PHASE 2
DRAFT ENVIRONMENTAL IMPACT STATEMENT

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Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

AANDC	Aboriginal Affairs and Northern Development Canada
ALTS	Adult Learning and Training Supports
ASETS	Aboriginal Skills and Employment Training Strategy
ATV	All-terrain vehicle
CBoC	Conference Board of Canada
CDO	Career Development Officer
CEA	Cumulative Environmental Effect
CHR	Community Health Representative
CHARS	Canadian High Arctic Research Station
CPI	Consumer Price Index
CRI	Community Readiness Initiative
CWB	Community Well-being
EDO	Economic Development Officer
EFAP	Employee and Family Assistance Program
EIS	Environmental Impact Statement
FANS	Financial Assistance for Nunavut Students
GDP	Gross Domestic Product
GN	Government of Nunavut
IQ	Inuit Qaujimajatuqangit
ITK	Inuit Tapiriit Kanatami
KIA	Kitikmeot Inuit Association
km^2	Square Kilometers
LHO	Local Housing Organization
LSA	Local Study Area
NAC	Nunavut Arctic College

NBCC	Nunavut Business Credit Corporation
NBS	Nunavut Bureau of Statistics
NDEDT	Nunavut Department of Economic Development and Transportation
NEAS	Nunavut Eastern Arctic Shipping
NGO	Non-governmental Organization
NHC	Nunavut Housing Corporation
NHS	National Household Survey
NIRB	Nunavut Impact Review Board
NSA	Nunavut Settlement Area
NSSI	Nunavut Sealift and Supply Inc.
NTCL	Northern Transportation Company Ltd.
NTI	Nunavut Tunngavik Incorporated
NWT	Northwest Territories
PHRS	Public Housing Rent Scale
QEC	Qulliq Energy Corporation
RCMP	Royal Canadian Mounted Police
RIA	Regional Inuit Association
RNFB	Revised Northern Food Basket
RRSP	Registered Retirement Savings Plan
RSA	Regional Study Area
SAO	Senior Administrative Officer
SEMP	Socio-economic Monitoring Program
SME	Small to Medium Enterprise
SPF	Skills and Partnership Fund
SIDS	Sudden Infant Death Syndrome
SUDI	Sudden Unexpected Death in Infancy

3. Socio-economics

The Hope Bay Project (the Project) has the potential to have both positive and adverse effects on socio-economic conditions. The interactions with socio-economics are due to the employment of a labour force and the procurement of goods and services for the Project, which in turn may result in changes to households and communities. This chapter evaluates the potential effects of the Project on: economic development; business opportunities; employment; education and training; migration, housing, and infrastructure and services; and community health and well-being. The assessment focuses on the communities of the Kitikmeot Region, Nunavut, but also considers economic impacts across the territory and Canada. Mitigation and socio-economic monitoring is described to minimize adverse socio-economic effects of the Project and enhance benefits to the Kitikmeot communities. Key mitigation includes measures defined in the Business Development Plan, Human Resources Plan, and Community Involvement Plan, as well as an Inuit Impact and Benefit Agreement (IIBA) between the Kitikmeot Inuit Association (KIA) and TMAC that is currently in place.

3.1 INCORPORATION OF TRADITIONAL KNOWLEDGE

3.1.1 Incorporation of Traditional Knowledge for Existing Environment and Baseline Information

The primary source of Inuit Traditional Knowledge (TK), or *Inuit Qaujimajatuqangit* (IQ), that was accessed for incorporation into the socio-economic effects assessment was the proposed Hope Bay Project, Naonaiyaotit Traditional Knowledge Project (NTKP) report (Banci and Spicker 2015). The report provides contextual information that promotes a deeper understanding of the socio-economic environment; however, the information is not directly applicable to the characterization of the current socio-economic setting. Rather, this information provides a context that informs an understanding of current conditions and trends. Enforcement of acceptable behaviour by individuals within the community and views on parenting are two examples of where traditional beliefs and practices influence the current socio-economic environment.

In traditional Inuit culture, there was no formal authority to decide whether behaviours were acceptable. Within the community there was general agreement on what was expected of individual in terms of their behaviour, how they conducted their lives, and what the commonly held values were. For example, the behaviours most commonly considered improper were lying, stealing, laziness, excessive mocking or gossiping, being unpredictable or jealous, and bragging excessively. Methods of social control included ignoring, ostracising, ridiculing, or shaming the person. More formalized methods of social control, or way through which to resolve disputes or conflicts included fist fights, wrestling, and song duels (Pauktuutit Inuit Women of Canada 2006). While approaches to decision making and local values have changed over time, information describing their origin facilitates the conceptualization of their evolution leading up to current conditions. Knowledge of this evolution informs the projection of future trends and changes likely to occur going forward.

Inuit believe that when a child is born, the soul or spirit of a recently decease relative is taken on by the newborn (Pauktuutit Inuit Women of Canada 2006). The naming of children played a focal role in societal development and children were named after and took on the social role of the deceased. That is, a child named after an uncle would then be called uncle by the family of the deceased. This practiced ensured that children were supported by the broadest possible network and were parented by many. Approaches to parenting an discipline were also informed by this custom, as the desire to

correct an undesirable behaviour was tempered with respect for the decreased person whose soul was carried by the child given that name (Tagalik 2010). This content contributes to an understanding of relationships within the family today and is essential in making informed predictions about the potential future changes within family relationships.

In Nunavut, TK is encompassed by the concept of IQ, which is described as "the traditional, current, and evolving body of Inuit values, beliefs, experience, perceptions, and knowledge regarding the environment, including land, water, wildlife and people, to the extent that people are part of the environment" (Qikiqtani Inuit Association 2009) or literally translates to 'that which the Inuit know and have always known'. Because TK provides a foundational understanding of the events and activities that have shaped Inuit society (e.g., social and gender roles, parental roles, and others) and Inuit relationships to each other and their communities, the review of TK material was an integral aspect of the assessment of the potential effects of the Project on VSECs.

3.1.2 Incorporation of Traditional Knowledge for VSEC Selection

The NTKP report provides information about Inuit culture and society that is essential to the development of a foundational understanding of current socio-economic conditions and the local socio-cultural values of Inuit which identified elements for consideration in the process of scoping VSECs for the Project assessment. Other sources informing that process included consultation with local communities, regional Inuit organizations, and other stakeholders, as well as previous engagement with Inuit and local communities as part of the Doris North Project.

Situating current socio-economic values within their traditional context facilitates an informed analysis of baseline information and current socio-economic trends and enables an insightful effects assessment. The NTKP report describes Inuit culture and traditional ways of life tied to traditional economy and education, social and gender roles, and Inuit well-being. This information was used to analyze current trends, infer potential future changes, and establish measures that promote positive outcomes related to the Project. Consideration of these valued aspects and their potential to interact with the proposed Project informed the section of VSECs employed for the Project assessment.

3.1.3 Incorporation of Traditional Knowledge for Spatial and Temporal Boundaries

The Inuit are people of place and were often called by the name of the land where they were from, as denoted by the suffix *'miut'* (Kral 2009). The spatial boundaries of the Project have been defined by the location of the Project and the predicted distribution of benefits and effects. Understanding how Inuit came to be at those locations and the circumstances surrounding the settlement of Inuit in communities provides context contributing to the effects assessment and development of measures to maximize Project benefits. Placing spatial boundaries within their historical context also highlights the nature of current socio-economic realities for Inuit.

Project temporal boundaries are defined by the planned phases of the Project and the information provided in the NTKP Report is not directly applicable to their characterization for the assessment of potential socio-economic Project effects.

3.1.4 Incorporation of Traditional Knowledge for Project Effects Assessment

The Project effect assessment draws on information collected through desktop research and baseline studies and is grounded within the historical context provided in the NTKP report. Without the context provided in the NTKP report, the interpretation of current conditions would be considerably more narrow. Situating current conditions within IQ and the context of the NTKP report informs the effects assessment by allowing for a socially and culturally appropriate interpretation of potential effects.

3.1.5 Incorporation of Traditional Knowledge for Mitigation and Adaptive Management

Similar to how it contributes to a deeper understanding of socio-economic conditions and the evaluation of Project effects, the TK information facilitated the development of socially and culturally appropriate mitigation and benefit enhancement measures, including the design of meaningful adaptive management processes. This is demonstrated in the participatory design of the Socio-economic Monitoring Program (SEMP) and the various management plans developed for the Project described later in this chapter, including the Community Involvement Plan, Human Resources Plan, and Business Development Plan. For all management plans, an understanding of IQ and Inuit traditions and customs allowed the processes, practices and procedures defined within each management plan to be appropriate within the socio-cultural context of the Project. This will help ensure effective implementation and the efficacy of the defined mitigation and benefit enhancement measures.

3.2 EXISTING ENVIRONMENT AND BASELINE INFORMATION

This section provides a summary of the methods and results of the socio-economic baseline information collected for the Project. Community-level research was carried out in 2011 and desk-based research was carried out in 2015.

3.2.1 Data Sources

Hope Bay Belt Project 2011 Socio-economic and Land Use Baseline Report provided detailed information on the methods and results for socio-economics studies (Appendix V6-3A; Rescan 2012). Secondary data was obtained through desk-based research and literature review. Information from Statistics Canada, the Nunavut Bureau of Statistics, Government of Nunavut (GN) departments, and other sources were compiled and analyzed. The literature review targeted publications of the Government of Canada, the GN, Inuit organizations and other co-management organizations, the private sector, and non-government organizations (NGOs), as well as academic literature and internet publications. Primary data sources included information obtained through community-level research conducted for the Project which is also described in Appendix V6-3A.

3.2.2 Methods

The collection of baseline information focused on key socio-economic characteristics for the Kitikmeot Region and involved community-level and desk-based research. Community-level socio-economic research was completed in 2011 and included interviews with approximately 70 key informants in the Kitikmeot Region (e.g., service providers from government administration, health services, wellness and social services, safety and protection services, business and economic development, and education and training). Desk-based research focused on publically available statistics compiled and analyzed at the regional and community levels. To further investigate themes and trends, an additional literature review of recently published material was conducted.

Regional-level information is presented for the Kitikmeot Region of Nunavut, while community-level information is presented for individual Kitikmeot communities: Cambridge Bay (also known as Iqaluktuuttiaq), Kugluktuk (previously known as Coppermine), Gjoa Haven (also known as Uqsuqtuuq), Taloyoak (previously known as Spence Bay), and Kugaaruk (previously known as Pelly Bay). Data characterizing the territory and other regions in Nunavut are provided to contextualize and enable comparison of socio-economic circumstances.

3.2.2.1 Socio-economic Study Areas

The communities of Cambridge Bay (~130 km from the Project) and Kugluktuk (~350 km) are the closest major population centres and comprise the socio-economic Local Study Area (LSA; Figure 3.2-1). Cambridge Bay is the largest community and the main economic and transportation hub for the Kitikmeot Region. Other Kitikmeot communities are at a greater distance from the Project, including Gjoa Haven (~445 km), Taloyoak (~550 km), and Kugaaruk (~690 km), which together with Cambridge Bay and Kugluktuk, comprise the socio-economic Regional Study Area (RSA; Figure 3.2-1). Although the focus of the LSA is on Cambridge Bay and Kugluktuk, the inclusion of all five permanent communities within the Kitikmeot Region as part of the RSA is reflective of the goal of having Project-related employment and business benefits distributed amongst Nunavummiut throughout the Kitikmeot Region. At the community level, baseline information is presented for all five communities in support of a fulsome assessment of the potential socio-economic effects of the Project.

Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) are settlements situated on the shores of Bathurst Inlet, and are excluded from the socio-economic baseline. These settlements are no longer occupied year-round (residents of Bathurst Inlet relocated to Cambridge Bay in approximately 2006, and residents of Omingmaktok relocated to Cambridge Bay in the fall of 2011). Bathurst Inlet and Omingmaktok are now used primarily as seasonal camps and former residents return at select times throughout the year. Government sources reflect this change and no longer report information for these settlements. As a result, there is no recent statistical or other data for Bathurst Inlet and Omingmaktok and, therefore, the baseline profile focuses on the five permanent Kitikmeot communities.

3.2.2.2 Information Caveats and Limitations

The limitations of the baseline information are dependent on the data collection, analysis, and presentation methods. Community research for primary data collection occurred in 2011; current socio-economic conditions in the communities may differ to the extent that there have been changes since that time. In addition, community research was based on interviews with key knowledge holders in the communities, focusing on collecting both local quantitative data and perception-based qualitative information. Perception-based information may be subject to biases or strategic responses; in order to minimize such errors, standard qualitative research methodology was employed and information was triangulated among sources, wherever feasible.

For secondary information, limitations vary by source. For example, Statistics Canada releases data on a variety of topics (such as population, housing, and employment) obtained from the Census of Canada (Census) conducted every five years. As a result of changes to the Census that occurred prior to the round of data collection for which results are available (2011), a new product called the National Household Survey (NHS) was established as a replacement to the previous 'Census long form'. The NHS provides information similar to the previous Canadian Census long form[1], while the Census itself consists of a 'short form' which includes eight questions related to population, family characteristics, and language[2]. While participation in the Census is mandatory, the NHS was a voluntary survey in 2011 that provides information about people in Canada by their demographic, social, and economic characteristics. Generally, response rates for the voluntary NHS in 2011 were lower in comparison to the past Census long form. Due to the changes in survey methodology and response rates, data from the 2011 NHS (Statistics Canada 2013c) should be considered with caution, particularly in making comparisons with 2006 or earlier census years.

[1] Prior to Census 2011, completion of the Canadian census was mandatory for all Canadians. For 2016 the mandatory Census long form was re-instated by the Government of Canada.

[2] As a result of changes to legislation that occurred prior to Census data collection in 2011, routinely collected data (employment, education, income, housing, etc.) was gathered as part of NHS.

Figure 3.2-1
Socio-Economic Study Area

3.2.3 Characterization of Baseline Conditions

Social and economic conditions in Nunavut are unique within Canada and have undergone a significant transformation over the last 50 years. The transition from a semi-nomadic existence to a predominantly permanent or settled communities occurred in the late 1950s and early 1960s. Following the collapse of pelt prices in the 1950s and a series of epidemics (e.g., TB) that killed many Inuit, the family allowance program was introduced in 1947 and became a primary source of income for many Inuit who had relocated to settlements in the 1950s and 1960s. The societal transformation that occurred with the transition from a semi-nomadic hunter-gatherer existence was substantial. Previously, gathering among Inuit was seasonal and kinship based. The introduction of settlements was characterized by the aggregation of a large number of Inuit from different kin groups, described by some as usual and bizarre (Kral 2009).

The transition to the wage economy was majorly disruptive to social roles within Inuit culture. Hunters, who were the most highly respected leaders with considerable prestige and superiority within the group, took on employment and varying degrees of success. Once Inuit relocated to settlements, economic inequality became prevalent due to large discrepancies in income and material possessions and the decline of cooperation between households. The transition to settlements was also marked by a shift in authority from the elders to the government and an increase in births linked in part to improved medical care and additional government payments provided by government with each child (Kral 2009).

Sedentary life also brought about a shift in how prestige was allocated by Inuit; traditionally linked to land-based mastery and the ability to provide, prestige became increasingly associated with what money could buy. Hunting has been described as the ‘cultural core’ of Inuit society and subsistence as a “highly complex activity linking kinship, ecology, economy, ideology, and larger social relations” (Kral 2009).

The social and economic change caused by the influence of modern culture and the wage economy on Inuit is currently underway. The result is not one of ‘old ways’ and ‘new ways’ but rather is a dynamic hybrid created by Inuit to navigate their current realities and the continuously changing elements of social and economic life that form the context within which the proposed Project might be developed and contribute to further social and economic change.

The purpose this section is to provide a baseline description of current social and economic conditions to inform the analysis of how conditions may change with the introduction of the Project. Socio-economic components for the study have been identified through a review of government environmental assessment guidelines and completed environmental assessments of other mine projects in Nunavut (i.e., Back River, Doris North, Mary River, and Meadowbank), the values and concerns local community stakeholders expressed during field studies, consideration of the existing socio-economic conditions within the Kitikmeot Region, and professional judgement. Moreover, the characterization of baseline conditions is consistent with the requirements of the Nunavut Impact Review Board (NIRB) as detailed in the Environmental Impact Statement (EIS) guidelines for the Hope Bay Project. The components include:

- Governance and Government Revenues;
- Community Demographics;
- Education and Training;
- Labour Force and Employment;

- Economic Development;
- Business Opportunities;
- Community Infrastructure and Public Services; and
- Health and Well-being.

Communities in Nunavut are remote and isolated from one another and from southern Canada. Transportation and communication options are limited. There are no roads into Nunavut or roads connecting the communities within Nunavut. Air travel is the main means of inter-community travel. Communities can also be reached by sea during a limited summer window and, for those communities nearest to each other, by snowmobile during winter months. The Kitikmeot Region is the most western of the three administrative regions within Nunavut and covers approximately 446,728 km^2.

Within the Kitikmeot Region there are five communities: Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and Kugaaruk. Cambridge Bay, a traditional hunting and fishing location, is the largest community, acting as a regional hub for government and business, as well as transportation to and from the region. Kugluktuk and Gjoa Haven have slightly smaller but growing populations, with economic growth primarily attributed to opportunities in the government and mining sectors. Traditional subsistence land-based activities, as well as construction, retail, education and public administration create the base of local economies. The local economy in communities of Cambridge Bay and Kugluktuk is also supported by employment in mining and transportation (Statistics Canada 2013d).

3.2.3.1 Governance and Government Revenues

Nunavut was formally established on April 1, 1999 when the Nunavut Settlement Area (NSA) was formed as separate from the Northwest Territories, in accordance with the provision of the *Nunavut Land Claims Agreement Act* (1993b) and the *Nunavut Act* (1993a). The Nunavut Agreement comprised the surrendering of Aboriginal claims, rights, and title to lands and waters in exchange for a set of collective rights and benefits for Inuit beneficiaries.

The Government of Nunavut

When Nunavut was created the government began a process of decentralization to ensure that Nunavummiut benefit from government employment at the community level. The hub or largest concentration of government is Iqaluit, Nunavut's capital. Government decentralization occurred over a number of years to 10 communities including Cambridge Bay, Gjoa Haven, and Kugluktuk (Sponagle 2015b).

Nunavut's legislative assembly governs its own proceedings and is based on a consensus style of government, rather than the more common style of party politics. In Nunavut, all Members of the Legislative Assembly are elected as independent candidates in their constituency. The consensus style is similar to traditional Inuit decision making; however, unanimous agreement is not required in most cases. Instead, a majority vote is sufficient. Unlike most jurisdictions in Canada, the Premier and Cabinet Ministers are chosen by the Members of the Legislative Assembly as whole. The Premier can assign portfolios to Ministers and designates a Deputy Premier (GN 2015).

The functions of the GN are carried out by a number of departments including: Community and Government Services; Culture and Heritage; Economic Development and Transportation; Education; Environment; Executive and Intergovernmental Affairs; Family Services; Finance; Health; and Justice (see Appendix V6-3A for further details).

Inuit Organizations

In addition to GN governance structures, Regional Inuit Associations (RIAs) and Nunavut Tunngavik Incorporated (NTI) have responsibilities related to the exercise of Inuit rights under the NLCA and use of Inuit-owned Lands (IOL). Within the Kitikmeot Region, the RIA is the Kitikmeot Inuit Association (KIA) with head offices in Cambridge Bay. The Socio-economic and Land Use Baseline Report provides a further description of the roles of responsibilities of RIAs and NTI (Appendix V6-3A).

Hamlet Governance

Community governance in Nunavut is organized by hamlets, headed by a mayor, deputy mayor, and council. A Senior Administrative Officer (SAO) has overall responsibility for hamlet operations. A key senior member of the staff is the Economic Development Officer (EDO), who is responsible for economic development programming. Hamlets have a number of departments that typically include public works, operations and maintenance, water and sewer, waste management, fire protection, wellness, lands, and economic development. Hamlet governments in the Kitikmeot Region face a number of challenges including staff hiring and retention, housing for staff (C. Dickson, pers. comm.), other infrastructure challenges, and challenging relationships with the GN (S. King, pers. comm.).

3.2.3.2 Community Demographics

Population

The Kitikmeot is the smallest of Nunavut's three regional areas[3] and represents 19% of Nunavut's population in 2011 (6,010 of 31,905). High birth rates have resulted in exponential population growth over the past two decades. The Inuit population increased by approximately 34% between 1996 and 2011 while the non-Inuit population has remained steady, decreasing by less than one percent (NBS 2013). Regionally, the population has increased from 4,816 in 2001, to 5,361 in 2006 (+ 11.3%), and 6,010 in 2011 (+12.1%) (NBS 2013). The communities have at least doubled in size between 1981 and 2011. The largest population increases took place in Kugaaruk (200.0%) and Gjoa Haven (144.6%; Statistics Canada 2012a), while Kugluktuk experienced a comparatively smaller but still significant increase (79%).

Cambridge Bay was the largest community in 2011 (1,608), while Kugaaruk was smallest (771). Kugluktuk and Gjoa Haven had populations of 1,450 and 1,279, respectively, and Taloyoak had a population of 899. For Nunavut as a whole, a strong natural increase and net in-migration from other areas of Canada are the main factors contributing to population growth (Statistics Canada 2012a).

Population estimates[4] indicate slightly larger populations in 2014. Cambridge Bay and Kugluktuk remained the largest with estimated populations of 1,684 and 1,591, respectively. In 2014, the estimated populations of Gjoa Haven, Taloyoak, and Kugaaruk were 1,370, 998, and 953, respectively (Nunavut Bureau of Statistics 2014g).

Aboriginal Population

A high proportion of the Kitikmeot population is Aboriginal (91% of the population, 5,465). Almost all Aboriginal people in the Kitikmeot Region are Inuit (5,410 or 99% of all Aboriginal people). For Cambridge Bay, 81% self-identified as Aboriginal, a decrease from 83% in 2006. This proportion was higher in the other communities, with 91% or more identifying as Aboriginal (Statistics Canada 2012a).

[3] The three administrative regions of Nunavut are Qikiqtaaluk (Baffin), Kivalliq (Keewatin) and Kitikmeot.
[4] Provided by the Nunavut Bureau of Statistics, based on the 2011 census, and adjusted for net under-coverage.

Age Distribution

All communities have exceptionally young populations compared to the rest of Canada. In 2011, the median age ranged from 27.4 years in Cambridge Bay to 18.4 years in Kugaaruk. The Kitikmeot Region has a median age of 23.0 years younger than Nunavut's median age of 24.1 years and much younger than the median age of 40.6 years for all of Canada (Statistics Canada 2012a).

The proportion of the population under 15 years of age in 2011 ranged from 26% in Cambridge Bay to 35.5% in Kugaaruk (Nunavut Bureau of Statistics 2014b). The GN's estimates the population will age moderately by 2036, although it will remain a substantially younger than the rest of Canada (Nunavut Bureau of Statistics 2014c).

Gender

Kitikmeot communities tend to have a slightly higher proportion of males to females with the most notable differences in Gjoa Haven and Kugaaruk where 52% of the population is male (Statistics Canada 2012a).

Family Structure and Traditional Gender Roles

In Inuit culture, family groups are the most important social unit. Prior to the 1950s, Inuit lived in small, family based groups that traveled seasonally in pursuit of food and depended on each other for survival. The transition to permanent communities caused a disruption to traditional Inuit culture and values including changes to the roles of men and women within the family. Traditional gender roles were based on the ability to perform the tasks required to obtain food and to survive on the land (Pauktuutit Inuit Women of Canada 2006).

Traditionally, marriage took place when a girl was approximately 14 years of age and when a man entered early adulthood. Men were providers and had primary authority outside the home, while women had primary authority within the home with responsibility for childrearing and other domestic duties. Modern marriages typically take place in late adolescence or early adulthood. Young couples often continue to live with relatives as there is a shortage of housing in most Inuit communities (Pauktuutit Inuit Women of Canada 2006).

Family structure in Nunavut differs from the rest of the Canadian population. Family couples (married and common-law) account for 70 to 75% of households in Nunavut while lone-parent families account for 25 to 30%, whereas in Canada approximately 84% are family couples and 16% are lone-parent families. The most notable difference in family structure is seen in the proportion of married couples in Nunavut (39.1%) as compared to Canada as a whole (67.0%; Statistics Canada 2012a).

Language

There are two Inuit languages in the Kitikmeot – Inuinnaqtun and Inuktitut. Inuinnaqtun is spoken primarily in Kugluktuk, and to some extent in Cambridge Bay. The eastern Kitikmeot communities of Gjoa Haven, Taloyoak and Kugaaruk mainly speak Inuktitut, as does the rest of Nunavut. However, there is enough commonality between the languages for the Inuit to understand each other in either tongue, much of the time.

Sixty-seven percent of Nunavummiut reported an Inuit language as their mother tongue in 2011. Within the Kitikmeot, English speakers accounted for approximately two-thirds of the population (59%) and those who spoke Inuktitut accounted for the remaining third (32%). A majority of Taloyoak and Kugaaruk residents indicated Inuktitut was their mother tongue. However, in the western Kitikmeot a majority indicated English was their mother tongue (Statistics Canada 2012a).

Religion

A majority of Kitikmeot residents are Christian (e.g., 73% in Cambridge Bay, 83% Kugluktuk, and over 90% in the remaining communities). In Kugaaruk, 95% of residents are Catholic, as are 46% of Gjoa Haven and 30% of Taloyoak. The Anglican Church has the largest membership in Cambridge Bay, Kugluktuk, and Taloyoak (50%, 68% and 65%, respectively). Traditional (Aboriginal) spirituality is practiced by 0.9% in Cambridge Bay and 1.4% in Kugluktuk. Some residents in Cambridge Bay, Kugluktuk, and Gjoa Haven report no religious affiliation (26%, 15%, and 9%, respectively), as well as less than 4% in Kugaaruk and Taloyoak (Statistics Canada 2013d).

3.2.3.3 Education and Training

Education Facilities and Programs

Each Kitikmeot community has kindergarten, elementary, and secondary schooling. The larger communities have separate secondary and elementary schools (i.e., Cambridge Bay, Kugluktuk, and Gjoa Haven), while the smaller communities (i.e., Taloyoak and Kugaaruk) have a single school for all grade levels. Students have the opportunity to obtain a high school certificate (or equivalent) in their home community.

Schools in the region typically provide English, math, science, art, physical education, health, and language classes (either Inuinnaqtun or Inuktitut), as well as career and program planning. There are early childhood education programs in Gjoa Haven and Kugluktuk, while Cambridge Bay has a conventional day care. Conventional day cares also operate periodically in Kugaaruk, Gjoa Haven, and Taloyoak.

Educational Attainment

In the eastern communities, about two-thirds of those aged 25 to 64 did hot have high school or other certificates/diplomas in 2011. Similarly, approximately half of those aged 25 to 64 did not have high school or other credentials in Gjoa Haven and Kugluktuk (Statistics Canada 2013i). Cambridge Bay had the highest level of educational attainment, as only 38% of residents (aged 25 to 64) were without high school or other certificates/diplomas. Overall, the proportion of the population without high school or other certificates/diplomas is well above the Canadian average of 13% (Statistics Canada 2013i).

The low rates of high school completion and low levels of educational attainment in the region reflect the historic lack of formal education facilities, as many older individuals have never attended school. Further, school attendance rates in the Kitikmeot Region can be low (e.g., approximately 50 to 70% of registered students do not attend class; P. Cipriano, pers. comm.). Western education continues to be controversial for the Inuit as a result of residential schools and social issues related to the settlement of communities in the 1960s. For Inuit who lived through these changes obtaining a western education is not highly valued (Pauktuutit Inuit Women of Canada 2006; Inuit Tapiriit Kanatami 2007, 2014).

In 2011, attainment levels for apprenticeship and trade certifications ranged from just over one-tenth (10, 12, and 15% in Gjoa Haven, Kugaaruk, and Kugluktuk, respectively) to lows of 8 and 9% in Taloyoak and Cambridge Bay, respectively. Overall, the two most common designations were ‘trades certificates’ and ‘college or non-university diplomas’; Cambridge Bay was the exception where ‘college or non-university diploma’ (13%) and ‘university certificate or diploma at the bachelor level or above’ were most common (12%; Statistics Canada 2013i).

Enrolment and Graduation Levels

Public school enrolment decreased between 2003 and 2013 in Cambridge Bay and Gjoa Haven, while Kugaaruk, Kugluktuk, and Taloyoak experienced slight increases (Nunavut Bureau of Statistics 2014a). School attendance rates are low across the territory (i.e., about 70% in 2014). Truancy rates in the Kitikmeot Region increased between 2001/2002 and 2010/2011, from an average of 21.2 to 25.3% (Nunavut Bureau of Statistics 2014g).

There were 34 high school graduates in the Kitikmeot Region in 2014. This represents the highest number of graduates since 2008, when 36 students graduated. Regional graduation rates have varied over time from lows of 11 students in 2001 and 2004 to highs of 36 and 39 in 2008 and 2002, respectively (Letts 2015). The number of high school graduates varies with community size (Nunavut Bureau of Statistics 2014f).

Common reasons cited by young Inuit men for not completing school are: wanting to work (18%), being bored (18%), and having to work (14%). For Inuit women, pregnancy/taking care of children (24%) was the most commonly reported reason for not finishing school (Statistics Canada 2008).

Post-secondary Education and Other Training

Post-secondary education is offered by the Nunavut Arctic College (NAC) whose central campus is in Cambridge Bay. NAC is responsible for all college programming and provides programs in all Kitikmeot communities through Community Learning Centres (NAC 2008).

Programs offered through the NAC include trades, certificates and diplomas, career development, academic studies, and continuing education. Enrolment at the NAC increased from 1,242 in 2007 to 1,335 in 2011. There are typically more female students (65%) than male students (35%; Association of Canadian Community Colleges 2010).

The NAC also offers high-school level programming, specifically in pre-trades to support employment in the mining sector (Anonymous 2, pers. comm.). The pre-trades program prepares students for the entrance exam to the Nunavut Trades Training Centre in Rankin Inlet (NAC 2015), which is the centre for trades schooling in Nunavut.

Funding for Education

GN Department of Family Services, Career Development Division provides funding for student education. Programs that provide funding for students include: Financial Assistance for Nunavut Students (FANS), Adult Learning and Training Supports (ALTS), and the Special Professional Fund (GN Department of Family Services 2015).

FANS provides partial funding for students attending a designated post-secondary institution and academic program. ALTS covers the cost of training or upgrading that can be completed in under one year and including training that that leads directly to employment or work readiness/upgrade training. The Special Professional Fund is for students accepted into a specialized post-secondary program at a Canadian university (e.g., veterinary medicine or optometry) (GN Department of Family Services 2015).

Federal funding for education in Nunavut includes the Aboriginal Skills and Employment Training Strategy (ASETS) and the Skills and Partnership Fund (SPF). ASETS links training and labour market demands to prepare Aboriginal Canadians for high-demand jobs. Program services include: skills development, training for high-demand jobs, job finding, programs for youth, programs for urban and Aboriginal people with disabilities, and access to childcare. ASETS is coordinated by the KIA in the

Kitikmeot Region (Employment and Social Development Canada 2014). The SPF facilitates partnerships between Aboriginal organizations, governments, businesses, and learning institutions to improve skills training and create opportunities for Aboriginal people. A partnership between the KIA and the NWT Mining Training Society (NWT MTS) was announced in 2012 to support the delivery of mine-related training in the NWT to Kitikmeot residents. Funding to support the training was provided by the KIA and was complimented by cash and in-kind contributions provided by government and industry (KIA 2012).

Education Challenges

Challenges to the delivery of education within the Kitikmeot Region are numerous. Schools have difficulties retaining qualified teachers and difficulties finding teachers that are fluent and able to teach in Inuktitut or Inuinnaqtun (Anonymous 1, pers. comm.; P. Cipriano, pers. comm.). While there are a number of Inuit teachers in schools, many Kitikmeot teachers have relocated from the rest of Canada. Non-local teachers may have difficulties working within the local culture. Education in the Kitikmeot is focused on core subject areas while speciality courses are often not provided (e.g. computers, mining, and cooking; Anonymous 1, pers. com. 2011; C. Kapolak, pers. com. 2011; P. Cipriano, pers. com. 2011). Some schools, however, have made considerable advances in providing specialty courses. For example, the high school in Cambridge Bay offered courses in computers, shop, and heritage during the 2013/2014 school year (GN & Kitikmeot School Operations 2014). The high school in Gjoa Haven has offered career and technology studies and shop courses (GN & Kitikmeot School Operations 2015b), while art and music courses have been offered at the Taloyoak High School (GN & Kitikmeot School Operations 2015a).

Another educational challenge is the real or perceived lack of connection between education and eventual employment as local employment often does not accrue (Anonymous 1, pers. comm.; P. Cipriano, pers. comm.). Other challenges stem from differences between western and Inuit culture as formal schooling is viewed by some as a system imposed from the south (C. Kapolak, pers. comm.). Finally, home issues often result in problems in the school (Anonymous 9, pers. comm.).

Nunavut Education Program Initiatives

The newly implemented (2013) Multiple Options Program is an opportunity for high school students to select, in addition to the core curriculum such as math and science, a major in one of six areas as they enter Grade Ten:

- Introduction to trades and technology;
- History, heritage, and culture;
- Community caregiving and family studies;
- Entrepreneurship and small business studies;
- Fine arts and crafts; and
- Information technology.

The main limitation of the Multiple Options Program is the capacity of Nunavut schools to provide each of the options, as expertise and space in schools is limited. Prior to implementation, an individual school was expected to provide only two or three of the listed six potential options (CBC News North 2012).

Another initiative is underway to promote literacy in Nunavut through the provision of 43 literacy coaches. The literacy coaches will help students with skills like reading, writing, speaking, and listening and will help fellow teachers develop additional literacy techniques (Sponagle 2015a).

3.2.3.4 Labour Force and Employment

Nunavummiut are engaged in both wage-based employment as well as traditional (or subsistence) work. The traditional economy is an important contributor to regional employment and income. Sharing and other Inuit customs continue to inform economic exchange between residents.

Traditional and Regional Economy

Traditional economic activities are recognized to be of great importance in the Kitikmeot communities, particularly among Inuit residents. The traditional (or subsistence) economy includes non-commercial hunting, fishing, trapping, and gathering. It also includes the transformation of harvested products into useful articles such as clothing, tools, or arts and crafts. Land Use (Volume 6 Section 4) provides a further description of the traditional economy.

The Kitikmeot Region has a mixed economy, focusing on public sector services, private sector market economies, and traditional activities. Formal economic sectors of particular importance include: government administration, health care and social services, education, retail, construction, transportation, and mineral exploration and development (Statistics Canada 2012b). The traditional economy is largely focused on subsistence land use. Inuit in the region often participate in the market economy to supplement their traditional livelihoods. The seasonality of subsistence harvesting and the availability of wage employment influence the timing and consistency of Inuit participation in wage employment and the market economy.

> *From an economic viewpoint, it is often emphasized that traditional hunting and fishing activities, taking place at a distance from modern infrastructure and market opportunities, can represent a barrier for broader participation in the market and thus limit access to what is provided from the market economy: not only wage income, but also access to credit, subsidies and market-related transfer payments"(Poppel 2006).*

The service sector is the base of the Kitikmeot economy, providing employment to around 84% of the employed labour force (Statistics Canada 2013i). Services in the region are related to business, education, retail trade, health, and social services, among others. In contrast, primary and secondary industries - including resource-based industries and construction - account for 18% of employment (Statistics Canada 2012a). Renewable and non-renewable resource sectors are also important to the regional economy, while tourism is an emerging industry. A recently conducted survey estimates that tourism-related businesses generated more than $40 million in revenue in 2011, representing 3.2% of overall Nunavut GDP that year[5] (GN DED&T 2015b). Opportunities to develop mineral-based deposits are expected over the next number of years, leading to continued economic growth in the region and its communities. Nunavummiut are expected to benefit from this growth.

Local employment opportunities are mainly within the public sector (e.g., GN, hamlet, health services, education services, etc.). Available opportunities within the private sector are limited but include retail (e.g., the Northern Store and Co-op), hotel management (e.g., Inns North, other private

[5] The survey indicated that 51% of spending was on airfare.

accommodations), and employment with local construction companies (e.g., carpenter, equipment mechanic, excavator operator, and maintenance technician).

Labour Force and Economy

The potential labour force within the Kitikmeot Region, which includes all individuals 15 years of age and older, was comprised of approximately 3,935 individuals in 2011. The active labour force was approximately 2,410 individuals, indicating an average participation rate (percentage of the potential labour force that is working or seeking work) of 61%, a slight decrease from 63% in 2006. This rate of participation is slightly lower than the territorial average (63%) and below the national average (66%; Statistics Canada 2007, 2013d). The lower rates of participation are reflective of the population engaged in the wage-based economy and may not capture those who are engaged solely in the traditional economy. Some regional residents participate in both the wage-based and traditional economies while others have not transitioned into the wage-economy and continue to solely rely on the traditional economy (Battle 2013). Further research would be required to thoroughly understand the drivers leading only some individuals to participate in the wage economy.

The adoption of wage-based employment has differed across the territory as there are fewer Kitikmeot residents working or seeking employment (61%) in comparison to residents of the Kivalliq (63%) and Qikiqtaaluk (65%) regions. Overall, most of what is consumed in Nunavut is produced outside the territory (Battle 2013). This is one factor that contributes to the limited availability of employment, particularly in the private sector.

Participation Rates

In 2011, participation rates in the Kitikmeot Region varied widely between communities (Table 3.2-1). In Cambridge Bay and Kugluktuk, participation rates were 71% and 64%, respectively, exceeding or matching national (66%) and territorial (63%) averages. Cambridge Bay is the regional hub and has a number of private businesses and employment opportunities. Kugluktuk residents have experienced some prosperity through employment with mines in the NWT.

Table 3.2-1. Labour Force Activity Characteristics in the Kitikmeot Region (2011)

	Cambridge Bay	Kugluktuk	Gjoa Haven	Taloyoak	Kugaaruk	Kitikmeot Region	Kivalliq Region[1]	Qikiqtaaluk Region	Nunavut	Canada
In the labour force	800 (70%)	615 (64%)	485 (59%)	295 (52%)	215 (48%)	2,410 (61%)	3,600 (63%)	7,475 (65%)	13,485 (63%)	17,990,080 (66%)
Not in the labour force	330 (29%)	350 (36%)	335 (41%)	275 (49%)	235 (52%)	1,515 (39%)	2,135 (37%)	4,120 (36%)	7,770 (37%)	9,269,445 (34%)
Participation rate[2]	71%	64%	59%	52%	48%	61%	63%	65%	63%	66%
Employment rate	61%	44%	39%	37%	36%	46%	50%	55%	52%	61%
Unemployment rate[3]	14%	31%	34%	27%	28%	25%	20%	15%	18%	8%

Source: Statistics Canada (2011).
Notes:
[1] Statistics Canada refers to the Kivalliq Region as "Keewatin" and the Qikiqtaaluk region as "Baffin".
[2] Participation rate is defined as the share of the potential labour force (total population 15 years and older) that is active (either employed or unemployed).
[3] Unemployment rate is defined as the share of the active labour force that is unemployed.

In contrast, participation rates in the eastern communities were generally lower. Approximately half of the working age population in Taloyoak and Kugaaruk reported they are not in the labour force. Given the fairly recent and ongoing transition to the wage economy, lower labour force participation is likely reflective of continued participation in a traditional or subsistence economy.

Employment and Unemployment Rates

Approximately 75% of the active labour force in the Kitikmeot was employed in 2011. Employment rates (percentage of the population 15 years of age and older that is employed) varied widely across communities from 36% in Kugaaruk to 61% in Cambridge Bay. There are fewer government jobs and private sector businesses in the eastern communities.

The unemployment rate (percentage of the active labour force that is unemployed) was relatively high in all communities compared to the national average of 8% and the Nunavut average of 18% except for Cambridge Bay which reported an unemployment rate of 14%. As the regional hub, there are employment opportunities with locally owned businesses and a concentration of opportunities for government employment in Cambridge Bay.

One-quarter of the Kitikmeot labour force was estimated to be unemployed in 2011, the highest regional unemployment rate (25%). This was notably higher than Qikiqtaaluk (15%) and Kivalliq (20%) regions which more closely reflect the territorial unemployment rate (18%; Statistics Canada 2007, 2013d). Unemployment, social assistance, and public housing are interconnected issues that are further discussed in Sections 3.2.3.9 and 3.2.3.10.

Based on the most recent employment data from 2011, the average unemployment rate in Nunavut was 18% (Table 3.2-1). The community of Gjoa Haven had the highest unemployment rate at 34% with 165 unemployed followed by Kugluktuk at 31% and 190 unemployed. The lowest unemployment rate was in Cambridge Bay (14%) which is the largest community and business hub for the region (with 690 employed and 115 unemployed). In total, there were 605 unemployed people (unemployment rate of 25%) in 2011 in the Kitikmeot Region. To compare, in 2011, the national unemployment rate was 8% (Statistics Canada 2013a) .

Labour Force Characteristics of the Aboriginal Identity Population

The majority of the individuals in Kitikmeot communities are Inuit and this segment of the population is experiencing rapid growth, meaning that Inuit comprise the large majority of the labour force. In the Kitikmeot Region, 91% of residents are of Aboriginal origin (90% Inuit) (Statistics Canada 2013f). The labour force characteristics of the Aboriginal identity population[6] in the Kitikmeot Region vary somewhat from those presented above for the total population. Understanding the employment circumstances of Inuit provides context as to the availability of the resident labour force for future employment.

In all communities, participation is slightly lower and unemployment is slightly higher among the Aboriginal identity population. Employment rates vary by community, from lows of approximately 35% in each Gjoa Haven, Taloyoak, and Kugaaruk to a high of 51% in Cambridge Bay. Presently, Inuit are engaged in the wage economy to a greater extent than has been realized in the past. Primary reasons for unemployment can include lack of jobs, caring for children and elder relatives, spending time on the land hunting or fishing, illness or disability, and waiting for recall or for another job to begin (E. Cameron, and C. Gabel 2015).

[6] Statistics Canada uses the term Aboriginal identity population to refer to all 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.

Unemployment rates were considerably higher in Gjoa Haven and Kugluktuk in 2011 (36% and 35%, respectively), representing increases from 2006 when the highest unemployment rates in the Kitikmeot were 32% and 31%, in Gjoa Haven and Taloyoak. In comparison, the unemployment rate for the Canadian Aboriginal population in 2011 was 15% (Statistics Canada 2013e). Higher than average unemployment rates reflect the lack of available employment opportunities as well as a mismatch between local skill sets and available employment (Battle 2013).

This focused account of Aboriginal labour force characteristics shows greater balance in participation rates between the Kitikmeot, Kivalliq, and Qikiqtaaluk regions (57%, 59% and 56%, respectively). In terms of unemployment among the Aboriginal identity population, the Kitikmeot Region remains highest of the three regions (30%), while the Kivalliq and Qikiqtaaluk regions more closely reflect the territorial average of 23%. The unemployment-to-job-vacancies ratio was 17.5 in Nunavut in 2014, meaning there were 17.5 unemployed individuals for every job vacancy. In comparison, the ratio for Canada is 6.1, meaning there are about six unemployed individuals for every job vacancy (Statistics Canada 2014).

Gender Variations in the Labour Force

Participation rates for males were generally higher as compared to females (from 4% higher in Kugaaruk to 10% higher in Cambridge Bay). Regionally, labour force participation was higher for males (by 7%) and employment rates were similar between males and females (1% difference). Unemployment rates were also generally higher for males (by 6%), with the exception of Taloyoak where the unemployment rate for females was slightly higher. The unemployment rate for females ranged from 33% in Kugluktuk to 15% in Cambridge Bay. For males, unemployment rates varied from 42% in Gjoa Haven to 21% in Cambridge Bay. In sum, this means that men are more actively involved in the labour force, but that many of these individuals are unemployed and seeking work. Information on labour supply statistics in terms of ages and other demographic categories (other than gender) is not available.

Gender variations in the Kitikmeot labour force may reflect the types of employment available, cultural norms, or other variables. Further research is required to define the drivers of gender variations in labour force participation.

Labour Force Experience

The labour force experience of all individuals aged 15 and over in the Kitikmeot Region was concentrated within service-based activities (Table 3.2-2). In 2011, approximately one-quarter of the labour force (24%) worked in sales and service occupations, which includes all retail, tourism, accommodation, and foods services. One-fifth (22%) of the labour force worked in trade, transport, and equipment operations occupations, which includes contractors, construction workers, and trades workers, among others. Another fifth (21%) worked in education, law and social, community and government services. The GN is a prominent employer in Nunavut communities. Business, finance, and administration occupations, and management occupations also made important contributions to the region's occupational profile, accounting for 13% and 7% of jobs, respectively.

Overall, there is greater a diversity of occupational experience in the western Kitikmeot Region than the east. In Cambridge Bay and Kugluktuk, residents had occupations in management, business, sciences, health, education, arts, sales, trades, natural resources, and manufacturing (Table 3.2-2). There was a concentration of occupations related to business, finance, and administration in Cambridge Bay. In the eastern Kitikmeot, the labour force was concentrated within fewer occupations. For example, more than a quarter of the population in each Gjoa Haven, Taloyoak, and Kugaaruk were employed in occupations in sales and services. Further, within the eastern Kitikmeot there was no labour force experience in manufacturing or natural and applied sciences (Table 3.2-2).

Table 3.2-2. Experienced Labour Force by Occupation, 2011

Occupation	Cambridge Bay	Kugluktuk	Gjoa Haven	Taloyoak	Kugaaruk	Kitikmeot Region	Kivalliq Region	Qikiqtaaluk Region
Management	80 (10%)	30 (5%)	25 (5%)	20 (8%)	10 (5%)	165 (7%)	295 (9%)	800 (11%)
Business, finance and Administration	135 (18%)	50 (9%)	55 (13%)	20 (8%)	25 (13%)	295 (13%)	470 (14%)	1,215 (17%)
Natural and applied sciences	40 (5%)	20 (4%)	0 (0%)	0 (0%)	0 (0%)	75 (3%)	75 (2%)	290 (4%)
Health	15 (2%)	15 (3%)	10 (2%)	10 (4%)	0 (0%)	50 (2%)	90 (3%)	215 (3%)
Education, law and social, community and government	155 (20%)	135 (24%)	85 (20%)	55 (22%)	35 (18%)	460 (21%)	645 (19%)	1,480 (21%)
Art, culture, recreation, sport	10 (1%)	15 (3%)	15 (4%)	10 (4%)	0 (0%)	50 (2%)	100 (3%)	325 (5%)
Sales and service	135 (18%)	140 (25%)	125 (29%)	65 (25%)	65 (33%)	525 (24%)	865 (26%)	1,520 (21%)
Trades, transport, equipment operators	135 (18%)	125 (23%)	95 (22%)	60 (24%)	60 (30%)	475 (22%)	690 (20%)	1,200 (17%)
Natural resources, agriculture, and production	30 (4%)	15 (3%)	10 (2%)	0 (0%)	0 (0%)	60 (3%)	105 (3%)	55 (1%)
Manufacturing and utilities	25 (3%)	10 (2%)	0 (0%)	0 (0%)	0 (0%)	45 (2%)	40 (1%)	100 (1%)

Source: Statistics Canada (2012e)

In the majority of the communities, the second largest portion of the labour force was employed in trades, transport and equipment operations occupations, followed by occupations in education, law and social, community and government services. Kugluktuk was the exception with education, law and social, community and government service occupations slightly exceeding trades, transport and equipment operations occupations (24% and 23%, respectively).

The NHS indicates that in 2011 there were 90 individuals employed in mining, quarrying, and oil and gas extraction. This included 35 individuals in Cambridge Bay, 40 individuals in Kugluktuk, and 10 individuals each in Gjoa Haven, Taloyoak, and Kugaaruk (Statistics Canada 2013i). In comparison, the 2006 census[7] indicated that occupations unique to primary industries, including mining, accounted for less than 5% of the local workforce, ranging from less than 2% in Cambridge Bay (approximately 10 people) to 5% in Gjoa Haven and Kugaaruk (approximately 10 people; Statistics Canada 2007). All Kitikmeot communities exhibit high participation in education, business, retail, and other service sector. Retail trade is particularly important in majority of communities, providing for 13% of the labour force in Kugluktuk, 15% in each Gjoa Haven and Kugaaruk, and 18% in Taloyoak. These labour trends are typical

[7] A direct comparison of the number of individuals employed in mining, quarrying, and oil and gas extraction between the 2006 Census and 2011 NHS is not possible as a result of changes to the data collected and categorization of data by Statistics Canada.

for small, relatively isolated northern communities. In Taloyoak, almost one-fifth of the labour force were employed in construction (18%) in 2011 (Statistics Canada 2013d). Notably, a recent report indicates that accommodation and outfitting businesses employed 1,258 Nunavummiut in 2011 (GN DED&T 2015b).

Labour force experience in the Kitikmeot is similar to the Kivalliq and the Qikiqtaaluk regions as the top three occupation categories in each region are: education, law and social, community and government; sales and service; and trades, transport and equipment operators. The proportion of the population with experience in trades, transport and equipment operation was highest in the Kitikmeot (22%, as compared to 20 and 17% in the Kivalliq and Qikiqtaaluk Region, respectively; Table 3.2-2).

Employment Opportunities

The GN is a prominent employer in the Kitikmeot Region. It dominates the service sector and is a major economic driver. Cambridge Bay is the largest and most diversified economy and is the business and employment hub for the Kitikmeot Region, with an economy that is fairly balanced across the sectors (J. MacEachern, pers. comm.). Other communities have relatively few private sector businesses and more limited employment opportunities. The employment opportunities that are available are centered on providing essential services required by the community.

To support government housing developments, there are construction companies in each community that provides employment opportunities. These may include: housing and building construction, heavy equipment operation and excavation, road construction and maintenance, pad construction, crushing to provide aggregate, and rental of trucks, tools, and equipment (B. Schoenauer, pers. comm.). These businesses provide a relatively large number of private sector jobs, particularly during the summer construction season, and for smaller communities they typically provide the greatest number of jobs outside of government. Other businesses that are common to all communities include retail and accommodation.

In general, employment opportunities in the Kitikmeot Region within the private sector are limited. Private sector employment opportunities that are available, as indicated by online postings, include general labour and skilled trade jobs. Employment opportunities outside the private sector include public employment opportunities with the GN. For example, there is a relatively new health centre in Cambridge Bay that requires nurses, mental health consultants, a manager of maternal and newborn services, and other positions. Recent research indicates there is a mismatch between the skills of the local labour force and the requirement of locally available employment (Battle 2013).

Income

The number of employees in Nunavut varied from 14,000 to almost 15,000 over 2010 to 2015, steadily increasing over the period with a small dip in 2014 (Table 3.2-3). Average weekly earnings were $1,256.70 in 2015 (about $65,000 in annual income), a 20% increase over 2010 (Table 3.2-3). However, the median income in the territory was much lower at $28,580 for Nunavut (Table 3.2-4).

Average earnings in the Kitikmeot Region ($37,780) were lower than the Kivalliq ($38,823) and Qikiqtaaluk ($47,395) regions in 2010 (Statistics Canada 2013i). Nunavut's minimum wage ($11.00 per hour) was under review in 2015 to determine how an increase would affect businesses and employees. The most recent change was an increase in 2011 from $10.00 per hour (CBC News North 2015a). Those earning the minimum wage and working full-time in 2010 would have had an annual income of approximately $20,880[8] – slightly below the median earnings of $22,734 in the Kitikmeot that year. The

[8] Based on full-time employment, 52 weeks per year.

median represents the middle income of all residents reporting income, indicating that approximately half of those reporting income in 2010 had annual income below the minimum wage, full-time equivalent (Statistics Canada 2013i). Further, a median income that is below the average income indicates there are more individuals earning a lower income while a few high income earners inflate the average income.

Table 3.2-3. Average Number of Employees and Average Weekly Earnings (Including Overtime), Nunavut, 2010 to 2015

	2010	2011	2012	2013	2014	2015
Average Number of Employees	14,047	14,533	14,579	14,747	14,656	14,801
Average Weekly Earnings	$1,050.15	$1,081.60	$1,125.37	$1,176.99	$1,236.44	$1,256.70
Estimated Annual Income	$54,608	$56,243	$58,519	$61,204	$64,295	$65,349

Source: (NBS 2016b)
Notes: The estimated annual income is calculated as the average weekly earnings times 52 weeks. It should be noted that the actual annual income may be potentially lower given the fact that not all individuals work full year.

Table 3.2-4. Nunavut Taxfilers with Employment Income by Region and Community

	2006	2007	2008	2009	2010	2011	2012	2013
Number of Taxfilers with Employment Income:								
Nunavut	14,060	14,200	15,070	15,420	15,940	16,340	16,510	16,460
Kitikmeot Region	2,510	2,490	2,730	2,740	2,820	2,890	2,960	2,890
Cambridge Bay	800	810	870	890	910	940	950	940
Gjoa Haven	470	460	510	520	550	580	570	580
Kugaaruk	290	300	330	340	330	360	380	360
Kugluktuk	630	610	660	640	640	640	680	630
Taloyoak	330	320	350	360	390	370	390	380
Proportion of Taxfilers with Employment Income:								
Nunavut	85%	84%	85%	85%	85%	85%	84%	83%
Kitikmeot Region	84%	83%	85%	84%	84%	84%	84%	81%
Cambridge Bay	89%	89%	90%	89%	89%	89%	89%	86%
Gjoa Haven	82%	81%	84%	81%	83%	83%	79%	78%
Kugaaruk	88%	86%	87%	87%	85%	86%	86%	80%
Kugluktuk	83%	81%	83%	82%	81%	80%	83%	78%
Taloyoak	79%	76%	80%	82%	83%	79%	81%	78%
Median Employment Income:								
Nunavut	$23,200	$24,310	$24,750	$25,140	$25,520	$26,500	$27,470	$28,580
Kitikmeot Region	$17,900	$18,500	$17,280	$17,300	$18,510	$18,900	$17,860	$17,490
Cambridge Bay	$27,300	$26,950	$28,070	$26,070	$30,620	$32,780	$29,800	$28,800

	2006	2007	2008	2009	2010	2011	2012	2013
Median Employment Income: ***(cont'd)***								
Gjoa Haven	$12,000	$14,800	$12,810	$12,690	$14,360	$14,220	$14,700	$14,070
Kugaaruk	$12,300	$12,190	$10,400	$11,780	$13,990	$12,330	$10,560	$10,250
Kugluktuk	$20,700	$21,850	$18,900	$18,720	$19,610	$22,520	$19,340	$15,540
Taloyoak	$12,500	$13,270	$11,970	$13,200	$12,830	$13,280	$10,890	$13,040

Source: (NBS 2014c)

Average earnings in the Kitikmeot Region ($37,780) were lower than the Kivalliq ($38,823) and Qikiqtaaluk ($47,395) regions in 2010 (Statistics Canada 2013i). Nunavut's minimum wage ($11.00 per hour) was under review in 2015 to determine how an increase would affect businesses and employees. The most recent change was an increase in 2011 from $10.00 per hour (CBC News North 2015a). Those earning the minimum wage and working full-time in 2010 would have had an annual income of approximately $20,880[9] – slightly below the median earnings of $22,734 in the Kitikmeot that year. The median represents the middle income of all residents reporting income, indicating that approximately half of those reporting income in 2010 had annual income below the minimum wage, full-time equivalent (Statistics Canada 2013i). Further, a median income that is below the average income indicates there are more individuals earning a lower income while a few high income earners inflate the average income.

Within the Kitikmeot Region, the median individual income in Cambridge Bay ($29,543) was highest in the region and higher than the territorial average ($25,662) in 2010. Other Kitikmeot communities reported median individual incomes below the Nunavut average[10]. Cambridge Bay also reported the highest median household income among the Kitikmeot communities ($85,543), which was approximately 12% more than the community with the second highest household income (Gjoa Haven at $76,204) and higher than the Nunavut average ($81,219) (Statistics Canada 2013i).

In the Kitikmeot Region the median employment income was $17,490 in 2013, with the highest median income in Cambridge Bay ($28,800) and the lowest in Kugaaruk ($10,250; Table 3.2-4). In 2013, in the Kitikmeot Region, there were 2,890 taxfilers with employment income, representing 81% of all taxfilers (Table 3.2-4). From among the Kitikmeot communities, Cambridge Bay and Kugaaruk had the highest proportion of taxfilers with employment income in 2013 (86% and 80%, respectively; Table 3.2-4).

Additionally, earnings vary by gender in the Kitikmeot. For example among those who worked full-time, the median employment income of females in Kugaaruk was approximately 40% lower ($36,793) than males ($61,038). Conversely in Gjoa Haven, the median income of females ($73,120) was about 23% higher in comparison to males ($56,647). Gendered differences in median income were not as striking in Kugluktuk and Cambridge Bay, at +6% and +3%, respectively for males. Taloyoak was an exception, where the difference between male and female median income was negligible (less than $300) (Statistics Canada 2013i).

Regionally, median household income in the Kitikmeot Region ($67,394) is below the Kivalliq and Qikiqtaaluk regions ($75,625 and $88,551, respectively). With the exception of Cambridge Bay, all communities sourced a relatively large amount of household income from government transfers from 18% of total income in Kugluktuk to 29% of total income in Kugaaruk. This is greater than the 13% average for Nunavut as a whole (Statistics Canada 2013i).

[9] Based on full-time employment, 52 weeks per year.
[10] In 2010, the median income was $21,842 in Kugluktuk; $22,459 in Gjoa Haven, $19,143 in Taloyoak, and $20,638 in Kugaaruk.

With respect to income sources, employment income[11] represents the largest source of income in all communities. Residents of Cambridge Bay had the highest proportion of income from employment at 87%, followed by Kugluktuk at 80%; for the remaining communities this source is above 70% but below 80% of total income. Government transfer payments are most utilized by residents in Kugaaruk (29%), followed by Taloyoak (28%) and Gjoa Haven (24%). In communities with high employment income, government transfer payments are proportionately lower (Cambridge Bay and Kugluktuk, respectively, 10% and 18%; Statistics Canada 2013d).

Finally, part-time (or seasonal) work within the Kitikmeot Region accounted for approximately 23% of employment. Across communities, part-time work accounts for 19% of the employment in Cambridge Bay with increasing percentages in other communities: Kugluktuk (28%), Gjoa Haven and Kugaaruk (24%), and Taloyoak (22%)(Statistics Canada 2013i). This has the overall effect of greatly lowering total annual earnings compared to what would be achieved with more full-time employment.

3.2.3.5 Territorial Economy and Economic Development

Real GDP and Economic Sectors in Nunavut

Nunavut's Gross Domestic Product (GDP) experienced a 25% increase from $1,666 million to $2,085 million between 2010 and 2014 (millions of chained 2007 dollars). Over this period, growth was continuous with a strong increase of 11.5% between 2012 and 2013 which was followed by a smaller, but similarly strong increase of 6.2% between 2013 and 2014. Overall, GDP growth in Canada's three territories was highest in Nunavut over this time period (Statistics Canada 2015d). Table 3.2-5 presents the annual growth in real GDP in Nunavut from 2010 to 2014.

Table 3.2-5. Annual Growth in Real Gross Domestic Product in Nunavut (2010 to 2014)

	2010	2011	2012	2013	2014
Real GDP – All Industries (millions of chained 2007 dollars)	$1,666.5	$1,742.6	$1,761.7	$1,963.5	$2,085.1
Annual Growth (%)	Na	4.5%	1.1%	11.5%	6.2%

Source: Statistics Canada (2015d)

In Nunavut, a number of factors shape the economy. The public sector is responsible for a notable portion of economic activity, private business is limited, and the retail industry is hindered by a lack of intra-regional transportation networks and cost-effective shipping. Overall, there is a heavy economic reliance on government-funded sectors. The four largest contributors to real GDP[12] in Nunavut were consistent between 2010 and 2014 and included the following industry sectors: construction; education services; public administration; and mining, quarrying, and oil and gas extraction. However, the contribution from the mining, quarrying, and oil and gas exploration sector in 2014 places the industry among the four top contributors (Statistics Canada 2015c). Health care and social assistance has consistently been the fifth largest contributor to GDP over the period 2010 to 2014, accounting for $110.4 million in 2014.

[11] Statistics Canada defines employment income as one type of market income that is a total of wages and salaries, including any net income from self-employment.
[12] Real GDP is a measure of the value of economic output, or goods and services produced, that is adjusted to account for inflation.

The contribution to real GDP from the mining, quarrying, and oil and gas extraction industry as well as construction industry increased substantially between 2010 and 2014 (by 82 and 63%, respectively; Table 3.2-6). In 2014, the contribution of the mining, quarrying, and oil and gas extraction industry ($366.2 million) to Nunavut's real GDP was comparable to the contribution made by public administration ($397.2 million), a long-standing leading contributor to GDP in the Territory.

Table 3.2-6. Select Industry Contribution to Real GDP in Nunavut (2010 to 2014)

Select Industries Contributing to GDP	Industry Contributions to GDP (millions of chained 2007 dollars)					% Growth 2010 to 2014
	2010	2011	2012	2013	2014	
Mining, quarrying, and oil and gas extraction	$201.5	$250.6	$285.2	$333.2	$366.2	82%
Construction	$209.7	$184.4	$131.4	$236.9	$342.5	63%
Education Services	$149.3	$150.4	$152.8	$155.7	$158.5	6%
Public Administration	$381.1	$386.3	$386.5	$387.3	$397.2	4%

Source: Statistics Canada (NBS 2015)

The Centre for the North's Territorial Outlook Report predicted 6.8% GDP growth in Nunavut for 2015 followed by more modest growth of 2.3% in 2016. The growth predicted in 2015 was attributed to Baffinland Iron Mine's first full year of production at Mary River, ongoing construction of the $143 million Canadian High Arctic Research Station in Cambridge Bay, and the $300 million Iqaluit airport expansion project (Northern News Services Online 2015).

The Territorial Outlook report also noted the impact of large construction projects on Nunavut's GDP due to the relatively small population. Mine construction at Mary River in 2013 boosted the construction industry by 80%, contributing to growth in the territory's GDP by 11.5%. Construction activities in 2015 are predicted to exceed those experienced in 2013 (Northern News Services Online 2015).

Mineral exploration spending in Nunavut peaked in 2011 at $535.7 million and more than doubled as compared to the previous year (2010; $256.7 million). Spending remained high in 2012 at $422.5 million, but declined by approximately 40% in 2013 to $257.6 million. Spending in 2014 was slightly lower than predicted (actual spending of $144.6 million); economic growth was linked to gold production at the Meadowbank mine, a ramping-up in construction activity at the Mary River iron ore project, and a number of public infrastructure projects (Northern News Services Online 2015). According to predictions, exploration spending in Nunavut will increase slightly in 2015, to $174.3 million (Natural Resources Canada 2015).

Current opportunities in Nunavut include Agnico Eagle's Meadowbank that may extend its productive life into 2018 through a two-phase expansion. Other projects in Nunavut that are either in the planning or permitting stage include: Back River Gold Mine, Bathurst Inlet Port and Road Joint Venture, Izok Corridor Zinc-Copper-Lead Mine, Kiggavik Uranium Mine, Mary River Iron Mine and railway and port, as well as Meliadine Gold Mine. These developments are estimated to provide $11 billion in development costs and provide more than 4,200 operating jobs for Nunavut (NNSL 2015).

Consumer Price Index

There is no data on Nunavut's Consumer Price Index (CPI). The estimated CPI is based on prices in Iqaluit. According to the Iqaluit index, prices rose by 1.9% between June 2014 and June 2015. In comparison, national change in CPI was 0.9%. Typical changes in the Iqaluit CPI vary from 1.0% to 2.0%

per year, with the exception of 2010 when the change in CPI was -0.7% and 2007 when it was 3.2%. There is no evident correlation between changes in the Iqaluit CPI and the national CPI. Overall, prices in the Kitikmeot Region, and in Nunavut and are can be as much as quadruple the Canadian average. For example, in 2015, the price of celery and carrots in the Kitikmeot Region was quadruple the Canadian average, bananas and carrots were triple the price, and beef and cooking oil were double (Nunavut Bureau of Statistics 2015). Northern communities face inflated food prices as a result of a lack of and expensive transportation options.

Nunavut Imports and Exports and Trade Balance

Nunavut imports two to three times as much as it exports, with virtually all exports and imports beginning or ending in other Canadian provinces. However, exports increased from $193 to $930 million between 2008 and 2013 (an increase of 389%), while during the same period imports increased only (10%), from $1,797 to $1,968 million (Nunavut Bureau of Statistics 2014e). In 2013, Nunavut continued to import more than twice as much as it exports. There has been a notable decrease of exports to other countries (46%) coupled with a dramatic increase in exports to other provinces (442%). The export of goods to other provinces rose dramatically between 2009 and 2010 (from $3 to $323 million), mainly associated with the commissioning and first production from the Meadowbank mine in 2010.

Imports from other countries decreased (-21%) between 2008 and 2013, while imports from other provinces increased slightly (3.5%). Over the same period, the import of services from other provinces increased steadily for an overall increase of 20% (Nunavut Bureau of Statistics 2014e). As evident, Nunavut's trade balance (the difference between the value of exports and the value of imports) was negative as imports were nine times the value of exports in 2008 and two times the value of exports in 2013. This points to a rather large shift in exports and moderate changes in imports. In real terms, export increased by 327.6% while imports decreased by 1.2% from 2008 to 2013 (Nunavut Bureau of Statistics 2014d).

GDP Expenditure Account and Household Consumption in Nunavut and Canada

In Nunavut, approximately one-third of consumption contributing to GDP is private while two-thirds is public. For Canada as a whole, the reverse is true - approximately two-thirds of total consumption is private and just over one-third is public. Final consumption expenditure (the total of public and private consumption) increased by approximately 5% between 2008 and 2013 in Nunavut. Government consumption in Nunavut accounted for approximately 65% throughout this time period, while household consumption routinely accounted for approximately 33% (Nunavut Bureau of Statistics 2014e). In contrast, Canadian household consumption accounted for approximately 72% of total consumption expenditure in 2013 (Statistics Canada 2015e).

Household final consumption expenditure increased by 16% in Nunavut while increasing only 10% nationally over the same period (2008 to 2013). In Nunavut, increases in the consumption of durable goods were highest at 27%, followed by semi-durable goods at 24%, and non-durable goods at 14%. The consumption of services also increased to 15%. In Canada, the household consumption of all goods and services increased by 11% and 13%, respectively (Statistics Canada 2015e).

Personal Savings and Investment Income

The GN collects information on Registered Retirement Savings Plan (RRSP) contributions and investment income. In 2013, there were 2,150 contributors (11.4% of all taxfilers), a decrease of 0.9% from 2012. In total, contributions totaled $15.9 million and the median contribution was $4,740, an increase of 4.1% from 2012 to 2013. In comparison, 23.4% of all taxfilers in Canada made contributions and the median contribution was $3,000 (Government of Nunavut 2015).

Incomes from investments were reported by 1,130 Nunavummiut taxfilers (or 6.2% of all taxfilers) in 2011, for a total of $5.7 million. This represents an increase of 1.8% in the number of taxfilers as compared to the previous year (2010) as well as an increase in total investment income of 23.8%. In comparison, the number of taxfilers reporting investment income in Canada increased by 0.7% and total investment income went up by 8.2% over the same period (Government of Nunavut 2013).

While data reporting the number of bank account holders in the territory is unavailable, efforts to establish greater access to services and provide financial management support have been ongoing. Until recently, Cambridge Bay was the only community in the Kitikmeot Region offering banking services. In August 2015, the First Nations Bank of Canada (FNBC) opened a full-service *First Nations Bank of Canada Community Banking Centre* in Kugluktuk providing business and personal banking services including loans, mortgages, investments, transaction accounts, and cash management. Within the previous year, the FNBC opened *Community Banking Centres* in Baker Lake and Pond Inlet. The FNBC, with the support of its largest shareholder, Inuit-owned Atuqtuarvik Corporation, has opened each of the three centres in Nunavut under an arrangement with Arctic Co-operatives Limited (First Nations Bank of Canada 2015).

Business Investment

Across Nunavut, government and private spending on non-residential building construction[13] reached previously unrealized highs in 2013 and 2014, with spending of approximately $121.5 million and $107.2 million, respectively. Prior to 2013/2014, this type of spending had exceeded $50 million just three times since 1999. Of total spending in 2013 and 2014, governmental non-residential building construction accounted for 10% and 30%, while commercial or private construction accounted for 86% and 65%, respectively. The development of mining facilities including building/facilities construction likely accounts for a large portion of private non-residential construction (Nunavut Bureau of Statistics 2014a). Non-residential building construction classified as industrial has accounted for less than 5% annually since 1999 (Nunavut Bureau of Statistics 2014a).

Nunavut Mining Industry Labour Supply and Demand

At the time of writing there were three operational mines in Nunavut (Doris North, Meadowbank and Mary River). In 2013, mining accounted for 15% or Nunavut's total GDP; to compare, four years earlier mining represented only 0.5% of Nunavut's GDP (MiHR 2014). In 2012, Nunavut produced three types of minerals including gold (accounting for 99% of all production and being the third largest producer in Canada), silver and diamonds (MiHR 2014).

Although Canada's mining labour force is relatively older, compared to other industries, Nunavut's mining labour force has a much higher proportion of workers that are younger. In 2011, an estimated 19% of Nunavut's mining labour force was 15 to 24 years of age and 33% was 25 to 34 years of age, compared to 11% and 26%, respectively, for Canada (MiHR 2014). However, there are gaps in educational attainment in Nunavut's labour force. Almost a half of the Nunavut's labour force (46%) has no certificate, diploma or degree and only 15% has a university level education (Statistics Canada 2013d). Also, those without a certificate, diploma or degree are less likely to participate in the labour force, compared to Canada in general, and those who do participate, are less likely to be employed.

[13] Spending on non-residential building construction includes both government and enterprise spending for industrial, commercial, and institutional buildings. Expenditures on residential construction and engineering work (e.g., bridges, roads, electrical dams, etc.) are not included.

In contrast, those with a university degree are much more likely to participate in the labour force and have high level of employment, as compared to the Canadian labour force (MiHR 2014). Nunavummiut, similar to Canadians in general, have similar participation rates for those with a high school degree or a college degree; however, Nunavummiut tend to have higher rates of unemployment. In comparison to the Canadian average, Nunavummiut with an apprenticeship or a trade certificate have lower participation rates and higher rates of unemployment as compared to Canadians with apprenticeship or a trade certificates (MiHR 2014).

In Nunavut, there is also a high percentage of the workforce who work in the territory but live elsewhere (MiHR 2014). In fact, despite the strong emphasis to first hire from the local labour force, it is estimated that nearly three quarters of Nunavut's workforce is from outside of Nunavut (MiHR 2014). The need to supplement the local workforce comes from the remoteness of mining operations, a small population size, and a lack of infrastructure and housing, as well as education gaps (MiHR 2014).

Over 80% of Nunavut's population is Inuit, and there is strong Inuit participation in the mining industry (NBS 2015b). Indigenous people are often employed in entry-level and labourer positions with potential barriers to employment including the level of educational attainment (education and skill do not meet entry requirements). Limited employer awareness of how to find and recruit Inuit workers is also at play (MiHR 2014). With respect to other diversity measures, women represent an estimated 20% of Nunavut's mining labour force, compared to 17% nationwide (MiHR 2014).

MiHR's hiring requirements forecast estimates that, over the next decade (by 2024), Nunavut's mining industry will require 1,120 hires or 112 hires per year on average (under the baseline scenario). Most of this requirement is expected to come from the replacement of existing workers that leave the industry (mainly due to reasons unrelated to retirement; MiHR 2014). Occupations highest in demand are likely to include trades and production, followed by demand for support workers, supervisors and coordinators, and technical occupations, as well as human resources and financial occupations (MiHR 2014). More specifically, the top five occupations with notable hiring requirement are:

- heavy equipment operators (except crane);
- heavy-duty equipment mechanics;
- truck drivers;
- drillers and blasters; and
- geological and mineral technologists and technicians.

The demand will largely stream from mineral extraction, followed by mineral exploration and mining support services (MiHR 2014). MiHR estimates that in 2013, 2,215 people worked in Nunavut's mining industry; this represented 18% of the total employment in the territory and contributed 18% to GDP (MiHR 2014; MAC 2015). Of the total employment, there were approximately 1,075 workers in the mineral extraction sector and over 1,140 workers in exploration and mining support services (MiHR 2014). Another statistic indicates that, in 2013, 49% of Nunavut's mining workforce were in mining and processing, 32% in exploration and 20% in support services; for Canada these proportions were, respectively, 61%, 22% and 17% (MiHR 2014).

MiHR also prepared an available talent forecast that refers to the new entrants to Nunavut's labour pool. New entrants to the mining industry are mostly individuals who just completed high school or post-secondary school and are planning to join the workforce. New entrants may also include international or interprovincial migrants, or those who are changing occupations or re-entering the workforce (MiHR 2014). The forecast predicts that, over the next ten years (up to 2024), the mining industry in Nunavut will attract a modest 120 new entrants or 12 new entrants per year; this is based

on historical rates for the mining industry and its ability to attract workers for specific positions from the broader labour pool (MiHR 2014). Given that the demand for selected occupations is estimated to be six times (790) the number of new entrants, it is expected that there will be a substantial talent gap (MiHR 2014). This talent gap is expected to vary for different occupations. The Mining Association of Canada estimates that the current mining projects in Nunavut that are in various stages of development will create 4,760 operating jobs and spend $11.4 billion in project development costs (MAC 2015). Although this has the potential to create a number of benefits for the territory, it is also expected to worsen the available talent gap for the mining sector.

The territorial market has been affected by the recent economic downturn. The *Labour Market Bulletin* for Northwest Territories, Nunavut and Yukon notes that in 2014, Nunavut lost 3.1% of full-time positions (ESDC 2014). In 2015, there was a loss of jobs in winter months but a gain in jobs in summer months (ESDC 2015b). Nevertheless, it is noted that the job outlook for Nunavut is still promising as new mining operations are either in permitting or the development stage (ESDC 2014, 2015a).

The skills gap within the mining industry is a current challenge across northern Canada, where resource development typically occurs. National recommendations point to the dedication of attention and resources for education, employability skills and job-specific skills development (CBoC 2011).

Given that current graduation rates and education levels in Nunavut are below those of the Canadian labour market, it is recognized that labour force capacity can be built through partnership and shared principles such as understanding each other's needs and long-term mutual goals for economic and community development (CBoC 2013). Employability skills, defined as lack of work experience, can be enhanced through mutual consideration of businesses to understand strengths, challenges, experiences, goals, and culture of the communities in which they operate, as well as individuals who must understand the working culture of their employers (CBoC 2013). Job-specific skills can be created by providing training opportunities including post-secondary education, trades training, supervisory and management training (CBoC 2013). The indicated areas are of importance in developing a work-ready talent pool in the North.

Labour Supply by Skill Level

The territorial and regional labour supply, as well as estimates of the size of the partly-utilized and unutilized labour force of the Kitikmeot Region is informed by an analysis of the 2011 NHS and Beyond 20/20 data provided by Statistics Canada (C. Wong, pers. comm.).

The 2011 NHS provides information on the size of the labour force in the Kitikmeot Region and in Nunavut, including the distribution of the population aged 25 to 64 (for total population and Aboriginal identity) by highest certificate, diploma or degree. This information is used to estimate the size of the territorial labour force by skill level (Table 3.2-7). It is noted that there is potential labour force 18 to 24 years of age that is not accounted for in this analysis. The labour force is defined for this analysis as those within the age range 25 to 64, but it is acknowledged that this is a conservative approach because those aged 18 to 24 are excluded from the analysis[14].

[14] Labour force data is typically provided for the age cohort of "15 years and over" or "25 to 64 years of age". By focusing on the second cohort, we are excluding those who are pursuing secondary or post-secondary education, and those under 18 who are unable to work at the mine site as specified by legislation.

The educational attainment is described according to the NOC coding system, using the following criteria:

- Skill Level A – occupations usually require university education;
- Skill Level B – occupations usually require college education or apprenticeship training;
- Skill Level C – occupations usually require secondary school and/or occupation-specific training; and
- Skill Level D – on-the-job training is usually provided for occupations (i.e., high school not required).

The total population of the Kitikmeot Region is estimated at 5,980, of which 2,545 is 25 to 64 years of age (Statistics Canada 2013f). The Aboriginal population in the Kitikmeot Region is estimated at 5,465, of which 2,130 is aged 25 to 64 (Statistics Canada 2013c). Of the total population of 5,980, approximately 5,410 (or 90%) are Inuit (Statistics Canada 2013c). Table 3.2-8 provides an overview of the Kitikmeot labour force 25 to 64 years of age by skill level.

Nunavut's education profile by skill level using the NOC coding system (see Table 3.2-7) is as follows:

- Almost a half (46%) of the total population in Nunavut, 25 to 64 years of age, does not have a high school diploma or equivalent; this is respectively 59% for the Aboriginal population in the territory.
- 15% of the total, or 3% of the Aboriginal population, in Nunavut has a university degree.

Table 3.2-7. Population by Skill Level, Nunavut, 2011

Category	Total Population in Nunavut (2011)		Total Aboriginal Identity Population in Nunavut (2011)	
	Number	Percentage	Number	Percentage
Total Population Aged 25 to 64	**14,280**	**100%**	**10,865**	**100%**
Skill Level A (university education)	2,090	15%	355	3%
Skill Level B (college education or apprenticeship training)	3,855	27%	2,850	26%
Skill Level C (secondary school and/or occupation-specific training)	1,770	12%	1,270	12%
Skill Level D (on-the-job training is usually provided)	6,565	46%	6,390	59%

Source: (Statistics Canada 2013h, 2013g)
Note: The following NHS categories were included within each NOC code: Skill Level A – "University certificate or diploma below bachelor level" and "University certificate or degree at or above bachelor level"; Skill Level B – "Apprenticeship or trades certificate or diploma" and "College, CEGEP and non-university certificate or diploma"; Skill Level C – "High school certificate or equivalent"; Skill Level D – "No certificate, diploma or degree".

The education profile of the Kitikmeot Region, by skill level using the NOC coding system (see Table 3.2-8) is as follows:

- 50% of the total population of the Kitikmeot Region or 59% of the Aboriginal population has no high school diploma or equivalent.
- 11% of the total population or only 2% of the Aboriginal population has a university degree.

- 28% of total population in the Kitikmeot Region has a college education or apprenticeship training and 10% has a secondary school or occupation-specific training; these proportions are comparable to those for the Aboriginal population.

Table 3.2-8. Population by Skill Level, Kitikmeot Region, 2011

Category	Total Population in Kitikmeot Region (2011)		Total Aboriginal identity Population in Kitikmeot Region (2011)	
	Number	Percentage	Number	Percentage
Total Population Aged 25 to 64	**2,545**	**100%**	**2,130**	**100%**
Skill Level A (university education)	285	11%	50	2%
Skill Level B (college education or apprenticeship training)	725	28%	605	28%
Skill Level C (secondary school and/or occupation-specific training)	260	10%	215	10%
Skill Level D (on-the-job training is usually provided)	1,275	50%	1,260	59%

Source: (Statistics Canada 2013f, 2013c)
Note: The following NHS categories were included within each NOC code: Skill Level A – "University certificate or diploma below bachelor level" and "University certificate or degree at or above bachelor level"; Skill Level B – "Apprenticeship or trades certificate or diploma" and "College, CEGEP and non-university certificate or diploma"; Skill Level C – "High school certificate or equivalent"; Skill Level D – "No certificate, diploma or degree".

The Kitikmeot, compared to Nunavut in general, has a slightly higher proportion of those with a college education or apprenticeship training, but lower representation of those with a university degree, secondary school or occupation-specific training (Table 3.2-7 and 3.2-8). These statistics confirm the low levels of educational attainment in Nunavut and the Kitikmeot Region, and point to a potential talent gap.

Barriers to taking advantage of resource developments include lack of skilled workers and low rates of post-secondary education and training (E. Cameron and C. Gabel 2015). It has been also reported that students lack the science and math skills required to pass trades entrance exams and that there are few post-secondary options available locally. However, although there is a struggle to gain academic and trades credentials, community members often obtain skills in professions such as mechanics, carpenters, electricians, and other trades as a result of learning from family or other mentors (E. Cameron and C. Gabel 2015).

Residents with a higher level of educational attainment tend to have higher rates of employment (Tables 3.2-9 and 3.2-10). Due to the low skill base of Nunavummiut, residents with a university degree realise a full rate of employment (100%). Those who do not have a high school diploma or equivalent face higher rates of unemployment: 22% for total population, 21% for Aboriginal population. Further, the Aboriginal population with a high school diploma or equivalent is less likely to be employed full-time, and more likely to be employed part-time or unemployed compared to the total population.

Based on similarities in distribution of residents by skill level in Tables 3.2-7 for Nunavut and 3.2-8 for the Kitikmeot, the distribution of employed full-time and part-time, and unemployed by skill level presented for Nunavut in Tables 3.2-9 (total population) and 3.2-10 (Aboriginal population) is assumed to be similar for the Kitikmeot Region. This leads to the estimation of the unutilized (unemployed) labour force by skill level for Nunavut and the Kitikmeot (Table 3.2-11).

Table 3.2-9. Distribution of Employed Full-time and Part-time, and Unemployed by Skill Level, Nunavut, 2011 – Total Population (aged 25 to 64)

Category	Full-time Employment	Part-time Employment	Unemployed
Skill Level A (university education)	100%	0%	0%
Skill Level B (college education or apprenticeship training)	85%	9%	6%
Skill Level C (secondary school and/or occupation-specific training)	82%	6%	12%
Skill Level D (on-the-job training is usually provided)	67%	11%	22%

Source: Statistics Canada (2016)
Note: The size of the unutilized (unemployed) and partly-utilized (employed part-time) labour force in Nunavut and the Kitikmeot is estimated using data provided by Statistics Canada, Beyond 20/20 (Statistics Canada 2016). The data provides the number of unemployed, and the number of employed part-time and full-time by educational attainment levels in Nunavut. The data is available for 2007 to 2015 for the total population. For consistency, 2011 is used as a reference year.

Table 3.2-10. Distribution of Employed Full-time and Part-time, and Unemployed by Skill Level, Nunavut, 2011 – Aboriginal Population (aged 25 to 64)

Category	Full-time Employment	Part-time Employment	Unemployed
Skill Level A (university education)	100%	0%	0%
Skill Level B (college education or apprenticeship training)	86%	5%	10%
Skill Level C (secondary school and/or occupation-specific training)	75%	8%	17%
Skill Level D (on-the-job training is usually provided)	67%	12%	21%

Source: Statistics Canada (2016)
Note: The size of the unutilized (unemployed) and partly-utilized (employed part-time) labour force in Nunavut and the Kitikmeot is estimated using data provided by Statistics Canada, Beyond 20/20 (Statistics Canada 2016). The data provides the number of unemployed, and the number of employed part-time and full-time by educational attainment levels in Nunavut. The data is available for 2007 to 2015 for the total Aboriginal population. For consistency, 2011 is used as a reference year.

As shown, there is no unutilized labour force in Nunavut or Kitikmeot at Skill Level A (university education). At Skill Level B (college education or apprenticeship training) there is more unutilized labour, for both Nunavut and the Kitikmeot, than at Skill Level C (secondary school and/or occupation specific training). This is believed to be mainly due to the labour pool at Skill Level B being more than double the size of that at Skill Level C for Nunavut, and nearly three times the size for the Kitikmeot.

In total, based on 2011 data for Nunavut, there are 1,843 unutilized Aboriginal workers and, correspondingly, 223 unutilized non-Aboriginal workers (Table 3.2-11). For the Kitikmeot, there are 363 unutilized Aboriginal workers; this leaves 22 unutilized non-Aboriginal workers (Table 3.2-11). These estimates, based on the 2011 labour market characteristics, represent the size of the potential labour pool from which the Project can draw workers.

Table 3.2-11. Estimation of Unutilized Labour, 2011

Category	Total Population		Aboriginal Identity	
	Nunavut	Kitikmeot	Nunavut	Kitikmeot
Skill Level A (university education)	0	0	0	0
Skill Level B (college education or apprenticeship training)	386	73	285	61
Skill Level C (secondary school and/or occupation-specific training)	301	44	216	37
Skill Level D (on-the-job training is usually provided)	1,379	268	1,342	265

To update the 2011 estimates using more recent data, 2015 labour force estimates are available for Nunavut, the Kitikmeot Region, and its communities. Population estimates for 2015 indicate that Nunavut had 17,598 residents 25 to 64 years of age; of that there were 3,039 residents age 25 to 64 in the Kitikmeot Region (NBS 2016c). This represents a growth of 22% for Nunavut and 18% for the Kitikmeot in the size of the labour force over 2011 estimates (Statistics Canada 2012f, 2012c). By applying estimates for 2011 for the distribution of residents by educational attainment, and the distribution of the unutilized labour force for Nunavut, the Kitikmeot and its communities, to the labour force estimates for 2015, the levels of the unutilized labour force are approximated for 2015 (Table 3.2-12). Approximated estimates for communities in the Kitikmeot Region are also based on the distribution of unemployed for the Kitikmeot Region, and the respective unemployment rates for each community in 2011 as more recent unemployment rates are not available.

As shown in Table 3.2-12, Kugluktuk and Gjoa Haven have the most unutilized workers at the Skill Level B, C and D, with other communities having similar distribution of unutilized labour force.

Table 3.2-12. Estimation of Unutilized Labour, 2015

Category	Nunavut	Kitikmeot	Cambridge Bay	Kugluktuk	Gjoa Haven	Taloyoak	Kugaaruk
Total Population (age 25 to 64)	**17,598**	**3,039**	**820**	**744**	**630**	**431**	**414**
Skill Level A	0	0	0	0	0	0	0
Skill Level B	476	144	21	42	39	21	21
Skill Level C	371	87	13	25	23	13	13
Skill Level D	1,699	529	77	154	143	78	77

3.2.3.6 Business Opportunities

There is a heavy dependency on the public sector as a result of the harsh climate, geographic remoteness, small population, and underdeveloped infrastructure systems that have led to serious constraints for private sector economic development in the territory. Cambridge Bay is the largest and most diversified economy and is the business hub for the Kitikmeot Region, with an economy that is fairly balanced across the sectors (J. MacEachern, pers. comm.; Statistics Canada 2013d).

The construction industry is prominent within Nunavut communities and has been supported by opportunities afforded by government spending on housing and infrastructure. There is at least one construction firm in each of the Kitikmeot communities whose services typically include housing and building construction, heavy equipment operation and excavation, road construction and maintenance, pad construction, and crushing to provide aggregate, as well as the rental of trucks, tools, and equipment (B. Schoenauer, pers. comm.). These privately owned businesses provide a relatively large number of private sector jobs, particularly during the summer construction season (J. Oleekatalik, pers. comm.).

Other construction includes public housing units or other types of government-owned buildings (e.g., cultural centre, Elders centre, recreation centre, hamlet government building). The annual construction of public housing, GN staff housing, and other staff housing in the Kitikmeot Region generates work and business for manufacturers from outside the territory and also the privately-owned local construction companies (Government of Canada 2012). Though not typical, the construction of private homes and facilities occurs occasionally.

Co-operatives are a popular business model in Nunavut. Each Kitikmeot community has a co-operative (co-op) retail store that sells food, clothing, and a broad range of household items. With the exception

of Kugaaruk, communities also have a competing Northern Store. Co-operatives operate the Inns North hotel chain and also hold a number of other contracts for providing services in the community. Recently, the co-op retail store (Arctic Co-operative Limited) has established an agreement with the First Nations Bank of Canada to provide banking services in three Nunavut communities, including Kugluktuk (First Nations Bank of Canada 2015).

Mining service businesses have developed in Cambridge Bay, including medical and safety services, expediting and logistical services, site management, catering, and janitorial services. The mining sector has also influenced economic conditions in the other Kitikmeot communities, including Kugluktuk which is near to the Diavik and EKATI operations in the NWT and Kugaaruk that has been a hub for local exploration companies such as Diamonds North and Indicator Minerals (L. Flynn, pers. comm.).

The new Canadian High Arctic Research Station (CHARS), funded by the Government of Canada, is under construction and is expected to promote private sector development and business opportunities in Cambridge Bay (The Municipality of Cambridge Bay 2015). The $142.4 million project is expected to be operational in 2017. Polar Knowledge Canada, a newly created federal organization will operate the facility with a mandate for advancing Canada's knowledge of the Arctic and strengthening Canadian leadership in polar science and technology (Government of Canada 2015b). Once operational, CHARS is expected to have 35 full-time and 50 part-time staff, be a year-round, multi-disciplinary facility located close to the centre of Cambridge Bay (The Municipality of Cambridge Bay 2015).

Directions for Regional Economic Development

Community Economic Development plans provide a vision for economic development and guide local efforts to support economic growth. There are a number of investment support programs offered by the GN to encourage the development of local business. The Nunavut Department of Economic Development and Transportation (NDEDT) provides funding to small business, individuals, organizations, and municipal governments. The four main funding programs include:

- Community Tourism and Cultural Industries Program – strengthens community infrastructure and readiness for tourism, and enhances economic development in sectors such as music, digital media, writing, and performing arts.
- Small Business Support Program – funding for up-and-coming small businesses, community organizations, and individuals to support growth. Funding is provided for small businesses, entrepreneur development and sustainable livelihoods.
- Strategic Investment Program – funding for expansion or start-up costs for businesses that are majority owned by Nunavut residents including financial support for training, marketing, and community development for community governments, not-for-profit corporations, and societies.
- Community Capacity Building Program – operational funding for business development centers and other organizations delivering programs on behalf of the NDEDT. Additional financial support for the employment and training of a Community Economic Development Officer and the preparation of a community economic development plan to increase the capacity of hamlets to promote local economic development.

Other business development support for Nunavut-based businesses is available from the Nunavut Business Credit Corporation (NBCC) which provides venture debt financing with a focus on small and medium-sized enterprises (SMEs) (Nunavut Business Credit Corporation 2015). The Atuqtuarvik Corporation, an Inuit investment company that also offers debt equity financing to viable Inuit businesses (e.g., start-ups, acquisitions, expansions; Atuqtuarvik Corporation 2015).

The 100% Inuit-owned Kitikmeot Corporation is the economic development arm of the KIA and is tasked with the development of business opportunities and economic development in the Kitikmeot. The Kitikmeot Corporation contributes to employment opportunities by developing profitable businesses, for example in mining and exploration, technology, travel services, property and insurance. Joint ventures include, for example, Kitikmeot Caterers, Kitnuna Corporation, Medic North Nunavut, Nuna Group of Companies, Nunami Stantec, Nunavut Sealink and Supply, PolarNet, and Toromont Arctic Caterpillar (Kitikmeot Corporation 2015a).

Challenges to Business Growth

Regional challenges to economic development within the Kitikmeot Region relate to the capacity of the labour force, existing transportation and other infrastructure, and access to capital. Relatively low levels of education and training within the labour force hinder economic development (S. Novak, pers. comm.). There is strong competition for skilled labour (C. Dimitruk, pers. comm.). Transportation can also be a substantial challenge (C. Hogaluk, pers. comm.). The cost of air travel is relatively high and schedules can be affected by poor weather (L. Flynn, pers. comm.). Communities must rely on one sealift delivery a year, which can compete with the transportation demands of industry potentially resulting in delivery delays (C. Dimitruk, pers. comm.). Supplies are also shipped by barge (e.g., dry goods, construction materials, and fuel) but this is limited to the summer months.

A lack of infrastructure is a continuing hindrance to business growth. This includes both a lack of housing for employees, as well as a lack of building space for the location of businesses. A number of hamlets are interested in establishing an “incubation mall” or building that has a number of office and storefront spaces that can be rented by small businesses. The construction and renovation of government buildings in some communities (e.g., Taloyoak, Gjoa Haven) are providing options for use by small business. The arts and crafts sector has been identified as a priority and requires work space for artists as well as a place to sell products (C. Dickson, pers. comm.).

Other challenges for business growth include access to funding for business start-ups, expansions, and capital purchases. However, there are a number of government services and programs available to provide grants and loans. Nevertheless, local businesses have difficulties raising the personal equity component required for funding (J. MacEachern, pers. comm.).

Operators of existing businesses or those wishing to establish new businesses in the LSA and the RSA often encounter barriers (E. Cameron, and C. Gabel 2015). Some of the challenges to developing a viable local business include high start-up costs, lack of local financing options, lack of financial training including financial management skills, lack of enforcement of local-purchasing regulations, and difficulty in competing with non-local businesses (E. Cameron, and C. Gabel 2015). Development of mining operations is, however, seen as a potential economic benefit to local businesses that supply goods and services to the region, not only through the potential business contracts obtained from the development but also through an increased disposable income of residents that is essential in supporting local businesses (E. Cameron, and C. Gabel 2015).

Kitikmeot Qualified Businesses & Registered Inuit Firms

Through the Hope Bay IIBA, TMAC has established a listing of businesses that are pre-qualified for work with the Project to promote and maximizing opportunities generated by the Hope Bay Project (KIA & TMAC 2015). Kitikmeot Qualified Businesses are Inuit owned firms that are located in the Kitikmeot Region and recognized by the KIA as a business capable of doing work for TMAC (Table 3.2-13). All other Inuit Owned Firms or entities not on the Registry are counted separately.

The Kitikmeot Qualified Business Registry includes information on the name of the business, a brief description of the basis for inclusion, a description of the goods and services, relevant experience, bondability and contact information. At the time of this report, there were 27 Kitikmeot Qualified Businesses in the initial Registry, with most located in Cambridge Bay (20), two in Taloyoak, two in Kugluktuk, and one in Gjoa Haven (Table 3.2-13). The list of businesses on the Registry will evolve and expand over time as additional businesses become qualified under the provisions of the IIBA.

Table 3.2-13. Kitikmeot Qualified Businesses as of September 2015

Business Name	Community	Comment
5136 Nunavut Ltd.	Cambridge Bay	Support services to Nunavut mining exploration sites, offering medical staff, kitchen staff, local hire training and programs
Qillaq Innovations (5140 Nunavut Ltd.)	Cambridge Bay	General contracting and retail sales of modular buildings
Angulaalik & Associates - Inuinnaqtun Language Services	Cambridge Bay	Language consulting, teaching, interpreting, and translating
Aqsaqniq Airways Ltd.	Taloyoak	Air charter services
CAP Enterprises Ltd.	Gjoa Haven	Heavy equipment, construction, goods and services
Ikakvik Kitikmeot Ltd.	Kugluktuk	Bridge design and installation
Kikiak Contracting Ltd.	Kugluktuk	Trade and services
Kitikmeot Air Ltd.	Cambridge Bay	Fixed wing aircraft charter service
Kitnuna BBE Expediting Ltd.	Cambridge Bay	Expediting and logistics
Kitikmeot Blasting Services Ltd.	Cambridge Bay	Provide explosives and explosive related services
Kitikmeot Caterers Ltd.	Cambridge Bay	Camp catering, camp management and janitorial services
Kitikmeot Cementation Mining and Development	Cambridge Bay	Underground mine development and training
Kitikmeot Cleaning Services	Cambridge Bay	Janitorial cleaning and retail
Kitnuna Corporation	Cambridge Bay	Trade and services
Kitnuna Expediting Services Ltd.	Cambridge Bay	Expediting services
Kitikmeot Helicopters Ltd.	Cambridge Bay	Helicopter contracting service
Kitnuna Pharmacy Ltd.	Cambridge Bay	Pharmacy services and medical supplies
Lyall Construction Ltd.	Taloyoak	Gravel hauling and general contracting
Medic North Nunavut Ltd.	Cambridge Bay	Emergency medical Services and medical equipment supply
Nuna West Mining Ltd.	Cambridge Bay	Site preparation & infrastructure development, construction management and site earthworks, and infrastructure
Nunavut Arctic Transportation Company	Cambridge Bay	Marine transportation industry
Nunavut Expediting Services Ltd.	Cambridge Bay	Expediting, camp building, and supply
Nunavut Resources Corporation	Cambridge Bay	Exploration finance, mine-related infrastructure development, regional infrastructure development and financing, investment banking and corporate finance advisory services
Nunavut Sealink and Supply Inc.	Iqaluit	Marine and marine transport services
QDC Logistics Ltd.	Cambridge Bay	Contractor for logistical services, aviation brokering, expediting, remote site management, camp buildings, remote site set up and maintenance
Sura Safety & Contracting Ltd.	Cambridge Bay	Safety supplies and paramedical services
Toromont Arctic Ltd.	Iqaluit	Heavy equipment services and parts

Source: KIA & TMAC (2015)

As outlined in the IIBA, Kitikmeot Qualified Business Contracts represent contracts for goods and services only open to bids from the Kitikmeot Qualified Businesses, whereas Open Contracts are for the provision of goods and services not provided by Kitikmeot Qualified Businesses. TMAC in collaboration with the KIA and other appropriate agencies will work to establish a bid preparation training program for Inuit. Contracts open only to bids from Kitikmeot Qualified Businesses will include the following categories:

- Air regional and site specific services
- Expediting
- Freight shipping
- Infrastructure planning, financing and related advisory – other than engineering, procurement and construction management services
- Catering and housekeeping
- Drilling – surface and subsurface
- Blasting services
- Earthworks and earthworks construction
- Surface mining
- Underground mining
- Environmental services
- Tire services – but not including supply of tires
- Medical and first aid
- Translation and cultural services, and
- Heavy equipment maintenance

With respect to new businesses in the territory, in 2014, there were 53 registered Inuit firms in the business registry maintained by NTI (Table 3.2-14). Eight Inuit firms were added to the registry between 2014 and 2015. Of these, four were related to mining and mine development related activities. Many businesses in the Kitikmeot Region provide mining services, including four newly registered businesses in the last year. The development of these businesses may have been supported by the Doris North Project (development at the Doris mine preceding TMAC's proposed development at Madrid and Boston sites) or by other mining projects and exploration in the region. A number of businesses provide services not explicitly related to mining but do service the mining industry. Examples include: medical and safety services, expediting and logistical services, site management, catering, and janitorial services. A number of these businesses have benefitted from business opportunities associated with the Project.

Table 3.2-14. Profile of Registered Inuit Firms in the Kitikmeot Region, 2015

Community	Type of Business	Number of Firms
Cambridge Bay	Camp catering, camp management and janitorial services	1
	Carpentry and furniture manufacturing, renovation	1
	Construction	2
	Construction, cartage, garage, property management, arcade	1
	Construction, property management, land surveying, real estate	1

Community	Type of Business	Number of Firms
	Construction, renovations, repairs, rentals	1
	Contractor for logistical services, aviation brokering, expediting, remote site management, camp buildings, remote site set up and maintenance	1
	Drilling and underground drilling	1
	Emergency medical services, medical equipment supply	1
	Expediting services	1
	Expediting and logistics	1
	Expediting, camp building and supply	1
	Exploration finance, mine-related infrastructure development and financing, investment banking and corporate finance advisory services	1
	Fixed wing aircraft charter service	1
	General contracting and retail sales of modular buildings	1
	Helicopter contracting service	1
	Janitorial cleaning and retail	1
	Language consulting, teaching, interpreting, and translating	1
	Marine transportation industry	1
	Pharmacy services, and medical supplies	1
	Plumbing, heating, and electrical	1
	Plumbing and heating	1
	Property management	1
	Provide explosives and explosive related services	1
	Real estate development	1
	Real estate investment, residential housing complex and hotel	1
	Retail, arts and crafts, souvenirs, giftware, sportswear	1
	Safety supplies and paramedical services	1
	Site preparation and infrastructure development, construction management and site earthworks and infrastructure	1
	Store, Inns North Hotel and other hotel	1
	Support services to Nunavut mining exploration sites, offering medical staff, kitchen staff, local hire training and programs	1
	Tourism lodge	1
	Trade and services	2
	Underground mine development and training	1
Gjoa Haven	Engineering, professional consulting services	1
	Heavy equipment, construction, goods and services for Gjoa Haven	1
	Hotel accommodations	1
	Outfitting and tourism	1
	Store, Inns North Hotel and other hotel, POL, post office	1
	Taxi	1
Kugaaruk	Harvest and sell Arctic char	1
	Store, Inns North Hotel and other hotel	1
Kugluktuk	Adventure tours, guide services, camp site security services, marine cargo handling, ATV/Skidoo Rentals	1
	Bridge design and installation	1
	Construction and contracting	1

Community	Type of Business	Number of Firms
	Convenience store, restaurant, taxi	1
	General contractor	1
	General office support services	1
	Retail sales of building supplies, residential furniture, recreational vehicles and outdoor equipment	1
	Store, cable TV, poll	1
	Trade and services	1
Taloyoak	Air charter services	1
	Automobiles, automobile parts and services	1
	Gravel hauling and general contracting	1
	Hotel	1
	Hotel and restaurant, cable, general contracting	1
	Retail, Inns North Hotel and other hotel, cable TV, post office	1
	Truck rental	1

Source: NTI (2015)
Note: Businesses appear same as in the registry.

Kitikmeot Region Business Development & Project Spending

The previous development and operation of the Doris North Project, and other mining activities in the region, have contributed to business development, particularly in Cambridge Bay. Many of the businesses poised to benefit from the development of the Project are likely also those that supported, and benefitted from the development of the Doris North mine. For example:

- To support the Doris North mine activities, a total of $5.6 million in contracts went to Inuit-owned businesses in 2013.
- In 2014 (January through December), TMAC awarded approximately $14.5 million in contracts to Inuit-owned businesses, or approximately 33% of the total contract spending and 2.7 times the amount awarded in 2013.
- For 2015 (January through September), TMAC contractor spend totaled $12.9 million to Kitikmeot Qualified Businesses (as defined under the new IIBA), and $4.1 million to other Inuit-owned businesses.

3.2.3.7 Community Infrastructure and Public Services

Local Accommodation

Each community in Nunavut has at least one hotel that provides accommodation and restaurant service that are often associated with or owned by the local Co-op (Table 3.2-15). Additional hotels, as well as bed and breakfast establishments, provide similar services. As shown in Table 3.2-15, the region has a total licenced capacity of 251 guests including 185 in Cambridge Bay.

Table 3.2-15. Hotels and Lodges in the Kitikmeot Region (2015)

Name	License Holder	Type of Operation	Outfitter Licence	Nunavut Based	Max Capacity
Admundsen Hotel	Qikiqtaq Co-Operative	Gjoa Haven Hotel	No	Yes	30
Arctic Islands Lodge	Ikaluktutiak Co-Operative	Cambridge Bay Hotel	No	Yes	73
Arctic Vision Bed & Breakfast	Arctic Vision Bed & Breakfast	Kugluktuk Bed & Breakfast	No	Yes	3
Boothia Inn	Aqsaqniq Ltd.	Taloyoak Hotel	No	No	16
Coppermine Inn	Coppermine Inn Ltd.	Kugluktuk Hotel	No	Yes	23
Enokhok Inn and Suites	Enokhok Developments	Kugluktuk Hotel	No	No	24
Enokhok Inn and Suites	Enokhok Developments	Cambridge Bay Hotel	No	No	21
Green Row Executive Suites	Aurizon Investments Ltd.	Cambridge Bay Hotel	No	Yes	49
Inukshuk Inn	Koomiut Co-Operative	Kugaaruk Hotel	No	Yes	12
Qillaq Lodge	5140 Nunavut Ltd. – Qillaq Innovations	Cambridge Bay Lodge	No	Yes	30
Umingmaktok Lodge B&B	Jago Services Ltd.	Cambridge Bay Hotel	No	Yes	12

Source: GN DED&T (2015a)
Notes: Other licenced Tourist Establishments in the Kitikmeot Region (e.g., outpost camps and lodges) are discussed in the Land Use Effects Assessment (Volume 6, Section 4).

Health Facilities and Services

Each community in the Kitikmeot Region has a health centre that serves as the focal point for the delivery of health care and social services. Community health centres provide access to a wide range of services to meet the health service needs of the residents, which include assessment, treatment, and prevention. Health centres are operated and staffed by the GN. Essential services are generally provided on a full-time basis by staff that live in the communities, while other services are provided at intervals by rotating health professionals through Stanton Hospital in Yellowknife (C. Evalik, pers. comm.). The Kitikmeot Region headquarters for the Nunavut Department of Health is in Cambridge Bay, with two additional offices in Kugluktuk (C. Evalik, pers. comm.).

Health care services can be broadly classified as consisting of (1) the treatment of illness or injury and (2) public health, services and programs. Health care is delivered by different community health care and social service providers that include the following:

- Community Health nurses – provide assessment and primary, direct care to patients (e.g., injury or illness).
- Community Health Representatives (CHRs) – deliver public health programs that include Well Woman, Well Child, Well Man, and Prenatal programs (M. Kayaksak, pers. comm.). Information topics include disease prevention, healthy eating, and drug and alcohol awareness, among others (R. Kamookak, pers. comm.; R. Okpik, pers. comm.).
- Home and Community Care workers – these workers serve clients who require extra care due to illness, poor health, or disability.
- Mental Health workers – provide assessment, counselling, treatment, and referrals to clients with mental health issues.

- Community Social Service workers – support the delivery of government services related to child protection, adoption, guardianship, adult support, residential care, and family violence services.

Health centres may also be staffed with a Psychiatric Nurse and/or a Dental Therapist. Filling vacant positions in many areas of health care has been a continuing struggle for the GN (GN Department of Health and Social Services 2010). Specialists visit community health centres on a rotational basis to provide services (e.g., audiology, vision, obstetrics, gynaecology, paediatrics, psychiatry, dentistry, and orthodontics; C. Evalik, pers. comm.). Nursing staff may contact on-call physicians outside of the region by phone to seek advice on the treatment of a case (T. Ennis, pers. comm.). Communities are also connected to a video teleconferencing system called Telehealth, which connects patients to physicians and specialized health professionals located in larger centres.

The Kitikmeot Health Centre in Cambridge Bay is the largest in the region and provides additional services not offered in other communities. This includes diagnostic services (i.e., medical laboratory, x-ray services, and endoscopy) and midwife services. In-patient care is also provided for both adults and children. The Kitikmeot Health Centre also serves as the training centre to provide orientation and mentorship to newly recruited community health professionals (Nunavut Department of Health and Social Services 2008).

Mental Health Facility

A mental health facility has been established in Cambridge Bay in lieu of the previously proposed residential addictions treatment center. The facility has the capacity to house 12 clients. The change in focus is linked to the Nunavut Suicide Prevention Strategy which outlines the need to improve infrastructure to provide better mental health services (Nunatsiaq News 2014b).

Community Wellness Centres and Services

Each Kitikmeot Region hamlet operates a wellness centre and administers programs aimed at promoting healthy living habits and the development of community. These programs also work closely with health care, social services, and the RCMP. Wellness programs aim to take a holistic approach to improving the health and well-being of community members. (DHSS 2006). Community wellness centres have coordinated the implementation of a number of programs, including:

- Pre-natal care – instruction in nutrition, cooking, sewing, and the use of country foods.
- Aboriginal Head Start – the pre-school program developed by the Government of Canada (Public Health Agency of Canada 2011) that focuses on early intervention for education, health, culture and language, nutrition, social support, and includes parental involvement.
- Children – food and education services as well as arts and crafts, story time, and moms and tots drop-in sessions.
- Youth – structured activities, such as sports, games, and movie nights at the youth centre.
- Elders – this program typically involves group activities at an Elders' Palace (a centre for Elders) and the operation of Health Foods North (food delivery to the home).
- Family violence – this initiative includes emergency shelter services for women and children and the delivery of support programs.
- Alcohol, gambling, and drug additions – programs consist of counselling services and public education and awareness campaign, which may include Alcoholics Anonymous and Alateen (i.e., a weekly discussion group for teens with abuse in the family due to alcohol abuse).

Nunavut has a territorial wellness coordinator that oversees wellness programming and community coordinators (or regional wellness program coordinators). As of 2011, two of the five Kitikmeot communities (Kugluktuk and Kugaaruk) had developed Community Wellness Plans as part of a pilot project funded by Health Canada (NTI 2011).

The hamlet of Cambridge Bay has operated a Wellness Center for over 25 years and provides numerous programs and services that fill the gap in locally available social services. The Wellness Centers mandate is to assist people in becoming independent, healthy, and safe (The Municipality of Cambridge Bay 2015).

Elder Care Services

Elder care services in the Kitikmeot are limited to a nine-bed facility in Gjoa Haven. Other community-level Elder care is provided by home care workers and through the individual hamlet wellness programs.

Emergency Shelters

Emergency housing is available in Cambridge Bay and Kugluktuk (Nunatsiaq News 2014a). The Crisis Shelter in Cambridge Bay which operates in partnership with the Community Wellness Center provides shelter to women and children (Cambridge Bay Community Wellness Center n.d.). Different forms of emergency housing have existed in the other Kitikmeot communities over time.

Recreation Programs and Facilities

Recreation in the communities is funded by hamlets and overseen by coordinators responsible for the delivery of programs and management of facilities (i.e., ice arena, community hall). Program availability varies by community and is based on local demand, infrastructure, and funding. Recreation programs focus on youth (S. Krug, pers. comm.) and include regular events such as ice hockey, curling, bingo, and weekend dances. Special events may include hockey tournaments, Christmas games, Arctic games, volleyball, cribbage tournaments, community feasts, and fishing derbies, as well as Canada Day and Nunavut Day celebrations (R. Tucktoo, pers. comm.).

Communications, Utilities, and Waste Management

Water and sewer services are provided by the hamlet and include water delivery and sewage pump-out by truck. In addition, Cambridge Bay has piped water supply to a number of buildings (Municipality of Cambridge Bay 2015). The GN owned Qulliq Energy Corporation (QEC) provides electricity to all communities in Nunavut. QEC generates and distributes power to all 25 Nunavut communities through the operation of 25 standalone diesel plants. Within the Kitikmeot, electrical and line maintenance is provided from Cambridge Bay (QEC 2014).

Communication services in the Kitikmeot Region include internet and phone services. Both are provided via satellite. High-speed internet services are available through Qiniq, Netkaster, and NorthwesTel. Qiniq is an Inuit-owned service provider offering wireless broadband internet via satellite in 25 Nunavut communities. In July 2015, the federal government announced that $35 million will be made available for Qiniq to double internet download speeds and make upgrades to the satellite-based internet service in Nunavut (CBC News North 2015c).

Emergency Response

Each community health centre provides medical emergency response. Emergency transportation is provided by the RCMP or personal vehicles with the exception of Cambridge Bay which has a hamlet-

operated ambulance service. There is an RCMP detachment and a volunteer fire department in each community.

Medical Evacuation

Patients with emergencies that cannot be addressed by the level of treatment available at community health centres are medically evacuated, typically to Stanton Territorial Hospital in Yellowknife, NWT. Non-emergency cases requiring a full-service hospital or medical specialists are also transported out of the community to Stanton Territorial Hospital (C. Evalik, pers. comm.). Transported cases include those needing access to specialized medical expertise for neurology, dermatology, rheumatology, oncology, orthopaedics, and urology, among others (T. Ennis, pers. comm.).

Search and Rescue

Other emergency services available in the Kitikmeot Region include search and rescue in the event that a person does not return from a trip on the land. The majority Inuit-owned business Kitikmeot helicopters, which is based in Cambridge Bay, provides search and rescue services in partnership with Great Slave Helicopters (Kitikmeot/Gleat Slave Helicopters 2015). Search and rescue services in the Kitikmeot are also provided by the Canadian Helicopters company (Kitikmeot Corporation 2015b) as well as the RCMP and Canadian Rangers (CBC News North 2015b).

Fire Protection

A volunteer fire department provides fire protection services in each community. Each hamlet has basic fire-fighting equipment.

Law Enforcement and Crime Prevention

RCMP in each community provides policing services including: law enforcement, criminal investigation, crime prevention, the swearing of legal documents, driver licencing, and community justice. The RCMP also assist Social Services and Mental Health Services, and provide first response and patient transport to the health centre, as required (J. Atkinson, pers. comm. P. Bouchard, pers. comm.; C. Gauthier, pers. comm.).

RCMP staffing varies by the size of the community and the local service demand. At a minimum, RCMP policy requires stationing at least two officers in each community. Emergencies that require specialized policing services or additional officers typically utilize RCMP staff stationed in Iqaluit or Yellowknife (J. Atkinson, pers. comm.). RCMP officers also participate in the Junior Rangers Program and assist municipal Bylaw Enforcement Officers (J. Atkinson, pers. comm.; L. Sharbell, pers. comm.). Basic equipment available to RCMP includes trucks, ATVs, and snowmobiles, and some detachments have a boat (J. Atkinson, pers. comm.).

Paramedic

Professional ambulance or paramedic services are not available in most of the Kitikmeot communities. Cambridge Bay, however, has an ambulance service that is staffed by volunteers. Ground transportation for trauma patients and emergencies may be undertaken by patients, assisted by the nursing staff, the RCMP or others (R. Joseph, pers. comm.; L. Sharbell, pers. comm.).

Regional Transportation and Shipping

Barges (the sealift) deliver annual provisions to communities during the ice-free period. The sealift includes food, household items, construction supplies, heavy equipment, and fuel, among other supplies that are needed throughout the year. The shipping ports that service the region include Hay River and Inuvik, NWT, and Ste-Catherine, Quebec. In past years, shipping ports have also included

Becancour and Valleyfield, Quebec. Most communities in Nunavut obtain sealift re-supply services directly from private carriers, except for the station at Eureka on Ellesmere Island and Kugaaruk, whose sealift resupply is first delivered to Nanisivik by Nunavut Sealift and Supply Inc. (NSSI) or Nunavut Eastern Arctic Shipping (NEAS) and then delivered to their final destination by the Canadian Coast Guard (Gregoire 2014). With the exception of Kugaaruk, the Kitikmeot communities receive barge service from the Northern Transportation Company Ltd. (NTCL) or NSSI annually (NSSI 2015; NTCL 2015a).

The 2014 sealift delivery by the Canadian Coast Guard from Nanisivik to Kugaaruk was disrupted by heavy ice between the usual anchorage location and the beach which did not allow cargo to be lightered by barge. Some cargo was transferred by the onboard helicopter, but three-quarters of the total cargo to supply Kugaaruk for the year could not be landed and was returned south to Churchill to be remarshalled in 2015. This was the first time since 1994, when the Canadian Coast Guide began providing service to Kugaaruk, that the delivery was not possible (Department of Community and Government Services 2015). In 2015, NSSI delivered directly to Kugaaruk for the first time (A. Buchanon, *pers. comm.*).

The 2015 delivery schedules for NSSI, NTCL, and NEAS do not include a schedule service to Bathurst Inlet and Omingmaktok , although NTCL has retained a pricing schedule for both (NEAS 2015; NSSI 2015; NTCL 2015b).

All Kitikmeot communities with the exception of Bathurst Inlet and Omingmaktok are accessible by scheduled air travel provided by First Air and Canadian North. Air travel is used for cargo deliveries as well as passenger travel. All communities are also serviced by chartered air travel by a number of companies based in Yellowknife and Edmonton. Other types of traffic include marine vessel and ATV in the summer months and snowmobile during winter months. Cruise ships also operate in the area especially through the renowned Northwest Passage.

3.2.3.8 Housing

Housing circumstances and costs in Nunavut differ from those that typify most of Canada. In Nunavut, the most common type of housing tenure is public, government subsidized housing (approximately 51%) which provides shelter for approximately 60% of the population (NHC 2014c). Private housing accounted for less than a quarter of units in the Kitikmeot Region in 2011 (Statistics Canada 2012a). A third type of housing tenure in Nunavut is subsidized staff housing, commonly provided for GN employees, teachers, nurses, and others who relocate from southern Canada and elsewhere. Staff housing and private market rental units form less substantial proportions of available housing in the communities.

The Nunavut Housing Corporation (NHC) is mandated to create, coordinate, and administer housing programs and provide fair access to a range of affordable housing options for families in Nunavut (NHC 2014d). The NHC administers public and GN staff housing units through local housing organizations (LHOs) that are located in each community in Nunavut. The annual budget of the LHOs in the Kitikmeot was approximately $7 million for 2015 (Table 3.2-16).

New public housing construction in the Kitikmeot communities will help address the housing need (J. Kaiyogana, pers. comm.). However, available funding for public housing falls short of the demand and, based on the current trends, construction continues to fall further behind the increasing need of a growing population. Specifically, NHC estimates that 3,580 new housing units are required across the territory to meet current needs (Bell 2015). Notably in 2013, Inuit Tapiriit Kanatami (ITK) estimated Nunavut was in need of 3,300 houses to address the current housing shortage and an additional 250 units annually thereafter (Inuit Tapiriit Kanatami 2014).

Table 3.2-16. Kitikmeot District LHO Operating Budgets (2015 to 2016)

Community	Operating Budget
Cambridge Bay	$1,407,852
Kugluktuk	$1,735,881
Gjoa Haven	$1,423,712
Taloyoak	$1,395,215
Kugaaruk	$1,092,664
Kitikmeot Total	$7,055,324

Source: Conroy (2015)

Housing Stock

The availability of suitable and affordable housing is an important issue for all Kitikmeot communities and "the overcrowding of housing is a clear non-medical health indicator for Inuit" (Inuit Tapiriit Kanatami 2007, 2014). The shortage and overcrowding of housing in Nunavut and throughout the Kitikmeot Region has broad implications for health and well-being and has been linked to family violence, depression, stress, and a higher incidence of infectious diseases (Inuit Tapiriit Kanatami 2007; NTI 2008; Inuit Tapiriit Kanatami 2014). Overcrowded conditions can lead to greater conflict and family violence, more substance abuse, a greater incidence of disease (e.g., respiratory illnesses), and mental health issues (S. Bucknor, pers. comm.; T. Ennis, pers. comm.). Winter further exacerbates these issues when individuals are confined indoors.

Recent census data also highlights overcrowded conditions in the Kitikmeot Region. In the eastern Kitikmeot communities of Gjoa Haven, Taloyoak, and Kugaaruk, more than 50% of households have four or more persons per household while approximately 20% of households have two-or-more family households (Statistics Canada 2012a). Approximately 46% of households in Kugluktuk and 38% of households in Cambridge Bay have four or more persons per household (Statistics Canada 2012a). The extent to which dwellings that house four people represents overcrowding is dependent on the number of bedrooms per household (data unavailable). Overall, there are more households in the Kitikmeot Region with four or more persons (52%) compared to the territorial average (47%), and there is also a higher percentage of two-or-more family households (13%) as compared to the territorial average (10%; Statistics Canada 2012a).

Total dwelling counts in the Kitikmeot Region range from approximately 170 in Kugaaruk to 540 in Cambridge Bay (Statistics Canada 2012e). The vast majority of these are occupied by residents with only 4 to 17% either occupied by temporary residents or unoccupied. The most common types of dwellings are single detached houses (59%) and row houses with three or more units (28%). The majority of dwellings are rented—approximately three out of every four dwellings across the region. Rented housing includes public housing, government staff housing (GN and Government of Canada), non-government employer-provided staff housing, and private market rental units. Public housing units are subsidized rented dwellings managed by the NHC and are available to Nunavummiut who meet eligibility requirements. Private market rental units are owned by private individuals, corporations, or other organizations and are made available on the rental market (Nunavut Bureau of Statistics 2011).

Public Housing Need

Census and NHS data suggest that overcrowding is more prevalent in the eastern Kitikmeot Region; however, NHCs needs-based allocation methodology determined that housing needs were greatest in Cambridge Bay, Gjoa Haven and Kugluktuk, each of which ranked as having some of the highest housing need in the territory in January 2013 (fourth, eighth, and tenth, respectively; NHC 2014a).

There is currently a shortage of public housing with relatively large waitlists. Recently, NHC has adopted a new approach to the development of housing in the territory that targets the construction of the maximum number of housing units, rather than the construction of some housing in every community. The previous allocation system created inefficiencies, as some of the highest costs of construction are those associated with the mobilization of labour and supplies. By reducing the number of construction sites, the number of units built is increased, and overall cost-per-unit is decreased (NHC 2014a).

The new approach is supported by a needs-based allocation methodology that accounts for community population and the capacity of community infrastructure and systems (e.g., land, power, water, sewage) to absorb the increased pressure from new units. The density and size of a unit (e.g., number of bedrooms) as well as the number of individuals on the housing waitlist are also considered. The new methodology was first used to rank each community and allocate a 2013/2014 federal housing investment of $100 million.

The assessment resulted in the allocation of 10 new housing units each in Cambridge Bay and Taloyoak as well as 20 units in Kugluktuk (Table 3.2-17; (NHC 2014a). Following the initial assessment, and 2013 ranking, an additional 40 units were allocated for construction in the Kitikmeot Region (2013 allocation; Table 3.2-17). Despite the allocation of new units, the January 2014 housing needs assessment determined that three communities in the Kitikmeot Region remained among those with the greatest housing need in in the Territory (Cambridge Bay, Gjoa Haven, and Kugluktuk).

Table 3.2-17. Public Housing and Housing Need in the Kitikmeot Region (2013/2014)

	January 2013			2013 Allocation		January 2014		
	Public Housing Units	Public Housing Waitlist	NHC Rank	Units Allocated	Revised NHC Rank	Public Housing Units	Public Housing Waitlist	NHC Rank
Cambridge Bay	256	63	11	10	13	266	72	6
Kugluktuk	271	83	6	20	7	291	71	10
Gjoa Haven	204	35	20	0	20	204	50	8
Taloyoak	180	45	10	10	18	190	29	21
Kugaaruk	126	25	17	0	14	126	26	16

Source: NHC (2014a)

Table 3.2-18 indicates the number of public housing units constructed in the Kitikmeot Region in 2013, 2014 and 2015. The units allocated in 2013 (Table 3.2-17) are reflected in Table 3.2-18 as public housing constructed. Following the federal investment of $100 million, the GN contributed $11.455 million for public housing based on the 2014 reassessment of need (NHC 2014a).

Table 3.2-18. Public Housing Constructed in the Kitikmeot Region

	Public Housing Units Constructed		
	2013	2014	2015
Cambridge Bay	0	0	10
Kugluktuk	0	0	20
Gjoa Haven	8	0	10
Taloyoak	0	0	0
Kugaaruk	0	0	15
Total	8	0	55

Source: Conroy (2015)

Public housing units include staff housing that is either owned by or leased to the GN as well as NHC public housing (Table 3.2-19). Despite the number of new public housing units constructed (55) in the Kitikmeot Region in 2015, the number of approved applicants on community waitlists (Table 3.2-19) has grown likely as potential tenants have since been encouraged to come forward and complete applications for housing to determine eligibility.

Table 3.2-19. Public Housing in the Kitikmeot Region (2015)

	Public Housing				Wait List for Public Housing (August 2015)
	Public Housing Units	Public GN Staff Housing (Owned)	Public GN Staff Housing (Leased)	Total NHC Housing Units	
Cambridge Bay	266	40	47	353	90
Kugluktuk	291	24	15	330	83
Gjoa Haven	212	15	15	242	49
Taloyoak	189	10	3	202	89
Kugaaruk	126	6	4	136	73
Total	1,084	95	84	1,263	384

Source: Conroy (2015)

The NHC has also implemented changes to the Public Housing Rent Scale (PHRS) to support individuals in retaining employment and gradually reducing their reliance on public housing. In the past, individuals receiving income support and the public housing subsidy, whose employment status changed from unemployed to employed, experienced an extreme rent increase. The increase was so substantial that it acted as a disincentive to employment and led people to quit their jobs in favour of income support and the public housing subsidy, in order to remain in their homes (NHC 2014b).

The new system aims to enable tenants to accumulate wealth, while gradually increasing the rent (or decreasing the public housing subsidy) in a manageable manner that supports individuals in retaining and advancing their employment (NHC 2014b). Changes to the PHRS include:

- rent will only be assessed on the income of the unit's two primary leaseholders;
- rent increases will be limited to 25% of the new rent assessed per year until the rent assessed total is reached for tenants that obtain new employment or receive a pay increase (rather than an immediate and total loss of subsidy once a tenant became employed); and
- tenants who obtain employment or pay increases will not be asked to pay a higher rent based on their new income until September 1st of the following year (NHC 2014b).

Additionally, the income of full-time students and individuals attending pre-trades and trade course, and other academic upgrading, will continue to be exempt from rental assessments. In Nunavut, there are 20,000 public housing tenants and over 5,000 public housing units. At the territorial level there are only 69 households with rent assessments greater than $1,500 per month and only 39 households with a combined household income greater than $120,000 per year. These changes to the PHRS are anticipated to increase the proportion of public housing tenants paying $60 per month to 76% and to create a revenue loss of $2.4 million in rental assessments in the first year. However, should 500 people (2.5% of public housing tenants) no longer require income support following the first year of the new program, the losses would be recovered (NHC 2014b).

3.2.3.9 Health and Community Well-being

Health Status

Disease, Life Expectancy, & Perceptions of Health

A number of indicators contribute to a holistic understanding of community health and well-being. For residents of Nunavut, this information is available at the territorial level. In 2013, Nunavummiut were less likely to perceive their overall health condition as very good or excellent as compared to Canadians at 43% and 60%, respectively. The proportion of Nunavummiut who perceive their overall health as very good or excellent is also decreasing (e.g., from 46% in 2010), while the comparable statistic for Canadians remains unchanged (Statistics Canada 2013i).

Nunavummiut experience lower rates of arthritis, diabetes, asthma, and high blood pressure; however, more Nunavummiut are overweight and obese, and have a higher incidence of cancer in comparison to national averages. The incidence of lung cancer (206.8 per 100,000) is particularly high at approximately four times the national average (56.9 per 100,000). Correspondingly, the rate of death due to respiratory disease in Nunavut is more than four times the national average.

Life expectancy is also much shorter for Nunavummiut in comparison to other Canadians (Statistics Canada 2013i). On average, Nunavummiut have a life expectancy of 71.6 years at birth and 15.2 years at age 65 (2007/2009 average). These values are strikingly lower than the Canadian average life expectancies for the same period (i.e., approximately 81.1 years at birth and 20.2 years at age 65). The lifespan for Nunavut males is almost 10 years shorter than the lifespan for the average Canadian male at birth and almost five years shorter at age 65. It has been estimated that Inuit have the lowest life expectancy among all of Canada's Aboriginal groups; in fact, Inuit currently have a life expectancy of an average Canadian in the 1940s (Spicer 2008). Comparisons of the two-year averages indicate that, for Nunavummiut, life expectancy at birth is not only lower than that of other Canadians, but life expectancy at birth is decreasing over time. In contrast, Canadian residents continue to experience small gains in life expectancy at birth. Lastly, although Nunavut residents have experienced greater gains in life expectancy at age 65 over time, Canadians continue to live longer (Statistics Canada 2013j).

The health status of all Inuit in Inuit Nunangat (which includes Nunavik in northern Quebec, Nunatsiavut in Northern Labrador, Nunavut, and the Inuvialuit Region of the Northwest Territories) is poorer in comparison to national averages. For example, research indicates there are:

- higher rates of chronic illness and infectious disease among Inuit infants and children;
- remarkably high tuberculosis rates for Inuit in Canada (262/100,000, compared to 0.7/100,00 for the non-Aboriginal population); and
- the highest rates of smoking in Canada (54% of adults are daily smokers) including 56% of Inuit women who are pregnant (Inuit Tapiriit Kanatami 2014).

High-risk behaviours such as alcohol abuse and smoking are known coping mechanisms connected to underlying socio-economic inequalities and issues associated with the legacy of colonialism. While there are direct health consequences associated with these behaviours (e.g., cancers), there are also indirect consequences (e.g., domestic violence) that fundamentally effect individual and community well-being. As a result, the social inequities that underpin these behaviours are key factors determining Inuit health and well-being (Inuit Tapiriit Kanatami 2014).

Infant Mortality & Birth Weight

Within Canada, adverse early child health outcomes (e.g., infant mortality, congenital anomalies, prematurity, and low birth weight) are highest in Nunavut (Collins 2012). In 2007, Nunavut's infant mortality rate was nearly three times that of Canada. In 2013, Nunavut's infant mortality rate remained more than double the national average (12% in comparison to 5%). A study conducted in 2012[15] concluded that sudden infant death syndrome (SIDS[16]; 21%), sudden unexpected death in infancy (SUDI[17]; 27%), and infections (21%) were the leading causes of infant death in Nunavut. Combined, SIDS and SUDI comprised the majority of infant mortality cases (48%). Of the SIDS/SUDI cases, sleep position and bed-sharing were major contributing factors (Collins 2012). While there have been specific years (1996 and 2007) during which Nunavut and Canada's infant mortality rates were comparable, the rate for Nunavut was approximately three times the Canadian average between 2006 and 2009.

In the case of infection as a cause of infant death, approximately two thirds of deaths were caused by respiratory infections while the remaining third were related to influenza. Cause specific mortality rates[18] and respiratory infections were higher in the Kitikmeot Region compared to the Kivalliq and Qikiqtaaluk regions. Infants in Nunavut also had the highest reported rate of hospitalization for lower respiratory tract infections worldwide. Some risk factors for respiratory infections and hospital admissions in Nunavut include prematurity, tobacco smoke exposure (prenatal and postnatal), overcrowding, and poor ventilation. Education strategies to promote safe sleeping practices and further understanding of infant mortality are underway (Collins 2012).

The proportion of low birth weight babies is also typically higher in Nunavut compared to Canada (Statistics Canada 2013i) and is a contributing factor in SIDS/SUDI cases (Collins 2012). Birth weight is another indication of the general health and well-being status of the population. The proportion of babies born in Nunavut with low birth weight has effectively remained unchanged between 2006 and 2010. Although the percentage of low birth weight babies born in Nunavut and in Canada has both increased and decreased over time, the percentage of low birth weight babies in Nunavut (7.6%) was higher than the Canadian average (6.20%) in 2013 (Statistics Canada 2013a).

The Social Determinants of Health

Well-being is a broad concept that approximates the overall wellness or quality of life in communities based on the complex interactions between existing social, economic, and cultural conditions. Research and reporting on the social determinants of Inuit health was conducted by Inuit Tapiriit Kanatami (ITK) in 2007 based on consultation that occurred between 2003 and 2004 and health statistics available at that time. Further research conducted to update these results in 2013 indicates that factors contributing to Inuit health and well-being include: the quality of early childhood development, culture and language, livelihoods, income distribution, housing, personal safety and security, education, food security, availability of health services, mental wellness, and the environment (Inuit Tapiriit Kanatami 2014).

[15] Conducted by the University of British Columbia, University of Victoria, the GN Department of Justice, GN Department of Health and Social Services, University of Manitoba, and NTI.
[16] SIDS is a diagnosis of exclusion where the cause of death remains unexplained after investigation including autopsy, examination of death scene, and review of clinical history.
[17] SUDI is a broader category that includes unexpected infants deaths with other risk factors present, such as an illness or risk factors for asphyxia.
[18] Cause specific mortality rates are defined by the World Health Organization (WHO) as "the mortality rate due to a specific disease or phenomena".

Health Centers, Services, and Capacity

Kitikmeot Region health centers provide a wide range of services available. Programs offered through the centres include the Canadian Pre-natal Program, chronic disease clinic, well women clinic, well man clinic, and well child clinic. Generally, all programs are well attended with the exception of the well man clinics. There is one health center in each Kitikmeot community.

The Nunavut Bureau of Statistics provides data describing the number of health center visits by community. Data is available from 2003 to 2014. Regionally, there were 43,722 visits to health centres in the Kitikmeot Region in 2014, which represents the highest number of health centre visits over the past decade at 6.6 visits per capita (regionally). Within the communities, Taloyoak had the highest number of health centre visits in 2014 at 8.3 visits per capita, followed by Cambridge Bay, Kugaaruk, and Kugluktuk, each with 6.4 visits per capita. Gjoa Haven had the lowest number of visits to the health centre per capita at 6.1. The main or typical reasons for visits to the health centres include: for sick clinic, prenatal care, well clinic, and/or chronic diseases (NBS 2016a).

The discussion of well-being as it relates to women's health is informed by a description of health services capacity (an overview of facilities and services is provided in Section 3.2.4.7). While there are a number of woman's health issues in the region, the challenges associated with giving birth are well documented. Typically in Nunavut and in many other northern jurisdictions in Canada, pregnant women must travel to a full-service medical facility in the south approximately four weeks prior to giving birth. The new Birthing Program at the Kitikmeot Health Centre in Cambridge Bay allows women with low-risk pregnancies to give birth with the assistance of a midwife (C. Evalik, pers. comm.). Obstetrical cases continue to be directed to either Stanton Territorial Hospital in Yellowknife or the University of Alberta Hospital in Edmonton (CIHI 2013).

Limited housing options hinder the ability of the Kitikmeot Health Centre to provide midwifery services to residents of other communities. Some expectant mothers may be reluctant to leave the community and prefer to remain near their families; as a result, many births still occur at health centres. However if expectant mothers must travel at all, they elect to continue their travel on to Yellowknife where they're able to access a greater variety of less expensive baby-related items (T. Ennis, pers. comm.; R. Joseph, pers. comm.).

All high-risk pregnancies are typically flown out of the community at 36 weeks (R. Joseph, pers. comm.). Conditions that result in the classification of a pregnancy as high-risk vary and include: age (under 17 or over 35), alcohol and/or drug use, smoking, diabetes, asthma, and cancer, as well as others. Statistics Canada reports that the proportion of Nunavut mothers giving birth outside the territory increased between 2007 and 2011 (i.e., from 40 to 47%; Statistics Canada 2013b).

Community Well-being Index

Community well-being (CWB) is a broad concept that approximates the overall wellness or quality of life based on the complex interactions between existing social, economic, and cultural conditions. Indigenous and Northern Affairs Canada (INAC) calculates an index of community well-being based on four components: education, labour force, income, and housing. While additional components contribute to overall well-being, these four components provide a reasonable estimate of well-being given what is known about the existing conditions and current data gaps. The community well-being scores can be used to compare well-being, at least as measured by the index, across Aboriginal and other Canadian communities and over time (INAC 2010).

INAC has measured and calculated community well-being scores for Inuit, First Nations, and non-Aboriginal communities, over a 30 year period (including 1981, 1991, 1996, 2001, 2006, and 2011).

While the CWB scores for Nunavut's communities have steadily increased over the past 30 years, the gap between Aboriginal and non-Aboriginal communities remains largely unchanged.

For 2011, the most recent data available, Nunavut had an overall community well-being index score of 61, the lowest of all the Canadian provinces and territories, and a decrease from 65.1 in 2006. Communities in the Kitikmeot Region also ranked low on the community well-being index. In 2006, Taloyoak, Kugaaruk, and Gjoa Haven scored very low (53, 55, and 56, respectively). Kugluktuk scored near the average for Nunavut as a whole, while Cambridge Bay fared somewhat better at 73, although still below the scores of other Canadian provinces and territories.

With the exception of Taloyoak, the CWB scores dropped in each of the Kitikmeot communities between 2006 and 2011 (i.e., by one point in each Cambridge Bay and Gjoa Haven, two points in Kugluktuk, and four points in Kugaaruk). Taloyoak is the exception as the only community in the Kitikmeot Region with an increased CWB score (53 in 2006 to 54 in 2011). Despite the overall decreases, the 2011 CWB scores in Cambridge Bay and Kugluktuk (73 and 65, respectively) exceeded the territorial average of 61. CWB scores in Gjoa Haven, Taloyoak, and Kugaaruk remained lower than the territorial average, at 55, 54, and 51, respectively.

A review of trends in the well-being of Inuit in Canada concluded that, on average, Inuit community well-being scores were 15 points lower than non-Aboriginal communities in 2006. In 2011, Inuit community well-being scores were 16 points lower. In 2006, there were 34 Inuit communities among the "bottom 500" Canadian communities, and no Inuit communities ranked among the "top 500" Canadian communities. Of the four components analyzed, the largest gap between Inuit and non-Aboriginal communities was in housing. Over the past 30 years, the gap between the CWB scores for Inuit and non-Aboriginal communities narrowed for both the income and education components; however, labour force activity scores varied and remained only slightly higher (four points) in 2011 than in 1981 (Statistics Canada 2015a; AANDC n.d.). This infers that while Inuit income levels and educational attainment now more closely resemble that of the non-Aboriginal population, similar gains have not been seen for the Inuit labour force (that is, the labour force circumstances of Inuit in 2011 have not substantially improved since 1981).

Acculturation

Prior to the 1950s, most Inuit lived on the land in extended family groups following the migration of wildlife across the Arctic. During this time men and women had very specific roles as hunters and care-givers that were tied to the land and linked to a way of life based on survival in harsh climatic conditions. During the 1950s, the Canadian government actively encouraged Inuit to settle in permanent communities and provided low-cost housing, medical facilities, and other modern services. The transition from subsistence to modern ways of living have radically disrupted Inuit social and environmental relationships and is recognized as contributing to social marginalization, stress, and a higher incidence of suicide (Inuit Tapiriit Kanatami 2014). For example, traditional gender roles were informed by the activities required to meet daily needs for food and shelter. Once those needs were met through a different means, gender roles shifted.

The roles of elders in Inuit communities are reported to have changed with the introduction of schools, peer groups, and southern media. Traditionally, within a family group an elder would provide direction as to how to deal with specific challenges, and elders were held as the ultimate authority. The introduction of numerous other 'authorities' has been linked to alcohol and drug use by teenagers (and others) who are, in many ways, torn between two worlds (Inuit Tapiriit Kanatami 2014).

While traditional land use activities persist, the transition from a traditional subsistence-based economy to a mixed traditional/wage economy has resulted in both beneficial and adverse outcomes. Residential schools created disconnect between traditional familial, communal, and socio-cultural relationships and disrupted the inter-generational exchange of knowledge, cultural values, parenting skills, and language which form the basis of Inuit identity. The legacy of residential school system is often cited as the source of 'community trauma' that continues to affect Inuit health and mental well-being today (Inuit Tapiriit Kanatami 2014).

Finally, acculturation, rapid cultural change, and the residential schools legacy have produced a number of serious and obvious stressors in everyday life. These stressors are harmful whether experienced personally or through indirect exposure (e.g., as a witness to the behaviour) and are linked to higher incidence of suicide. Stressors include: exposure to or experience of physical abuse, sexual abuse, or substance abuse, suicide of a friend(s) or family member(s), a sense of alienation, hopelessness, and mental health issues such as depression. These factors can create overwhelming stress and undermine the ability of an individual to cope with stress (Henderson 2003).

Country Foods

Country foods are an important foundation within Inuit culture that link and perpetuate traditional harvesting activities, social and familial relationships, as well as sharing and informal networks. The 2006 Aboriginal Peoples Survey (Statistics Canada 2008) included a review of country foods and harvesting within Inuit Nunaat, or the "Inuit homeland" which includes the Inuit of Nunatsiavut, Nunavik, Nunavut, and Inuvialuit. For the majority of Nunavut residents (66%), at least half of the meat and fish they consume is obtained through traditional harvesting methods. An additional 38% report that more than half of the meat and fish consumed is obtain through harvesting activities (as compared to the amount that is purchased in stores).

In 2006, over two-thirds of Nunavummiut harvested country foods in the previous year. A higher portion of males participated in harvesting (74%) than females (59%). The portion of the population harvesting country food was slightly lower for those aged 15 to 24, but remained relatively stable for both males and females. The 2006 Aboriginal Peoples Survey also reported that approximately 57% of Nunavut children ages 6 to 14 ate wild meat, caribou, walrus, and/or muktuk three or more days per week (Inuit Qaujisarvingat Knowedge Centre n.d.).

Although food subsidy programs such as Nutrition North and Food Mail aim to provide an affordable healthy diet for Inuit, the composition of this diet is quite different from the foods Inuit have traditionally consumed. Fruit and vegetables thought to be an essential part of healthy diet are not naturally available in Nunavut and must be flown into the community at costs that are often not affordable to the majority of consumers. The length of time to transport fresh food to the north usually results in short shelf lives and less appealing produce than is available from in the south (National Aboriginal Health Organization 2004). The appropriateness of a traditional diet is characterized by the following:

> *When one eats meat, it warms your body very quickly. But when one eats fruit or other imported food, it doesn't help you keep very warm. With imported food… you're warm just a short period of time. But [our] meat is different; it keeps you warm. It doesn't matter if it's raw meat or frozen meat… it has the same effect* (Freeman et al. 1998).

There has been a recent focus on the issue of food security in Nunavut (Statistics Canada 2010; De Schutter 2012; Northern Public Affairs 2012). In the recent roundtable discussion "Issues and Ideas for Change," Kitikmeot residents described hunger, poverty, food security, nutrition, and access to country foods as key issues (Nunavut Roundtable for Poverty Reduction 2011).

The International Polar Year Inuit Child Health Survey (Egeland 2010) was conducted by the Qanuippitali Steering Committee and McGill University and included participants from each of Nunavut's 25 communities. The goal of the survey was to obtain an overview of the health status and living conditions of Nunavummiut. The study concluded that food insecurity is a problem in Nunavut homes. The survey indicated that 35.1% of homes were severely food insecure (defined as disrupted eating patterns and reduced food intake among adults and/or children), and another 35.1% of homes were moderately food insecure. Homes with children were more likely to be food insecure than homes without children. Specifically, the survey indicated that 38.4% of homes with children were severely food insecure and another 33.0% were moderately food insecure (Egeland 2010). This suggests that over two-thirds of Nunavummiut homes with children struggle with food security.

The Canadian Community Health Survey 2007/2008 reported that Canada's national average for food insecurity was approximately 7.8%. In comparison, Nunavut's rate of food insecurity at 31.9% was more than four times the national average (Statistics Canada 2010).

The Cost of Food and Household Items

In the Kitikmeot Region, food is subsidized as part of the Food Mail Program and is shipped from Yellowknife. Through INAC's program called the Northern Food Basket (now called the Revised Northern Food Basket [RNFB]) Program, food price surveys were conducted in the region between 2005 and 2009. The program estimates the cost of a typical basket of groceries and other household items for a family of four by comparing similar products and brands in a northern community to the cost of the same products in the most appropriate southern communities. In 2008, surveys were conducted in March and September in Edmonton, Yellowknife, Gjoa Haven, and Kugaaruk to account for any seasonal variation in food prices.

Overall, the cost of food is increasing in both northern and southern communities. However, the cost difference between southern centres and the Kitikmeot communities is substantial. A year later, in 2009, the weekly cost of the RNFB in Taloyoak was almost double the cost in Yellowknife. Although Cambridge Bay had the lowest RNFB cost in the Kitikmeot in 2009, the weekly cost of food and household items remained almost $200 higher than Yellowknife and $171 higher than Edmonton. For Kitikmeot families (of four people) calculating a monthly household budget, this equates to anywhere between an additional $680 and $800 per month.

The RNFB program is now overseen by Nutrition North, a subsidy program that launched in early 2011 that works with northern stores and southern food suppliers to help ensure Northerners have access to affordable nutritious foods. Data reporting the cost of the RNFB in 2013-2014 estimates the cost to feed a family of four a healthy diet for one week. While weekly food costs in the Kitikmeot[19] Region remain high ranging from $425 to $461 (in 2014), notable decreases in cost occurred between March 2011 and March 2014. This decrease followed the implementation of the Nutrition North Program. The largest decrease in cost occurred in Kugluktuk (-14% or $69) and the smallest in Cambridge Bay (-6% or $27). Despite the progress made by Nutrition North, annual fluctuations continue to be evident as weekly food costs increased slightly in Cambridge Bay and Gjoa Haven (approximately 1%) between March 2013 and 2014 (Government of Canada 2015a).

Financial Management Programs

Career Development Officers (CDOs) are available in Cambridge Bay and Kugluktuk. CDOs provide group employment workshops focused on enhancing the skills of job seekers. One component of the group

[19] Data is unavailable for Kugaaruk.

employment workshop focuses on personal finances and budgeting. Other topics include life skills, job search skills, interview skills and childcare options (GN Family Services 2015; Nunavut Community Information Database 2015).

Social Assistance Recipients

More than half of the population of the Kitikmeot Region received social assistance 2013 (52.7%; the most recent year for which data is available), representing a regional increase of 9.4% over the previous year. Increases in the number of social assistance recipients (between 2012 and 2013) ranged from 4.0% in Kugaaruk to 9.2% in Gjoa Haven, with the exception of Cambridge Bay which saw an increase of 23.6% (or about 100 residents). At the community level, social assistance recipients comprise about 68% of the population in each Gjoa Haven and Taloyoak, 62% in Kugaaruk, 49% in Kugluktuk, and 32% in Cambridge Bay (NBS 2016d).

Mental Health and Suicide

Suicide is a multifaceted issue in Nunavut with high rates attributed to recent and rapidly occurring social change. ITK reports that "suicide is a demonstrative sign of socio-economic distress and a strong manifestation of social exclusion" (Inuit Tapiriit Kanatami 2014). High suicide rates have led to a general sense of discontinuity and a loss of self-reliance among Nunavummiut. The GN has identified the following factors contributing to risk of suicide:

- personal characteristics of depression, deficits in problem-solving skills, and substance abuse;
- situational factors of living in a troubled family, physical or sexual abuse, loss of a parent or caregiver, and exposure to suicidal acts of family or friends;
- social network, including loss of relationships, isolation, and inter-personal problems; and
- socio-cultural factors of poverty, social disorganization, and loss of tradition.

Factors reducing suicide risk include having a stable home life, being educated, being employed, and receiving mental health care as required (GN et al. 2010).

The number of deaths by suicide and the degree of suicide-related trauma are higher in Nunavut than in other Canadian jurisdictions. In 2009, the RCMP responded to approximately 983 calls where persons were threatening or attempting suicide in Nunavut (GN et al. 2010). In a recent survey, 43.6% of respondents reported suicide ideation (i.e., thoughts of committing suicide) over the course of a week and 30% reported attempting suicide over a six-month period, 16% on multiple occasions. Suicide-related deaths are highest among young Inuit males (GN et al. 2010). Suicide in Nunavut peaked in 2013, with 45 deaths, and decreased to 27 in 2014 (Contenta 2015).

Suicides in Nunavut (per 100,000) remained more than three times the Canadian average, and seven times higher than the province with the least suicides (i.e., Ontario) between 2009 and 2011 (Conference Board of Canada 2015). The proportion of Nunavummiut reporting very good or excellent mental health was the lowest in Canada at 57% (Statistics Canada 2013j), much lower than the Canadian average of 72%. Despite these higher rates, between 2009 and 2011 , there has been a downward trend in suicides in Nunavut (Conference Board of Canada 2015).

In response to the need to more effectively address suicide in Nunavut communities, the GN, NTI, the Embrace Life Council, and the RCMP worked together to develop the Nunavut Suicide Prevention Strategy (2010) and Implementation Plan (2011). The Plan included specific actions as well as a timeline for implementation that extended to March 2014 (Government of Nunavut 2010). Subsequently, a one-year extension was announced in March, 2014 by the partners of the Nunavut

Suicide Prevention Strategy. The extension aimed to allow for the review and evaluation of implemented activities (Embrace Life Council 2014).

As follow-up to the Nunavut Suicide Prevention Action Plan (2011), a literature review characterized the risk factors and protective mechanisms associated with suicide. In brief, the report concluded:

- Child sexual abuse is a demonstrated risk factor for suicidal behaviour;
- There is little evidence to demonstrate that specific documentation of child sexual abuse practices are related to healing outcomes;
- Children whose parents have experienced trauma are at a higher risk for suicidality;
- There is little evidence to demonstrate peer counselling is effective at reducing risk behaviour or promoting healthy behaviour; and
- Cannabis use is linked to suicidal ideation, suicide attempts, and completed suicides (Snelling 2013).

Primary research was also conducted in relation to each of the identified themes, and reinforced these conclusions.

In the latter half of 2015, an inquest into Nunavut's high rate of suicide was held. Each partner tasked with the development and implementation of Nunavut's Suicide Prevention Strategy (GN, NTI, the Embrace Life Council, and the RCMP) testified at the inquest, as contribution toward a final recommendation of how future deaths by suicide can be prevented (Skura 2015).

Crime

From 2001 to 2013 across the Kitikmeot Region, crime rates decreased slightly. Notable is the regional decline in violent crime between 2009 and 2013, following a steady increase from 2001 to 2009. The regional rate of non-violent crime has also decreased over this time period, despite slight increases in Taloyoak and Kugaaruk. Rates of both violent and non-violent crime in Kugaaruk rose above those reported in 2001.

For other violations (i.e., mischief, bail violations, disturbing the peace, arson, and offensive weapons) and federal statute violations including drug-related offenses, Cambridge Bay and Kugluktuk have the highest crime rates from 2001 to 2013. In particular, Kugluktuk had relatively high rates of other violations[20] from 2003 through 2006 and in 2013 has surpassed rates of other violations and federal statute violations in Cambridge Bay. In other communities, trends in crime rates are less evident showing substantial fluctuations over time.

Despite population increases in all communities, the total number of criminal violations steadily declined in Cambridge Bay, Gjoa Haven, and Taloyoak between 2009 and 2013. In Kugluktuk, there was a notable decrease in theft from 109 to 46 incidences, but a rise in disturbance of the peace from 41 to 132 incidences. In contrast, the total number of violations in Kugaaruk increased for all crimes. The most common types of criminal violations are mischief, assault, and disturbing the peace in each of the

[20] Other violations include criminal code offences that are not classified as violent or property crime incidents (excluding traffic). Examples include mischief, bail violations, disturbing the peace, arson, prostitution, and offensive weapons. Prior to 2009, other violations included sexual offences against children, forcible confinement or kidnapping, extortion, uttering threats, threatening or harassing phone calls.

Kitikmeot communities, with the exception of Kugaaruk where the most common violations were mischief, assault, and administration of justice[21] (NBS 2014a).

The number of calls for service is also an important indicator of demand on policing services in each community, as a call for service may not necessarily result in a police-reported incidence of crime. For each community in the Kitikmeot Region, the number of calls for service has increased between 2010 and 2012, most notably in Kugaaruk where the number of calls for police services has increased by approximately 186% over the two years. This may be related to an increase in police presence in the community (Statistics Canada 2015b).

Community Justice

Community justice is also an important feature of the social landscape in Nunavut. It is based on the practice of restorative justice, meaning the development of a healing relationship with the community, reintegration and mediation. The responsibilities of the Community Justice Division, Nunavut Department of Justice, include: diversions[22], crime prevention, family mediation, victim services, and administration of the *Family Abuse Intervention Act (2006)* (Community Justice Division 2011). IQ serves as the guiding principle of community justice, including:

- inuuqatigiitsiarniq (respecting others, relationships, and caring for people);
- tunnganarniq (fostering good spirit by being open, welcoming, and inclusive);
- pijitsirniq (serving and providing for families and communities); and
- qanuqtuurniq (being innovative and resourceful).

Within each community, there is a Community Justice Committee and, except where there are position vacancies, a Community Justice Outreach Worker. Committees are made up of a diversity of people from the community, including elders. For diversion clients, the Community Justice Committee meets to assess cases and to prescribe the necessary restorative measures. The mandate of the Community Justice Committee also includes crime prevention, community awareness, and advocacy (Community Justice Division 2011).

The Ilavut Healing Centre in Kugluktuk opened in 2005 and provides a culturally based approach to healing low risk offenders. The centre's aim is to reconnect inmates with Inuit traditions and societal values. The minimum-security centre has the capacity to hold 15 inmates and stresses healing and community integration much like a halfway house. In 2013-2014, the average occupancy was eight inmates (Auditor General of Canada 2015).

There are five correctional outpost camps in Nunavut with two to four beds each that provide criminal offenders with the opportunity to connect with Inuit heritage and culture by learning land skills, usually from an elder. All five renewed three year contracts in 2013 (Rohner 2014). The correctional outpost camps are run as small private businesses by a family living on the land that is willing to invite offenders into their homes.

[21] Violations that are classified as administration of justice include failure to comply with an order to appear, escape or helps to escape from lawful custody, prisoner unlawfully at large, breach of probation, and other violations (NBS 2014).
[22] Diversions are programs in the criminal justice system that allow the RCMP to refer an offender to a Community Justice Committee that works with the offender, the family, and victim to 'make things right'. In the Kitikmeot, community justice often includes a method of family group conferencing (Department of Justice, 2015).

"They'll build a qamutiq and during the qamutiq building they'll talk about family issues, about how they came to be where they are, how the Inuit population came to be where they are. It's traditional counselling and learning on the land" (Rohner 2014).

3.2.3.10 Community Readiness Initiatives

The Canadian Northern Economic Development Agency (CanNor) is currently funding community-based research aimed to enhance the ability of northerners to benefit from resource and other development. Funds are focused to enable communities to take a more active role in managing and benefiting from the impacts of resource development. Research to establish joint implementation plans that advance community readiness activities ahead of resource development projects, combine co-operative governance and the gathering of community-based evidence.

As part of regional community readiness, the KIA signed an MOU with the CanNor with respect to cooperation for the coordination and management of major projects in the Kitikmeot Region in November 2012. The MOU is a mutual understanding of cooperation and confirms the parties mutual interest in supporting responsible resource and regional infrastructure development, working collaboratively to facilitate the effective and transparent environmental assessment/impact review and regulatory permitting of projects, and optimizing opportunities to advance economic development for Kitikmeot Inuit, as related to major projects (CanNor & KIA 2012).

The first Community Readiness Initiative (CRI) project in the Kitikmeot was based in Kugluktuk and began in 2014. Envisioned as a community-driven initiative, work commenced with a feast, community-wide survey, focus groups, and requests for community members to identify changes they would like to see in their community. The CRI process has recently begun in Cambridge Bay.

The Kugluktuk Community Readiness Plan and recommendations were finalized in November 2015. The work was based on an assessment of the socio-economic community needs prior to mine development. The CRI team sought to document how Kugluktuk residents thought resource development in the Kitikmeot region may impact their community and to assist with planning for the potential benefits and impacts (Cameron and Gabel 2015). The final CRI recommendations focused on issues and challenges for which there is potential for community-level action to address to improve well-being.

The CRI resulted in four recommendations (Cameron and Gabel 2015):

- First, address the mental health challenges faced by individuals and families: strengthen the professional mental health services available and strengthen the range of community-based activities that can support individual, family, and community wellness.
- Second, invest in the well-being of children: there is recognition that children that have a good start in life are those who mature into happy and successful adults.
- Third, focus on employability in general and developing a critical mass of well-educated people: in mining as well as all other sectors (as opposed to a focus on developing skills specific to the mining sector).
- Forth, ensure access to and well-being of the land and wildlife: the land is not only a source of county food but is central to mental health and wellness, culture and language, the development of skills and judgement, and the building and maintenance of relationships.

Mental health was a top priority for Kugluktukmiut in preparation for major resource development and was the highlighted as the primary recommendation of the CRI. Actions to contribute to improved

mental wellness included obtaining funding for several new mental health workers as well as support for the development of community-based, culturally-relevant health and wellness programs.

Other priority recommendations included support for a process to provide criminal record suppression to those who are eligible. The CRI report indicates that having a criminal record is linked to poverty, poor infrastructure, and housing conditions and is also a deterrent to participation in training and seeking employment. At present, obtaining criminal record suppression is incredibly challenging due to the cost of and inadequate access to legal services. The KIA has a program in place to assist beneficiaries in pursuing criminal record suppression; however, there is only one lawyer available for the region and many people are not aware of the program. Efforts to build awareness around this issue may be hugely beneficial for those who are eligible for criminal record suppression and otherwise qualified for employment.

The final CRI priority recommendation is to provide workshops to increase financial literacy and money management skills. A strong majority of Kugluktukmiut (84%) who contributed to the CRI process felt they would benefit from learning more about how to manage money.

3.2.3.11 Summary

Governance in the Kitikmeot communities is provided by hamlets which are typically responsible for public works, water and sewer, waste management, fire protection, wellness, recreation, and economic development. Hamlet governments also lead community planning with the assistance of the GN.

There has been immense population growth in the Kitikmeot communities over the past 30 years. The transition to community life and the wage economy has, in many ways, altered the structure of Inuit society and daily life. The Kitikmeot Region has a median age of 23.0 years, which is slightly lower than Nunavut's median age of 24.1 years and much younger than the Canadian median age of 40.6 years (Statistics Canada 2012a). A high proportion of the population in the Kitikmeot communities is Aboriginal, primarily Inuit. In 2011, approximately 81% of Cambridge Bay residents self-identified as Aboriginal. This proportion was higher in all the other Kitikmeot communities, with 91% or more identifying as Aboriginal. The Kitikmeot communities tend to have a slightly higher proportion of males as compared to females. Within the Kitikmeot communities, there is a notable difference in family structure as compared to the general Canadian population. This difference is seen in the lower proportion of married couples in the Kitikmeot Region (48.3%) as compared to Canada (80.1%). In 2011, the majority of Taloyoak and Kugaaruk residents reported an Inuit language as their mother tongue, while in Gjoa Haven and the western Kitikmeot communities, the majority of residents reported English as their mother tongue.

Formal education levels are low in the Kitikmeot communities when compared to Canadian averages. The proportion of the population with formal education is slightly higher in Cambridge Bay but is still well below the Canadian average. However, given the fairly recent introduction of western-style education (within the last 50 years), the evolving transition to the wage economy, and current economic conditions within communities, lower than average high school completion rates are expected. Current economic conditions have led to a disconnect between education and employment, leaving some residents to prefer an early transition to wage-labour, where possible, or other pursuits such as family. Over time, the number of high school graduates has varied but generally increased and is expected to continue in this direction.

The Kitikmeot communities have high rates of unemployment among men and women. In 2011, the potential labour force in the region was approximately 3,925 people with an active labour force of 2,410 people, indicating a 61.4% participation rate, which is lower than the Nunavut average of 63.4%

(Statistics Canada 2012d). In Kitikmeot communities, unemployment rates are also higher than the Nunavut average of 18% as well as the national average of 8%. The exception is Cambridge Bay with an unemployment rate of 14%. One-quarter of the Kitikmeot Region labour force were estimated to be unemployed in 2011 resulting in the highest unemployment rate within the territory (25%). In comparison, the Qikiqtaaluk (15%) and Kivalliq (20%) regions more closely reflect the territorial rate (18%; Statistics Canada 2007, 2011).

Overall, the Kitikmeot economy is characterized as mixed and is focused across three major sectors – public, private, and traditional. The public sector dominates and acts as a major economic driver for local communities. Cambridge Bay has a more diversified economy than the other communities, and is increasingly expanding into the private sector. Regional economic development is constrained by a lack of skilled labour, lack of infrastructure, and difficulties with transportation and distance from outside markets.

In Cambridge Bay, individual and household income are typically higher and employment-based (derived in greater proportions from employment) as compared to the other Kitikmeot communities. The proportion of income from government transfers in other Kitikmeot communities is typically higher than the Nunavut average. On the whole, the Kitikmeot Region has the lowest earnings compared with the other regions in Nunavut (Statistics Canada 2012d).

As evidenced by typical health indicators, such as infant mortality and life expectancy, the health status of Kitikmeot residents requires further improvement to be on par with that of the general Canadian population. Despite the relatively small populations, there are a wide range of health services and programs available in Kitikmeot communities. Although Cambridge Bay is the only community that provides full-time physician services, visiting doctors see patients in the other communities on a rotational basis. With respect to community health within Kitikmeot communities, relatively high suicide rates are a concern. This has been attributed to recent rapid social change, resulting in a loss of self-reliance and a sense of discontinuity (GN et al. 2010).

General community well-being, as described by INAC's CWB index, varied within Kitikmeot communities. Cambridge Bay and Kugluktuk scored higher (73, 65) than the Nunavut average (61), while Gjoa Haven, Taloyoak, and Kugaaruk scored exceptionally low (55, 54, and 51, respectively). Crime and housing conditions contribute to lower community health and well-being. Crime rates among Kitikmeot communities are highest in Cambridge Bay, Kugluktuk, and Gjoa Haven. Kugaaruk typically has low crime rates in relation to other Kitikmeot communities.

Public housing is the most common type of tenure, and dependence on the public sector for housing is likely to continue given severe economic, climatic, and geographic constraints on private sector involvement. Although housing challenges exist in all Kitikmeot communities, the NHC's new allocation methodology and federal funding have and continue to progress new home construction to alleviate overcrowding conditions in public housing units.

Nunavut's GDP experienced an overall increase of approximately 25% between 2010 and 2014. A strong increase of 11.5% between 2012 and 2013 was followed by a smaller, but similarly strong increase of 6.2% between 2013 and 2014. Overall, GDP growth in Canada's three territories was highest in Nunavut over this time period (Statistics Canada 2015d).

Nunavut imports almost three times as much as it exports, with virtually all exports and imports coming from or ending in other Canadian provinces. Overall, between 2008 and 2013, there was a significant increase in exports of 327% and a slight decrease in imports of less than one percent (Nunavut Bureau of Statistics 2014e).

In Nunavut, the final consumption expenditure, or the total of public and private consumption, increased by approximately 5% between 2008 and 2013. This routinely included approximately 65% government consumption and 33% household consumption (Nunavut Bureau of Statistics 2014e). Cambridge Bay has a more diversified economy than the other communities, and continues to expand into the private sector. The traditional subsistence economy is important to livelihoods in the Kitikmeot Region and is based on Inuit culture. Harvesting activities underpin the social fabric of communities and perpetuate traditional forms of social relationships and networks among Inuit.

With respect to health within Kitikmeot communities, persistent high suicide rates are a major concern. Recent rapid social change resulting in a loss of self-reliance and a sense of discontinuity are important factors in triggering suicides (Government of Nunavut 2010). Maintaining cultural knowledge, education, language, activities, and values are of high importance in Kitikmeot communities. There are two main Inuit languages within the region – Inuinnaqtun and Inuktitut. Although English is most often spoken at home, traditional languages are still spoken in some households most commonly in Gjoa Haven, Taloyoak, and Kugaaruk. Elders' camps and other education activities are organized for youth, allowing them to learn about Inuit cultural and traditional practices through direct involvement.

Communities in the Kitikmeot are preparing for mining and other future developments anticipated to support local economies and provide much needed employment. The measures taken to prepare for development may vary by community but are likely to focus on education and training and establishing means through which projects proponents can enhance the ability of local communities to benefit from mining development within the region.

3.3 VALUED COMPONENTS

3.3.1 Potential Valued Components and Scoping

Valued Socio-economic Components (VSECs) are those components of the human environment considered to be of scientific, ecological, economic, social, cultural, or heritage importance (Volume 2, Section 4). The selection and scoping of VSECs considers socio-economic conditions and trends that may interact with the proposed Project, variability in socio-economic conditions over time, and data availability as well as the ability to measure socio-economic conditions that may interact with the Project and are important to the communities potentially impacted by the Project.

3.3.1.1 The Scoping Process and Identification of VSECs

The scoping of VSECs follows the process outlined in the Assessment Methodology (Volume 2, Section 4). VSECs considered for inclusion in the socio-economic effects assessment relate to the local economy, businesses, and employment; education; infrastructure and services; demographics; and health and wellbeing (NIRB 2012b).

The EIS guidelines (NIRB 2012b) propose a number of VSECs to be considered for inclusion in the socio-economic effects assessment:

- Economic development opportunities;
- Contracting and business opportunities;
- Employment;
- Education and training;
- Population demographics;

- Health and well-being;
  - Individual and community wellness;
  - Family and community cohesion; and
  - Crime
- Community infrastructure and public service, including housing; and
- Health and safety including worker and public safety.

The identified VSECs represent an appropriate starting point to guide the identification and scoping of VSECs (NIRB 2012b). The selection of VSECs began with those proposed in the EIS guidelines and was further informed through consultation with communities, regulatory agencies, available TK, professional expertise, the CRI reports, and the NIRB's final scoping report (Appendix B of the EIS Guidelines). For an interaction to occur there must be spatial and temporal overlap between a VSEC and Project component and/or activities. The determination of VSECs and potential effects for inclusion in this effects assessment considered and was informed by:

- Community-level research conducted for the Project including interviews with local service providers;
- The Cambridge Bay and Kugluktuk Community Readiness Initiative Reports (Cameron and Gabel 2015) [REFERENCE TO CAMBRIDGE BAY REPORT TO BE ADDED WHEN AVAILABLE]
- Review of recently completed Nunavut EAs (e.g., Back River, Meliadine);
- The Hope Bay Project Inuit Impact and Benefit Agreement (IIBA; (KIA and TMAC 2015);
- Consultation and engagement with local and regional Inuit groups (for example, the KIA);
- The Environmental Impact Statement (EIS) guidelines and appendices (NIRB 2012b); and
- The public, during public consultation and open house meetings held in the Kitikmeot communities in May, 2016 (see Volume 2, Section 3, Public Consultation).

Other key data sources that have provided context to inform the selection of VSECs and effects to be assessed include the Hope Bay Baseline Report (Rescan 2012), the Draft Nunavut Land Use Plan (NPC 2014), the NIRB reference and guidance documents (NIRB 2013b, 2013c, 2013d), and the KIA TK Report (Banci and Spicker 2012). Topics discussed during community meetings, focus groups, interviews, and other meetings with the KIA and relevant government bodies were integrated within specific VSECs for further examination in the assessment process.

The content and results of other EIS chapters were reviewed to inform the selection of VSECs and effects including Public Consultation (Volume 3, Section 2), Government Engagement (Volume 2, Section 3), Human Health Risk Assessment (Volume 6, Section 5), and the Land Use Effects Assessment (Volume 6, Section 4). Specific chapters and sections of these volumes are referenced, where appropriate.

The selection of VSECs was also informed by community research, specifically interviews with hamlet officials, business owners, and numerous health, education, housing, and social service providers in the Kitikmeot, who highlighted the importance of community wellness and the need for employment.

3.3.1.2 NIRB Scoping Sessions

Scoping sessions hosted by NIRB (NIRB 2012c) with key stakeholders and local community members (i.e., the public) focused on identifying the components that are important to local residents, as related to the Project. Comments made during these sessions were compiled and analysed as part of VSEC scoping. Notably, many remarks related to the human environment linked to the socio-economics centered on the desire for employment tempered with the need to minimize adverse effects to the environment and community wellness.

Comments indicated a desire for: employment at the mine, specific barriers to mine employment (e.g., criminal record checks), job shadowing, ongoing training in local communities, financial planning guidance for youth, and benefits to the eastern Kitikmeot communities. An increased presence of drugs and alcohol in the communities (brought in by company contractors) was also a concern. Other comments described a concern regarding Nunavut's capacity to provide enough people to staff the high number of currently proposed projects and whether it was possible to spread Projects out over time (NIRB 2012c).

3.3.1.3 TMAC Consultation and Engagement Informing VSEC Selection

Community meetings for the Hope Bay Project were conducted in each of the five Kitikmeot communities between May 2nd and 6th, 2016. The meetings are a central component of engagement with the public and an opportunity to share information and seek public feedback. Overall, the community meetings were well attended, attracting a total of 144 attendees. Public feedback (questions, comments, and concerns) about the proposed Project was obtained through open dialogue during Project presentations, through discussions that arose during the presentation of Project materials (e.g., information brochure, storyboards, and maps), and comments provided in feedback forms. One common topic of discussion in each of the five community meetings was employment. Questions, comments, and concerns related to employment included:

- The number of hires and types of jobs available;
- The process of applying for a job;
- Points of hire/pick-up locations and flight routing;
- Support for apprenticeship programs;
- Difficulties with relying on KIA Community Liaison Officers in the communities for hiring;
- The duration of employment;
- The level of Inuit and Nunavut employment;
- The number of hires from the community;
- Benefits to smaller communities;
- Positions for women (e.g., as bear monitors);
- Work hours and schedule;
- Advertisement of job openings and hiring process;
- Engagement of high school students and training for graduates;
- Hiring of Kitikmeot Inuit versus Inuit from elsewhere; and
- The location of training.

Other socio-economic topics of discussion during the 2016 community meetings included business opportunities, and the process for Inuit businesses to get contract work with TMAC.

3.3.2 Valued Components Included in the Assessment

VSECs have been selected to represent the interests of Kitikmeot residents in relation to the Project. Regional interests were identified in public and community meetings held in the Kitikmeot communities. The scoping analysis identified the following VSECs for inclusion in the assessment:

1. Economic development;
2. Business opportunities;
3. Employment;
4. Education and training;
5. Migration, Housing, and Infrastructure and Services; and
6. Community Health and Well-being.

The VSECs selected to guide the assessment of the potential effects of the Project on socio-economics are those:

- that have potential to interact with the activities and components of the Project;
- identified as important by local communities, Inuit organizations, governments, regulators, and other stakeholders during consultation and engagement; and
- informed by Inuit IQ (Volume 2, Section 2) and professional judgement.

Table 3.3-1 summarizes the VSECs included in the socio-economic assessment and indicates whether each proposed by the EIS guidelines (NIRB 2012b) have either been included as indicated, included as part of another VSEC, or otherwise addressed elsewhere in the EIS.

Table 3.3-1. VSECs Included in the Socio-economic Assessment

VSECs proposed in the EIS Guidelines	Included/ Excluded	Rational	Final VSEC
Economic development and opportunities	Included	Project-related procurement of local, regional, and territorial goods and services; indirect and induced Project employment	Economic Development
Contracting and business opportunities	Included	Project-related procurement of local goods and services; indirect Project employment	Business Opportunities
Employment	Included	Direct, indirect and induced Project employment	Employment
Education and training	Included	Provision of Project employment expected to enhance local education profile and training available, and place demand on local training institutions	Education and Training
Population demographics	Excluded	Consideration is given to the potential for in-migration as a result of indirect and induced employment as part of the VSEC Migration, Housing, and Infrastructure and Services	Migration, Housing, and Infrastructure and Services
Health and wellbeing: Individual and community wellness	Included	Project employment, specifically increased income	Community Health and well-being

VSECs proposed in the EIS Guidelines	Included/ Excluded	Rational	Final VSEC
Health and wellbeing: Family and community cohesion	Included	Project employment, specifically changes to family routines due to the fly-in/fly-out operation of the Project	Community Health and well-being
Health and wellbeing: Crime levels	Included	Project contracting and employment, specifically an increased income disparity	Community Health and well-being
Community infrastructure and public service, including housing	Excluded	Potential Project interactions with community infrastructure and public services included housing are assessed in relation to the VSEC Migration, Housing, and Infrastructure and Services which is included in the assessment to address local concerns related to migration, lack of services capacity, and overcrowding of housing	Migration, Housing, and Infrastructure and Services
Health and safety including worker and public safety	Excluded	Human health and safety as potentially impacted by environmental risks is assessed as part of the Human Health Risk Assessment (Volume 6, Section 5). Public safety within the Kitikmeot communities is discussed as part of effects to Community Health and Well-being including crime levels. Management of worker health and safety on site is discussed in the Hope Bay Health and Safety Management Plan (Volume 8, Annex 23).	Community Health and well-being

The VSEC **Economic Development** was selected to guide the discussion of the Project's anticipated beneficial effects on regional, territorial, and national economic production (Gross Domestic Product, or GDP) and revenues (taxes, royalties and other fees paid to governments and Inuit organizations). The discussion considers the anticipated direct, indirect, and induced effects of the Project on the regional economy, including, for example, the potential demand created by local Project employees with increased incomes and the induced effects of the Project on local demand for goods and services.

The VSEC **Business Opportunities** was selected to guide the discussion of the Project's anticipated effects on existing Inuit and northern businesses and viability of new or additional business ventures in the region and territory. The discussion considers Project contract and sub-contract opportunities and focuses on the procurement of goods and services from local suppliers. Predictions are provided to characterize the contributing effect of increased income within the Kitikmeot on the demand for goods and services potentially enhancing local demand and creating new business opportunities.

The VSEC **Employment** was selected to guide the discussion of the Project's anticipated effects on the regional labour force as a result of the provision of direct, indirect, and induced employment. The discussion considers regional employment estimates, the potential for the Project to compete with local employers for workers, and how the Project might alter the capacity of the labour force.

The VSEC **Education and Training** was selected to guide the discussion of the Project's anticipated effects on education and training opportunities available, local demand for education and training, and youth outlooks on education and the future. The discussion considers the locally expressed desire for employment, regional education profile, employment requirements of the Project, and contributions to the Kitikmeot Employment and Training Fund. Also considered is the potential for the Project to influence youth perceptions of the connection between education, employment and future opportunities.

The VSEC **Migration, Housing, and Infrastructure and Services** was selected to represent local concern for the potential for population influx, affecting housing demand, and creating pressure on locally provided services including health care and education. Project employees will be housed in a camp at the Project site, reducing the potential for migration to the Kitikmeot Region. Any induced migration is expected to be focused within two communities – Cambridge Bay and Kugluktuk. However, the current state of housing demand, overcrowding, and limited services capacity requires that consideration be given to this potential impact.

The VSEC **Community Health and Well-being** was selected to guide the discussion of the anticipated indirect effects of the Project on individual and family social life. These indirect effects may arise as a result of other direct effects of the Project, namely employment, increased income, and changes to existing family routines. The discussion includes consideration for individual, family, and community health including mental health, physical health, and cultural well-being. The latter is related to potential changes in the typical routines of families that may enhance or detract from current levels of participation in traditional land use and other cultural activities. Consideration is given to the implications of these changes for food security, which is currently a topic of concern in the region and territory. Potential changes to public safety and crime levels are also discussed.

3.3.3 Valued Components Excluded from the Assessment

In addition to the VSECs included in the assessment, there is one VSEC proposed in the EIS guidelines (NIRB 2012b) that is excluded from the assessment as interaction with the Project is not anticipated:

- Population Demographics

The potential effects related to this VSEC have been considered and either included as effects to a revised VSEC (e.g., Migration, Housing, and Infrastructure and Services) or do not have potential to interact with the Project. In some instances, potential effects have been excluded from further evaluation as they relate to the above excluded VSEC and instead are considered as part of other effects that have the potential to interact with the VSECs included in the assessment. A rationale is provided below.

3.3.3.1 Potential Effects Excluded from the Assessment

The review of potential effects in some instances refined the effect to enable a more focused analysis or scoped out an aspect of the effect for which there is not expected to be an interaction with a VSEC. The aim of this approach was to clearly define the effects, how each effect is linked to the Project, and how each Project-induced effect is expected to interact with a VSEC. The rationale for the exclusion of certain potential effects is provided in Table 3.3-2.

Table 3.3-2. Potential Socio-economic Effects Excluded from the Assessment

VSEC	Potential Effect	Included/Excluded
Population Demographics	Potential for Project-induced demographic changes in population, migration, re-distribution and the effects of those changes, including interactions between local residents and non-residents.	This effect is considered in related to the VSEC Migration, Housing, and Infrastructure and Services.
	Potential effects of fly-in/fly-out employment on population demographics.	Project employees will be housed in camps at site and the potential for interaction with regional population demographics is negligible.

VSEC	Potential Effect	Included/Excluded
	Potential effects from various Project phases, including unemployment as a result of temporary suspension of operations or mine closure.	In the case of a temporary closure of the Project, non-local employees would return home (outside of the region) and local employees are expected to remain at their usual residence. The potential for an effect on population demographics is negligible.
Economic Development	Potential impact on the traditional economic activities including hunting, fishing, and/or sport hunting and guiding.	This effect is considered in the Land Use Effects Assessment (Volume 6, Section 4) and is not included in this chapter.
	Potential impacts related to accessibility and removal of barriers for travelling, fishing, hunting/trapping, and other activities by local communities as a result of the construction and operation of the all-weather road.	This effect is considered in the Land Use Effects Assessment (Volume 6, Section 4) and is not included in this chapter.
	Provide a discussion of the effects of the Project on personal savings rate.	This effect is excluded as both quantitative and contextual data are unavailable. It is expected that, on average, increases in incomes as a result of Project-related employment will result in an increase in the personal savings rate.
Community Infrastructure and Public Services	Discussion of building new and updating existing structures including weather shields and outposts beyond the boundary of communities and along hunting/travelling routes and/or at hunting grounds which may facilitate local hunting activities/travelling in Project areas.	TMAC does not expect to construct weather shields or other structures at this time. However, TMAC has adopted a strategy to accommodate travelling land users passing through the Project area (see also Land Use Effects Assessment, Volume 6, Section 4).
	Assessment of the incremental costs imposed by the needs from the Project directly and/or indirectly on public infrastructure, services, including those caused by Project-induced demographic change.	This effect is considered in relation to the VSEC Migration, Housing, and Infrastructure and Services.
	Description of the extent and current capacity of local transportation systems and associated infrastructure.	TMAC does not anticipate using local transportation systems and associated infrastructure, other than periodic use of community airports for the transportation of local workers and goods and services from regional businesses. The potential for an effect on transportation systems and infrastructure is negligible.
	Assessment of the public health and environmental health needs and implications to the Proponents community initiatives.	The focus of the Proponents community investment initiatives to be included in Community Involvement Plan (Volume 8, Annex 24).
	A discussion of community access to Project infrastructure upon closure, including the all-weather road.	This effect is considered in the Land Use Effects Assessment (Volume 6, Section 4) and is not included in this chapter.

VSEC	Potential Effect	Included/Excluded
	A discussion of the potential to bring in freight for communities by return shipping, and likelihood to share shipping costs with local communities.	A specific discussion or evaluation is not required for the effects assessment. TMAC is adding to the customer base for shipping companies in the central Arctic and supporting locally-based shipping companies. TMAC directly negotiates with Kitikmeot-based businesses to provide sea transport services. NEAS and NSSI are both on the Kitikmeot Qualified Business Registry facilitated through the IIBA. Typically, servicing the Project is one of many other customer shipments into the Kitikmeot Region (i.e., Hope Bay is one stop in addition to community stops). In the 2016 shipping season, TMAC shared shipping costs with local communities, and expects that this practice will continue. Shippers are responding to the new business from the Project by both chartering vessels and selling deck space. When deck space is sold, this adds to the revenue and lowers the costs for the community resupply, as it is just one of potentially several offloads within the region.
Employment	Discussion of culturally-sensitive workforce management practices that will meet both the Project's immediate labour force needs as well as the region's longer-term economic development needs.	A discussion of workforce management practices is provided in the Human Resources Plan (Volume 8, Annex 26).
Education and Training	Evaluation of training programs planned by the Proponent, the associated challenges and likelihood of success of trainees to satisfy the Project needs and regional economy development with consideration of cultural and language barrier.	A discussion of workforce management practices is provided in the Human Resources Plan (Volume 8, Annex 26).
	Discussion of the potential for longer term community capacity building programs, if any have been planned or will be planned and are anticipated to be implemented throughout the Project's lifetime, regarding how mine training plans can enhance the transferability of skills after the mine closure (e.g., management and HR skills, computer skills, heavy equipment experience, finance skills, etc.).	A discussion of workforce management practices is provided in the Human Resources Plan (Volume 8, Annex 26).
Community Health and Well-being	Changes to cultural integrity as a result of potential demographic change.	The Project is not expected to result in a level of in-migration that would alter the cultural composition of Kitikmeot communities. The potential for an effect is negligible
	Linkages between increased incomes and STIs as well as other communicable diseases.	The discussion of management practices related to workplace conduct is included in the Human Resources Plan (Volume 8, Annex 26).
	Potential impacts of workplace discipline and cultural conflicts among Nunavummiut and southern workers, including those issues which may be related to or exacerbated by language barriers between employees.	A discussion of workforce management practices and mitigation measures including those related to language and cross-cultural employee orientation is provided in the Human Resources Plan (Volume 8, Annex 26).

VSEC	Potential Effect	Included/Excluded
	Topics For Discussion: Overview of the current financial management programs available in the potentially affected communities.	Implementation and use of financial management programs is discussed as mitigation for potential effects and is presented in the Human Resources Plan (Volume 8, Annex 26).
	Topics For Discussion: Description of barriers to current financial management programs and any incentives that would be provided by the Proponent for healthy financial management.	Implementation and use of financial management programs is discussed as mitigation for potential effects and is presented in the Human Resources Plan (Volume 8, Annex 26).

3.4 SPATIAL AND TEMPORAL BOUNDARIES

The spatial boundaries selected to shape this assessment are determined by the Project's potential impacts on the socio-economic environment. Regional-level data are provided for the Kitikmeot Region and for Nunavut, while community-level data is presented for each of the communities in the Kitikmeot Region: Cambridge Bay (also known as Iqaluktuuttiaq), Kugluktuk (previously known as Coppermine), Gjoa Haven (also known as Uqsuqtuuq), Taloyoak (previously known as Spence Bay), and Kugaaruk (previously known as Pelly Bay). In some cases, depending on information availability, Nunavut-wide information is presented.

Temporal boundaries are selected that consider the different phases of the Project and their durations. The Project's temporal boundaries reflect those periods during which planned activities will occur and have potential to affect a VSEC.

The determination of spatial and temporal boundaries also takes into account the development of the entire Hope Bay Belt Project activities as currently designed. The assessment considers both the incremental potential effects of the Project, which is the subject of this Application, as well as the total potential effects of the additional Project activities in combination with the currently approved mine development at Doris North and advanced exploration activities at Madrid and Boston.

3.4.1 Project Overview

Through a staged approach, the Hope Bay Project is scheduled to achieve mine operations in the Hope Bay Greenstone Belt through mining at Doris, a bulk sample followed by commercial mining at Madrid North and South, and mining of the Boston deposit. To structure the assessment, the Hope Bay Project is broadly divided into: 1) the Approved Projects (Doris and exploration), and 2) the Phase 2 Project (this application).

3.4.1.1 The Approved Projects

The Approved Projects include:

1. the Doris Project (NIRB Project Certificate 003, NWB Type A Water Licence 2AM-DOH1323);
2. the Hope Bay Regional Exploration Project (NWB Type B Water Licence 2BE-HOP1222);
3. the Boston Advanced Exploration Project (NWB Type B Water Licence 2BB-BOS1217);
4. Madrid Advanced Exploration Project (NWB Type B Water Licence under Review).

<u>The Doris Project</u>

Following acquisition of the Hope Bay Project by TMAC in March of 2013, planning and permitting, advanced exploration and construction activities have focused on bringing Doris into gold production in

early 2017. In 2016, the Nunavut Impact Review Board and Nunavut Water Board (NWB) granted an amendment to the Doris Project Certificate and Doris Type A Water Licence respectively, to expand mine operations to 6 years and mine the full Doris deposit. Mining and milling rates were increased to a nominal 1,000 tpd to 2,000 tpd.

The Doris Project includes the following:

- the Roberts Bay offloading facility: marine jetty, barge landing area, beach and pad laydown areas, fuel tank farm/transfer station, and quarries;
- the Doris Site: 280 person camp, laydown area, service complex (e.g., workshop, wash bay), quarries, fuel tank farm/transfer station, potable water treatment, waste water treatment, incinerators, explosives storage, and diesel power plant;
- Doris Mine works and processing: underground portal, temporary waste rock pile, ore stockpile, and processing plant;
- water use for domestic, drilling and industrial uses, and groundwater inflows to underground development;
- Tailings Impoundment Area (TIA): Schedule 2 designation of Tail Lake with two dams (North and South dams), roads, pump house, and quarry;
- all-weather roads and airstrip, winter airstrip, and helicopter pads; and
- water discharge from the TIA will be directed to the outfall in Roberts Bay.

Hope Bay Regional Exploration Project

The Hope Bay Regional Exploration Project has been ongoing since the 1990s. Much of the previous work for the program was based out of the Windy Lake (closed in 2008) and Boston sites (put into care and maintenance in 2011). All exploration activities are currently based from the Doris Site with plans for some future exploration at the Boston Site. Components and activities for the Hope Bay Regional Exploration Project include:

- staging of drilling activities out of Doris or Boston sites; and
- operation of exploration drills in the Hope Bay Belt area, which are supported by helicopter.

Boston Advanced Exploration

The Boston Advanced Exploration Project, which operates under a Type B Water Licence, includes:

- the Boston exploration camp, sewage and greywater treatment plant, fuel storage and transfer station, landfarm, and a heli-pad;
- mine works consisting of underground development for exploration drilling and bulk sampling, temporary waste rock pile, and ore stockpile;
- potable water and industrial water taken from Aimokatalok Lake; and
- treated sewage and greywater discharged to the tundra.

Since the construction of Boston will require the reconfiguration of the entire site, construction and operation of all aspects of the Boston Site will be considered as part of the Phase 2 Project for the purposes of the assessment.

Madrid Advanced Exploration

In 2014, TMAC applied for an advanced exploration permit to conduct a bulk sample at the Madrid North and Madrid South sites which are approximately 4 km south of the Doris Site. The program includes extraction of a 50,000 tonne bulk sample from each site, which will be trucked to the mill at the Doris Site for processing and placement of tailings in the TIA. All personnel will be housed at the Doris Site.

The Water Licence application is currently before the NWB. Madrid advanced exploration includes constructing and operating of the following at each of the sites:

- Madrid North and Madrid South: workshop and office, laydown area, diesel generator, emergency shelter, fuel storage facility/transfer station, contact water pond, and quarry;
- Madrid North and Madrid South mine works: underground portal and works, waste rock pad, ore stockpile, compressor building, brine mixing facility, saline storage tank, air heating facility, and vent raises;
- A road from the Doris Site to Madrid with branches to Madrid North, Madrid North vent raise, and the Madrid South portal.

3.4.1.2 The Phase 2 Project

The Phase 2 Project includes the Construction and Operation of commercial mining at the Madrid (North and South) and Boston sites, the continued operation of Roberts Bay and the Doris sites to support mining at Madrid and Boston, and the Reclamation and Closure and Post-Closure phases of all sites. Excluded from the Phase 2 Project, for the purposes of the assessment, are the Reclamation and Closure and Post-closure of unaltered components the Doris Project as currently permitted and approved.

Construction

Phase 2 construction will utilize the infrastructure associated with Approved Projects. Additional infrastructure to be constructed for the proposed Phase 2 Project includes:

- expansion of the Doris TIA (raising of the South Dam, construction of West Dam, and development of a west road to facilitate access);
- construction of an off-loading cargo dock at Roberts Bay (including a fuel pipeline, expansion of the fuel tank farm and laydown area);
- construction of infrastructure at Madrid North and Madrid South to accommodate mining;
- complete development of the Madrid North and Madrid South mine workings;
- construction of a process plant, fuel storage, power plant, and laydown at Madrid North;
- all weather access road (AWR) and tailings line from Madrid North to the south end of the TIA;
- AWR linking Madrid to Boston with associated quarries;
- all infrastructure necessary to support mining activities at Boston including construction of a new 200-person camp at Boston and associated support facilities, additional fuel storage, laydown area, ore pad, waste rock pad, process plant, airstrip, diesel power plant, and dry-stack tailings management area (TMA) at Boston; and
- infrastructure necessary to support ongoing exploration activities at both Madrid and Boston.

Operation

The Phase 2 Project represents the staged development of the Hope Bay Belt beyond the Doris Project (Phase 1). Phase 2 operations include:

- mining of the Madrid North, Madrid South, and Boston deposits;
- transportation of ore from Madrid North, Madrid South and Boston to Doris for processing, and transportation of concentrate from process plants at Madrid North and Boston to Doris for final gold refining once the process plants at Madrid North and Boston are constructed;
- use of Roberts Bay and Doris facilities, including processing at Doris and maintaining and operating the Robert's Bay outfall for discharge of water from the TIA;
- operation of a process plant at Madrid North to concentrate ore, and disposal of tailings at the Doris TIA;
- operation of a process plant at Boston to concentrate ore, and disposal of tailings to the Boston TMA; and
- on-going use and maintenance of transportation infrastructure (cargo dock, jetty, roads, and quarries).

Reclamation and Closure

At Reclamation and Closure, all sites will be deactivated and reclaimed in the following manner (see Volume 3, Section 5.5):

- Camps and associated infrastructure, laydown areas and quarries, buildings and physical structures will be decommissioned. All foundations will be re-graded to ensure physical and geotechnical stability and promote free-drainage, and any obstructed drainage patterns will be re-established.
- Using non-hazardous landfill, facilities will receive a final quarry rock cover which will ensure physical and geotechnical stability.
- Mine waste rock will be used as structural mine backfill.
- The Doris TIA surface will be covered rock. Once the water quality in the reclaim pond has reached the required discharge criteria, the North Dam will be breached and the flow returned to Doris Creek.
- The Madrid to Boston All-Weather Road and Boston Airstrip will remain in place after Reclamation and Closure. Peripheral equipment will be removed. Where rock drains, culverts, or bridges have been installed, the roadway or airstrip will be breached and the element removed. The breached opening will be sloped and armoured with rock to ensure that natural drainage can pass without the need for long-term maintenance.
- A low permeability cover, including a geomembrane, will be placed over the Boston TMA. The contact water containment berms will be breached. The balance of the berms will be left in place to prevent localised permafrost degradation.

3.4.2 Spatial Boundaries

The assessment of the potential effects of the Project on social and economic conditions considers two distinct sub-regional areas of interest – the west and east Kitikmeot regions. Each Kitikmeot community is a pick-up-point for the Project which provides an equal opportunity for Project employment to all

Kitikmeot residents. However, it is anticipated that Project contracting and procurement will be focused within communities with established goods and services providers that are located nearest to the Project. For that reason, the communities in the western Kitikmeot, Cambridge Bay and Kugluktuk, may experience the effects of the Project to more pronounced degree as compared to communities in the eastern Kitikmeot.

The socio-economic LSA is defined as the west Kitikmeot Region and includes the communities of Cambridge Bay and Kugluktuk while the RSA also includes the eastern Kitikmeot Region including Gjoa Haven, Taloyoak, and Kugaaruk. The LSA and RSA are shown in Figure 3.2-1.

The communities of Omingmaktok (Bay Chimo) and Kingaok (Bathurst Inlet) are no longer occupied year round and do not offer typical municipal services such as health and education services. For this reason, these are not included as study communities for the socio-economic effects assessment. This socio-economic effects assessment focuses on the five populated Kitikmeot communities. However, within the IIBA, TMAC provides transportation for workers to the Project should any workers choose to reside in Omingmaktok or Kingaok during certain times of the year.

3.4.3 Temporal Boundaries

The temporal boundaries for each VESC were defined in relation to planned activities over the lifetime of the Phase 2 Project within which a reasonable expectation of interaction with environmental or socio-economic components can be predicted.

The Project represents a significant development in the mining of the Hope Bay Greenstone Belt. Even though this Project spans the conventional Construction, Operation, Reclamation and Closure, and Post-closure phases of a mine project, Phase 2 is a continuation of development currently underway. Phase 2 has four separate operational sites: Roberts Bay, Doris, Madrid (North and South), and Boston. The development of these sites is planned to be sequential. As such, the temporal boundaries of this Project overlap with a number of Existing and Approved Authorizations (EAAs) for the Hope Bay Project and the extension of activities during Phase 2.

For the purposes of the EIS, distinct phases of the Phase 2 Project are defined (Table 3.4-1). It is understood that construction, operation and closure activities will, in fact, overlap among sites; this is outlined in Table 3.4-1 and further described in Volume 3 (Project Description).

The post-closure phase of the Phase 2 Project is scoped out of the socio-economic effects assessment as the primary drivers of socio-economic effects are employment and procurement which will be limited during this period. Phase 2 activities during post-closure include reclamation, monitoring, and reporting and will not generable a level of employment or spending that has potential to affect social and economic conditions (see Project Description Volume 3, Sections 5.6, 5.6, and 5.7).

The assessment also considers a Temporary Closure phase should there be a suspension of Project activities during periods when the Project becomes uneconomical due to market conditions. During this phase, the Project would be under care and maintenance. This could occur in any year of Construction or Operation with an indeterminate length (one to two year duration would be typical). The effects assessment for the VSECs economic development, business opportunities, and employment will include the phase Temporary Closure (Table 3.4-1).

Table 3.4-1. Temporal Boundaries for the Effects Assessment for Socio-economics

Phase	Project Year	Calendar Year	Length of Phase (Years)	Description of Activities
Construction	1 - 4	2019 - 2022	4	**Roberts Bay:** construction of marine dock and additional fuel facilities (Year 1 – Year 2); **Doris**: expansion of the Doris TIA and site (Year 1); **Madrid North:** construction of process plant and road to Doris TIA (Year 1); **All-weather Road**: construction (Year 1 – Year 3); **Boston**: site preparation and installation of all infrastructures including process plant (Year 2 – Year 5).
Operation	5 - 14	2023 - 2032	10	**Roberts Bay**: shipping operations (Year 1 – Year 14) **Doris**: mining (Year 1 - 4); milling and infrastructure use (Year 1 – Year 14); **Madrid North:** mining (Year 1 – 13); ore transport to Doris mill (Year 1 -13); ore processing and concentrate transport to Doris mill (Year 2 – Year 13); **Madrid South:** mining (Year 11 – Year 14); ore transport to Doris mill (Year 11 – Year 14); **All-weather Road**: operational (Year 4 – Year 14); **Boston**: winter access road operating (Year 1 – Year 3); mining (Year 4 – Year 13); ore transport to Doris mill (Year 4 – Year 5); processing ore (Year 6 – Year 13); and concentrate transport to Doris mill (Year 6 – Year 13).
Reclamation and Closure	15 - 17	2033 - 2035	3	**Roberts Bay**: facilities will be operational during closure (Year 15 – Year 17); **Doris**: site and facilities will be operational during closure (Year 15 – Year 17); mining, milling, and TIA decommissioning (Year 15 – Year 17); **Madrid North:** all components decommissioned (Year 15 – Year 17); **Madrid South:** all components decommissioned (Year 15 – Year 17); **All-weather Road**: road will be operational (Year 15 – Year 16); decommissioning (Year 17); **Boston**: all components decommissioned (Year 15 – Year 17).
Temporary Closure	NA	NA	NA	**All Sites:** Care and maintenance activities, generally consisting of closing down operations, securing infrastructure, removing surplus equipment and supplies, and implementing on-going monitoring and site maintenance activities.

Note: NA = not applicable.

3.5 PROJECT-RELATED EFFECTS ASSESSMENT

3.5.1 Methodology Overview

This assessment was informed by a methodology used to identify and assess the potential socio-economic effects of the Project and is consistent with the requirements of Section 12.5.2 of the Nunavut Agreement and the EIS guidelines (NIRB 2013a). The effects assessment evaluates the potential direct and indirect effects of the Hope Bay Project on the environment and follows the

general methodology provided in Volume 2, Section 4 (Effects Assessment Methodology), and comprises a number of steps that collectively assess the manner in which Phase 2 and the Hope Bay Project will interact with the VSECs defined for the assessment (Section 3.3).

To provide a comprehensive understanding of the potential effects for the Project, the Phase 2 components and activities are assessed on their own as well as in the context the Existing and Approved Projects within the Hope Bay Greenstone Belt. The effects assessment process is summarized as follows:

1. Identify potential interactions between the Project and the VECs or VSECs, and the resulting potential effects.
2. Identify mitigation or management measures to eliminate or reduce the potential effects.
3. For Phase 2 *in isolation of* the Existing and Approved Projects, characterize the potential incremental effects.
4. For Phase 2 *in combination with* the Existing and Approved Projects, characterize the potential effects.
5. For *both* Phase 2 in isolation and for the entire Hope Bay Project (Phase 2 in combination with the Existing and Approved Projects), characterize any residual effects (potential effects that would remain after mitigation and management measures have been applied).
6. Determine the significance of potential residual effects.

In order to characterize the potential socio-economic effects that could result from the interactions between the Project and VSECs, and to characterize residual effects, the analysis relies of the results of an economic impact analysis conducted to predict the impacts of the Project on employment, income, GDP, and government tax revenues (Section 3.3.3 and Appendix V6-3B). Information on other contributions made by TMAC to governments and Inuit organizations, such as those defined through the Framework Agreement and IIBA with the KIA, is also considered. These economic impacts are used as indicators for predicting indirect socio-economic impacts on other VSECs. In addition to economic modelling, other methods used to characterize the effects include use of: information available on the past experience of the Doris Project and other mine projects; comparison of potential changes in baseline conditions to socio-economic effects and points of criticality that are evidenced in the literature; and professional judgement. The effects assessment relies on both qualitative and quantitative information.

3.5.2 Identification of Potential Effects

Project activities and components mostly likely to interact with the socio-economic environment are those that relate to engagement of a workforce (TMAC employees and contractors) and the procurement of goods and services by the Project. Potential interactions between the Project's activities and components by phase, and the VSECs and potential effects are presented in Table 3.5-1. Interactions marked with an 'X' are carried forward into the characterization of potential effects in Section 3.5.4.

Table 3.5-1. Project Interaction with Socio-economic VSECs

Project Component/ Activity	Economic Development		Business Opportunities	Employment			Education and Training		Mitigation, Housing, and Infrastructure and Services			Community Health and Well-being		
	Changes to economic growth		Changes to local business growth	Changes to employment opportunities and income	Changes to labour force capacity	Competition for local labour	Changes to demand for education and training programs	Changes in perceptions of education and employment	In-migration to the Kitikmeot Region	Changes to the demand for housing	Changes to the demand for local services	Changes to family stability	Changes to family spending	Changes to food security and cost of living
Construction														
Employment and labour	P		P	P	P	N	P	P	N	N	N	P/N	P/N	P/N
Procurement of goods and services	P		P	P	P	N	P	P	N	N	N	P/N	P/N	P/N
Operation														
Employment and labour	P		P	P	P	N	P	P	N	N	N	P/N	P/N	P/N
Procurement of goods and services	P		P	P	P	N	P	P	N	N	N	P/N	P/N	P/N
Reclamation and Closure														
Employment and labour	N		N	N	N		P	P				P/N		
Procurement of goods and services	N		N	N	N		P	P				P/N		
Post-closure														
Employment and labour														
Procurement of goods and services														
Temporary Closure														
Employment and labour	N		N	N										
Procurement of goods and services	N		N	N										

Notes: P = Positive; N = Negative and non-mitigatable; Blank = no interaction

The review and analysis of baseline data, the Project description, the results of public and stakeholder consultation, the CRI reports, and the EIS Guidelines (2012) resulted in the identification of potential Phase 2 Project effects on the socio-economic environment. Effects are primarily understood as the result of an interaction between Phase 2 components or activities and a VSEC. Employment is considered one of the main pathways of impact that may alter the current socio-economic environment, as well as the procurement of goods and services by the Phase 2 Project in the Kitikmeot Region. Employment and procurement are considered substantial benefits and has the potential to enhance the regional labour force, regional businesses, individual and family income, the need for retail and other secondary services, and other aspects of the socio-economic environment within Kitikmeot communities.

The review of potential effects in some instances refined the effect to enable a more focused analysis or scoped out an aspect of the effect for which there is not expected to be an interaction with a VSEC. The aim of this approach was to clearly define effects, how each effect is linked to the Phase 2 Project, and how Project-induced effects are expected to interact with a VSEC. The rationale for the inclusion of potential effects is provided below.

Economic Development

Changes to economic growth – this effect will consider Project contributions to territorial GDP and tax revenues accruing to the federal and territorial governments during Construction and Operation. Changes to economic growth at Closure will also be assessed. This effect also considers the tax revenues to government, funds TMAC paysthrough the IIBA (e.g., for training and business development), and the revenues and royalties that will accrue to regional Inuit associations related to the use IOL, advancing mining operations, and other activities.

Business Opportunities

Changes to local business growth - this effect is defined to include the opportunities for Inuit and northern businesses as a result of Project procurement and as enhanced by implementation of the IIBA. This effect will consider the potential for existing business expansion and/or diversification of goods and services, as well as the potential for new or additional businesses to emerge.

Employment

Changes to employment opportunities and income – this effect is the direct result of Project employment and procurement and is focused on these Project benefits at the regional, territorial, and national levels. This effect also considers the estimated amount of personal income the Project will provide to regional, territorial, and national levels.

Changes to labour force capacity – this effect is defined as the potential for changes to the skills and experience of the regional labour force as a result of the requirements of Project employment (i.e., education levels, skills, and labour force experience) and participation in the Project.

Competition for local labour – this effect considers the potential for currently employed residents of the Kitikmeot Region to leave their employment for mine-related employment. The higher-wages offered for mine-related work may entice those currently employed in the Kitikmeot or may change existing salary and compensation expectations. This effect also considers the ability of local employers to retain their employees (e.g., hamlet or Government of Nunavut employees).

Education and Training

Changes to the demand for education and training programs – this effect considers the capacity of the regional education system to accommodate the potential increased demand for local accredited education and training programs. Increased demand for programs and courses is anticipated due to mine-related employment opportunities. Consideration is also given to the types of education and training programs and courses available in the Kitikmeot Region.

Changes in perceptions of education and employment – the effect considers the integration of traditional and western education values that has occurred to date and considers the motives of youth and their participation in education, and the effect that the Project may have on this.

Migration, Housing, and Infrastructure and Services

In-migration to the Kitikmeot Region – this effect considers the potential for the Project to result in spin-off (indirect or induced) employment wherein non-local individuals may relocate to the region to obtain employment that has been created locally due to economic growth associated with the Project. Direct Project employment is not expected to result in in-migration as workers will be housed at site in camps, and the Project will have multiple points of hire where location of residence is not a factor in determining eligibility for employment.

Changes to the demand for housing – this effect considers the potential for Project-related in-migration or changes in employment and income status of individuals to result in effects on housing demand. This effect focuses on the potential for indirect or induced Project employment to affect local housing demand.

Changes to the demand for local services – this effect considers the potential for Project-related in-migration to increase the demand for local services, many of which currently operate at capacity. This effect focuses on the potential for indirect and induced Project employment to affect the demand for local services.

Community Health and Well-being

Changes to family stability– the effect considers the ability of local families and others to adapt to the lifestyle of fly-in/fly-out rotation work associated with Project employment. Consideration is given to absent family member(s) and implications for children, childcare, spousal relationships, and gender roles. Implications for the mental and physical health of workers and their families are also considered.

Changes to family spending – this effect considers the relatively recent introduction of the wage economy and implication for increased incomes on individual and family spending patterns as a result of mine-related employment. Increased income as related to family consumption and housing subsidy eligibility, as well as the linkages between increased income and increased levels of gambling, substance abuse, domestic violence, family violence, and sexually transmitted infections (STIs) are also considered. This may also, in turn, lead to additional demands on local services, such as health and social services, due to an increase in these activities.

Changes to food security and cost of living – this effect considers the potential for changes to traditional harvesting activities and local food costs and discusses the contribution of traditional livelihoods to community and individual well-being.

3.5.2.1 Socio-economic VSECs, Effects and Indicators

The indicators selected to inform the assessment of the potential effects of the Project (including cumulative and transboundary effects) on the VSECs are identified in Tables 3.5-2. The selection of indicators was informed by public consultation, the TK report (Banci and Spicker 2012), and the CRI reports (Cameron and Gabel 2015), and is based on scientific methods as well as professional judgement.

Table 3.5-2. Socio-economic Effects and Indicators by VSEC

VSEC	Effect	Indicator
Economic Development	Changes to economic growth	Nunavut and Canada GDP
		Payments to the KIA and NTI (e.g., royalties, exploration and production lease rents, land tenure payment, water compensation, and IIBA implementation payments)
		Corporate tax payments to governments
		Other tax benefits
Business Opportunities	Changes to local business growth	Number of Kitikmeot Qualified Businesses
		Value of contracts awarded to Kitikmeot based and Inuit Owned businesses
		Number of new businesses
		Sales (e.g., supplies and services)
Employment	Changes to employment opportunities and income	Number of Kitikmeot residents with employment
		Project-related employment
		Indirect and induced jobs
		Wages
		Unemployment rate
		Number of unemployed
		Regional income/tax filers with employment income;
		Number of social assistance recipients
	Changes to labour force capacity	Number of individuals with work experience
		Number of individuals with education and other skills
	Competition for local labour	Transferrable skills and experience in the local labour force (e.g., truck drivers)
		Project-related employment in the Kitikmeot Region
		Wages
Education & Training	Changes to demand for education and training programs	Number of certificate programs and courses available to Kitikmeot residents
		Number of Kitikmeot residents enrolled in programs and courses
	Change in perceptions of education and employment	Public school truancy rate
		Public school enrollment
		Secondary school graduates
Migration, Housing, and Infrastructure and Services	In-migration to the Kitikmeot Region	Nunavut annual components of migration (i.e., Interprovincial in/out migrants, non-permanent residents, net migration)
	Changes to demand for local services	Number of social services case files
		Number of health clinic visits
		Number of police calls to service
		Project related in-migration
		Project related employment

VSEC	Effect	Indicator
	Changes to the demand for housing	Number of public housing units by community Public housing waitlist by community Number of privately-owned units by community Number of dwellings that are crowded Project related in-migration Project related employment
Community Health and Well-being	Changes to family stability	Project related employment Project related employment by gender
	Changes to family spending	Project related employment Number of criminal violations by community Number of impaired driving violations Number of drug violations Gambling activity levels
	Changes to food security and cost of living	Number of individuals participating in traditional harvesting and prevalence of sharing Cost of RNFB food basket. Level of country foods consumption

3.5.3 Economic Impact Modeling

An economic impact model was used to estimate the direct, indirect, and induced benefits of the Phase 2 Project, as well as that of the Approved Projects (primarily consisting of the Doris Project). Each of these can be distinguished as follows:

- direct impacts are the employment, personal income, GDP and government tax revenue generated directly by Phase 2 and the Hope Bay Project, including the impacts generated by industries directly contracted to supply the on-site goods and services used by the Project;
- indirect impacts are the employment, personal income, GDP and government tax revenue associated with all industries that are ultimately supplying the goods and services used by the industries supplying the Hope Bay Project, and includes all transactions to the beginning of the supply chain (excluding direct on-site suppliers to the Hope Bay Project and the Hope Bay Project itself); and
- induced impacts are the employment, personal income, GDP and government tax revenue associated with economic activity because of workers spending their incomes on goods and services, including those directly and indirectly employed because of the Hope Bay Project.

The DYNATEC model used is based on Statistics Canada's Input-Output Model of the economies of Canada and the provinces and territories, but incorporates econometric modules to allow for dynamic, non-linear simulations of the likely effects. With the use of econometric modules, the linear behaviour of the base input-output model is reduced to more closely mimic the real economy. A key characteristic of the model is that it is dynamic and is able, through each iteration of revenues and expenditures, to show how the economic impacts are distributed on a yearly basis. This provides for a more realistic understanding of the actual annual economic benefits as the initial expenditures work their way through the economy.

The current version of the model uses the 2011 dataset of Statistics Canada's Input-Output Model, enhanced with data from various sources dating from 2011 to 2015. The core of the model operates at a level of aggregation consisting of 295 commodities and 117 industries. Both open and closed versions of the model were run. The open model is used to estimate indirect effects (effects from inter-industry

purchases of goods and services), while the closed version is used to estimate induced effects (effects from spending of after-tax household income, primarily from wages and salaries, taking into account the propensity to save).

In addition to the model's ability to simulate the dynamic nature of the economy, a key characteristic of the model is its ability to provide estimates of the distribution of the effects by region (i.e., for the three regions of Nunavut, including the Kitikmeot Region). The model does this through a mathematical allocation that takes into account the characteristics of existing industries and business within each region, current economic structures and supplier relationships, and employment and skill base profiles.

The output statistics of the economic impact modelling are provided in constant 2015 Canadian dollars and include:

- employment;
- personal income;
- GDP; and
- government tax revenues.

The detailed results of the economic impact model for Phase 2 are provided in Appendix V6-3B (*Phase 2 of the Hope Bay Project: Economic Impact Model Report*).

The economic impact model is not able to estimate the direct business taxes or royalties paid by the Hope Bay Project. This includes payments to the KIA and NTI consisting of royalties, exploration and production lease rents, land tenure payments, water compensation, and IIBA implementation payments, as well as corporate tax payments to the federal and provincial/territorial governments. This information is estimated as part of the Hope Bay Project's financial model and is reported separately in Section 3.5.5.1 (Economic Development).

3.5.4 Mitigation and Adaptive Management

The following sections detail monitoring plans and adaptive measures, as well as mitigation measures designed to enhance Project benefits and to reduce or eliminate the potential adverse effects of the Project. Once these measures are taken into account the end result, or expected residual effect, is characterized in Section 3.5.6.

3.5.4.1 Inuit Impact and Benefit Agreement

TMAC and the KIA reached agreement in 2006 on an IIBA related to the existing Doris North Project. A key feature of this agreement was the establishment of an Implementation Committee made from representatives of both parties. From 2007, this committee met frequently and regularly to consider Inuit employment, contracting, training, and other Project-related matters. Kitikmeot Inuit are key Project stakeholders, and as such, this Implementation Committee has been instrumental in addressing a number of real and potential Project impacts to the satisfaction of TMAC and the KIA.

In accordance with Article 26 of the Nunavut Agreement, in March 2015, TMAC entered into a new IIBA with the KIA for the Hope Bay Project. This agreement supersedes the Doris North IIBA and will be applicable to future phases over the 20 year term of the agreement. Common to both the Doris North and Hope Bay IIBA, TMAC and the KIA have jointly established an IIBA Implementation Committee whose purpose is to ensure that the provisions of the IIBA are met.

The IIBA sets out principles and methods to, among other purposes, maximize Inuit training, employment and business opportunities arising from the Operation of the Project, and provide a mechanism through which effective communication and cooperation can take place.

Key features of the IIBA include provisions for, among others:

- Setting annual and long-term Inuit training targets;
- Setting annual Inuit employment targets;
- First opportunity to resident Kitikmeot Inuit for employment, followed by non-resident Inuit;
- Establishment and administration of a Training and Education Fund;
- Promotion of Inuit content in procurement, including requirement to engage Kitikmeot Qualified Businesses for certain types of goods and services; and
- Establishment, under certain conditions, of a Business Development Fund.

3.5.4.2 Proposed Monitoring Plans and Adaptive Management

The Phase 2 Project has an existing Socio-economic Monitoring Program (SEMP) that will accommodate the activities that are the subject of this assessment. The SEMP defines a number of indicators that have been selected based on the impact predictions and mitigation measures in the Doris North FEIS (Miramar 2005) and recently modified to reflect changes in planned development activities that have occurred since. For each social and economic indicator, specific measures, data requirements, and data sources have been identified, and data collection and reporting is on-going. The SEMP allows for both early detection of adverse effects on VSECs and reporting of impact and benefit objectives for the Project.

As part of the SEMP, TMAC works in collaboration with other stakeholders including the Government of Nunavut (GN), Indigenous and Northern Affairs Canada (INAC), the KIA, and the communities of the Kitikmeot Region. A Socio-economic Working Group for the Project, with membership from TMAC, the GN, INAC and the KIA, is responsible for developing and overseeing the SEMP. A Terms of Reference for the SEMP outlines each member's roles and responsibilities with regards to socio-economic monitoring throughout the life of the Project. TMAC is also committed to ongoing participation in the Kitikmeot Socio-economic Monitoring Committee (K-SEMC) to report results of the SEMP and receive feedback and input regarding any revisions to the SEMP or adaptive management and mitigation that may be required in the event unanticipated impacts are identified. TMAC prepares annual SEMP reports and will continue to do so throughout the life of the Project. Reports are submitted to the Nunavut Impact Review Board and shared with the wider K-SEMC.

The existing SEMP will be modified, if necessary and as appropriate, to monitor the predicted impacts characterized in the EIS, as well as regional concerns identified by the K-SEMC where relevant to the Project. The review of the SEMP will be done in collaboration with the Socio-economic Working Group.

3.5.4.3 Mitigation Measures for Specific VSECs and Potential Effects

This section details mitigation measures proposed for each VSEC to reduce or eliminate the potential negative interactions with the Project, and measures designed to enhance Project benefits.

<u>Economic Development</u>

The effects of the Project on local, regional, territorial, and national economic development are anticipated to be positive. The Project will make contributions to GDP, territorial and federal tax

bases, as well as royalties and other payments to regional Inuit associations. These contributions facilitate a greater degree of economic activity than would be possible without the Project. As a result, effects of the Project on economic development associated with increases in GDP, government tax revenue and other payments during the Construction and Operation phases of the Project are expected to be positive and do not require mitigation measures. Measures to enhance Project's contributions to economic development in the Kitikmeot Region include TMAC's commitments to maximizing business and employment opportunities, capacity building, as well as monetary contributions to Inuit associations as defined by the new Framework Agreement and IIBA with the KIA. Measures to enhance the benefits of the Project on economic development are further described by the Human Resources Plan (Volume 8, Annex 26). These measures are based on industry best practice and those that have been refined based on the experience of the Doris North Project to date.

The reduction and eventual removal of Project contributions to GDP, government tax revenue and other payments during Reclamation and Closure, and Post-Closure, is considered as a natural end to all mining and other industrial/business operations. There are no specific mitigation measures to eliminate such effects; however, TMAC's communication of Project schedule with local and regional governments and businesses can help to prepare them for the gradual change and allow governments and other organizations, such as the KIA and NTI, to secure other sources of revenue. Planned engagement activities are described by the Community Involvement Plan (Volume 8, Annex 24).

Business Opportunities

Project contribution to local business growth during the Construction and Operation phases is a positive effect of the Project that does not require mitigation measures. Measures to enhance this beneficial effect include:

- provide assistance, feedback, information and lead time to contractors from the Kitikmeot communities on bids and bidding policies;
- require and monitor local content plans on major bids;
- waive bond provisions at tender for Inuit owned businesses;
- provide annual business opportunities forecast; and
- promote awareness of procurement opportunities within the Kitikmeot Region.

TMAC will communicate Project's schedule to ensure that local governments, local and regional businesses and other interested institutions/organizations are aware of Project activities as well as any opportunities that can contribute to business growth in the Kitikmeot Region. Additionally, as described in Section 3.5.4.2, through the IIBA, TMAC is committed to promoting and maximizing business opportunities for the engagement of Kitikmeot Qualified Businesses in the development and operation of the Hope Bay Project. These include bid preparation training program for Inuit and offering contracts open only to Kitikmeot Qualified Businesses. The IIBA includes provisions for the establishment of a Business Development Fund, the intent of which is to invest in building the capacity for Inuit business development in the Kitikmeot. As defined within the IIBA, a TMAC Liaison will work with the appropriate TMAC department to, among other responsibilities, assist TMAC to maximize Kitikmeot Qualified Business procurement by identifying businesses interested in procurement opportunities, considering opportunities for capacity building and development and assisting Kitikmeot Qualified Businesses to access available business opportunities.

The reduction and eventual removal of Project contributions to business growth at the Reclamation and Closure phase, and the Post-Closure phase, is considered as a natural end to all mining and other

industrial or business operation. There are no specific mitigation measures that could eliminate this effect; however, TMAC's communication of Project's activities and schedule with local and regional governments and businesses can help to alleviate this effect. Planned engagement activities are described by the Community Involvement Plan (Volume 8, Annex 24). Business once serving the Project will have time to gradually adjust their operations to prepare for reduction in business contracts or obtain new business contracts from other providers in the region.

Employment

Changes to employment opportunities and income as well as changes to labour force capacity, during the Construction and Operation phase, are considered as beneficial effects of the Project as they will increase employment and personal income, as well as contribute to the skill level and experience of the local and regional labour force. Benefit enhancement measures are described within the Human Resources Plan (Volume 8, Annex 26) and include the provisions of the IIBA. Enhancement measures for these effects and measures for addressing potential gaps in education and training include:

- give Inuit first opportunity for employment;
- build cultural awareness and enforce harassment policies;
- promote awareness of employment opportunities within Kitikmeot communities;
- collaborate with training institutions;
- develop and implement a Recruitment Strategy;
- collaborate and partner with relevant agencies and contractors to ensure skill requirements are being met; and
- collaborate with education and training providers to develop training programs geared toward the long-term employment of women in non-traditional occupations.

Education and training initiatives will allow a greater proportion of Nunavummiut to meet the requirements for employment with the Project. Other mitigation measures include initiatives for training with the Nunavut Arctic College and collaboration with the KIA. Recent TMAC activities include, but are not limited to, the following:

- participation on the Cambridge Bay Community Readiness Committee preparing the community for future developments;
- participation in on the KIA ASETS Program Working Group aiming to allocate ASETS training funding to the most beneficial effect;
- participation in the Nunavut Mine Training Roundtable tasked with allocating Government of Nunavut Mine Training Funding; and
- support of a joint venture between TMAC's drilling contractor, Geotech Drilling, and Kitikmeot Corporation to train Inuit drillers for both surface and underground exploration drilling.

TMAC also will develop:

- a Human Resource Strategy that addresses training and education;
- specified areas of training;
- Career Development Plans for Inuit employees;

- Inuit Training Targets that are subject to review and adjustment by the IIBA through the Implementation Committee;
- Community Information and Career Awareness Sessions in the Kitikmeot; and
- Kitikmeot Secondary School achievement awards.

TAMC will communicate with the Department of Education headquarters staff on any planned initiatives relating to youth employment in their Human Resources Plan, and other programs that may relate to education, in order to identify common points of interest and action that would help integrate the Proponent's activities into the existing education program, and communication and delivery plans. Communication or collaboration between TMAC and the Department of Education is to be consistent with the provisions of the 2015 Hope Bay IIBA, including those related to training and education, and recognize that, as defined by the IIBA, training and educational support is a shared responsibility between TMAC and the KIA.

At Project Reclamation and Closure, and Post-Closure, to help employees transition to new employment, TMAC will develop and implement a Workforce Transition Plan that will:

- Support training and career development opportunities prior to Reclamation and Closure, including worker training programs as part of worker recruitment and on the job training to enhance worker job expertise.
- Implement measures prior to Reclamation and Closure to assist employees to identify opportunities for career succession planning and employment, including providing job search assistance to workers seeking the service to maximize the number of workers that find alternative suitable employment.
- Identify skills acquired during employment with the Project and match the identified skills to similar positions available at Reclamation and Closure, and Post-Closure, as well as alternative industries.
- Assist employees in identifying ongoing employment and training opportunities in the LSA and RSA that will require existing or complementary skills, including assisting workers in identifying available external resources.

These measures are thought to contribute to Project employees' ability to transition to other employment once Operation ends. The above measures will also be implemented to mitigate potential adverse effects associated with Temporary Closure. However, it is recognized that a lack of lead time prior to the business decision being made to enter into a Temporary Closure phase may limit the extent to which the measures may be fully implemented prior to a reduction in direct Project employment.

With respect to the competition for labour, there are no specific measures that TMAC can implement in isolation to eliminate the competition for labour other than the measures already listed including training Inuit workers and developing a Recruitment Strategy. These activities will help develop the skill and experience level of the workers in the region, increasing the size of the skilled labour force available.

Education and Training

Changes to the demand for education and training programs, as well as changes in perceptions of education and employment are positive effects of the Project. The effects will occur primarily during the Construction and Operation phases. Proposed enhancement measures focus primarily on the hiring of Inuit workers and supporting training to increase the size of the available skilled labour pool to

better meet Project requirements. TMAC will share information on training opportunities with the Kitikmeot communities, the IIBA Implementation Committee, and other agencies responsible for delivery of training and education programming to support the efficient and effective delivery of programming. The partnership of industry, the KIA, the GN, and education and training institutions has the potential to provide advanced education opportunities for local Inuit and, as a result, increase the size of the available resources with the needed skill base in the Kitikmeot Region to help meet longer-term hiring requirements.

As defined by the IIBA, TMAC will pay into a Training and Education Fund if Inuit Employment Targets are not met, and there will be shared support of training and education between TMAC and the KIA. Through the work of the Implementation Committee, key provisions of the IIBA that are particularly relevant include:

- Setting of annual and long-term training targets (including apprenticeships) that are achievable by TMAC using commercially reasonable efforts;
- Creating, maintaining and annually updating a list of relevant education and training opportunities for Inuit; and
- Annually evaluating and reporting on the Inuit Training Target achievements, Inuit training and recruitment plans, improving compliance with Inuit Training Targets, and funded activities (among others).

As outlined in the Human Resources Plan (Volume 8, Annex 26), the human resources strategy will identify barriers to employment and advancement at the Project, and will include talent management initiatives such as training, career planning, and advancement. TMAC's training will include on-the-job training and skills development across a range of work areas. Career development plans will be developed for all Inuit employees.

TMAC will host a community information and career awareness session in all Kitikmeot communities at least annually. This will serve to encourage Inuit to attain the skills and education qualifications necessary to take advantage of employment opportunities. Information will be provided to communities on: labour needs of the Project; skills, behaviours and qualifications required for employment at the Project; available training opportunities and educational support programs; and career opportunities in related fields (e.g., science, technology, professional services). During Operation, TMAC will also sponsor competitions and achievement awards at the secondary school level in fields relevant to or related to mining sector careers.

Migration, Housing, and Infrastructure and Services

Project workers will be accommodated at site in camps, and the Project will have multiple points of hire where location of residence is not a factor in determining eligibility for employment. As a provision of the IIBA, TMAC provides air transportation for its Inuit employees, who are residents of Kitikmeot communities, to and from the point of hire and the Project site. For these reasons, a direct effect of the Project on in-migration to the Kitikmeot Region is expected to be avoided.

As assessed, there is the potential for the Project to result in spin-off (indirect or induced) employment wherein non-local individual may relocate to the region to obtain employment that has been created locally due to economic growth associated with the Project. However, this effect is expected to be minimal. TMAC has not identified any mitigation that is required for this potential effect.

Similarly, for changes to the demand for housing and changes to the demand for local services, no specific mitigation is required. However, as defined within the Community Involvement Plan (Volume 8, Annex 24) TMAC will maintain communications with service providers within the Kitikmeot communities over the life of the Project, and share information to assist in the development of collaborative adaptive management measures, should unanticipated impacts arise and mitigation be required. Further, as discussed above, the Hope Bay Project SEMP allows for early detection of adverse effects on VSECs and provides a forum to identify and discuss arising issues with governments, the KIA, and community stakeholders.

Community Health and Well-Being

Across the Kitikmeot Region, there are programs in place to promote community well-being, including various wellness programming, health programming, and community and social services (see Section and Appendix 6V-3A). Additional measures are to be implemented to mitigate Project-related effects on community health and well-being, focused on the Construction and Operation phases.

To mitigate changes to family stability, changes to family spending, and changes to food security and cost of living, the IIBA has a number of provisions including:

- Instituting an Employee and Family Assistance Program (EFAP) to provide Inuit employees and their families with services to assist them with dealing with personal problems, family matters, mental health concerns, and alcohol, drug and gambling dependencies;
- Serving country foods on site, commensurate with the level of demand and nutritional needs of Inuit employees;
- Maintaining a drug and alcohol policy which includes a “zero tolerance” at the Project;
- Providing on-site access to communications facilities to allow communication between Inuit employees and their spouses and families; and
- Providing country food kitchens and cultural activities at the Project as determined by the Implementation Committee and as space permits.

In addition, a TMAC Liaison will work with the appropriate TMAC department to, among other responsibilities: act as a liaison with the Inuit employees of TMAC; identify employee counselling needs as appropriate; develop on-going consultation with Inuit employees of TMAC to identify their needs, issues and concerns; and assist in identifying and developing wellness initiatives. In sum, these measures are designed to mitigate changes to the health and well-being of workers and their families.

3.5.5 Characterization of Potential Effects

This section describes and characterizes each potential socio-economic effect identified in Section 3.5.2. The mitigation and management measures identified in Section 3.5.4 are applied, and any residual effects identified. Residual effects are the effects that are remaining after mitigation and management measures are taken into consideration. If the implementation of mitigation measures eliminates a potential effect and no residual effect is identified on that VSEC, the effect is eliminated from further analyses. If the proposed mitigation measures are not sufficient to eliminate an effect, a residual effect is identified and carried forward for additional characterization and a significance determination in Section 3.5.6.

3.5.5.1 Economic Development

Phase 2 Project expenditures during the Construction and Operation phases have the potential to contribute to the economic growth and development in the LSA and the RSA as a whole through contributions to the territorial GDP, as well as the federal and territorial government tax revenue. The Hope Bay Project is also expected to make payments to the KIA and the NTI including royalties, exploration and production lease rents, land tenure payment, water compensation, IIBA implementation payments and others payments. Additional contributions to GDP and to federal and provincial/territorial tax revenue will take place across Canada.

GDP provides an aggregate measure of economic production, or in other words, the market value of all goods and services produced by the economy during a specific period. Tracking growth changes in GDP provides a good indicator of economic health. Project contributions to GDP, therefore, indicate an increase in an overall economic production and, as a result, contributions to economic growth. Government revenue finances the provision of public goods and services. An increase in contributions to the government revenue can improve the ability of governments to provide public goods and services and consequently support the socio-economic needs of residents. Finally, other financial contributions, such as those to the KIA or the NTI, help to promote the social, economic and cultural well-being of Inuit in Nunavut.

Mineral development provides opportunities for employment while promoting economic development and investment in the community (E. Cameron and C. Gabel 2015). There are also opportunities for business contracts and increases in business revenue. Further, spin-off opportunities that are associated with mining are seen as a major benefit of resource developments; however, communities often require support and planning in order to take full advantage of those opportunities (E. Cameron and C. Gabel 2015). Project contributions to economic development are mainly expected during the Construction and Operation phases, with reduction or full removal of those benefits during Reclamation and Closure.

Changes to Economic Growth

Characterization of Phase 2 Potential Effect

Construction

Total Phase 2 Project expenditures during the Construction phase are estimated at $809.3 million, including $367.0 million in capital expenditures (CAPEX) and $442.3 million in operating expenditures (see Appendix V6-3B for more detail). CAPEX are expected to occur primarily within Alberta and Ontario. Some expenses are also expected in British Columbia, Quebec and the Northwest Territories. Further, it is expected that all of process equipment and at least a half of infrastructure purchases will be purchased via direct import.

The economic impact model provides an estimation of total (direct, indirect and induced) GDP impacts in Canadian provinces and territories, and for the three regions in Nunavut (Qikiqtaaluk, Kivalliq, and Kitikmeot). The total GDP impact of the Phase 2 Construction phase in Canada is estimated at $727.4 million, with $53.2 million estimated for 2019, $116.3 million predicted for 2020, $197.5 million predicted for 2021, and $261.3 million for 2022. Most GDP impacts associated with construction are expected to dissipate by 2029. GDP impacts are expected to be most felt in Ontario ($166.7 million), Alberta ($142.2 million), and British Columbia ($125.8 million); GDP impacts in Nunavut are estimated at $58.1 million. In Nunavut, of the $58.1 million in GDP impacts, $40.0 million is predicted for the Kitikmeot Region, $17.1 million is predicted for the Qikiqtaaluk, and $1.1 million for the Kivalliq (Table 3.5-3; see Appendix V6-3B for more detail). Of the total impacts in the Kitikmeot, $34.4 million

will be contributed from direct Phase 2 Project activities, $1.6 million from indirect and $4.0 million from induced activities (see Appendix V6-3B for more detail).

Table 3.5-3. GDP and Tax Revenue (Millions of Dollars), Nunavut

	Construction				Operation			
		Tax Revenue				Tax Revenue		
Region	GDP	Federal	Territorial	Total	GDP	Federal	Territorial	Total
Qikiqtaaluk	$17.1	$1.9	$1.3	$3.2	$26.5	$2.4	$1.8	$4.2
Kivalliq	$1.1	$0.1	$0.1	$0.2	$12.9	$1.3	$1.0	$2.4
Kitikmeot	$40.0	$4.5	$2.2	$6.7	$190.4	$14.8	$9.3	$24.1
Total Nunavut	**$58.1**	**$6.5**	**$3.6**	**$10.1**	**$229.8**	**$18.6**	**$12.2**	**$30.8**

The economic impact model provides estimates of indirect and induced tax revenues to territorial, provincial and federal governments as a result of the economic activity generated by the Phase 2 Project in Nunavut and across Canada (AppendixV6-3B). The economic model also estimates the direct tax revenues derived from workforce payroll (i.e., personal incomes taxes paid by workers).

As a result of the construction of the Phase 2 Project, the economic impact model estimates that a total of $143.9 million will be contributed to the government tax revenue in Canada, including $81.2 million in federal and $62.7 million in provincial and territorial taxes. For 2019, the government tax revenue is estimated at $10.6 million; it is predicted to be $22.5 million in 2020, $38.3 million in 2021, and $51.7 million in 2022, with contributions dissipating by 2029. By province, highest impacts on the provincial tax revenue will be felt in Ontario ($34.9 million), Alberta ($29.4 million), British Columbia ($21.1 million), and Quebec ($19.5 million). The total benefit of the construction of the Phase 2 Project to the Government of Nunavut from taxes is predicted at $3.6 million, with $2.2 million coming from the economic activity in the Kitikmeot Region (Table 3.5-3; see Appendix V6-3B for more detail).

Project's contribution to economic growth during the Construction phase is considered as a positive effect.

Operation

Total operating expenditures (OPEX) for the Operation phase is estimated at $2,723.0 million, plus an additional $144.8 million in sustaining CAPEX. Of the total OPEX during the Operation phase, the majority will be spent on mining, followed by general and administrative (G&A) expenses, processing, and surface activities (see Appendix 6V-3B for more detail).

For Operation, the total GDP impacts of the Phase 2 Project are estimated at $3,073.7 million, with $231.4 million predicted for the first year of the Operation phase (2022), gradually increasing to a high of $314.4 million in 2032, the last year of operation. Although the Operation phase is anticipated to be 10 years in duration, the injection of capital into territorial and national economies is anticipated to have effects on GDP that continue past the Operation phase, with most impacts dissipating by 2037 because of time lags associated with indirect and induced impacts. GDP impacts of the Operation phase are expected to be most felt in Newfoundland and Labrador ($651.5 million), Ontario ($532.3 million), British Columbia ($515.3 million), Alberta ($491.0 million), and Quebec ($432.6 million), followed by Nunavut ($229.8 million). Of the total GDP impacts in Nunavut, $190.4 million will benefit the Kitikmeot Region, $26.5 million is predicted for the Qikiqtaaluk, and $12.9 million for the Kivalliq (Table 3.5-3; see Appendix V6-3B for more detail). Of the total impacts in the Kitikmeot, $148.0 million will be

contributed from direct Phase 2 Project activities, $24.1 million form indirect and $18.3 million from induced activities (see Appendix V6-3B for more detail).

Additionally, during the Operation phase, $528.4 million will be contributed to the government tax revenue in Canada, with $286.4 million benefiting the federal and $242.1 million going to the provincial and territorial governments. Total tax contributions are expected to peak in 2032 at $63.8 million, with most benefits dissipating by 2037. Highest impacts at the provincial level will be felt in Newfoundland and Labrador ($53.6 million), Quebec ($52.1 million), Ontario ($44.0 million), British Columbia ($32.5 million), and Alberta ($32.0 million). The total benefit to the Government of Nunavut, as a result of Phase 2 operation, is predicted at $12.2 million, with $9.3 derived from the economic activity in the Kitikmeot Region (Table 3.5-3; see Appendix V6-3B for more detail).

Additonal taxes, royalties and other fees that are paid directly by the operator during the Operation phase, as estimated by TMAC, include:

- an estimated $144.3 million in payments to the KIA and NTI (in sum consisting of royalties, exploration and production lease rents, land tenure payments, water compensation, and IIBA implementation payments); and
- an estimated $256.6 million in corporate tax payments to the federal and provincial/territorial governments as well as $32.7 million in non-production based royalties to the federal government.

Estimates of royalty payments, taxes and other sums are prospective and are based on assumptions of gold price, foreign exchange rates, tax rates, and various other economic factors. Should these factors change, the amounts could differ from those estimated here.

Project's contribution to economic growth during the Operation phase is considered as a positive effect.

Reclamation and Closure

As Phase 2 production comes to an end, and it enters the Reclamation and Closure phase, most contributions to the economic development will gradually decrease. The closure costs are estimated at $42.7 million; however, economic modeling does not estimate economic impacts associated with those costs. Further, there will be some employment opportunities throughout the Reclamation and Closure phase, decreasing over the phase. The Phase 2 Project's direct contributions to GDP and government tax revenue end with cessation of direct expenditures, while the indirect and induced contributions to GPD and government tax revenue will gradually decrease and eventually dissipate a number of years later. All other contributions associated with production, including payments to the KIA and NTI, will come to an end once the Phase 2 Project ceases production.

A decrease in Phase 2's contribution to economic growth during the Reclamation and Closure phase is considered as an adverse effect when compared with Operation; however, there will still be a net positive economic benefit compared to the baseline condition without the Phase 2 Project, and the decrease in benefits with the move into Closure and Reclamation does not negate the positive impacts provided by the Phase 2 Project during the Construction and Operation phases.

Temporary Closure

During any Temporary Closure phase that may occur (e.g., a business decision is made in the future to suspend Operation and move into care and maintenance pending improved economic conditions), there would be a decrease in expenditures resulting in a loss of Phase 2 Project contributions to GDP and tax

revenues accruing to the federal and territorial governments. Royalties and other payments to the Inuit associations (i.e., KIA and NTI), including those payments defined by the Framework Agreement and the IIBA, are also expected to decrease close to pre-Project baseline levels as many are linked to expenditures, employment levels, and mine production amounts. As with Reclamation and Closure, a decrease in Phase 2's contribution to economic growth during Temporary Closure is considered an adverse effect when compared with Construction or Operation. All contributions to economic growth will not cease, however, as ongoing maintenance activities will be required at site meaning a reduced level of ongoing employment and procurement of goods and services by the Phase 2 Project.

Characterization of Hope Bay Project Potential Effect

The Doris Project is completing construction and is scheduled to begin production in early 2017. In addition, the Madrid Advanced Exploration Project and other ongoing exploration activities are planned for the Hope Bay Greenstone Belt. These expenditures were separately modeled in order to understand the economic impacts of these components.

Due to construction and exploration expenditures in 2015 and 2016, total economic impacts of the Hope Bay Project are estimated to be $143.5 million in GDP contributions across Canada, including $12.2 million in Nunavut and $9.7 million in the Kitimeot Region. Due to Doris operation and other Hope Bay Project exploration expenditures planned to the year 2021, total GDP impacts are predicted to be an additional $473.3 million across Canada, including $49.6 million in Nunavut and $37.5 million in the Kitikmeot Region.

The corresponding tax revenues for the same periods are estimated to be a total of $25.0 million across Canada, including $14.3 million in federal and $10.7 million in provincial and territorial taxes, due to expenditure in 2015 and 2016. For the Doris operation, $87.5 million will be contributed to the government tax revenue in Canada, with $48.7 million benefiting the federal and $38.8 million going to the provincial and territorial governments. The total benefit to the Government of Nunavut due to the Approved Projects is predicted at $3.7 million in tax revenues, with $2.9 derived from the economic activity in the Kitikmeot Region.

As with Phase 2, there are additional taxes, royalties and other fees that will be paid directly by the operator during the construction and operation of Doris. As estimated by TMAC, these include:

- an estimated $69.5 million in payments to the KIA and NTI (in sum consisting of royalties, exploration and production lease rents, land tenure payments, water compensation, and IIBA implementation payments); and
- an estimated $22.4 million in corporate tax payments to the federal and provincial/territorial governments.

In sum, the complete Hope Bay Project will provide significant GDP and tax revenue contributions to the Government of Nunavut, as well as the federal government and other territorial and provincial governments across Canada.

Residual Effect of Changes to Economic Growth

The Phase 2 Project is expected to have beneficial residual effects on economic growth and development through contributions to GDP and to federal and provincial government tax revenue. These effects are expected to be felt in the LSA, the RSA, Nunavut, and Canada as a whole, during the Construction and Operation phases. Given the substantial contributions of the Project in terms of Project expenditures and employment, increased economic growth is anticipated to have a positive residual effect on the Economic Development VSEC. Phase 2 has the potential to reshape the economy

of the Kitikmeot, as one that is increasingly experienced and diverse, and able to support various types of development.

Approaching the end of the Operation phase, the beneficial effects will start to dissipate with complete removal of all beneficial effects expected by 2043. At Reclamation and Closure, as well as for a short time during Temporary Closure, the Phase 2 Project's contributions to economic growth will decrease as a result of an end to production activities. The eventual removal of GDP and tax benefits with and following Post-Closure is an inevitable characteristic of resource development projects. The identified mitigation will assist in easing this transition for communities, Inuit organizations, and government. **No residual negative effect on the VCES Economic Development is predicted because of a reduction to economic growth during Reclamation and Closure and during Temporary Closure.**

3.5.5.2 Business Opportunities

The Phase 2 Project, through the provision of business contracts to businesses in the LSA and the RSA, will support economic prosperity and create new economic opportunities. New businesses may be created to provide goods and services not presently available in the LSA or the RSA. Also, existing businesses may have the potential to expand or diversify as a result of local Phase 2 Project expenditures, expenditures by suppliers and expenditures by workers directly employed by the Phase 2 Project, or those benefiting from indirect and induced worker income within the Kitikmeot Region. The effect of an increase in business opportunities is expected to occur during the Construction and Operation phases of the Phase 2 Project, with benefits being reduced during the Reclamation and Closure phases, and ceasing during the Post-Closure phase.

Changes to Local Business Growth

Characterization of Phase 2 Potential Effect

Construction

The construction of the Phase 2 Project is expected to provide contracting business opportunities that will help existing businesses grow and expand in capacity. Also, new businesses may be created if there is demand for specific goods or services not already available in the LSA or the RSA. Total expenditures over the Construction phase, a four-year period beginning in 2019 and ending in 2022, are estimated at $809.3 million, included CAPEX and OPEX during that phase. Although most capital required for mining will be sourced from outside of Nunavut such as mine and surface equipment purchases, an estimated $50.7 million (or an average of $12.7 million per year) is expected to be spent directly on suppliers within the Kitikmeot Region (Table 3.5-4).[23] Some construction activities at the Phase 2 Project for which local and regional contractors may be hired include construction of the all-weather road from Madrid to the Boston Site, expanding infrastructure at Boston such as the accommodations camp, as well as other activities related to mine development and construction of shared infrastructure.

Indirect and induced spending also has the potential to increase opportunities for businesses in the LSA and the RSA. The economic model provides an estimate of the value of indirect and induced sales that are associated with economic activity derived from spending by suppliers and workers spending their incomes on goods and services, including those directly and indirectly employed because of the Phase 2 Project.

[23] This estimate comes from the economic model report and it approximates the direct value of sales or the value of contracts awarded to businesses in the LSA and the RSA. The estimate is consistent with previously awarded contracts by TMAC to local and regional businesses as summarized in the section.

This type of spending will also help existing businesses grow, with businesses responding to a higher demand for goods and services as a result of an increase in business revenue and personal income.

Table 3.5-4. Sales in Nunavut by Region (Millions of Canadian Dollars)

	Construction			Operation		
	Direct	Indirect	Induced	Direct	Indirect	Induced
Qikiqtaaluk	$5.6	$10.3	$21.6	$0.0	$36.6	$28.2
Kivalliq	$0.0	$0.7	$1.5	$0.0	$10.7	$16.3
Kitikmeot	$50.7	$3.4	$22.4	$241.7	$52.6	$133.8
Total Nunavut	$56.3	$14.4	$45.5	$241.7	$99.9	$178.3
Canada	$715.0	$584.0	$680.3	$2,610.3	$2,107.9	$3,014.4

The Construction phase of Phase 2 is expected to contribute $584.0 million in indirect and $680.3 million in induced sales across Canada (Table 3.5-4). With respect to indirect sales, largest benefits are expected in Ontario ($231.7 million), Quebec ($109.9 million), Alberta ($113.3 million), and British Columbia ($75.7 million). Nunavut is expected to benefit in $14.4 million in indirect sales, of which $3.4 million will take place in the Kitikmeot Region and $10.3 million in the Qikiqtaaluk Region (Table 3.5-4).

Largest induced sales impacts are expected in Ontario ($166.3 million), Alberta ($124.4 million) and British Columbia ($124.3 million). In Nunavut, $45.5 million is expected to benefit the territory in induced sales, of which $22.4 million is predicted for the Kitikmeot Region (Table 3.5-4). Industries most likely to benefit from indirect and induced sales include businesses/institutions serving households, transportation, retail trade, food services and accommodation, rental businesses and financial institutions. Summarizing, indirect and induced activity is expected to benefit the Kitikmeot Region in a total of $25.8 million in sales of various types (or an average of $6.5 million per year). These are substantial contributions to the regional economy that will help existing businesses to prosper and new businesses to develop.

An increase in business opportunities for businesses in the LSA and the RSA during the Construction phase is considered as a positive effect of the Phase 2 Project.

Through the IIBA, TMAC promotes and maximizes opportunities for the employment of Inuit and the engagement of Kitikmeot Qualified Businesses in the development and operation of the Hope Bay Project (KIA & TMAC 2015). Kitikmeot Qualified Businesses are Inuit owned firms that are located in the Kitikmeot Region and recognized by the KIA as a business capable of doing work for TMAC (for a detailed listing see Section 3.2.3.6). All other Inuit Owned Firms or entities not on the Registry are counted separately, and are also expected to continue to benefit from contracting opportunities.

As outlined in the IIBA, Kitikmeot Qualified Business Contracts represent contracts for goods and services only open to bids from the Kitikmeot Qualified Businesses, whereas Open Contracts are for the provision of goods and services not provided by Kitikmeot Qualified Businesses. TMAC, in collaboration with the KIA and other appropriate agencies, will work to establish a bid preparation training program for Inuit. Contracts open only to bids from Kitikmeot Qualified Businesses are described in detail in Section 3.2.6.3.

Operation

Similarly, Project spending during the Operation phase has the potential to provide opportunities for local and regional business growth. Total direct sales during Operation are estimated at

$2,610.3 million. Depending on Phase 2 requirements, an estimated $241.7 million (or an average of $24.2 million per year) is expected to be spent in the Kitikmeot Region. This amount represents the approximated value of contracts to regional businesses.

Indirect and induced sales for the Operation phase are, respectively, estimated at $2,107.9 million and $3,014.4 million for Canada. Largest indirect impacts are expected in Alberta ($549.5 million), Quebec ($500.6 million), Ontario ($495.0 million), and British Columbia ($348.2 million). In Nunavut, $99.9 million is expected to benefit the territory in indirect sales, of which $52.6 million is predicted for the Kitikmeot Region and $36.6 million is predicted for the Qikiqtaaluk Region (Table 3.5-4).

Largest induced impacts are expected in Ontario ($630.1 million), Newfoundland and Labrador ($590.2 million), British Columbia ($511.1 million), Quebec ($440.8 million) and Alberta ($429.2 million). In Nunavut, $178.3 million is expected to benefit the territory in induced sales, of which $133.8 million is predicted for the Kitikmeot Region (Table 3.5-4). Industries expected to benefit from indirect and induced sales include transportation, repair and maintenance, support activities for mining, rental and real estate, financial institutions, retail and wholesale trade, accommodation and food services. Summarizing, the economic model estimates that $186.4 million (or approximately $18.6 million per year) is expected to benefit the Kitikmeot Region in indirect and induced sales.

An increase in business opportunities for businesses in the LSA and the RSA during the Operation phase is considered as a positive effect of the Phase 2 Project.

Reclamation and Closure

During Reclamation and Closure, there will be limited business opportunities related to reclamation and closing of Madrid North, Madrid South and Boston mines. It is expected that of the $42.7 million in closure cost, a portion will be awarded to Kitikmeot Qualified Businesses and other Iniut Owned and Nunavut businesses. However, overall this phase will see a decrease in business opportunities as a result of production activities coming to an end. It is expected that businesses previously suppling the Phase 2 Project will have time to adjust their respective capacities or work with other mining developments and exploration companies in the region, although this will be dependent on the economic conditions at the time. Nevertheless, a decrease in Phase 2's contribution to business opportunities during the Reclamation and Closure phase is expected and is considered as an adverse effect. This decrease, however, does not negate the positive impacts provided by the Phase 2 Project during the Construction and Operation phases.

Temporary Closure

During any Temporary Closure phase that may occur, procurement opportunities for Inuit and northern businesses will decrease because of the decrease in Phase 2 Project expenditures. As with Reclamation and Closure, the resulting decrease in local business growth during Temporary Closure will result in an adverse effect when compared with Construction or Operation. The ability of LSA and RSA businesses to replace the lost business will be dependent on the economic conditions at the time and the market opportunities with other projects in the region. All business opportunities will not cease, however, as ongoing maintenance activities will be required at site meaning a reduced level of ongoing employment and procurement of goods and services by the Phase 2 Project.

Characterization of Hope Bay Project Potential Effect

Prior to Phase 2 and for the operation of Doris, there will be substantial additional expenditures. From 2015 through 2021, CAPEX and OPEX expenditures are estimated to be a total of about $527 million. This represents significant additional business opportunities in Nunavut and the Kitikmeot Region.

There has been a recent increase in local and regional business capacity, particularly in Cambridge Bay (see Section 3.2.3.6), which may serve as an indication of new business opportunities arising as a result of the Hope Bay Project. With respect to new businesses in the territory, in 2014, there were 53 registered Inuit firms in the business registry maintained by NTI (Section 3.2.3.6). Eight additional firms were added to the registry in 2015.

Although the value of future contracts awarded to business in the LSA or the RSA cannot be determined at this point, previous direct spending of the Doris Project on RSA suppliers offers a general sense of potential future spending. Kitikmeot Qualified Businesses and Inuit-owned businesses were awarded a total of $17.5 million in contracts in 2014 and $29.7 million in 2015. From January through September of 2016, this increased to a total of $39.1 million, with $33.7 million of that total going to Kitikmeot Qualified Businesses. Similar or greater contributions are expected over the Construction and Operation phases of the Phase 2 Project.

Residual Effect of Changes to Local Business Growth

The Phase 2 Project is expected to contribute to the growth of the local business capacity through the provision of contracts to Kitikmeot Qualified Businesses as well as other Inuit and non-Inuit businesses in the Kitikmeot Region. Enhancement measures described in Section 3.5.5.4 (Business Opportunities) will help to support the development and growth of local businesses throughout Project Construction and Operation. Given Project needs to procure goods and services from local and regional suppliers, **changes to the local business growth are anticipated to have a positive residual effect on the VSEC Business Opportunities**.

At Reclamation and Closure and Temporary Closure, Project's contributions to local business growth will be reduced and eventually removed (during and following Post-closure) as a result of cessation of Phase 2 Project procurement of goods and services. Compared with Operation, there will be a negative residual effect because of a reduction in local spending during Reclamation and Closure and during Temporary Closure. Through the provisions of the IIBA, TMAC will work with the KIA and other stakeholders to enhance local business capabilities and the benefits realized by businesses within the region during Construction and Operation. Although Project-related business opportunities will be reduced during Reclamation and Closure, and eventually cease at the end of mine life, **the Project is predicted to have an overall beneficial effect on local business development and growth. No negative residual effect is predicted**.

3.5.5.3 Employment

Changes to Employment Opportunities and Income

Phase 2 Project Construction and Operation have the potential to increase employment and personal income through the provision of direct employment opportunities, as well as through the contribution to the creation of indirect and induced employment opportunities. At Reclamation and Closure, there will be a reduction in employment opportunities and the associated personal income. This reduction will continue throughout the Post-Closure phase, with all direct Phase 2 employment ceasing at the end of that phase. This section considers potential changes in employment and income opportunities, as well as their effect on the regional and territorial unemployment levels and other indicators.

One way in which the Phase 2 Project can affect economic indicators is through increasing employment levels during the Construction and Operation phases; a decrease in those levels can be the expected during Reclamation and Closure.

Through the provision of employment and income during the Construction and Operation phases, the Phase 2 Project also has the potential to reduce the number of people who require social assistance. Recent data indicates that the number of social assistance recipients continued to increase for the Kitikmeot Region from 3,082 in 2011 to 3,432 in 2013, representing an 11% increase (Table 3.5-5). Similar trend was reported for most Kitikmeot communities, with the exception of Cambridge Bay. Between 2012 and 2013, the number of social assistance recipients increased in all Kitikmeot communities with the highest increase in Cambridge Bay (24%), followed by Gjoa Haven (9%), Kugluktuk (9%), Taloyoak (5%) and Kugaaruk (45%; Table 3.5-5).

Table 3.5-5. Number of Social Assistance Recipients, 2010 to 2013

	2010	2011	2012	2013
Kitikmeot	**3,133**	**3,082**	**3,136**	**3,432**
Cambridge Bay	481	455	428	529
Gjoa Haven	822	835	838	915
Kugaaruk	477	479	529	550
Kugluktuk	702	680	704	766
Taloyoak	651	633	637	672

Source: (NBS 2014b)

TMAC has committed, under the IIBA, to maximizing employment benefits in the LSA and the RSA. Under the IIBA signed in March of 2015, TMAC highlights Inuit employment preference which means that if there are two or more equally matched Inuit and non-Inuit candidates, TMAC will hire Inuit candidates (KIA & TMAC 2015). As outlined in the IIBA, priority to hiring employees at the Hope Bay Project is in the following order:

1. Kitikmeot Inuit and other Nunavut Inuit resident in the Kitikmeot Region;
2. All other Kitikmeot and Nunavut Inuit;
3. Residents of the Kitikmeot Region; and
4. All others.

TMAC also works closely with the Implementation Committee to identify recruitment strategies that will maximize Inuit employment at the Hope Bay Project and to meet or exceed the Inuit Employment Targets. Points of hire will include the communities for Kugluktuk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugaaruk, as well as Kingaok and Omingmaktok. TMAC also will show preference for employing qualified Inuit students from the Kitikmeot communities to other summer employment candidates (KIA & TMAC 2015).

Characterization of Phase 2 Potential Effect

Construction

The Phase 2 Project is estimated to create 1,041 person-years in CAPEX-related employment, plus an additional 1,267 person-years in OPEX employment, for a total of 2,308 person-years in direct employment over the four-year Construction phase (Table 3.5-6). It is further estimated that of the total direct employment, the Kitikmeot Region will benefit in 57 person-years of employment in 2019, 61 person-years in 2020, 109 person-years in 2021, and 84 person-years in 2022, for a total of 312 person-years over the Construction phase (approximately 90% of all direct employment opportunities in Nunavut are expected to take place in the Kitikmeot Region; Appendix V6-3B). Overall, the majority of

direct employment is expected to benefit the province of Newfoundland and Labrador (455), British Columbia (451), Alberta (438), and Nunavut (346; Appendix V6-3B).

Table 3.5-6. Direct Project Employment (person-years) during the Construction Phase (2019 to 2022)

Area	Year 1 2019	Year 2 2020	Year 3 2021	Year 4 2022
CAPEX Workforce	298	222	363	158
OPEX Workforce	113	243	445	466
Total	**411**	**465**	**808**	**624**

Additional employment benefits will be created in supplier industries and further back in the supply chain as a result of workers spending. The economic model estimates that the Phase 2 Project will create 2,817 person-years in indirect and 1,561 person-years in induced employment opportunities across Canada (Table 3.5-7). Of that, 89 indirect and 38 induced person-years of employment will be created in Nunavut, with most indirect impacts benefiting the Qikiqtaaluk Region (59 person-years) followed by the Kitikmeot Region (27 person-years; Table 3.5-7). Indirect and induced employment impacts will dissipate by 2028 (Appendix V6-3B).

Table 3.5-7. Total Employment (person-years) and Personal Income Impacts during the Construction Phase

	Direct Employment	Indirect Employment	Induced Employment	Total
Employment:				
Canada	2,307	2,817	1,561	6,685
Nunavut	346	89	38	473
Qikiqtaaluk	35	59	15	108
Kivalliq	0	2	5	7
Kitikmeot	312	27	19	358
Income:				
Canada	$287.1	$158.6	$80.9	$526.6
Nunavut	$42.8	$4.9	$2.6	$50.3
Qikiqtaaluk	$8.6	$3.3	$1.7	$13.6
Kivalliq	$0.0	$0.2	$0.3	$0.5
Kitikmeot	$34.3	$1.3	$0.6	$36.2

The increase in direct, indirect and induced employment during the Construction phase will be associated with an increase in personal income. Direct employment is expected to contribute $287.1 million in personal income across Canada, with annual average earnings are estimated at $124,000. Further, an estimated $158.6 million will be earned in indirect income, with average earnings of $56,300, and $80.9 million in induced personal income with average earnings of $51,800 (Table 3.5-7).

Nunavut is expected to benefit in $50.3 million in personal income impacts. Further, in the Kitikmeot Region, $34.3 million in personal income benefits is predicted for those with direct employment; an additional $1.3 million in indirect and $0.6 million in induced personal income will benefit the region. These will add up to substantial income benefits that will likely increase both the median and average incomes.

In sum, direct employment opportunities averaging an estimated 78 jobs for workers from the Kitikmeot Region, have the potential to increase the number of employed, and reduce the regional unemployment rate by up to 4% (from about 25% to 21%, all else being equal); this is assuming that all hired employees come from the pool of the unemployed. This would also be expected to reduce the number of social assistance recipients. The additional indirect and induced opportunities in the Kitikmeot Region have the potential to further reduce the unemployment rate and the number of social assistance recipients.

Increases in jobs and personal income are the most frequently mentioned benefits of working at a mining operation, as reported by Kugluktuk residents through their "Community Readiness Initiative" (see Section 3.2.3.10; E. Cameron and C. Gabel 2015). Income is not only seen as a necessary source for workers and their families, but higher income also has the ability to improve workers' self-esteem and provide a sense of contributing to the community (E. Cameron and C. Gabel 2015).

An increase in employment opportunities and personal income throughout the Construction phase is considered as a positive effect of the Phase 2 Project.

Operation

During the Operation phase, the Phase 2 Project will hire up to 820 workers during peak production, plus additional workers associated with CAPEX, for a total of 8,162 person-years of direct employment for the phase (Table 3.5-8). Workers will be hired as mine contractors and in processing, surface operations, mine supervision and technical staff, maintenance, site administration, and off-site support (Table 3.5-8). Direct employment impacts are predicted to be most felt in Newfoundland and Labrador (3,286), followed by British Columbia (1,320) and Nunavut (960) (see Appendix V6-3B for details). Further, of the 960 person-years of direct employment created in Nunavut, virtually all of it is expected to take place in the Kitikmeot Region (Appendix V6-3B).

Table 3.5-8. Direct Project Employment (person-years) during the Operation Phase (2023 to 2032)

Area	Year 5 2023	Year 6 2024	Year 7 2025	Year 8 2026	Year 9 2027	Year 10 2028	Year 11 2029	Year 12 2030	Year 13 2031	Year 14 2032	Total
CAPEX Workforce	129	45	10	9	8	7	24	45	27	8	312
OPEX Workforce	490	810	815	815	820	820	820	820	820	820	7,850
Total	**619**	**855**	**825**	**824**	**828**	**827**	**844**	**865**	**847**	**828**	**8,162**

The Operation phase of the Phase 2 Project will further create 11,715 person-years in indirect and 7,369 person-years in induced employment across Canada (Table 3.5-9). Of those, 610 indirect and 170 induced person-years of employment will be created in Nunavut (Table 3.5-9). The Kitikmeot Region will benefit in 413 person-years in indirect and 46 person-years in induced employment. Employment benefits are also anticipated for the Qikiqtaaluk and the Kivalliq (Table 3.5-9). Indirect and induced employment impacts associated with the Operation phase will dissipate by 2037 (Appendix V6-3B).

The increase in direct, indirect and induced employment during the Operation phase will be accompanied by an increase in personal income. Direct employment is expected to contribute $1,248.2 million in personal income across Canada, including $147.1 million in benefits to Nunavut. Annual average earnings for direct Project employment are estimated at $153,000. An estimated $610.2 million will be earned in indirect income, with average earnings of $52,100 per year, and $378.3 million in induced personal income with average earnings of $51,300 (Table 3.5-9). For Nunavut, the total personal income impact for the Operation phase is estimated at $192.1 million, with $170.5 million earned in the Kitikmeot Region (Table 3.5-9).

Table 3.5-9. Total Employment (person-years) and Personal Income Impacts during the Operation Phase

	Direct Employment	Indirect Employment	Induced Employment	Total
Employment:				
Canada	8,162	11,715	7,369	27,246
Nunavut	960	610	170	1,740
Qikiqtaaluk	0	161	76	238
Kivalliq	0	36	48	84
Kitikmeot	960	413	46	1,419
Income:				
Canada	$1,248.2	$610.2	$378.3	$2,236.7
Nunavut	$147.1	$33.6	$11.5	$192.1
Qikiqtaaluk	$0.0	$10.4	$5.1	$15.5
Kivalliq	$0.0	$2.6	$3.5	$6.1
Kitikmeot	$147.1	$20.6	$2.9	$170.5

In general, with 960 person-years of direct employment in the Kitikmeot Region created over the Operation phase (an average of 96 jobs per year), and $147.1 million in direct personal income effect (and average of $14.7 million per year or $153,000 per job), the Phase 2 Project has potential to increase the employment levels and reduce the unemployment rate. If all positions were filled by those who are currently unemployed, the unemployment rate would decrease by as much as 4%. It is expected that a number of currently unemployed will find employment with the Phase 2 Project or associated with spin-off employment in the communities. Further, those who transition from current employment to employment with Phase 2 will be likely replaced by the currently unutilized labour. Direct employment would be also expected to reduce the number of social assistance recipients. Indirect and induced employment opportunities in the Kitikmeot Region have the potential to further reduce the unemployment rate and the number of social assistance recipients.

An increase in employment opportunities and personal income throughout the Operation phase is considered as a positive effect of the Phase 2 Project.

Reclamation and Closure

Although it is currently unknown how many person-years of employment will be created at the Phase 2 Project during Reclamation and Closure, it is expected that there will be a substantial drop in employment opportunities compared with Operation. There is potential for the unemployment rate and number of people receiving social assistance to increase; however, the extent to which this will occur is difficult to predict and will be determined by the number of other projects and employment opportunities available in the region at that time (year 2033 or later) and the ability of individuals to transition to other employment. Although some indirect and induced employment is expected to continue throughout this phase, with most employment expected to dissipate by 2037 for Canada and 2035 for Nunavut, there will be fewer opportunities and reduced personal income.

A decrease in employment opportunities and personal income throughout the Reclamation and Closure phase is considered as an adverse effect of the Phase 2 Project. However, that does not negate contributions to employment and personal income that took place throughout the Construction and Operation phases, but is rather seen as an inevitable end to a mining operation.

Temporary Closure

During any Temporary Closure phase that may occur, there will be a loss of direct, indirect and induced employment and associated personal incomes within the RSA, as well as across the territory and nationally. Compared with Operation (Table 3.5-9) employment will be substantially reduced but will not cease, however, as ongoing maintenance activities will be required at site meaning a reduced level of ongoing employment and procurement of goods and services. As with Reclamation and Closure, the resulting decrease in employment opportunities and income during Temporary Closure will result in an adverse effect when compared with Construction or Operation. The ability LSA and RSA workers to find alternative employment will be dependent on the economic conditions at the time and the employment opportunities with other projects in the region.

Characterization of Hope Bay Project Potential Effect

Additional employment and income benefits are predicted due to the development and production of the Doris mine, as well as other planned exploration activities associated with the Hope Bay Project. Excluding Phase 2, Hope Bay is expected to create a total of 5,724 person-years of direct, indirect and induced employment across Canada.

Total employment impacts for 2017, the first year of Doris Project operation, are estimated at 822 person-years. In 2018, 1,139 person-years of employment will be created, falling to 1,107 person-years of employment in 2019 and 793 in 2020, and dissipating thereafter. Largest employment benefits are expected to be created in Ontario, Alberta and British Columbia, followed by Quebec and Newfoundland and Labrador. In Nunavut, the operation of the Doris Project will create an estimated 444 person-years of direct, indirect and induced employment of which 374 person-years are predicted for the Kitikmeot Region, or an average of about 75 jobs (full-time equivalent) from 2017 through 2021.

Similarly, total personal income benefits of the operation of Doris are estimated at $337.4 million for Canada. In Nunavut, of the $38.5 million in total personal income impact, $32.6 million is predicted for the Kitikmeot Region.

Residual Effect of Changes to Employment Opportunities and Income

The Phase 2 Project is expected to increase employment and income levels within the Kitikmeot Region and Nunavut, as well as elsewhere in Canada throughout the Construction and Operation phases. Enhancement measures described in Section 3.5.5.4 (Employment) will facilitate local hiring efforts and help to maximize local employment levels. The provision of employment opportunities and increases in personal income has the potential to result in substantial positive benefits for the Kitikmeot. **As a result, a positive residual effect on the VSEC Employment is predicted during Construction and Operation**.

Approaching the end of the Operation phase and throughout the Reclamation and Closure phase, there will be a gradual decrease in employment opportunities, and the associated personal income, that can temporarily increase local and/or regional unemployment levels. Despite the mitigation measures described in Section 3.5.5.4 (Employment) to reduce this effect, a **negative residual effect of a decrease in employment opportunities and income during the Reclamation and Closure phase is predicted. Similarly, a negative residual effect is predicted for any Temporary Closure phase**.

Changes to Labour Force Capacity

The Phase 2 Project, through the provision of employment opportunities, has the potential to change the skills and experience of the territorial and regional labour force and contribute to building labour force capacity. TMAC, under the IIBA, agreed to supporting training opportunities for Inuit (KIA & TMAC 2015). TMAC's human resources strategy will contain talent management initiatives such as training,

career planning and advancement. The strategy will also contain specific measures to maximize Inuit employment, training and advancement and meeting or exceeding Inuit Training Targets. The IIBA specifies that TMAC may include on-the-job technical training and skills development in a variety of areas including underground mining, surface operations, mill processing, geotechnical and environmental. Career development plans will also be developed for all Inuit employees. TMAC and the KIA will encourage the government and local agencies to develop and provide training related to trades within the Kitikmeot high school system and off-site education and training programs aimed at preparing Inuit for employment in mining and related fields (KIA & TMAC 2015). Additionally, a Training and Development Fund will be developed to promote relevant post-secondary education to which TMAC will contribute $15,000 initially followed by yearly contributions of up to $100,000 (KIA & TMAC 2015). Those employed by the Phase 2 Project will gain years of work related experience that will help them obtain other jobs once operations cease.

As described in Section 3.2.3.4, of those who were employed in 2011 in the Kitikmeot Region, 24% held occupations in sales and service, 22% in trades, transportation and equipment operation, 21% in education, law, social, community and government, and 13% in business, finance and administration (Section 3.2.3.4, Table 3.2-2). This trend continued also across most Kitikmeot communities. By industry, of the 2,205 employed, 30% worked in public administration, 12% in retail trade, 10% in educational services, 10% in construction and 4% in mining and quarrying, with the remaining working in other industries (Statistics Canada 2013f).

Data provided in Section 3.2.3.5 is used to determine the effects of the Phase 2 Project on the employment by skill level and on the labour force capacity.

Characterization of Phase 2 Potential Effect

Construction

During the Construction phase, direct employment opportunities at the Phase 2 Project will include construction employment (up to 363 jobs) as well as production employment (up to 466 jobs; see Table 3.5-6). Construction jobs will require mostly workers with a Skill Level C and B (classification according to the National Occupational Classification, or NOC system); however, the specific demand by skill level cannot be determined at this time as it will depend on the needs of the specific suppliers contracted for construction-related activities. Additional demand for workers at various skill levels will come from indirect and induced employment opportunities.

The economic model estimates that, over the Construction phase, the Project will provide 473 person-years of direct, indirect and induced employment in Nunavut, including 358 person-years of employment in the Kitikmeot Region (Appendix V6-3B). It is further estimated by the economic model that of the total direct employment, the Kitikmeot Region will benefit in 57 person-years of employment in 2019, 61 in 2020, 109 in 2021, and 84 in 2022, for a total of 312 direct person-years of employment (Appendix V6-3B). It is expected that some of the workers hired for the Construction phase will be hired to fill construction jobs, whereas others will be hired to fill production jobs. As a result, an estimated 312 person-years of direct work experience will benefit residents in Nunavut, with all workers obtaining some form of on-the-job training (with most workers receiving multiple training sessions). Although the construction period is relatively short, with fewer training opportunities provided, the labour force capacity in the Kitikmeot Region is expected to increase as a result of the Phase 2 Project.

The effect of an increase in the labour force capacity as a result of Phase 2 Project direct, indirect and induced employment opportunities created over the Construction phase is a positive effect.

Operation

Based on requirements for workers to fill positions related to operations, as defined by the Hope Bay Project Prefeasibility Study (TMAC, 2015), about 10% of workers are expected to be required to have Skill Level A, 45% Skill Level B, 35% Skill Level C, and 10% of workers to have Skill Level D.[24] Workers will be required for operations, maintenance and surface operations, milling, mining including mine crew maintenance, geology, management, environment, cementation, and administration. In total, an estimated 820 operation positions with different skill levels and areas of expertise will be available with the Phase 2 Project.

Compared with Construction, the Operation workforce is larger and employed for a longer period of time (up to 10 years). An estimated 960 person-years of direct work experience will benefit residents in Nunavut, with all workers obtaining on-the-job training. As a result, the labour force capacity in the Kitikmeot Region is expected to increase substantially as a result of the Phase 2 Project.

Table 3.5-10 compares estimated labour supply (Table 3.2-12, Section 3.2.3.5), as indicated by the number of unutilized workers, to the total Phase 2 Project labour demand based on an assumed maximum production workforce of 820 (years 2027 through 2032; Table 3.5-8). As estimated, there are up to 760 unutilized workers in the Kitikmeot Region of Nunavut. Of the unutilized workers, 144 have Skill Level B, 87 have Skill Level C, and 529 are classified as Skill Level D. In the wider Nunavut Territory, there are an estimated 2,546 unutilized workers. As shown, at the regional level, there are not enough unutilized workers to meet labour requirements at Skill Levels A, B, and C. At the territorial level, there are not enough workers to meet Phase 2 Project labour demand at Skill Level A. For this reason, although concerted efforts will be made by TMAC to maximize Inuit employment on the Phase 2 Project, the majority of the workers will need to be sourced from outside of the Kitikmeot Region.

Table 3.5-10. Labour Demand less Labour Supply

Category	Supply of Unutilized Workers		Project Demand	Supply Less Demand	
	Nunavut	Kitikmeot		Nunavut	Kitikmeot
Skill Level A (university education)	0	0	82	(82)	(82)
Skill Level B (college education or apprenticeship training)	476	144	369	107	(225)
Skill Level C (secondary school and/or occupation-specific training)	371	87	287	84	(200)
Skill Level D (on-the-job training is usually provided)	1,699	529	82	1,617	447
Total	**2,546**	**760**	**820**	**1,726**	**(60)**

Notes:
Phase 2 Project labour demand estimates are preliminary. Numbers may not add up due to rounding.

The economic model predicts that during the Operation phase 1,740 person-years of total (direct, indirect and induced employment) will be created in Nunavut, including 1,419 person-years of total employment in the Kitikmeot Region (Appendix V6-3B). Of the total employment, 960 person-years of direct employment will be created in the Kitikmeot Region (all direct employment impacts in Nunavut are predicted for the Kitikmeot Region; Appendix V6-3B). That is, it would be expected that on

[24] It should be noted that these estimates are approximations only and are subject to revision and refinement as Phase 2 Project design and planning progresses. As such, the estimates reported here should be treated as approximations only.

average, approximately 96 Phase 2 Project employees at various skill levels would be hired from the Kitikmeot Region. However, this section looks at the total potential employment of Nunavummiut to utilize the currently unutilized labour force and maximize training and employment opportunities for the residents of the LSA and RSA.

For planning purposes, is assumed that Nunavummiut may represent from 5% to 30% of positions during the Operation phase, depending on the work area (e.g., mining, processing, surface operations, general & administration). As in the case of other mining projects, some of required workforce at the Project will be sourced from outside of Nunavut, especially if the Project's requirements by skill level cannot be met. Potential provinces from which labour could be sourced include Newfoundland and Labrador, British Columbia, Ontario, and Alberta.

High and low hiring scenarios of Nunavummiut in the Kitikmeot Region are explored to assess the existing suitability of the regional labour force to meet Project labour requirements (Table 3.5-11). Under the low hiring scenario, it is assumed that 10% of the Project workforce at Skill Levels B and C are from the Kitikmeot; for Skill Level D, it is assumed that 30% of all positions will be filled. Under the high hiring scenario, it is assumed that 30% of the Project's workforce at Skill Levels B and C are from the Kitikmeot, with all positions being filled at Skill Level D (Table 3.5-11). Given the lack of regional and territorial workers available at Skill Level A, it is modestly assumed that 5% at the low scenario and 10% at the high scenario will be hired at Skill Level A. Skill Level A workers are assumed to leave their current occupations and seek employment at the mine. In sum, it is assumed that for the low scenario approximately 12% of the total workforce (all skill levels) will be comprised of Nunavummiut, and for the high scenario it is assumed that approximately 35% of the total workforce will be Nunavummiut. Further, in the Kitikmeot Region, 90% of residents are Inuit and this proportion is used to estimate the proportion of Inuit employment (Statistics Canada 2013f). All estimates are considered at the peak of Phase 2 Project operations when 820 production workers are expected to be required.

Table 3.5-11. High and Low Hiring Scenarios for Kitikmeot Workers

Category	Inuit		Total		Total Project Demand
	Low	High	Low	High	
Skill Level A (university education)	4	7	4	8	**82**
Skill Level B (college education or apprenticeship training)	33	100	37	111	**369**
Skill Level C (secondary school and/or occupation-specific training)	26	77	29	86	**287**
Skill Level D (on-the-job training is usually provided)	23	74	25	82	**82**
Total	**86**	**258**	95	**287**	**820**

Note:
Numbers may not add up due to rounding.

The high hiring scenario is consistent with other projects in the Territory. For example, in 2014 the Meadowbank mine reported to have Inuit representation of 31%; the company noted that this employment level was a result of extensive training and support programs in the region (S. Rogers 2014). The high and low scenarios are presented in Table 3.5-11.

At the high hiring scenario, the Kitikmeot Region would meet Project labour demand at Skill Level B, C (just) and D; however, it would be expected that not all who have the right skill level would have the required trade background. Also, the vast availability of unutilized workers at Skill Level D provides

substantial potential to train those workers to qualify for positions at Skill Levels C or B. In such a case, strong emphasis on supporting appropriate training opportunities for trade occupations is required. Finally, most Skill Level A workers would need to be sourced from outside of the territory. Additional demand for workers at various skill levels will come from indirect and induced employment as well as from the replacement of workers who decide to leave their current positions for employment at the Phase 2 Project. The demand from indirect and induced effects cannot be estimated as there is not enough information on the types of jobs that would be created.

In general, the Project has potential to tap into the unutilized labour market in the Kitikmeot Region, and through the provision of on-the job training as well as the support of other training opportunities, increase the labour force capacity in the region. The number of jobs created under the low hiring scenario (Table 3.5-11) is consistent with estimates of the economic model (Section 3.5.3; Appendix V6-3B) that predicts an average of 96 direct Phase 2 jobs created for residents of the Kitikmeot Region. Based on the high hiring scenario, an estimated 287 workers would benefit from direct employment and related training opportunities and on-the-job experience. Labour force capacity could also increase as a result of previously discouraged job seekers re-entering the labour pool as a result of new job opportunities, and workers employed as a result of direct and indirect employment opportunities created by the Phase 2 Project.

The effect of an increase in the labour force capacity as a result of Phase 2 direct, indirect and induced employment opportunities created over the Operation phase is considered a positive effect.

Reclamation and Closure

Over the Reclamation and Closure phase of the Phase 2 Project, there will be a reduction in Phase 2 Project employment, as well as in indirect and induced employment opportunities. As such, Phase 2's contributions to building the labour force capacity in the region will cease. However, work-related experience and increased capacity gained throughout the Operation phase will help workers in the Kitikmeot Region obtain new employment.

The effect of a decrease in Phase 2 Project contributions to building regional labour force capacity during the Reclamation and Closure phase is considered as an adverse effect. However, this effect is not expected to negate benefits created during the Construction and Operation phases, and it is perceived as a typical outcome common to the close of operations.

Characterization of Hope Bay Project Potential Effect

In addition to Phase 2, the Approved Projects are estimated to provide to Nunavut a total of 444 person-years of total employment benefits (including direct and spin-off employment) from 2017 onwards, primarily associated with Doris mine production. This will add further to the work experience and labour force capacity within Nunavut and the Kitikmeot Region.

Direct employment by Doris is estimated to be about 180 person-years for Kitikmeot Region workers, primarily from 2017 to 2021, for an average of about 36 workers per year. This will be in addition to the hiring estimates of the Phase 2 Project provided above (Table 3.5-11). The job skills and experience gained will be similar to that resulting from Phase 2.

Residual Effect of Changes to Labour Force Capacity

During the Construction and Operation phases, the Phase 2 Project is expected to increase the capacity of the labour force in the Kitikmeot Region. At present, Kitikmeot residents face a number of barriers to employment including gaps in education and a lack of work-related experience. The Phase 2 Project, through the provision of direct and indirect employment, on-the-job training as well as supporting

other training opportunities, has the potential to increase the ability of individuals to engage in the wage economy. Enhancement measures described in Section 3.5.5.4 (Employment) will support training opportunities and skill development to maximize employment of Inuit from the LSA and the RSA. As a result, **the increased capacity of the labour force is anticipated to have a positive residual effect on the Employment VSEC during Construction and Operation. During Reclamation and Closure, the Phase 2 Project's contributions to increasing labour force capacity will no longer continue, but no negative residual effect is predicted**.

Competition for Local Labour

Competition for local labour may result from the shortage of skilled workers, such as those with Skill Level A, B and C, and workers leaving their current jobs to find Phase 2 Project-related employment in hopes of earning higher wages. Phase 2 is expected to offer relatively well-paying jobs and will require workers with skills and experience also required by other employers in the LSA and the RSA. A number of workers hired for the Phase 2 Project will include hires from the Doris Project (RPA 2015). Competition for local labour could take place during the Construction phase and at the beginning of the Operation phase when hiring takes place to fill the remaining available positions; no competition during the Reclamation and Closure and the Post-Closure phases is expected.

MiHR estimates that in 2013, 2,215 people worked in Nunavut's mining industry; of the total employment, there were approximately 1,075 workers in the mineral extraction sector and over 1,140 workers in exploration and mining support services (MiHR 2014). The demand for workers will largely stream from mineral extraction, followed by mineral exploration and mining support services (MiHR 2014). In Nunavut, there is a high percentage of workforce who work in the territory but live elsewhere (MiHR 2014). In fact, despite the strong emphasis to hire from the local labour force, it is estimated that nearly three quarters of Nunavut's workforce is from outside of Nunavut. The need to supplement the local workforce comes from the remoteness of mining operations, a small population size, and a lack of infrastructure and housing, as well as education gaps (MiHR 2014). In mining, Indigenous people are often employed in entry-level and labourer positions with potential barriers to employment including the level of educational attainment (education and skill do not meet entry requirements). Limited employer awareness of how to find and recruit Inuit workers is also at play (MiHR 2014).

As described in Section 3.2.3, employment opportunities in the Kitikmeot Region are limited and include mainly the public sector (e.g., GN, hamlet, health services, education services). Employment opportunities within the private sector include retail (e.g., the Northern Store and Co-op), accommodations, and employment with local construction companies (e.g., carpenter, equipment mechanic, excavator operator, and maintenance technician).

MiHR's hiring requirements forecast estimates that, over the next decade (by 2024), Nunavut's mining industry will require 1,120 hires or 112 hires per year on average (under the baseline scenario). Most of this requirement is expected to come from the replacement of existing workers that leave the industry (mainly due to reasons unrelated to retirement; MiHR 2014). Occupations highest in demand are likely to include trades and production, followed by demand for support workers, supervisors and coordinators, and technical occupations, as well as human resources and financial occupations (MiHR 2014). More specifically, the top five occupations with notable hiring requirement are:

- heavy equipment operators (except crane);
- heavy-duty equipment mechanics;
- truck drivers;
- drillers and blasters; and
- geological and mineral technologists and technicians.

MiHR also prepared an available talent forecast that refers to the new entrants to Nunavut's labour pool. New entrants to the mining industry are mostly individuals who just completed high school or post-secondary school and are planning to join the workforce. New entrants may also include international or interprovincial migrants, or those who are changing occupations or re-entering the workforce (MiHR 2014). The forecast predicts that, over the next ten years (up to 2024), the mining industry in Nunavut will attract a modest 120 new entrants or 12 new entrants per year; this is based on historical rates for the mining industry and its ability to attract workers for specific positions from the broader labour pool (MiHR 2014). Given that the demand for selected occupations is estimated to be six times (790) the number of new entrants, it is expected that there will be a substantial talent gap (MiHR 2014). This talent gap is expected to vary for different occupations and may contribute to competition for labour in the territory.

Characterization of Phase 2 Potential Effect

Construction

The Construction phase of the Project will require up to 466 production workers and up to 363 workers with construction related skills and experience. The economic model predicts that, of the total Project-related employment during Construction, the Kitikmeot Region will benefit in 57 person-years in direct employment in 2019, 61 person-years in 2020, 109 person-years in 2021, and 84 person-years in 2022 (Section 3.5.3; Appendix V6-3B). That is, on average an estimated 78 workers hired for the Phase 2 Project during the Construction phase would be from the Kitikmeot Region. Some of these jobs would be labourer positions, with workers possibly hired from the unutilized labour pool (unemployed workers), workers with Skill Level D or workers not currently participating in wage economy. However, other jobs would be filled by workers currently holding other occupations in the region. This could put strain on employers in the LSA and the RSA, as they would be unlikely to compete with wages offered at the Phase 2 Project, and would be required to find and train new employees, a process that can be costly.

The effect of the potential competition for labour is not expected to affect professional occupations in health, education, financial or legal institutions. Such positions are typically well-paid and are not affected by high turnover rates. Rather, it would be expected that workers with transferrable skills and experience, typically holding occupations related to trades, transportation, heavy equipment operation, natural resources, and construction would be interested in Phase 2-related employment. Also, occupations in maintenance, repair, janitorial and kitchen services may experience some demand. Given a shortage of skilled workers in the Kitikmeot Region and the wider Nunavut, the Phase 2 Project will need to source some labour from other provinces and territories including Newfoundland and Labrador, British Columbia and Alberta.

Further, although the Phase 2 Project will pay a range of salaries, depending on the required skill level, position and experience, the average earnings for the Construction phase is estimated at $124,000 per year. As described earlier in this section, the median/average salary for residents in the Kitikmeot Region is noticeably lower. Wage differences can further contribute to the competition for local labour and temporarily affect the ability of local businesses to provide goods and services and/or earn revenue if they are unable to find qualified workers at wages they can afford to pay.

Potential competition for local labour during the Construction phase is considered an adverse effect of the Phase 2 Project.

Operation

During the Operation phase, the Phase 2 Project will hire up to a peak of 865 workers. The economic model predicts that on average 96 workers will be from the Kitikmeot Region (Section 3.6.2). However,

further investigation of local employment impacts under the high hiring scenario predicts that up to 287 workers could be from the region. Most workers hired for operations at the Doris mine (up to 344 workers) will likely continue working for the Hope Bay Project; therefore, the competition for local labour will involve hiring workers for the additional positions required for Phase 2 Operation.

Jobs related to operations will include positions in the following areas:

- management, supervisory and administrative;
- health, safety and first aid;
- mining (engineers, technicians, miners, heavy equipment operators, drillers, bolters);
- geology (geologists, technicians, helpers);
- milling (metallurgists, technicians, operators);
- environment (coordinators, technicians); and
- maintenance and surface operations (electricians, mechanics, plant operators, millwrights, maintenance clerks, warehousemen, and other tradesmen and labourers).

In general, there are very few jobs that require very specialized skillsets that they are not transferable to other industries. As identified by MiHR, transferable skills include, for example, those related to supervisory and managerial roles as they required common skills such as organizing, controlling, directing, evaluating, developing and implementing procedures and policies, hiring and assigning work, and administering. These skills are transferable among sectors including exploration, mining, agriculture, automotive, supply, tourism, construction, forestry, petroleum, military, printing and even fish harvesters (MiHR 2015). For workers without work experience trying to get employed in mining, transferable skills can include communication skills, working autonomously, working under direction, being a fast learner, working safely, being adaptable to different conditions and hardworking, as well as team work and leadership. Other skills needed for miners include technical work and thinking (operating and maintaining equipment and conducting repairs as needed), being able to apply workplace safety measures, being physically capable, as well as a problem solver and a decision maker.

The average annual earnings for the Operation phase is estimated at $124,000, with ranges from $40,000 per year and up, which is again above the average/median employment income in the region. This can serve as an incentive for qualified workers to leave their current jobs and find Project-related employment. This effect is primarily expected at the beginning of the Operation phase as the Phase 2 Project tries to fill available positions. However, the removal of skilled local workers from the local labour pool can affect the prosperity of local businesses in similar ways as described above. As a result, potential competition for local labour during the Operation phase is considered an adverse effect of the Phase 2 Project.

Characterization of Hope Bay Project Potential Effect

From 2017 to 2021, the Approved Projects (primarily Doris) are estimated to employ on average 36 workers (full-time equivalent) from the Kitikmeot Region. This is in addition to the estimated average of 78 workers hired for the Phase 2 Project during the Construction phase. The total demand for workers in the Kitikmeot Region is expected to be approximately 113 (FTE) over this period (2017 to 2021), higher than the 96 workers predicted for the Phase 2 Operation phase. Average worker earnings are expected to be similar across the Hope Bay Project, differing according to the job position and requirements. It is the overlap between the Construction phase of the Phase 2 Project with the Doris Project and exploration activities that will further increase the competition for labour within Nunavut

and, more specifically, the Kitikmeot Region. The potential effect will be as described above for the Phase 2 Project, but of higher magnitude.

Residual Effect of Competition for local labour

Throughout the Construction and Operation phases, the Phase 2 Project has the potential to increase competition for local labour with specific skills (e.g., truck drivers and heavy equipment operators currently residing in Kugluktuk and Cambridge Bay). Construction will overlap with the additional worker demand from production at the Doris Project. Competition for workers with higher, more specialized skill levels can also occur due to the lower supply of such workers. While Project employment may be perceived as presenting a viable opportunity for those presently employed, this effect is not expected to be widespread. Some competition for local employment may also be expected from the replacement of workers who leave current positions to work at the mine or from the demand for workers for indirect employment opportunities. As a result, **a negative residual effect on the VSEC Employment due to competition for labour is predicted for the Construction and Operation phases**.

3.5.5.4 Education & Training

Changes to Demand for Education and Training Programs

Employment opportunities created by the Project are expected to increase the demand for education and training programs by Kitikmeot residents. Individuals in the labour force are expected to seek out local education and training so that they better qualify for both direct employment opportunities with Phase 2 and indirect employment opportunities with suppliers that may be based in the Kitikmeot communities. The NAC provides a range of post-secondary education and training programs, and TMAC and the KIA have established an IIBA that includes provisions to support local education and training initiatives (KIA & TMAC 2015). Existing NAC program offerings that will be particularly relevant include introductory trades and pre-trades programs, pre-employment programs, as well as some certificate programs (e.g., camp cook). The pre-trades program is offered within the Kitikmeot Region and prepares high school students for the entrance exam for the Nunavut Trades Training Centre in Ranking Inlet. Academic studies programs focused on the improvement of skills to meet basic employment needs, such as the Adult Basic Education program, are also expected to be in demand. Program offerings in each community are dependent on there being sufficient local student interest, as well as the availability of the necessary funding and availability of qualified instructors and classroom space. The GN is currently expanding NAC classroom and dormitory space in Cambridge Bay to support growth. Many programs, such as those offered by the Nunavut Trades Training Centre, often run under capacity. This effect is predicted to be positive, because the increased demand will result in an increased utilization of the existing programming offered in the Kitikmeot Region and elsewhere (e.g., trades schooling in Rankin Inlet) and support a demand-driven development of programs available to residents.

Characterization of Phase 2 Potential Effect

Construction

Construction phase employment opportunities are expected to drive the demand for education and training programs. Many of those engaged in employment with the construction of the Doris Project are expected to be retained as employees during the construction of the Phase 2 Project (as well as transferred to Doris Project operations employees). Additional opportunities are also expected to be available to Kitikmeot residents. On-the-job training will be provided which may reduce the demand for local education and training to some extent. TMAC has proactively provided information regarding the type of employment opportunities that will be available to prepare local residents interesting in obtaining Hope Bay Project employment.

Demand for education and training programs is expected to be greatest before and during the construction phase as local residents prepare to obtain long-term employment during the Operation phase of the Phase 2 Project. The increased demand for education and training may result in a greater utilization, availability and diversity of training programs in the region and is not anticipated to affect education infrastructure or administration. The Project is expected to support an increase in funding resources available to the NAC and others in the longer term as governments work to enhance the capabilities of local educational institutions.

Other potential effects related to the demand for education and training may include an increased demand for trades and other mine employment related programs at the high school level. Through programming currently offered in secondary schools, it is expected that there will be an increase in mining sector relevant education tracts, in particular the introduction to trades and technology tract.

Operation

Because of the longer duration of the Operations phase (approximately 10 years), there is expected to be a continued increased demand for education and training. The increased demand is expected to be focused within areas related to Phase 2 Project employment including: management, supervisory and administrative; health, safety and first aid; mining (engineers, technicians, miners, heavy equipment operators, drillers, bolters); geology (geologists, technicians, helpers); milling (metallurgists, technicians, operators); environment (coordinators, technicians); and maintenance and surface operations (electricians, mechanics, plant operators, millwrights, maintenance clerks, warehousemen, and other tradesmen and labourers). This increase demand is expected to utilize existing available programming offered within the Kitikmeot Region (e.g., pre-trades, camp cook), but will also provide an opportunity for the NAC to expand into other programs as the demand warrants. Residents seeking more advanced education and training to take advantage of more senior positions available with the Phase 2 Project will need to leave the region to pursue this (e.g., trades training in Rankin Inlet, other technical college and university level training offered South).

Reclamation and Closure

During Reclamation and Closure, there is expected to be a decrease in the demand for education and training within the Kitikmeot Region corresponding to the decrease in employment opportunities compared to Operation. However, the effect is still expected to be positive. Many workers from Operation are expected to be retained for the Reclamation and Closure phase, as there will be a continued reliance on skills related to mining (e.g., heavy equipment operators), environment, and surface operations, among others. But some job descriptions and required skill sets will differ to meet reclamation work needs. This is expected to result in a change in the types of education and training demanded. Some requirements will be met through on-the-job training by TMAC, but through its working relationships with the KIA and NAC programming needs will be identified and developed to the extent possible to support the further development of the skills and experience of the regional workforce.

Characterization of Hope Bay Project Potential Effect

With the initial of production at the Doris Project, many of the same job skills and education will be required as with the Operation of the Phase 2 Project. Given that the start of production at Doris will precede Phase 2 Operation, there will be a longer duration in the demand for many of the same types of education and training programs, and this will allow for a longer timeframe for the development of education programs to serve the needs of Kitikmeot residents. Overall, with the Hope Bay Project including Phase 2, the demand for education and training programs is expected to be higher and of longer duration. This is expected to result in a further increase in the capacity of the local labour force

and employment benefits realized as part of the longer-term benefits represented by the development of the Hope Bay Greenstone Belt.

Residual Effect of Changes to Demand for Education and Training Programs

During Construction and Operation phases, and to a lesser extent during Reclamation and Closure, the Phase 2 Project has the potential to increase the demand for education and training programs among residents of the Kitikmeot Region. While on-the-job training will be provided, demand for local and education and training programs is expected to increase. The partnerships that have been established between industry, the KIA, the GN and institutions to provide education and training programs will be critical to the ability of the Phase 2 Project to meet training needs. In addition, the IIBA includes measures to ensure Inuit Training Targets are met and the Human Resources Plan includes career development planning for all Inuit employees. Regular information will also be provided to Kitikmeot communities about the qualifications required to access Phase 2 Project employment. **There will be a positive residual effect on education and training due to changes to the demand for programs as a result of the Phase 2 Project**.

Change in Perceptions of Education and Employment

For historical and cultural reasons, obtaining a western education is not highly valued among the older generation of Inuit (Pauktuutit Inuit Women of Canada 2006; Inuit Tapiriit Kanatami 2007, 2014). This has led to an overall lack of community-level support for education. In combination with this, is the limited local job opportunities whereby many youth have not been able to experience the benefits of an education (e.g., obtaining a high school diploma is not seen as increasing the likelihood of obtaining meaningful employment). However, the connection between formal education and employment opportunities within the Kitikmeot and other regions of Nunavut is now becoming more established. With the increase in employment opportunities within Kitikmeot communities afforded by the Phase 2 Project, there is expected to be a further re-enforcement of the direct link between education and employment, and a positive change in school attendance and completion. This is expected to be reflected in a number of statistics, such as a reduction in the high public school truancy rate (recently averaging from about 21 to 25% across the region) and an increase in the relatively low school enrollment and number of secondary school graduates (numbers being highly variable over the years, from lows of 11 to highs reaching 34 to 39 across the region from 2001 to 2014). An indication of this change in perceptions, although not shown to be directly related to the Hope Bay Project, is evidenced in the Socio-economic Monitoring Program reporting for the Doris North Project (i.e., 34 graduates in 2014 in the Kitikmeot Region, 12 in Cambridge Bay alone).

Characterization of Phase 2 Potential Effect

Construction

During Construction, the Project is expected to have positive impacts on perceptions of education and employment among Inuit, including:

- increased understanding and experience of the connection between formal education and employment;
- potential increased school attendance and graduation rates (particularly at the high school level); and
- increased interest in education and training programs.

While there are a growing number of examples of training leading to employment available across Nunavut (e.g. Back River, Doris, Mary River, and Meadowbank), Kitikmeot residents have typically not

had direct experience with educational attainment leading to employment. Limited employment opportunities in the LSA and RSA may contribute to the perception that the completion of high school or other education and training programs is not necessarily linked to employment and income benefits. These perceptions are reflected in high school graduation rates which are well below the Canadian average. The proportion of the Canadian population without high school or other certificates/diplomas is 13% (Statistics Canada 2013i). In Cambridge Bay, 38% of residents (aged 25 to 64) were without high school or other certificates/diplomas. In other RSA communities, the proportion of residents without high school or other certificates diplomas ranges from approximately half to two-thirds of those aged 25 to 64 (Statistics Canada 2013i).

Operation

The positive effect of a change in perceptions of education and employment is expected to be further enhanced through Operation. With the longer-term, permanent employment that will be offered by the Phase 2 Project, it is expected that local youth will see and experience the benefits of education. As awareness of the skills required to become employed by the Phase 2 Project increases through sponsored programs, it is expected that an awareness of the link between completing high school or other training programs and employment will also increase. In addition to these programs, tangible examples can also play a role in changing perceptions. For youth, in particular, the presence of parents or other adults in the community who are employed by Phase 2 can support the perception that formal education is valuable through modeling.

Reclamation and Closure

It is anticipated that the Project will operate for approximately 10 years. During this period, it is likely that a more robust system of education and training to support employment in mining and related areas will become established, and that many Kitikmeot residents will have experienced the connection between education and training and employment first hand. By Reclamation and Closure, it is expected that the Phase 2 Project will have had long-term positive effects on the perceptions of the value of formal education in relation to employment. Although the number of jobs available during this phase will be substantially lower than during Operation, the positive perception is expected to persist as many workers continue to be employed by Phase 2 and employment and training shifts focus to those skills required for Reclamation and Closure.

Characterization of Hope Bay Project Potential Effect

With the additional demands for workers and the additional business opportunities associated with the Hope Bay Project, including the Doris Project, Phase 2 and associated exploration activities, there will be a further positive change in perceptions of education and employment throughout the Kitikmeot Region. The Hope Bay Project represents a real opportunity for local residents, most positions requiring post-secondary education or training. For those residents that do obtain work with the Hope Bay Project (100 plus), this will provide a real example of the benefits of education and the connection with employment success.

Residual Effect of Change in Perceptions of Education and Employment

The Phase 2 Project, and the Hope Bay Project as a whole, provides an important opportunity during the Construction and Operation phases, and to a lesser extent the Reclamation and Closure phase, to establish the link between completing education and training programs and obtaining employment. The Operation phase is expected to provide longer-term, more direct opportunity to illustrate this connection as Kitikmeot residents who have obtained employment during Construction will serve as examples or models for other potential employees, and there are more longer term permanent employment opportunities available during Operation. Production at the Doris Project, which preceded the Operation phase of the Phase 2 Project, will extend and enhance this effect. In addition, during

Operation, TMAC-sponsored initiatives to increase awareness of mining sector careers have the potential to reinforce the link between education and employment. **A positive residual effect of change in perceptions of education and employment is predicted on the VSEC Education and Training**.

3.5.5.5 Migration, Housing, and Infrastructure and Services

In-migration to the Kitikmeot Region

The strong population increase seen within the Kitikmeot Region in recent years is primarily driven by natural population increase (high birth rate), with net migration, considering both migration from outside of the territory and from another regions of Nunavut, being much smaller in comparison (for the Kitikmeot Region from 2014 to 2015, natural population increase was estimated to be 82 individuals while net migration was 12 individuals){Statistics Canada, 2016 #295}. Due to the Project there is expected to be a negligible increase to in-migration to the Kitikmeot Region or between communities within the Kitikmeot primarily because of two factors: 1) the agreement under the IIBA to maintain multiple points of hire across the Kitikmeot Region and to transport workers from their home community (i.e., moving to a community closer to the Hope Bay Project like Cambridge Bay has no locational advantage); and 2) the fly-in/fly-out nature of the operation, meaning that non-Kitikmeot employees see no advantage to moving to the Kitikmeot Region. As an employee from elsewhere in Nunavut or Canada, the advantage of relocating to a Kitikmeot community is minimal. In addition, options for relocation to the Kitikmeot Region are limited and can be unattractive to Southern workers due to the scarcity of available, quality housing in the communities. New or expanding Project-related businesses, including businesses that supply the Phase 2 Project and businesses that provide goods and services to local residents, have the potential to cause some influx as these businesses bring in workers with the necessary skills and experience from elsewhere. It is expected that any in-migration associated with the Phase 2 Project will be for skilled workers, not locally available. This may be a concern for indirect Project-related employment (i.e., suppliers to the Project) as required skills are typically greater and more specialized than for induced employment (e.g., retail-level jobs). However, the number of jobs this represents is modest, with many positions (in particular, induced employment opportunities) expected to be filled by current residents.

Characterization of Phase 2 Potential Effect

Construction

During Construction, in-migration to the Kitikmeot Region is expected to be negligible. The economic model predicts that the total number of indirect jobs created in the Kitkmeot Region to be approximately 27 person-years over the four years of construction, or an average of about 7 full-time jobs in supplier industries (see Table 3.1-7 in Appendix V6-3B). Total number of induced jobs is estimated to be approximately 19 person-years or an average of about 5 full-time jobs over the Construction phase. It is expected that many of these positions will be able to be filled by current residents. Any in-migration will be negligible compared to the current size of the population and existing labour force.

The total number of direct employment for Kitikmeot residents is approximately 312 person-years, or about 78 full-time jobs per year. This estimate includes contractors that will be working on site. This is a conservative estimate because it does not take into account measures to enhance employment of local residents and the provisions of the IIBA, with actual employment of Kitikmeot residents likely to be greater. Nevertheless, there is not expected to be in-migration with direct workers, again because of the use of multiple points of hire and fly-in/ fly-out operation with on-site camp facilities. This conclusion is further supported by the results of the SEMP which, from 2013 to 2015, has not recorded

any Hope Bay Project employees relocating to other communities within the Kitikmeot Region due to work at the mine.

Operation

The economic model predicts that the total number of indirect jobs created in the Kitkmeot Region to be approximately 413 person-years over approximately 10 years of Operation, or an average of about 41 full-time jobs in supplier industries (see Table 3.2-7 in Appendix V6-3B). Total number of induced jobs is estimated to be approximately 46 person-years or an average of about 5 full-time jobs over the Operation phase. It is expected that many of these positions will be able to be filled by current residents.

The total number of direct employment for Kitikmeot residents is approximately 960 person-years, or about 96 full-time jobs per year. Again, this estimate includes contractors that will be working on site and is a conservative estimate because it does not take into account measures to enhance employment of local residents and the provisions of the IIBA.

Similar to the Construction phase, a small or negligible change in Kitikmeot population due to in-migration is anticipated during Operation. Migration between communities within the Kitikmeot Region is also expected to be negligible.

Characterization of Hope Bay Project Potential Effect

As with Phase 2, the Hope Bay Project as a whole is predicted to have a small or negligible effect on the Kitikmeot population due to in-migration. As previously discussed, direct Project employment has not and is not expected to result in in-migration. The key Project design features and mitigation to remove the incentive for workers to relocate are the fly-in/ fly-out nature of the development, and maintaining multiple points of hire.

Over the next five to six years (to 2022), the economic model estimates that the additional indirect and induced employment due to the Approved Projects is about 50 jobs (FTE). This is in addition to the estimated 12 jobs (FTE) curing the Construction phase of Phase 2. During Operation of Phase 2, it is estimated that there will be 46 jobs (FTE) generated throughout the Kitikmeot Region. Thus, overall, the Hope Bay Projects is predicted to result in about 50 to 60 spin-off jobs created in the RSA over a longer period of about 16 years. Given the high unemployment rates and relatively low labour force participation rates within the Kitikmeot Region, and given that many of these jobs will not require specific training and education (e.g., service industry), this is not expected to change the prediction of a small change in the Kitikmeot population due to in-migration.

Residual Effect of In-migration to the Kitikmeot Region

Due to the fly-in/fly-out nature of the operation and multiple points of hire, in-migration to the Kitikmeot region because of direct Phase 2 Project employment during is expected to be negligible. Transportation for Inuit employees will be provided from their point of hire to site, eliminating the need for employees to move from their home community to access employment. Employees from elsewhere in Nunavut and Canada are expected to report directly to the Phase 2 Project site, avoiding any potential impacts on Kitikmeot communities. With respect to indirect and induced Phase 2-related employment in the Kitikmeot Region, the economic impact model predicts that these impacts will be modest during Construction (an average of about 12 additional full-time jobs), but higher during Operation (about 46 jobs during Operation). With the Doris Project, regional employment during Phase 2 Constructions is expected to be similar to the Operation phase. Many of these are expected to be filled by current residents. **No negative residual effect of in-migration to the Kitikmeot Region is predicted**.

Changes to the Demand for Housing

The predominant housing tenure in Nunavut is public, government-subsidized housing. Approximately 60% of the Territory's population lives in public housing, administered by the NHC (NHC 2014c). Public housing supply in Nunavut is not capable of meeting current demand. In 2013, Inuit Tapiriit Kanatami (ITK) estimated Nunavut as a whole was in need of 3,300 houses to address the current housing shortage and an additional 250 units annually thereafter (Inuit Tapiriit Kanatami 2014). As of the 2011 census, total dwelling counts in the Kitikmeot Region range from approximately 170 in Kugaaruk to 540 in Cambridge Bay (Statistics Canada 2012e). More recent data (January 2014) from the NHC shows there to 266 public housing units in Cambridge Bay, 291 in Kugluktuk, 204 in Gjoa Haven, 190 in Taloyoak, and 126 Kugaaruk (NHC 2014a). Waitlists for public housing varied from a low of 26 in Kugaaruk to a high of 72 in Cambridge Bay. While new NHC housing construction across the Kitikmeot Region should help address housing needs, similar to the Nunavut-wide trend, the development of new units is not expected to fully meet demand in the Kitikmeot.

Overcrowding in public housing units has been identified as a "clear non-medical health indicator for Inuit" (Inuit Tapiriit Kanatami 2007, 2014). While it is not known whether four people per household necessarily represents overcrowding in all cases, census data for the Kitikmeot Region indicates that more than 50% of households in Gjoa Haven, Taloyoak, and Kugaaruk have four or more persons. In Kugluktuk and Cambridge Bay the proportion of four or more-person households is slightly lower at 46% and 38%, respectively (Statistics Canada 2012a). Overall, there are more households in the Kitikmeot Region with four or more persons (52%) compared to the territorial average (47%), and there is also a higher percentage of two-or-more family households (13%) as compared to the territorial average (10%; Statistics Canada 2012a).

NHC has recently implemented changes to the Public Housing Rent Scale (PHRS), which determines the level of public housing subsidy households receive. Previously, a change in employment status (from unemployed to employed) resulted in such an acute increase in rent that acted as a disincentive to employment. The new system focuses on enabling continued employment to support wealth accumulation through gradual increases in rent (or reductions in subsidy).

In the Kitikmeot Region, private housing represented less than a quarter of all units in 2011 (Statistics Canada 2012a). Staff housing is often available for those who relocate to Nunavut from elsewhere in Canada; however, this type of housing is mostly available to public sector employees (e.g. GN employees, teachers, nurses, etc.). Private sector businesses will typically provide housing for workers that have relocated from the South or elsewhere. In fact, securing suitable housing for workers is a primary consideration before employment commitments are made. Businesses building and operating their own staff housing is a proven and successful human resource strategy in Cambridge Bay. This prevents any impact on the existing public housing stock.

Skilled workers from other Kitikmeot communities may relocate to Cambridge Bay for work with a supplier to the Phase 2 Project. In this situation, it is likely that the employer will provide housing, meaning that there would be no increase in the demand for public housing in the LSA. Employment increases and in-migration associated with induced economic impacts at the retail level are more likely to result in increases in public housing demand within the LSA. However, that in-migration could also have the effect of freeing-up public housing in another community within the RSA.

Characterization of Phase 2 Potential Effect

Construction

As noted in the previous section, in-migration to the Kitikmeot Region because of the Project or to LSA communities (Cambridge Bay and Kugluktuk) from elsewhere within the Kitikmeot Region is expected to be negligible. For this reason, it is not expected that Kitikmeot communities will experience population influx-induced demand for housing. However, changes in income due to increased Project-related employment among Kitikmeot residents is expected to impact housing costs for those living in public housing and, potentially, demand for other housing types.

During pre-construction and construction, an increase in participation in education and training programs is expected among Kitikmeot residents. Those employed by the Phase 2 Project who are also full-time students, attending pre-trades and trades courses, or other academic upgrading, will be exempt from the new system of PHRS rental assessments. This period of exemption may provide an incentive, encouraging Kitikmeot residents to seek employment and participate in education and training programs. In the case of NHC tenants who take advantage of this opportunity, housing demand will likely remain constant in the near term, but may change slowly over time in step with career progression or advancement.

In cases where Phase 2 Project employees are subject to rental assessments due to a change in employment status, increases will be limited to 25% of the new rent assessed per year. Assessments triggered by a change in employment status or an increase in income do not come into effect until September 1st of the following year. This system provides an increased opportunity for Phase 2 Project employees to save employment earnings, which will potentially change their demand for different types of housing over time (e.g. a change from public to private housing).

Operation

As with Construction, in-migration to the Kitikmeot Region because of the Project or to LSA communities (Cambridge Bay and Kugluktuk) from elsewhere within the Kitikmeot Region is expected to be negligible. For this reason, it is not expected that Kitikmeot communities will experience population influx-induced demand for housing.

Despite current overcrowding, the limited number and high cost of private market rental units and the high cost of construction (i.e. to build a private home), leave Kitikmeot residents with few alternative housing options. As the Phase 2 Project moves into Operation, those Kitikmeot residents who have been consistently employed through the construction phase may have accumulated enough wealth to seek alternative housing arrangements. As additional Kitikmeot residents gain employment during Operation, they too may seek alternative housing options as they accrue savings.

Financial management planning will be an important factor in changes in housing demand within Kitikmeot communities. Increased income does not necessarily translate to increased savings towards housing, particularly in communities where private home ownership is atypical.

Despite the need for additional public housing units and the potential for Phase 2 Project employees to direct savings towards other housing options, the overall impact of changes to the demand for housing due to the Phase 2 Project is expected to be minimal. Analysis of 2006 and 2011 census and National Household Survey (NHS) data in the Kitikmeot region do indicate an increase in the number of private dwellings between 2006 and 2011 in Cambridge Bay, Kugluktuk, and Gjoa Haven (between a 9% and 26% increase across communities). However, these increases occurred during a period where Doris Project

spending and employment varied, indicating that other independent factors also play a role in changes in housing demand (ERM 2015).

Characterization of Hope Bay Project Potential Effect

Consideration of potential changes to the demand for housing due to the Hope Bay Project, including Phase 2, does not substantively change the conclusions of the assessment for Phase 2. As previously discussed, the Doris Project will mean, overall, an extension of the potential effect over a longer time period, with effects during the Phase 2 Construction phase being similar to the Operation phase. Mitigation identified for Phase 2 is in place for the Hope Bay Project. There is expected to be an additional positive effect with workers being consistently employed through the production period at the Doris mine and the Construction and Operation phases of Phase 2, further enhancing the ability of workers to accumulate wealth and seek alternative housing arrangements. RSA residents that gain work related to the Hope Bay Project, and that do reside in public housing, will see their rental rates rise over time. However, overall this is not expected to have an effect on the demand for public housing.

Residual Effect of Changes to the Demand for Housing

The Phase 2 Project is predicted to have a negligible effect on in-migration to the Kitikmeot Region or relocation from other communities within the region (e.g., from eastern communities to Cambridge Bay or Kugluktuk). With consideration of the complete Hope Bay Project, this is not predicted to change appreciably. Private sector businesses that experience growth because of the Project will typically provide housing for their workers that have relocated from the South or elsewhere, preventing any effect on the public housing stock. For workers who gain employment with Phase 2 and the Hope Bay Project and are residing in public housing, this will have a gradual effect on rental scales according to NHC policy, and is not expected to have a negative residual effect on either the incentive for employment or the demand for public housing. As employees accumulate wealth over time, changes in preference for housing type and tenure may begin to emerge (i.e., shift in preference from public housing to private accommodations). Impacts related to changes to the demand for housing are expected to be minimal overall. Should the level of impact change over time, it will be collaboratively addressed through measures outlined in TMAC's Community Involvement Plan (Volume 8, Annex 24). **No negative residual effect of changes to the demand for housing is predicted.**

Changes to the Demand for Local Services

The Kitikmeot communities are served by a range of services including health care, social services, police and emergency services, and local infrastructure.

All communities in the Kitikmeot have a health centre. Regionally, health care centre visits decreased during the 2004 to 2012 period and then increased in 2014 to the highest number of recorded visits in a decade at 6.6 visits per capita (NBS 2016a). Many factors influence health care centre visits and each community has different utilization rates. Over the 2004 to 2013 period, Kugluktuk, Cambridge Bay and Gjoa Haven had lower rates of health centre visit per capita than Taloyoak and Kugaaruk.

The social assistance case load in the Kitikmeot Region generally increased between 2002 and 2012, with large increases in Kugaaruk and Kugluktuk, but relatively small increases in Cambridge Bay and Gjoa Haven. However, between 2012 and 2013, the regional caseload increased by 15%, with large increases in both Kugaaruk and Cambridge Bay. While monthly caseloads in each community vary due to a number of factors, per capita caseload rates are consistently lower in Cambridge Bay, the region's largest community (ERM 2015).

Changes in population, employment, access to alcohol and drugs, and other complex factors contribute to the number of police calls received in each community on an annual basis. Regionally, a general

increase in police calls was observed over the 2010 to 2014 period; however, many fluctuations occurred over the same period. Significant fluctuations occurred in Cambridge Bay between 2010 and 2012 (increase) and then again between 2013 and 2014 (decrease) (ERM 2015).

All communities in the Kitikmeot Region have hamlet-supplied water and sewer services. Qulliq Energy Corporation (QEC) provides electricity to all Nunavut communities with diesel plants in all communities. Satellite internet and phone services are available across the Kitikmeot region, along with high-speed internet service which is expected to be upgraded in the coming years.

Characterization of Phase 2 Potential Effect

Construction

Due to the fly-in/fly-out nature of the operation and the predicted negligible impact on in-migration to LSA and RSA communities because of the Phase 2 Project, changes to demand for local services are expected to be minimal as any changes will be influenced primarily by existing Kitikmeot Region residents in ways that are similar to continuing trends.

Phase 2 has the potential to change the demand for health care services in Kitikmeot communities as the health conditions of employees may change during employment. However, the determinants of health are diverse and previous fluctuations in health care centre usage in Kitikmeot communities have not been directly linked to previous project activity (i.e., Doris Project). While at site, Phase 2 Project employees will have access to health care and related services, which may reduce the need for community health care centre visits for Project-related and/or common health issues (e.g., minor injuries, colds, etc.). While in the community, demand for health care services may be indirectly affected by the Phase 2 Project should additional support be required for those employees who engage in higher risk behaviours while off rotation (e.g., alcohol and drug use, STIs). In addition, some health issues may be addressed through the EFAP, providing an alternative to some health centre services for Project employees and their families.

Social assistance caseloads in Kitikmeot communities may also be affected by the Phase 2 Project depending on the employment opportunities available to each community. During periods of employment, caseloads may experience a modest decrease during the Construction phase; however, the need for social assistance is likely to fluctuate as Phase 2 employment levels and individual employment patterns fluctuate.

In some cases, increased income gained through Phase 2 Project employment may be indirectly linked to increased substance abuse. There is potential for an increase in demand for police services due to issues related to increased use of alcohol and drugs (e.g., domestic violence) in Kitikmeot communities. However, it is expected that most employees will experience positive benefits of increased income and not engage in unproductive or potentially criminal activities.

Operation

Effects similar to those described above for the Construction phase are anticipated during the Operation phase. However, with higher levels of Phase 2 Project employment during this phase, there may be further decreases in the demand for social assistance.

Characterization of Hope Bay Project Potential Effect

As with Phase 2, changes to demand for local services due to the Hope Bay Project are expected to be minimal as any changes will be influenced primarily by existing Kitikmeot Region residents in ways that are similar to continuing trends. With the additional employment impacts associated with the Doris

Project and exploration activities during the Construction phase of Phase 2, effects are predicted to be similar to the Operation phase because employment and income effects will be similar. With the identified mitigation, a negative residual effect is not predicted. However, there is expected to be a further positive effect of a reduction in the demand for social assistance.

Residual Effect of Changes to the Demand for Local Services

During Construction and Operation there is potential for changes to the demand for local services, including health care, social services and police services, among other government services. However, changes to demand for these types of services depend on myriad factors unrelated to Phase 2 or the Hope Bay Project at play within each community. Project-related impacts in this area are expected to be minimal and indirect, and any changes will be influenced primarily by existing Kitikmeot Region residents in ways that are similar to continuing trends in infrastructure and service use. Should unforeseen impacts be identified, they will be addressed through measures outlined in TMAC's Community Involvement Plan (Volume 8, Annex 24). **No negative residual effect of changes to the demand for local services is predicted.**

3.5.5.6 Community Health and Well-being

Changes to Family Stability

Due to the fly-in/fly-out nature of the Phase 2 Project and workers being away from home while on shift (typically on a two-week on/ two-week off rotation), the Project has the potential to affect family stability among households with one or more employees. The potential for one or more household members to be away from the family for an extended period may be disruptive to family life, particularly for Inuit who, culturally, place high value on close extended family relationships.

Most project employees are predicted to be male given historical experience of the mining sector, although TMAC is committed to employment equity and increasing the share of women in the workforce. The Canadian mining industry average was approximately 16% female participation in 2012 (MiHR 2013). TMAC employment associated with the Doris Project has exceeded this average, although construction-related employment by contractors has had a lower share of women in the workforce. It is expected that with Phase 2 Project employment there will be an increased burden on women in the household. This has implications for children and childcare, spousal relationships, and gender roles. It also has the potential to adversely affect the mental and physical health of individuals. The number of household members expected to be employed and the types of relationships affected (e.g. marital and parental) are both factors in assessing overall impact.

Characterization of Phase 2 Potential Effect

Construction

Both positive and negative effects on family stability are predicted during the Construction phase. Phase 2 Project employment and the associated increase in income may have a positive effect on family stability, as increased income brings the potential for an overall increase in standard of living and decrease challenges associated with providing financially for the family. However, with a worker being away from home there is expected to be a shift in household responsibilities and resources (e.g., ability of the individual to participate in childcare and the running of the household will decrease).

In two-parent families where one or more parent is employed by the Phase 2 Project, household responsibilities may fall solely to the parent who is not on rotation. In single-parent families, rotation schedules may put undue pressure on other family members (e.g. grandparents, siblings) to pick up additional household responsibilities, including childcare.

The negative implications of fly-in/fly-out work rotation schedules can include increased stress on the family members who remain at home due to an increased need to make independent decisions, worry about the family member who is away, loneliness, younger children's adjustment to a parent coming and going, and increased family violence and break-ups InterGroup Consultants 2005).

The work rotation schedule can also cause strain on personal relationships (e.g., common law or marital relationships) due to periods of separation and a reduction in opportunities for regular communication. Tension in personal relationships in the form of loneliness, jealousy, and feelings of distrust, have the potential to result in anger and associated negative behaviours.

An increased need for daycare services may arise in order to better support families with children. Availability of day care services within Kitikmeot communities are currently limited and vary by community, and it is anticipated that fly-in/fly-out worker rotation schedules will only increase demand for these services.

Over time, and with the right supports in place, families may also experience some of the positive effects of a fly-in/fly-out worker rotation schedule including, for example, extended time with family while off rotation.

Operation

Effects of the Phase 2 Project on community health and well-being due to changes to family stability during the Operation phase will be as described above for the Construction phase.

Reclamation and Closure

During Reclamation and Closure, it is expected that most Inuit employees will choose to remain in their home community within the Kitikmeot Region. As Phase 2 Project employment is reduced post-operation, employees will likely experience a period of adjustment as they transition off of the fly-in/fly-out worker rotation schedule. Both positive and negative changes in family stability may occur during this time of transition. Potential negative implications include increased stress due to a decrease in employment income and any associated negative relationship behaviours that may arise. Potential positive implications include the ability to reconnect with family members and the ability to be more present and active in family life.

Characterization of Hope Bay Project Potential Effect

Given that total employment and income levels with the Hope Bay Project will be similar to the Operation phase of the Phase 2 Project, but beginning in 2017 and extending through the Phase 2 Construction period, the assessment of the potential changes to family stability does not appreciably change. The longer duration of opportunities provided by the Hope Bay Project will allow more time for workers and their families to adjust to the lifestyle. Potential negative effects include increases in stress on family relationships and individuals, changes in roles and responsibilities, and increases in resulting negative behaviours. TMAC has implemented a number of measures to mitigate negative effects throughout the life of the Hope Bay Project.

Residual Effect of Changes to Family Stability

Changes to family stability are anticipated during Phase 2 Project Construction and Operation, and during the operation of the Hope Bay Project, primarily due to the fly-in/fly-out worker rotation schedule and the social stressors that this can add to the family with the separation and periodic re-introduction of the family member upon return from a work rotation. Potential impacts are wide-ranging and include, but are not limited to, increased tension in marital and parental relationships, increased need for childcare services, increased potential for negative behaviours (e.g., gambling,

alcohol and drug use) as a coping mechanism, increased stressors on mental health, and increased potential for family violence and break-up. Measures have been identified, including an EFAP, to mitigate potential adverse effects. Communications facilities to help maintain connections between Phase 2 Project employees and their families will also be available on site. In addition, a TMAC Liaison will be responsible for ongoing consultation with Inuit employees to identify specific needs and support the active management of any employee issues that arise. Positive effects of changes to family stability during Construction and Operation will also occur as a result of the Phase 2 Project, primarily due to increases in household income and the resulting increase in standard of living and ability to provide financially for the family. But overall, **changes to family stability during Construction and Operation are predicted to result in a negative residual effect on the VSEC Community Health and Well-being**.

During Reclamation and Closure, similar issues are expected to arise, although for different reasons. With a reduction in employment, the loss of work, changes in the time spent at home, and changes in family roles and responsibilities are again expected to increase social stressors in the home and within the extended family. The loss of income will decrease the standard of living and ability to provide financially for the family, and decreasing the resources that workers and their families have available to them to help deal with stressors. **During Reclamation and Closure, changes to family stability are predicted to result in a negative residual effect on the VSEC Community Health and Well-being**.

Changes to Family Spending

The Phase 2 Project has implications for changes to individual and family spending. It is expected that increased income from Project employment will influence two broad types of spending, including productive spending (e.g., housing, education) and unproductive spending (e.g., gambling, alcohol and drugs).

While Kitikmeot residents have been employed by the Hope Bay Project at Doris and other projects in the region, the transition to a wage-based economy across the Kitikmeot Region has been somewhat slower than in other regions. There are fewer Kitikmeot residents working or seeking employment (61%) in comparison to residents of the Kivalliq (63%) and Baffin (65%) regions. Similarly, average earnings in the Kitikmeot Region ($37,780) were lower than the Kivalliq ($38,823) and Baffin ($47,395) regions in 2010 (Statistics Canada 2013i). This points to the potential for the Phase 2 Project to signify a shift in workforce participation and income levels in the Kitikmeot Region, with implications for family spending. This has the potential to be realized as both a positive and adverse effect. With respect to adverse effects, key indicators include the number of criminal violations, impaired driving violations, and drug violations, as well as gambling activity levels; these indicators are expected to reflect any adverse effects due to increases in unproductive spending as a result of the Phase 2 Project.

Characterization of Phase 2 Potential Effect

Construction

The Phase 2 Project is expected to affect individual and family spending during Construction. The effect will vary depending on individual and family circumstances prior to and during Phase 2 employment.

There is potential for employees to increase their unproductive spending as a result of increased income. However, such unproductive spending is not anticipated among the majority of Phase 2 Project employees, partly due to TMAC's "zero tolerance" policy for alcohol and drug use (KIA & TMAC 2015). In cases where Phase 2 employees engage in unproductive spending, it is acknowledged that this type of spending may contribute to other indirect negative impacts such as increased crime, domestic

violence, and drug and alcohol use. These social issues currently exist in the Kitikmeot Region but have the potential to be indirectly exacerbated by the Phase 2 Project.

For employees, increased income also has the potential to change family spending related to housing and other areas of household consumption. Changes in employment status also carry implications for income supports. Those living in public housing will experience a gradual decrease in rental subsidy as employment status changes and income level increases. This gradual transition is designed to support wealth accumulation and greater financial independence. For example, following the development of the Meadowbank Mine, reliance on income support decreased by 20% in Baker Lake. This effect is positive as increased income and levels of responsibility for finances serve to establish greater overall self-reliance for individuals and families.

As an additional positive effect due to changes in family spending, Phase 2 Project employees may also use income to support traditional lifestyle activities such as harvesting. The cost of equipment can be a barrier to participation in traditional lifestyle activities, so there is potential for increased income to enable larger equipment purchases (e.g. ATVs, snow machines, hunting rifles).

Operation

Effects of the Phase 2 Project on community health and well-being due to changes to family spending during the Operation phase will be as described above for the Construction phase.

Characterization of Hope Bay Project Potential Effect

Again, because the complete Hope Bay Project will result in employment and income impacts within the Kitikmeot Region that are similar to the Operation phase of the Phase 2 Project, but beginning in 2017 and extending through the Phase 2 Construction period, the assessment of the potential changes to family spending does not appreciably change. The potential effects will be as described for Phase 2.

Residual Effect of Changes to Family Spending

As personal incomes increase through Phase 2 Project employment, family spending is also expected to increase. A number of positive impacts are associated with productive spending in the areas of education, housing, consumer goods, and investments in durable goods (e.g. harvesting equipment). However, there is also potential for an increase in unproductive spending among some Phase 2 and Hope Bay Project employees and their family members, including increases in gambling and alcohol and drug use. However, how income is spent is a personal choice made by individuals and will, to a large extent, determine whether there is a positive or negative residual effect. Mitigation to address the negative effects of unproductive spending, including the EFAP and a “zero tolerance” drug and alcohol policy, and TMAC Liaison role, will be in place during Construction and Operations phases. Experience of the Doris Project and projects elsewhere indicate that issues associated with unproductive spending are typically isolated to a relatively small number of individuals, with increases in income from employment exacerbating existing challenges that those individuals and their families face. In addition to the positive effects of changes to family spending, **during Construction and Operation a negative residual effect of changes to family spending on the VSEC Community Health and Well-being is predicted**.

Changes to Food Security and Cost of Living

The transition to the wage economy has been ongoing in Nunavut since the time of community settlement over 50 years ago. Reconciling subsistence economies with the wage economy is a continuing struggle, particularly as employment opportunities are scarce and the cost of living high.

For example, under the Consumer Price Index (CPI) Food Price Basket, the cost of a food basket in the Kitikmeot Region was almost double that of Canada overall in March 2014. While the price of a food basket under the Revised Northern Food Basket (RNFB) program has decreased across Kitikmeot communities during the 2011 to 2014 period, the cost is still almost double that of the Canadian average (ERM 2015). While weekly food costs in the Kitikmeot[25] Region remain high ranging from $425 to $461 (in 2014).

An important aspect of food security within the RSA communities is the continuance of traditional land use practices and the harvesting of country foods. For the majority of Nunavut residents (66%), at least half of the meat and fish they consume is obtained through traditional harvesting methods; an additional 38% report that more than half of the meat and fish consumed is obtain through harvesting activities (as compared to the amount that is purchased in stores) (Statistics Canada 2008). The 2006 survey also reported that approximately 57% of Nunavut children ages 6 to 14 ate wild meat, caribou, walrus, and/or muktuk three or more days per week (Inuit Qaujisarvingat Knowedge Centre n.d.). Another survey indicated that 35.1% of homes were severely food insecure (defined as disrupted eating patterns and reduced food intake among adults and/or children), and another 35.1% of homes were moderately food insecure (Egeland 2010). Homes with children were more likely to be food insecure than homes without children.

Characterization of Phase 2 Potential Effect

Construction

As noted above, the cost of food in Nunavut is significantly higher than the Canadian average. This contributes to higher rates of moderate and severe food insecurity in Kitikmeot communities. Limited employment opportunities in the wage economy in Kitikmeot communities coupled with the high cost of equipment to enable subsistence harvesting leaves many households food insecure. There is potential for the Phase 2 Project to reduce food insecurity through increased employment and income.

Employees who choose to use their income productively (e.g. spending on nutritious foods, purchasing equipment to support harvesting) have the potential to positively impact food security not only in their own households but also amongst their extended family networks, due to the Inuit cultural practice of sharing food (and country foods in particular).

There is also potential for employees to continue or increase their traditional harvesting activities due to the increases in personal income (affording an increase in ability to purchase fuel and equipment) and the extended period of time off work afforded by the fly-in/fly-out worker rotation schedule. A positive impact of Phase 2 Project employment may, therefore, be an overall increase in subsistence harvesting in Kitikmeot communities.

Operation

Effects of the Phase 2 Project on community health and well-being due to changes to food security and cost of living during the Operation phase will be as described above for the Construction phase.

[25] Data is unavailable for Kugaaruk.

Characterization of Hope Bay Project Potential Effect

Similarly, with consideration of the complete Hope Bay Project the effects due to changes in food security and cost of living do not change appreciably, and will be as described above for the Phase 2 Project.

Residual Effect of Changes to Food Security and Cost of Living

Increased incomes due to Phase 2 and Hope Bay Project employment are expected to have an overall positive impact on food security, enabling households to better manage the high cost of living in Kitikmeot communities. While not on site, employees may be able to increase country food consumption through the purchase of harvesting equipment and supplies, which is expected to enhance their ability to engage in hunting activities. This will be complemented by a number of mitigations to ensure access to country foods for employees while they are on-site, including providing a country food kitchen and serving country foods. **No negative residual effect of changes to food security and cost of living on the VSEC Community Health and Well-being is predicted**.

3.5.6 Characterization of Residual Effects

3.5.6.1 Definitions for Characterization of Residual Effects

In order to determine the significance of a residual effect, each potential negative residual effect is characterized by a number of attributes consistent with those defined in of the EIS Guidelines (Section 7.14, Significance Determination for the Hope Bay Project; NIRB 2012a). A definition for each attribute and the contribution that it has on significance determination is provided in Table 3.5-12. Residual effects that have been assessed as positive, as evaluated above (Section 3.5.5), are not further assessed for significance.

Table 3.5-12. Attributes to Evaluate Significance of Potential Residual Effects

Attribute	Definition and Rationale	Impact on Significance Determination
Direction	The ultimate long-term trend of a potential residual effect - positive, neutral, or negative.	Positive, neutral, and negative potential effects on VSECs are assessed, but only negative residual effects are characterized and assessed for significance.
Magnitude	The degree of change in a measurable parameter or variable relative to existing conditions. This attribute may also consider complexity - the number of interactions (Project phases and activities) contributing to a specific effect.	The higher the magnitude, the higher the potential significance.
Equity	The dispersal of potential residual effects across different social groups or segments of society.	A high degree of equity indicates a relatively even dispersal of the residual effect. The lower the equity, the higher the potential significance.
Duration	The length of time over which the residual effect occurs.	The longer the length of time of an interaction, the higher the potential significance.
Frequency	The number of times during the Project or a Project phase that an interaction or socio-economic effect can be expected to occur.	Greater the number times of occurrence (higher the frequency), the higher the potential significance.
Geographic Extent	The geographic area over which the interaction will occur.	The larger the geographical area, the higher the potential significance.
Reversibility	The likelihood an effect will be reversed once the Project activity or component is ceased or has been removed. This includes active management for recovery or restoration.	The lower the likelihood a residual effect will be reversed, the higher the potential significance.

For the determination of significance, each attribute is characterized. The characterizations and criteria for the characterizations are provided in Table 3.5-13. Each of the criteria contributes to the determination of significance.

Table 3.5-13. Criteria for Residual Effects for Socio-Economic Attributes

Attribute	Characterization	Criteria[1]
Direction	Positive	Beneficial
	Variable	Both beneficial and undesirable
	Negative	Undesirable
Magnitude	Negligible	No change on the exposed indicator/VSEC
	Low	Differing from the average value for the existing socio-economic conditions to a small degree, and well below the range of historical variation
	Moderate	Differing from the average value for the existing socio-economic conditions and approaching the limits of historical variation
	High	Differing from the existing socio-economic conditions so that there will be a detectable change beyond the range of historical variation (i.e., change of system state from the existing conditions)
Equity	Equitable	Even distribution of potential residual effects across different social groups or segments of society
	Neutral	Potential residual effects are unevenly distributed but do not pertain to any particular social group or segment of society
	Inequitable	Uneven distribution of potential residual effects occurring to particular social groups or segments of society, including vulnerable groups
Duration	Short	Up to 3 years (Construction phase)
	Medium	Greater than 3 years and up to 22 years (3 years Construction phase, 17 years Operation phase, 2 years Reclamation and Closure phase)
	Long	Beyond the life of the Project
Frequency	Infrequent	Occurring only occasionally
	Intermittent	Occurring during specific points or under specific conditions during the Project
	Continuous	Continuously occurring throughout the Project life
Geographic Extent (socio-economic)	LSA communities	Communities of Cambridge Bay and Kugluktuk
	RSA communities	Communities of Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and Kugaaruk
	Beyond Kitikmeot Region	Beyond the RSA communities
Reversibility	Reversible	Effect reverses within an acceptable time frame with no intervention
	Reversible with effort	Active intervention (effort) is required to bring the effect to an acceptable level
	Irreversible	Effect will not be reversed

3.5.6.2 Determining the Significance of Residual Effects

Section 7.4 of the EIS Guidelines (NIRB) provided guidance, attributes, and criteria for the determination of significance for residual effects. Also, the Canadian Environmental Assessment Agency's *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects (CEA Agency 1992)* also guided the evaluation of significance for identified residual effects. The significance of residual effects is based on comparing the predicted state of the environment with and without the Project, including a judgment as to the importance of the changes identified.

Probability of Occurrence or Certainty

Prior to the determination of the significance for negative residual effects, the probability of the occurrence or certainty of the effect is evaluated. For each negative residual effect, the probability of occurrence is categorized as unlikely, moderate or likely. Table 3.5-14 presents the definitions applied to these categories.

Table 3.5-14. Definition of Probability of Occurrence and Confidence for Assessment of Residual Effects

Attribute	Characterization	Criteria
Probability of occurrence or certainty	Unlikely	Some potential exists for the effect to occur; however, current conditions and knowledge of socio-economic trends indicate the effect is unlikely to occur.
	Moderate	Current conditions and socio-economic trends indicate there is a moderate probability for the effect to occur.
	Likely	Current conditions and socio-economic trends indicate the effect is likely to occur
Confidence	High	Baseline data are comprehensive; predictions are based on well-established and understood socio-economic conditions and trends; effect relationships are well understood.
	Medium	Baseline data are comprehensive; predictions are based on socio-economic trends that are currently developing or changing; effect relationships are generally understood, with some assumptions made based on other socio-economic trends and conditions.
	Low	Baseline data are limited; predictions are based on socio-economic trends and conditions that vary across communities and regions; effect relationships may be variable or poorly understood.

Determination of Significance

As defined in the EIS Guidelines (NIRB), effect significance "is based on comparing the predicted state of the environment with and without the Project and expressing a judgment as to the importance of the changes identified."

The overall significance of an effect is derived from the experience and professional judgment of the environmental practitioners who prepare the assessment, considering the rankings of the contributing attributes of significance. While substantially based on professional judgment, the following are general rules of thumb applied in determining significance:

- If the magnitude of the negative effect is low, then the predicted effect is "not significant". If effects on measurable components meet applicable performance criteria, standards or

guidelines, then the magnitude of the effect is negligible to moderate and, therefore, the prediction will be that an effect that is "not significant."

- If the geographic extent of the effect is confined to the LSA, then the predicted effect is likely to be "not significant."
- If the extent of a negative socio-economic effect is limited to individuals who also receive a corresponding positive benefit, then the predicted effect is likely to be "not significant."
- If the effect has a moderate to high reversibility, the predicted effect is likely to be "not significant."
- If the duration of the effect is short term (e.g., Construction phase only) then the effect prediction is also likely to be "not significant."

Confidence

The knowledge or analysis that supports the prediction of a potential residual effect—in particular with respect to limitations in overall understanding of the socio-economic environment and/or the ability to foresee future events or conditions—determines the confidence in the determination of significance. In general, the lower the confidence, the more conservative the approach to prediction of significance must be. The level of confidence in the prediction of a significant or non-significant potential residual effect qualifies the determination, based on the quality of the data and analysis and their extrapolation to the predicted residual effects. "Low" is assigned where there is a low degree of confidence in the inputs, "medium" when there is moderate confidence and "high" when there is a high degree of confidence in the inputs. Where rigorous baseline data were collected and scientific analysis performed, the degree of confidence will generally be high. Table 3.5-14 provides descriptions of the confidence criteria.

Residual effects identified in the Project-related effects assessment are carried forward to assess the potential for cumulative interactions with the residual effects of other projects or human activities (addressed in Section 5.4 Cumulative Effects Assessment Methodology) and to assess the potential for transboundary impacts should the effects linked directly to the activities of the Phase 2 Project inside the Nunavut Settlement Area (NSA), which occurs across provincial, territorial, international boundaries or may occur outside of the NSA (addressed in Section 3.5.7).

3.5.6.3 Characterization of Residual Effects for Employment

The provision of employment is expected to produce substantial benefits in the Kitikmeot Region. These employment opportunities may result in competition for labour locally as a result of the demand for skilled labour and the higher than average incomes often associated with mine employment. This negative residual effect on the VSEC Employment is anticipated during Phase 2 Project Construction and Operation. Further, at Reclamation and Closure and Temporary Closure, the removal of employment opportunities is expected to have a negative residual effect on the VSEC Employment due to the loss of employment opportunities and income compared with Operation.

This section characterizes the expected negative residual effects of the Phase 2 and Hope Bay Project on the VSEC Employment. A summary of the characterization of each negative residual effect and the determination of significance is provided in Table 3.5-15 for Phase 2 and Table 3.5-16 for the complete Hope Bay Project. Positive residual effects are not further evaluated.

Table 3.5-15. Summary of Residual Effects and Overall Significance Rating for Socio-economics - Phase 2

Description of Residual Effect	Attribute Characteristic							Overall Significance Rating		
	Direction (*positive, variable, negative*)	**Magnitude** (*negligible, low, moderate, high*)	**Equity** (*equitable, neutral, inequitable*)	**Duration** (*short, medium, long*)	**Frequency** (*infrequent, intermittent, continuous*)	**Geographic Extent** (*LSA communities, RSA communities, beyond Kitikmeot Region*)	**Reversibility** (*reversible, reversible with effort, irreversible*)	**Probability** (*unlikely, moderate, likely*)	**Significance** (*not significant, significant*)	**Confidence** (*low, medium, high*)
Employment										
Changes to employment opportunities and income	Negative	Moderate	Neutral	Short	Intermittent	RSA Communities	Reversible	Likely	Not Significant	High
Competition for local labour	Negative	Moderate	Neutral	Medium	Intermittent	RSA Communities	Reversible	Likely	Not Significant	Medium
Community Health and Well-being										
Changes to family stability	Variable	Low	Neutral	Medium	Continuous	RSA communities	Reversible	Moderate	Not Significant	Medium
Changes to family spending	Variable	Low	Neutral	Medium	Continuous	RSA communities	Reversible	Moderate	Not Significant	Medium

Table 3.5-16. Summary of Residual Effects and Overall Significance Rating for Socio-economics – Hope Bay Project

Description of Residual Effect	Attribute Characteristic							Overall Significance Rating		
	Direction (*positive, variable, negative*)	**Magnitude** (*negligible, low, moderate, high*)	**Equity** (*equitable, neutral, inequitable*)	**Duration** (*short, medium, long*)	**Frequency** (*infrequent, intermittent, continuous*)	**Geographic Extent** (*LSA communities, RSA communities, beyond Kitikmeot Region*)	**Reversibility** (*reversible, reversible with effort, irreversible*)	**Probability** (*unlikely, moderate, likely*)	**Significance** (*not significant, significant*)	**Confidence** (*low, medium, high*)
Employment										
Changes to employment opportunities and income	Negative	Moderate	Neutral	Short	Intermittent	RSA Communities	Reversible	Likely	Not Significant	High
Competition for local labour	Negative	Moderate	Neutral	Medium	Intermittent	RSA Communities	Reversible	Likely	Not Significant	Medium
Community Health and Well-being										
Changes to family stability	Variable	Low	Neutral	Medium	Continuous	RSA communities	Reversible	Moderate	Not Significant	Medium
Changes to family spending	Variable	Low	Neutral	Medium	Continuous	RSA communities	Reversible	Moderate	Not Significant	Medium

Changes to Employment and Income Opportunities

This effect is expected to be negative in direction and moderate in magnitude. The magnitude of the effect will depend on the number of Phase 2 Project workers that are able to continue employment during Reclamation and Closure or Temporary Closure, and able to find alternative employment elsewhere at the time. The duration is anticipated to be short term. It is expected that with the skills and experience gained by regional workers on the Phase 2 Project, this will increase their ability to find employment elsewhere. The equity of this effect is determined to be neutral. The frequency is expected to be intermittent as the effect will occur at specific points in time when labour force reductions are made. The geographic extent is expected to be limited to the RSA, with most impacts taking place in the LSA. The effect is reversible as those who lose Phase 2 Project-related jobs will obtain employment elsewhere.

The probability is rated as likely as the effect will occur given the planned closure of the Phase 2 Project. Confidence is rated as medium as there is uncertainty with respect to the actual number of local and regional workers hired for the Project. As a result, the effect 'changes to employment and income opportunities' at Project Reclamation and Closure is determined to be **Not Significant**. This significance rating is based on the short duration, limited geographic extent and the reversible nature of the effect. Because Phase 2 Reclamation and Closure occurs at the end of the planned Hope Bay Project activities (i.e., Doris development and exploration activities will occur prior) there is no change to the assessment conclusions for the Hope Bay Project.

Competition for Local Labour

This effect is expected to be negative in direction and moderate in magnitude. The magnitude is assessed as moderate because the expected competition for labour has the potential to affect some local and regional operations/businesses given the transferability of skills required for Phase 2 and the Hope Bay Project. During the Construction phase of Phase 2, because of the shorter-term duration of employment opportunities and the specialized skillset required, is anticipated to be minimal and to affect a small number of operations/businesses. However, with the Hope Bay Project (i.e., Doris) the demand for workers will be similar during both the Construction and Operation phases of Phase 2. However, the duration is still anticipated to be medium term. The equity of this effect is determined to be neutral. The frequency is expected to be intermittent as the effect is expected to occur when hiring takes place. The geographic extent is expected to be limited to the RSA, with most impacts taking place in the LSA. The effect is reversible and exists only as an indirect effect of employment.

There is a moderate probability that this effect will occur and a medium level of confidence is provided based on past experience. As a result, the effect 'competition for local labour' is determined to be **Not Significant**. This significance rating is based on the moderate magnitude, limited geographic extent, and the reversible nature of the effect.

3.5.6.4 Characterization of Residual Effects for Community Health and Well-being

Phase 2 and the Hope Bay Project is predicted to result in residual effects on the VSEC Community Health and Well-being due to changes to family spending and changes to family stability associated with the influence of increased household incomes and the change in family roles and relationships associated with Project work. These effects are predicted to be both positive and negative. Mitigation has been identified to enhance the positive and reduce the negative aspects of these two effects; however, in keeping with a precautionary approach, the negative residual effects are further assessed and evaluated for significance.

This section characterizes the expected negative residual effects of the Phase 2 and Hope Bay Project on the VSEC Community Health and Well-being. A summary of the characterization of each negative residual effect and the determination of significance is provided in Table 3.5-15 for Phase 2 and Table 3.5-16 for the complete Hope Bay Project. Positive residual effects are not further evaluated.

Changes to Family Stability

The effect 'changes to family stability' is both negative and positive in direction. As a negative effect it is assessed as being low in magnitude because it is expected to affect a relatively small number of households resulting in a change in the existing socio-economic conditions but overall, for the LSA and RSA communities, below the range of historic variation. The equity of this effect is determined to be neutral in that it is not expected to affect one segment of society or group more than another. The duration is predicted to be medium-term and the frequency to be continuous as the residual effect is related to ongoing Phase 2 and Hope Bay Project employment during Construction and Operation phases. The geographic extent is expected to be limited to the RSA communities. The effect is reversible because it is a direct result of Project employment and income. Because the complete Hope Bay Project will result in employment and income impacts within the Kitikmeot Region that are similar to the Operation phase of the Phase 2 Project, but beginning in 2017 and extending through the Phase 2 Construction period, the assessment of the potential changes to family stability does not appreciably change compared with Phase 2 in isolation.

There is a moderate probability that this effect will occur and a medium level of confidence is provided based on past experience. As a result, the effect 'changes to family stability' is determined to be **Not Significant**. This significance rating is based on the low magnitude and the reversible nature of the effect. The determination is further supported as the effect does not extend beyond the life of the Project and is only applicable for individuals and their families who receive the corresponding benefit of employment.

Changes to Family Spending

The effect 'changes to family spending' is both negative and positive in direction, with the realization of negative effects a result of the spending choices and behaviours of individual workers. As a negative effect it is assessed as being low in magnitude because it is expected to affect a relatively small number of households resulting in a change in the existing socio-economic conditions but overall, for the LSA and RSA communities, below the range of historic variation. The equity of this effect is determined to be neutral in that it is not expected to affect one segment of society or group more than another, although individuals with pre-existing challenges associated with gambling and substance abuse issues are expected to be more vulnerable. The duration is predicted to be medium-term and the frequency to be continuous as the residual effect is related to ongoing Phase 2 and Hope Bay Project employment during Construction and Operation phases. The geographic extent is expected to be limited to the RSA communities. The effect is reversible because it is a direct result of Project employment and income. Because the complete Hope Bay Project will result in employment and income impacts within the Kitikmeot Region that are similar to the Operation phase of the Phase 2 Project, but beginning in 2017 and extending through the Phase 2 Construction period, the assessment of the potential changes to family spending does not appreciably change compared with Phase 2 in isolation.

There is a moderate probability that this effect will occur and a medium level of confidence is provided based on past experience. As a result, the effect 'changes to family spending' is determined to be **Not Significant**. This significance rating is based on the low magnitude and the reversible nature of the effect. The determination is further supported as the effect does not extend beyond the life of the Phase 2 Project and is only applicable for individuals and their families who receive the corresponding benefit of employment.

3.6 CUMULATIVE EFFECTS ASSESSMENT

3.6.1 Methodology Overview

The potential for cumulative effects arises when the potential residual effects of Phase 2 and the Hope Bay Project affect (i.e., overlap and interact with) the same VSEC that is affected by the residual effects of other past, existing or reasonably foreseeable projects or activities. Interacting projects and activities may combine to create additive or synergistic effects. An additive effect increases the effect in a linear way. A synergistic effect may result in an effect greater than the sum of the two actions.

3.6.1.1 Approach to Cumulative Effects Assessment

The general methodology for cumulative effects assessment (CEA) is described in Volume 2, Section 4, and focuses on the following activities:

1. Identify the potential for Project-related residual effects to interact with residual effects from other human activities and projects within specified assessment boundaries. Key potential residual effects associated with past, existing, and reasonably foreseeable future projects were identified using publicly available information or, where data was unavailable, professional judgment was used (based on previous experience in similar geographical locations) to approximate expected environmental conditions.
2. Identify and predict potential cumulative effects that may occur and implement additional mitigation measures to minimize the potential for cumulative effects.
3. Identify cumulative residual effects after the implementation of mitigation measures.
4. Determine the significance of any cumulative residual effects.

3.6.1.2 Assessment Boundaries

The CEA considers the spatial and temporal extent of Phase 2 and Hope Bay Project-related residual effects on VSECs combined with the anticipated residual effects from other projects and activities to assist with analyzing the potential for a cumulative effect to occur.

Spatial Boundaries

The cumulative effects assessment considers past, existing, and reasonably foreseeable major projects with potential residual effects that occur within the outer geographical limit of possible interaction with the Hope Bay Project. For the purpose of this assessment, the spatial boundaries used for the CEA include past, existing, and reasonably foreseeable projects and human activities in Nunavut and the Northwest Territories considered to have potential effects within the socio-economic RSA that are relevant to current residents. The socio-economic RSA is as defined in Section 3.4.2 (Spatial Boundaries) and includes communities of Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and Kugaaruk.

Temporal Boundaries

The temporal boundary used for the CEA includes those projects and human activities considered to have residual effects that may act on current residents of the socio-economic RSA also affected by the Phase 2 Project as defined by the phases of the Phase 2 Project (i.e., there is temporal overlap). Temporal boundaries for the Project effects assessment are defined in Section 3.4.3 (Temporal Boundaries); for the CEA a longer timeline must be considered to account for the timelines of the other projects and human activities that may have temporal overlap.

The following periods were identified and evaluated as part of the CEA.

- **Past:** These are historical, closed projects and activities occurring within the outer geographical limit of possible interaction with the Project. The year 2001 was selected as the past temporal boundary, representing a time when rigorous baseline studies and activities first occurred in the CEA study area. Baseline studies captured the effects of past activities.
- **Existing:** These are projects and activities undergoing construction or operating concurrently with the Phase 2 Project and occurring within the outer geographical limit of possible interaction with the Phase 2 Project.
- **Reasonably Foreseeable Future:** These are projects formally accepted into a regulatory approvals process and occur within the outer geographical limit of possible interaction with the Phase 2 Project. The boundaries are VSEC-specific and based on the predicted length of time it would take for the VSEC to recover to baseline conditions, if possible.

3.6.2 Potential Interactions of Residual Effects with Other Projects

The mining industry is the main source of industrial activity in Nunavut, which is being explored for uranium, diamonds, gold and precious metals, base metals, iron, coal, and gemstones. In addition to major mining development projects, other land use activities are also present in the territory and, as required under Section 7.11 of the EIS Guideline (NIRB), were considered for potential interactions with the Hope Bay Project. The identified mining, exploration and land used activities that may potentially interact with selected VSECs for the Phase 2 Project are summarized in Table 3.6-1.

Table 3.6-1. Past, Existing, and Reasonably Foreseeable Future Projects with the Potential to Interact Cumulatively with Socio-economics

	Project	Location	Type	Proponent	Dates Active	Current Status
Past	Jericho	Nunavut	Diamond mine	Shear Diamonds Ltd.	2006 to 2012	Care and maintenance
	Lupin	Nunavut	Gold mine	Elgin Mining Inc.	1982 to 2004	Care and maintenance
	Snap Lake	Northwest Territories	Diamond mine	De Beers Canada Inc.	2008 to 2015	Care and maintenance
Present	Canadian High Arctic Research Station	Nunavut	Science station	Polar Knowledge Canada	2014 to 2018 (construction) Operation thereafter	Construction
	Diavik	Northwest Territories	Diamond mine	Rio Tinto and Dominion Diamonds	2003 to 2023	Operating
	Ekati	Northwest Territories	Diamond mine	Dominion Diamonds	1998 to 2033	Operating
	Gahcho Kué	Northwest Territories	Diamond mine	De Beers and Mountain Province	2015 to 2028	Operating (by 2017)

	Project	Location	Type	Proponent	Dates Active	Current Status
Reasonably Foreseeable Future	Back River (George Lake and Goose Lake)	Nunavut	Gold mine	Sabina Gold and Silver Corp.	2019 to 2029	Application submitted
	Bathurst Inlet Port and Road	Nunavut	All-weather road	BIPR	20 years	Pre-application
	Coppermine River	Nunavut	Copper mine	Kaizen Discovery Inc.	Unknown	Exploration
	Courageous Lake	Northwest Territories	Gold mine	Seabridge Gold	15 years	Pre-application
	Grays Bay Road and Port Project	Nunavut	All-weather road	Nunavut Resources Corp. & GN	Unknown	Pre-application
	Hackett River	Nunavut	Base metal mine	Glencore Plc.	15 years	Pre-application
	Hood River	Nunavut	Gold mine	WPC Resources Inc.	Unknown	Exploration
	Itchen Lake	Nunavut	Gold mine	Nunavut Resources Corporation and Transition Metals Corp.	Unknown	Exploration
	Izok Corridor (High Lake and Izok Lake)	Nunavut	Copper, zinc, gold, silver mine	MMG Resources Inc.	14 years	Pre-application
	Ulu Lake	Nunavut	Gold mine	WPC Resources Inc.	Unknown	Exploration

With respect to socio-economic effects, the following VSECs were considered in the CEA:

- Employment
- Community Health and Well-being

For the purpose of this CEA, all potential cumulative effects are described but only negative residual effects are characterized. The majority of residual socio-economic effects assessed for the Phase 2 Project were deemed to be positive or beneficial in nature. In reviewing the socio-economic positive residual effects, none of these are expected to become negative when combined with existing, past and future projects. The following effects were determined as negative residual effects of Phase 2 and the Hope Bay Project, which combined with other projects and developments, have the potential to cumulatively interact:

- Changes to employment opportunities and income
- Changes to competition for local labour
- Changes to family stability
- Changes to family spending

3.6.3 Identification of Mitigation and Management Measures

Mitigation measures for cumulative effects involves taking further action, where possible, to avoid or minimize cumulative effects on VSECs. Because cumulative effects typically result from the combined effects of multiple developments, responsibility for their prevention and management is shared among

the various developments that contribute to them. It is usually beyond the capability of any one party to implement all of the measures required to reduce or eliminate cumulative effects; therefore, measures often require collaborative efforts between projects or activities. Lack of control over operators of other projects or activities potentially confounds implementation of additional mitigation measures for cumulative effects. Proposed mitigation measures must take technical, environmental, and economical feasibility into consideration as well as the ability to influence the independent operators of other projects and activities.

3.6.3.1 Mitigation and Management Measures for Employment

Mitigation measures proposed to reduce or eliminate the adverse effect of a decrease in employment opportunities and income during Phase 2 Reclamation and Closure, and the adverse effect of competition for local labour at Construction and Operation are described in Section 3.5.5 (Employment). No additional mitigation measures are proposed other than those already implemented by present projects and developments, and those to be implemented by reasonably foreseeable projects and developments.

3.6.3.2 Mitigation and Management Measures for Community Health and Well-being

Mitigation measures proposed to reduce or eliminate the negative effect of changes in family stability and the negative effect of changes in family spending during Construction and Operation of the Phase 2 Project are described in Section 3.5.5 (Community Health and Well-being). No additional mitigation measures are proposed other than those already implemented by present projects and developments, and those to be implemented by reasonably foreseeable projects and developments.

3.6.4 Characterization of Potential Cumulative Effects

This section describes and characterizes the potential cumulative effects on the VSECs Employment, and Community Health and Well-being. If the identified mitigation measures are not sufficient to eliminate a cumulative effect, a cumulative residual effect is identified and described and the specific projects and activities contributing to the cumulative residual effect are discussed. Cumulative residual effects are carried forward for significance determination (Section 3.6.4).

3.6.4.1 Employment

Changes to Employment Opportunities and Income

The reduction in direct employment and other economic opportunities at the Reclamation and Closure phase of the Phase 2 Project has the potential to result in a negative cumulative residual effect on employment opportunities and income if there are other projects and developments that have coinciding closure dates with that of Phase 2. None of the present projects or developments listed in Table 3.6-1 have coinciding closure dates with that of the Phase 2 Project. Given the uncertain schedule of the Back River Project (originally expected to close around year 2029) it may be that closure of that project corresponds with the Phase 2 Project (Reclamation and Closure phase is expected to begin in 2032). Although with low confidence, it is possible for one or more of the reasonably foreseeable projects to have closure dates that coincide with those of the Phase 2 Project. In such a case, there would be cumulative interaction related to the decrease in employment opportunities and personal income that would be considered as an adverse cumulative effect. However, there is a large degree of uncertainty with respect to potential cumulative interactions and an adverse cumulative residual effect. To be conservative, **there is predicted to be a residual negative cumulative effect of changes to employment opportunities and income during Phase 2 Reclamation and Closure**.

Competition for Local Labour

The Hope Bay Project has the potential to result in a negative cumulative residual effect on competition for local labour a result of its demand and the demand of other projects and developments for labour in the Kitikmeot Region. This effect is expected as a result of direct, indirect and induced employment opportunities throughout the Construction and Operation phases of the Phase 2 Project, in combination with the Doris Project, which may coincide with activities of other projects and developments that are also expected to demand workers from the Kitikmeot Region. The potential projects that can cumulatively interact with Phase 2 and the Hope Bay Project include, in particular, CHARS and the Back River Project, as well as other reasonably foreseeable projects and developments listed in Table 3.6-1.

The Back River Project is particularly relevant in this context. This project will require many of the same skillsets and draw from the same communities within the Kitikmeot Region. In total, the Back River Project is expected to require an average of about 400 workers during a 4-year construction phase and 700 workers during a 10-year operation phase. Overall, this places the Back River Project on par in terms of the number workers required and the duration of employment. The Back River Project has yet to receive regulatory approval to proceed and its development remains uncertain. However, should its development correspond with the Hope Bay Project, residual effects of competition for local labour could be exacerbated. **A residual negative cumulative effect of competition for labour on the VSEC Employment is predicted.**

3.6.4.2 Community Health and Well-being

Changes to Family Stability

A residual adverse effect of changes to family stability is predicted for the Hope Bay Project, primarily due to the fly-in/fly-out worker rotation schedule and the social stressors that this can add to the family with the separation and periodic re-introduction of the family member upon return from a work rotation. A negative cumulative effect may occur because other mine developments in the region operate using a similar model and the timing of the Hope Bay Project may coincide with activities of other projects and developments that are also expected to demand workers from the Kitikmeot Region. The potential projects that can cumulatively interact with Phase 2 and the Hope Bay Project include the currently operating diamond mines in the Northwest Territories and the Back River Project, as well as other reasonably foreseeable projects and developments listed in Table 3.6-1. The potential effects are as described in the Project effects assessment and include increased tension in marital and parental relationships, increased potential for negative behaviours (e.g., gambling, alcohol and drug use) as a coping mechanism, increased stressors on mental health, and increased potential for family violence and break-up. **Changes to family stability is predicted to result in a negative residual cumulative effect on the VSEC Community Health and Well-being.**

Changes to Family Spending

As described in the Project effects assessment, a number of positive impacts are associated with employment and the income it provides, including productive spending in the areas of education, housing, and consumer goods and services. However, there is also potential for an increase in unproductive spending among some workers and their family members, including increases in gambling and alcohol and drug use. Additional employment and income in the RSA communities can exacerbate these adverse effects. The potential projects that can cumulatively interact with Phase 2 and the Hope Bay Project include, in particular, CHARS and the Back River Project, as well as other reasonably foreseeable projects and developments listed in Table 3.6-1. **Changes to family spending is predicted to result in a residual negative cumulative effect on the VSEC Community Health and Well-being.**

3.6.5 Characterization of Cumulative Residual Effects

Negative cumulative residual effects for the future case with the Project are characterized using the same criteria applied in the Project-related effect assessment methodology (Section 3.5.6): direction, magnitude, duration, equity, frequency, geographic extent, reversibility, probability of occurrence, and confidence in the analyses and conclusions. Using the same approach as the Project-related effect assessment, the negative cumulative residual effect is characterized as either significant or not significant. A summary of the characterization of each negative cumulative residual effect and the determination of significance is provided in Table 3.6-2. Positive cumulative residual effects are not characterized.

3.6.5.1 Employment

Changes to Employment Opportunities and Income

The potential adverse cumulative effect of decrease in employment opportunities and income during the Reclamation and Closure phase of the Hope Bay Project, coinciding with other projects and developments, is expected to be negative in direction and moderate in magnitude. The magnitude will depend on the number of reasonably foreseeable projects approved for operations and having coinciding closure dates with those of the Hope Bay Project. The duration is anticipated to be short term given the short nature of the phase. The equity of this effect is determined to be neutral. The frequency is expected to be intermittent as the effect is expected to occur with decreasing production activities. The geographic extent is expected to be limited to the RSA. The effect is reversible as those who lose jobs will obtain employment elsewhere.

The probability is rated as unlikely as currently no other present or reasonably foreseeable projects or developments have coinciding closure dates with those of the Phase 2 Project. Confidence is rated as medium as there is uncertainty with respect to the actual number of projects and developments having overlapping closure dates; this is particularly true with respect to the certainty and timing of the Back River Project. As a result, the cumulative effect ‘changes to employment and income opportunities’ is determined to be **Not Significant**. This significance rating is based on the moderate magnitude, short duration, limited geographic extent and the reversible nature of the effect.

Competition for Local Labour

The potential a negative cumulative effect of competition for local labour is assessed as being negative in direction and moderate in magnitude. The magnitude of competition for labour from within the RSA communities will depend on the schedule of other projects, in particular the Back River Project. However, it is expected to be focused on those individuals with the necessary mine-related skills and experience. There remains a large component of the RSA labour force that is available, but lacks the necessary training and experience. The extent to which projects such as Hope Bay are successful in hiring from the Kitikmeot communities will depend on the success of training and education initiatives. The duration is anticipated to be medium term, and the equity is determined to be neutral. The frequency is expected to be intermittent as the effect is expected to occur when hiring takes place. The geographic extent is expected to be limited to the RSA. The effect is reversible and exists only as an indirect effect of employment.

There is a moderate probability that this effect will occur and a medium level of confidence is provided based on the lack of information of the potential overlapping activities of the Hope Bay Project and other projects and developments in the region. As a result, the cumulative effect ‘competition for local labour’ is determined to be **Not Significant**. This significance rating is based on the moderate magnitude, regional geographic extent, and the reversible nature of the effect.

Table 3.6-2. Summary of Cumulative Residual Effects and Overall Significance Rating for Socio-economics

Description of Residual Effect	Attribute Characteristic							Overall Significance Rating		
	Direction (*positive, variable, negative*)	**Magnitude** (*negligible, low, moderate, high*)	**Equity** (*equitable, neutral, inequitable*)	**Duration** (*short, medium, long*)	**Frequency** (*infrequent, intermittent, continuous*)	**Geographic Extent** (*LSA communities, RSA communities, beyond Kitikmeot Region*)	**Reversibility** (*reversible, reversible with effort, irreversible*)	**Probability** (*unlikely, moderate, likely*)	**Significance** (*not significant, significant*)	**Confidence** (*low, medium, high*)
Employment										
Changes to employment opportunities and income	Negative	Moderate	Neutral	Short	Intermittent	RSA Communities	Reversible	Unlikely	Not Significant	Medium
Competition for local labour	Negative	Moderate	Neutral	Medium	Intermittent	RSA Communities	Reversible	Moderate	Not Significant	Medium
Community Health and Well-being										
Changes to family stability	Variable	Moderate	Neutral	Medium	Continuous	RSA communities	Reversible	Moderate	Not Significant	Medium
Changes to family spending	Variable	Low	Neutral	Medium	Continuous	RSA communities	Reversible	Moderate	Not Significant	Medium

3.6.5.2 Community Health and Well-being

Changes to Family Stability

The cumulative effect 'changes to family stability' is both negative and positive in direction. As a negative effect it is assessed as being moderate in magnitude because it is expected to affect a larger number of households in the RSA communities, compared with the Hope Bay Project in isolation, with the additional development of remote work projects, such as the Back River Project. However, it is assumed that other projects will implement mitigation similar to that identified for the Hope Bay Project. The equity of this effect is determined to be neutral in that it is not expected to affect one segment of society or group more than another. The duration is predicted to be medium-term and the frequency to be continuous as the residual effect is related to ongoing employment. The geographic extent is expected to be limited to the RSA communities. The effect is reversible because it is a direct result of employment and income.

There is a moderate probability that this effect will occur, depending on the realized timing of other project developments, and a medium level of confidence is provided based on past experience. As a result, the negative residual cumulative effect 'changes to family stability' is determined to be **Not Significant**. This significance rating is based on the moderate magnitude and the reversible nature of the effect. The determination is further supported as the effect is only applicable for individuals and their families who receive the corresponding benefits of employment from the projects considered.

Changes to Family Spending

The residual cumulative effect 'changes to family spending' is predicted to be both negative and positive in direction, with the realization of negative effects a result of the spending choices and behaviours of individual workers. The negative effect it is assessed as being low in magnitude because it is expected that, despite addition projects bringing additional employment and income to the Kitikmeot communities, negative spending choices are still expected to affect a relatively small number of households. As previously discussed, how income is spent is a personal choice made by individuals and will, to a large extent, determine whether there is a positive or negative residual cumulative effect. It is further assumed that other projects will implement mitigation that is similar to TMAC's, such as offering an EFAP and enforcing a "zero tolerance" drug and alcohol policy with workers. The equity of this effect is determined to be neutral in that it is not expected to affect one segment of society or group more than another, although individuals with pre-existing challenges associated with gambling and substance abuse issues are expected to be more vulnerable. The duration is predicted to be medium-term and the frequency to be continuous because the residual effect is associated with ongoing employment. The geographic extent is expected to be limited to the RSA communities. The effect is reversible because it is a direct result of Project employment and income.

There is a moderate probability that this effect will occur, depending on the realized timing of other project developments, and a medium level of confidence is provided based on past experience. As a result, the negative cumulative effect 'changes to family spending' is determined to be **Not Significant**. This significance rating is based on the low magnitude and the reversible nature of the effect.

3.7 TRANSBOUNDARY EFFECTS

The EIS Guidelines (NIRB) define transboundary effects as those effects linked directly to the activities of the Project inside the NSA, which occur across provincial, territorial, international boundaries or may occur outside of the NSA (NIRB 2012a). Transboundary effects of the Project have the potential to act cumulatively with other projects and activities outside the NSA.

3.7.1 Methodology Overview

The following systematic process was used to determine which VSECs would be included in the transboundary effects assessment:

- Identify any potential residual adverse effects of the Project (Phase 2 and the complete Hope Bay Project) on a VSEC, after mitigation measures are applied, that may result in transboundary effects.
- Determine whether the residual effects of the Project may operate cumulatively in a transboundary context with the environmental effects of projects or activities located in other jurisdictions. Assess whether the Project will interact cumulatively in a meaningful way (i.e., is "likely" to heighten effects).
- Describe mitigation measures, where feasible, that may be applied where measurable effects are described.

3.7.2 Potential Transboundary Effects

Phase 2 and the Hope Bay Project are assessed as having non-significant residual effects on the VSECs Employment, and community Health and Well-being. Specifically, the residual effects are:

- Employment
  - Changes to employment opportunities and income
  - Changes to competition for local labour
- Community Health and Well-being
  - Changes to family stability
  - Changes to family spending

3.7.2.1 Employment

Changes to Employment Opportunities and Income

The negative effect of changes to employment opportunities and income at Reclamation and Closure is assessed as being primarily limited to the Kitikmeot Region. The employment of workers from the Northwest Territories with Phase 2 and the Hope Bay Project is predicted to be relatively modest (see Appendix V6-3B) and workers from other areas of Canada are expected to come from a diversity of areas including larger population centres where there are more work opportunities. In addition, with remote fly-in/ fly-out mine operations, the workers are typically experienced with and expect to transition to work on other projects based on the opportunities available across Canada. A potential residual adverse effect of the Project (Phase 2 and the Hope Bay Project) on Employment associated with changes to employment opportunities and income is not predicted.

Changes to Competition for Local Labour

As assessed, the negative residual effect of changes to competition for local labour due to Phase 2 and the Hope Bay Project is predicted to be limited to the Kitikmeot Region. This effect is not expected to reach into Yellowknife, in particular, because of the relatively modest number of workers expected to come from that community. A potential residual adverse effect of the Project (Phase 2 and the Hope Bay Project) on Employment associated with changes to competition for local labour is not predicted.

3.7.2.2 Community Health and Well-being

Changes to Family Stability

A residual adverse effect of changes to family stability is predicted for the Hope Bay Project, primarily due to the fly-in/fly-out worker rotation schedule and the social stressors that this can add to the family. The effect is expected to be primarily limited to the Kitikmeot communities because of the focus on hiring in the region and the current socio-economic conditions and challenges. A potential residual adverse effect of the Project (Phase 2 and the Hope Bay Project) on Community Health and Well-being associated with changes to family stability is not predicted.

Changes to Family Spending

The residual Project effect of changes to family spending results in both positive and negative outcomes, and is highly dependent on the spending choices made by individuals and the success of mitigation. The effect is expected to be primarily limited to the Kitikmeot communities because of the focus on hiring in the region and the current socio-economic conditions and challenges. A potential residual adverse effect of the Project (Phase 2 and the Hope Bay Project) on Community Health and Well-being associated with changes to family spending is not predicted.

In summary, no potential transboundary effects on socio-economics due to Phase 2 and the Hope Bay Project are predicted.

3.8 IMPACT STATEMENT

The Hope Bay Project (the Project) has the potential to have both positive and adverse effects on socio-economic conditions. The interactions with socio-economics are due to the employment of a labour force and the procurement of goods and services for the Project, which in turn may result in changes to households and communities.

VSECs have been selected to represent the interests of Kitikmeot residents in relation to the Project. Regional interests were identified in public and community meetings held in the Kitikmeot communities. The scoping analysis identified the following VSECs and potential effects for inclusion in the assessment:

- Economic Development
  - Changes to economic growth (Project contributions to territorial GDP and tax revenues accruing to the federal and territorial governments).
- Business Opportunities
  - Changes to local business growth (the opportunities for Inuit and northern businesses as a result of Project procurement and as enhanced by implementation of the IIBA).
- Employment
  - Changes to employment opportunities and income (the direct result of Project employment and procurement).
  - Changes to labour force capacity (the potential for changes to the skills and experience of the regional labour force as a result of the requirements of Project employment).
  - Competition for local labour (the potential for currently employed residents of the Kitikmeot Region to leave their employment for mine-related employment).

- Education and Training
  - Changes to the demand for education and training programs (considering the capacity of the regional education system to accommodate the potential increased demand for local education and training programs).
  - Changes in perceptions of education and employment (considering the integration of traditional and western education values that has occurred to date and the motives of youth and their participation in education).
- Migration, Housing, and Infrastructure and Services
  - In-migration to the Kitikmeot Region (the potential for the Project to result in spin-off employment wherein non-local individual may relocate to the region to obtain employment that has been created locally due to economic growth associated with the Project).
  - Changes to the demand for housing (the potential for Project-related in-migration or changes in employment and income status of individuals to result in effects on housing demand).
  - Changes to the demand for local services (the potential for Project-related in-migration to increase the demand for local services).
- Community Health and Well-being
  - Changes to family stability (the ability of local families and others to adapt to the lifestyle of fly-in/fly-out rotation work associated with Project employment).
  - Changes to family spending (implication for increased incomes on individual and family spending patterns as a result of mine-related employment).
  - Changes to food security and cost of living (the potential for changes to traditional harvesting activities and local food costs and the contribution of traditional livelihoods to community and individual well-being).

A key mitigation to be implemented for Phase 2 is the Hope bay Project IIBA, which sets out principles and methods to, among other purposes, maximize Inuit training, employment and business opportunities arising from the Operation of the Project, and provide a mechanism through which effective communication and cooperation can take place. Key features of the IIBA include provisions for, among others: setting annual and long-term Inuit training targets; setting annual Inuit employment targets; first opportunity to resident Kitikmeot Inuit for employment, followed by non-resident Inuit; establishment and administration of a Training and Education Fund; promotion of Inuit content in procurement, including requirement to engage Kitikmeot Qualified Businesses for certain types of goods and services; and establishment, under certain conditions, of a Business Development Fund.

In addition, the Hope Bay Project has an existing Socio-economic Monitoring Program (SEMP) that will accommodate the activities that are the subject of this assessment. The SEMP allows for both early detection of adverse effects on VSECs and reporting of impact and benefit objectives for the Project. As part of the SEMP, TMAC works in collaboration with other stakeholders including the GN, INAC, the KIA, and the communities of the Kitikmeot Region.

The effects assessment concluded that most potential effects would be positive and beneficial. However, four negative residual effects were identified for the VSEC Employment and the VSEC Community Health and Well-being.

Approaching the end of the Operation phase and throughout the Reclamation and Closure phase of Phase 2, there will be a gradual decrease in employment opportunities, and the associated personal

income, that can temporarily increase local and/or regional unemployment levels compared with the levels achieved during Operation. Mitigation will be in place to assist workers in the transition, including a Workforce Transition Plan. The effect 'changes to employment and income opportunities' at Project Reclamation and Closure is determined to be **Not Significant.**

Throughout the Construction and Operation phases, the Phase 2 Project has the potential to increase competition for local labour with specific skills (e.g., truck drivers and heavy equipment operators currently residing in Kugluktuk and Cambridge Bay). Construction will overlap with the additional worker demand from production at the Doris Project. Competition for workers with higher, more specialized skill levels can also occur due to the lower supply of such workers. While Project employment may be perceived as presenting a viable opportunity for those presently employed, this effect is not expected to be widespread. Some competition for local employment may also be expected from the replacement of workers who leave current positions to work at the mine or from the demand for workers for indirect employment opportunities. The effect 'competition for local labour' is determined to be **Not Significant**.

Changes to family stability are anticipated during Phase 2 Project Construction and Operation, and during the operation of the Hope Bay Project, primarily due to the fly-in/fly-out worker rotation schedule and the social stressors that this can add to the family with the separation and periodic re-introduction of the family member upon return from a work rotation. Potential impacts are wide-ranging and include, but are not limited to, increased tension in marital and parental relationships, increased potential for negative behaviours (e.g., gambling, alcohol and drug use) as a coping mechanism, increased stressors on mental health, and increased potential for family violence and break-up. Positive effects of changes to family stability during Construction and Operation will also occur as a result of the Phase 2 Project, primarily due to increases in household income and the resulting increase in standard of living and ability to provide financially for the family. The negative effect 'changes to family stability' is determined to be **Not Significant**.

The effect 'changes to family spending' is both negative and positive. A number of positive impacts are associated with productive spending in the areas of education, housing, consumer goods, and investments in durable goods. However, there is also potential for an increase in unproductive spending among some Phase 2 and Hope Bay Project employees and their family members, including increases in gambling and alcohol and drug use. However, how income is spent is a personal choice made by individuals and will, to a large extent, determine whether there is a positive or negative residual effect. Issues associated with unproductive spending are typically isolated to a relatively small number of individuals, with increases in income from employment exacerbating existing challenges that those individuals and their families face. As a result, the effect 'changes to family spending' is determined to be **Not Significant**.

The potential cumulative effects of Phase 2 and the Hope Bay Project were reviewed and assessed as **Not Significant**. The CEA considered the effects of past, present, and future projects on VSECs for which the primary assessment resulted in residual effects, specifically, on the VSEC Employment and the VSEC Health and Community Well-being. The CEA noted that should other projects be approved and developed, the adoption of similar mitigation and management measures to reduce or eliminate potential negative outcomes is expected. No potential transboundary effects of Phase 2 and the Hope Bay Project were identified.

In sum, the socio-economic effects of the Hope Bay Project will continue to provide significant benefits to the residents of the Kitikmeot Region, as well as Nunavut and Canada as a whole, with the development of Phase 2. Where negative residual effects are anticipated, mitigation and management measures have been established to reduce or eliminate these effects. The socio-economic benefits represent a unique opportunity for further development of the Kitikmeot Region.

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