for consideration as Valued Components (VCs). In order to be identified as a VC for the Application, there must be a perceived likelihood that the VC will be affected by the Project. Scoping of economic VCs took into account issues and concerns raised during Project consultation with the public and stakeholders (see Sections 4.6 and 4.7), discussions with the British Columbia Environmental Assessment Office (BC EAO) and other government agencies, and the experience of other recent BC projects. Interactions with the Project Working Group, comprised of representatives from federal, provincial and local governments and Aboriginal Groups, also helped to frame the VCs.

Table 7.4-1 provides a summary of the rationale and justification for choosing and assessing each economic VC. Additional specific detail for the VCs is provided in relevant application sections.

Table 7.4-1. Rationale for including Business as a VC in the Application

Valued Components	Identified by*				Rationale for Inclusion
	AG	G	P/S	SK	
Business	X	X	X	X	The Project is expected to provide opportunities for local businesses during all phases. Competition for labour was identified as a concern by some in the business community and local government.

*AG = Aboriginal Group; G = Guideline Requirement; P/S = Public/Stakeholder; SK = Scientific/professional knowledge

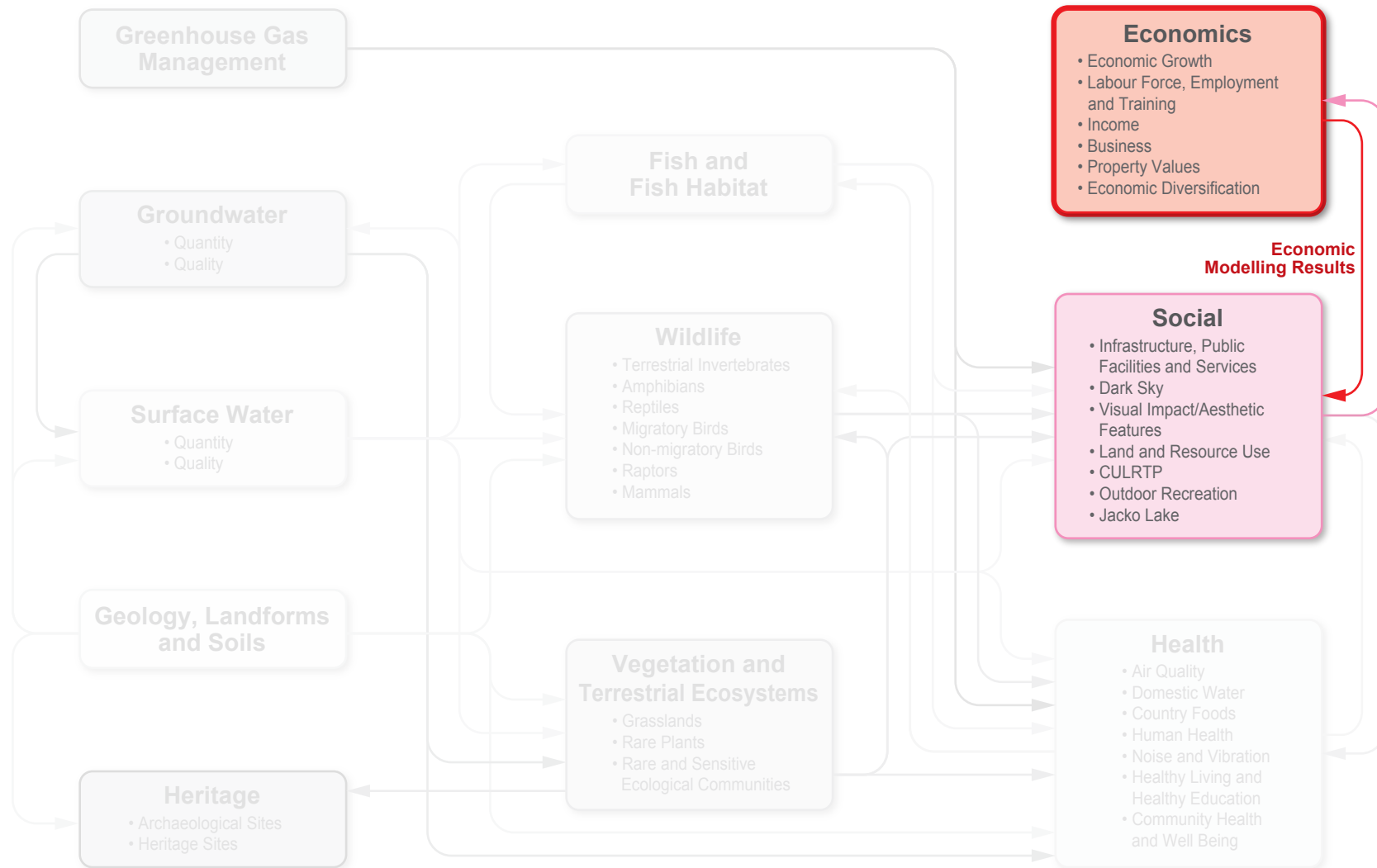
Topics related to business concerns and potential challenges were raised often during Project consultation with Aboriginal Groups, government agencies, the public, and stakeholders. Of particular interest was the potential involvement of local (including Aboriginal Groups) businesses during the life of the Project.

Discussion in this section includes the nature of potential Project opportunities, including potential contracting and entrepreneurial opportunities. Where feasible, the involvement of local (including Aboriginal Groups) businesses is described. Indirect business opportunities are also considered since the increased employment and business income can have effects on businesses such as restaurants and accommodations, although Project effects on these types of businesses in and around the City of Kamloops are expected to be positive. The information developed to support the analysis of this VC also contributes to other analyses for other valued components (VCs), as summarized in Figure 7.4-1

7.4.2 Background

The Project will be an open pit copper and gold mine, producing 65,000 tonnes of ore per day for processing. Ore will be processed in a conventional flotation processing plant, producing copper/gold concentrate that will be transported to the Port of Vancouver for shipment to offshore smelters. The Construction phase is expected to last two years, while operations are expected to last 23 years, followed by a 5-year decommissioning and closure phase.

Figure 7.4-1
Inputs to Economic Valued Components



Total Project construction expenditures are estimated at approximately \$1.54 billion (KAM 2015). Project operations expenditures are estimated at \$299 million per year (on average), or \$6.9 billion over the 23-year operations phase. These estimates have been prepared for the purpose of the environmental assessment and are intended to reflect a conservative estimate of Project economics to forecast the distribution of Project construction and operations expenditures within British Columbia and the rest of Canada.

The Project is expected to provide a large number of opportunities to the business community in the Local Study Area (LSA)¹ and Regional Study Area (RSA)², including Aboriginal businesses. Most of these opportunities will be associated with the Project, directly or indirectly, through provision of goods and services to companies undertaking Project-specific work. Expenditures will be reduced in the closure and decommissioning, and post-closure phases. Although opportunities are expected to continue to be available for local businesses during these phases, they will be greatly reduced. In light of the substantially smaller magnitude of Project expenditures and the uncertainty inherent in predicting expenditures 25 years in advance, they were not calculated for the decommissioning and closure and post-closure phases. Where necessary, they will be discussed qualitatively.

Through the socio-economic data collection process and during consultation, concerns were expressed over labour competition (e.g., through wage pressures) potentially adversely affecting other businesses in the mining sector in the LSA and RSA, particularly for small to medium-sized businesses currently associated with the mining sector, and local governments who may wish to retain contractors and consultants for the maintenance and expansion of municipal infrastructure. This section of the Environmental Assessment Certificate Application/Environmental Impact Statement (Application/EIS) will provide a description of the business environment within the context of its capacity to service the needs of the Project.

7.4.2.1 *Regional Overview*

The RSA is defined by the boundaries of the Thompson-Nicola Regional District (TNRD), which covers more than 45,000 km² from Merritt and Lytton to north of Blue River. Much of the RSA economy relies on public services, including health care and education. Tourism has become an increasingly important contributor to the regional economy (Horne 2009). Historically, mining has been an important sector to the RSA and continues to be so. Forestry has traditionally been an important economic driver but developments in the sector (e.g., pine beetle infestation) have reduced its importance. Each of these industries provides opportunities for economic growth in the RSA and LSA.

7.4.2.2 *Historical Activities*

Kamloops is characterized by a relatively stable economy compared to other major population centres in the Province. This is seen as a function of the City's economic diversity and decreased reliance on any particular sector (City of Kamloops and InterGroup Consultants 2012).

¹ The LSA for the Business VC consists of Kamloops, the TNRD-J, and the Project First Nations: the Tk'emlúps te Secwépemc and the Skeetchestn Indian Band. Study areas are further defined in Section 7.4.3.

² The RSA for the Business VC consists of the TNRD.

Historical events and policies that have shaped the Kamloops area economy include the following:

- **Mining development:** Mining has historically been a key economic driver in the Kamloops area. Mining activity in the area can be traced back over 100 years with exploration within the LSA and immediate vicinity of the LSA beginning in the 1880s. The former Afton Mine included the Ajax east and west pits (located within the Project footprint), as well as the Afton pit (approximately 8 km northwest of the Project). Operations on the Afton pit began in 1977 and operations on the Ajax East and Ajax West pits were initiated in 1989. Activities at the Afton pit and Ajax East and West pits were subsequently suspended in 1991 due to depressed metal prices. Currently, the New Afton Mine, which utilizes the historic Afton pit and infrastructure, can process up to 12,500 tonnes of ore per day (New Gold 2014; Ajax KPI Program 2011-2012). Other mines in the area include Highland Valley Copper (HVC) (50 km from Kamloops), Copper Mountain (170 km from Kamloops), and Gibraltar (about 330 km from Kamloops). Currently there are exploration activities and proposed mines throughout the RSA.
- **The SSN and mining:** The Cultural Heritage Study (Ignace 2014) notes that ethnographers such as James Teit have noted the use of copper by the Secwépemc. Teit noted that copper tube beads and copper earrings were common. While Teit assumes that most of the copper used was European-made, other ethnographers observed that copper deposits were mined by the Secwépemc. Among these were Copper Creek, which is located on the north shore of Kamloops Lake (Ignace 2014). The SSN was also involved in gold mining before the 1858 Fraser Canyon gold rush. According to Ignace (2014), maps from the beginning of the 1858 gold rush confirm early Aboriginal involvement in gold mining as some maps show “Indian Diggings” on the north shore of Kamloops and Shuswap lakes. Hudson’s Bay Company journals and accounts also show trading for gold dust by Aboriginal persons who likely engaged in placer mining. Gold panning continued into the twentieth century.
- **Transportation and infrastructure development:** Kamloops has served as an important transportation hub since the 1890s through railway development and subsequent highway construction during the 1950s. Other notable developments have included the Kamloops airport expansion in 2009 (Venture Kamloops 2014).
- **Forestry sector development:** Forestry has been an important driver in the local economy despite periodic (and recent) industry downturns. Weyerhaeuser established their pulp mill operations in 1965. Domtar purchased the mill in 2007 and is currently running the facility at a reduced capacity, having closed one pulp machine at the plant, which affected 125 workers (Klassen 2014; Domtar 2012; Ajax KPI Program 2011-2012).
- **Education and technology development:** These sectors have become areas of increasing focus for Kamloops in recent years. Thompson Rivers University (TRU) was incorporated in 2005 (and formerly operated as the University College of the Cariboo) and offers a wide variety of academic degrees, as well as trades-oriented programming. In 2011, the TRU’s Law Faculty opened (TRU n.d.). As a whole, employment associated with the professional, scientific and technical services sector within the Thompson/Okanagan Development Region (excluding Kelowna) has been on an upward trend since 2001 and Kamloops is actively working towards expanding the technology sector (Venture Kamloops 2014; Ajax KPI Program 2011-2012). BC Aboriginal Mine Training Association (BC AMTA), which

helped Aboriginal people gain employment in the mining sector, closed in 2014. The closure removed one line of support for Aboriginal people looking for training to secure employment in the mining industry (Stueck 2014).

- **Other development:** The Kamloops economy has also been shaped by the increasing role of tourism, the City’s designation as “The Tournament Capital of Canada” (2001), and the development of the Sun Peaks Resort.

Notable recent economic challenges include the closures of Pollard Banknote (2010) and Convergys (2010), and more recently, the closures of one line at the Domtar plant (2013) and the closure of Kamloops Daily News in 2014 (Klassen 2014; Venture Kamloops 2014).

As noted earlier, mining has historically been an important sector within the RSA, although revenues have been decreasing annually since commodity prices were at or near record highs in 2011. Mining is seen by city officials as an important sector in the economy of Kamloops and a contributor to the diversity of the economy (Ajax KPI Program 2011-2012). In the Thompson Okanagan Development Region (excluding the Kelowna Census Metropolitan Area), in which the RSA is located, the number of individuals employed in the mining and oil-and-gas extraction sector has grown at a faster rate than all industries between 1997 and 2013 (Venture Kamloops 2014). However, during consultation with stakeholders, some residents expressed concern that the development of the Project could transform Kamloops back into a perceived single-industry town reliant on mining, instead of a city with the diverse economy observed today.

7.4.2.3 *Baseline Studies*

The objective of the baseline research was to understand existing business conditions within the LSA and RSA.

Data Sources

The main sources of information for the baseline included literature, KPIs with individuals who have relevant experience. Key contributors to the discussion on potential business opportunities included representatives from:

- KGHM Ajax Mining Inc. (KAM);
- Other local mining companies and contractors;
- Local educational institutions, including organizations focused on training Aboriginal persons;
- Venture Kamloops;
- City of Kamloops;
- Kamloops Chamber of Commerce;
- Tourism Kamloops; and
- Other interested parties.

Methods

The approach to understanding baseline conditions focused largely on secondary data, such as reports from Venture Kamloops, Statistics Canada census data, and websites for education and training - including Aboriginal training organizations (e.g., BC AMTA) complemented by information from key person interviews (KPIs).

Characterization of Business Baseline Condition

Business Sectors

Public services and resource industries are important business sectors in Kamloops. Companies operating in the public services and resource industries are some of the largest employers in the City. The largest employers in the City of Kamloops are the Interior Health Authority, School District no. 73, Teck Highland Valley Copper Mine (HVC), New Gold Inc. (New Afton Mine), and TRU (Venture Kamloops 2015).

Primary industry, which includes mining and oil and gas extraction, agriculture, logging and forestry, fishing, and trapping (Statistics Canada 2006), provides a substantial proportion of employment in the LSA, especially with HVC and New Gold being two of the top five employers in Kamloops (Venture Kamloops 2014). According to Statistics Canada (2013), employment in mining and gas extraction industry employed slightly more people than agriculture, forestry, and hunting. The reverse is true of the RSA (i.e., the TNRD), where slightly more individuals are employed in agriculture, forestry, and hunting. Forestry in the region includes the Kamloops Timber Supply Area (TSA), as well as parts of the Merritt and 100 Mile House TSAs. Forestry in the Kamloops TSA has been in decline in recent years.

Aboriginal-owned Businesses

Aboriginal-owned businesses in the LSA and RSA will have opportunities to engage in Project-related work. Aboriginal Groups in the LSA and RSA include the Project First Nations: the Tk'emlúps te Secwépemc (TteS) and the Skeetchestn Indian Band (SIB), who comprise the Stk'emlupsemc te Secwépemc Nation (SSN). Other Aboriginal Groups are involved through the Project Working Group (includes the Lower Nicola Indian Band (LNIB) and Ashcroft Indian Band [AIB]) or were identified by the CEA Agency for consideration (includes the Whispering Pines/Clinton Indian Band (WP/CIB), and the Métis Nation British Columbia (MNBC)).

Businesses owned by the TteS include the following:

- Mt. Paul Industrial Park;
- Tk'emlúps Petro Canada gas station;
- Sagebrush Downs/Mount Paul Centre, which is located in Mt. Paul Industrial Park;
- Spiyu7ullucw Ranch (located just outside the LSA);
- Tk'emlúps Forestry Development Corporation;
- Secwépemc Museum and Heritage Park; and

- Tk'emlúps Car Wash, which employs community members (TteS 2015a, 2015b, 2015c, Tk'emlúps Business Development 2011).

The TteS also leases lands for the development of Sun Rivers Estates, providing services and utilities for these homes.

The SIB owns and operates Big Sky Station, which includes a gas bar, convenience store, gift shop, catering, mobile home park, and tourist information. Big Sky Station is located approximately 46 km from Kamloops. The SIB also maintains the Wildhorse Town movie set. The set has been used in several film and television productions up to 2008 (Skeetchestn Indian Band n.d.).

The SSN have a contracting entity called Stk'emlupsemc Enterprises Inc. that is engaged in economic development on behalf of the TteS and SIB in their traditional territory (Aboriginal Business and Investment Council n.d.).

The LNIB engages in a variety of businesses and economic initiatives, including an irrigation system, cattle ranching, logging/forestry products and small businesses. Businesses owned by LNIB include LNIB Holdings Ltd., Shulus Forest Enterprises Inc., Shulus Cattle Co., LNIB Construction Ltd., LNIB Real Estate Developments Ltd., and LNIB Energy Ltd. The LNIB also has equity investment in Spayum Developments Ltd. and Nicola Valley Services Administration lands and building (LNIB 2014).

The AIB has a number of economic agreements with Kinder Morgan, Tolko, West Fraser, Waste Tech, and Highland Valley Copper. The Band also owns the NI'alapxm Eagle Motorplex and the Ashcroft Travel Centre, a gas station/truck stop. The Band is also involved in ranching (AIB pers. comm. 2014).

The WP/CIB owns Wildland Protection Services, which provides wildlife hazard assessments, wildfire hazard abatement services, and wildfire protection training and education services (WP/CIB 2015).

According to AMEC Foster Wheeler (2015), the MNBC website identifies 68 Métis businesses in the Province; however, it is not possible to identify how many are in the vicinity of the Project. The BC Hydro Aboriginal Business Directory identifies 30 businesses with Métis affiliation in the Southern Interior-Thompson Okanagan Region. Neither list is exhaustive since business owners voluntarily submit business information for inclusion (AMEC FW 2015).

To date, KAM has engaged First Nations (either solely owned or operated, or through joint venture) on the following types of work:

- Archaeological assessment and monitoring;
- Civil works construction;
- Maintenance services;
- Small scale forestry;
- First Aid;
- Security;

- Environmental monitoring and research; and
- Drilling and exploration.

Economic Trends and Prospects

The RSA has experienced notable economic change in recent years with a decline in the forestry sector and growing tourism and mining sectors. The unstable lumber markets have resulted in closures and output reductions of mills in the Kamloops area, in addition to the 2008 Weyerhaeuser shutdown, Ainsworth Lumber's mills in Savona and Lillooet also closed in 2009. Economic trends related to mining, forestry and other sectors are discussed in more detail below.

Trends in the Mining Sector

Since commodity prices peaked in 2011, the mining sector in British Columbia has weakened in recent years as several important mineral and metal prices (gold, silver, copper, lead, zinc, and coal) have either declined or remained steady. Metallurgical coal and copper, which generate the most revenue in BC's mining sector, produced lower gross mining revenues as their prices declined (PricewaterhouseCoopers 2014).

Despite the recent decline in commodity prices, gross provincial revenues from the mining sector have trended upward from \$4.6 million in 2004 to \$8.5 million in 2013, an increase of over 80%. The number of employees in the mining sector has also steadily risen from about 6,000 in 2003 to over 10,000 in 2013 (PricewaterhouseCoopers 2011, 2014).

There are a number of active and proposed mines within and near the RSA including:

- **Highland Valley Copper (HVC):** The Highland Valley Copper mine is located near Logan Lake and is approximately 50 km by highway from Kamloops. In 2014, HVC was the third largest employer in the LSA with over 1,300 employees. In the past five years, the number of employees has risen from 800 to approximately 1,380. About half of the HVC workforce lives in Kamloops. The remainder of the workforce commutes from other nearby communities in the RSA including Logan Lake and Ashcroft (Ajax KPI Program 2011-2012; Dechert *pers. comm.* 2014). The mine is currently expected to operate until 2027 based on a new operations plan (Teck 2015).
- **New Afton:** The New Afton Mine is approximately 10 km west of the Ajax Project, and is primarily an underground operation. The mine began commercial production in 2012. As of December 31, 2014, there were 447 employees and 14 contractors (New Gold 2015). Seventy-five to eighty percent of the operation's workforce lives in Kamloops (Ajax KPI Program 2011-2012). The mine is expected to be in operation for a total of 12 years until approximately 2024.
- **Harper Creek Mine Project (proposed):** Located 150 km from the City of Kamloops, this project (if approved) would have a mine life of about 28 years (BC EAO and CEA Agency 2015). The mine is expected to have approximately 600 positions during construction and peak operation employment of 466 positions (ERM Consultants Canada Ltd. 2015).

Other mines in operation in the vicinity include:

- **Copper Mountain:** Located outside of the RSA, 170 km from the City of Kamloops, the mine started production in 2011 and it is expected to operate for 17 years. The mine's current workforce is approximately 500 people.
- **Gibraltar:** Located outside the RSA, 330 km from City of Kamloops, the mine opened in 2004 and it is expected to operate for about 27 years. Its current workforce is approximately 620 people.
- **Other proposed projects:** The New Prosperity Gold-copper Mine (located outside the LSA about 300 km from the City of Kamloops; mine life of about 20 years) has filed for a second judicial review after the federal government did not authorize the project (CEA Agency 2014; Taseko Mines Limited 2014). Ruddock Creek (located about 155 km from the City of Kamloops) has submitted a project description to the Provincial and Federal governments (Imperial Metals 2015).

Trends in the Forestry Sector

Timber harvesting in the Kamloops TSA increased by about 50% between 2009 and 2011. The increase was as a result of the forestry industry coming out of an economic downturn, the mountain pine beetle infestation slowing, and the industry undergoing salvage operations by harvesting beetle-affected trees before they lost their value. In 2012, it was anticipated that the forestry industry around Kamloops would experience a downward economic trend in the subsequent five years (Sommer et al., *pers. comm.* 2012). However, as of 2014, BC's forestry and wood-products sector was expected to remain a significant growth driver for the province through 2018 (Central 1 2014).

Domtar, which operates a pulp mill in Kamloops, has invested around \$120 million in their pulp mill over the last couple of years to improve its competitiveness. The mill produces electricity from sawmill residue material it receives from about 20 regional sawmills, including mills in Merritt, Vernon, and Kelowna (Adams *pers. comm.* 2012). In 2014, Domtar employed 316 people (Venture Kamloops 2015).

Forestry is an important regional economic activity and the downturn in the forest industry has implications for direct and indirect employment related to the Project. Although there has been a recent reduction in available employment in the forestry sector, some of the skills used in the forestry sector may be transferable to work in the mining sector (Ajax KPI Program 2011-2012), potentially increasing the supply of available local workers.

Trends in the Agriculture Sector

Agriculture, ranching in particular, is an important economic driver in the LSA and RSA. Cattle ranching is the primary agricultural activity in proximity to the Project. Within the RSA, cattle ranching and horse keeping accounted for most of the agricultural activity. In the RSA, roughly one third of farms are engaged in cattle ranching and farming, which includes farms that focus on raising, milking, and fattening cattle. Operations engaged in raising horses, mules, donkeys, and other equines made up over 20% of agricultural operations in the RSA (Statistics Canada 2011a). The majority of farmland in the RSA are unmanaged pastures used in ranching operations (Invest in Thompson-Nicola 2015). The total gross farm receipts for the RSA in 2010, which include receipts from all

agricultural products sold and program payments and custom work receipts, was \$72.6 million (Statistics Canada 2011b).

Trends in the Tourism Sector

Tourism has become an increasingly important component of the LSA economy. The tourism market is both domestic and international. The international market is structured around the fact that the City of Kamloops has traditionally been an overnight stopover for tourists travelling and experiencing the Rocky Mountains, typically via Thomas Cook Travel, Brewster Bus Lines or the Rocky Mountaineer rail line. The local market consists of opportunities related to fishing, biking, hiking, snowshoeing, skiing, and various other outdoor opportunities (Ajax KPI Program 2011-2012).

Tourist traffic in Kamloops amounts to approximately 90,000 to 95,000 people per year occupying hotel rooms in the city.³ Tourism accounts for an estimated \$55 million in revenue through accommodations (Ajax KPI Program 2011-2012). There are about 3,000 hotel and motel rooms in Kamloops (City of Kamloops 2015) and at least 300 campgrounds and RV park sites (a mixture of full hook-up, water, and electricity), excluding provincial parks in the area and sites in other communities in the TNRD (Tourism Kamloops 2015a). The accommodation sector has increased local capacity in response to increased demand with initiatives such as the establishment of various hotel chains and with renovations and expansions to existing facilities.

Some tourism marketing focuses on the significance of ranching and grasslands in the RSA. Tourism Kamloops (2015b) promotes Western Heritage Trails in Kamloops and the surrounding area from Merritt in the south to Clearwater in part by providing itineraries for motorcycle drives and driving tours (Tourism Kamloops 2015c, 2015d). These itineraries are not limited to Kamloops and cover other areas of the RSA. Tourism Kamloops also works with TteS to bring international bus tours to their reserve to engage in a cultural sharing program (Ajax KPI Program 2011-2012).

Notable tourism-related events and activities that have helped to shape the local economy include the following:

- **Development of Sun Peaks Resort:** Located 50km northeast of Kamloops, the resort generates 340,000 skier visits per year. It also operates a bike park and golf course, all supported by 7,000 tourist beds. Resort employment approximates 500 people year-round and 1,000 during the winter.
- **Designation of Kamloops as “The Tournament Capital of Canada”:** – The City of Kamloops prides itself on being a prime location for tournaments and events and has invested upwards of \$60 million in facility upgrades over the last ten years (Venture Kamloops 2014). The Tournament Capital brings in an estimated \$12 million per year.
- **Kamloopa Powwow:** This event occurs at the TteS Powwow grounds and is one of the largest powwows in western Canada (Tourism Kamloops 2015e).

³ Estimate does not include Sun Peaks but does include corporate travel.

7.4.3 Assessment Boundaries

7.4.3.1 Spatial Boundaries

Local Study Area

The Local Study Area (LSA), as illustrated in Figure 7.4-2, for the Business VC consists of the City of Kamloops, the TNRD-J electoral area, and the Tk'emlúps te Secwépemc and the Skeetchestn Indian Band. Characterization of the LSA was undertaken through consideration of potential Project effects to socio-economic indicators and is considered as the area where most Project effects are likely to accrue. Most of the businesses expected to be engaged in the Project are from this immediate area, therefore most of the effects associated with this VC will be focused in this area.

Regional Study Area

As illustrated in Figure 7.4-3, the RSA for the Business VC consists of the Thompson-Nicola Regional District. This geographic unit accounts for other businesses outside of the City of Kamloops and immediate vicinity that may be affected by the Project. Lower Nicola Indian Band, AIB, and WP/CIB are located within the RSA.

7.4.3.2 Temporal Boundaries

Temporal boundaries for the assessment of the Business VC are listed below. Of particular interest to this section will be the first two phases, construction and operations, where most of the project opportunities are expected to be realized.

- **Construction:** 3 years;⁴
- **Operation:** 23 years;
- **Decommissioning and Closure:** 5 years (includes project decommissioning, abandonment and reclamation activities, as well as temporary closure, and care and maintenance); and
- **Post Closure:** 5+ years (includes ongoing reclamation activities and post-closure monitoring).

7.4.3.3 Administrative Boundaries

The administrative boundaries relate primarily to the boundaries of the TNRD, City of Kamloops and other relevant Statistics Canada census divisions and subdivisions. These boundaries reflect the scope of the baseline information and effects assessment.

⁴ The Project Construction Phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4). The Construction and Operations phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.

7.4.3.4 *Technical Boundaries*

No specific technical boundaries were identified.

7.4.4 Project Benefits Related to Business Opportunities

Given the Project's proximity to Kamloops and the scope of business currently engaged in the mining industry both directly and indirectly, it is expected that a large proportion of Project contracting needs will be addressed by local or regional businesses.

Potential effects on business are not typically considered to result from single Project components or activities but the aggregate of multiple components or activities. For example, open pit development and water intake construction activities are less relevant to potential business effects than Project employment.

Mining is seen by City of Kamloops officials as an important sector in the economy of Kamloops, which contributes to the diversity of the economy (Ajax KPI Program 2011-12012). In the Thompson Okanagan Development Region (excluding the Kelowna Census Metropolitan Area), in which the TNRD is located, the number of individuals employed in the mining and oil and gas extraction sector has grown at a faster rate than all industries between 1997 and 2013 (Venture Kamloops 2014).

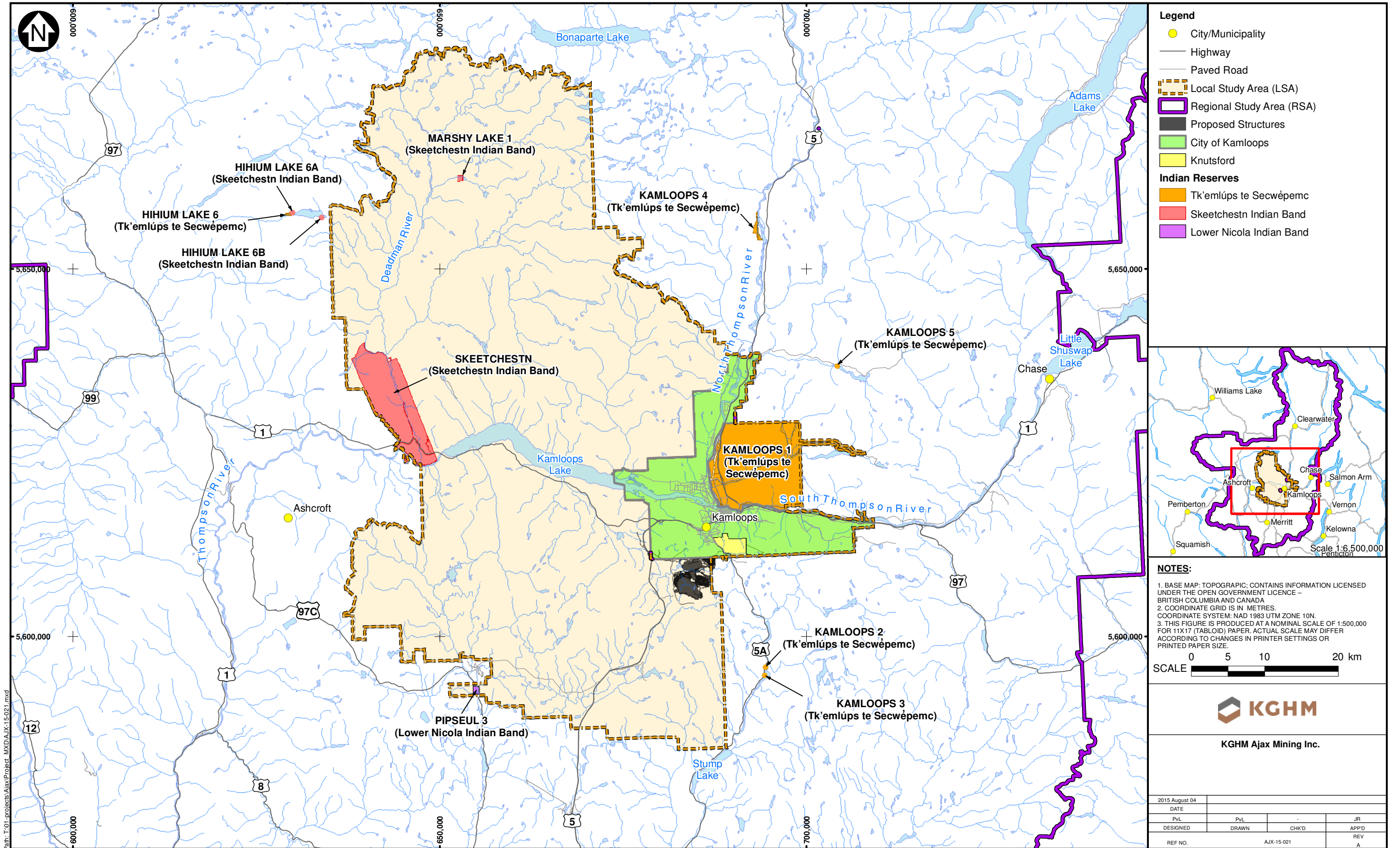
KAM is developing a business procurement plan. The Project will depend on several contract services during the Construction and Operations phases. These could include, but are not limited to:

- Open pit mining;
- Mobile and fixed equipment maintenance;
- Site services including security and maintenance;
- Transportation services and fuel services;
- Expediting/mine resupply; and
- Communications.

Based on the operating experience of another BC mining project, and given the factors identified above (e.g., proximity to City of Kamloops), it is reasonable to expect that between 25% and 35% of total expenditures (including supplies, services and contract labour) will take place within the Kamloops area. With average annual operating expenditures of \$299 million, between \$75 and \$105 million could occur in the Kamloops area alone.

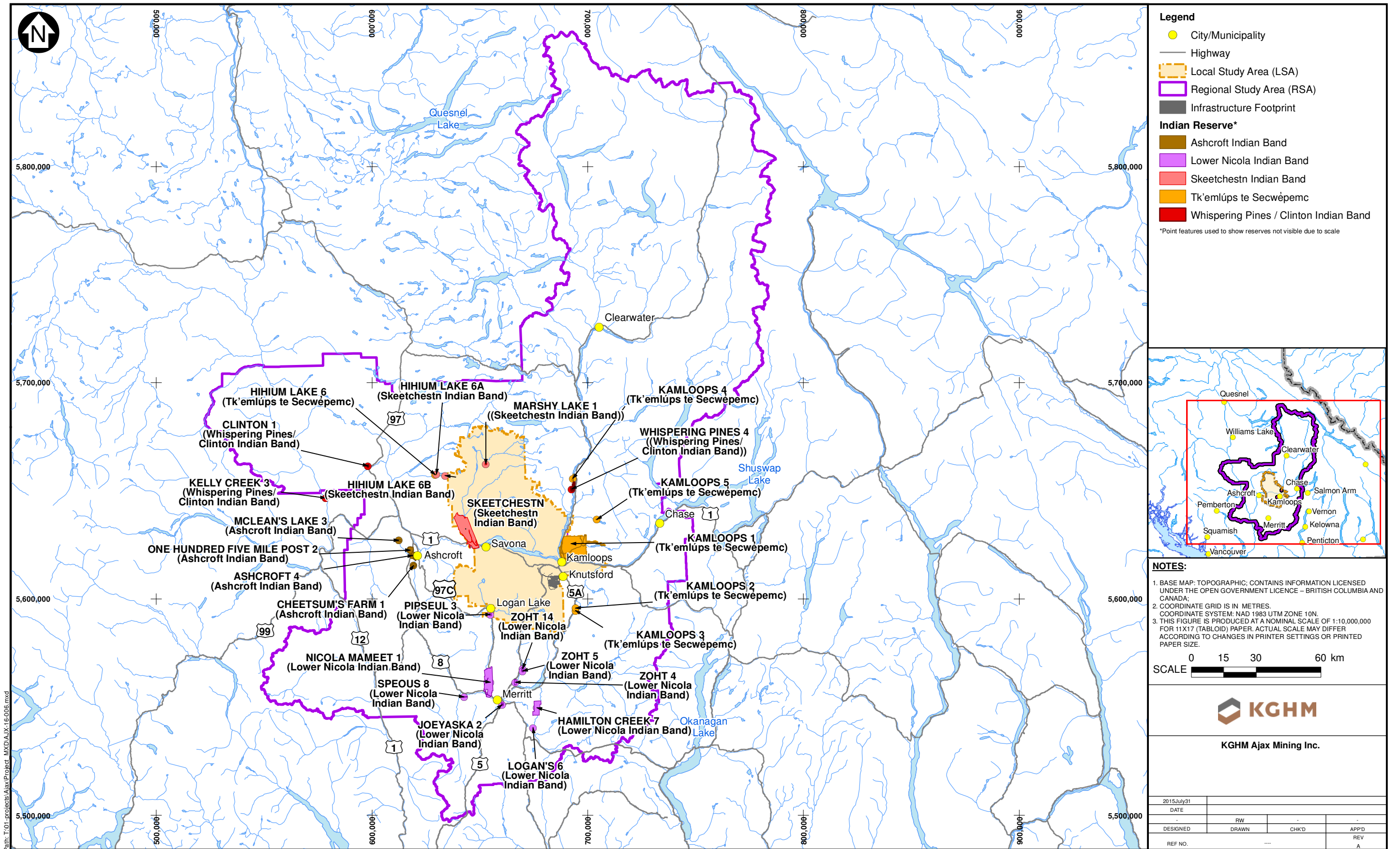
Local expenditures during the Construction Phase are also expected to be sizable, although the local percentage will likely be lower given that some major equipment purchases will have to be sourced nationally and internationally. Business opportunities for local contractors will also be available during the Decommissioning and Closure, and Post-closure phases, although expenditures and related businesses opportunities will progressively decrease over these phases.

Figure 7.4-2
Local Study Area



Path: T:\01_projects\Ajax\Project_MXD\AJX-15-021.mxd

Figure 7.4-3
Regional Study Area



Path: T:\01_projects\Ajax\Project_MXD\AJX-16-006.mxd

Benefits associated with other VCs like labour force, employment and training, and income also arise out of these business opportunities. The Project will require a large workforce made up of a broad range of occupations. This includes positions in trades, engineering and technical, management and supervisory, administrative and support occupations. Given the Project's proximity to Kamloops and its history of resource development, much of the anticipated workforce is expected to be filled locally.

During construction, employment is expected to peak at approximately 1,800 jobs. Most of this employment will be apprentice trades, as well as heavy equipment operators and labourer positions that are representative of a mining construction workforce. Between approximately 850 and 1,150 of these positions are expected to be filled by local residents. Average workforce requirements during operations are estimated at approximately 468 personnel, with a higher proportion being heavy equipment operators and truck drivers. It is estimated that between about 270 and 350 of operations positions could be filled locally.

Income benefits associated with these employment opportunities will be notable. New income will be generated through employment earnings in the City of Kamloops and surrounding communities during all phases of the Project. This in turn will lead to indirect economic activity in retail, hospitality, and other service sectors through the spending of wage income. In total over the entire Construction Phase, the Project will generate between \$264 million and \$328 million dollars in employment earnings (combination of direct, indirect and induced earnings). During the Operations Phase, the corresponding amount will average approximately \$80 million per year, or \$1.8 billion over the 23-year period.

Businesses likely to benefit from the Construction and Operation of the Project, either directly or indirectly, include contracting⁵, equipment⁶ services, support services⁷, and consulting⁸. These are the businesses that will supply most goods and services to the Project. Competition between the hospitality sector and the mining sector is not anticipated given the different skill sets and the comparatively large supply of potential workers that the hospitality sector has access to within the City of Kamloops. However, other businesses, not necessarily related to the mining sector, could lose workers if workers decide to leave current positions to obtain a high paying job with the Project or Project's contractors. Labourers can come from nearly any sector. In such a case, some competition for workers between the non-mining sectors and the mining sector can potentially take place. This potential effect is considered more closely in Section 7.4.5.2.

7.4.5 Potential Adverse Effects of the Project and Proposed Mitigation for Business Opportunities

Many economic effects of the Project are considered to be beneficial, including potential effects related to the generation of business opportunities and increased business capacity. A summary of these benefits was provided in Section 7.4.4. These are described in further detail in Section 2.7,

⁵ Drilling, mining, mineral processing, mine construction, procurement, water management, health and safety, security.

⁶ Buildings and structures, electrical equipment, mineral processing, transportation, crushing and conveying, excavation and loading, drilling and blasting, pumps and pipelines.

⁷ Education and training, human resources, financial and legal, health and safety, transportation and travel.

⁸ Environmental and people, management and financial, planning, exploration.

Project Benefits. The following sections provide a discussion and analysis of the potential adverse effects of the Project on the Business VC.

7.4.5.1 *Identifying Potential Adverse Effects on Business*

This section begins with a discussion of why certain interactions were included in Table 7.4-2 Identifying Potential Project Effects. The AIR/EIS Guidelines require a consideration of potential Project effects on business. As noted above, potential effects on business do not typically result from single Project components or activities, but rather an aggregate of multiple components and activities. In addition, not all individuals or communities are likely to be affected to the same extent. Table 7.4-2 describes the relationship between various aggregated Project components and activities, and the potential effects on the business. Only interactions that are characterized as “M” (moderate) or “H” (key) are carried forward to the effect assessment on this VC. Three potential effects were initially considered:

- Relatively high wages associated with Project employment could lead to competition for labour;
- Businesses providing goods and services to the Project could be affected by a reduction in procurement and business contracts when the mine closes; and
- Land-based businesses such as tourism, recreation, and agriculture may be affected by aesthetic and environmental changes caused by the Project.

Labour Competition

During interviews with representatives from nearby mining operations and support service providers, some concern was raised about the potential for current employees to resign in order to seek employment with the Project. These concerns could be particularly acute for the small to medium-sized businesses that supply the mining sector. The Project will require a large, skilled workforce of tradespersons, engineers, heavy equipment operators, administrative staff, and others. Mining jobs in general are high-paying employment opportunities. Direct employment with a mine generally provides for higher wages than wages offered by businesses providing services and supplies to the mining sector, and this could lead to competition for labour. This potential interaction is rated as moderate (“M”) and is assessed further in this section.

Loss of Business Contracts at Closure

As the Project moves from Operations into Decommissioning and Closure, there will be a decrease in associated business opportunities as Project activities and associated workforce wind down. This decrease will continue over a five year period. These effects will occur mostly within the LSA and RSA. The loss of Project-related business opportunities is considered to be an adverse effect, although it is typical of the finite nature of mining developments. With the increased business capacity that is expected to have been developed over the course of the Project, and the likelihood of other mining projects being constructed in the future, it is expected that businesses engaged in Project opportunities will be well-positioned to take advantage of other opportunities. Additionally, as the Operation Phase progresses towards Decommissioning and Closure, the demand for goods and services will gradually decline. This will provide an opportunity for local and regional businesses to adjust to the gradual decrease in demand. As a result this potential interaction is rate as low (“L”) and is not carried further in the effects assessment.

Table 7.4-2. Identifying Potential Project Interactions and Effects on Business

Project Activities		Potential Adverse Effects on Business		
		Increased Labour Competition	Effects on Land-Based Businesses	Loss of Business Contracts at Closure
Construction	Clearing and Grubbing	O	L	O
	Earthworks	O	L	O
	Overburden/Topsoil Stockpile	O	L	O
	Laydown Areas and Storage Yards	O	L	O
	Project Lighting	O	L	O
	Site Security and Fencing	O	L	O
	Fuel Storage and Filling Area	O	L	O
	Hazardous Wastes Transport, Storage, and Disposal	O	L	O
	Construction Wastes Transport, Storage, and Disposal	O	L	O
	Sewage Infrastructure and Disposal	O	L	O
	Public Road Realignment, Use, and Maintenance	O	L	O
	Site Road Construction, Use and Maintenance	O	L	O
	Haul Truck Road Construction, Use, and Maintenance	O	L	O
	Site Buildings and Process Plant	O	L	O
	Explosives Magazine and Storage Facilities	O	L	O
	Open Pit Development	O	L	O
	Drilling and Blasting	O	L	O
	Crushing Mine Rock	O	L	O
	Loading, Hauling, and Deposition of Mine Rock	O	L	O
	Temporary Ore Stockpile	O	L	O
	Tailing Storage Facility Development	O	L	O
	Power Transmission, Distribution	O	L	O
	Natural Gas Line	O	L	O
	Pipeline Utility Corridor (Potable Water, Sewage, and Site Water)	O	L	O
	Water Intake from Kamloops Lake	O	L	O
	Fire Suppression Infrastructure	O	L	O
	Contact Water	O	L	O
	Non-contact Water	O	L	O
Haul Truck Road	O	L	O	
Water Management Dams	O	L	O	
Mine Staffing (Direct Employment)	M	O	O	
Contracted Employment	M	O	O	
Taxation	O	O	O	

Project Activities		Potential Adverse Effects on Business		
		Increased Labour Competition	Effects on Land-Based Businesses	Loss of Business Contracts at Closure
Operation	Open Pit Development	O		
	Drilling and Blasting	O		
	Hauling Mine Rock and Ore from Pit	O	L	O
	Crushing and Conveying Ore	O	L	O
	Temporary Ore Stockpile	O	L	O
	Development of Mine Rock Management Facilities	O	L	O
	Stripping, Loading, Hauling, Deposition, and Contouring of Topsoil and Overburden	O	L	O
	Revegetation through Progressive Reclamation	O	L	O
	Process Plant Operation	O	L	O
	Deposition to Tailing Storage Facility	O	L	O
	Site Road Use and Maintenance (Materials, Personnel, Supplies)	O	L	O
	Concentrate Transport and Storage	O	L	O
	Explosives Magazine and Storage Facilities	O	L	O
	Fire Suppression Infrastructure	O	L	O
	Fuel Storage and Filling Area	O	L	O
	Hazardous Wastes Transport, Storage, and Disposal	O	L	O
	General Wastes Transport, Storage, and Disposal	O	L	O
	Sewage Infrastructure and Disposal	O	L	O
	Laydown Areas and Storage Yards	O	L	O
	Power Transmission, Distribution	O	L	O
	Project Lighting	O	L	O
	Site Access, Security and Fencing	O	L	O
	Water Intake from Kamloops Lake	O	L	O
	Contact Water	O	L	O
	Non-contact Water	O	L	O
	Potable Water Treatment and Use	O	L	O
	Haul Truck Road	O	L	O
	Mine Staffing (Direct Employment)	M	O	O
Contracted Employment	M	O	O	
Taxation	O	O	O	

Project Activities		Potential Adverse Effects on Business		
		Increased Labour Competition	Effects on Land-Based Businesses	Loss of Business Contracts at Closure
Decommissioning and Closure	Dismantling of Ancillary Buildings	O	L	O
	Pit Lake Planning	O	L	O
	Site Road/Bridge Decommissioning	O	L	O
	Tailing Storage Facility Decommissioning and Reclamation	O	L	O
	Mine Rock Management Facilities Reclamation	O	L	O
	Fuel Storage and Filling Area	O	L	O
	Hazardous Wastes Transport, Storage, and Disposal	O	L	O
	General Wastes Transport, Storage, and Disposal	O	L	O
	Sewage Infrastructure and Disposal	O	L	O
	Laydown Areas and Storage Yards	O	L	O
	Power Transmission, Distribution	O	L	O
	Project Lighting	O	L	O
	Site Access, Security and Fencing	O	L	O
	Contact Water	O	L	O
	Non-contact Water	O	L	O
	Potable Water Treatment and Use	O	L	O
	Haul Truck Road	O	L	O
	Road use to the Project (Materials, Personnel, Supplies)	O	L	O
	Mine Staffing (Direct Employment)	L	O	L
	Contracted Employment	L	O	L
Taxation	O	O	O	
Post Closure	General Site Inspections and Maintenance	O	O	O
	Contact Water	O	O	O
	Non-contact Water	O	O	O
	Road use to the Project (Materials, Personnel, Supplies)	O	O	O
	Mine Staffing (Direct Employment)	L	O	L
	Contracted Employment	L	O	L

Notes:

O No interaction anticipated.

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

M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.

H Interaction; warrants further consideration.

Effects on Land-Based Businesses

During Project consultation, concerns were raised about how potential effects of the Project on the environment and landscape could impact businesses operating in the LSA and RSA. These included specific concerns regarding businesses associated with the tourism sector (e.g., tour operators, recreational/adventure business operators) and agricultural (primarily ranching) interests, which could be affected by aesthetic, environmental, and access changes associated with the Project.

With respect to tour operators, potential effects would be associated primarily with visual impacts, and air quality as bus tours in particular utilize the Coquihalla highway to and from the City of Kamloops. Section 8.3 (Visual Quality) considers potential visual impacts associated with the Project, including potential effects from the Coquihalla highway. Based on the analysis provided in Section 8.3, the overall visual effect from this location is expected to be minimal and as such, no effects are anticipated for businesses engaged in these tourism activities.

Similarly, potential effects on outdoor recreation are discussed in Section 8.6 and include consideration of changes to access resulting from the Project footprint and blasting activities as well as diminished quality of the experience for recreationalists. Significant effects on outdoor recreation are not anticipated. Concerns raised by owners of outdoor recreation/adventure tourism businesses focused on potential effects related to the overall recreation or adventure experience and not on the economic viability of their respective businesses. Findings from interviews with local outfitters suggest that other lakes in the area would also be suitable for their business purposes. These topics are discussed in greater detail in Section 8.6 (Outdoor Recreation).

Concerns related to the viability of ranching interests in the area around the Project site are addressed in Section 8.4 (Land and Resource Use).

Therefore, potential interactions of the Project with tourism, recreation, and agricultural interests are considered to be low ("L") and are not considered further in this section of the assessment.

7.4.5.2 *Effects on Business*

This section addresses the potential adverse effects related to labour competition resulting from the Project. This effect is tied to the potential challenges associated with labour competition within the mining supply and service sector as employees in this sector potentially seek Project jobs that are either higher-paying or are based in a more desirable location (e.g., Kamloops-based resident currently working for a mining contractor based in Logan Lake).

Increased Labour Competition

Potential effects related to labour competition have been assessed using a combination of secondary literature, qualitative information collected from interviews undertaken with individuals and associations with relevant knowledge and experience, workshop sessions with the City of Kamloops, and professional judgement. Preliminary insights regarding First Nation participation in Project-related business opportunities was obtained from KAM.

Many different factors inform potential challenges associated with labour competition, each of which can vary over time. They range from large-scale economic trends (e.g., the general state of the provincial economy, levels of development activity in Alberta) to more specific, localized circumstances (e.g., status of other mining operations in the LSA and RSA). Any uncertainty related to these trends can make it a challenge to accurately predict the nature and scope of potential labour competition.

Competition for skilled workers is mainly driven by a shortage of skilled workers, which can be exacerbated during times when these workers are in high demand. The shortage of skilled workers has been identified as one of Canada's greatest future economic challenges. Labour shortages are present in specific sectors such as construction, mining and petroleum with the shortage expected to worsen over the next decade. Factors contributing to the shortage of skilled workers in the mining industry include mismatched job vacancies with the skills of people who are seeking work and low levels of labour market participation among groups of potential workers. As a result, there is a reliance on commuting workers, and an estimated 9% of the workforce in the mining industry represents commuters, compared to 3% for all other industries.

The shortage of skilled workers is not only applicable to mining projects but also to local and regional businesses that compete with the mining industry for skilled workers. During Project Construction and Operation, employment opportunities are expected to increase the demand for skilled labour and, as a result, could create labour shortages for regional businesses. For businesses in the mining sector and other industries that require workers with similar skillsets, it may become more difficult to find workers.

For Project in the Construction Phase, the first year of construction will required 1,175 workers (including 498 designated trades and 565 non-designated trades); 1,800 workers (including 1,340 designated trades and 316 non-designated trades) will be required in the second year; and 898 workers will be required in the last year of Project Construction (including 630 designated trades and 163 non-designated trades). During Year 1 of construction, the Project could hire between 750 and 940 positions locally, out of a total estimated 1,175 positions. In Year 2 of construction, local hires are expected to range between 850 and about 1,150 out of a total of up to 1,800 positions. During Year 3 of construction, the Project is expected to hire 275 to 400 local positions out of a total of almost 900 positions. As shown, the demand for local workers will be notable. Construction phase employment is short-term in nature and while higher than average wages are attractive workers may be reluctant to leave their permanent positions for a short-term commitment. The extent of the competition during this Phase will depend on workers' skill sets available locally and regionally, the size of the unutilized labour force, and the employment levels.

During the 23-year Operation Phase, annual employment opportunities range between 400 and 500. Approximately 250 non-designated trade positions, 100 designated trade positions (including millwrights and pipefitters positions), 50 engineering and technical positions (e.g., metallurgists, geologists), and between 30 and 40 positions for each of administrative/support and management/supervisory occupations will be required. The percentage of local hires could range from 58% to 74% (about 270 and 350 positions).

The Operation Phase provides an economic pathway through the creation of employment and training opportunities potentially drawing locally employed people away from their current

positions. The Project will require a large skilled workforce of tradespersons, engineers, heavy equipment operators, administrative staff, and others. Mining jobs in general are high-paying employment opportunities. Direct employment with a mine generally provides higher wages than wages offered by businesses providing services and supplies to the mining sector. The long-term nature of the Operations Phase also presents a greater risk that skilled workers may elect to leave their current employment for employment with the Project.

In KPIs with representatives from nearby mining operations and support service providers, some concern was raised about the potential for existing employees to resign in order to seek employment with the Project. These concerns could be particularly acute for the small to medium-sized businesses that supply the mining sector due to the overlap in skillset required both by the Project and the local businesses. Although other mining operations noted the potential for their workers to move to jobs on the Project, employment mobility was something they were accustomed to and could manage effectively through human resource planning (e.g., recruitment initiatives), competitive wages and other measures (Ajax KPI Program 2011-2012). In areas where existing or anticipated skill shortages have been identified (e.g., millwrights, pipefitters and steelworkers in the LSA and RSA), increased labour demand, particularly during the Construction Phase, could exacerbate this issue.

In general, the demand for local workers during the Operation phase will be notable, and although the Project will offer long-term positions, this demand will most likely occur at the beginning of the phase during the hiring process. Most workers will be considered to be hired for the life of the mine, and therefore, this effect is not expected to continue over the duration of the phase. Any additional competition for workers during the life of the mine will come from employee turnover that is expected to be in par with that for the industry. As such, local businesses that lost skilled workers will be able to hire and train new employees. Additionally, local and regional prospective workers will enroll in education and training to meet the increased demand for Project-related positions. This is expected to offset any additional pressures on the labour market, as well as local and regional businesses.

To deal with a shortage of skilled workers, it is expected that businesses can tap into the unutilized labour market in the City of Kamloops, and support and provide on-the-job training opportunities to fill available, general labour positions. However, some competition for skilled labour with local and regional businesses is expected as workers, attracted by higher Project wages or new work opportunities, could leave current employment to obtain employment with the Project.

7.4.5.3 *Mitigation Measures for Business*

It is expected that potentially affected small to medium-sized businesses will have mechanisms in place to accommodate or alleviate competitive pressures as required. However, KAM will engage industry through the Community Liaison Group to identify and mitigate potential concerns related to labour competition. Topics for discussion will include anticipated Project activities and workforce estimates, including a breakdown of specific occupational requirements. The goal of these interactions would be to identify potential supply/demand areas that could lead to adverse labour competition conditions for small to medium-sized businesses and work together to offset any challenges. Potential working solutions may include joint recruitment efforts or training and education initiatives.

Residual effects are anticipated after application of mitigation measures.

7.4.6 Residual Effects and Their Significance

7.4.6.1 Summary of Residual Effects

Residual effects are those Project effects that remain after mitigation is applied. This section describes in greater detail the post-mitigation residual effect for the Business VC. A summary of predicted effects on this VC is provided in Table 7.4-3. As presented in Table 7.4-2, there are no medium or key interactions expected between the Project and the Business VC during the Decommissioning and Closure and Post Closure phases. As a result, no potential effects are anticipated for these phases.

Table 7.4-3. Summary of Residual Effects on Business

Project Effect	Project Phase (timing of effect)	Project Component/ Physical Activity	Description of Cause-Effect ¹	Description of Mitigation Measure(s)	Description of Residual Effect
Benefit: Project Employment and Procurement	Construction and Operation	Employment and procurement of local business services	Project demand for goods and services will generate business opportunities. Direct, indirect, and induced employment and income will also benefit local businesses.	Human resource development plan to maximize local employment with the Project.	Not Applicable (Benefit)
Increased labour competition	Construction and Operation	Employment	Pressure on businesses to compete with the Project to attract and retain employees could lead to staff turnover (and resulting capacity pressures) and pressure to increase higher wages.	Engagement with local business community and Community Liaison Group to jointly address challenges	Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses.

¹ "Cause-effect" refers to the relationship between the Project component/physical activity that is causing the change or effect in the condition of the VC.

Increased Labour Competition

Increased labour competition, particularly for small to medium-sized businesses may result from increased costs associated with staff turnover and increased wages in order to compete with the Project for employees. Some degree of this change is already being experienced by businesses in the City of Kamloops and surrounding area.

This effect may be more pronounced during Year 2 of construction when the peak estimated workforce will be required (approximately 1,800 workers), although most positions will be short-term. Increased labour competition may also be noticeable as the Project moves into the Operation Phase as long-term position will be available.

The amount of labour competition will vary by specific occupation, and especially for those where there is currently existing shortages and which will be in high demand by the Project. Labour supply challenges are expected for some specific occupational classifications, especially millwrights, pipefitters and steelworkers, all three of which are going to be in relatively high demand over the course of both the Construction and Operation phases. While the local market is expected to supply the majority of employees for the Project there is an expectation that workers will also be sought from outside of the local area. Other opportunities exist to offset potential labour supply issues include the hiring of local individuals that are currently commuting out of the local area (e.g., to Fort McMurray) and to train and hire individuals with forestry experience who may only require a nominal amount of training to qualify for Project positions. These options will help offset potential labour competition effects.

7.4.6.2 *Criteria for Characterization of Residual Effects*

Residual effects are characterized using the following standard criteria: magnitude, duration, frequency, geographic extent, reversibility, resiliency and social value. The definitions of these terms for the assessment of Project effects on Business are outlined in Table 7.4-4, Definitions of Characterization Criteria for Residual Effects on Business.

7.4.6.3 *Characterization of Residual Effects*

There is one anticipated residual effect of the Project on the Business VC: Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses.

Characterization of residual effects is based primarily on information collected from KPI and workshop settings as well as professional judgement. The following ratings were assigned for potential effect of increased labour competition:

- The magnitude of the potential effect is considered to be minor. There will be a small difference from the baseline conditions. Given the history of mining in the area and the well-established mining supply and service sector, the small and medium-sized businesses that may have concerns with respect to Project-related wage and workforce pressures are expected to have mechanisms in place to manage these. During the KPI program, respondents noted that they already had experience dealing with competition for labour with other mining operations located near Kamloops.
- The duration of the effect is expected to be medium-term (i.e., from 6 to 25 years). The effect could be more pronounced during Operations as the jobs will be longer lasting compared to Construction and will also be direct employment opportunities rather than contract. During Construction, workers are less likely to leave existing jobs given the relatively short duration of most of the employment opportunities.
- The geographic extent of this effect is expected to be the LSA, as the vast majority of businesses that service the mining sector are located in the immediate vicinity of the City of Kamloops.

Table 7.4-4. Definitions of Characterization Criteria for Residual Effects on Business

Magnitude	Duration	Frequency	Geographic Extent (Physical/Biophysical)	Reversibility	Resiliency	Social Value	Likelihood of Effects	
							Probability	Confidence Level
<i>How severe will the effect be?</i>	<i>How long will the effect last?</i>	<i>How often will the effect occur?</i>	<i>How far will the effect reach?</i>	<i>To what degree is the effect reversible?</i>	<i>How resilient is the receiving environment or population?</i>	<i>How influential is the effect on the broader socio-economic environment?</i>	<i>How likely is the effect to occur?</i>	<i>How certain is this analysis?</i>
<p>Negligible: No or very little detectable change from baseline conditions</p> <p>Minor: Differs from the average value for baseline conditions to a small degree.</p> <p>Medium: Differs substantially from the average value for baseline conditions and approaches the limits of natural variation.</p> <p>Major: Differs substantially from baseline conditions, resulting in a detectable change beyond the range of natural variation.</p>	<p>Short-term: Effect lasts 1 to 5 years.</p> <p>Medium-term: Effect lasts 6 to 25 years.</p> <p>Long-term: Effect lasts between 26 and 50 years.</p> <p>Far Future: Effect lasts more than 50 years.</p>	<p>Once: Effect is confined to one discrete period in time during the life of the Project.</p> <p>Sporadic: An effect that occurs at sporadic or intermittent intervals during any phase of the Project.</p> <p>Regular: Effect occurs on a regular basis during the life span of the Project.</p> <p>Continuous: Effect occurs constantly during the life of the Project.</p>	<p>Local: Effects extend less than 500 m from Project infrastructure.</p> <p>LSA: Effect is limited to the LSA (i.e., Sub-area).</p> <p>RSA: Effect extends across the broader region (e.g., RSA).</p> <p>Background: Effect extends beyond the regional scale, and may extend across or beyond the province.</p>	<p>Reversible Short-term: Effect can be reversed relatively quickly.</p> <p>Reversible Long-term: Effect can be reversed within 20 years of Post Closure.</p> <p>Irreversible: Effect cannot be reversed (i.e., is permanent).</p>	<p>Low: The receiving environment or population has a low resilience to imposed stresses, and will not easily adapt to the effect.</p> <p>Neutral: The receiving environment or population has a neutral resilience to imposed stresses and may be able to respond and adapt to the effect.</p> <p>High: The receiving environment or population has a high natural resilience to imposed stresses and can respond and adapt to the effect.</p>	<p>Low: The effect has limited ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>Medium: The effect has some ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p> <p>High: The effect has moderate ability to alter the economic base, social structure, community stability or the well-being of people in the study area.</p>	<p>High: It is highly likely that this effect will occur.</p> <p>Medium: This effect is likely, but may not occur.</p> <p>Low: This effect is unlikely but could occur.</p>	<p>High: > 80% confidence. There is a good understanding of the cause-effect relationship and all necessary data are available for the Project area. There is a low degree of uncertainty and variation from the predicted effect is expected to be low.</p> <p>Medium: 50 to 80% confidence. The cause-effect relationships are not fully understood, there are a number of unknown external variables, or data for the Project area are incomplete. There is a moderate degree of uncertainty; while results may vary, predictions are relatively confident.</p> <p>Low: < 50% confidence. The cause-effect relationships are poorly understood, there are a number of unknown external variables, and data for the Project area are incomplete. High degree of uncertainty and final results may vary considerably.</p>

Table 7.4-5. Characterization of Residual Effects, Significance, Likelihood and Confidence on Business

Residual Effect	Residual Effects Characterization Criteria							Significance of Adverse Residual Effects	Likelihood and Confidence	
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Resiliency	Social Value		Probability	Confidence
Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses	Minor	Medium-term	Sporadic	LSA	Reversible Short-term	Neutral	Low	Not Significant (minor)	Medium	Medium

- The frequency of the effect is identified as sporadic. Different occupations will be required at different times and in different numbers during Project Construction and Operations. The effect could be more pronounced during Year 2 of Construction given the large number of employees required for the Project. It could also be more pronounced when the Project moves into operations as those positions may be seen to be more desirable.
- The effect is expected to be reversible in the short-term. As noted above, the mining supply and service sector is well-established in the area. These companies are expected to have mechanisms in place to manage them.
- Resiliency to the effect is rated as neutral. It is anticipated that businesses will have mechanisms in place to manage this potential effect.
- Social value is rated as low given that the mining supply and service sector is well-established in the area and mining has been a long-standing economic driver for the City of Kamloops and surrounding area.

7.4.6.4 *Significance of Residual Effects*

Some small to medium-sized business may experience challenges associated with labour competition as a result of the Project. This could be more pronounced at certain times during the Construction and Operations phases and for certain occupations. However, similar pressures currently exist in the local mining supply and service industry and most businesses will be adept in handling them. No substantial change from current circumstances is anticipated. The residual effect is expected to be **Not Significant (Minor)**.

7.4.6.5 *Characterization of Likelihood and Confidence*

The probability of the residual effect occurring is medium. The effect is likely but not certain. The confidence level for the analysis is also medium. There are a wide range of variables that could influence whether or not the residual effect occurs and therefore a moderate degree of uncertainty.

7.4.6.6 *Summary of Residual Effects Assessment and Significance*

In summary, residual effect related to increased labour competition is expected to be Not Significant (Minor; Table 7.4-6). While it is expected that the businesses will be able to manage effectively through their own planning, KAM will engage industry through representation on the Community Liaison Group to identify and mitigate potential concerns related to labour competition. Mitigation measures may include identification of upcoming potential supply/demand challenges and joint efforts to offset these (e.g., through joint recruitment and training initiatives). The residual effect is carried forward into the cumulative effects assessment (CEA).

Table 7.4-6. Summary of Residual Effects, Mitigation, and Significance on Business

Residual Effects	Project Phase	Mitigation Measures	Significance
(Benefit) Project Employment and Procurement	Construction and Operation	Enhancement measures are detailed in Section 7.2.4.5 and include actions aimed to maximize local employment with the Project.	Not Applicable (Benefit)
Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses	Construction and Operations	Engagement with businesses and community liaison group to identify potential challenges and implement joint solutions	Not Significant (Minor)

7.4.7 Cumulative Effects Assessment

7.4.7.1 Introduction

Cumulative effects assessment (CEA) examines how the residual effects of multiple projects and/or activities can potentially interact to have an adverse effect on a VC. These interactions can be direct, indirect, additive, and synergistic.

Business is directly and indirectly tied to other economic VCs, including the income VC and the labour force, employment, and training VC. The residual effect on business relates to the potential for increased labour competition as a result of the Project, and how this may affect small to medium-sized businesses in the mining supply and service sector through competitive pressure for employees. If other projects or activities in the LSA and RSA have substantial workforce requirements that overlap with the skills and experience required by the Project, the residual effect could be exacerbated as the available labour supply becomes depleted.

7.4.7.2 Identification of Other Actions that May Affect Business

Chapter 5 (Assessment Methodology) describes the past, present, and reasonably foreseeable projects and activities that could interact with the effects of the Project. These projects are screened against the residual effects of the Project. For the Business VC, the key concern from a cumulative effects perspective is whether other projects or activities in the RSA and LSA are anticipated to have workforce requirements that overlap with the skills and experience required by the Project during the Construction and Operation phases.

7.4.7.3 Interactions between Residual Project Effects and Other Project or Activity Effects

The Construction and Operation phases are expected to occur between 2017 and 2042. Table 7.2-7 screens potential interactions with other projects and activities in terms of a cumulative effect on competition for labour. Screening considered projects with similar workforce requirements at a similar time. Of the projects and activities shown in Table 7.2-7, only potential interactions ranked “M” or “H” are subject to further assessment as potential cumulative effects. Historic projects (e.g., Vidette Lake Mine and Iron Mask Mine) do not require labour and therefore will not contribute to competition for labour; these projects are not considered further. Similarly, the labour requirements of current operations or activities are considered as part of the baseline and are not expected to change competition for labour.

Table 7.4-7. Ranking Potential for Residual Effects to Interact Cumulatively with Effects of Other Human Actions on Business

Residual Effect	Industrial Projects/Activities												Natural Resources and Land Use			Tourism and Commercial Recreation Activities					Community Infrastructure			Transportation							
	Vidette Lake Mine	Afton Mine (Historical)	Iron Mask Mine	Bonaparte Mine	New Afton Mine (New Gold)	Highland Valley Copper Mine (Teck)	Domtar Kamloops Pulp Mill	Tolko-Hefley Creek Plywood and Veneer	LaFarge Cement Plant	Trans Mountain Pipeline System (Kinder Morgan)	Trans Mountain Pipeline System - Expansion (Kinder Morgan)	Harper Creek	Highland Valley Copper - Bethlehem Expansion	Kamloops Forest District	Agriculture	Ranching	Tranquille on the Lake	Lac le Jeune Resort	Tobiano Golf Course	Recreational Hunting, Fishing, Foraging	Recreational Trails	City of Kamloops Wastewater Management	Water Treatment Centre	City Expansion and Growth	Lac le Jeune Road	Highway 1	Highway 5A	Highway 5 (Coquihalla Highway)	Kamloops Airport	Rail Yards and Lines (CP and CN)	
Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses	O	O	O	O	L	L	L	L	L	L	M	M	O	O	O	O	O	O	O	O	O	L	L	L	O	O	O	O	O	O	O

Notes:

- (-) No spatial or temporal overlap.
- O Spatial or temporal overlap, but no interaction anticipated OR No change from current condition anticipated, and already captured as part of baseline characterization. No further consideration warranted.
- L Negligible to minor interaction expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.
- M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.
- H Key interaction; warrants further consideration.

The Trans Mountain Pipeline (TMPL) Expansion and Harper Creek mine are carried through into the CEA. Each of these projects will overlap spatially and temporally with the effect of the Project and will require similar skilled workers. Therefore, these projects could interact with the residual effect of increased labour competition during the Project's Construction and Operations Phases, and is discussed further below.

Potential interactions are rated as negligible to minor ("L") for several projects and activities. With respect to existing industrial projects such as the New Afton mine, HVC mine (and planned Bethlehem expansion), and the Trans Mountain Pipeline, the negligible to minor ranking acknowledges that fluctuations in their demand for skilled labour could potentially interact with the demands of the Project. However, these activities currently exist and operate and are therefore included in the baseline, and are not expected to generate substantial new demands for skilled labour. In regard to the planned Bethlehem expansion at the HVC mine, the expansion is expected to utilize the existing workforce associated with the current HVC operation.

The City of Kamloops has expressed concerns that competition for skilled labour could affect the ability to retain businesses to construct and maintain municipal infrastructure projects. This potential effect is assessed in Chapter 8.1 (Infrastructure, Public Facilities, and Services VC).

Of the projects or activities listed in Table 7.4-8, both Harper Creek and the TMPL Expansion are considered in the cumulative effects assessment. Construction activities for both projects could potentially take place during the same period of time as the Project, although this is not certain as both Projects are still in their respective licensing phases.

- The **TMPL Expansion** project, partially located within the Project footprint, is expected to begin as early as 2016 with construction in the Kamloops area specifically taking place from the summer of 2016 through the fall of 2017. As such, there could be some overlap with Project construction. This could further constrain the anticipated labour supply and place additional strain on the small- to medium-sized businesses already facing competitive pressure from the Project. Kamloops is identified as a construction hub for one segment of the pipeline project.
- The **Harper Creek** mining project, located approximately 150 km from Kamloops is currently going through the environmental assessment (EA) application process. Construction could take place during the time frame that the Project is anticipated to be under construction.

The following scenarios describe the potential for overlap in workforce requirements related to the Project, Trans Mountain pipeline expansion and Harper Creek:

- **The Project:** During Year 1 of Project construction, between 750 and 950 employees are expected to be retained locally. Equipment operators comprise the majority of these positions, followed by skilled tradespersons. During Year 2, this will range from between approximately 850 and 1,150, with the majority of employees being in the skilled trades occupations. In Year 3, the estimated number of local hires ranges from 430 to approximately 590 employees.

It is important to note, however, that these estimates do not necessarily represent the number of workers that will be on-site at any given time. The estimates will differ on a monthly basis.

- **TMPL Expansion:** Construction in the Kamloops area is currently expected to take place from the summer of 2016 through the fall of 2017. A pumping station in Kamloops is also scheduled for construction from June 2016 through May 2017. From June 2016 through the fall of 2017, these works will require an average of up to 297 employees per month although estimates are likely to be lower as the project moves into decommissioning. Estimates suggest that between 30 and 90 employees will be sourced from the Fraser-Fort George and Thompson-Nicola Regional Districts, this amounts to approximately 30 employees on average from the combined regions. If the proposed hub location is close to Kamloops then it is likely that individuals within the RSA and LSA especially could have access to these opportunities.
- **Harper Creek:** This mine project is expected to have approximately 600 positions during construction (over 18 to 24 months, expected to begin in 2016) and peak operation employment of 466 positions. The project application notes that it may contribute to increased competition for skilled workers within the TNRD as individuals opt to work closer to home rather or work for higher salaries. With respect to the Project, the application suggests that given the transit distance and the low number of workers needed, interactions are considered of moderate risk level (ERM Consultants Canada Ltd. 2015).

Depending on the Project's final construction plan and schedule, there could be some overlap of construction activities, and therefore labour force requirements, between the Project and the construction of the TMPL Expansion and Harper Creek. If the construction phases overlap, there could be a cumulative increase in hiring and related demand for skilled workers; similar to the effect described in Section 7.4.5, this could affect the ability of small and medium-sized businesses (in the construction and mining sectors) to attract and retain employees and provide competitive salaries.

The effect would be particularly pronounced if Year 2 of Project construction overlaps with the pipeline construction activities and/or peak Harper Creek construction activities currently planned for 2016. From a labour competition perspective, adding the potential for an estimated 30 to 90 local hires (for the pipeline), up to 600 (for Harper Creek) to the Project's Year 2 Project estimates of 850 to 1152 local hires could put additional strain on small to medium-sized businesses in the mining service and supply sector.

With respect to the Trans Mountain pipeline expansion, as described in Section 7.4.5.2, it is not likely that existing employees of businesses in the LSA or RSA would choose to seek employment on the construction of the pipeline or the Project, given the relatively short period of time during which construction is expected to take place. In a similar manner, given the relatively long commute time between the Harper Creek project and the relatively small construction workforce this interaction is not expected to be result in a substantive effect on labour competition in the LSA and RSA.

7.4.7.4 *Proposed Mitigation Measures*

Potentially affected small to medium-sized businesses are expected to have mechanisms in place to accommodate or alleviate competitive pressures as required. However, KAM has proposed to engage industry through the Community Liaison Group to identify and mitigate potential concerns related to labour competition. The goal of these interactions would be to identify potential

supply/demand areas that could lead to adverse labour competition conditions for small to medium-sized businesses and work together to offset any challenges. KAM will seek input from representatives of each of the Harper Creek and TMPL Expansion projects to discuss and find solutions to alleviating these potential challenges.

7.4.7.5 Evaluation of Significance of Residual Cumulative Effects

After the implementation of mitigation measures described above, a cumulative effect may remain in relation to increased labour competition in the LSA (Table 7.4-10).

Table 7.4-10. Summary of Cumulative Effects Mitigation Measures and Residual Effects on Business

Ajax Project Activity	Other Human Action Activity	Description of Potential Cumulative Effect	Description of Mitigation Measure(s)	Description of Residual Cumulative Effect
Employment	<ul style="list-style-type: none"> Trans Mountain Pipeline Expansion Harper Creek 	Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses	Industry engagement	Increased labour competition as a result of demands for skilled labour associated with construction of TMPL Expansion and Harper Creek projects

Table 7.4-11 presents the characterization of cumulative residual effects on business. Characterization is based primarily on information collected from KPI and workshop settings as well as professional judgement.

For the potential cumulative effect of increased labour competition, the following ratings were assigned:

- The magnitude of the potential effect is considered to be minor. This is a function of the short time period during which the cumulative effect may occur, as well as the relatively small construction workforces for both Harper Creek and the Trans Mountain pipeline expansion. The small and medium-sized businesses that may have concerns with respect to Project-related wage and workforce pressures are expected to have mechanisms in place to manage these.
- The duration of the effect is expected to be medium-term (i.e., from 6 to 25 years). The potential effect could be most notable during construction, with both the Trans Mountain pipeline expansion and Harper Creek construction expected to take place at roughly the same time as Ajax construction. With respect to operations, Harper Creek's operations phase would be underway for the duration of the Project Operations phase.
- The geographic extent of this effect is expected to be the LSA as the vast majority of businesses that service the mining sector (and therefore their employee-base) are located in the immediate vicinity of the City of Kamloops.
- The frequency of the effect is identified as regular. The effect could be more pronounced during Year 2 of Construction given the large number of employees required for the Project.

- The effect is expected to be reversible in the short-term. As noted above, the mining supply and service sector is well-established in the area. These companies are expected to have mechanisms in place to manage them.
- Resiliency to the effect is rated as neutral. It is anticipated that businesses will have mechanisms in place to manage this potential effect.
- Social value is rated as low given that the mining supply and service sector is well-established in the area and mining has been a long-standing economic driver for the City of Kamloops and surrounding area.

The cumulative residual effect is expected to be **Not Significant (Minor)**. Some small- to medium-sized business may experience challenges associated with labour competition as a result of the Project. This could be more pronounced at certain times during the Construction and Operations phases and for certain occupations. These pressures currently exist in the local mining supply and service industry and most businesses will be adept in handling them. However, in order to proactively address potential concerns, KAM proposes to engage industry through the Community Liaison Group (or other forum, to be determined) to identify and mitigate potential concerns related to labour competition. The goal of these interactions would be to identify potential supply/demand areas that could lead to adverse labour competition conditions for small to medium-sized businesses and work together to offset any challenges.

The probability of the residual effect of increased labour competition, occurring in unison with a similar effect of the TMPL Expansion project, and the Harper Creek project has medium probability as these Projects are not yet approved. There is a medium confidence in this determination.

7.4.8 Conclusion

The Project is expected to provide a large number of opportunities for businesses within the LSA and RSA, including Aboriginal businesses. The Project construction phase expenditures are estimated at \$1.54 billion and Project Operations Phase expenditures are estimated at \$299 million per year (on average), or \$6.9 billion, of the 23-year operations phase. Given the Project's proximity to Kamloops and the scope of business currently engaged in the mining industry both directly and indirectly, it is expected that a large proportion of Project contracting needs will be addressed by local or regional businesses.

During the Construction Phase, local expenditures are expected to be sizable, although the local percentage will likely be lower given that some major equipment purchases will have to be sourced nationally and internationally. During the Operation Phase average annual local expenditures of between \$75 to \$105 million could occur in the Kamloops area alone. Business opportunities for local contractors will also be available during the decommissioning and closure, and post-closure phases, although expenditures and related businesses opportunities will progressively decrease over these phases.

Table 7.4-11. Characterization of Cumulative Residual Effects, Significance, Likelihood and Confidence on Business

Cumulative Residual Effect	Residual Effects Characterization Criteria							Significance of Adverse Residual Effects	Likelihood and Confidence	
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Resiliency	Social Value		Probability	Confidence
Increased labour competition as a result of demands for skilled labour associated with construction of TMPL Expansion and Harper Creek projects	Minor	Medium-term	Regular	LSA	Reversible Short-term	Neutral	Low	Not Significant (minor)	Medium	Medium

Benefits are also expected to accrue to local businesses from other VCs like Labour Force, Employment and Training, and Income. The large workforce requirements during the Construction and Operations phases will provide opportunities for a broad range of occupations. It is expected that much of the anticipated workforce will be supplied from within the LSA and RSA. Wage income received from Project direct employment will benefit the local businesses and economy as this income is spent within the LSA and RSA on goods and services.

The Project’s demand for skilled labour during Construction and Operation phases may increase competition for labour in the LSA. The relatively high-paying jobs with the Project could draw skilled workers to Project employment and make it challenging for local businesses that rely on the same skilled workers to find and retain labour. This could also put pressure on local businesses to wage raises in response. While it is expected that the businesses will generally be able to manage effectively through their own planning, KAM will engage industry through representation on the Community Liaison Group to identify and mitigate potential concerns related to labour competition.

There exists the potential for interactions related to increased labour competition and construction activities as a result of the proposed Harper Creek mine and the Trans Mountain pipeline expansion projects. Construction activities for both projects could potentially take place during the same period of time as the Project, although this is not certain as both Projects are still in their respective licensing phases. The Project Operations overlaps that of Harper Creek, which is located 150 km from Kamloops. Industry engagement is identified as a tool to help offset potential challenges related to increased labour competition.

Table 7.4-12. Summary of Project and Cumulative Residual Effects, Mitigation, and Significance for Business

Residual Effects	Project Phase	Mitigation Measures	Residual Effect Significance	Residual Cumulative Effect Significance
Benefit: Project Employment and Procurement	Construction and Operation	Employment and procurement of local business services	Not Applicable (Benefit)	Not Applicable (Benefit)
Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses	Construction; Operations	Engagement with local business community and Community Liaison Group to jointly address challenges	Not Significant (Minor)	Not Significant (Minor)

7.5 PROPERTY VALUES

7.5.1 Rationale

With respect to Property Value, concerns expressed to date have largely focused on specific residential neighbourhoods in the City of Kamloops (e.g., Aberdeen, Pineview Valley) and Knutsford. In addition, concerns have also been noted by rural residents in the vicinity of the Project. Potential effects on Property Value are typically considered in environmental assessments (EAs) when a proposed project overlaps or is in close proximity to private properties; this situation is often applicable to and associated with linear developments, such as pipelines and transmission lines. Property values are also sometimes considered where a proposed project could result in population increase (e.g., an influx of workers), which could increase property and rental prices through increased demand.

The inclusion of Property Values as a VC for the Ajax Project (the Project) arises from the proximity of the Project to the City of Kamloops and residential areas. Concerns expressed to date have focused on the possibility that property values (primarily residential) could decline as a result of the presence of the Project and related environmental and aesthetic changes (Table 7.5-1). Other parties have acknowledged that the Project will likely not have an effect on property values in Kamloops. In other words, some residents are concerned that the presence of the Project could make nearby neighbourhoods less desirable to live in, and thus, influence the property markets in these areas. Key considerations with respect to Property Values include concerns regarding how effects on other VCs, including Air Quality and Noise and Vibration, could influence property values over time. Although concerns to date have focused on residential properties, Application Information Requirements/Environmental Impact Statement Guidelines (AIR/EIS Guidelines), the assessment will consider potential effects on residential, commercial, industrial, and agricultural properties.

Table 7.5-1. Rationale for Including Property Values in Application/EIS as a VC

Valued Components	Identified by*				Rationale for Inclusion
	AG	G	P/S	SK	
Property Values		X	X		Local residents have expressed concern that the presence of the Project and associated environmental effects could decrease residential property values, particularly for residential neighbourhoods located closest to the Project.

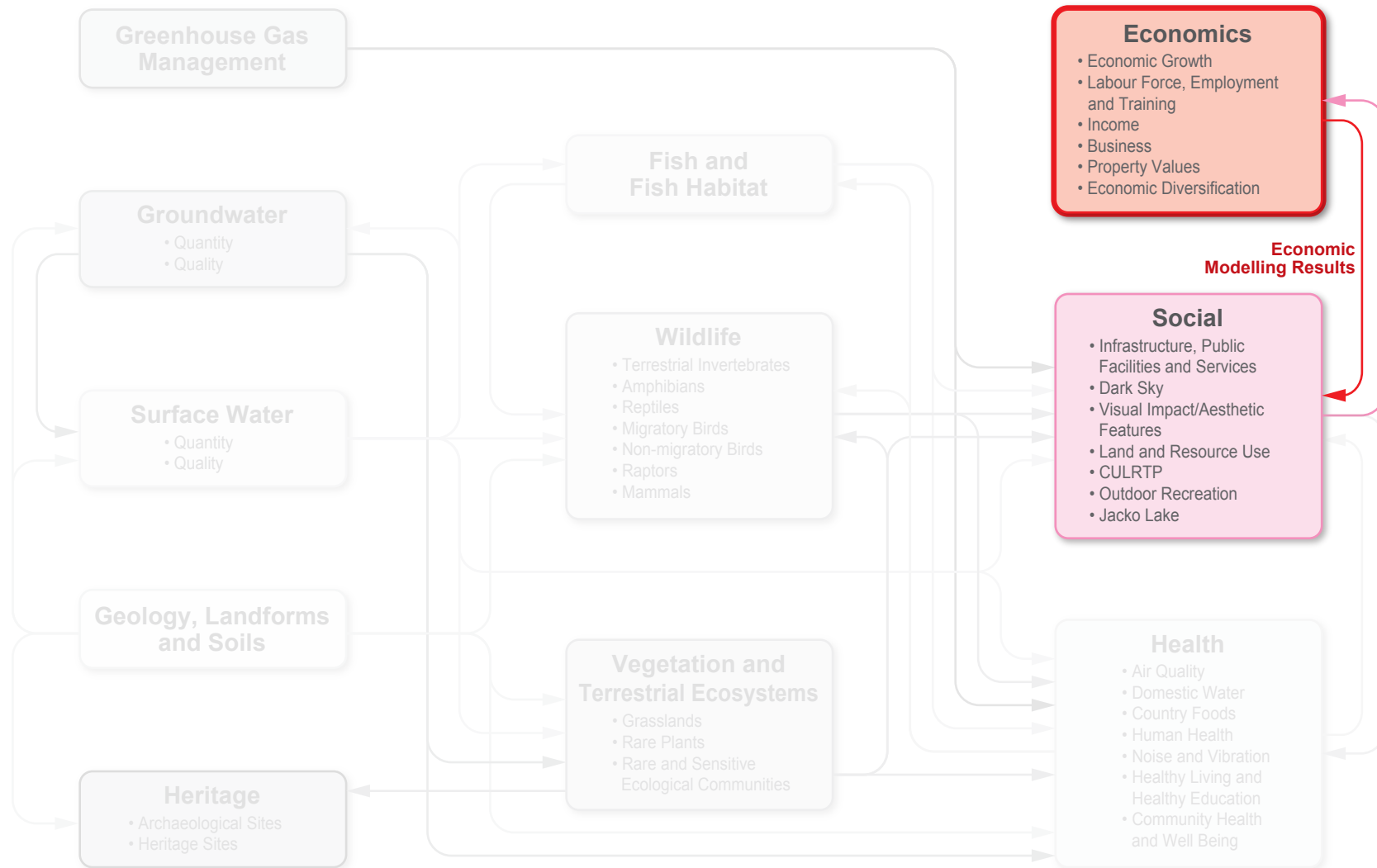
*AG = Aboriginal Group; G = Guideline Requirement; P/S = Public/Stakeholder; SK = Scientific/professional knowledge.

Figure 7.5-1 shows the interactions between economic and other types of VCs.

7.5.2 Background

This section provides a summary of the current real estate market, with a focus on real estate in Kamloops, including characteristics and trends in Kamloops for residential real estate, commercial and industrial real estate, agricultural real estate, and, where feasible and relevant, commentary.

Figure 7.5-1
Inputs to Economic Valued Components



7.5.2.1 *Regional Overview*

The Project is located within the Thompson Nicola Regional District (TNRD), an area in the British Columbia (BC) interior that includes both urban and rural landscapes. The TNRD describes itself as an area that “offers the best of both worlds. Urban life within vibrant communities, and outlying rural regions that showcase the region’s beauty – pristine but rugged mountains, rolling grasslands, lush evergreen forests and both historic and modern areas all within approximately 45,000 square kilometers” (TNRD 2013).

7.5.2.2 *Historical Activities*

Kamloops, and the surrounding region, has a long history of human activity that contributes to the current baseline condition, which is defined more specifically in the following section of this assessment.

Following the completion of the transcontinental railroad in 1885, the population around the City of Kamloops grew rapidly, approaching about 500 people by the turn of the twentieth century. During this time, the City was incorporated and established a public works system. Key economic drivers included the timber industry and agriculture (vegetables, orchards). The City’s population grew steadily with the exception of two periods: during the Depression and after the Second World War. After this period, the population began to grow again, and much of the land that had formerly been used for agricultural purposes in the valley was used for residential development. Ranching (including cattle grazing) also developed, and currently occurs immediately within and adjacent to the Project. Mining activities have also served as a key economic driver since the early 1900s.

7.5.2.3 *Baseline Studies*

Socio-economic baseline studies were undertaken from 2011 through to 2015, with a focus on more recent data, and included consideration of primary and secondary data sources. Given the location of the Project adjacent to city boundaries, the baseline studies primarily sought to understand trends in property values within Kamloops, and in particular in the neighbourhoods closest to the Project (i.e., the southwest sector of the City, including the residential neighbourhoods of Pineview Valley, Aberdeen, and Upper Sahali, and the rural area of Knutsford). The intent of these studies was to provide a starting point on which to base the prediction of potential Project effects. Baseline information is summarized below, and more detailed baseline findings are in the Ajax Project Socio-economic Baseline (Appendix 7.1-A).

Data Sources

The baseline studies for Property Values were based on a combination of primary and secondary sources. Primary sources included interviews, focus groups, and workshops with individuals who expressed concerns regarding potential property value effects, as well as individuals who have knowledge regarding the local housing market and the factors that influence it. These interviews, workshops, and focus groups took place at various times from 2011 through 2014. Key contributors to the discussions on potential effects on Property Values include representation from:

- City of Kamloops;
- Thompson-Nicola Regional District;

- Developers;
- Local realtors; and
- Property owners.

Secondary data sources include a variety of publicly available resources such as government statistics, housing market statistics, academic literature, and municipal documents (e.g., community plans).

Consultation activities undertaken with the Aboriginal Groups during the Pre-Application period included capacity building and funding, Traditional Knowledge/Traditional Land Use (TK/TLU) studies, community meetings, site tours, and meetings with Aboriginal Group representatives (see Section 4.3). Multiple attempts have been made to engage each Aboriginal Group to seek the baseline data required for the Application/Environmental Impact Statement (EIS), including the circulation of baseline documentation for review and comment. The information gathered through this engagement has been incorporated in the Application/EIS and considered in the assessments. In some cases, the requested information was not available from Aboriginal Groups or from secondary sources at the time of writing. Where appropriate, additional information made available by Aboriginal Groups will be considered in Project development plans.

Methods

A combination of primary and secondary data was collected to characterize the existing baseline conditions. Secondary sources were analyzed for gaps and, where possible, interviews were arranged to help fill those gaps. To determine the approach, available literature, including other EISs and consultation records were examined before determining the data required to describe the baseline. Quantitative and qualitative data were collected through interviews conducted through key person interview (KPI) program and a workshop on property values.

Characterization of Property Values Baseline Condition

The following sections summarize current conditions and trends for residential, agricultural, industrial, and commercial real estate in Kamloops. The discussion of residential property will focus on the neighbourhoods closest to the Project (Pineview Valley, Aberdeen, Upper Sahali, and Knutsford) and the rural residences that are in close proximity to the Project Site boundary (see Figure 7.5-4 for a map of the Local Study Area [LSA], including the neighbourhoods included in the assessment and Project infrastructure).

Residential Properties

Kamloops is situated in the Thompson River valley. The community has a variety of different neighborhoods at different elevations (Figure 7.5-2). Residents and home owners select neighborhoods depending on the features they desire in a property (e.g., views, accessibility). Homes in valley neighbourhoods such as Westsyde, Brocklehurst, Dallas, and Valleyview tend to have level yards and be a few degrees warmer, which allows for more gardening options and driveways that are easier to access. In the surrounding hills, lots in Aberdeen, Rose Hill, Sahali, Dufferin, and Batchelor Heights neighbourhoods tend to have sloping properties and are prized for their views. There are long-term residents in every sector of the Kamloops who prefer their location

for specific reasons and move within in the same sector when upgrading or downsizing. The North Shore is sometimes identified as an accessible neighborhood for a starter home because prices there are lower overall (Ajax KPI Program 2011-2012).

The southwest sector of the City, which includes the Aberdeen neighbourhood, has been expanding since the 1980s, and is the sector identified in the Kamloops Official Community Plan (KAMPLAN) as having the most growth potential. The neighbourhood has been the target area for most municipal spending on infrastructure (City of Kamloops 2004). Aberdeen has a mix of high-end and starter housing, as well as a mobile home park and numerous condominium complexes.

Aberdeen is the closest residential neighbourhood to the Project, as the southern edge of this neighbourhood is approximately 2 km from the northern extent of the Project (Figure 7.5-4). House prices in Q1 and Q2 of 2015 ranged from the \$160,000-\$199,999 price range to over \$600,000 (Figure 7.5-3). In the first half of 2015, 112 residential properties in Aberdeen had been sold in this year, which represents 11.3% of home sales in the Kamloops Division.¹ This may in part be accounted for by the relative size and level of development activity in the neighbourhood. Both the price range and unit sales volume for Aberdeen have remained comparatively one of the highest in Kamloops for the past decade. Appendix 7.1-A (Section 2.4-Property Values) includes additional information on historical property sales in Kamloops.

Pineview Valley is located west of Aberdeen and approximately 3.5 km north from the northern extent of the Project Site (Figure 7.5-2). House prices in Q1 and Q2 of 2015 settled in the \$280,000-\$319,999 price range to \$520,000-\$559,999 price range. Of all the residential properties sold in the Kamloops Division in the first half of 2015, less than 2% were in Pineview Valley, likely due to fewer residential plots and the area not being as extensively developed as other neighbourhoods; in addition, part of the neighbourhood is zoned for industrial and commercial development (Figure 7.5-4).

The Kamloops and District Real Estate Association (KDREA) does not separate Lower and Upper Sahali when reporting data. As a result, home prices and sales are reported for Sahali. Upper Sahali is northeast of Aberdeen and is approximately 3 km from the northern extent of the Project Site (Figure 7.5-4). Lower Sahali is north of Upper Sahali. In Q1 and Q2 of 2015, home prices ranged from the \$80,000-\$119,999 price range to the over \$600,000 price range. In the first half of 2015, a comparable number of residential properties were sold in Sahali as were sold in Aberdeen: 97 properties, which represents 9.8% of residential sales in the Kamloops Division.

Knutsford is east of the Project. The northern portion of the neighbourhood is within Kamloops city limits and the southern portion is in the TNRD. There are residences located directly east of the Project on Long Lake Road and the nearest land parcels (with homes) are approximately 2 km from the western extent of the Project Site. In addition to residential properties in Knutsford, plots in the TNRD were assessed as residential by BC Assessment on the western side of the Project between Lac Le Jeune Road and Highway 5. These parcels tend to be larger and are assessed as both agricultural

¹ Sub-areas included in the Kamloops Division are Aberdeen, Barnhartvale, Batchelor Heights, Brocklehurst, Campbell, Cherry Creek/Savona, Dallas, Dufferin/Southgate, Heffley, Juniper Heights, Knutsford-Lac Le Jeune, McLure/Vinsula, Monte lake/Westwold, North Kamloops, Paul Lake, Pinantan, Pineview Valley, Pritchard, Rayleigh, Red lake, Sahali, South Kamloops, South Thompson, Sun Peaks, Sun Rivers, Tobiano, Valleyview, Westmount, and Westsyde (KDREA 2015a).

and residential (TNRD 2015). They are located within 1 km of Project infrastructure. According to statistics from KDREA, five homes in the Knutsford-Lac Le Jeune sub-area sold during the first half of 2015. This sub-area is not heavily developed and parcels tend to be larger, therefore, the low volume of sales is expected. Prices ranged from less than \$40,000 to over \$600,000.

Commercial Properties

Commercial real estate is used for a variety of purposes, including retail and office space. There are numerous commercial districts of various sizes in the different neighborhoods of Kamloops. Some of the larger commercial districts include the City Centre, the North Shore Town Centre, the Tranquille Commercial District, the Southwest Sector Commercial Area, and the Southeast Area Commercial District (City of Kamloops 2004).

In the last 15 years, the Southwest Sector Commercial Area has undergone rapid expansion, with the addition of numerous new retail businesses and restaurants on McGill Road, Notre Dame, Summit Drive, Hillside Drive, as well as new hotels on Rogers Way and Hugh Allan Drive and neighboring streets. The closest area zoned for commercial use to the Project is approximately 3 km north of the northern extent of the Project Site (Figure 7.5-4).

The vacancy rate for retail inventory in Kamloops decreased between Q3 2013 and Q3 2014 (Colliers International 2014a), but has since increased (Colliers International 2015a). The change in vacancy rate is likely in part due to the increased retail inventory, which rose from 5,117,000 sqft (square feet) in Q3 2014 to 5,144,980 sqft in Q2 2015.

The vacancy rate for office space in Kamloops increased between Q3 2013 and Q3 2014 and has held fairly steady through Q2 2015 (Colliers International 2014b, 2015b). Sub-areas outside of the City Centre tended to have higher vacancy rates. The initial increase in vacancy rates was due to an increase in new construction (Colliers International 2014b, 2015b).

Industrial Properties

Kamloops has industrial areas located throughout the City (Table 7.5-2 and Figure 7.5-4). Based on the most recently available inventory, a number of the industrial areas, such as the Iron Mask and Old City Yard sites, were underused. The Iron Mask East and West Industrial Parks are located near the junction of Hwy 5 and Hwy 1 at the southwest entrance of the City, and are the closest industrial parks to the proposed Project site. They are over 6 km northwest of the Project.

In addition to the industrial parks presented in Table 7.5-2, the Tk'emlúps te Secwépemc (TteS) operates the Mt. Paul Industrial Park on Kamloops IR 1 (see Figure 7.5-6 for location of reserve parcel). The industrial park can accommodate 350 tenants (TteS 2015).

With the exception of the Iron Mask Industrial Park, there is comparatively little industrial land in the southwest sector of the city (Ajax KPI Program 2011-2012). The City of Kamloops undertook a review of industrial lands in 2011, resulting in a recommendation that heavy industries which could potentially impact air quality should be located out of the valley. The Iron Mask site, which sits at a higher elevation than sites closer to the river, was recommended as a location for such industries (City of Kamloops 2011).

Figure 7.5-2
City of Kamloops Neighbourhoods

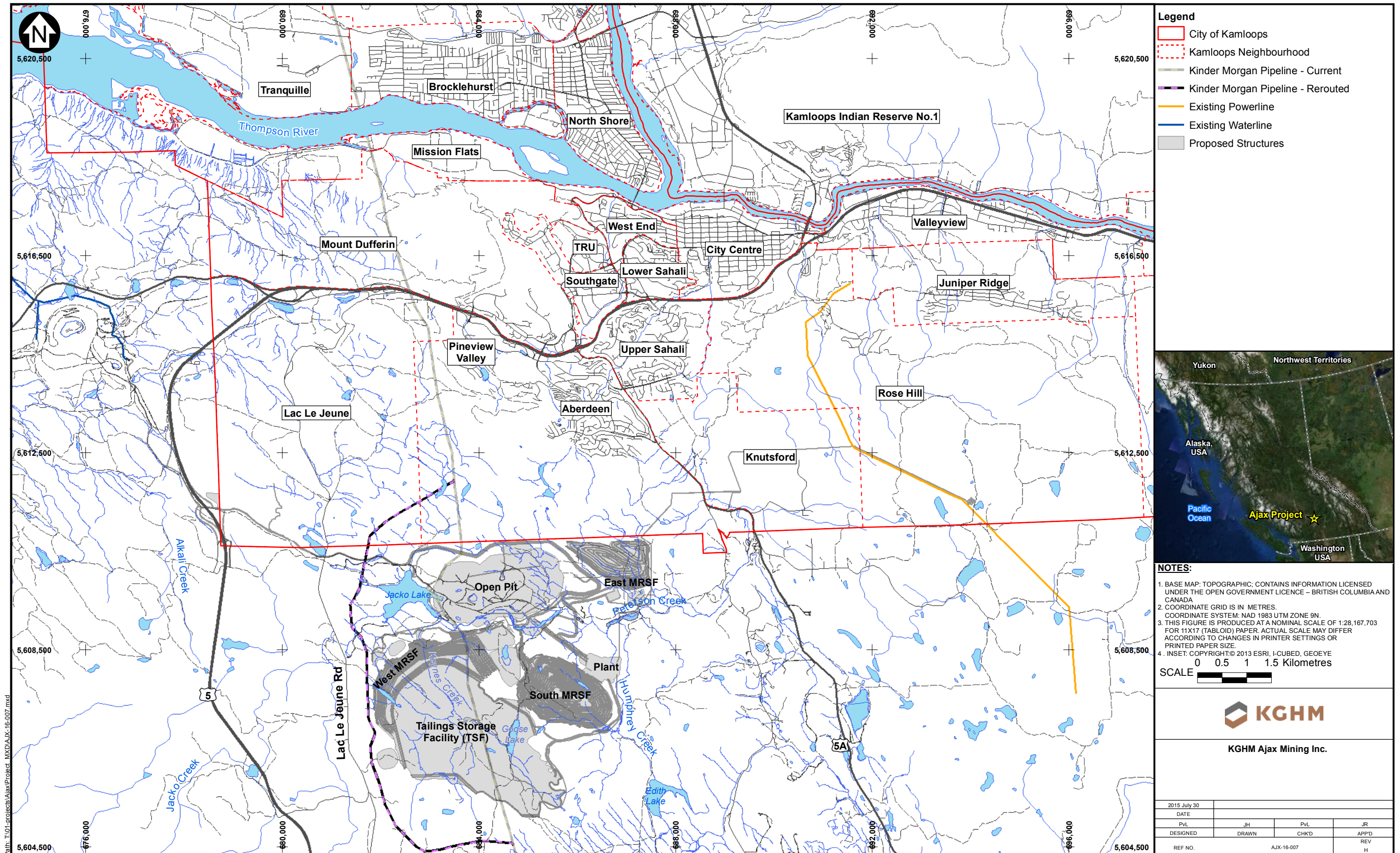
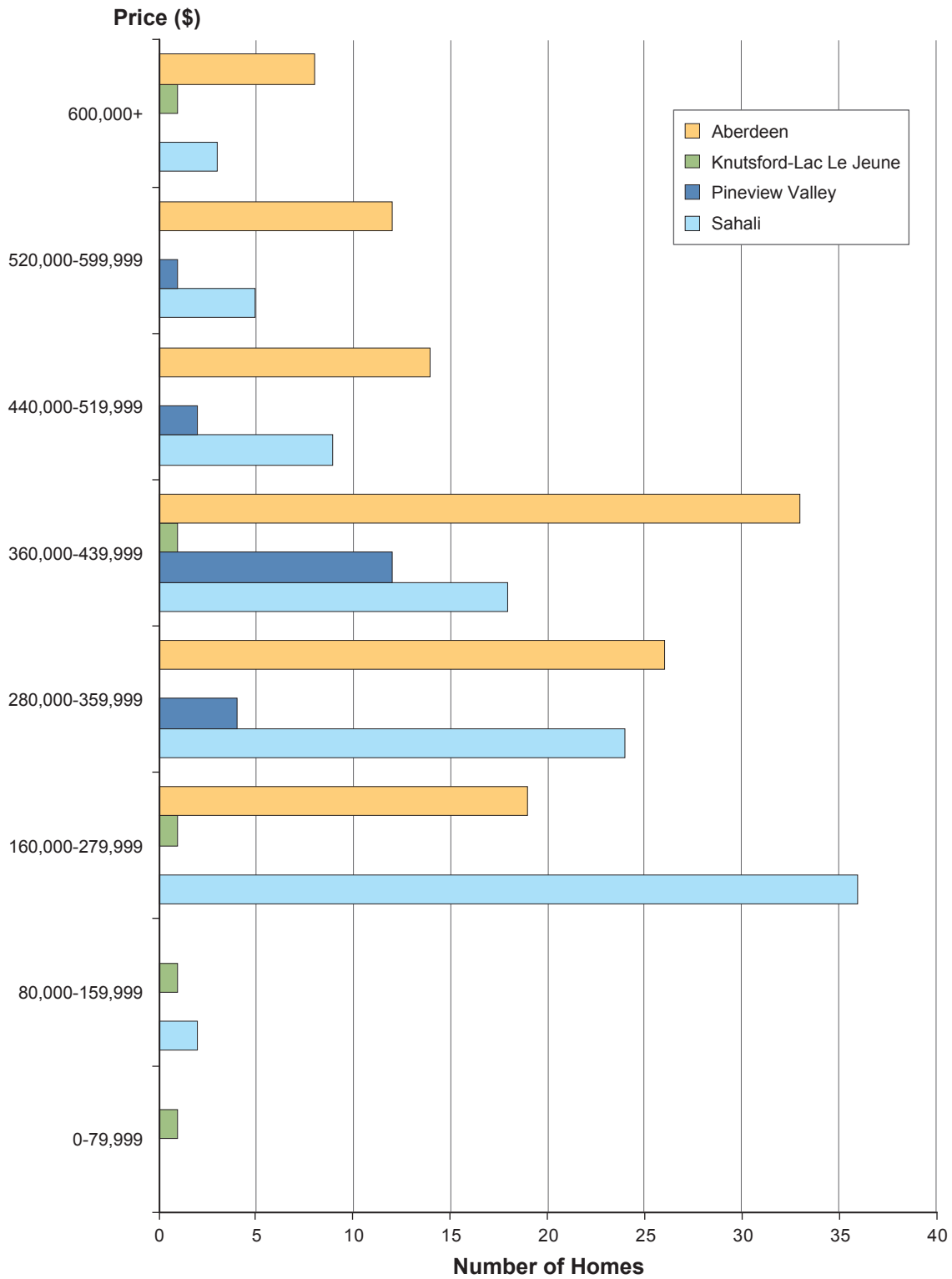


Figure 7.5-3

Homes Sold in Aberdeen, Knutsford-Lac Le Jeune, Pineview Valley, and Sahali, Q1 and Q2 2015



Includes homes, condominiums, apartments, and mobile homes

Table 7.5-2. Industrial Sites, City of Kamloops

Industrial Areas	Total Area	Number of Parcels
Ord Road	14.34 ha	24
Tranquille Road	30.92 ha	5
Airport	46.5 ha	2
Mission Flats	174.09 ha	11
Old City Yard	13.27 ha	27
McGill Road	72.49 ha	39
Southgate	41.7 ha	77
Iron Mask East	94.3 ha	21
Iron Mask West (expansion area included)	73.78 ha	14
Bowers	10.58 ha	30
Campbell Creek East	111.18 ha	29
Campbell Creek West	74.61 ha	33
Kelly Douglas	18.09 ha	13
Tolko	44.8 ha	7
Domtar Lands	697.8 ha	9

Source: City of Kamloops 2011.

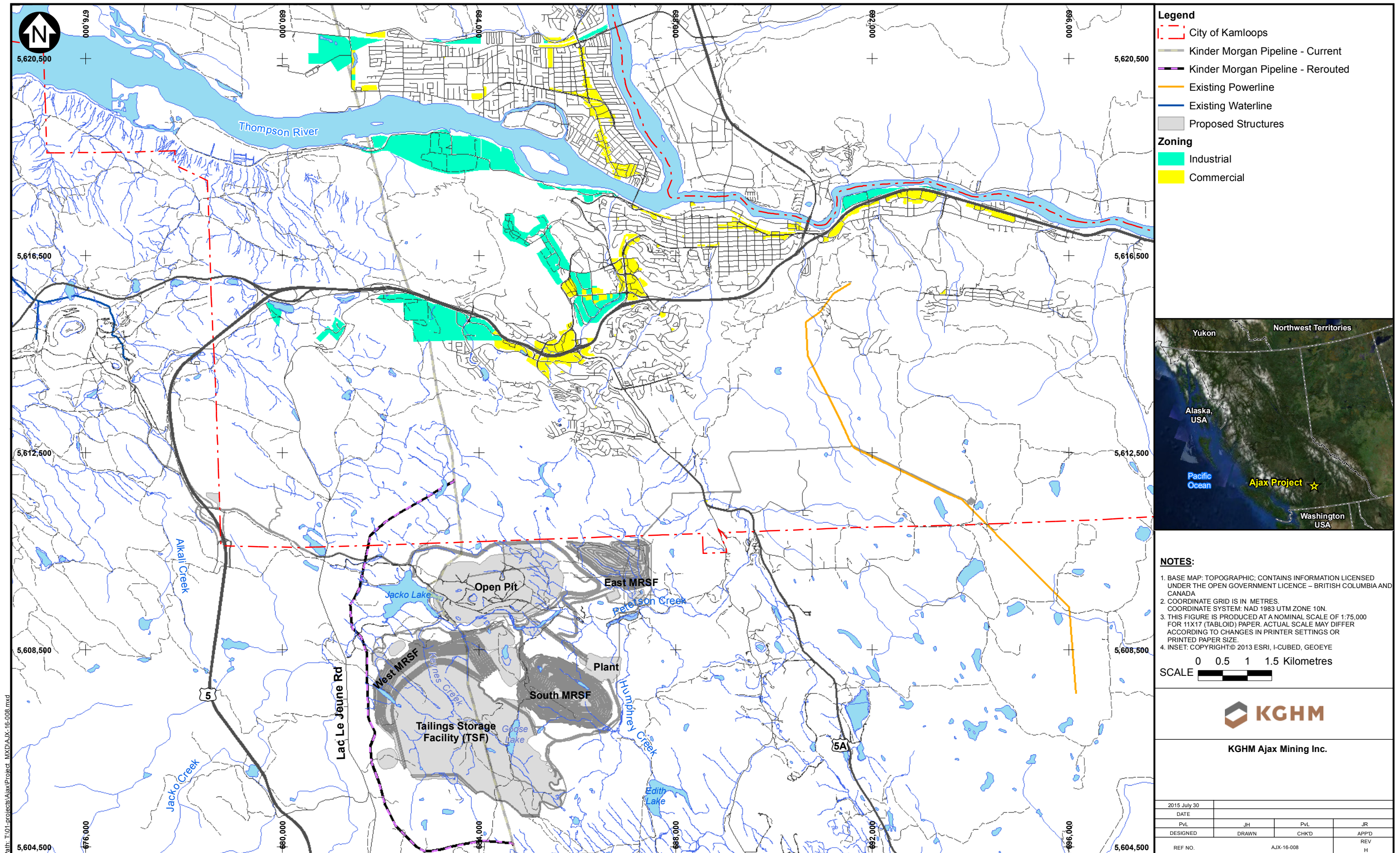
Vacancy rates for industrial property decreased between Q3 2014 and Q2 2015 (Colliers International 2014c, 2015c).

Agricultural Properties

The proposed Project is located in the Agricultural Land Reserve (ALR), a provincially designated zone in which agriculture is recognized as the priority use. In this zone, farming is encouraged and non-agricultural land uses are controlled. Much of the agricultural land that borders the Project Site is held by Sugarloaf Ranch, which has been acquired by KGHM Ajax Mining Inc (KAM). There are other private landowners with properties bordering the Project as well. Many of these landowners hold multiple parcels and have a residence on one of them. Residences that are located on agricultural property are included in discussions of residential property values.

Cattle ranching is the primary agricultural activity in proximity to the Project (See Section 8.4, Land and Resource Use for more details). In BC, farmland value was relatively stable from 2009 to 2012 varying less than one percent annually. In 2013, there was an increase of 3.0% (Farm Credit Canada 2014). According to KDREA (2015), there are fewer farm properties for sale compared to other property types. For example, there were only 25 properties classified as farms for sale at the end of June 2015.

Figure 7.5-4
City of Kamloops Industrial and Commercial Lands



7.5.3 Assessment Boundaries

Assessment boundaries define the maximum limit within which the effects assessment is conducted. They encompass the areas within, and times during which, the Project is expected to interact with the VCs, as well as the constraints that may be placed on the assessment of those interactions due to political, social, and economic realities (administrative boundaries), and limitations in predicting or measuring changes (technical boundaries). The definition of these assessment boundaries is an integral part in scoping for Property Values and encompasses possible direct, indirect, and induced effects of the Project on Property Values, as well as the trends in processes that may be relevant.

7.5.3.1 *Spatial Boundaries*

Local Study Area

The Local Study Area (LSA) is composed of the four neighbourhoods that are located closest to the Project and are therefore more likely to experience Project effects than other neighbourhoods. The neighbourhoods are Pineview Valley, Aberdeen, Upper Sahali, and Knutsford as well as a portion of Lac Le Jeune Road. The LSA extends south of the Kamloops municipal boundary and includes land designated for agricultural use according to the Kamloops South Official Community Plan (TNRD 2011). See Figure 7.5-5 for a map of the LSA.

Regional Study Area

The Regional Study Area (RSA) is the area defined by the City of Kamloops; the Kamloops South Official Community Plan to the south of the municipal boundary; and the Kamloops 1 IR. These areas were included because they could potentially experience Project effects related to air quality, visual quality, or other changes. Please see Figure 7.5-6 for a map of the RSA.

7.5.3.2 *Temporal Boundaries*

Potential Project effects on Property Values are expected to be primarily associated with the Construction and Operations phases of the Project, although potential effects during Decommissioning and Closure will also be considered. The duration of the Project phases are:

- **Construction:** 2 years;
- **Operation:** 23 years;
- **Decommissioning and Closure:** 5 years (includes project decommissioning, abandonment and reclamation activities, as well as temporary closure, and care and maintenance); and
- **Post Closure:** 5+ years (includes ongoing reclamation activities and post-closure monitoring).

7.5.3.3 *Administrative Boundaries*

Data sets used for baseline information on property values and trends in property values may not have consistent spatial boundaries.

- The Canada Mortgage and Housing Corporation uses census divisions and subdivisions for reporting. For Kamloops, it uses the Kamloops Census Agglomeration, which includes Chase, Kamloops, Kamloops 1 IR, Logan Lake, Sahhalkum 4 IR, Sun Peaks Mountain, Thompson-Nicola J (Copper Desert Country), Thompson-Nicola P (Rivers and the Peaks), and Whispering Pines 4 IR (Statistics Canada 2013).
- Statistics published by the Kamloops District Real Estate Association do not distinguish between Upper and Lower Sahali and report statistics for Sahali.

7.5.3.4 *Technical Boundaries*

Technical boundaries are identified in connection with the diversity of factors affecting property values, many of which are outside the influence of the Project. This makes it difficult to predict future changes to property values, especially in connection with specific Project-related effects.

In addition, there are minimal centralized reporting mechanisms for various types of property, which creates difficulties in presenting assessing effects of residential, agricultural, commercial, and industrial properties in the LSA and RSA.

7.5.4 **Potential Effects of the Project and Proposed Mitigation for Property Values**

This section assesses the potential effects of the Project on property values.

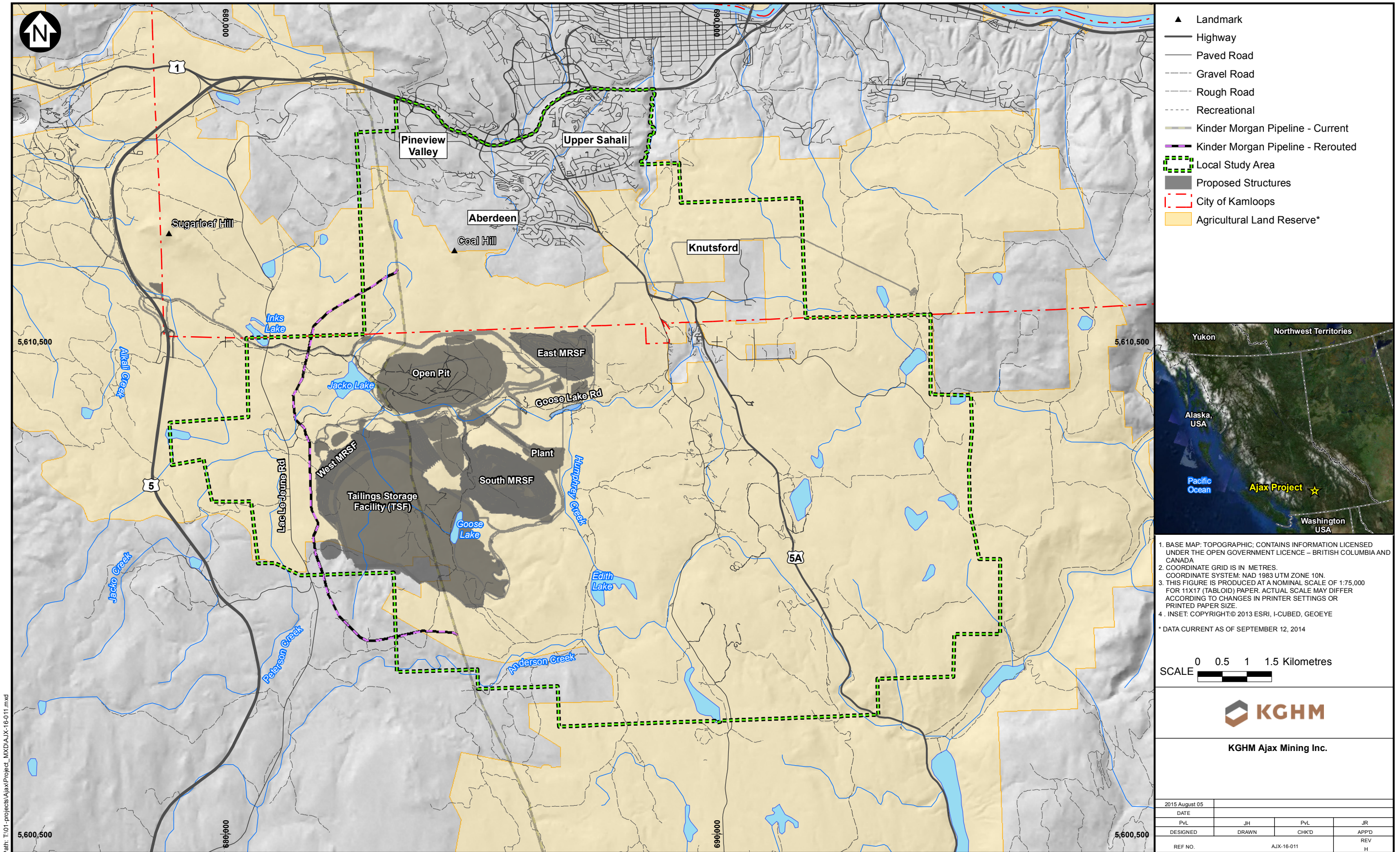
7.5.4.1 *Identifying Potential Effects on Property Values*

The pathways by which the Project could affect Property Values vary depending on the type of property and the characteristics important to its use. Table 7.5-3 identifies potential influences on the value of residential, agricultural, commercial, and industrial properties. The potential influences, or pathways, are identified based on the VCs assessed for the Project, including labour force (which could lead to population growth), nuisance factors (noise, vibration), changes in visual quality, Project infrastructure (including the transmission line), environmental health (air quality), and easements and rights-of-way across private property.

While certain environmental effects of Project Construction and Operation could influence the desirability of affected properties (e.g., drilling and blasting causing noise and vibration), comments made during public engagement suggest that the development of the Project itself—even in the absence of measurable environmental effects—is a concern for some residents of Kamloops, including those in the neighbourhoods closest to the Project (i.e. the LSA: Pineview Valley, Aberdeen, Upper Sahali, and Knutsford).

The interaction matrix presented in Table 7.5-4 is presents the Project activities and components during Construction and Operation, and identifies how they may contribute to a potential effect on property values. For a detailed breakdown of potential interactions between the various factors that may affect Property Values, refer to the comparable tables in the assessments of Air Quality (Section 10.1), Noise and Vibration (Section 10.5), Visual Impact and Aesthetic Features (Section 8.3), and Grasslands (Section 6.10).

Figure 7.5-5
Local Study Area



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Figure 7.5-6
Regional Study Area

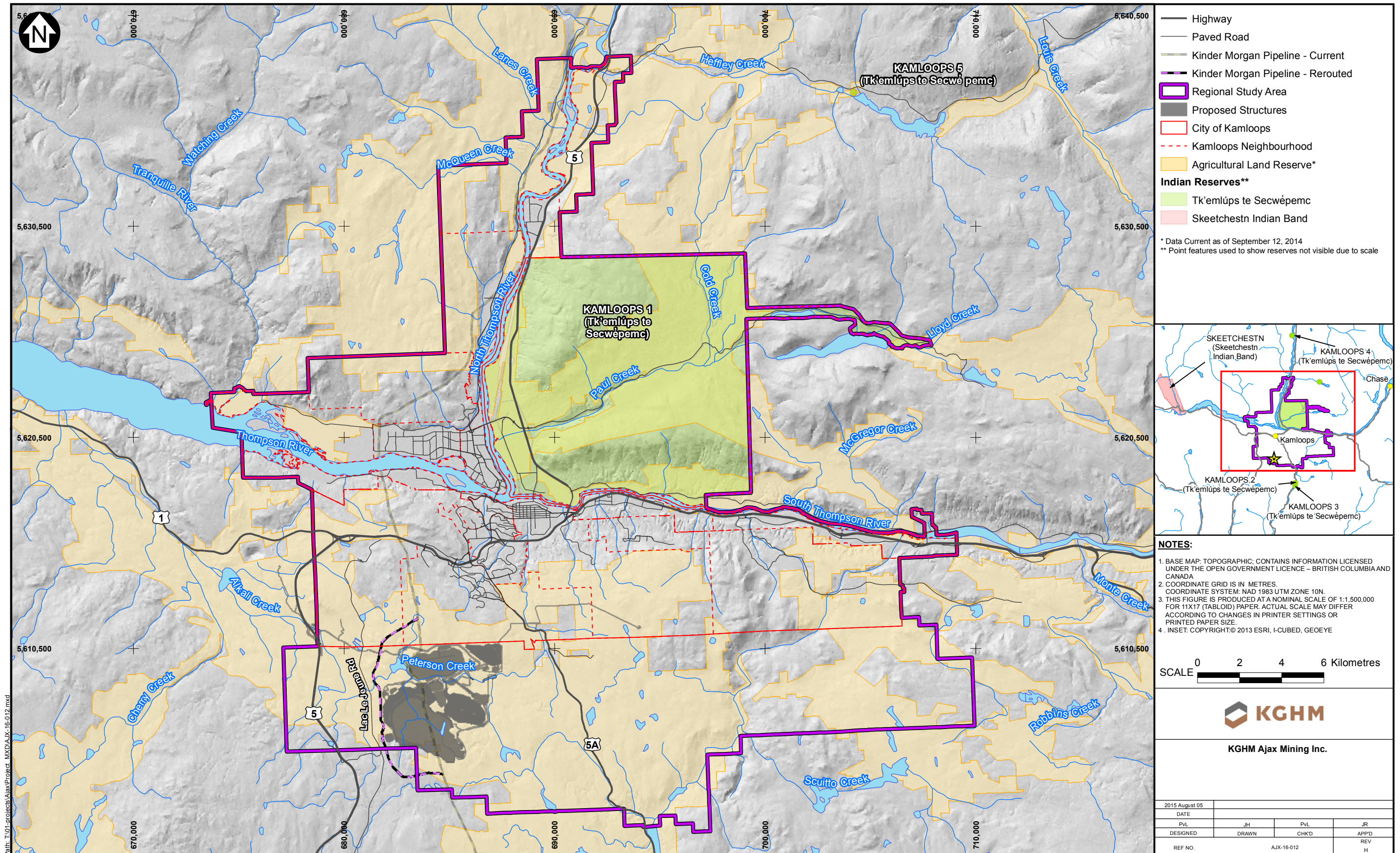


Table 7.5-3. Potential Influence on Property Values

Potential Pathway / Link to Project	Residential Property	Agricultural Property	Commercial Property	Industrial Property
<p>Labour force and population growth: An influx of population during the Operation Phase could increase demand for housing in the LSA and RSA, potentially increasing residential property prices. During Decommissioning and Closure, an out-migration of workers could increase the number of houses on the market, potentially decreasing residential property prices.</p>	X			
<p>Air quality: Decreased air quality could decrease the desirability of residential and agricultural properties.</p>	X	X		
<p>Noise: Increased noise levels due to Project activities could decrease the desirability of residential properties.</p>	X			
<p>Vibration: Increased vibration from Project activities (e.g., blasting) could be found annoying or could cause structural damage, which could lower the value of residential, agricultural, commercial, and industrial property.</p>	X	X	X	X
<p>Visual impact: View of Project infrastructure, including transmission line, may disrupt viewsheds and make residential properties less desirable.</p>	X			
<p>Changes to Vegetation: Project activities may remove areas where grazing occurs or alter the quality of vegetation and reduce the value of agricultural properties.</p>		X		
<p>Easements and Rights of Way (Transmission Line): Easements and rights of way for transmission line may affect future improvements to property or affect agricultural use.</p>		X		

Table 7.5-4. Identifying Potential Project Interactions and Effects on Property Values

Project Activities		Potential Effects on Property Values			
		Changes to Residential Property Values	Changes to Agricultural Property Values	Changes to Commercial Property Values	Changes to Industrial Property Values
Construction	Clearing and Grubbing	M	M	L	L
	Earthworks	M	M	L	L
	Overburden/Topsoil Stockpile	M	M	L	L
	Laydown Areas and Storage Yards	M	M	L	L
	Project Lighting	M	M	L	L
	Site Security and Fencing	M	M	L	L
	Fuel Storage and Filling Area	M	M	L	L
	Hazardous Wastes Transport, Storage, and Disposal	M	M	L	L
	Construction Wastes Transport, Storage, and Disposal	M	M	L	L
	Sewage Infrastructure and Disposal	M	M	L	L
	Public Road Realignment, Use, and Maintenance	M	M	L	L
	Site Road Construction, Use and Maintenance	M	M	L	L
	Haul Truck Road Construction, Use, and Maintenance	M	M	L	L
	Site Buildings and Process Plant	M	M	L	L
	Explosives Magazine and Storage Facilities	M	M	L	L
	Open Pit Development	M	M	L	L
	Drilling and Blasting	M	M	L	L
	Crushing Mine Rock	M	M	L	L
	Loading, Hauling, and Deposition of Mine Rock	M	M	L	L
	Temporary Ore Stockpile	M	M	L	L
	Tailing Storage Facility Development	M	M	L	L
	Power Transmission, Distribution	M	M	L	L
	Natural Gas Line	M	M	L	L
	Pipeline Utility Corridor (Potable Water, Sewage, and Site Water)	M	M	L	L
	Water Intake from Kamloops Lake	M	M	L	L
	Fire Suppression Infrastructure	M	M	L	L
	Contact Water	M	M	L	L
	Non-contact Water	M	M	L	L
	Haul Truck Road	M	M	L	L
	Water Management Dams	M	M	L	L
	Mine Staffing (Direct Employment)	M	M	L	L
	Contracted Employment	M	M	L	L
Taxation	M	M	L	L	

Project Activities		Potential Effects on Property Values			
		Changes to Residential Property Values	Changes to Agricultural Property Values	Changes to Commercial Property Values	Changes to Industrial Property Values
Operation	Open Pit Development	M	M	L	L
	Drilling and Blasting	M	M	L	L
	Hauling Mine Rock and Ore from Pit	M	M	L	L
	Crushing and Conveying Ore	M	M	L	L
	Temporary Ore Stockpile	M	M	L	L
	Development of Mine Rock Management Facilities	M	M	L	L
	Stripping, Loading, Hauling, Deposition, and Contouring of Topsoil and Overburden	M	M	L	L
	Revegetation through Progressive Reclamation	M	M	L	L
	Process Plant Operation	M	M	L	L
	Deposition to Tailing Storage Facility	M	M	L	L
	Site Road Use and Maintenance (Materials, Personnel, Supplies)	M	M	L	L
	Concentrate Transport and Storage	M	M	L	L
	Explosives Magazine and Storage Facilities	M	M	L	L
	Fire Suppression Infrastructure	M	M	L	L
	Fuel Storage and Filling Area	M	M	L	L
	Hazardous Wastes Transport, Storage, and Disposal	M	M	L	L
	General Wastes Transport, Storage, and Disposal	M	M	L	L
	Sewage Infrastructure and Disposal	M	M	L	L
	Laydown Areas and Storage Yards	M	M	L	L
	Power Transmission, Distribution	M	M	L	L
	Project Lighting	M	M	L	L
	Site Access, Security and Fencing	M	M	L	L
	Water Intake from Kamloops Lake	M	M	L	L
	Contact Water	M	M	L	L
	Non-contact Water	M	M	L	L
	Potable Water Treatment and Use	M	M	L	L
	Haul Truck Road	M	M	L	L
	Mine Staffing (Direct Employment)	M	M	L	L
	Contracted Employment	M	M	L	L
	Taxation	M	M	L	L

Project Activities		Potential Effects on Property Values			
		Changes to Residential Property Values	Changes to Agricultural Property Values	Changes to Commercial Property Values	Changes to Industrial Property Values
Decommissioning and Closure	Dismantling of Ancillary Buildings	L	L	L	L
	Pit Lake Planning	L	L	L	L
	Site Road/Bridge Decommissioning	L	L	L	L
	Tailing Storage Facility Decommissioning and Reclamation	L	L	L	L
	Mine Rock Management Facilities Reclamation	L	L	L	L
	Fuel Storage and Filling Area	L	L	L	L
	Hazardous Wastes Transport, Storage, and Disposal	L	L	L	L
	General Wastes Transport, Storage, and Disposal	L	L	L	L
	Sewage Infrastructure and Disposal	L	L	L	L
	Laydown Areas and Storage Yards	L	L	L	L
	Power Transmission, Distribution	L	L	L	L
	Project Lighting	L	L	L	L
	Site Access, Security and Fencing	L	L	L	L
	Contact Water	L	L	L	L
	Non-contact Water	L	L	L	L
	Non-contact Water	L	L	L	L
	Haul Truck Road	L	L	L	L
	Road use to the Project (Materials, Personnel, Supplies)	L	L	L	L
	Mine Staffing (Direct Employment)	L	L	L	L
	Contracted Employment	L	L	L	L
Taxation	L	L	L	L	
Post Closure	General Site Inspections and Maintenance	L	L	O	O
	Contact Water	L	L	O	O
	Non-contact Water	L	L	O	O
	Road use to the Project (Materials, Personnel, Supplies)	L	L	O	O
	Mine Staffing (Direct Employment)	L	L	O	O
	Contracted Employment	L	L	O	O

Table 7.5-4 lists the Project components and/or activities with which property values are expected to interact. Interactions that are rated as “M,” potential moderate interactions, or “H,” key interactions are carried forward to the effects assessment. In light of the proximity of residential neighbourhoods to the Project, which is located approximately 2 km south of Aberdeen, and the intensity of Project activities, interactions between the Project and residential property values are ranked as an “M” for the Construction and Operation phases. This includes rural residences on properties bordering the Mine Site. The interaction between the Project and residential properties is ranked as an “L” for Decommissioning and Closure, and Post-closure, phases since the intensity of Project activities – and

associated sources of dis-amenities sources of dis-amenities (e.g., changes to air quality and noise and vibration levels) will gradually decline and cease during these phases. Visual impacts may linger but progressive reclamation will reduce these effects over time.

The Project is surrounded by agricultural land, which is primarily used for ranching (i.e. cattle grazing), although other agricultural activities occur in the vicinity. Since agricultural property borders the Mine Site and the Project will alter some agricultural activities (see Section 8.4, Land and Resource Use for more details), interactions between agricultural property values and the Project are ranked as an “M” during the Construction and Operations phases. During these phases, Project activities are expected to be the most intense. Interactions between agricultural property values and the Project are expected to be low to negligible during the Decommissioning and Closure and Post-closure phases as Project activities cease and progressive reclamation continues.

Potential Project effects on industrial property values are expected to be neutral or positive. The vacancy rate for industrial property has been increasing because of economic uncertainty and an increase in supply (Colliers International 2014a). Project Construction and Operations will likely cause an increase in business opportunities for suppliers of goods and services (see Section 7.4, Business, for more details), which could increase the demand for industrial properties. Therefore, effects on industrial property values are expected to be positive and will not be carried forward through to the effects assessment. It should also be kept in mind that areas zoned for industrial property are located further from the Project than the closest residences and agricultural property (Figure 7.5-4).

The Project is also expected to have a neutral or positive effect on commercial property values. Commercial properties (Figure 7.5-4) are located further away from the Project than the nearest residential neighbourhoods, although they are located in the Pineview Valley and Aberdeen neighbourhoods. The Project will generate a variety of business opportunities for local suppliers and services, some of which will require new or expanded commercial space. Although different businesses have different real estate requirements (e.g., a restaurant typically requires a different sort of property than an office), the overall effect on the value of commercial property is expected to be neutral to positive. An increased demand by businesses would be expected to increase the value of commercial properties. Since the potential effect on commercial property value is not expected to be adverse, it will not be carried forward to the assessment of effects.

As noted above, only adverse interactions that are characterized as “M” (moderate) or “H” (key) in Table 7.5-4 are carried forward to the assessment of potential effects on Property Values. As a result, potential Project effects on residential and agricultural property values will be carried forward through to the discussion of residual effects. Potential effects on industrial or commercial properties are not assessed further.

7.5.4.2 *Effects on Property Values*

This section describes the potential effects of the Project on residential and agricultural property values, with the discussion organized by the following pathways: labour force and population growth, air quality, noise and vibration, visual impact, easements and rights of way for the transmission line, and changes to vegetation.

Acknowledging the wide range of factors that can influence property values, the approach taken to the assessment is qualitative. The following sections will:

- Describe the Project-related physical, environmental and aesthetic changes (in accordance with the effect pathways identified above) that could influence residential and/or agricultural property values; and
- To the extent feasible, provide an assessment of the expected directional change in residential and/or agricultural property values as a result of predicted Project-related effects.

This approach will allow the assessment to determine if property values could increase or decrease as a result of potential Project effects but it will not attempt to quantify potential increases or decreases.

The qualitative approach to this assessment was confirmed through discussions with individuals knowledgeable about the real estate market in Kamloops; an examination of hedonic modelling, which stakeholders inquired about through public engagement to date; and a review of other regulatory filings. Considering these three sources of information, a qualitative approach was determined to be the most suitable in light of the multitude of external factors that can influence property values. Hedonic modelling, while useful, does not necessarily produce conclusive results, and a standard methodology within the EA framework is not available. These considerations are discussed below.

Factors Influencing Property Values

Property values are determined through the interplay of multiple factors, which makes attributing fluctuations to a single factor difficult. Moreover, these factors are wide-ranging, as they can include demographics, government policies related to home ownership, the economy, interest rates, and home location (Burda 2013; Nguyen n.d.). Participants in the KPI program (2011-2012; 2014-2015) and a focus group on special socio-economic topics (City of Kamloops and InterGroup Consultants 2012) acknowledged that property values in Kamloops are affected by a multitude of factors with no single factor necessarily playing a more important role than others. Specific factors identified that could potentially affect property values in Kamloops included demographics, interest rates, available housing stock, a shift in the City's image, an influx of new businesses, and market correction (City of Kamloops and InterGroup Consultants 2012).

A focus group, including Kamloops realtors and representatives from the municipal government, demonstrated the interplay of factors affecting Property Values during a discussion of Brocklehurst, a neighbourhood in Kamloops located on the north shore of the Thompson River (City of Kamloops and InterGroup Consultants 2012). Generally, Brocklehurst is viewed as a less desirable area of Kamloops in comparison to other areas (Ajax KPI Program 2011-2012). The Domtar Pulp Mill is located across the Thompson River from the neighbourhood and residents are sometimes affected by some of the nuisance factors associated with the mill, such as the odour. While participants in the focus group thought that the pulp mill may have affected housing prices in the neighbourhood, they acknowledged that other factors have also likely played a role, such as the perception that the neighbourhood is working class; the inconvenient commute into downtown Kamloops; and the

noise from passing trains. Participants also stated that the neighbourhood has benefits too, including the perception that it is family-oriented (City of Kamloops and InterGroup Consultants 2012). Additionally, the lower prices on the North Shore of Kamloops in general may make buying a house there attractive (Ajax KPI Program 2011-2012).

Hedonic Modelling

Due in part to public interest, hedonic modelling was examined as a potential approach. To determine the extent to which certain attributes affect values, hedonic modelling is a standard tool that can be used by economists and real estate appraisers to isolate the influence of different factors on property values (Sommerville and Wetzel 2014). This tool estimates the effect of an attribute, including one that is independent of housing characteristics and locational factors, on sales prices. The tool can, at least conceptually, “hold all features of a property constant and tease out the independent effects of a particular characteristic, such as environmental quality” (Williams 2011).

Hedonic estimation has been used in academic studies to examine the effects of industrial sites on property values. Generally, hedonic estimation finds an adverse relationship between property values and industrial sites but the method does not provide conclusive results. Results of hedonic pricing models can vary considerably depending on a variety of factors. De Vor and de Groot (2009) examined the relationship between residences and industrial sites, which they classified as either heavy industry sites (heavy industry, sea harbour, and transport sites) or regular sites (miscellaneous and high-tech sites). The former category was expected to generate noise, traffic, and pollution. The latter category was expected to generate less noise, traffic, and pollution than the heavy industrial sites. The study notes that the extent of pollution and property location can affect results. Sommerville and Wetzel (2014) note that effects are dependent on the data and mathematical form used to describe the relationship between an industrial site (a pipeline, in this study), and a residential property. Other factors that could influence a property’s valuation include the perception of risk (which media coverage can exacerbate), and the occurrence of an adverse environmental event, the impact of which will shift over time (Sommerville and Wetzel 2014; McCluskey and Rausser 2000).

Other Projects

Recent environmental assessments that included potential effects on property values were examined. It should be noted that assessments of potential project-related effects on property values may be captured within other socio-economic VCs (e.g. Cost of Living, Residential Properties), or may not be relevant to projects in remote areas. In the case of linear developments, property values are often subject to valuation and negotiated agreements with affected landowners, and are thus addressed outside of the EA process.

Recent examples of the assessment of the effects of project development on property values include the Keystone XL Pipeline, a nuclear waste storage facility, and a transmission line in northern BC, which are described in Table 7.5-5. The Keystone XL Pipeline and Northwest Transmission Line are both linear developments, which is different from the Project, because the value of property assessed, provided it is assessed, is typically adjacent to or crossed by the development. This is the case for the Northwest Transmission Line (Table 7.5-5). The Deep Geologic Repository (DGR), in some regards, is more similar to the Project because it is not a linear development. The EA for the DGR focussed on a qualitative assessment (Table 7.5-5).

Table 7.5-5. Recent EISs Assessing Potential Effects on Property Values

Project	Effect	Summary
Keystone XL Pipeline	The EIS for the project examined potential project effects on property values during construction and operation of a pipeline.	<ul style="list-style-type: none"> • The assessment conducted a literature review and used the results from relevant studies to predict if there would be any potential effects. • The EIS ultimately concluded that there could be short-term effects to property values during construction because of visual, noise, and land disturbance effects, but that effects on residential and agricultural property values during operations, if adverse, were not likely to be statistically significant (United States Department of State 2011a). • Despite the lack of predicted changes in property values, the EIS discusses how property values and sales volumes could initially decrease as a result of an adverse environmental effect but how that effect would decrease over time (United States Department of State 2011b). The supplemental filing for the project did not alter those conclusions (United States Department of State 2014).
Deep Geologic Repository (DGR) for Low and Intermediate Level Waste	The EIS for the project includes an assessment of effects on Residential Property Values as a Valued Ecosystem Component (VEC).	<ul style="list-style-type: none"> • The DGR is a proposed storage facility 680 metres underground for intermediate-level nuclear waste proposed by Ontario Power Generation (OPG). • The assessment focused on a qualitative analysis of the project's potential interactions with residential property values. These include the potential of the project's presence to influence community character and/or lead to outmigration, the presence of an increased workforce, and potential changes to a range of environmental factors, including air quality, noise levels, and water quality (surface and groundwater) (OPG 2011). • No residual adverse effects were anticipated on residential property values due to dust, noise, and increased traffic (OPG 2011). • No adverse effects expected from the visual presence of the project.
Northwest Transmission Line	The Application assessed potential effects on Private Properties adjacent to the route as a VEC.	<ul style="list-style-type: none"> • The assessment focused on properties adjacent to the proposed route and examined a potential decreased quality of life related during the construction and restoration phase to environmental disturbances from changes to visual quality, loss of valued landscape features, increased traffic, decreased water quality and quantity, and increased noise, dust, and industrial presence. • For the operations phase, an appraisal was conducted on adjacent properties, which concluded that there would be low to no changes in market value for 29 properties and uncertain results for five (Rescan 2010).

Changes to Residential Property Values

Different aspects of the Project and its effects may influence property values in different ways. The following sections describe potential changes and how they may relate to property values, based on the assessment of effects presented in other sections of the Application/EIS.

Labour Force and Population Growth

Direct, indirect, and induced employment created by the Project could result in population growth, which could have an effect on residential property values during the Operation Phase. During the Construction Phase, it is not expected that labour force and population growth will result in any changes to residential property values, as non-local workers will be employed in the short term and in-migration is not expected; therefore, the Project will not create increase demand for housing in the LSA during this phase. The influx of temporary workers may have an effect on rental and short-term accommodation availability and prices. These potential effects are assessed in Section 8.1, Infrastructure, Public Facilities, and Services.

During the Operation Phase, labour force and population growth may act as a pathway between the Project and residential property values. The Project will hire locally where possible, and non-local hires are expected to relocate to Kamloops (or within daily commuting distance) to work at the Project. In-migration associated with Project operations will likely be permanent as operations are scheduled to last 23 years. Kamloops is an urban centre with many amenities, and KAM will not provide workforce accommodations. Permanent in-migration would create new demand for permanent housing, as opposed to short-term and temporary accommodations, and may increase the number of home buyers (although some employees may prefer to rent accommodations).

As described in Section 2.7.3, the Project is expected to require a minimum average of 468 direct employees during the Operation Phase. Of these employees, between 121 and 197 are expected to be hired from outside the LSA and RSA. In addition to direct employment, indirect and induced employment may result in additional non-local workers relocating to Kamloops. As a result of direct, indirect, and induced employment, up to 397 workers plus families are expected to in-migrate. These incoming households could affect residential property values, particularly if the majority of in-migration occurs during the initial years of operations. A concentrated influx of workers and their families could create a short-term increase in demand for residential properties, which could cause residential property values to increase in response. As noted above, multiple factors are considered when an individual decides to purchase a house, including type of structure (e.g., number of bedrooms), its location relative to amenities that matter to that individual (e.g., schools, shopping, green space), and property values are also influenced by a number of external factors.

While increased property values are typically considered to be a benefit, especially for current homeowners and developers, a reduction in housing stock (i.e., decreased availability) and an increase in prices (i.e., reduced affordability) could be perceived as a negative effect, particularly for segments of the population that currently have challenges finding and retaining affordable housing (see Section 8.1, Infrastructure, Public Facilities, and Services for a more detailed description of affordable housing in Kamloops).

The current housing market in and around Kamloops—including the Property Values LSA (which includes Pineview Valley, Aberdeen, Upper Sahali, and Knutsford), suggests that a short-term increase in home buyers is not anticipated to affect housing availability and affordability. There were 2,117 active residential listings at the end of June 2015 (KDREA 2015a), and the market is noted to be well balanced. Active residential listings include single-family homes (residential, waterfront; residential; and house and acreage) and multi-family homes (condos, multiplexes, and mobile homes) (KDREA 2015b). A more detailed description of the housing market in Kamloops can be found in Section 8.1 (Infrastructure, Public Facilities, and Services).

In addition to the available units for sale, CMHC data on housing starts and dwelling completions demonstrate that housing stock in the Kamloops area is increasing.² Two hundred thirty-four single detached units were completed in 2013 and 251 were completed in 2014. Housing starts also increased between 2013 and 2014 with 219 starts for single detached units in 2013 and 281 in 2014. When the number of available residential units for sale (i.e., approximately 2,000 units), the consistent rate of housing starts and completion (i.e., approximately 200 units in recent years), and the availability of rental units are considered, the in-migrating workforce is expected to be sufficiently provided for. Therefore, the Project workforce during the Operation Phase is not expected to have an adverse effect on housing affordability and availability in Kamloops.

The Project could have an adverse effect on residential property values during the Decommissioning and Closure Phase. The workforce will substantively decrease as operations cease, the Project is decommissioned, and reclamation activities continue. As employment levels drop, workers may move away from Kamloops to seek other employment. An increased number of homes on the market may lead to reduced property values. While this is a possibility, it is not expected to have a noticeable effect on residential property values. There are many factors involved in determining whether or not to leave a community, including the desirability of a new location. The majority of mining developments are in remote locations so moving away from a population centre permanently may not be appealing, especially if a fly-in, fly-out option is available. Additionally, the economy in Kamloops is diverse, so employees, with the help of the planned workforce transition support offered by KAM (described in Section 7.2, Labour Force, Employment, and Training), will likely be able to find other suitable employment in Kamloops. Finally, the proportion of the population that would leave Kamloops after the Operation Phase, when compared to the anticipated population of Kamloops in 2042 (anticipated end of Project operations) is anticipated to be less than 1% of the projected population. An out-migration should not flood the real estate market sufficiently enough to lower property values. Therefore, the Project is not expected to have an adverse effect on property values during the Decommissioning and Closure Phase.

Air Quality

The Project may affect air quality during the Construction and Operations phases. Effects on Air Quality are assessed in Section 10.1. With respect to Property Values, an increase in criteria air contaminants (CAC) can be characterized as a dis-amenity, which may adversely affect property

² Housing data from the CMHC is for the Kamloops Census Agglomeration (CA), which includes Kamloops, Chase, the Kamloops 1 IR, Logan Lake, Sahhalkum 4 IR, Sun Peaks Mountain, the TNRD-J, the TNRD-P, and Whispering Pines 4 IR.

values by making a property less desirable (de Vor and de Groot 2009). In regard to the Project, Kamloops residents have expressed concern that changes in air quality, in particular dust (i.e., dustfall [DF]) and particulate matter (PM₁₀ and PM_{2.5}), may affect property values in the neighbourhoods closest to the Project, such as Aberdeen and Upper Sahali. In addition, air quality is a long-standing concern for residents of Kamloops and the LSA, in part because of the concentration of population within the Thompson Valley. Valleys are subject to temperature inversions, which can, in effect, confine pollutants to lower levels of the atmosphere (i.e., closer to the surface), where they can accumulate (City of Kamloops 2012).

The air quality study includes background air quality values and dispersion modelling of a selection of CACs based on three scenarios:

- **Base Case:** Includes modelling an inventory of existing air quality and emissions within the Kamloops airshed (e.g., industrial emissions, heating emissions) without the presence of the Project;
- **Project Case:** Has been separately modelled for the Construction and Operations phases, and includes only Project-related emissions; and
- **Application Case:** Has also been completed for both the Construction and Operations phases, and is the sum of the Base Case and appropriate Project Case scenario.

Each of these scenarios considered the following CACs: total dustfall (DF), total suspended particulates (TSP), inhalable particulate matter (PM₁₀), respirable particulate matter (PM_{2.5}), sulphur dioxide (SO₂), oxides of nitrogen (NO_x), and carbon monoxide (CO).

Based on the air quality assessment, the Base Case suggests that the baseline air quality in the four residential neighbourhoods comprising the LSA (i.e., Pineview Valley, Aberdeen, Upper Sahali, Knutsford and portions of Lac le Jeune) and the rural residences around the Project falls within applicable government objectives (e.g., Ambient Air Quality Objectives [AAQO]). Other neighbourhoods in Kamloops (including areas of the city centre and North Kamloops), which are included in the RSA, were noted to have lower levels of air quality that sometimes exceed the applicable objectives.

During the Construction Phase, the CAC concentrations that were already in exceedance in the Base Case were predicted to remain in exceedance with the primary contributor being the Base Case; in other words, the primary influence is the existing conditions in the area, and not the Project. The affected neighbourhoods include downtown and the North Shore, and are included in the RSA. The same situation is expected during the Operation Phase.³

The air quality in Pineview Valley, Aberdeen, Upper Sahali, Knutsford, and the rural residences west of the Project is not expected to change substantively as a result of Project emissions for CACs during the Construction and Operations phases. During the Construction Phase, no exceedances are

³ There are some instances during the Operation Phase where CAC concentrations are predicted to exceed regulatory criteria at the plant boundary. These are discussed in more detail in relation to Agricultural Property, below, and in Section 10.1 (Air Quality).

expected to affect residential areas. During the Operation Phase, two exceedances were predicted: 24-hour TSP and 24-hour PM₁₀ exceedances could affect small areas of upper Aberdeen and rural residences on the western and eastern plant boundary (Figure I-13 and Figure I-15, in Appendix 10.1-A, respectively) for a limited part of each year. The 24-hour TSP exceedance is predicted to occur 16 days of the year in winter (December and January) and the 24-hour PM₁₀ is predicted to be greater than the AAQO 34 days of the year in winter and spring. Overall, these exceedances are anticipated to be not significant (Section 10.1, Air Quality).

Based on the results of the air quality modeling for the Construction and Operation phases, changes in air quality are not expected to adversely affect residential property values in Pineview Valley, Aberdeen, Upper Sahali, Knutsford, and the rural residences closest to the Project Site because of the limited magnitude and duration of the exceedances each year.

However, while the results of air quality modelling predict that air quality will remain relatively unaffected in the LSA, the perception of air quality effects (or risks), may in itself, influence property values. The perceptions of residents and prospective buyers can be influenced by media coverage, the availability of information (including transparency of Project documentation), and levels of trust in the Project proponent (i.e., KAM), the government, and regulatory processes. As such, the importance of perception cannot be ignored, and it is therefore acknowledged that, there could be a short-term decline in residential property values until buyers are confident that the outcomes of air quality modelling are accurate and that the mitigation measures to which KAM has committed for air quality are effective.

Noise

The Project is expected to increase noise during the Construction and Operation phases, and are assessed in Section 10.5 (Noise and Vibration). Noise can be classified as a “nuisance factor,” the presence of which may change a neighbourhood’s character or irritate residents and make an area less desirable.

The noise assessment focused on noise emissions from the Project and potential effects on humans. A total of 28 noise receptors were identified, including daycares, residences, schools, hospitals, and future residential development areas. The receptors are within and outside the local noise study area (1.5 km from the plant boundary) and the regional noise study area (3 km from the plant boundary), while the modelling domain covers a 30 km x 30 km area. The assessment characterized the existing acoustic environment through two baseline studies. For the Project, studies looked at the Construction Phase (for which Year 1 was assessed, representing the worst-case scenario), and the Operation Phase (which assessed Year 2, Years 4/8). Piling activities during the Construction Phase were assessed separately. The reasons for choosing these years are described in more detail in the Noise and Vibration Technical Data Report (Appendix 10.5-A).

This noise assessment used Health Canada’s guidance for change in percent highly annoyed (%HA) for the Construction Phase, and the British Columbia Oil and Gas Commission’s Noise Control Guideline’s Permissible Sound Limits (PSL) noise thresholds during the Operation Phase:

- **Construction Phase:** Noise was estimated in terms of %HA. Health Canada guidance advises that %HA should not change more than 6.5%. During both phases of the Project (Construction and Operations), in all scenarios including the piling activities, the percent change in %HA did not exceed 6.5% for residences.
- **Operation Phase:** the PSL limit is met for both daytime and nighttime during Year 2 and Years 4/8 at the residential receptors. In addition, Low-Frequency Noise (LFN) results are not expected to be problematic at most receptors.

Although these limits are met for both phases, according to Section 10.5 (Noise and Vibration), some of the rural residential receptors are expected to experience a “perceptible change from baseline condition” during Construction and Operation (Section 10.5, Noise and Vibration), although it is noted that noise levels for these (and all other) residential receptors will not exceed the thresholds for sleep disturbance or annoyance (%HA). Two of these receptors are in Knutsford (receptors 4 and 9) and two are on the west and east perimeter of the Project Site (receptors 8 and 21) (Figure 10.5-5 and Figure 10.5-6).

In light of these results, it is anticipated that noise effects will not have a substantive effect on residential property values in Kamloops (i.e., in Pineview Valley, Aberdeen, Upper Sahali). However, for rural residences near the Project Site perimeter, including two properties in Knutsford, there may be an effect as the noise level is predicted to be noticeable and the property may become less desirable.

Vibration

The Project is expected to increase vibration during the Construction and Operation phases, and is assessed in Section 10.5 (Noise and Vibration). Vibration could affect residential Property Values by causing structural damage to houses, thereby reducing their value.

The vibration assessment focused on blast-induced ground vibration and air blast effects on human habitats and structures using 31 vibration receptors, including residences, commercial structures, potential future residential development areas, Jacko Lake fish habitat area, and open recreation areas. The vibration study area comprised a 3 km radius around the open pit, and a modelling domain of 11 km by 11 km was used.. Project activities linked to vibration include construction equipment, piling, and truck traffic during the Construction Phase and blast-induced vibrations during the Operation Phase.

According to the Noise and Vibration Technical Data Report (Appendix 10.5-A), vibration effects (ground vibration and air blast overpressure) during the Construction and Operation phases are anticipated to be below structural damage limits; therefore, there are no anticipated effects to residential property values based on potential structural damage to homes as a result of construction equipment, truck traffic, equipment, piling, and blasting. In connection with vibration being a nuisance or annoyance, the residential receptors, which included rural residences on the perimeter of the Project Site, were assigned a minor magnitude, which means that vibration is below the human annoyance threshold. As a result, the Project is not anticipated to reduce residential property values.

While neither noise nor vibration are expected to affect residential property values in neighbourhoods in the LSA, the perception of risks and effects could have a temporary effect for

reasons similar to those described above in relation to air quality effects. As predictions of the assessment are confirmed and mitigation measures demonstrated to be effective, changes in property values associated with perceived risk would be corrected.

Visual Impact

Visible landscape can also influence Property Values, potentially decreasing value if the existing view changes to something considered less desirable or undesirable. The Project could potentially have adverse effects on residential property values if it substantially affects the view from a residence. Potential visual impacts of the Project are assessed in Section 8.3 (Visual Impact and Aesthetic Features).

In Section 8.3, potential visual effects of the Construction, Operation, and Decommissioning and Closure phases are assessed together (based on the largest extent of visual change). The Post-closure Phase is discussed separately and includes reclamation and re-vegetation of the land. The assessments considered a variety of viewpoints for views of the Project infrastructure and for views of the transmission line. Viewpoints included locations in Pineview Valley, Aberdeen, Upper Sahali, Knutsford, and near rural residences south of the Kamloops city boundaries (Figure 8.3-2 and Table 8.3-1). Visual impacts were characterized in terms of the character of the existing landscape (e.g., extent of man-made effect on landscape), expected degree of modification, extent of visual effect, and distance from the viewpoint.

Three neighbourhoods in the LSA (Pineview Valley, Aberdeen, Upper Sahali,) did not have views of the Project, although the transmission line is expected to be visible some of these neighbourhoods. In Knutsford, locations on Simms Road, Upper Rose Hill Road, Lower Rose Hill Road and Long Lake Road, will have views of the Project and the transmission line. For the Operation Phase, Long Lake Road is expected to experience a moderate degree of visual effect from its view of the Project. The anticipated degree of visual effect on Simms Road, Upper Rose Hill Road, and Lower Rose Hill Road are slight. For the transmission line, the Knutsford Hill Road viewpoint (Viewpoint 12) is expected to experience a moderate degree of visual effect.

Other rural residences located around the Project will generally experience a greater degree of visual impact according to the assessment conducted in Section 8.3. Viewpoint 17, which is on Edith Lake Road south of the Project, is anticipated to experience a “substantial” degree of visual effect, while Goose Lake Road East (Viewpoint 19) are expected to experience a “moderate” degree of visual effect during the Operation Phase. These degrees of visual effect are expected to be reduced in the Post-closure Phase as progressive reclamation proceeds.

In light of the generally low ratings of the predicted degree of visual effects for the Project and the transmission line, aesthetics are not expected to affect residential property values in Pineview Valley, Aberdeen, and Upper Sahali. Project infrastructure, except for the transmission line, is not visible from the neighbourhoods in the southwest sector of Kamloops during any phase of the Project. Rural residences, including homes in Knutsford, are anticipated to have varying views of the Project. Most residential receptor locations as described in Section 8.3, Visual Impact and Aesthetic Features (Table 8.3-1) are expected to experience negligible to minor degrees of visual effect, while one residential receptor was identified to have a view of the transmission line.

Changes to Agricultural Property Values

The Project falls within the provincial ALR, and cattle ranching is the primary agricultural activity in the immediate vicinity of the Project. Cattle ranching typically involves the production of hay (which is normally baled for winter feed), movement of cattle between ranges for grazing (on private and crown land), reproduction operations, the sale of steers and heifers, and herd culls. More detail on potential Project effects on ranching can be found in Section 8.4, Land and Resource Use. This section describes the potential effects of the Project on the value of agricultural property.

Air Quality

The air quality summary provided above in relation to residential property values also applies to agricultural property values. Since BC Assessment assesses plots in more than one category (i.e., a parcel may be assessed in both the residential and agricultural classes), potential Project effects on rural residences are included in the discussion of residential property values above. Ranchers have expressed concern with how elevated levels of certain CACs could affect the way agricultural land is used, namely whether the suitability of land for grazing and/or hay production could be affected (Ajax KPI Program 2011-2012).

During the Construction Phase, there are two CAC exceedances identified for agricultural property, based on modelling results at the boundary of the Project Site (as described in Appendix 10.1-A, Air Quality Technical Data Report). Average 24-hour TSP is predicted to exceed the threshold of $120 \mu\text{g}/\text{m}^3$ by $7 \mu\text{g}/\text{m}^3$ at the northeast plant boundary towards the east side of the open pit on one day of the year. This exceedance is not expected to affect agricultural property values as the effect occurs almost exclusively on the Project Site, which is land owned by KAM and to which there will be limited access. However, a small sliver of privately held land with an active grazing lease may also be affected by the TSP exceedance north of the plant boundary. The second exceedance during Construction is the 24-hr average for PM_{10} , which also occurs at the northern plant boundary on the east end of the open pit. This exceedance is expected to cover a larger area of privately held land with a grazing lease, although it covers a relatively small proportion of the total land used for agriculture around the Project Site and is anticipated to occur on 6 days of the year. The exceedances for both 24-hour TSP and 24-hour PM_{10} are expected to occur during the winter.

During the Operation Phase, there are three predicted exceedances that could affect agricultural property: 24-hour average TSP, 24-hour average PM_{10} , and 24-hour average $\text{PM}_{2.5}$. As for the Construction Phase, these three exceedances occur on the northern plant boundary towards the east end of the open pit and two of them (24-hour TSP and 24-hour PM_{10}) occur at the western boundary (see Appendix 10.1-A, Air Quality TDR for more detail). The exceedances are expected to occur primarily within the boundaries of the Project footprint, but there may also be exceedances over privately owned land with grazing leases. However, the affected privately owned land area comprises a relatively small portion of the total agricultural land surrounding the Project and for a limited duration each year. The exceedance for 24-hour average TSP is 6 days of the year in December and January; for 24-hour average PM_{10} is 34 days of the year in winter (November through January) and spring (March and April); and for 24-hour average $\text{PM}_{2.5}$ is 3 days of the year during the winter. In light of the limited spatial and temporal scope and the seasonality of these exceedances, they are not expected to have a noticeable effect on agricultural property values.

Noise and Vibration

The description of noise and vibration in the discussion of Project effects to residential property values applies to agricultural property values as some of the residential receptors are located on agricultural property. Vibration is anticipated to be below the human annoyance threshold, while the change in noise is anticipated to be perceptible (although below thresholds for annoyance or sleep disturbance). These changes could reduce the desirability of the land for grazing purposes.

Easements and Rights of Way

The potential effects on property values are cited as a concern by stakeholders involved in various types of linear development (e.g., pipelines and transmission lines), especially since these sort of developments are often routed through agricultural land. The Keystone XL EIS suggests that land disturbance may result in short-term effects on agricultural property values during construction, but pipelines disturb more land than transmission lines. An additional review of regulatory filings for linear development projects suggests the property value is not often scoped into assessments as a valued component for several reasons: there are usually negligible effects; proponents will monitor the situation near their infrastructure; and, settlements are negotiated outside the EA process. In addition to conclusions in regulatory filings, additional literature on easements and rights of way and property values confirms that easements and rights-of-way do not necessarily adversely affect the market value of agricultural property (Enns 2012; Jackson and Pitts n.d.).

Vegetation

The Project is located in grasslands south of Kamloops. Grasslands supply valuable grazing opportunities for livestock and the Project is surrounded by ranches. According to the effects assessment on Grasslands (Section 6.10), the Project may result in habitat loss and alteration for the grasslands on which the Project will be built and which surround the Project footprint.

Habitat loss is not expected to affect agricultural property values as the anticipated habitat loss occurs within the Project footprint. Habitat alteration could affect grasslands beyond the perimeter of the Project Site and would occur primarily through dust deposition and the introduction of invasive species. Dust is not expected to alter grassland habitat as the additional fugitive dust created by the Project is not anticipated to exceed Ministry of Environment guidelines. While road construction and maintenance, power distribution, and pipeline utility corridor may aid the spread of invasive species, the anticipated effect is expected to be low because only a limited amount of additional habitat could be altered. Since the effect is expected to be low, changes to vegetation are not expected to materially decrease agricultural property values.

7.5.4.3 Mitigation Measures for Property Values

Effects assessments discussed in other sections of the Application/EIS provided the input for the effects assessment on residential and agricultural property values. Mitigation measures proposed by these disciplines have been included in Project Design and will help mitigate potential Project effects on Property Values. Mitigation measures for the following assessments and management plans will help minimize Project effects on residential and agricultural property values:

- Section 10.1, Air Quality;

- Section 10.5, Noise and Vibration;
- Section 8.3, Visual Impact/ Aesthetic Features;
- Section 8.4, Land and Resource Use (ranching mitigation);
- Section 7.2, Labour Force, Employment, and Training
- Section 6.10, Grasslands;
- Section 11.6, Dust Control Plan
- Section 11.7, Invasive Plant Management Plan;
- Section 11.22, Noise Management Plan;
- Section 11.26, Air Quality Monitoring Plan;
- Section 11.28, Landscape Design and Restoration Plan;
- Section 11.29, Wildlife and Vegetation Monitoring Plan; and
- Section 11.30, Ranch Management Plan.

Additional Measures

The above mitigation measures and management plans will minimize potential Project effects on air quality, noise and vibration, aesthetics, and vegetation will help minimize potential Project effects on residential and agricultural property values (Table 7.5-6).

KAM and/or the relevant service provider (Fortis, BC Hydro) will negotiate the necessary easements with landowners. The easement for the transmission line right-of-way to the east of the Project has already been negotiated.

In practice, property values are subject the influence of many variables, many of which are outside the control of the Project. Therefore, additional measures to address potential changes to property values associated with the Project will focus on monitoring and adaptive management. Before construction begins, KAM will develop and implement an engagement mechanism through the Community Liaison Group. The engagement mechanism will provide stakeholders with a formal means by which to contact KAM with concerns or grievances. It will also provide KAM with a coordinated strategy for sharing Project information and communicating the results of air quality and other monitoring programs to the Community Liaison Group and other interested parties. As part of the engagement mechanism, there will be an annual general meeting to provide monitoring results to special interest groups.

KAM will also develop and implement a monitoring system for property values and, if necessary, develop adaptive management strategies to address any unforeseen Project effects.

Table 7.5-6. Summary of Residual Effects on Property Values

Project Effect	Project Phase (timing of effect)	Project Component/ Physical Activity	Description of Cause-Effect ¹	Description of Mitigation Measure(s)	Description of Residual Effect
Changes to residential property values	Construction; Operation	All	Real or perceived changes in air quality, noise, vibration, and visual quality could lead to a decline in residential property values.	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; Implementation of engagement and information sharing mechanism	Residential property values could decline for rural residences around the perimeter of the Project Site, and possibly in Knutsford or Aberdeen, due to real or perceived changes in air quality, noise and vibration, and visual impacts
Changes to agricultural property values	Construction; Operation	All	Real or perceived changes in air quality, noise, vibration, and vegetation could lead to a decline in agricultural property values.	Implementation of Project design and best management practices for air quality, noise and vibration, vegetation, including invasive species management; adaptive management; Implementation of engagement and information sharing mechanism	Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation

¹ "Cause-effect" refers to the relationship between the Project component/physical activity that is causing the change or effect in the condition of the VC.

7.5.5 Residual Effects and Their Significance

7.5.5.1 Summary of Residual Effects

There are numerous factors affecting residential property values, many of which are specific to individuals and their personal values. This makes predicting Project effects on Property Values complex in part because homeowners have different priorities for the qualities they look for in a home, as well as different levels of tolerance for various dis-amenities. For example, workers who move to Kamloops for employment during the Operations Phase may find living in the southwest sector of Kamloops attractive because of the easy commute to the Project. In-migration for Project employment may increase demand in these neighbourhoods could support stable or increasing levels of home-buying and property values.

For residential property values, the real or perceived changes to air quality, noise and vibration levels, and aesthetics could decrease property values. Property values in Pineview Valley and Upper Sahali (both in the LSA) are not expected to be affected by the Project due to distance from the Project Site and the results of the assessments on Air Quality (Section 10.1), Noise and Vibration (Section 10.5), and Visual Impacts (Section 8.3).

The results of air quality modelling currently suggest that some of the rural residences near the perimeter of the Project Site and the southern edge of Aberdeen may experience short-term and temporary increases (up to 34 days a year during the winter and two months of the spring) in emissions above government objectives. In addition, four rural residences closest to the Project Site are expected to experience perceptible changes in noise levels. These residences are also expected to experience visual impacts, along with some areas of Knutsford. Due to the degree of Projects effects, it is anticipated that the rural residences closest to the Project will be most affected, while residences in Knutsford and in Aberdeen may also experience a decrease in residential property values due to real or perceived changes in air quality, noise and vibration, and aesthetics (Table 7.5-6).

Agricultural property values for those parcels located closest to the Project may also experience a decrease in value due to real or perceived affects to air quality, noise and vibration levels, and vegetation. Similar to air quality and residential property, changes to air quality are anticipated to be temporary, seasonal, and affect only those properties that line the Project perimeter. The exceedances which are localized, temporally limited, and seasonal are not expected to alter use of agricultural lands. KAM is committed to working with ranchers so they may continue to ranch in the area. Noise and vibration levels are anticipated to increase in the areas closest to the Project Site, but vegetation alteration in the grasslands to the east of the Project is not anticipated to be a significant effect (Table 7.5-6).

7.5.5.2 Criteria for Characterization of Residual Effects

The criteria for characterizing residual effects to Property Values are described in Table 7.5-7.

7.5.5.3 Characterization of Residual Effects

Potential residual effects are identified for both the Construction and Operations phases of the Project. These are characterized in Table 7.5-8. There are no established thresholds for characterizing

the significance of residual effects on property values therefore these characterizations are qualitative.

Residential property values could decline for rural residences around the perimeter of the Project Site, and possibly in Knutsford or Aberdeen, due to real or perceived changes in air quality, noise and vibration, and visual impacts

Changes to residential property values may result from environmental and aesthetic effects (or perceived effects, particularly in neighbourhoods less proximate to the Project, including Aberdeen) during construction through to peak operations as this represents a shift in mode of operations. Changes in modes of operations are anticipated to create uncertainty in connection with Project effects for property owners and prospective property owners. An engagement mechanism to share monitoring results and address any concerns that arise is anticipated to help mitigate this effect, along with the mitigation measures from other disciplines (e.g., Air Quality, Section 10.1).

This potential effect is characterized as follows, based on a conservative (i.e., realistic worst-case) consideration of the pathways by which the Project could affect residential property values.

- **Magnitude:** The predicted changes to air quality, noise and vibration levels, and visual quality are anticipated to be not significant. However, there may be perceptible noise for residences closest to the Project Site; therefore, the magnitude is characterized as minor.
- **Duration:** This effect is anticipated to occur during the Construction Phase could extend into the Operation Phase, and is expected diminish after monitoring demonstrates the accuracy of the predictions made in the Application/EIS and/or provides KAM with the opportunity to adaptively address effects of the Project. This effect is therefore anticipated to be medium-term in duration.
- **Frequency:** Since this effect is related to a variety of Project activities, the frequency is regular.
- **Geographic Extent:** Potential changes in property values are anticipated to be localized within in two neighbourhoods and rural residences located closest to the Project, therefore the geographic extent is local.
- **Reversibility:** This effect is expected to be reversible in the short-term as the monitoring for air quality and noise and vibration are expected to demonstrate that predictions made in the Application/EIS are accurate and/or further address changes through ongoing monitoring and adaptive management. KAM will have a robust reporting mechanism for monitoring changes in air quality, noise, and vibration and multiple methods for engaging the community regarding its concerns.
- **Resiliency:** Resiliency is expected to be high because there are multiple factors involved in determining property values so they are anticipated to be resilient to changes in any one factor.
- **Social Value:** The social value is neutral because property values, in light of the investment they represent, are important in maintaining the well-being of people in the LSA.

Table 7.5-7. Definitions of Characterization Criteria for Residual Effects on Property Values

Magnitude	Duration	Frequency	Geographic Extent (Physical/Biophysical)	Reversibility	Resiliency	Social Value	Likelihood of Effects	
							Probability	Confidence Level
<i>How severe will the effect be?</i>	<i>How long will the effect last?</i>	<i>How often will the effect occur?</i>	<i>How far will the effect reach?</i>	<i>To what degree is the effect reversible?</i>	<i>How resilient is the receiving environment or population?</i>	<i>How influential is the effect on the broader socio-economic environment?</i>	<i>How likely is the effect to occur?</i>	<i>How certain is this analysis?</i>
<p>Negligible: No or very little detectable change from baseline conditions.</p> <p>Minor: Differs from the average value for baseline conditions to a small degree.</p> <p>Medium: Differs substantially from the average value for baseline conditions and approaches the limits of natural variation.</p> <p>Major: Differs substantially from baseline conditions, resulting in a detectable change beyond the range of natural variation.</p>	<p>Short-term: Effect lasts 1 to 2 years, i.e., for the Construction Phase.</p> <p>Medium-term: Effect lasts 3 to 25 years, i.e., to the end of the Operation Phase</p> <p>Long-term: Effect lasts between 26 and 50 years.</p> <p>Far Future: Effect lasts more than 50 years.</p>	<p>Once: Effect is confined to one discrete period in time during the life of the Project.</p> <p>Sporadic: Effect an effect that occurs at sporadic or intermittent intervals during any phase of the Project.</p> <p>Regular: Effect occurs on a regular basis during the life span of the Project.</p> <p>Continuous: Effect occurs constantly during the life of the Project.</p>	<p>Site-specific: Effect extends less than 500 m from infrastructure or activity.</p> <p>Local: Effect is limited to the LSA.</p> <p>Regional: Effect extends across the broader region (e.g., RSA)</p> <p>Beyond Regional: Effect extends beyond the regional scale, and may extend across or beyond the province.</p>	<p>Reversible Short-term: Effect can be reversed relatively quickly.</p> <p>Reversible Long-term: Effect can be reversed within 20 years of Post Closure.</p> <p>Irreversible: Effect cannot be reversed (i.e., is permanent).</p>	<p>Low: The receiving environment or population has a low resilience to imposed stresses, and will not easily adapt to the effect.</p> <p>Neutral: The receiving environment or population has a neutral resilience to imposed stresses and may be able to respond and adapt to the effect.</p> <p>High: The receiving environment or population has a high natural resilience to imposed stresses, and can respond and adapt to the effect.</p>	<p>Low: The receptor being affected plays a limited role in maintaining the economic base, social structure, community stability or the wellbeing of people in the study area.</p> <p>Neutral: The being affected plays an important role in maintaining the economic base, social structure, community stability and the well-being of people in the study area.</p> <p>High: The being affected plays a highly important role in maintaining the economic base, social structure, community stability and the well-being of people in the study area.</p>	<p>High: It is highly likely that this effect will occur.</p> <p>Medium: This effect is likely, but may not occur.</p> <p>Low: This effect is unlikely but could occur.</p>	<p>High: > 80% confidence. There is a good understanding of the cause-effect relationship and all necessary data are available for the Project area. There is a low degree of uncertainty and variation from the predicted effect is expected to be low.</p> <p>Medium: 50 to 80% confidence. The cause-effect relationships are not fully understood, there are a number of unknown external variables, or data for the Project area are incomplete. There is a moderate degree of uncertainty; while results may vary, predictions are relatively confident.</p> <p>Low: < 50% confidence. The cause-effect relationships are poorly understood, there are a number of unknown external variables, and data for the Project area are incomplete. High degree of uncertainty and final results may vary considerably.</p>

Table 7.5-8. Characterization of Residual Effects, Significance, Likelihood and Confidence on Property Values

Residual Effect	Residual Effects Characterization Criteria							Significance of Adverse Residual Effects	Likelihood and Confidence	
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Resiliency	Context		Probability	Confidence
Residential property values could decline for rural residences around the perimeter of the Project Site, and possibly in Knutsford or Aberdeen, due to real or perceived changes in air quality, noise and vibration, and visual impacts	Minor	Medium-term	Regular	Local	Reversible Short-term	High	Neutral	Not Significant (Moderate)	Low	Low
Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation	Minor	Medium-term	Regular	Local	Reversible Short-term	High	Neutral	Not Significant (Moderate)	Low	Low

Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation

Much of the reasoning behind the characterization of residual effects on changes to residential property values holds true for agricultural property values.

- **Magnitude:** The potential changes to air quality, noise and vibration levels, and changes to grasslands are anticipated to be not significant for all agricultural properties with the exception of those bordering the Project Site, where changes to noise levels are anticipated to be perceptible. Therefore, the magnitude is minor.
- **Duration:** This effect is anticipated to occur during the Construction Phase through to the peak of the Operation Phase until monitoring demonstrates the accuracy of the predictions made in the Application/EIS and/or provides KAM with the opportunity to adaptively address effects of the Project. This effect is therefore anticipated to be medium-term in duration.
- **Frequency:** Since this effect is related to a variety of Project activities, the frequency is regular.
- **Geographic Extent:** Changes in agricultural property values are anticipated for those properties closest to the Project, therefore the geographic extent is local.
- **Reversibility:** This effect is expected to be reversible in the short-term as the monitoring for air quality and noise and vibration are expected to demonstrate that predictions made in the Application/EIS are either accurate and/or further address changes through ongoing monitoring and adaptive management. KAM will have a robust reporting mechanism for monitoring changes in air quality, noise, and vibration and multiple methods for engaging the community regarding its concerns. For ranchers in particular, KAM will have an established process for interacting with them to ensure that agricultural activities around the Project continue through the life of the Project.
- **Resiliency:** Resiliency is expected to be high because there are multiple factors involved in determining property values so they are anticipated to be resilient to changes in any one factor.
- **Social Value:** The social value is neutral because property values, in light of the investment they represent, are important in maintaining the well-being of people in the LSA and are important for sustained ranching operations in the area.

7.5.5.4 *Significance of Residual Effects*

The Project's effect on residential property values are expected to be Not Significant (Moderate); this pertains primarily to the rural residential properties adjacent to the Project Site, although there may also be a smaller effect on residential areas in Aberdeen and Knutsford (where noticeable environmental changes are not predicted, but real estate could be influenced by concerns or perceived effects). There may be some fluctuations in property values, especially when there is a notable change in Project activities (e.g., the shift from construction to operations); however, it is expected that once monitoring results are available and confirm the predictions in the Application/EIS, and/or KAM shows a commitment to further addressing changes through ongoing monitoring and adaptive management, the market will self-correct. This determination of significance is conservative and the actual effect may

not be as pronounced, especially since the Project may also support the value of residential properties because of in-migration workers during the Operation Phase.

Changes to agricultural property values are expected to be Not Significant (Moderate) because, similarly to residential property values, there may be some fluctuations in market values as there are shifts in the mode of operation for the Project. The primary difference will be that the Project is surrounded by agricultural property and therefore real and perceived effects may be more pronounced. This determination of significance is also considered conservative in light of the mitigation measures specific to ranchers (Section 8.4, Land and Resource Use).

7.5.5.5 *Characterization of Likelihood and Confidence*

The probability of effects on residential and agricultural property values is low. Stakeholders, especially residents of Kamloops, have expressed concern about a wide range of topics related to the Project during all phases, including potential Project effects on nearby neighbourhoods, including those in the LSA (Pineview Valley, Aberdeen, Upper Sahali, and Knutsford). These concerns are expected to be addressed in the early stages of Project development and throughout the remainder of the Project phases through monitoring and adaptive management. In light of the numerous factors involved in determining property values, a pronounced influence of the Project is considered unlikely but it may occur.

As property values are influenced by a large and complex set of variables, confidence in the analysis is low. The cause-effect relationship between the Project and Property Values is not fully understood and there are numerous external variables that could potentially affect changes to residential and agricultural property values in the LSA. It will be difficult to directly attribute fluctuations in property values to the Project. As discussed above, other factors that could influence property values include the rate of housing starts, population growth, macro-economic changes, and government policies. In addition to these factors, it is also difficult to predict with any accuracy how people will react to Project construction and operations. Attitudes towards the Project and reasons for buying and selling property are similarly diverse and it will be difficult to directly attribute effects of the project on decisions to buy and sell property.

7.5.5.6 *Summary of Residual Effects Assessment and Significance*

During the Construction and Operation phases of the Project, the Project activities are expected to have a Not Significant (Moderate) effect on changes on residential property values for those rural residences located around the Project Site perimeter, and potentially for residences in Knutsford and Aberdeen, and for the agricultural properties closest to the Project Site perimeter. For residential property, this is due to real and perceived changes to air quality, noise levels, vibration levels, and visual impacts. For agricultural property, this is due to real and perceived changes to air quality, noise levels, vibration levels, and changes in vegetation. Mitigation measures for other disciplines, such as Air Quality, Noise and Vibration, and Visual Impacts and Aesthetic Features will minimize potential Project effects on residential and agricultural property values. After the implementation of mitigation measures, the Project is still expected to have two residual effects (Table 7.5-9). These two effects will be carried forward to the cumulative effects assessment (CEA) in Section 7.5.6.

Table 7.5-9. Summary of Residual Effects, Mitigation, and Significance on Property Values

Residual Effects	Project Phase	Mitigation Measures	Significance
Residential property values could decline for rural residences around the perimeter of the Project Site, and possibly in Knutsford or Aberdeen, due to real or perceived changes in air quality, noise and vibration, and visual impacts	Construction; Operations	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; implementation of engagement and information sharing mechanism	Not Significant (Moderate)
Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation	Construction; Operations	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; implementation of engagement and information sharing mechanism	Not Significant (Moderate)

7.5.6 Cumulative Effects Assessment

7.5.6.1 Introduction

This section describes the potential incremental effects likely to result from the Project on the environment when the effects are combined with those from other past, present, or future projects and activities. The intent is to determine whether the residual effects of the Project could interact with the residual effects of other projects or activities thereby creating a greater effect on the Property Values VC.

The residual effects on Property Values relate to potential changes in residential and agricultural property values as a result of Project construction and operations and how changes (real or perceived) to air quality, noise and vibration, the presence of the Project, and its associated linear developments are perceived. Property values can be further affected if other projects in the area add to the dis-amenities and nuisance factors that affect property values.

7.5.6.2 Identification of Other Actions that May Affect Property Values

Chapter 5 (Assessment Methodology) describes the past, present, and reasonably foreseeable projects and activities that could interact with the effects of the Project. These projects are screened against the residual effects of the Project. For the Property Values VC, the key concern from a cumulative effects perspective is whether other projects or activities could contribute to real or perceived changes in air quality, noise and vibration, or visual impact in the same area and at the same time as the Project.

7.5.6.3 Interactions between Residual Project Effects and Other Project or Activity Effects

Table 7.5-10 screens the other projects and activities that could be included in the CEA for Property Values. Only potential interactions ranked “M” or “H” are subject to further assessment as potential cumulative effects. Past projects no longer interact with either residential or agricultural property values. Active projects are already considered in the baseline. Of the future projects listed, only the

Trans Mountain Pipeline (TMPL) Expansion is anticipated to have a moderate interaction (“M”) with potential Project effects on Property Values. The other projects listed in Table 7.5-10 are not included in the CEA because there is no spatial or temporal overlap (i.e., past projects) or their effects on property values are already included in the characterization of the baseline.

The construction of the TMPL Expansion project is expected to overlap with agricultural land parcels adjacent to the Project Site; therefore, potential cumulative effects will be examined in connection with agricultural property values. The TMPL Expansion is not expected to interact with the Project’s residual effect on residential property values; therefore, no potential cumulative effects on residential properties are identified.

Effects of the TMPL Expansion may interact with Project-related changes in agricultural property values. The TMPL Expansion will twin an existing pipeline in Alberta and BC, build new and modified facilities, and build three new berths at the Westridge Marine Terminal in Burnaby, BC (TMPL 2013). Of these aspects of the project, the twinning activities are expected to interact with potential changes in agricultural property values as this will involve the expansion and/or movement of the current pipeline right-of-way. In the vicinity of the Project, TMPL will need to reroute the pipeline because it currently runs under the proposed open pit. The proposed rerouted line will run east of Lac Le Jeune Road and west of the General Arrangement. According to the Technical Update No. 2 filed with the National Energy Board by TMPL (2014), the reroute will affect 13 new parcels of land, 11 of which are owned by KAM, one of which is owned by the Crown, and one of which is privately held. At the time of the filing, the private landowner had not raised any concerns about the proposed TMPL alignment.

Construction of the TMPL Expansion may have a temporary adverse effect on agricultural property values that may interact with changes caused by the Project. Construction may preclude use of some of the agricultural land and the new pipeline right-of-way may preclude later agricultural use of the property. As noted above, the EIS for the Keystone XL Project determined that land disturbance could have a short-term effect on property values, but this effect on agricultural property values is during operations, and, if adverse, was not likely to be statistically significant (United States Department of State 2011a). In addition, the TMPL Expansion and rerouting to accommodate Project infrastructure is expected to affect one privately held lot (TMPL 2014).

7.5.6.4 *Proposed Mitigation Measures*

It is expected that the decision to primarily use existing easements and rights-of-way will help mitigate any potential effects of the TMPL Expansion on agricultural property values overall. Closer to the Project, Trans Mountain will need to reroute the pipeline because it currently runs under the proposed open pit. There is a TMPL Land Program, the objectives of which are “obtaining landowner acceptance and land rights grants for survey, construction, restoration and transition to operations by providing fair compensation and addressing non-monetary issues in a respectful, sincere, and honest manner (TMPL 2013). It assumed that Trans Mountain will negotiate compensation and other arrangements directly with the landowner.

Table 7.5-10. Ranking Potential for Residual Effects to Interact Cumulatively with Effects of Other Human Actions on Property Values

Residual Effect	Industrial Projects/Activities													Natural Resources and Land Use			Tourism and Commercial Recreation Activities					Community Infrastructure			Transportation						
	Vidette Lake Mine	Afton Mine (Historical)	Iron Mask Mine	Bonaparte Mine	New Afton Mine (New Gold)	Highland Valley Copper Mine (Teck)	Domtar Kamloops Pulp Mill	Tolko-Hefley Creek Plywood and Veneer	LaFarge Cement Plant	Trans Mountain Pipeline System (Kinder Morgan)	Trans Mountain Pipeline System - Expansion (Kinder Morgan)	Harper Creek	Highland Valley Copper - Bethlehem Expansion	Kamloops Forest District	Agriculture	Ranching	Tranquille on the Lake	Lac Le Jeune Resort	Tobiano Golf Course	Recreational Hunting, Fishing, Foraging	Recreational Trails	City of Kamloops Wastewater Management	Water Treatment Centre	City Expansion and Growth	Lac le Jeune Road	Highway 1	Highway 5A	Highway 5 (Coquitalla Highway)	Kamloops Airport	Rail Yards and Lines (CP and CN)	
Residential property values could decline for rural residences around the perimeter of the Project Site, and possibly in Knutsford or Aberdeen, due to real or perceived changes in air quality, noise and vibration, and visual impacts	-	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation	-	-	-	O	O	O	O	O	O	M	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

Notes:

- (-) No spatial or temporal overlap.
- O Spatial or temporal overlap, but no interaction anticipated OR No change from current condition anticipated, and already captured as part of baseline characterization. No further consideration warranted.
- L Negligible to minor interaction expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.
- M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.
- H Key interaction; warrants further consideration.

Additional mitigation measures, similar to those undertaken by KAM to minimize Project construction effects on noise and vibration and air quality could also be taken by Trans Mountain.

There are no additional mitigation measures for KAM to undertake that would reduce the potential effects of the TMPL Expansion on agricultural property values.

7.5.6.5 Evaluation of Significance of Residual Cumulative Effects

After the implementation of mitigation measures described above, a cumulative effect will likely remain (Table 7.5-11). There may be a reduction in the value of agricultural property for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, vegetation, and temporary land disturbance.

Table 7.5-11. Summary of Cumulative Effects Mitigation Measures and Residual Effects on Property Values

Ajax Project Activity	Other Human Action Activity	Description of Potential Cumulative Effect	Description of Mitigation Measure(s)	Description of Residual Cumulative Effect
All	Construction of TMPL Expansion	Change to agricultural property values	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; compensation for easements	Agricultural property values could decline for those properties on the perimeter of the Project Site boundary due to real or perceived changes in air quality, noise and vibration, vegetation, and temporary land disturbance

As shown in Table 7.5-12, the cumulative effect is similar to the Project effect described in Section 7.5.5, and is also anticipated to be Not Significant (Moderate). This is primarily because the effect is expected to be short-term (i.e., during the construction of the TMPL Expansion project), occur once (when construction phases of the Project and the TMPL Expansion overlap), be highly localized (to the area between the Project Site and Lac Le Jeune Road), and be reversible in the short-term (as the land disturbance will end once the pipeline has been rerouted).

Due to the uncertainties described in Section 7.5.5.5 regarding the various factors influencing property values, the probability of a cumulative effect of the Project with the TMPL Expansion is low, and there is a low level of confidence in this assessment. The assessment is intended to be conservative (i.e., worst-case), and a less pronounced effect may result.

7.5.7 Conclusion

Table 7.5-13 presents a summary of Project and cumulative residual effects for Property Values. The Project is anticipated to adversely interact with residential and agricultural property values through changes in population, air quality, noise levels, vibration levels, visual impacts, and grasslands vegetation. With the exception of population change, these effects were all assessed separately in the

Application EIS in sections 10.1 (Air Quality), 10.5 (Noise and Vibration), 8.3 (Visual Impacts and Aesthetic Features), and 6.10 (Grasslands). Overall, none of these effects are anticipated to be significant.

In the context of property values, there will be occasional exceedances in air quality guidelines close to the Project Site perimeter, but these exceedances are anticipated to be localized and largely limited to a small number of days in the winter. However, Project-related noise and vibration levels may be perceptible at properties on the eastern and western perimeters of the Project Site; these changes could affect the desirability of the parcels. The Project may also be visible from some residential properties to the west and south of the Project. Residential neighbourhoods in the City of Kamloops (e.g., Pineview Valley, Aberdeen, and Upper Sahali) will not have a view of the Mine Site, although the transmission line may be visible from some areas.

For agricultural property values, those parcels closest to the Project will experience the greatest degree of effects, but only noise levels and air quality are anticipated to potentially have an influence on the value of agricultural properties. Similar to the discussion in the context of residential property values, changes in air quality are localized, seasonal, and for a small percentage of each year. Therefore, they are not anticipated to change agricultural usage. Noise levels could change some usage of fields close to the Project but KAM is committed to working with local ranchers to continue agricultural activity around the Project (see Section 8.4, Land and Resource use).

Based on the outcomes of the other disciplines that could affect property values, the Project is not expected to affect property values in Pineview Valley or Upper Sahali. For residences closer to the Project (i.e., the rural residences closest to the Project Site perimeter, and potentially in Aberdeen and Knutsford), real or perceived changes in air quality, noise levels, vibration levels, and visual impacts could result in a short-term decline in property values; however, the influence of these factors are not certain as the Project is not expected to noticeably affect noise, air quality, views, or other aspects in Aberdeen or other neighbourhoods. There may be an increase in noise levels for rural residences bordering the Project Site but noise levels will remain below the threshold for sleep disturbance and %HA. If there are short-term fluctuations in property values, it is expected that the market will correct after the real effects of the Project are shown—through environmental monitoring and disclosure of results—to be minimal. KAM is also committed to adaptive management in order to proactively identify and address the Project's effects on the environment and community. In addition, population growth could support stable or increasing residential property values during the Operation Phase.

Mitigation measures for other disciplines are expected to reduce the nature of effects on property values, and KAM's monitoring, engagement strategy, and robust reporting mechanisms are expected to mitigate potential adverse Project effects on residential and agricultural property values. Monitoring and reporting will provide KAM an opportunity to share the accuracy of the predictions made in the Application/EIS and address issues that arise through adaptive management. Project effects on agricultural property are expected to be the same, although population change and visual impacts are not expected to have an effect.

Table 7.5-12. Characterization of Cumulative Residual Effects, Significance, Likelihood and Confidence on Property Values

Residual Effect	Residual Effects Characterization Criteria							Significance of Adverse Residual Effects	Likelihood and Confidence	
	Magnitude	Duration	Frequency	Geographic Extent	Reversibility	Resiliency	Context		Probability	Confidence
Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation	Minor	Short-term	Once	Local	Reversible Short-term	High	Neutral	Not Significant (Moderate)	Low	Low

Table 7.5-13. Summary of Project and Cumulative Residual Effects, Mitigation, and Significance for Property Values

Residual Effects	Project Phase	Mitigation Measures	Residual Effect Significance	Residual Cumulative Effect Significance
Residential property values could decline for rural residences around the perimeter of the Project Site, and possibly in Knutsford or Aberdeen, due to real or perceived changes in air quality, noise and vibration, and visual impacts	Construction; Operation	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; implementation of engagement and information sharing mechanism	Not Significant (Moderate)	No residual cumulative effect
Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation	Construction; Operation	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; implementation of engagement and information sharing mechanism	Not Significant (Moderate)	Not Significant (Moderate)

Since property values are affected by a variety of factors and many preferences are highly personal, determining the Project’s influence on residential and agricultural property values is challenging. In light of these challenges, the determinations of significance for Project residual effects on both residential and agricultural property are conservative. For the rural residences closest to the Project Site, changes property value as a result of effects to air quality, noise levels, vibration levels, and visual impacts is Not Significant (Moderate); the environmental effects of the Project will be less noticeable at properties in Aberdeen or Knutsford, although perceptions or concerns about impacts could also influence property values in these areas until monitoring results (and practical experience) show that effects are adequately managed. The decrease of agricultural property values for those properties closest to the Project Site perimeter due to real and perceived changes to grasslands vegetation, air quality, noise levels, and vibration levels is also characterized as Not Significant (Moderate).

The Project residual effect on agricultural property values is expected to interact with project effects from the TMPL Expansion. The interaction is expected to be brief, localized, and temporary. Therefore, the determination of significance (Not Significant [Moderate]) does not change for the CEA.

7.6 ECONOMIC DIVERSIFICATION

7.6.1 Rationale

During Project-related consultation, a number of different economic topics were raised for consideration as Valued Components (VCs). In order to be identified as VCs for the application there must be a perceived likelihood that the VC will be affected by the Project. Scoping of economic VCs took into account issues and concerns raised during Project consultation with the public and stakeholders (see Sections 4.6 and 4.7), discussions with the British Columbia Environmental Assessment Office (BC EAO) and other government agencies, and the experience of other recent projects in British Columbia (BC). Interactions with the Project Working Group, comprised of representatives from federal, provincial and local governments and Aboriginal Groups also helped to frame the VCs.

Table 7.6-1 provides a summary of the rationale and justification for choosing and assessing each economic VC. Additional, specific detail for the VCs is provided in relevant application sections.

Table 7.6-1. Rationale for including Economic Diversification as a VC in the Application

Valued Components	Identified by*				Rationale for Inclusion
	AG	G	P/S	SK	
Economic Diversification		X	X		Concerns have been raised that the economy of the RSA could become too dependent on the mining industry and therefore potentially vulnerable to a downturn in the mining sector.

Note:

*AG = Aboriginal Group; G = Guideline Requirement; P/S = Public/Stakeholder; SK = Scientific/professional knowledge

The topic of Economic Diversification was raised during Project consultation with the public and stakeholders, discussions with the BC EAO and other government agencies.

Economic diversification refers to the distribution of economic activity across a range of industries or sectors. Economic diversification can support economic sustainability within a region and can help to mitigate potential effects of a sudden downturn in any single sector. In both the Local Study Area (LSA)¹ and Regional Study Area (RSA)², mining has historically been an important economic sector. Since 2001, approximately 2% of total employment in Kamloops, the primary population centre in the LSA, was associated with mining and oil and gas extraction industries (Statistics Canada 2002). Within the RSA, this figure has ranged from 2% in 2001 to 4% in 2011 (Statistics Canada 2013, 2007, 2002). City of Kamloops officials have acknowledged the importance of the mining sector, noting that it contributes to the diversity of the economy (Ajax KPI Program 2011-2012). The interest in assessing potential effects related to economic diversification (or lack thereof) relates primarily to concerns about the region becoming increasingly dependent on the mining sector and becoming vulnerable to potential effects of a sudden downturn.

¹ The LSA is described in more detail in Section 7.6.3.2. It is defined as the City of Kamloops, the TNRD-J Copper Desert Country Census subdivision, and the reserve parcels for the Tk'emlúps te Secwépemc and Skeetchestn Indian Band for which Census Canada provides data. These reserve parcels are, respectively, Kamloops 1 and Skeetchestn.

² The RSA is the TNRD. Further detail is available in Section 7.6.3.2.

Analysis of potential effects on economic diversification is closely tied to the effects assessed for the Economic Growth VC (Section 7.1); Labour Force, Employment and Training VC (Section 7.2); Income VC (Section 7.3); and Business VC (Section 7.4). The information developed to support the analysis of this VC also contributes to other analyses for other VCs (Figure 7.6-1).

7.6.2 Background

Employment and business opportunities associated with the Project are expected to shape the economic diversity of the LSA and RSA.

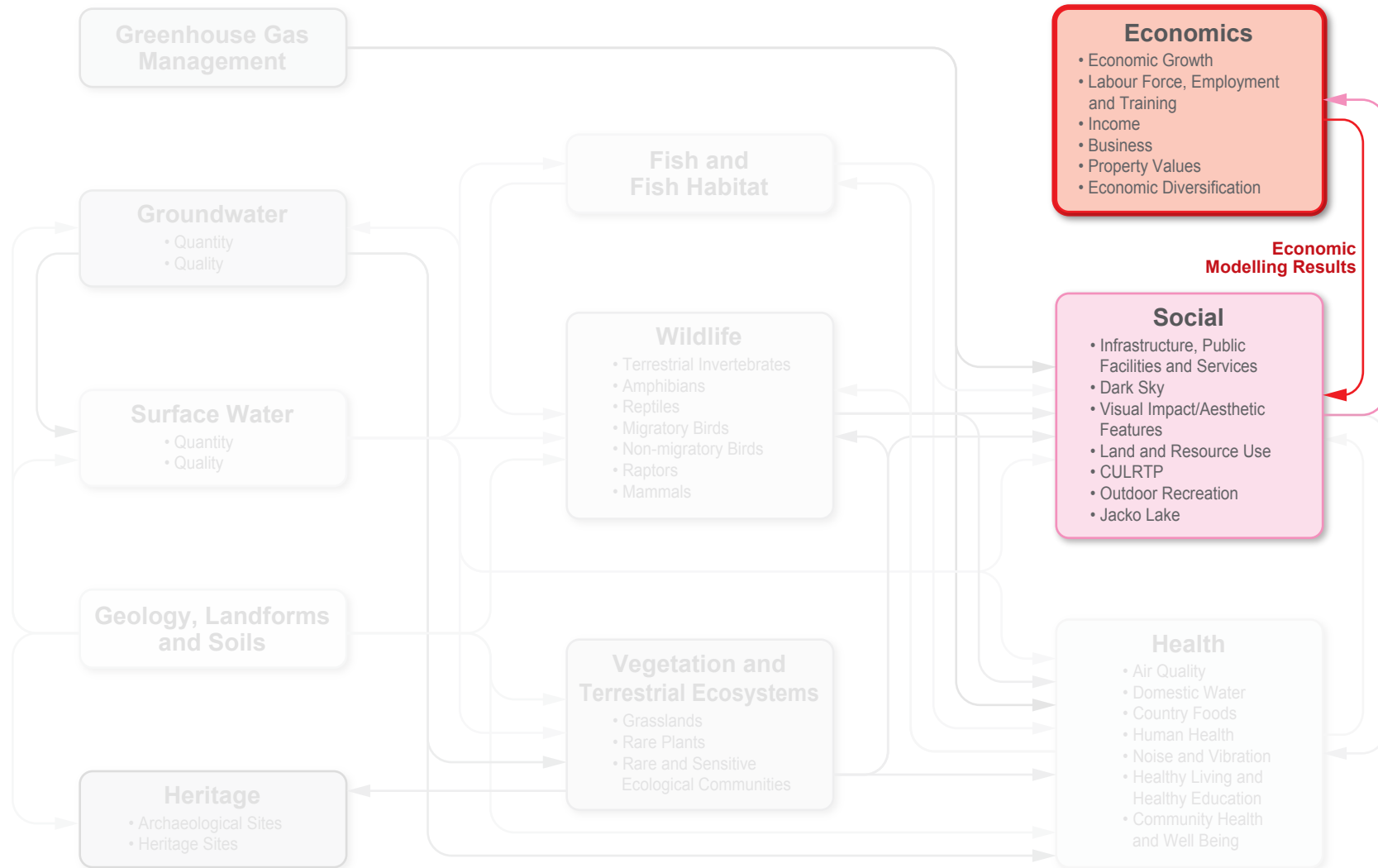
As presented in Project Benefits (Section 2.7.3, Labour Force, Employment, and Training), the Project is expected to generate between approximately 898 and 1,175 direct employment opportunities per year depending on the year during the Construction Phase. Residents of the LSA are expected to fill between 433 and 1,153 of these positions per year, depending on the year. During the 23-year Operations Phase, the Project is expected to support, on average, a total of between 450 and 500 direct employment opportunities each year. Between 271 and 347 of those positions are expected to be filled by residents of the LSA.

7.6.2.1 Regional Overview

The RSA is the Thompson-Nicola Regional District (TNRD), which covers more than 45,000 km² from Merritt and Lytton to north of Blue River. Included in the RSA are three Aboriginal Groups designated by either the BC EAO or the Canadian Environmental Assessment Agency (CEA Agency) for inclusion in the Application for an Environmental Assessment Certificate/Environmental Impact Statement for a Comprehensive Survey (Application/EIS). These three Aboriginal Groups are the Lower Nicola Indian Band (LNIB), Ashcroft Indian Band (AIB), and Whispering Pines/Clinton Indian Band (WP/CIB). The LSA is the City of Kamloops (Kamloops), the TNRD-J Copper Desert Country Census subdivision, and the populated reserve parcels for which Statistics Canada provides data for the Tk'emlúps te Secwépemc (TteS) (Kamloops 1 Indian Reserve [IR]), and the Skeetchestn Indian Band (SIB) (Skeetchestn IR). Together the TteS and SIB form the Stk'emlupsemc te Secwépemc Nation (SSN).

Much of the RSA economy is based on public services, including health care and education. Tourism has become an increasingly important aspect of the regional economy, but is still a relatively small contributor to the overall economy (Horne 2009). Mining has historically been an important sector within the RSA and continues to be so. Since 2001, approximately 2% to 3% of employment in Kamloops (which corresponds closely to the total labour force of the LSA) had been employed in mining and oil and gas extraction industries. Within the RSA, primary industry employment has ranged from 2% in 2001 to 4% in 2011 (Statistics Canada 2013, 2007, 2002). In addition to mining, the economy of the RSA is based on government services, including health care and education, and the tourism sector is increasingly important (Horne 2009).

Figure 7.6-1
Inputs to Economic Valued Components



7.6.2.2 *Historical Activities*

A more complete description of historical activities that have helped to shape the Kamloops area economy is provided in Appendix 7.1-A. Highlighted activities include:

- **Mining Development:** Mining has historically been a key economic driver in the Kamloops area. Mining activity in the area can be traced back over 100 years with exploration within the LSA and immediate vicinity of the LSA beginning in the 1880s. The former Afton Mine included the Ajax east and west pits (located within the Project footprint), as well as the Afton pit (approximately 8 km northwest of the Project). Operations on the Afton pit began in 1977, and operations on the Ajax East and Ajax West pits were initiated in 1989; activities at the Afton pit and Ajax East and West pits were subsequently suspended in 1991 due to depressed metal prices. Currently, the New Afton Mine, which utilizes the historic Afton pit and infrastructure, can process up to 12,500 tonnes of ore per day (New Gold 2014; Ajax KPI Program 2011-2012). Other mines in the area include Highland Valley Copper (HVC) (50 km from Kamloops), Copper Mountain (170 km from Kamloops), and Gibraltar (about 330 km from Kamloops), and there are exploration activities and proposed mines throughout the RSA.
- **The SSN and Mining:** The Cultural Heritage Study (Ignace 2014) notes that ethnographers (e.g., James Teit) have noted the use of copper by the Secwépemc. He noted that copper tube beads were common as were copper earrings. While Teit assumes that most of the copper used was European-made, other ethnographers observed that there were some copper deposits that were mined by the Secwépemc. Among these were Copper Creek, which is located on the north shore of Kamloops Lake (Ignace 2014). The SSN was also involved in gold mining before the 1858 Fraser Canyon gold rush. According to Ignace (2014), maps from the beginning of the 1858 gold rush confirm early Aboriginal involvement in gold mining as some maps show “Indian Diggings” on the north shore of Kamloops and Shuswap lakes. Hudson’s Bay Company journals and accounts also show trading for gold dust by Aboriginal persons who likely engaged in placer mining. Gold panning continued into the twentieth century.
- **Transportation and Infrastructure Development:** Kamloops has served as an important transportation hub since the 1890s through railway development and subsequent highway construction during the 1950s. Other notable developments have included the Kamloops airport expansion in 2009 (Venture Kamloops 2014).
- **Forestry Sector Development:** Forestry has been an important driver in the local economy despite periodic (and recent) industry downturns. Weyerhaeuser established their pulp mill operations in 1965. Domtar purchased the mill in 2007 and is currently running the facility at a reduced capacity after closing one pulp machine at the plant, which affected 125 workers (Klassen 2014; Domtar 2012; Ajax KPI Program 2011-2012).
- **Education and Technology Development:** These sectors have become areas of increasing focus for Kamloops in recent years. Thompson Rivers University (TRU) was incorporated in 2005 (and formerly operated as the University College of the Cariboo) and offers a wide variety of academic degrees as well as trades-oriented programming. In 2011, the TRU’s Law Faculty opened (TRU n.d.). As a whole, employment associated with the professional, scientific and technical services sector within the Thompson/Okanagan Development Region (excluding Kelowna) has been on an upward trend since 2001 and Kamloops is actively working towards expanding the technology sector (Venture Kamloops 2014; Ajax KPI Program 2011-2012). BC Aboriginal Mentoring and Training Association, which helped

First Nations people gain employment in the mining sector, closed in 2014. The closure removes one support for First Nations people looking for training to secure employment in the mining industry (Stueck 2014).

- **Other Development:** The Kamloops economy has also been shaped by the increasing role of tourism, the City's designation as "The Tournament Capital of Canada" (2001), and the development of the Sun Peaks Resort.
- **Notable recent economic challenges:** Recent challenges have included the closure of Pollard Banknote (2010) and Convergys (2010) and more recently, the closure of one production line at the Domtar plant (2013) and the closure of Kamloops Daily News in 2014 (Klassen 2014; Venture Kamloops 2014).

Mining has historically been an important sector within the RSA, although revenues have decreased since commodity prices were at or near record highs in 2011. Mining is seen by City officials as an important sector in the economy of Kamloops and a contributor to the diversity of the economy (Ajax KPI Program 2011-2012). In the Thompson Okanagan Development Region (excluding the Kelowna Census Metropolitan Area), in which the RSA is located, the number of individuals employed in the mining and oil-and-gas extraction sector has grown at a faster rate than all industries between 1997 and 2013 (Venture Kamloops 2014). However, during consultation with stakeholders, some residents expressed concern that the development of the Project could transform Kamloops back into a perceived single-industry town reliant on mining, instead of a city with the diverse economy observed today.

7.6.2.3 Baseline Studies

The objective of the baseline research was to understand existing conditions related to economic diversification in the LSA and RSA. Below is a summary of conditions. More detail can be found in Appendix 7.1-A, Ajax Project Socio-economic Baseline.

Data Sources

A variety of data sources were consulted to understand and describe the current situation in the LSA and RSA in connection with economic diversification. Among the data sources consulted were the Census of Canada and National Household Survey by Statistics Canada; reports published by Venture Kamloops, an arm's-length economic development corporation for Kamloops; the Cultural Heritage Study (Ignace 2014) by SSN; publicly available information from Aboriginal businesses; and Horne's studies (2004, 2009) on economic diversity in BC. In addition to looking at secondary sources, interviews were conducted as part of a Key Person Interview (KPI) program. These interviews included individuals who are involved in various industry sectors (e.g., forestry, mining, tourism) at different levels (e.g., direct involvement in the private sector, government officials). Where possible, information and concerns from Aboriginal Groups were considered and included. This information came from publicly available sources (e.g., annual reports, websites) and records from interactions (e.g., meeting notes, written comments for the regulator and/or KAM).

Consultation activities undertaken with the Aboriginal Groups during the Pre-Application period included capacity building and funding, TK/TLU (Traditional Knowledge/Traditional Land Use) studies, community meetings, site tours, and meetings with Aboriginal Group representatives (see Section 4.3). Multiple attempts have been made to engage each Aboriginal Group to seek the baseline data required for the Application/EIS including the circulation of baseline documentation for review and

comment. The information gathered through this engagement has been incorporated in the Application and considered in the assessments. In some cases, the requested information was not available from Aboriginal Groups at the time of writing or from secondary sources. Where appropriate, additional information made available by Aboriginal Groups will be considered in Project development plans.

Methods

The approach to understanding baseline conditions focused primarily on a review of secondary data. Information was also gleaned from discussions and interviews with individuals who have knowledge regarding general economic circumstances in the LSA and RSA to help inform the baseline discussion. This included discussions with representatives from the City of Kamloops and TRU.

Characterization of Baseline Conditions

Kamloops and the surrounding area has consistently had one of the more diverse economies in BC (Horne 2009). Overall, the dependence on primary industry, including forestry and mining, and tourism have traditionally been well below the scenarios reported for other areas in the Province. The RSA has experienced economic change in recent years as an outcome of the declining forestry sector and growing tourism and mining sectors. Trends related to relevant economic sectors are discussed in more detail below along with how economic diversity has been considered within the regional economy

Trends in the Mining Sector

After commodity prices peaked in 2011, the mining sector in British Columbia has been on the decline in recent years as several important mineral and metal prices (gold, silver, copper, lead, zinc, and coal) have either declined or remained steady. Metallurgical coal and copper, which generate the most revenue in BC's mining sector, both produced lower gross mining revenues as their prices declined (PricewaterhouseCoopers 2014).

Despite the recent decline in commodity prices, gross provincial revenues from the mining sector have been trending upward from \$4.6 million in 2004 to \$8.5 million in 2013, an increase of over 80%. The number of employees in the mining sector has also steadily risen from about 6,000 in 2003 to over 10,000 in 2013 (PricewaterhouseCoopers 2011, 2014).

There are a number of active and proposed mines within, and near, the RSA including:

- **Highland Valley Copper (HVC):** The Highland Valley Copper mine is located in the RSA near Logan Lake and is approximately 50 km by highway from Kamloops. In 2014, HVC was the third largest employer in the LSA with over 1,300 employees. In the past five years, the number of employees has risen from 800 to approximately 1,380. About half of the HVC workforce lives in Kamloops. The remainder of the workforce commutes from other nearby communities in the RSA including Logan Lake and Ashcroft (Ajax KPI Program 2011-2012; Dechert *pers. comm.* 2014). The mine is currently expected to operate until 2027 based on a new operations plan (Teck 2015).
- **New Afton:** The New Afton Mine is in the LSA and approximately 10 km west of the Ajax Project, and is primarily an underground operation. The mine began commercial production in 2012. As of December 31, 2014, there were 447 employees and 14 contractors (New Gold 2015a). Seventy-five to eighty percent of the operation's workforce lives in Kamloops (Ajax KPI Program 2011-2012). The mine is expected to be in operation for a total of 12 years until

approximately 2024, although the results of exploration suggest that operations could be extended by 5 years (New Gold 2015b).

- **Harper Creek Mine Project** (proposed): The proposed project is in the RSA and located 150 km from the City of Kamloops. If approved, the project would have a mine life of about 28 years (BC EAO and CEA Agency 2015). The mine is expected to have approximately 600 positions during construction and peak operation employment of 466 positions (ERM Consultants Canada Ltd. 2015b).

Other mines in operation in the vicinity of the RSA include:

- **Copper Mountain:** Located outside of the RSA, 170 km from the City of Kamloops, the mine started production in 2011 and it is expected to operate for 17 years. Its current workforce is approximately 500 people.
- **Gibraltar:** Located outside the RSA, 330 km from City of Kamloops, the mine opened in 2004 and it is expected to operate for about 27 years. Gibraltar's current workforce is approximately 620 people.
- **Other proposed projects:** The New Prosperity Gold-copper Mine (located outside the LSA about 300 km from the City of Kamloops; mine life of about 20 years) has filed for a second judicial review after the federal government did not authorize the project (CEA Agency 2014; Taseko Mines Limited 2014). Ruddock Creek (located about 155 km from the City of Kamloops) has submitted a project description to the Provincial and Federal governments (Imperial Metals 2015). Bonaparte Mine, located 45 km north of the City Kamloops, is currently in the exploration and drilling stage.

Trends in the Forestry Sector

Timber harvesting in the Kamloops Timber Supply Area (TSA) increased by about 50% between 2009 and 2011 as a result of the forestry industry coming out of an economic downturn, the mountain pine beetle infestation slowing, and the industry undergoing salvage operations by harvesting beetle-affected trees before they lost their value. In 2012, it was anticipated that the forestry industry around Kamloops would experience a downward economic trend in the subsequent five years (Sommer et al., pers. comm. 2012). However, as of 2014, BC's forestry and wood-products sector was expected to remain a significant growth driver for the province through 2018 (Central 1 2014).

Unstable lumber markets have resulted in closures and output reductions of mills throughout BC and in the Kamloops area. In addition to the shutdown of the Weyerhaeuser mill in Kamloops in 2008, Ainsworth Lumber's Savona and Lillooet mills also closed in 2009.

Domtar, which operates a pulp mill in Kamloops, has invested around \$120 million in their pulp mill over the last couple of years to improve its competitiveness. The mill produces electricity from sawmill residue material it receives from about 20 regional sawmills, including mills in Merritt, Vernon, and Kelowna (Adams pers. comm. 2012). In 2014, Domtar employed 316 people (Venture Kamloops 2015).

Forestry is an important regional economic activity, and the downturn in the forest industry has implications for direct and indirect employment related to the Project. Although there have been recent reductions of available employment in the forestry sector, some of the skills used in the forestry sector may be transferable to work in the mining sector (Ajax KPI Program 2011-2012) potentially adding to the supply of available local workers.

Trends in the Agriculture Sector

Agriculture, ranching in particular, is an important economic driver in the LSA and RSA. Cattle ranching is the primary agricultural activity in proximity to the Project in terms of land use. Within the RSA, cattle ranching and horse keeping accounted for most of the agricultural activity. In the RSA, roughly one third of farms are engaged in cattle ranching and farming, which includes farms that focus on raising, milking, and fattening cattle. Operations engaged in raising horses, mules, donkeys, and other equines made up over 20% of the agricultural operations in the RSA (Statistics Canada 2011a). The majority of farmland in the RSA is unmanaged pastures used in ranching operations (Invest in Thompson-Nicola 2015). The total gross farm receipts for the RSA, which include receipts from all agricultural products sold and program payments and custom work receipts, in 2010 was \$72.6 million (Statistics Canada 2011b).

Trends in the Tourism Sector

Tourism has become an increasingly important component of the LSA economy. The tourism market is both domestic and international. The international market is structured around the fact that Kamloops has traditionally been an overnight stop-over for tourists travelling and experiencing the Rocky Mountains, via either Thomas Cook Travel, Brewster Buslines or the Rocky Mountaineer rail line. The local market consists of opportunities related to fishing, biking, hiking, snowshoeing, skiing and various other outdoor opportunities (Ajax KPI Program 2011-2012).

Tourist traffic in Kamloops amounts to approximately 90,000 to 95,000 people per year occupying hotel rooms in the city.³ Tourism accounts for an estimated \$55 million in revenue through accommodations (Ajax KPI Program 2011-2012). There are about 3,000 hotel and motel rooms in Kamloops (City of Kamloops 2015) and at least 300 campground and RV park sites (a mixture of full hook-up, water, and electricity), excluding provincial parks in the area and sites in other communities in the TNRD (Tourism Kamloops 2015). The accommodation sector has increased local capacity in response to increased demand with initiatives such as the establishment of various hotel chains and with renovations and expansions to existing facilities.

Some tourism marketing focuses on the significance of ranching and grasslands in the RSA. Tourism Kamloops (2015b) promotes Western Heritage Trails in Kamloops and the surrounding area from Merritt in the south to Clearwater in part by providing itineraries for motorcycle drives and driving tours (Tourism Kamloops 2015c, 2015d). These itineraries are not limited to Kamloops and cover other areas of the RSA. Tourism Kamloops also works with TteS to bring international bus tours to their reserve to engage in a cultural sharing program (Ajax KPI Program 2011-2012).

Notable tourism-related events and activities that have helped to shape the local economy include the following:

- **Development of Sun Peaks Resort:** Located 50km northeast of Kamloops, the resort generates 340,000 skier visits per year. It also operates a bike park and golf course, all supported by 7,000 tourist beds. Resort employment approximates 500 people year-round and 1,000 during the winter.
- **Designation of Kamloops as “The Tournament Capital of Canada”:** The City of Kamloops prides itself on being a prime location for tournaments and events and has invested upwards

³ Estimate does not include Sun Peaks but does include corporate travel.

of \$60 million in facility upgrades over the last ten years (Venture Kamloops 2014). The Tournament Capital brings in an estimated \$12 million per year.

- **Kamloopa Powwow:** This event occurs at the TteS Powwow grounds and is one of the largest powwows in western Canada (Tourism Kamloops 2015c).

With the establishment of various hotel chains and renovations and expansions to existing facilities, Kamloops is well-positioned to accommodate the tourism industry. As of 2014, provincial hotel tax revenues, which are an important indicator for tourism growth, for the Kamloops area approximated \$900,000 per year (Tourism Kamloops 2014; Venture Kamloops 2014).

Thompson Rivers University

Thompson Rivers University offers a wide variety of academic degrees but offers many trades-oriented programs as well. The trade school at TRU regularly attracts students from across Canada and has seen an increase in international student enrollments over the last decade. Program numbers and funding are adjusted every couple of years (Ajax KPI Program 2011-2012). TRU also offers degrees in engineering, geology, and environmental sciences. In 2011, the TRU's Law Faculty opened (TRU n.d.).

In 2014, the university ranked as the fifth largest employer in the city of Kamloops with over 1,100 employees (Venture Kamloops 2015) and it is a notable contributor to the LSA economy. According to the 2010-2011 update of an economic impact study conducted by TRU faculty, the total annual economic impact of international students alone on the Kamloops economy is \$87.8 million, which represents a growth of 214% from 2005 (TRU 2011).

Measuring Economic Diversification

Baseline levels of economic diversity in the LSA and RSA are measured using two key indicators: the income dependency ratio and the economic diversity index. These indicators are detailed in studies published by the Province (e.g., Horne 2004, 2009) that examine the extent to which local economies in the Province are economically dependent on various sectors. These studies are developed on the basis of data collected by Statistics Canada during the Census of Canada. Currently, the most recent study available is based on 2006 Census data.

The geographic units used by Horne do not align exactly with the LSA and RSA. The Kamloops Local Area, which most closely aligns with the LSA, consists of additional Census subdivisions, including District Municipality of Logan Lake; two additional electoral districts, Thompson-Nicola P and Thompson-Nicola; the Village of Chase; and the following additional Indian reserves, Spatsum 11, Neskonlith 1 (Neskainlith 1), Sahhalkum 4, and Neskonlith 4. The additional local areas used by Horne (2009) that are included in the RSA are the Ashcroft Local Area, Merritt Local Area, and North Thompson Local Area. The discussion below, however, will focus on the Kamloops Local Area as the majority of the population in the RSA resides in it and is representative of the regional economy.

Income Dependency

Income dependency describes the extent to which specific industries directly and indirectly generate incomes for particular regions. Horne's (2009) estimates assume that income flow within a community can be classified as "basic" or "non-basic" depending on the source of income.

Basic income is defined as income that comes from the "outside world." It can take the form of either employment income (wages and salaries) from jobs producing services that are exported; jobs

producing goods and services related to the tourism sector; and from public sector jobs who receive income from a larger regional, provincial, or federal government. Basic non-employment income includes transfer payments from these other governments and other income related to retirement pensions. Non-basic income represents employment income derived from jobs in the community that provide goods and services to individuals who live in the community, including employment in the retail trade, local transportation, and other services. There are 10 sectors that generate basic employment income. They are forestry and associated manufacturing, mining and associated manufacturing (including oil and gas), fishing and trapping and associated manufacturing, agriculture and food and beverage manufacturing, tourism, high technology, public sector, construction, and film production and sound recording (Horne 2009).

The income dependency approach is framed around the assumption that a healthy basic sector creates a healthy non-basic sector, which is in place to service the basic sector. Each dollar of basic community income is attributed to either one of the basic industries or to a non-employment income source. Therefore, the industry definitions used in Table 7.6-2 include not only the basic activity, but also downstream processing and indirect activities that are purchased locally. Higher percentages associated with the primary industry activities (e.g., mining, forestry, and other resource development industries) indicate a higher reliance on them, and consequently greater vulnerability in the event of associated commodity market downturns.

Table 7.6-2. Income Dependencies for Kamloops Local Area (% Total Income)

Industry Categories	Income Dependency (% of Total After-Tax Income)			
	1991	1996	2001	2006
Forestry and Associated Manufacturing	10	11	10	9
Mining and Associated Manufacturing, including Oil and Gas	7	7	6	6
Fishing and Trapping and Associated Manufacturing	0	0	0	0
Agriculture and Food and Beverage Manufacturing	2	2	2	1
Tourism	2	6	6	6
Public Sector	21	27	29	27
Construction	n/a	n/a	6	8
Other ¹	23	21	8	10
Non-Employment Income Categories				
Transfer payments	15	16	18	16
Other Non-employment Income	20	10	13	16

Source: Horne (2009).

Note:

¹ 'Other' consists of a roll-up of high technology and film production/sound recording categories. "Other" also includes the construction sector for 1991 and 1996.

Table 7.6-2 summarizes the income dependencies for the Kamloops Local Area, based on employment income for basic industry categories. Although these figures are derived for a broader area than the LSA, they are likely representative of the LSA as well; in particular, the proportional distribution between industries provides a good indication of income and employment relationships between industries.

In each census year used to determine income dependencies, incomes associated with the public sector represented the largest percentage of contribution to after-tax incomes. Mining and associated manufacturing, including oil and gas, were comparatively lower at 6% or 7%. Although more recent data is not currently available, it is likely that this percentage has either remained steady or increased

as the New Afton Mine began operations in 2012, while the other major mine in the area, HVC, has continued its operations.

In addition to the New Afton Mining coming online, the First Nations in the Kamloops Local Area, namely the SSN, have become more active in the mining sector since the 2006 Census of Canada on which Horne's most recent set of income dependencies were based. The SSN concluded a partnership agreement in 2008 with New Gold. The agreement provides the members of the TteS and SIB with employment, education, training, and business opportunities (SSN 2014). Stl'emlupsemc-Arrow Transportation is a joint venture that hauls concentrate from the New Gold mine site to Vancouver. Another SSN joint venture involved in mining include Stk'emlupsemc Amalgamated Ventures Inc., which provides safety, security, and First Aid at the New Gold Mine Site (SSN 2014).

Other notable findings for the Kamloops Local Area's income dependency, per Horne's study (2009), include:

- The public sector is the dominant income source for the Kamloops Local Area, comprising 27% of total income in 2006. For comparison, the Victoria Local Area, which contains the seat of the provincial government, saw 39% of total income in 2006 from the public sector.
- Forestry and wood processing represented 9% of income for the Kamloops Local Area in 2006. Corresponding figures for 1996 and 2001 were 11% and 10% respectively, indicating that from an income dependency perspective, circumstances have remained relatively static. For comparison purposes, the Quesnel, Burns Lake, and Vanderhoof local areas are heavily dependent on forestry and wood processing, which represents between 34% and 46% of income in these communities.
- The Kamloops Local Area has a relatively low dependence on mining and associated manufacturing, which represented approximately 6% to 7% of income between 1996 and 2006. For comparison purposes, the income dependencies for Fernie, Fort St. John, and Kitimat-Terrace local areas were 44%, 37% and 22% respectively.
- The Kamloops Local Area's dependence on income associated with tourism is relatively low (6% of income), in comparison to areas such as the Squamish Local Area (between 21% and 30% of income) and for the Golden and Invermere local areas (between 14% and 20% of income).

The income dependency data for the Kamloops Local Area (see definition above) indicates that the relative weighting between income job categories, and the underlying economic diversity it reflects, has remained constant during most if not all of the 1991 to 2006 period. This suggests that, while resource industries are important drivers in the regional economy, the economy is also relatively diversified between resource industries, the public sector, tourism and construction. This economic diversity suggests that the regional economy is more insulated than other regional economies from a downturn in any of the resource sectors.

Income dependency within the TNRD is similar to that found within the Kamloops Local Area. Table 7.6-3 shows the comparative income dependency information in 2006 for the local areas within the TNRD. Merritt and North Thompson both show greater income dependencies on the forestry and associated manufacturing sector than Ashcroft and Kamloops, reflecting the role the forestry sector has compared to the mining sector in the local area economy.

Table 7.6-3. Income Dependencies for Local Areas in the TNRD (% Total Income, 2006)

Industry Categories	Income Dependency (% of Total After-Tax Income)			
	Ashcroft	Merritt	North Thompson	Kamloops
Forestry and Associated Manufacturing	11	23	30	9
Mining and Associated Manufacturing, including Oil and Gas	10	7	2	6
Fishing and Trapping and Associated Manufacturing	0	0	0	0
Agriculture and Food and Beverage Manufacturing	8	3	3	1
Tourism	6	6	7	6
Public Sector	23	22	16	27
Construction	7	9	6	8
Other ¹	6	1	2	10
Non-Employment Income Categories				
Transfer payments	18	18	20	16
Other Non-employment Income	12	12	13	16

Source: Horne (2009).

Note:

¹ 'Other' consists of a roll-up of high technology and film production/sound recording categories.

Diversity Index

The diversity of local economies can be also quantified using a local area's economic dependencies data (i.e., the income dependency percentages described above) to construct a diversity index. The resulting value measures the extent to which a community is dependent on specific economic sectors, if at all. A value of zero means that the local economy is completely dependent on one sector. A value of 100 denotes equal dependence on all sectors (i.e., a diverse economy).

In British Columbia, diversity indices across different local areas are typically between 50 and 80. The diversity index for the Kamloops Local Area in 2006, as defined by Horne (2009) was 74, which was within the top ten ranked (i.e. most diverse) areas in the province, out of more than 60 areas. In 1991, 1996 and 2001 the corresponding figures were 75, 74 and 72 respectively. For comparison, the Invermere Local Area had the highest level of economic diversity with a diversity index of 79, while the Stewart Local Area ranked lowest at 51, indicating a relatively low level of economic diversity (Horne 2009).

A review of income dependencies and diversity indexes for the Kamloops Local Area indicates that the area has historically had a low level of dependency on any one economic sector and continues today to be characterized by higher levels of economic diversity compared to other local areas in BC.

Table 7.6-4 shows the diversity indexes for Local Areas included within the TNRD between 1996 and 2006. Local Areas within the TNRD demonstrate a similar economic diversity to that of the Kamloops Local Area, though both Merritt and North Thompson, with greater income dependencies on the forestry sector are lower than both Kamloops and Ashcroft Local Areas.

Table 7.6-4. Diversity Indexes for Local Areas within the TNRD (1996, 2001, 2006)

Local Area	1996	2001	2006
Kamloops	74	72	74
Ashcroft	77	76	77
Merritt	70	68	70
North Thompson	64	61	68

Source: Horne (2009).

7.6.3 Assessment Boundaries

7.6.3.1 Spatial Boundaries

Local Study Area

As illustrated in Figure 7.6-2, the LSA for the Economic Diversification VC consists of Kamloops, the TNRD-J electoral area, the TteS (based near Kamloops on the Kamloops 1 IR) and the SIB (based near Savona on the Skeetchestn IR). The key indicator for discussing potential changes in economic diversification is income, particularly basic income. The benefits associated with Project employment income will be experienced most acutely within the LSA. It is within this context that economic diversification will be assessed.

Regional Study Area

As illustrated in Figure 7.6-3, the RSA for the Economic Diversification VC consists of the TNRD and includes communities within a 1.5-hour driving distance of the Project (e.g., Merritt, Logan Lake, Chase). There are numerous skilled workers in this area and the Project may attract workers from Aboriginal and non-Aboriginal communities throughout the RSA. The Project is also expected to generate indirect and induced income opportunities across the RSA.

7.6.3.2 Temporal Boundaries

Temporal boundaries for the assessment of the Economic Diversification VC include the following Project phases:

- **Construction:** 3 years;⁴
- **Operation:** 23 years;
- **Decommissioning and Closure:** 5 years (includes project decommissioning, abandonment and reclamation activities, as well as temporary closure, and care and maintenance); and
- **Post Closure:** 5+ years (includes ongoing reclamation activities and post-closure monitoring).

⁴ The Project construction phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4). The construction and operations phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.

7.6.3.3 Administrative Boundaries

The key administrative boundary utilized for this VC is the Kamloops Local Area as defined by Horne (2009). The Kamloops Local Area is broader than the LSA, and includes additional communities such as Logan Lake⁵. However, given that the City of Kamloops comprises a substantial portion of the Local Area population, and that the majority of job opportunities and associated income (i.e., the key indicators related to economic diversification) are expected to be captured within the City of Kamloops and adjacent communities, it is reasonably considered that these figures are representative of the LSA for the purposes of this assessment. Table 7.6-5 provides the populations of the two defined areas based on the 2006 Census. Complete population information for the 2006 and 2011 Census is provided in Section 8.1, Infrastructure, Public Facilities and Services and Appendix 7.1-A Socio-economic Baseline for the Ajax Project.

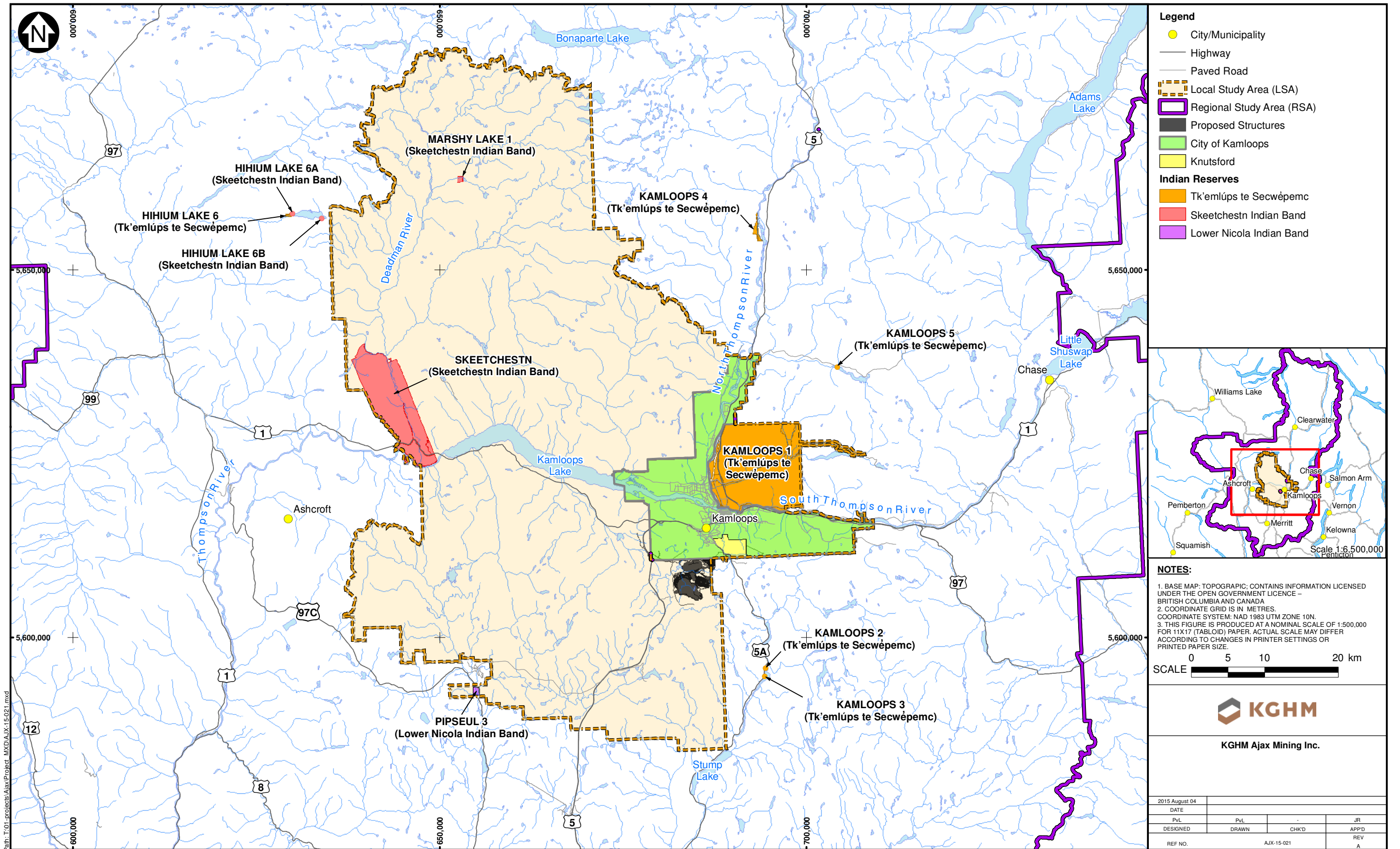
Table 7.6-5. Population by Census Subdivision in Kamloops Local Area, 2006

Communities	Local Study Area	Kamloops Local Area
Kamloops	80,376	80,376
TNRD-J	1,609	1,609
Tk'emlúps te Secwépemc (Kamloops 1 IR)	1,786	1,786
Skeetchestn Indian Band (Skeetchestn IR)	258	258
District Municipality of Logan Lake		2,162
Thompson-Nicola P		4,081
Thompson-Nicola		2,981
Village of Chase		2,409
Spatsum 11		0
Neskonlith 1 (Neskainlith 1),		85
Sahhalkum 4		310
Neskonlith 2		121
Total	84,029	96,178

Source: Statistics Canada (2007)

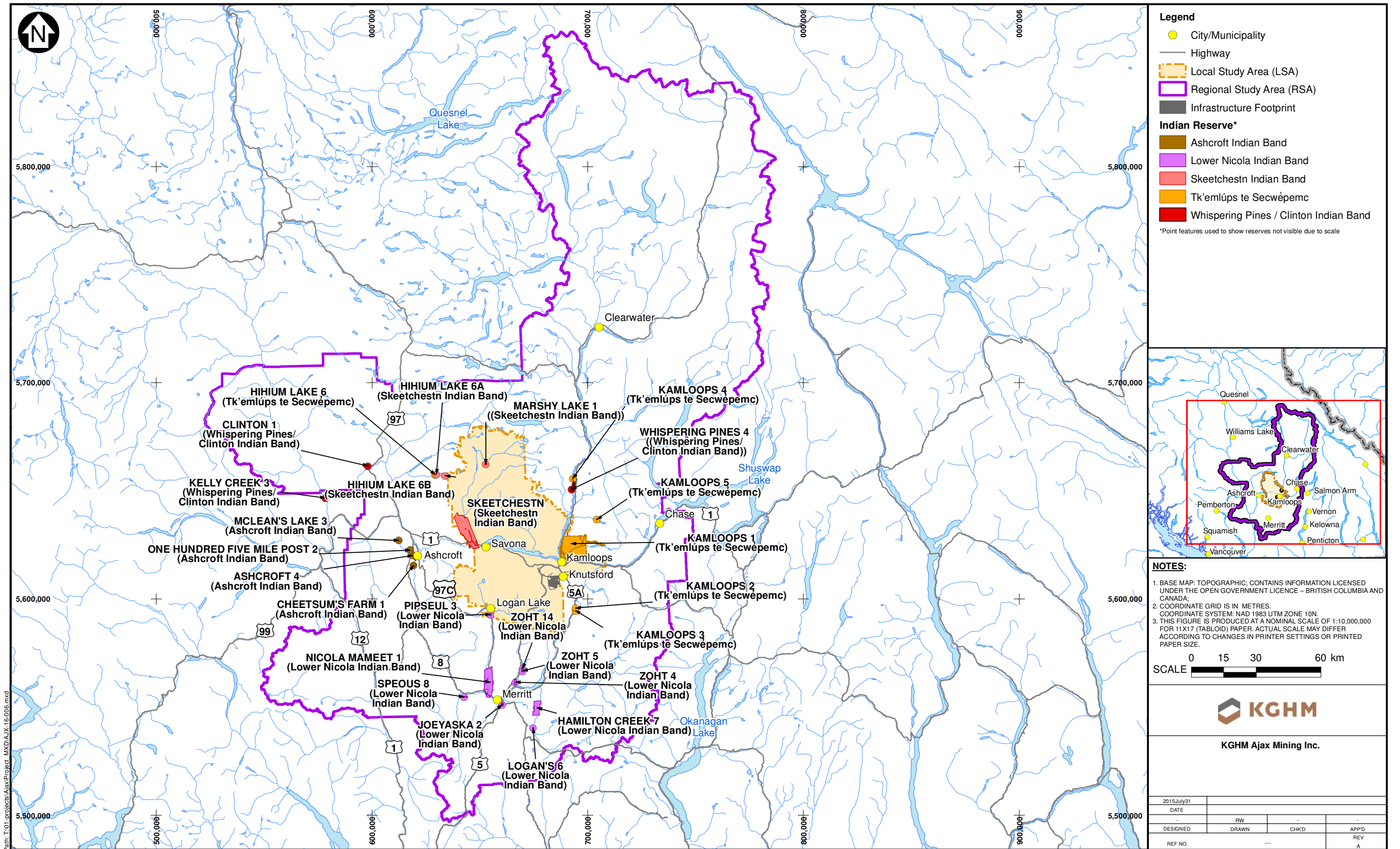
⁵ The Kamloops Local Area includes additional Census subdivisions, including District Municipality of Logan Lake; two additional electoral districts, Thompson-Nicola P and Thompson-Nicola; the Village of Chase; and the following additional Indian reserves, Spatsum 11, Neskonlith 1 (Neskainlith 1), Sahhalkum 4, and Neskonlith 2. The additional local areas used by Horne (2009) that are included in the RSA are the Ashcroft Local Area, Merritt Local Area, and North Thompson Local Area.

Figure 7.6-2
Local Study Area



Path: T:\01_projects\Ajax\Project_MXD\AJX-15-021.mxd

Figure 7.6-3
Regional Study Area



Path: T:\01_projects\Ajax\Project_MXD\AJX-16-006.mxd

7.6.3.4 *Technical Boundaries*

The technical boundaries of the assessment relate to the capacity of the Statistics Canada Input-Output model to predict Project income values as they relate to communities in the LSA and RSA, the relative contribution of other industrial sectors to the overall economy, and the subsequent contribution the Project makes to the diversity of the provincial economy. The input-output model only produces results at the provincial, national, and international level. As such there are limitations to the ability to predict how income will change at a community or regional level. In addition, income rates, including direct, indirect, and induced income, are based upon the outcomes of the Statistics Canada input-output model with information supplied by capital and operating expenditures for the Project. The assessment is based on the broad assumptions that inform the model and its outcomes.

As noted previously, the technical boundaries of the assessment are also defined by the limited availability of information for Aboriginal communities within the Statistics Canada census.

7.6.4 **Project Benefits Related to Economic Diversification**

Mining is seen by City of Kamloops officials as an important sector in the economy of Kamloops, which contributes to the diversity of the economy (Ajax KPI Program 2011-12012). In the Thompson Okanagan Development Region (excluding the Kelowna Census Metropolitan Area), in which the TNRD is located, the number of individuals employed in the mining and oil and gas extraction sector has grown at a faster rate than all industries between 1997 and 2013, but other sectors, such as the service sectors are also helping to support a growing economy (Venture Kamloops 2014). During the Construction and Operations phases of the Project, employment on it and its expenditures are expected to continue supporting a diverse economy in Kamloops.

The total cost of the Ajax Mine Construction Phase is estimated at \$1.54 billion (2015 Cdn\$). This is a sum of all wages and benefits paid to mine staff, all purchases of machinery and equipment, all payments to construction companies and other service providers, and all other spending on goods and services, utilities, and taxes. These estimates have been prepared for the purpose of the environmental assessment and are intended to reflect a conservative estimate of Project economics to forecast the distribution of Project construction and operations expenditures within British Columbia and the rest of Canada.

Approximately two-thirds of all direct expenditures in the construction phase are expected to be made within BC and one-third imported from elsewhere in Canada and internationally. The majority of expenditures, estimated at slightly more than \$1 billion, will be made in the Kamloops area and elsewhere in BC. Some expenditures, such as specialized mining machinery and equipment, are only available from outside the province. Based on information provided by KAM, as well as industry averages reflected in Statistics Canada's Interprovincial Input-Output Model, an estimated \$522 million of the direct mine construction expenditure will be for items imported from outside BC, including \$323 million of international imports and \$199 million of imports from the rest of Canada.

High and low scenarios were prepared for the number of construction jobs that could be supplied by local residents of the Kamloops area. Detailed estimates are provided in Section 7.2 Labour Force Employment and Training, which Table 7.6-7 presents a summary. During peak construction, between 850 and 1,150 local residents are expected to be employed on the Project. The higher the level of local hiring during the Construction Phase, the greater the induced effect will be because

workers will be more likely to spend their wage income in the local area rather than spending them wherever they (and their families) are permanently residing. The level of construction employment sourced locally does not change the indirect effect because local purchases of goods and services during the construction phase are not affected by the origin of the workforce.

Table 7.6-7. Estimates of Local Hires for Project Construction¹

	Year 1		Year 2		Year 3	
	Low	High	Low	High	Low	High
Total Local Hires, including direct, indirect, and induced	1,205	1,425	1,510	1,850	765	950

Notes:

Derived from workforce estimate data provided by KGHM Ajax (2014).

¹ *The Project construction phase is defined as a two-year period for the purposes of the environmental assessment; however, the total period between the start of construction activities and plant commissioning is approximately three years (see Section 2.2.4). The construction and operations phases overlap. Since the magnitude of construction activities in the third year is much smaller than in the previous two years, the overlap does not influence the conclusions of many of the effects assessments. For the effects assessments on the Economic Growth; Labour Force, Employment, and Training; Income; Business; and Economic Diversification VCs the three-year construction phase is more relevant as these assessments are particularly influenced by Project construction workforce and expenditures. Therefore, these VCs will refer to the three-year construction phase instead of to the two-year phase.*

The Project is also expected to generate between \$183 million and \$242 million in employment income, for direct employment, over the entire Construction Phase. In an average year during the Operations Phase, an estimated 453 direct job opportunities will be available, corresponding to potentially up to \$53 million in annual direct employment earnings.

The generation of employment income from direct employment (i.e., basic income) is expected to contribute positively to economic diversity within the LSA. The increased basic income will also lead to an increase in non-basic income as the indirect and induced effects flow through the economy. The Kamloops Local Area economy, as described previously, is already relatively diverse and does not have a dependence on any single economic sector, including mining.

7.6.5 Potential Adverse Effects of the Project and Proposed Mitigation for Economic Diversification

Many economic effects of the Project are considered to be beneficial, including potential effects related to economic diversification. Benefits of the Project are described above and in Section 2.7 (Project Benefits). Beneficial effects on economic diversity are anticipated during both the Construction and Operations phases. The following discussion considers the potential adverse effects of the Project on economic diversification.

7.6.5.1 Identifying Potential Effects on Economic Diversification

The AIR/EIS Guidelines require a consideration of potential Project effects on economic diversification. Potential effects on economic diversification do not typically result from single Project components or activities, but rather an aggregate of multiple components and activities. Some Project components, such as construction and operations employment, have more influence on economic diversification than other Project components, such as water intake from Kamloops Lake. Table 7.6-6 describes the

relationship between various Project components and activities, and the potential effects on economic diversification. Only potential adverse interactions are ranked and only those interactions that are considered “M,” moderate, or “H” key are carried through to the effects assessment.

Table 7.6-6. Identifying Potential Project Interactions and Effects on Economic Diversification

Project Component/Physical Activities		Potential Adverse Effects on Economic Diversification
		Decrease in Economic Diversity
Construction	Clearing and Grubbing	O
	Earthworks	O
	Overburden/Topsoil Stockpile	O
	Laydown Areas and Storage Yards	O
	Project Lighting	O
	Site Security and Fencing	O
	Fuel Storage and Filling Area	O
	Hazardous Wastes Transport, Storage, and Disposal	O
	Construction Wastes Transport, Storage, and Disposal	O
	Sewage Infrastructure and Disposal	O
	Public Road Realignment, Use, and Maintenance	O
	Site Road Construction, Use and Maintenance	O
	Haul Truck Road Construction, Use, and Maintenance	O
	Site Buildings and Process Plant	O
	Explosives Magazine and Storage Facilities	O
	Open Pit Development	O
	Drilling and Blasting	O
	Crushing Mine Rock	O
	Loading, Hauling, and Deposition of Mine Rock	O
	Temporary Ore Stockpile	O
	Tailing Storage Facility Development	O
	Power Transmission, Distribution	O
	Natural Gas Line	O
	Pipeline Utility Corridor (Potable Water, Sewage, and Site Water)	O
	Water Intake from Kamloops Lake	O
	Fire Suppression Infrastructure	O
	Contact Water	O
	Non-contact Water	O
	Haul Truck Road	O
	Water Management Dams	O
	Mine Staffing (Direct Employment)	O
Contracted Employment	O	
Taxation	O	

(continued)

Table 7.6-6. Identifying Potential Project Interactions and Effects on Economic Diversification (continued)

Project Component/ Physical Activities		Potential Effects on Economic Diversification
		Decrease in Economic Diversity
Operation	Open Pit Development	○
	Drilling and Blasting	○
	Hauling Mine Rock and Ore from Pit	○
	Crushing and Conveying Ore	○
	Temporary Ore Stockpile	○
	Development of Mine Rock Management Facilities	○
	Stripping, Loading, Hauling, Deposition, and Contouring of Topsoil and Overburden	○
	Revegetation through Progressive Reclamation	○
	Process Plant Operation	○
	Deposition to Tailing Storage Facility	○
	Site Road Use and Maintenance (Materials, Personnel, Supplies)	○
	Concentrate Transport and Storage	○
	Explosives Magazine and Storage Facilities	○
	Fire Suppression Infrastructure	○
	Fuel Storage and Filling Area	○
	Hazardous Wastes Transport, Storage, and Disposal	○
	General Wastes Transport, Storage, and Disposal	○
	Sewage Infrastructure and Disposal	○
	Laydown Areas and Storage Yards	○
	Power Transmission, Distribution	○
	Project Lighting	○
	Site Access, Security and Fencing	○
	Water Intake from Kamloops Lake	○
	Contact Water	○
	Non-contact Water	○
	Potable Water Treatment and Use	○
	Haul Truck Road	○
	Mine Staffing (Direct Employment)	○
	Contracted Employment	○
	Taxation	○

(continued)

Table 7.6-6. Identifying Potential Project Interactions and Effects on Economic Diversification (completed)

Project Component/ Physical Activities		Potential Effects on Economic Diversification
		Decrease in Economic Diversity
Decommissioning and Closure	Dismantling of Ancillary Buildings	L
	Pit Lake Planning	L
	Site Road/Bridge Decommissioning	L
	Tailing Storage Facility Decommissioning and Reclamation	L
	Mine Rock Management Facilities Reclamation	L
	Fuel Storage and Filling Area	L
	Hazardous Wastes Transport, Storage, and Disposal	L
	General Wastes Transport, Storage, and Disposal	L
	Sewage Infrastructure and Disposal	L
	Laydown Areas and Storage Yards	L
	Power Transmission, Distribution	L
	Project Lighting	L
	Site Access, Security and Fencing	L
	Contact Water	L
	Non-contact Water	L
	Potable Water Treatment and Use	L
	Haul Truck Road	L
	Road use to the Project (Materials, Personnel, Supplies)	L
	Mine Staffing (Direct Employment)	L
	Contracted Employment	L
Taxation	L	
Post Closure	General Site Inspections and Maintenance	L
	Contact Water	L
	Non-contact Water	L
	Road use to the Project (Materials, Personnel, Supplies)	L
	Mine Staffing (Direct Employment)	L
	Contracted Employment	L

Notes:

- O No interaction anticipated.
- L Negligible to minor interaction expected; implementation of best practices, standard mitigation and management measures; no monitoring required, no further consideration warranted.
- M Potential moderate interaction requiring unique active management/monitoring/mitigation; warrants further consideration.
- H Interaction; warrants further consideration.

The effect ‘Decrease in economic diversity’ was selected to review the potential for the Project, through Project employment and expenditures, to reduce the diversity of the local economy by increasing the proportion of the economy that is based on providing goods and services to the mining industry.

Reduced economic diversity was raised as a concern during consultation, particularly with respect to a potential over-dependence on the mining industry that could make Kamloops more vulnerable to economic fluctuations in this industry. Currently, mining is an important sector that contributes to the diversity of the Kamloops economy. During the Construction and Operations phases of the Project, employment and expenditures are expected to continue supporting a diverse economy in Kamloops. As levels of expenditures and employment decrease through the end of the Operations Phase and throughout the Decommissioning and Closure Phase, the influence of the Project on the economies of the LSA and RSA will decrease. While this could decrease the economic diversity of the region, this interaction is expected to be negligible to minor since the economy is already diverse and the level of diversity has been stable. Therefore, although potential adverse interactions are identified for the Decommissioning and Closure, and Post-Closure, phases, these interactions are ranked as low, and further assessment is not warranted.

While mining activities have increased in the region over the past decade, the Kamloops economy is characterized as very diverse (Section 7.6.2.3). Further, as described in Chapter 7.4, the skills required for employment in the mining industry are often applicable to a variety of industries. An adverse effect on economic diversity is not expected.

7.6.5.2 *Effects of Economic Diversification*

For all Project phases, no adverse effects on economic diversification are likely to result from the Project.

7.6.5.3 *Mitigation Measures for Economic Diversification*

No adverse effects on economic diversification are likely to result from the Project. As a result, there are no mitigation measures suggested or proposed.

7.6.6 **Residual Effects and Their Significance**

7.6.6.1 *Summary of Residual Effects*

No adverse effects on economic diversification are likely to result from the Project. As a result, there are no anticipated residual effects.

7.6.7 **Cumulative Effects Assessment**

No adverse effects on economic diversification are likely to result from the Project. As a result, there are no anticipated residual effects to carry forward to consideration under cumulative effects.

7.6.8 **Conclusion**

The Project is expected to positively contribute to economic diversification in both the LSA and RSA throughout the Project's economic life. In total, between 1,510 and 1,850 total local positions (i.e., direct, indirect, and induced) are expected to be supported by the Project during the peak of the Construction Phase, and 933 total positions during the Operations Phase. As the Project transitions into the Decommissioning and Closure Phase, employment and project-related expenditures will be substantially reduced. Although this will result in much reduced Project-related spending, it will not reduce goods

and services expenditures and contracting opportunities below existing conditions. The experience gained by individuals and businesses in the study area that become engaged with the Project is expected to have enhanced the economy. Much of the skills and capabilities gain through involvement with the Project are those that are widely applicable and in high demand. The economically diverse study area is expected to provide local residents and business with numerous opportunities throughout and beyond the life of the Project.

7.7 SUMMARY OF ASSESSMENT OF POTENTIAL ECONOMIC EFFECTS

Table 7.7-1 summarizes all residual Project and cumulative effects, significance determinations, and mitigation measures for the assessment of economic Valued Components. Additional summary information is also provided in Chapter 18.

Table 7.7-1. Summary of Residual Project and Cumulative Effects and Mitigation Measures: Economic

Residual Effect	Project Phase	Mitigation	Significance of Project Residual Effect	Significance of Cumulative Residual Effect
VC: Economic Growth (Section 7.1)				
<i>Benefit:</i> Contributions to economic growth	Construction, Operation	Measures to maximize local employment and procurement	N/A (benefit)	N/A (benefit)
Decrease in economic activity and government revenues.	Decommissioning and Closure.	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Not Significant (Minor).	No residual effect
VC: Labour (Section 7.2)				
<i>Benefit:</i> Project employment and training opportunities	Construction, Operations	Human resource development plan to maximize local employment	N/A (benefit)	N/A (benefit)
Reduced employment and training opportunities due to reductions in workforce.	Decommissioning and Closure.	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Not Significant (Moderate).	No residual effect
VC: Income (Section 7.3)				
<i>Benefit:</i> Project-related employment income	Construction and Operation	Human resource development plan to maximize local employment with the Project	N/A (benefit)	N/A (benefit)
Decreased income generation due to reductions in workforce and expenditures.	Decommissioning and Closure.	Communication with employees to allow them to prepare for post-Project activities; transition planning (including workforce transition plan) to maximize likelihood of employees gaining employment elsewhere	Not Significant (Moderate).	No residual effect
VC: Business (Section 7.4)				
Competition for labour could lead to increased costs associated with staff turnover and wage increases for local and regional businesses.	Construction, Operation.	Engagement with local business community and Community Liaison Group to jointly address potential challenges.	Not Significant (Minor).	Not Significant (Minor).

Residual Effect	Project Phase	Mitigation	Significance of Project Residual Effect	Significance of Cumulative Residual Effect
<i>Benefit:</i> Project employment and procurement	Construction, Operation	Measures to maximize local employment and procurement	N/A (benefit)	N/A (benefit)
VC: Property Values (Section 7.5)				
Residential property values could decline for rural residences around the perimeter of the Project Site, and possibly in Knutsford or Aberdeen, due to real or perceived changes in air quality, noise and vibration, and visual impacts	Construction; Operation.	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; implementation of engagement and information sharing mechanism.	Not Significant (Moderate)	No residual effect
Agricultural property values could decline for those properties on the perimeter of the Project Site due to real or perceived changes in air quality, noise and vibration, and vegetation	Construction; Operation.	Implementation of Project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features; adaptive management; implementation of engagement and information sharing mechanism.	Not Significant (Moderate)	Not Significant (Moderate)
VC: Economic Diversification (Section 7.6)				
No residual adverse effects				

7.8 REFERENCES

Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

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