

## **SECTION 14**

# **MAXIMIZING BENEFITS AND MINIMIZING IMPACTS TO COMMUNITIES**



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## Appendices

Appendix 14A Economic Impact Report

## Section 14 Abbreviations

Term	Description
AANDC	Aboriginal and Northern Development Canada
CLC	Community Learning Centres
CPI	Consumer Price Index
CPR	Cardiopulmonary resuscitation
CSR	Corporate social responsibility
DAR	Developer's Assessment Report
EA	Environmental Assessment
EFAP	Employee and Family Assistance Program
ELP	Ekati Leadership Program
ESA	Effects Study Area
FDD	Final Domestic Demand
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GNWT	Government of Northwest Territories
HSSA	Health and Social Services Authority
IBA	Impact Benefit Agreement
IPI	Implicit Price Index
KIA	Kitikmeot Inuit Association
KLOI	Key Line of Inquiry
LKDFN	Lutsel K'e
LSA	Local Study Area
LVL	Light Vehicle Licence
MTS	Mine Training Society
MVRB	Mackenzie Valley Review Board
n/a	not available
NHS	National Household Survey
NLDP	Northern Leadership Development Program
NSMA	North Slave Métis Alliance
NTLU	Non-traditional Land Use
NWT	Northwest Territories
NWTEIM	Northwest Territories Economic Impact Model
OHC	Occupational Health Centre
PA	Physician Assistants
RCMP	Royal Canadian Mounted Police
RSA	Regional Study Area
SDP	Supervisory Development Program
SEA	Socio-Economic Agreement
SHE	Safety, Health and Environment
SON	Subject of Note



Term	Description
STI	Sexually Transmitted Infections
TG	Tłı̨chǫ Government
TK	Traditional Knowledge
TCWR	Tibbitt to Contwoyto Winter Road
TOR	Terms of Reference
US	United States
VC	Valued Component
WHMIS	Workplace Hazardous Materials Information System
WLP	Workplace Learning Program
YKDFN	Yellowknives Dene First Nation





## Section 14 Units of Measure

Unit	Definition
%	percent
\$	dollar
km	kilometre
tpd	tonnes per day

## 14 MAXIMIZING BENEFITS AND MINIMIZING IMPACTS TO COMMUNITIES

This section of the *Developer's Assessment Report* (DAR) for the Jay Project (Project) discusses the Key Line of Inquiry (KLOI) *Maximizing Benefits and Minimizing Impacts to Communities*. The following topic areas are discussed individually; taken together they make up the socio-economic environment:

- population demographics;
- economics;
- employment and incomes;
- education and training;
- health and well-being;
- physical infrastructure; and,
- non-traditional land use (NTLU).

In general, Project benefits are associated with the stabilization of population, economics, employment and incomes, and support for education and training, while potential negative impacts are associated with demand on infrastructure and disruption of NTLU. The Project has the potential to have both beneficial and detrimental effects on health and well-being, but assessing these effects is a more speculative exercise given the difficulty in predicting people's response to a project, and the effects that diamond mining has had on communities to date. Many effects have been mitigated with community development and contributions to social programs. Social management and environmental design (policies and procedures) play a role in minimizing negative impacts to communities and enhancing benefits. Section 14 describes the existing socio-economic environment, potential Project effects, and the mitigations and social management measures expected to maximize benefits and minimize impacts.

### 14.1 Introduction, Methods and Social Management

#### 14.1.1 The Project

The existing Dominion Diamond Ekati Corporation (Dominion Diamond) Ekati Mine and its surrounding claim block is located approximately 300 km northeast of Yellowknife in the Northwest Territories (NWT). The nearest community is Wekweètì, located approximately 200 km to the west of the mine. Dominion Diamond proposes to develop the Jay pit, along with associated mining and transportation infrastructure to add 10 years of operational mine life to the Ekati Mine. Reclamation activities will occur following the operations phase. Most facilities required to support the Project already exist at the Ekati Mine.

The Jay kimberlite pipe is located beneath Lac du Sauvage in the southeastern portion of the Ekati Mine property approximately 7 km to the northeast of the Misery Pit. A horseshoe shaped dike will be constructed to isolate the portion of Lac du Sauvage overlying the Jay kimberlite pipe. The isolated portion of Lac du Sauvage will be dewatered to allow for open-pit mining of the kimberlite pipe. The Project will also require an access road, pipelines, and power lines to the new open-pit.

## **14.1.2 Socio-Economic Assessment Methods**

### **14.1.2.1 *Baseline Data Collection***

Data are available regarding socio-economic conditions in the NWT and its constituent communities. As such, the socio-economic baseline study relied largely on current sources that characterize the socio-economic setting (e.g., the Statistics Canada census household surveys, Communities and Diamonds reports, literature on social conditions in the NWT). Ekati Staff provided information and data regarding their existing operation (e.g., fiscal and employment effects). Staff also provided valuable anecdotal data on the effects that Ekati has had on communities and workers.

Interviews and email correspondence were conducted with various information holders at the Ekati mine, including members of the procurement, human resources, and community relations teams. Data obtained regarding employee place of residence, incomes, community investment, procurement, and employment were aggregated to protect worker privacy and to respect the confidentiality of Impact Benefit Agreements (IBAs) signed with communities.

The following sources were retrieved and then summarized to characterize the baseline setting:

- Statistics Canada 2001, 2006, and 2011 census community profiles;
- Communities and Diamonds reports;
- socio-economic agreement reports for the existing NWT diamond mines;
- Government of the Northwest Territories (GNWT), Government of Canada, and Government of Nunavut statistical data and reports;
- Aboriginal and Northern Development Canada (AANDC) reports;
- school board, health authority, and Royal Canadian Mounted Police (RCMP) reports and websites;
- previous regulatory applications and commissioned reports; and,
- community and business websites.



In the interest of consistency and comparability between NWT and Nunavut, statistical data used in the discussion of population and demographics, labour force participation, employment by industry, incomes, and educational attainment are from the *2011 Statistics Canada Census National Household Survey* (Statistics Canada 2011a). The National Household Survey (NHS) data are available for most of the local study area (LSA) communities and for the NWT as a whole. According to the NHS, the communities of Bathurst Inlet and Umingmaktok do not have permanent populations. Published government statistical data are not available for these communities. The community of N'Dilo is counted in the City of Yellowknife Census Sub-Division, and so is not reported on separately.

The NHS census data has limitations. Although most census data can be considered representative, they are not 100% reliable. For example, the response rate may vary between census sub-division, and respondents may not answer the census completely. Further, when the census data is aggregated, in most cases the totals are rounded. This rounding can result in totals that exceed or fall short of 100%, or are not equal to the sum of all values in a given row or column of a table.

In addition, rounding is not consistent throughout census topics. For example, while the total population aged 15 and over in the NWT is reported as 32,455 when discussing family structure, it is also reported as 31,750 when the census details labour force characteristics. When summing census sub-divisions to reach a total for the NWT, different rounding at the sub-division level can result in a difference of several hundred. Although this difference is less pronounced at the community level, given that multiple sub-divisions are not rolled up into one total, it does make direct comparison between census topics difficult. Rounding practices are, however, consistent within census topics. Therefore, the categories within the topic (e.g., unemployed, employed, and participation are all categories of the "labour force") are comparable.

Where topics did not directly overlap, and where more recent or reliable data were available, reporting deviated from the NHS. This is most notable in the Health and Well-being section of the baseline report, where health statistics were sourced largely from the GNWT Bureau of Statistics.

### **14.1.2.2 Scoping**

#### **14.1.2.2.1 Scoping Sessions**

Public scoping sessions to inform the Environmental Assessment (EA) process were held on January 7 and 8, 2014 in Yellowknife, NWT and hosted by Mackenzie Valley Review Board (MVRB).

These sessions included members of the North Slave Métis Alliance (NSMA), Tłı̨chǫ Government (TG), and Yellowknives Dene First Nation (YKDFN). Additional scoping sessions were held in Behchokǭ on January 14, 2014 and in Lutsel K'e (LKDFN) on January 16, 2014. Scoping sessions were intended to capture issues that would be included in the Terms of Reference (TOR) for the Jay Project.

#### **14.1.2.2.2 Community Engagement Workshops**

Community Engagement Workshops were hosted by Dominion Diamond from March 10 to 13, 2014 with NSMA, YKDFN, TG and Kitikmeot Inuit Association (KIA). These workshops were intended to provide a focused discussion regarding key issues related to the original Jay-Cardinal Project, particularly regarding fish and wildlife, and to assist Dominion Diamond in meaningfully incorporating Traditional Knowledge (TK) into the Project plan.

After undertaking a full review of the Project, Dominion Diamond decided to mine the Jay pipe only and remove the Cardinal pipe from the Project. In making this change, Dominion Diamond responded to the feedback it received from Dominion Diamond's engagement meetings with communities and stakeholders.

Additional workshops in communities were held on the Jay Project following the release of the revised TOR:

- Lutsel K'e (12 participants on June 17, 2014);
- Lutsel K'e (11 participants on July 15, 2014);
- Tłıchq̓ (16 participants in Behchok̓ on June 24, 2014);
- Yellowknives Dene First Nation (9 participants on June 25, 2014);
- North Slave Métis Alliance (7 participants on June 26, 2014); and,
- Kugluktuk (7 participants on June 27, 2014).

#### **14.1.2.2.3      *Community Site Visits***

Dominion Diamond hosted site visits during the summer. The following groups have participated in these tours:

- Wekweètì – Tłıchq̓ Government representatives and students;
- Gamètì – Tłıchq̓ Government representatives and students;
- Whatì – Tłıchq̓ Government representatives and students;
- Yellowknives Dene First Nation – Chiefs and Elders;
- Behchok̓ – Tłıchq̓ Government representatives and students;
- Inter-Agency Coordinating Team for the Ekati Mine – including representatives from various federal and territorial departments and regulators;
- IEMA;
- Lutsel K'e – community representatives; and,
- Tłıchq̓ – Elders for the What'aa Project.

The purpose of the site visits were to provide tours of the existing facilities and operations as well as to provide an update on the Jay Project. Throughout these tours, community members commented on the traditional use of the Ekati area as well as expressed concerns and recommendations on the development of the Jay Project.



### **14.1.2.3 Valued Components and Measurement Indicators**

Valued Components (VCs) are typically defined as being components of the socio-economic environment (e.g., economic development and opportunities, education and training, and public infrastructure and services) that are important to people's well-being and quality of life. Any change to a VC that can be attributed to a project represents a project effect.

For a socio-economic component to qualify as "valued" for purposes of a project's effects assessment, the component must be known (or be reasonably expected) to occur in the project's area of influence. There must be a reasonable expectation that the component can be meaningfully affected by the project and people must articulate that value is in fact assigned to the component.

A list of potential VCs for the Project are provided in the TOR for the Project based on community consultation efforts completed by MVRB (2013). A broad process of consultation was also undertaken by Dominion Diamond to gather community input on the Project, and to identify key community concerns (refer to Section 4 for further discussion of community engagement). Experience from other projects in the Canadian North and, in particular, the communities affected by diamond mines, was also used in the selection of VCs. The VCs are not assigned to specific groups or sub-sets of groups, but rather represent the general views of the local population.

Valued Components and associated measurement indicators identified for purposes of this socio-economic assessment are listed in Table 14.1-1 in the order of presentation in the assessment of effects sections. The VCs and measurement indicators are not organized to reflect relative importance to communities, but in an effort to provide a narrative framework of cause and effect that does not require excessive length, cross-referencing or repetition.

With regard to Table 14.1-1, elements not specifically identified here as VCs and/or endpoints are not unimportant. On the contrary, all elements of economic, social and cultural life integrate and contribute to overall individual, family and community quality of life, and most are subsumed (and will be discussed) within broader VCs. Further, the diversity of human experience and the range of responses to a project have the result that every component of the socio-economic environment is important to at least some people. A significant effect on a component valued by even a limited number of individuals or families can be important to consider. Finally, there are a number of themes that cut across more than one VC; themes that are considered but are not easily framed as discrete VCs. These include, as examples, gender, self-reliance (broadly defined here as reliance on one's own efforts to achieve quality of life goals), vulnerability to change, and sustainability.

**Table 14.1-1 Valued Components, Assessment Endpoints, and Measurement Indicators**

Valued Component	Assessment Endpoints	Measurement Indicators
Population Demographics	<ul style="list-style-type: none"> <li>• none</li> </ul>	<ul style="list-style-type: none"> <li>• population growth or decline</li> <li>• in and out migration</li> <li>• ethnic composition</li> <li>• age and gender composition</li> <li>• language</li> </ul>
Economy	<ul style="list-style-type: none"> <li>• continue economic and fiscal benefits to communities and the territory</li> </ul>	<ul style="list-style-type: none"> <li>• capital investment</li> <li>• Gross Domestic Product (GDP)</li> <li>• corporate taxes and royalties</li> <li>• other economic and fiscal effects such as inflation</li> </ul>
Employment	<ul style="list-style-type: none"> <li>• maximizing local participation in the Project</li> <li>• improving the capacity of the labour force</li> </ul>	<ul style="list-style-type: none"> <li>• local and regional employment</li> <li>• employment rate</li> <li>• unemployment rate</li> <li>• participation rate</li> <li>• incomes</li> </ul>
Education and Training	<ul style="list-style-type: none"> <li>• encouraging further education in the interest of capacity building</li> <li>• supporting educational services</li> <li>• minimizing negative impacts</li> </ul>	<ul style="list-style-type: none"> <li>• labour force training initiatives</li> <li>• educational attainment</li> <li>• capacity of education services</li> </ul>
Health and Well-being	<ul style="list-style-type: none"> <li>• supporting health, social, emergency and protective services</li> <li>• minimizing negative impacts</li> </ul>	<ul style="list-style-type: none"> <li>• physical and mental health</li> <li>• capacity of healthcare services</li> <li>• family structure and welfare</li> <li>• social and economic disparity</li> <li>• capacity of social services</li> <li>• public health and safety</li> <li>• capacity of emergency response services</li> <li>• crime</li> <li>• capacity of protective services</li> </ul>
Physical Infrastructure	<ul style="list-style-type: none"> <li>• supporting the maintenance of physical infrastructure</li> <li>• minimizing negative impacts</li> </ul>	<ul style="list-style-type: none"> <li>• housing stock and condition</li> <li>• capacity and condition of transportation infrastructure</li> <li>• air</li> <li>• roads</li> <li>• capacity and condition of physical infrastructure</li> <li>• solid waste disposal</li> <li>• water and sanitation</li> <li>• utilities</li> </ul>
NTLU	<ul style="list-style-type: none"> <li>• minimizing negative impacts</li> </ul>	<ul style="list-style-type: none"> <li>• non-renewable resource extraction</li> <li>• tourism</li> <li>• hunting (outfitting)</li> <li>• fishing (commercial)</li> <li>• outdoor recreation</li> <li>• parks and protected areas</li> </ul>

NTLU = non-traditional land use.



#### **14.1.2.4      *Spatial Boundaries***

For purposes of socio-economic assessment, a project footprint is most often considered a study area only where there is a resident population. This is not the case for the Project. The Project's local and regional socio-economic study areas are defined below. For some socio-economic parameters, there is potential for trans-boundary effects. Areas outside the NWT are not considered to constitute an assessment study area, however, where there is potential for a trans-boundary effect this is discussed in the relevant sections.

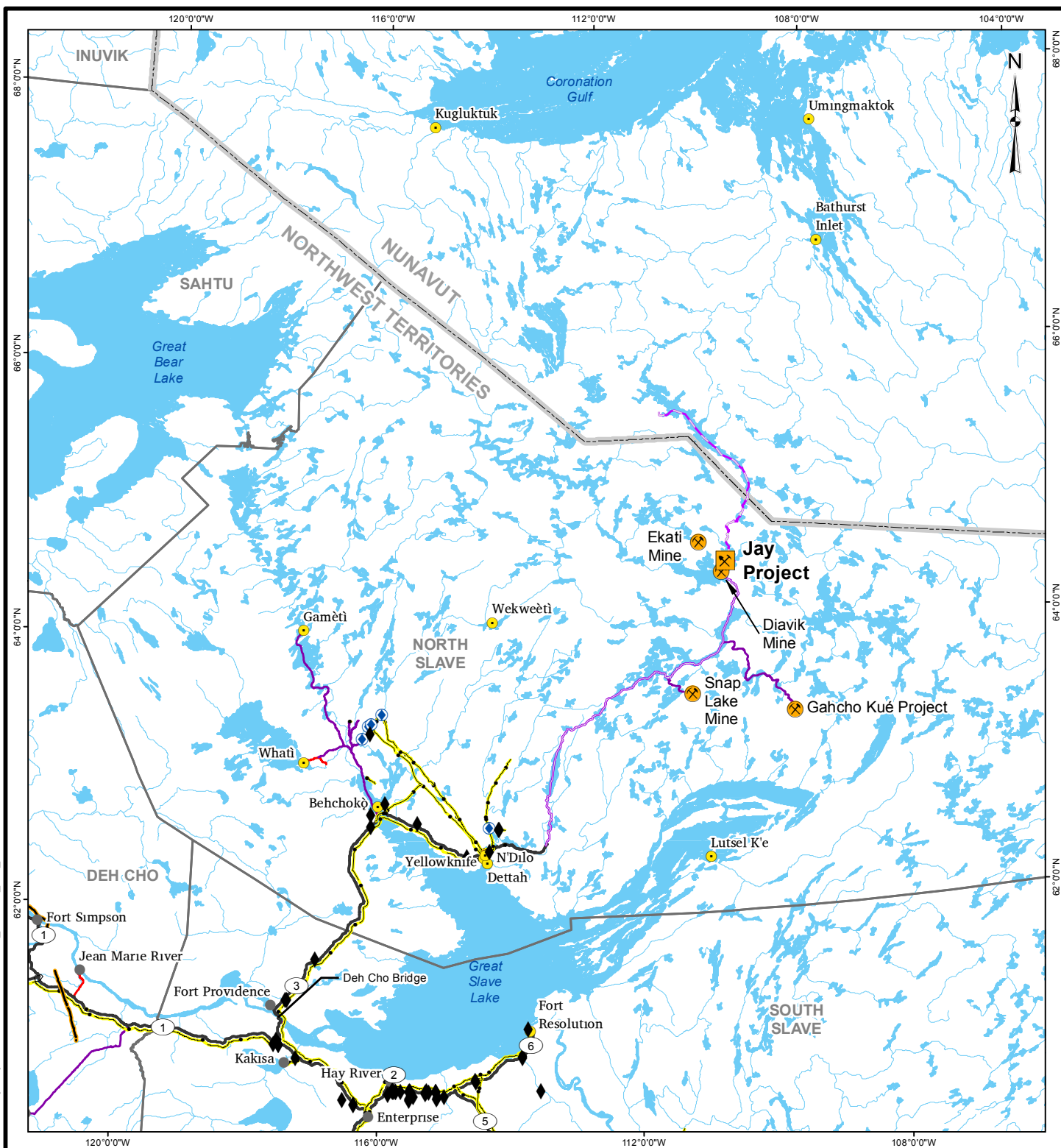
##### **14.1.2.4.1      *Socio-Economic Local and Regional Study Areas***

Some Project effects (e.g., economic, employment and population effects) have the potential to extend beyond the immediate vicinity of the mine into the broader region. As a result, it is important to discuss regional baseline characteristics. The regional study area (RSA) for the socio-economic baseline and impact assessment is the NWT, given the potential for territorial-level Project effects.

The local study area (LSA) (Map 14.1-1) for the socio-economic baseline and impact assessment is limited to those communities with the greatest potential to experience Project-related effects.

Akaitcho (LKDFN and YKDFN), the TG and the NSMA have signed IBAs with the proponent. While not within the RSA, the hamlet of Kugluktuk (and Kitikmeot Inuit Association) have also signed an IBA with Ekati, and so is included in the discussion of LSA communities. The Inuit communities of Umingmaktok and Bathurst Inlet and the community of Fort Resolution have been included in the LSA given their locations relative to the Project and their potential to experience continued effects. The communities considered in the socio-economic LSA, their populations, and distances from the Project, are presented in Table 14.1-2. Communities other than Yellowknife are referred to collectively as "rural LSA communities".





## LEGEND

- |  |                                  |  |  |
|--|----------------------------------|--|--|
|  | JAY PROJECT                      |  | NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD |
|  | EXISTING MINE OR PROJECT         |  | TERRITORIAL/PROVINCIAL BOUNDARY                      |
|  | COMMUNITY WITHIN LSA             |  | WATERCOURSE  |
|  | COMMUNITY OUTSIDE LSA            |  | WATERBODY  |
|  | HIGHWAY                          |  | NWT REGION   |
|  | ALL-SEASON ROAD                  |  | HYDRO LOCATION                                       |
|  | WINTER ROAD                      |  | QUARRYING LOCATION                                   |
|  | TIBBITT TO CONTWOYTO WINTER ROAD |  | PIPELINE   |
|  |                                  |  | TRANSMISSION LINE                                    |

## REFERENCE

WATER OBTAINED FROM ATLAS OF CANADA  
 NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012  
 REGIONAL BOUNDARY DATA AND UTILITIES DATA OBTAINED FROM GNWT  
 QUARRYING LOCATIONS OBTAINED FROM MVLWB  
 PROJECTION: CANADA LAMBERT CONFORMAL CONIC

## DOCUMENT

DEVELOPER'S ASSESSMENT REPORT

100 0 100  
 SCALE 1:4,500,000 KILOMETRES



DOMINION  
 DIAMOND

JAY PROJECT  
 NORTHWEST TERRITORIES, CANADA

TITLE

## SOCIO-ECONOMIC LOCAL STUDY AREA



Golder  
 Associates

PROJECT	13-1328-0041	FILE No. DAR_SocioEc_001_GIS
DESIGN	JO	19/09/14
GIS	JG	17/10/14
CHECK	JO	17/10/14
REVIEW	LH	17/10/14
SCALE AS SHOWN		REV. 0
MAP 14.1-1		

**Table 14.1-2 Socio-Economic Local Study Area Communities, Populations, and Distances from the Project**

Community	Population (2012)	Distance From Project (km)
Behchokq	1,915	350
Dettah	210	315
Fort Resolution	470	425
Gamèti	250	345
Lutsel K'e	280	250
N'Dilo	n/a	320
Wekweèti	140	195
Whati	490	385
Yellowknife	18,830	320
Kugluktuk	1,440	425
Bathurst Inlet	n/a	270
Umingmaktok	n/a	365
Northwest Territories	40,800	n/a

Source: Statistics Canada (2011a); Google Earth (2014).

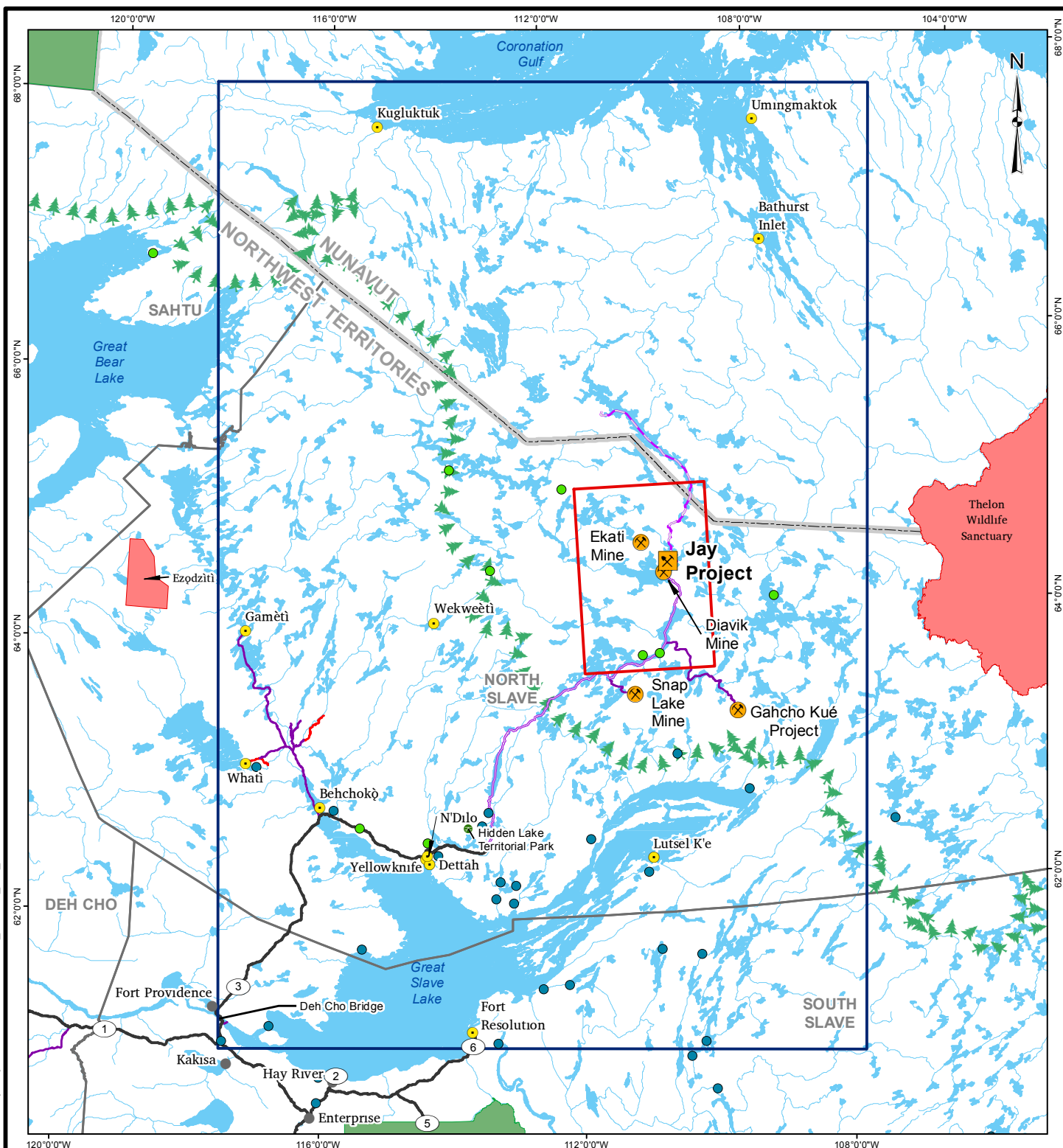
Note: Distances are approximate and rounded to the nearest 5 km.

The hamlet of Kugluktuk, which is not within the RSA, is included in the discussion of LSA communities because it has signed an Impact Benefit Agreement with the Ekati mine.

km = kilometre; n/a = not available.

#### **14.1.2.4.2 Non-Traditional Land Use Local and Regional Study Areas**

The Non-traditional Land Use (NTLU) RSA roughly corresponds to the area around the socio-economic LSA communities (Map 14.1-2). These are the areas most likely to be used by community residents for outfitting, sightseeing, fishing, and other land uses. Most land use in these areas is not expected to change given the nature of the Project (i.e., an extension of an existing mining operation) and the remote location of the mine. Therefore, while NTLU in the NTLU RSA is noted, the baseline and effects assessment will focus more heavily on the NTLU LSA (Map 14.1-3), which is the area around the mine where effects to terrestrial resources, water, and air are more likely.



## LEGEND

	JAY PROJECT		WATERBODY
	EXISTING MINE OR PROJECT		TREELINE
	HIGHWAY		COMMUNITY WITHIN RSA
	ALL-SEASON ROAD		COMMUNITY OUTSIDE RSA
	WINTER ROAD		FISHING LODGE
	TIBBITT TO CONTWOYTO WINTER ROAD		HUNTING LODGE
	NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD		TERRITORIAL PARK
	TERRITORIAL/PROVINCIAL BOUNDARY		NWT REGION
	WATERCOURSE		NATIONAL PARK
			PROTECTED AREA
			LAND USE RSA
			LAND USE LSA

## REFERENCE

WATER OBTAINED FROM ATLAS OF CANADA  
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012  
REGIONAL BOUNDARY DATA OBTAINED FROM GNWT  
PROJECTION: CANADA LAMBERT CONFORMAL CONIC

## DOCUMENT

DEVELOPER'S ASSESSMENT REPORT

100 0 100  
SCALE 1:4,500,000 KILOMETRES



DOMINION  
DIAMOND

JAY PROJECT  
NORTHWEST TERRITORIES, CANADA

TITLE

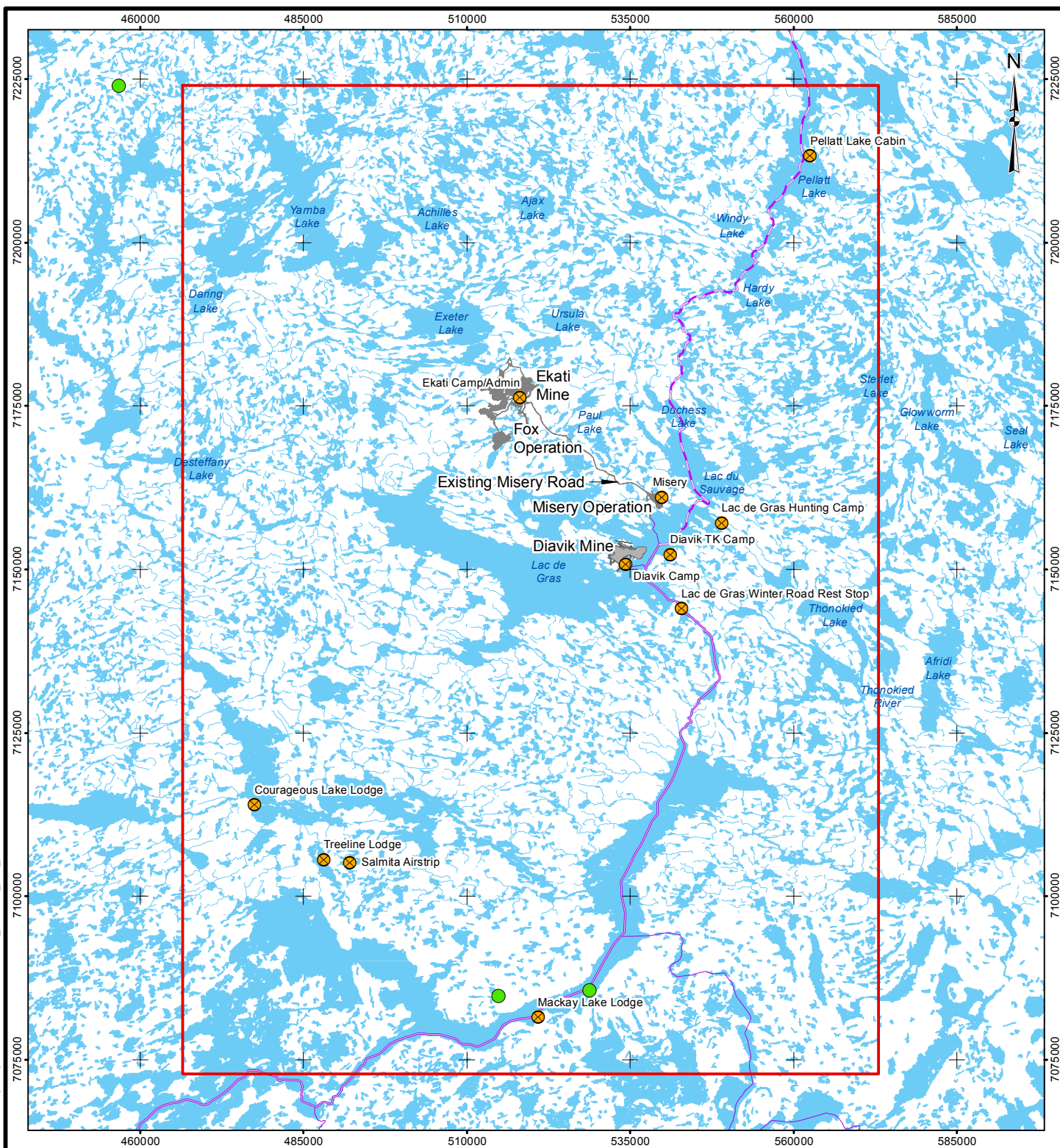
## NON-TRADITIONAL LAND USE REGIONAL STUDY AREA



Golder  
Associates

PROJECT	13-1328-0041	FILE No. DAR_SocioEc_002_GIS
DESIGN	JO	28/03/14
GIS	JG	17/10/14
CHECK	JO	17/10/14
REVIEW	LH	17/10/14
SCALE AS SHOWN		REV. 0
MAP 14.1-2		





## LEGEND

- EKATI MINE FOOTPRINT
- DIAVIK MINE FOOTPRINT
- WINTER ROAD
- TIBBITT TO CONTWOYT TO WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYT TO WINTER ROAD
- WATERCOURSE
- WATERBODY
- FISHING LODGE
- RECEPTOR LOCATION
- LAND USE LSA

## REFERENCE

NATIONAL TOPOGRAPHIC BASE DATA (NTDB) 1:250,000  
 CANVEC © NATURAL RESOURCES CANADA, 2012  
 NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012  
 DATUM: NAD83 PROJECTION: UTM ZONE 12N

## DOCUMENT

DEVELOPER'S ASSESSMENT REPORT

15 0 15  
 SCALE 1:850,000 KILOMETRES



DOMINION  
 DIAMOND

JAY PROJECT  
 NORTHWEST TERRITORIES, CANADA

TITLE

## NON-TRADITIONAL LAND USE LOCAL STUDY AREA



Golder  
 Associates

PROJECT		13-1328-0041	FILE No. DAR_SocioEc_003_GIS	
DESIGN	JO	28/03/2014	SCALE AS SHOWN	REV. 0
GIS	JG	17/10/14	<b>MAP 14.1-3</b>	
CHECK	JO	17/10/14		
REVIEW	LH	17/10/14		



### **14.1.2.5 Temporal Boundaries**

Project construction is scheduled to occur from 2015 to 2020. The projected mine life is 11 years, with the operation phase commencing in 2019 and final closure occurring in 2030. Reclamation activities, and some operational activities, are expected to occur from 2030 to 2032. To capture the possibility for overlapping construction and operations activities, economic modelling includes some amount of buffer on all dates, as described in detail in the economic assessment (Appendix 14A). The temporal boundaries for the socio-economic assessment are, therefore, 2014 to 2032. Baseline data upon which to measure effects against is primarily from 1998 to 2014.

The assessment focuses on the construction phase and the first years of operation. Confidence in predictions is relatively high during the construction phase given the advanced stage of project planning and knowledge of associated economic and employment effects. Similarly, initial planning of operations as applied to the first projected year is relatively advanced, and assumes a stable rate of production over the operational life of the mine. Given the rapid pace of socio-economic change in the NWT, projections of potential Project effects into the 2020s and 2030s are considered to be more speculative. As closure will occur in a year and in a social and economic context that is currently undetermined, the effects of closure are discussed more generally.

Socio-economic conditions are continually evolving in response to other projects, government initiatives, and multiple other factors that are both unknown and unpredictable. The baseline scenario against which the Project's socio-economic effects are assessed is in some respects dated given the limitations of public available data. This assessment's temporal boundaries are therefore such as to suggest that conclusions reached are not necessarily predictive, but rather indicative of the potential for effects, both positive and negative. Information regarding the effects of mining projects in the NWT and how these effects can be most effectively managed will be realised as the Project concludes feasibility studies. Dominion Diamond will continue to review expectations of Project effects and proposed management measures in the interim to 2015 and beyond.

### **14.1.2.6 Assessment Structure**

Each respective socio-economic VC is discussed using the following scenarios:

The **Existing Environment** describes historical and current trends and conditions up to 2014. In some cases, data is limited, and so may only be available for earlier years (e.g., 2011, 2012 or 2013).

The **Base Case** considers how the existing environment will change in the future. The Base Case scenario considers the existing Ekati, Diavik, and Snap Lake diamond mines operating in the North Slave region of the NWT. The mines are expected to close in 2020, 2023, and 2029, respectively. The Gahcho Kué Project will be introduced to the territory's economy, with the first full year of production being 2017, and operations continuing for 11 years.



No other mining project or major economic event is introduced to the Base Case, as including projects with unproven economics generates questionable results that are not helpful in understanding the economic effects of the actual project being studied. The potential Prairie Creek Mine, NICO Mine, and Nechalacho Mine have all completed Developer Assessment Reports. However, because of low commodity prices, missing infrastructure, and capital financing, no immediate development of the projects has occurred. Any one of these factors may be significant enough to prevent a project from being developed indefinitely. Therefore, these projects are not included in the Base Case economic scenario, as it is not possible to estimate a reasonable project scope or timeframe and because including them arbitrarily skews the results causing a shift in the focus of discussions toward a highly speculative future state of NWT's economy.

The **Project Effects** section describes the incremental effect of the Project on the Base Case during construction, operations and closure. Incremental Project effects are described, and a cumulative result of the combined Project effects and the effects of the other reasonably foreseeable developments described in the Base Case. For the purpose of the socio-economic impact assessment, the Project consists of three phases: construction, operations, and closure<sup>1</sup>.

The proposed schedule includes construction that will span five years (2015 to 2020), with most of the work taking place between 2018 and 2020. For the purpose of economic modelling, the cost of construction has been assumed to be US\$671 million. This includes US\$119 million of equipment that will be imported into the territory. Dominion Diamond has assumed an average dollar conversion rate of US\$0.91 to CDN\$1.00. For the purpose of the SEIA, this preliminary estimate has been used throughout. Pre-feasibility studies are ongoing, and will provide an updated estimate of the capital costs required for the Project once complete. The total cost of construction is expected to be between US\$600 and US\$700 million. The labour requirement for this construction phase is estimated to equal 442 full-time equivalent jobs.

The first full year of operations will be 2021. At this point in time, the mine is being developed as an open pit operation with production spanning 11 years until 2031. Average employment during the 11 years of operations is estimated at 1,100 to 1,200. Average operating costs are preliminarily estimated at US\$357 million.

Reclamation will follow the mine's operations. This will include the reclamation of the entire site including the Jay open pit, the camp and processing facility. Reclamation of the original mine plan that are not needed for the Jay Project operations will take place throughout the operational life of the mine.

Finally, the **Residual Impact Classification and Determination of Significance** section describes, in EA terminology, the nature of Project effects, and identifies whether or not an effect is considered to be significant. Residual impact classification and significance criteria are described further below in Section 14.1.2.7.

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<sup>1</sup> For the purpose of the socio-economic assessment, closure includes reclamation activities.



### **14.1.2.7      *Residual Effects Analysis***

The residual effects assessment first considers Dominion Diamond's proposed socio-economic management framework, including mitigation and benefit enhancement measures, ongoing engagement, monitoring, and the Ekati Socio-Economic Agreement with the Government of the Northwest Territories. The assessment then considers experiences in the NWT with regard to large mining projects, drawing from Community and Diamonds reports and past regulatory applications. The presentation of the Project's socio-economic management measures and Ekati's experience provide background information for the assessment of the Jay Project socio-economic effects.

The mechanisms through which a socio-economic effect may occur are discussed first, taking into account Project design measures, socio-economic management measures and Ekati's experience. Residual effects not mitigated entirely by socio-economic management are characterized using the criteria of direction, magnitude, geographic extent and duration. Significance is determined, in most cases, qualitatively.

#### **14.1.2.7.1      *Socio-Economic Effects Criteria***

The criteria for assessing potential socio-economic effects are broadly comparable to those used for biophysical effects. There are, however, some differences in the choice and/or the definition of criteria.

**Direction** indicates whether an effect is considered positive (a benefit) or negative. Socio-economic effects are not neutral, although some effects may have both positive and negative dimensions (or are positive for some people and negative for others) and some potentially negative effects may become positive with the implementation of socio-economic management measures.

**Magnitude** refers to the degree of change in a VC that an effect has the potential to produce. Magnitude may be negligible, low, moderate, or high and is usually (but not always) qualitatively assigned. Negligible indicates no discernible effect. Low magnitude indicates a discernible effect on a VC, but one that is not expected to materially affect people's quality of life. Moderate magnitude indicates a noticeable and potentially detrimental or beneficial change to people's quality of life. High magnitude indicates that the effect is expected to substantially interfere with or enhance the quality of life of at least some individuals, families or communities.

The primary exception to the above relates to select economic effects. A relatively large project, such as the Project, which is constructed, operates and then closes within a region characterized by very small territorial and community economies, will have economic effects that, where these are quantifiable, are necessarily of high magnitude. High magnitude criteria are individually defined for most economic VCs in the individual effect assessment sections below. Criteria for low and moderate magnitude economic effects have not been developed, as they are not used.

**Geographic extent** relates to most socio-economic effects and is considered in terms of administrative units (i.e., census communities and divisions). Local effects are experienced by people closest to a proposed project. For most socio-economic components, this is defined as the LSA communities. Regional effects are experienced at the territorial level (i.e., the NWT) for most socio-economic components. For NTLU, local effects occur within the NTLU LSA while regional effects occur inside the NTLU RSA.



Some effects are experienced by some, but not other individuals within an assessment area, and may not have community level manifestations. Any potential for particularly negative effects on some individuals needs to be identified and addressed. Where there is potential for an effect to extend beyond the NWT, this is noted as a trans-boundary effect. As no people reside at the Project site, there is no Project footprint assessment area.

**Duration** refers to the length of time over which an effect occurs. Socio-economic effects are not typically linked exclusively to project phases, given that they are relative to the individual human experience. While effects to an aspect of the physical environment may be considered short-term during construction, medium-term if lasting into operations, and long-term if extending beyond operations into closure, the same may not be true for aspects of the human environment.

Duration thresholds are established based on the period in which it can be reasonably expected that a project will affect an aspect of the socio-economic environment. For the purposes of this socio-economic effects assessment, short-term has been defined as a period of one year or less (i.e., a temporary nuisance not affecting the long-term activities of humans). Medium-term duration has been defined as a period of 1 to 5 years (i.e., a period wherein human activities may be temporarily altered or suspended, after which time regular activity is likely to begin). Long-term has been defined as effects that are expected to persist for longer than 5 years (i.e., after which time, human activity may resume, but, after a long amount of time, at a potentially different level or quality).

**Reversibility** is not achievable for many socio-economic effects (unlike many physical and biological effects). Socio-economic effects are part of an ongoing process of interdependent economic and social change extending into the future and generally cannot be reversed to return to one or all of pre-project development conditions.<sup>2</sup> For example, although most employment will come to an end at final closure, job experience and training will have enhanced the capacity of individuals to find other employment, with lifelong implications. Therefore, the employment effect will not be fully reversed. Further, since it is presumed that a project is only permitted if it is expected to bring net economic and/or social benefit, a return to pre-project conditions may not in fact be desirable. Thus, the reversibility criterion is only used, by exception, where an effect can be considered to be fully reversible.

**Frequency** is often not a useful criterion for socio-economic assessment. Although there are isolated exceptions, most socio-economic effects are experienced continuously by people. Where frequency is relevant to the assessment of a specific effect, this is noted in the discussion of that effect, again by exception.

**Likelihood** can be problematic to assign for socio-economic effects. With some exceptions, most socio-economic effects are considered highly likely (almost certainly) to affect at least some individuals even where community level effects may not be observable. In the event that an effect is considered likely, but with less certainty, this is noted in the assessment, again by exception.

Table 14.1-3 presents definitions of socio-economic assessment criteria.

<sup>2</sup> In this sense, most socio-economic effects are cumulative, as they are products not only of a given project but of the interaction of that project and its effects with the broader, continuously evolving, economic and social environment.



**Table 14.1-3 Definitions of Residual Impact Criteria Used to Evaluate Significance for Socio-Economics**

Direction	Magnitude	Geographic Extent	Duration	Reversibility	Frequency
<b>Negative:</b> Adverse effect on a VC  <b>Positive:</b> Beneficial effect on a VC	<b>Negligible:</b> Indicates no discernible change to a VC  <b>Low:</b> Indicates a discernible effect on a VC but the effect is not expected to materially affect people's quality of life  <b>Moderate:</b> Indicates a noticeable and potentially detrimental or beneficial change to people's quality of life  <b>High:</b> Indicates that the effect is expected to substantially interfere with or enhance people's quality of life For quantifiable economic effects, all effects are considered of high magnitude and criteria for high are variable	<b>Local:</b> Effect is within the socio-economic LSA communities  <b>For NTLU:</b> Effect is within the NTLU LSA  <b>Regional:</b> Effect is within NWT <b>For NTLU:</b> Effect is within the NTLU RSA  <b>Individual:</b> Although no community level effects are expected, individuals and/or families are expected to be affected	<b>Short:</b> Effect occurs over one year or less  <b>Medium:</b> Effect occurs over one to 5 years  <b>Long:</b> Effect occurs over more than 5 years	<b>Most effects are considered to be irreversible</b>  <b>By exception:</b>  <b>Reversible:</b> Effect is transient for duration outlined, beyond which conditions will return to baseline.	<b>Most effects are considered to be continuous</b>  <b>By exception:</b>  <b>Periodic:</b> Effect occurs intermittently or may repeat over the assessment duration

LSA = local study area; NTLU = non-traditional land use; RSA = regional study area; VC = valued component.



#### **14.1.2.7.2      *Determination of Significance***

There are important differences in the methods used to determine significance and in the prediction confidence for socio-economic assessment as compared to biophysical assessments.

First, the significance of socio-economic effects must often be determined qualitatively. For example, it may be straightforward to conclude that an effect is not significant if it is very small, is of short duration, and affects almost no one; or to conclude that an effect is significant if it is very large, of long duration, and affects most people. However, determining significance in cases that are less well defined necessarily depends on:

- the perceptions and values of affected people and their leadership (as made evident through engagement);
- qualitative data and interpretation, and observations of the economic and social reality (including for example resilience in face of change) of a project area; and,
- lessons learned from other experiences.

As a result there may appear to be a stronger element of professional judgment, as opposed to the use of quantitative tools (such as Decision trees or valued matrices), in reaching conclusions on significance for socio-economic impacts.

Second, there are no established thresholds or standards for most VCs. Although it may be possible to set thresholds for some socio-economic effects for purposes of an environmental assessment, it often cannot be demonstrated that there is any consensus on any specific threshold value or what such a threshold means in terms of significance of an effect. For example, it might be determined that in-migration representing 5% of a community's population is a threshold for magnitude<sup>3</sup>. To the extent that migration happened over a period of years, was predominantly made up of people able to access stable employment, consisted primarily of returning family members and/or happened in a community with little natural population increase, this might be considered a benefit and a higher threshold might be warranted. Conversely, the effect might be considered negative under a different set of circumstances. The quantitative threshold of 5% would thus be subject to circumstance when determining significance.

Third, many socio-economic effects may not lend themselves to the assignment of criteria or determination of significance except in terms of potential, thus introducing a larger element of uncertainty into socio-economic effects assessment. There is generally the expectation that an effect brought forward for assessment will occur, at least to some degree. However, it is, for example, extremely difficult to predict whether some effects will be positive, negative or both, and in what ways for whom. Socio-economic effects will result from interrelationships between:

- Project activities;
- the responses on the part of individuals, families and communities to socio-economic management measures implemented by a proponent; and,
- decisions made by individuals, families and communities with regard to events and situations unrelated to a project.

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<sup>3</sup> This, and other examples of the challenges of quantifying many socio-economic effects in this section, is a constructed example for purposes of this discussion only.



Fourth, mitigation and benefit enhancement measures are put in place to create the conditions and opportunities for individuals to improve their lives. That is, to offer mechanisms to enhance the potential for benefit, or at least the avoidance of harm. However, it is not possible to ensure that everyone will necessarily take advantage of those opportunities. There are also other forces at work outside the control of a single project that can undermine the success of mitigation and benefit enhancement measures. Thus, while mitigation and benefit enhancement measures are developed, implemented and adjusted over time to provide positive opportunities, people may choose not to participate and other realities may intrude. The effectiveness of socio-economic management therefore may not always be complete for everyone. This speaks to the importance of adaptive management.

Finally, a project may have negative socio-economic effects on at least some people. Benefits are expected, however some individuals, families and communities will experience some negative effects in a context of overall net socio-economic effect. This is in contrast to negative biophysical effects, which are most often mitigated into insignificance over the long-term through engineering design, good practice policies and procedures, compensatory environmental improvements, reclamation or other means.

In summary, the challenges of quantification, thresholds, unpredictability, and effectiveness of socio-economic management measures and expectations of both negative and positive residual effects together imply that the approach to socio-economic assessment, for most effects, is more qualitative and nuanced than for biophysical assessment. In coming to conclusions on residual socio-economic effects, there is necessarily high dependence on engagement results and comparable experiences; in this case, experience in relation to other large mining projects in northern Canada. Socio-economic assessment, particularly in the case of the Project, must also give important weight to socio-economic baseline trends; that is, not only to current socio-economic conditions. Evolving change can be expected to interact with a project over its life cycle.

Residual effects are defined as either 'not significant' or 'significant' on the basis of assigned criteria. For purposes of this effects assessment, each residual effect is determined to be not significant or significant on the basis of the expected result for most people or of the effect's manifestation at the community level. This is not to suggest that effects that may be experienced at the level of some individuals or families are not important, or even critical, to quality of life. Where this is the case, the effect is fully discussed, Dominion Diamond will implement mitigation and benefit enhancement measures in response, and the residual effect will be assigned attributes in terms of the criteria described in Section 9.1.3. Such effects however are determined to be not significant in terms of quality of life for most people and/or at the community level.

#### **14.1.2.7.3 Prediction Confidence**

Confidence in the prediction of whether an effect is significant or not significant is often high, regardless of all the uncertainties in describing the detail of that effect. This may at times seem to be a contradiction. For example, the Economic assessment can only provide an approximation of effects on Gross Domestic Product (GDP) and labour income, but even in the event of large errors in the approximation, the Project's effects on GDP and labour income will necessarily be significant.



### **14.1.2.8 Cumulative Effects**

The approach to cumulative social and economic effects is, in some respects, different from that taken by the physical and biological disciplines. When describing conditions and trends beyond present day, the socio-economic impact assessment considers all reasonably foreseeable projects. While some projects may have been announced, or are in the planning process, they are not necessarily considered to be reasonably included in predictions of future conditions, from an economic stand point. Rather, only projects with proven economics (e.g., funding, approvals) and a strong, real likelihood of proceeding are considered in the interest of providing a meaningful projection of future social and economic conditions. The Project's effects are then described, first incrementally, and then in conjunction with the Base Case projects. The assessment of Project effects is, therefore, inherently cumulative in nature.

There are several projects included by the physical and biological disciplines that are that are considered too speculative to include in the socio-economic impact assessment. The potential Prairie Creek Mine, NICO Mine, and Nechalacho Mine have all completed Developer Assessment Reports and in the case of Prairie Creek, have acquired all necessary licences. Passing these regulatory requirements has not, however, led to the immediate development of the projects due to other preventative factors, including issues of low commodity prices, missing infrastructure, and capital financing. These factors are significant enough that any one may keep a project from being developed indefinitely. It is, therefore, not possible to estimate a reasonable scope of development or timeframe for projects of this nature. To include such projects in the socio-economic cumulative scenario would therefore skew the discussion to a highly speculative scenario that is neither conservative, nor likely to manifest.

Some other projects, while potentially having a cumulative interaction with far-reaching biophysical VCs, would not interact with the Project in terms of economics and social impacts. These other projects will not likely affect the local study area communities because of their distance from the Project is great, or because they will be required to maximize hiring from another study area (i.e., Nunavut).

The projects considered in the cumulative scenario of the socio-economic impact assessment include the existing Ekati, Diavik and Snap Lake mines, and the Gahcho Kué Mine. Gahcho Kué is included because of its advanced stage of development, initial staging of materials and construction activities, and its financial viability (i.e., the current price of diamonds). It is also reasonable to assume that De Beers will be in a position to finance the development of the project when the licensing is in place.



### 14.1.3 Socio-Economic Management

This section presents socio-economic mitigation and benefit enhancement measures in place for the existing Ekati mine that will be carried over to the Project. The actions and commitments herein will evolve over time as the Project evolves, and will be regularly reviewed so that changes can be made adaptively.

The main objectives of socio-economic management for the Project are to:

- mitigate the negative effects and enhance the benefits (creating value) of the Project for all Project stakeholders;
- create opportunities for people in the North Slave Region, IBA communities, and the NWT more generally, to participate in the Project, thereby enhancing self-reliance, well-being and sustainability;
- establish a role for Dominion Diamond as an active participant in the sustainability of communities in the NWT; and,
- maintain goodwill and good relations with people and their governments.

Because socio-economic effects are so interrelated, and in some cases cascading, it is not practical to present measures specific to each effect identified in the socio-economic effects assessment. As an illustration of the complexities:

- One measure can be expected to affect the outcome of a number of different impacts. For example, preferential employment policies (to increase the numbers of Northerners and Northern Aboriginals working for the Project) can be expected to increase individual, community and territorial economic activity and incomes, but should also build capacity to participate in the wage economy over the longer term, provide resources for traditional activity, reduce demand for government services and contribute to overall community well-being.
- One impact can be expected to be affected by a number of different effect mitigation and benefit enhancement measures. For example, incomes can increase as a result of preferential employment, preferential contracting, training and other measures intended to enhance job performance, and over the longer term as a result of school based programs intended to keep children in school.

Effect mitigation and benefit enhancement measures are therefore discussed below by category of measure rather than by the effects they are expected to address.

#### 14.1.3.1 *Existing Ekati Agreements*

Dominion Diamond intends to maintain the existing IBAs in place with the Tłıchǫ Government, the Akaitcho Treaty 8 (YKDFN and LKDFN), the NSMA and the Hamlet of Kugluktuk/Kitikmeot Inuit Association. The Socio-Economic Agreement between the GNWT and Dominion Diamond for the Ekati Mine will also be maintained. Commitments associated with each respective type of agreement are discussed further in the sections below.



### **14.1.3.2      *Employment, Contracting and Procurement***

Dominion Diamond's employment policy is to maximize employment of Northerners (including Northern Aboriginals), with the intent to see that Project benefits accrue not only to the NWT and Canadian economies, but also to the people in IBA communities. Such a policy implies that Project specific initiatives may be required to address barriers to employment where people have little experience with the mining sector or barriers to participation in mining. To operate effectively, efficiently and safely, however, Dominion Diamond's requirement is for a comparatively skilled and experienced workforce. In this regard, the existing Ekati operations workforce is expected to transfer to the Project's operations, thereby extending their current employment. It is Dominion Diamond's intention that employees working at the existing Ekati mine will be offered the opportunity to transfer to the Project once operations commence. These transfers will be subject to:

- the terms and conditions of the existing IBAs;
- the timing of available positions at the Project;
- the ability of the transferring employees to fill the positions as they become available at the Project; and,
- the need to maintain economically viable operations at both sites, i.e., the winding down of current mining operations at Ekati and the ramping up of Project operations.

There will likely be some new positions or openings due to attrition. Initiatives will be put in place to enhance employment opportunities through human resource policy and procedures as identified below.

#### **Hiring Targets**

The Ekati Socio-Economic Agreement (SEA) hiring priority targets will remain in place for the Project, with the following thresholds set for Northern and Northern Aboriginal employment:

- during construction: 33% Northern (of which 44% will be Northern Aboriginal);
- during operations at less than 18,000 tpd: 62% Northern (of which 50% will be Northern Aboriginal); and,
- during operations at greater than 18,000 tpd: 72% Northern (of which 50% will be Northern Aboriginal).

Dominion Diamond will strive to continue to meet hiring targets, and will employ management practices aimed at maximizing local participation in the Project, as described below.



## Transport of Workers

Dominion Diamond is committed to maximizing northern and northern Aboriginal employment and as such, will continue its focus on hiring from northern communities. To this end, Dominion Diamond will maintain points of hire or fly points in all IBA communities and as of June 1, 2015, Edmonton will no longer be a fly point community. The designated points of hire align with Dominion Diamond's SEA and IBAs and include:

- Yellowknife;
- Behchoko;
- Whati;
- Wekweeti; and
- Gameti.

Dominion Diamond recognized fly points are :

- Yellowknife;
- Lutsel K'e;
- Kugluktuk;
- Hay River;
- Fort Smith;
- Fort Resolution.
- Fort Simpson;
- Inuvik;
- Norman Wells;
- Délne;
- Cambridge Bay; and

## Advertisement of Positions and Application Process

Dominion Diamond will work with community leaders to arrange community tours. Other community tours will be arranged as required. The purpose is to provide information on employment opportunities. As well, employment officers, in place in some IBA communities, will be kept abreast of these opportunities. Their role is to help identify candidates who have an interest in working at the mine, and to facilitate the application process to help eliminate any barriers associated with the online application process. In addition, to help make the hiring process more accessible, where possible, interviews with interested candidates will be conducted in IBA communities.

Dominion Diamond intends to continue Ekati's existing involvement in career fairs and high school programs aimed at informing students about mining employment. Building upon this, Dominion Diamond will explore the possibility of extending these outreach initiatives to younger age groups within the school system.

## **Contracting and Procurement**

Dominion Diamond strives to contract locally where possible. Contractors are encouraged to adhere to the hiring targets identified in the Ekati SEA, and are required to track employment by IBA community, and by northern and Aboriginal identity. Dominion Diamond is committed to liaising with IBA community leadership to communicate contracting opportunities in an effort to maximize the use of local businesses.

In addition to the employment targets detailed above, the Ekati SEA identifies procurement targets as follows:

- During construction: 28% of goods and services are purchased from local (Northern) businesses.
- During operations: 70% of goods and services are purchased from local (Northern) businesses.

As with contracting opportunities, Dominion Diamond will endeavour to communicate procurement needs and procedures to IBA communities and local suppliers.

### **14.1.3.3 Workforce Management**

#### **Rotation and Camp Accommodation**

Most of the positions at the Ekati Mine operate 24 hours a day. Shifts for these positions are 12 hours, and run from 6:00 am to 6:00 pm, and vice versa. Shift rotations are largely on a two-week-on, two-week-off cycle, whereby employees are flown to site from the designated points of hire and fly points. Some positions do not operate on a 24-hour day, or a two-week rotation. These positions are typically administrative, supportive and professional/managerial in nature, and operate on a weekly Monday to Friday schedule. Many of these positions are in Yellowknife. A number of positions operate on a four-day-on, three-day-off (i.e., Monday to Thursday) schedule at camp.

While on site, employees will be housed in the existing Ekati camp. There is potential for the expansion of the Misery camp, should additional housing be required during peak periods of activity. Rooms are private to employees while they are on site.

Recreation facilities are available on site, including a gym, weight lifting room, three squash courts, and indoor and outdoor walking tracks. Fitness classes, yoga classes and evening activities such as volleyball are available to employees. Cultural activities such as sewing circles and drum classes are also offered, and a cultural practices room is being developed.

Country foods are available on special occasions such as National Aboriginal Day, however, there are barriers to regularly supplying these food items on site, including the lack of viable commercial suppliers, and food-related health and safety regulations associated with the preparation of food while on site. There are refrigerators available for employees to store food items, should they wish to pre-prepare meals.





## **Exit Interviews and Conflict Resolution**

Since the transition of Ekati to Dominion Diamond, exit interviews have been conducted with outgoing employees, and have been (and will continue to be) tracked to identify employment issues and barriers to advancement. Monthly meetings between Human Resources and other department will occur to discuss feedback.

Unionized positions at the Ekati mine can access dispute resolution processes established in their collective agreement. There is also a joint union/management committee to address workplace concerns. Non-union employees and union employees alike also have access to human resources professionals who can provide alternative dispute resolution services, and facilitate discussions between employees, and between employees and managers. The Kwe Beh Working Group is a Tłıchq organization that manages the implementation of the Tłıchq IBA. The group provides employees an alternative forum in which to address issues and concerns.

Dominion Diamond supports community liaisons and community-based committees in IBA communities, and supports community-based committees. These groups can provide feedback to the mine regarding employee and broader community concerns and issues, and work with Dominion Diamond to develop solutions.

## **Cross-Cultural Awareness**

Dominion Diamond is establishing an Aboriginal Awareness course for supervisors and employees in development roles. The aim of the course is to foster an environment of cultural awareness, and to avoid cross-cultural conflict. Additional training is also being considered for all employees, and may take the form of an online cultural awareness course.

## **Code of Conduct and Safety**

Dominion Diamond recently revamped the Ekati Mine Code of Conduct. The code emphasizes the expectation that all personnel at Ekati must treat others with respect, be fit for work, and be mindful of personal hygiene. The use of drugs and alcohol while on shift is prohibited, and a zero tolerance stance on arriving at points of hire and fly points under the influence of drugs or alcohol is enforced. Weapons, gambling, fishing and the removal of plants, rocks, minerals and company property are also prohibited by the policy.

From November until mid-April, a winter clothing policy is in place, mandating that travellers must be wearing an appropriate winter coat, boots, hat and gloves before boarding charters at the points of hire and fly points.



#### **14.1.3.4 Education and Training**

##### **Educational Requirements**

Dominion Diamond will establish minimum training requirements for mining employment, as per the existing Ekati Mine practices. On a case-by-case basis, educational gap analyses will be conducted to consider promising candidates who do not meet the established minimum education requirements.

Dominion Diamond has also reintroduced the adult educator role at the mine in an effort to provide ongoing educational support to existing and future Project employees. This role was initially put in place to facilitate employment of northerners who did not meet education requirements at the mine when Ekati began operations, but was discontinued when, after several years of operation, northern candidates and existing employees had the required training for advancement at the mine. The Project will also reinstate the Ekati Workplace Learning Program (WLP). Employees identified as having educational gaps are referred to the WLP, through which they receive training pertinent to their position, and access to computer-based courses and individual tutoring. The WLP is optional, and matches one hour of the employee's personal time with an hour of paid employment in the pursuit of additional training pertinent to mining skill development.

##### **Pre-employment and Apprenticeship**

Dominion Diamond supports external organizations, including the Mine Training Society (MTS), in the provision of pre-employment training in select programs (e.g., mineral processor trainee program). Dominion Diamond will continue to work with these organizations to facilitate placements, and where possible, will select candidates from organization programs for vacant roles at the trainee level. Pre-employment training is aimed at providing specific skill sets before full employment at the mine, and is focused on northerners.

Ekati also has a long history of supporting apprenticeship programs, with 74 northern and northern Aboriginal apprentices obtaining successful employment since 1998 – 15 of which have been employed at Ekati itself. Dominion Diamond intends to continue to support apprenticeship programs, and will work with the GNWT apprenticeship board to facilitate successful apprenticeships, appropriate registration, and program administration. Apprentices are expected to attend school in the north, and are registered with Aurora College. Currently (2014), there are 24 direct (i.e., non-contractor) apprenticeship positions at Ekati. Dominion Diamond intends to maintain this number throughout the remaining life of the mine, and for the life of the Project, where possible.

##### **Employee Development**

Dominion Diamond will continue to provide Ekati workforce development programs for all full-time employees. These include individual development plans to evaluate skill deficiencies, job area-specific progression plans to move employees into new roles, and a talent management program focused on key developmental positions for candidates with high potential. Dominion Diamond has also developed an operations progression plan, and is developing a site services plan specific to associated positions at the mine.



In addition to these development programs, Dominion Diamond intends to continue health and safety, skills upgrading, supervision, leadership and management training programs as follows:

- Supervisory Development Program (SDP) – Developed collaboratively with Ekati employees, and aimed at improving the strategic management skills of supervisors and high-potential employees, this program consists of six modules taken over a two-year period. The six modules are:
  - 1) Health and safety leadership;
  - 2) Problem solving and conflict resolution;
  - 3) Performance management;
  - 4) Coaching;
  - 5) Understanding our business; and,
  - 6) Leadership conversations.
- Ekati Leadership Program (ELP) – In existence since 2009, the ELP facilitates the growth and development of leadership skills through a series of three-day residential workshops designed to foster new ways of thinking and approaching leadership issues. The program was temporarily suspended in 2014 to allow for the transition to Dominion Diamond, but will be reinstated in 2015 with the development of Dominion Diamond's mission, visions and values for Ekati.
- Northern Leadership Development Program (NLDP) – Similar to the ELP, the NLDP is aimed at building leadership skills in northern employees. The program is collaboratively administered with Aurora College, and emphasises a northern perspective in leadership roles.

## Community Education and Training

Dominion Diamond provides scholarship funding for post-secondary education to northerners and members of our IBA groups. The Dependent Education Assistance Policy provides financial assistance to the dependents of northern-based employees in pursuit of post-secondary studies. Ekati IBA communities are provided with funds to be administered by the community for the purpose of academic scholarship. The EKATI Plus program provides annual scholarships open to all NWT students and the Women in the Workforce program promotes the training and hiring of women in non-traditional roles.

Dominion Diamond recognizes TK as important components of a traditional education, and the maintenance of skills and knowledge among the Aboriginal population. To this end, in 2012, Ekati Mine provided \$3.4 million of investments in community development initiatives in the NWT and in Kugluktuk. Dominion Diamond expects to continue community investment in TK, and funding of the following TK programs:

- youth programs delivered at schools intended to develop traditional skills related to activity on the land;
- Gamètì Sewing Club;



- Gamètì Drumming and Singing Workshop;
- Goyatiko Language Society, Yellowknives Dene First Nation Traditional Knowledge Digitizing Project;
- Lutsel K'e Dene First Nation Traditional Knowledge Digitizing Project;
- Lutsel K'e Traditional Drumming and Singing Workshop;
- Lutsel K'e Canoe Journey;
- Kugluktuk Heritage Centre;
- North Slave Métis Alliance, Genealogy Project;
- Tłı̨ch̓ Imbe Program;
- Tłı̨ch̓ Youth Summer Program including visiting heritage sites out on the land;
- Tłı̨ch̓ TK Symposium;
- Tłı̨ch̓ Government, Traditional Knowledge Digitizing Project;
- National Aboriginal Day; and,
- Trails Series Films.

### **14.1.3.5 Health and Well-being**

#### **Employee and Family Assistance Program**

Dominion Diamond will maintain an Employee and Family Assistance Program (EFAP) open to employees and their families (i.e., spouses and children). The EFAP is administered by NorthStar Centre for Counselling, and provides counselling services pertaining to a number of topics including family and marital dynamics, addictions, interpersonal, work and career topics, financial management, and psychiatric and emotional issues. Access to the program is unlimited on site, and beneficiaries are eligible for up to six free sessions per calendar year while off-site in Yellowknife. Current (2013) EFAP usage statistics are as follows:

- alcohol-related: 4;
- drug related: 1;
- interpersonal: 4;
- marital issues: 8;
- psychiatric/emotional: 11;
- work/career related: 1; and,
- other issues: 2.



## On-Site Medical Services

Dominion Diamond maintains two on-site Occupational Health Centers (OHC). The Primary OHC is located at the Main Camp, while a smaller one is located at the Misery site. The Main Camp OHC employs four full-time Physician Assistants (PA) working a two week on, two week off rotation schedule. There are usually two PAs working per shift. The Misery OHC employs two PAs who also work a two week on, two week off rotation, with one PA on site at all times. A wellness activity coordinator will also be available on site to assist employees and contractors in developing and maintaining healthy lifestyles. A physician provides assessment and supervision via telecommunications, and site visits.

Both OHCs provide 24-hour health care to members of the workforce for emergency and non-emergency issues by providing comprehensive assessments, diagnosis, intervention and management of client care and are equipped for Advanced Cardiac and Trauma Services. The OHCs are also equipped to provide and maintain health surveillance by using in-house spirometry, audiometry, and respiratory mask fit-testing. Dominion Diamond has recently started a Health Promotion Program aimed at preventing chronic diseases in conjunction with the Government of Northwest Territories – Department of Health and Social Services.

Current (July 1, 2013 to June 30, 2014) usage statistics of the OHCs are as follows:

- health surveillance visits: 911;
- occupational injury visits: 590;
- non-occupational injury visits: 2,561;
- re-check visits: 179;
- physical exam visits: 4;
- medical administration visits: 9;
- medical counselling visits: 38; and,
- blood pressure check visits: 434.

## Health and Safety

The Ekati Occupational Hygiene Team is mandated to evaluate the risks or agents that can have long-term health effects on workers due to prolonged exposure. Programs currently implemented by the team include a Respiratory Protection Program, and the Hearing Loss Protection Program.

Ekati's Emergency Response Team is responsible for responding to all emergencies at Ekati, and is on call 24 hours a day, seven days a week. The Incident Management Team responds to any incident on site in support of the Emergency Response Team, and is staffed by employees from various backgrounds with diverse skill sets. The team trains on a regular basis with desktop scenarios.

All employees and contractors are required to complete both security and medical clearances before being granted access to the Ekati mine site.



## Environmental Health Monitoring

Dominion Diamond currently participates in monitoring initiatives associated with the biological and physical environment. Monitoring results are published, and available for public review. The following programs monitor changes to the biophysical environment:

- The Grizzly Bear DNA study was conducted in 2012, and tracks the composition of the grizzly bear population in the vicinity of the mine.
- The Aquatic Effects Monitoring Program is designed to detect effects or changes in the aquatic ecosystems potentially influenced by the Ekati mine.
- The Ekati Diamond Mine's Air Quality Monitoring Program tracks ambient air conditions near the mine.
- Caribou Studies (behavioral surveys of groups of caribou, as well as focal surveys on individual caribou) are conducted annually throughout the year.
- The Ekati mine has participated in the North American Breeding Bird Survey since 1998. This survey occurs across North America, tracking over 400 bird species and their population trends by listening to their vocalizations. It occurs early morning one day in the summer, while an ornithologist works alongside the Department of the Environment. The survey is conducted every 500 m from the beginning of the Misery Road turnoff.

### 14.1.4 Pathway Analysis

#### 14.1.4.1 *Methods*

The effects assessment uses pathways (Project-environmental interactions) to assess effects. Pathway analysis is a screening step used to determine the existence and magnitude of linkages from the initial list of potential effects pathways for the Project. This screening step focuses the effects analysis on pathways that require a more comprehensive assessment of effects on major socio-economic components. Pathways are determined to be either primary or as having no linkage using scientific and traditional knowledge, logic, and experience with similar developments, and environmental design features. Each potential pathway is assessed and described as follows:

- **no linkage** – pathway is removed by environmental design features or policies so that the Project results in no detectable (measurable) environmental or socio-economic change, and no residual effects to a VC relative to baseline or guideline values; or,
- **primary** – pathway is likely to result in a measurable change that could contribute to residual effects on a VC relative to baseline or guideline values.

Pathways determined to have no linkage to socio-economic components or those that are considered minor are not predicted to result in significant effects to the socio-economic environment. No linkage and minor pathways are summarized but not carried through to the residual effects assessment.



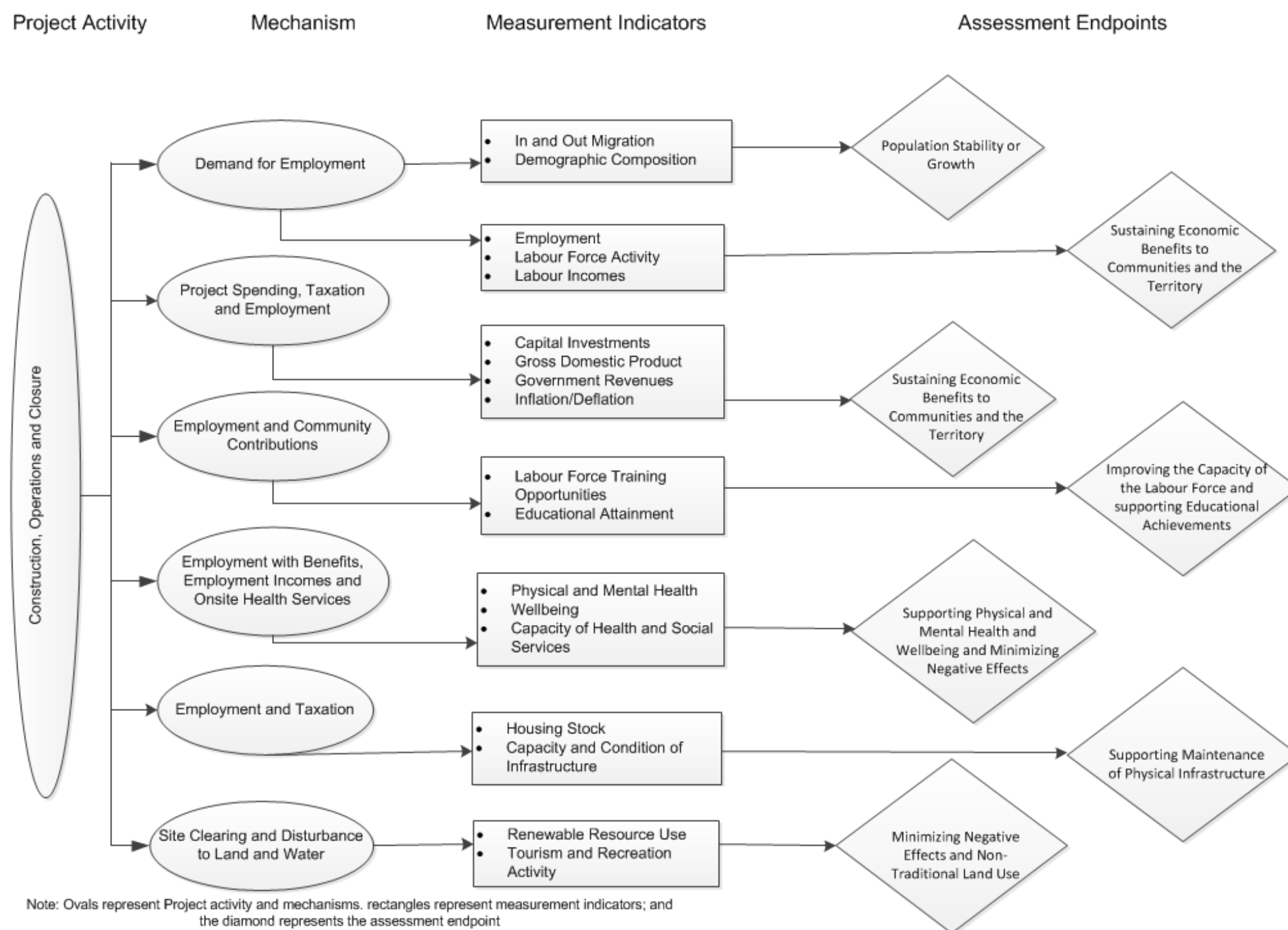
Primary pathways require further effects analysis in the effects assessment to determine the environmental significance from the Project on socio-economic components, and are carried through into the residual effects assessment.

Figure 14.1-1 shows linkages between the Project, component activities, measurement indicators and assessment endpoints.

#### **14.1.4.2      *Pathway Screening***

The pathway screening for the Project's potential effects on the socio-economic environment is shown in Table 14.1-4.

Figure 14.1-1 Linkage Diagram Identifying Potential Effects on Population Demographics





**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Population Demographics	Interterritorial in-migration	Construction and operations employment and contracting opportunities	Project-induced in-migration to the NWT from southern communities	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	No linkage
Population Demographics	Intrateritorial migration from rural to urban communities	Construction and operations employment and contracting opportunities	Project-induced out migration from rural LSA communities to Yellowknife (urban)	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	Primary
Population Demographics	Intrateritorial migration between rural communities	Construction and operations employment and contracting opportunities	Project-induced migration between rural LSA communities	<ul style="list-style-type: none"> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	No linkage
Population Demographics	Interterritorial out-migration	Construction and operations employment and contracting opportunities	Project-induced out-migration from the NWT to southern communities	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	No linkage

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Population Demographics	Interterritorial out migration	Construction and operations employment and contracting opportunities	The Project would maintain the base case population from 2019 to 2025, and soften the trend of out-migration from the NWT to southern communities from 2026 to 2030	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	Primary
Economy	Capital investment	Capital expenditures during construction and operations	Capital expenditure would add to the economic activity in the NWT, including investment	<ul style="list-style-type: none"> <li>• Strategies that increase capacity of local businesses to supply the Project with goods and services</li> </ul>	Primary
Economy	Gross Domestic Product	Project spending on goods and services during construction and operations	The Project would contribute to the GDP of the NWT	<ul style="list-style-type: none"> <li>• None required</li> </ul>	Primary
Economy	Government revenues	Payment of taxes and royalties, and employee payment of income tax during operations.	The Project would result in personal income tax, corporate tax and other taxes and revenues to the NWT	<ul style="list-style-type: none"> <li>• None required</li> </ul>	Primary
Economy	Inflation	Construction and operations employment and contracting opportunities	Project-induced in-migration to the NWT from southern communities could increase consumer prices and result in inflation	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	No linkage
Economy	Inflation	Construction and operations employment and contracting opportunities	The Project would discourage out-migration from the territory as a result of the closure of the existing Ekati mine, thereby stabilizing inflation and avoiding deflation	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	Primary

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Employment and Incomes	Local employment	Construction and operations employment	The Project would maintain local employment during construction and operations	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> </ul>	Primary
Employment and Incomes	Labour force characteristics	Construction and operations employment	The Project would postpone spikes in unemployment rate	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> </ul>	Primary
Employment and Incomes	Incomes	Construction and operations employment	The Project would maintain incomes for the local labour force, and add to labour income in the NWT	<ul style="list-style-type: none"> <li>Transition existing Ekati operations workforce to the Project operations</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Offer wealth management through life skills training to employees through an EFAP</li> </ul>	Primary
Education and Training	Education achievement	Construction and operations requirement for trained labour force	Project employment educational requirements could lead to increased interests in completing education and educational attainment	<ul style="list-style-type: none"> <li>Providing training opportunities</li> <li>Working with local education authorities to communicate the need for education in the pursuit of mining employment</li> <li>Support efforts to upgrade education</li> <li>Provide career counselling</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	Primary

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Education and Training	School capacity	Construction and operations employment opportunity related in-migration	In-migration to the NWT could lead to increased number of children of school-age, leading to higher admission rates and larger class sizes	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> </ul>	No linkage
Education and Training	Education funding	Construction and operations taxes, royalties and community contributions	The Project would continue to provide community contributions and tax revenue to the GNWT, thereby supporting educational funding	<ul style="list-style-type: none"> <li>None required.</li> </ul>	Primary
Education and Training	Demand for educational services	Construction and operations requirement for trained labour force	The Project would maintain some level of demand for mining-related educational services in the NWT	<ul style="list-style-type: none"> <li>None required</li> </ul>	Primary
Education and Training	Labour force training	Construction and operations training	Project training will continue to build capacity in the labour force, thereby strengthening the NWT population's ability to participate in the labour force	<ul style="list-style-type: none"> <li>Providing training opportunities</li> <li>Working with local education authorities</li> <li>Support efforts to upgrade education</li> <li>Provide career counselling</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> </ul>	Primary
Education and Training	Teacher retention	Construction and operations employment opportunity related in-migration	Substantial in-migration could drive the cost of living up, which has been noted as an issue in retaining teachers	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> </ul>	No linkage

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Health and Well-being	Physical health and safety awareness	Health and Safety training	Project health and safety training (e.g., defensive driving, first aid) could improve safety awareness, and provide skills for treatment of minor injuries	<ul style="list-style-type: none"> <li>None required</li> </ul>	Primary
Health and Well-being	Physical and mental health	Project medical and counselling services	Project medical and counselling services would benefit the physical and mental health of employees and their families	<ul style="list-style-type: none"> <li>None required</li> </ul>	Primary
Health and Well-being	Time for traditional pursuits	Rotational employment	Rotational employment would provide time for traditional harvesting in the two week off period	<ul style="list-style-type: none"> <li>None practical</li> </ul>	Primary
Health and Well-being	Time in communities	Rotational employment	Rotational work would require employees to be away from their communities during the two week on period, preventing them from participating in community events and volunteering	<ul style="list-style-type: none"> <li>None practical</li> </ul>	Primary
Health and Well-being	Vulnerability	Construction and operations employment	Preferential hiring of women and Aboriginals would build capacity in these groups, and provide employment, thereby reducing their vulnerability	<ul style="list-style-type: none"> <li>None required</li> </ul>	Primary
Health and Well-being	Funding for traditional pursuits	Employment income	Employment income would provide support for traditional harvesting activities	<ul style="list-style-type: none"> <li>None required</li> </ul>	Primary
Health and Well-being	Income	Employment income	Employment income would contribute to income disparity between employee families and families not benefiting from employment	<ul style="list-style-type: none"> <li>None practical</li> </ul>	Primary

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Health and Well-being	Health Services	Construction and Operations	Project-induced in-migration may increase demand on health services	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> </ul>	No linkage
Health and Well-being	Health Services	Construction and Operations	Project workforce may increase demand on health services	<ul style="list-style-type: none"> <li>• Provide a first responder medical station at the accommodation camp facilities to meet workers' medical needs while at site, to limit the demand for governmental health facilities for work related injuries</li> <li>• First aid training</li> <li>• Driver training and enforcement of a driver code of conduct, to control speeds and encourage considerate driving</li> </ul>	No linkage
Health and Well-being	Social services	Construction and Operations	Project-induced in-migration may increase demand on social services	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Support Community Liaison Coordinator positions to work with communities throughout the Project</li> </ul>	No linkage
Health and Well-being	Social services	Construction and operations	Project workforce may increase demand on social services	<ul style="list-style-type: none"> <li>• Offer drug and alcohol programming and other counselling to employees and their immediate families</li> <li>• Offer EFAP to employees and their immediate family members</li> </ul>	No linkage

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Health and Well-being	Protective Services	Construction and Operations	Project-induced in-migration may increase demand on protective services	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Support Community Liaison Coordinator positions to work with communities throughout the Project</li> </ul>	No linkage
Health and Well-being	Protective Services	Construction and Operations	Project workforce may increase demand on police services	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Offer drug and alcohol programming and other counselling to employees and their immediate families</li> <li>• Offer EFAP to employees and their immediate family members</li> </ul>	No Linkage
Physical Infrastructure	Housing	Construction and Operations	Project workforce may increase demand on local housing	<ul style="list-style-type: none"> <li>• Use the existing Ekati camp to accommodate employees while on shift</li> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> </ul>	No linkage

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Physical Infrastructure	Housing	Construction and Operations	Project-induced in-migration to Yellowknife from rural LSA communities may increase demand on local housing	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> <li>Out-migration from the north (including Yellowknife) to the south is expected to continue, and offset intra-territorial migration's effect on housing in Yellowknife.</li> </ul>	No linkage
Physical Infrastructure	Local and Regional Transportation	Construction and Operations	Project-induced in-migration may increase traffic on local roads	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> <li>Out-migration from the north (including Yellowknife) to the south is expected to continue, and offset intra-territorial migration's effect on infrastructure in Yellowknife.</li> </ul>	No linkage
Physical Infrastructure	Local and Regional Transportation	Construction	Project-related construction traffic may increase traffic volumes on the Tibbitt to Contwoyto Winter Road (TCWR)	<ul style="list-style-type: none"> <li>Liaise with other road users (e.g., the Diavik mine) on transportation schedule between Yellowknife and the Project</li> </ul>	Primary
Physical Infrastructure	Local and Regional Transportation	Construction and Operations	The Project would use existing air infrastructure in point of hire of fly point communities to transport workers and goods to and from site	<ul style="list-style-type: none"> <li>Maintain production at existing levels to continue existing traffic volumes</li> </ul>	Primary



**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Physical Infrastructure	Communication	Construction and Operations	Project-induced in-migration may increase demand on communication services	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> <li>Out-migration from the north (including Yellowknife) to the south is expected to continue, and offset intra-territorial migration's effect on infrastructure in Yellowknife.</li> </ul>	No linkage
Physical Infrastructure	Waste management	Construction and Operations	Project construction and operations could generate waste and increase demand for waste management	<ul style="list-style-type: none"> <li>Mine waste will be processed and stored on-site</li> <li>Other industrial waste will be disposed of at approved landfills, and Dominion Diamond will pay all applicable disposal fees</li> </ul>	Primary
Physical Infrastructure	Waste management	Construction and Operations	Project-induced in-migration could increase demand on waste management services	<ul style="list-style-type: none"> <li>Points of hire or fly points in all rural LSA communities</li> <li>Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>Transition existing Ekati operations workforce to the Project operations</li> <li>Revenues paid to municipal, territorial and federal governments by the Project are expected to contribute to territorial funding of infrastructure</li> <li>Out-migration from the north (including Yellowknife) to the south is expected to continue, and offset intra-territorial migration's effect on infrastructure in Yellowknife</li> </ul>	No linkage

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
Physical Infrastructure	Water treatment and sewage	Construction and Operations	Project-induced in-migration could increase demand on water treatment and sewage systems	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Revenues paid to municipal, territorial and federal governments by the Project are expected to contribute to territorial funding of infrastructure</li> <li>• Out-migration from the north (including Yellowknife) to the south is expected to continue, and offset intra-territorial migration's effect on infrastructure in Yellowknife</li> </ul>	No linkage
Physical Infrastructure	Utilities	Construction and Operations	Project-induced in-migration could increase demand on utilities	<ul style="list-style-type: none"> <li>• Points of hire or fly points in all rural LSA communities</li> <li>• Source construction labour preferentially from point of hire or fly point communities (including Yellowknife)</li> <li>• Maintain priority hiring and contracting for Northerners and Northern Aboriginals</li> <li>• Transition existing Ekati operations workforce to the Project operations</li> <li>• Revenues paid to municipal, territorial and federal governments by the Project are expected to contribute to territorial funding of infrastructure</li> <li>• Out-migration from the north (including Yellowknife) to the south is expected to continue, and offset intra-territorial migration's effect on infrastructure in Yellowknife</li> </ul>	No linkage
NLTU	Hunting	Construction and Operations	The Project may affect the availability of wildlife for hunting in the LSA	<ul style="list-style-type: none"> <li>• Employ mitigation measures detailed in the wildlife and habitat pathway analysis (DAR Section 13)</li> </ul>	Primary

**Table 14.1-4 Pathway Screening**

Valued Component	Key Indicator	Project Component/ Activity	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
NLTU	Fishing	Construction and Operations	The Project may affect the availability of fish for fishing in the LSA	<ul style="list-style-type: none"> <li>Employ mitigation measures detailed in the fish and fish habitat pathway analysis (DAR Section 9)</li> </ul>	Primary
NLTU	Hunting, fishing and other land-based tourism	Construction and Operations	Project-related noise may have an effect on hunting, fishing and land-based tourism in the LSA	<ul style="list-style-type: none"> <li>Employ mitigation measures for noise control (Appendix C3)</li> <li>Where possible, minimize the above-ground visibility of waste rock piles</li> </ul>	Primary
NLTU	Hunting, fishing and other land-based tourism	Construction and Operations	Project-related visual effects may have an effect on hunting, fishing and land-based tourism in the LSA	<ul style="list-style-type: none"> <li>Employ mitigation measures for noise control (Appendix C3)</li> <li>Where possible, minimize the above-ground visibility of waste rock piles</li> </ul>	Primary
NLTU	Parks and protected areas	Construction and Operations	Project-related disturbances could affect parks and protected areas	<ul style="list-style-type: none"> <li>The Project will not be built within any parks or protected areas</li> </ul>	No linkage

EFAP = Employee and Family Assistance Program, GNWT = Government of the Northwest Territories, LSA = Local Study Area, NLTU = Non-traditional Land Use, NWT = Northwest Territories, TCWR = Tibbitt to Contwoyo Winter Road.



## 14.2 Population Demographics

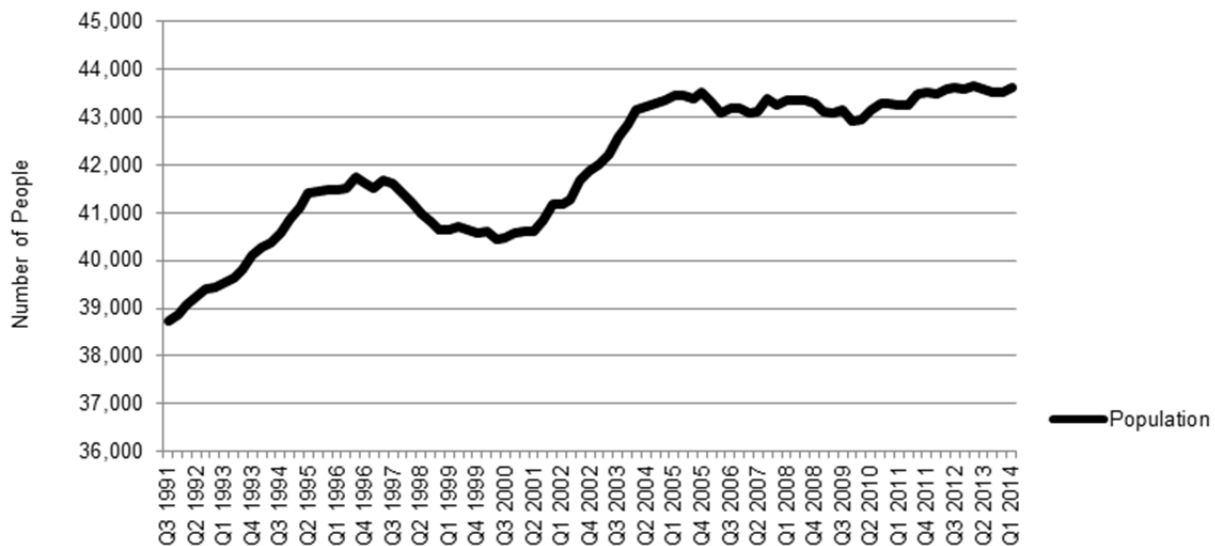
### 14.2.1 Existing Environment

This section summarizes existing population dynamics in the NWT. For a full discussion of population, demographics and physical and social infrastructure in the NWT and LSA communities, please refer to the socio-economic baseline (Annex XV, Section 3.1).

#### 14.2.1.1 Population

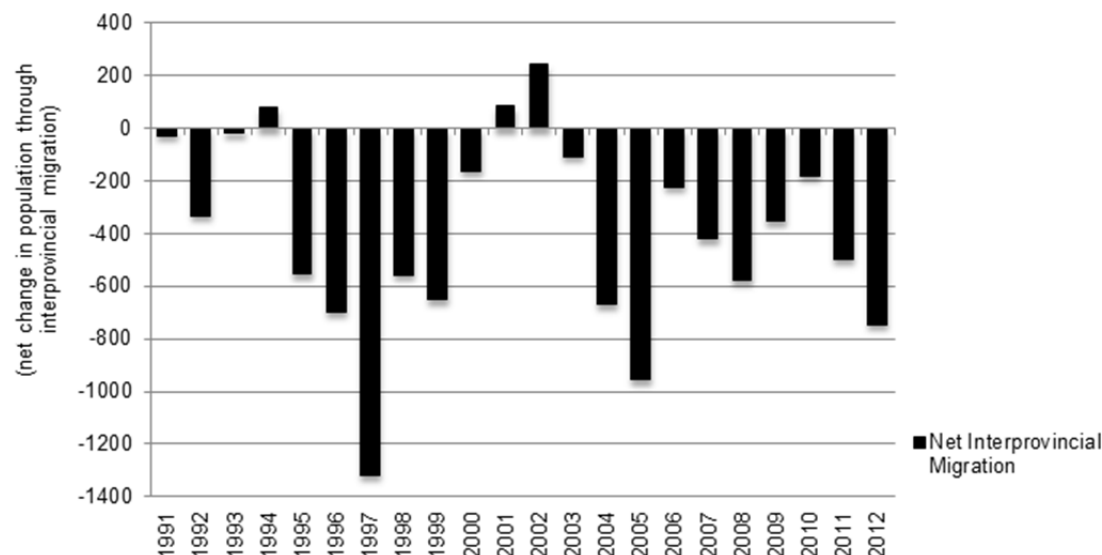
The population of the NWT has increased modestly over the past 20 years (Figure 14.2-1). Strong growth between 1991 and 1996 was, to some extent, countered by a sharp out-migration-driven population decline between 1997 and 2000 (Figure 14.2-2). Subsequent growth during the early 2000s coincided with the growth of the mining industry, when high demand for skilled labour at mines such as Ekati and Diavik contributed to a net positive in-migration trend. This positive migration trend was, however, short-lived. Overall, out-migration from the territory has been markedly higher than in-migration (Figure 14.2-2).

**Figure 14.2-1 Population in the Northwest Territories, 1991 to 2014**



Source: Statistics Canada 2014a.

Following the population growth of the early 2000s, the NWT's population stabilized, with net negative interprovincial migration largely countered by international in-migration, high birth rates, and, comparatively, low death rates.

**Figure 14.2-2 Net Interprovincial Migration, 1991 to 2012**

Source: Statistics Canada 2014a.

In most of the rural LSA communities, population decline has been pronounced since 2001. Lutsel K'e, Gamètì and Fort Resolution all experienced population declines of over 10% between 2001 and 2011. Wekweètì, Whatì and Dettah had little or no population growth during the same period. Behchokò and Yellowknife were the only two communities to see population increases above 5%. Much of this increase can be attributed to the current migration trend of rural to urban, and north to south movement. Kugluktuk experienced an increase of approximately 19% (228 people) between 2001 and 2011<sup>4</sup>.

Between 2006 and 2011, 720 people had moved to Yellowknife from other locations in the NWT. While only amounting to 4.1% of the population of the city, this number is important considering the low populations in the smaller communities in the NWT, including the LSA communities, from which people would have moved. Others still, including people in Yellowknife, migrate south in search of warmer climates and lower cost of living.

<sup>4</sup> Economic shocks (including shifts in employment opportunities) can drive population change. The Project is expected to have an economic effect on the NWT and, in particular, the LSA communities in the NWT. The Project is not expected to result in economic effects in Nunavut, including Kugluktuk, Bathurst Inlet and Umingmaktok. As a result, Project-driven changes to population and associated effects on health, wellbeing, infrastructure and services in Kugluktuk, Bathurst Inlet and Umingmaktok are not anticipated.



### 14.2.1.2 Demographics

The NWT population is almost evenly split between Aboriginal (51.9%) and non-Aboriginal (48.1%) people (Table 14.2-1). Most of the NWT Aboriginal population lives in small communities, including those in the LSA, where over 85% to 90% of each community's population identifies as Aboriginal.

Yellowknife has experienced growth in the Aboriginal population, which now comprises a quarter (25.4% or 4,780 people) of the total population. Conversely, since 2006, the Aboriginal population of smaller communities has decreased, suggesting that, despite high birth rates, Aboriginal people are leaving smaller communities for Yellowknife.

**Table 14.2-1 Local Study Area Community Population (2011)**

Community	Population (2011) <sup>(a)</sup>				
	Total	Aboriginal		Non-Aboriginal	
		#	%	#	%
Behchokò	1,915	1,795	93.7	120	6.3
Dettah	210	205	97.6	5	2.4
Fort Resolution	470	425	90.4	45	9.6
Gamètì	250	240	96.0	10	4.0
Lutsel K'e	280	240	85.7	40	14.3
Wekweètì	140	130	92.9	10	7.1
Whatì	490	455	92.9	35	7.1
Yellowknife	18,830	4,780	25.4	14,050	74.6
Kugluktuk	1,440	1,315	91.3	125	8.7
NWT	40,800	21,155	51.9	19,645	48.1

Source: Statistics Canada (2011a,b).

Note: The percentage change in Aboriginal and non-Aboriginal identity populations is not reported because, in small communities, a very small population change skews the percent increase, creating a misleading picture of population growth.

Non-Aboriginal population is derived by subtracting the total Aboriginal population from the general population.

n/a = not applicable; # = number; % = percent; NWT = Northwest Territories.

In the NWT, over one-third (37% or 15,100 people) of the population identifies as First Nations. A further 11.7% (4,780) identify as Inuit and 6.7% (2,715) as Métis. In Yellowknife, nearly one-fifth of the population is First Nations, with smaller groups of Inuit and Métis. The majority of the city's population is of either North American (i.e., southern Canadian and American) or European ethnic origins. Most people living in the rural LSA communities identify as First Nations (80% to 98%, depending on community). There are also small Métis populations in Behchokò (4.7% or 90 people), Dettah (4.8% or 10 people), and Fort Resolution (18.1% or 85 people). Kugluktuk has a predictably large Inuit population (91.0% or 1,310 people). Fort Resolution notably has larger Métis and non-Aboriginal populations (combined 53.2% or 250 people) than the other LSA communities, but is still predominantly First Nations (79.8% or 375 people).

The knowledge of Aboriginal languages declined greatly in the NWT and the LSA communities between 1989 and 2011 (approximately -20% to -53%, depending on community). In 1989, over half (55.6%) of NWT's Aboriginal population had knowledge of an Aboriginal language. By 2011, less than one-third (31.0%) of the Aboriginal population had this knowledge.



In the NWT, of those who speak an unofficial language<sup>5</sup>, Tłıchʔ (22.9% or 2,335 speakers) and Slavey (15.8% or 1,615 speakers) are the most common languages spoken. People who speak unofficial languages also report speaking Dene (5.8% [595 speakers]), Cree (2.2% [225 speakers]), and Inuktitut (2.0% [200 speakers]). Other Aboriginal languages are spoken by 19.8% of the unofficial language speakers, and non-Aboriginal languages account for 33.1% of the population with knowledge of an unofficial language.

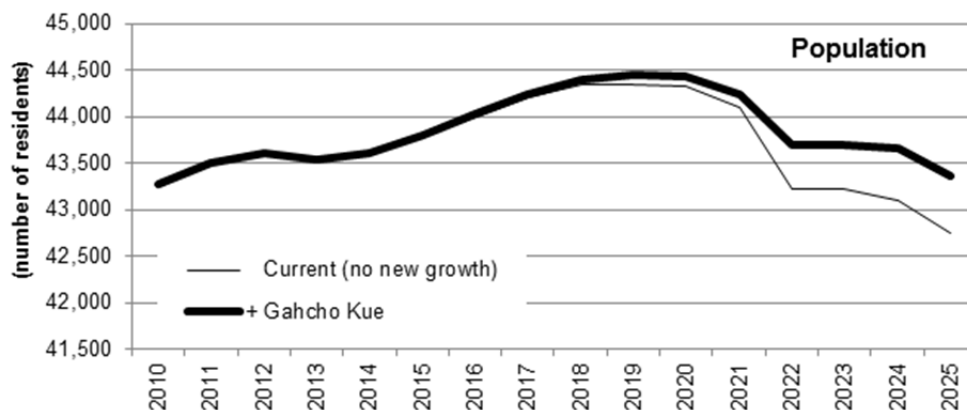
### 14.2.2 Base Case

The **Base Case** considers how the existing environment will change in the future, and focuses on the changes in the mining industry from 2014 to 2030. The Base Case scenario considers the existing Ekati, Diavik, and Snap Lake diamond mines operating in the North Slave region of the NWT. The mines are expected to close in 2020, 2023, and 2029, respectively. The Gahcho Kué Project will be introduced to the territory's economy, with the first full year of production being 2017, and closure in 2028.

The Base Case population scenario is one where the two largest private-sector employers in the territory (Ekati and Diavik) exit the economy. Because this is an extreme scenario, it is difficult to predict precisely how people will react in terms of their decision to migrate outside of the NWT. For the purpose of the Base Case discussion, there is no attempt to predict such reaction. Base Case population projections are predicated on a no-new-economic-growth scenario, with the exception of the Gahcho Kué mine, which has been approved and can be reasonably expected to move forward as planned.

The population of the NWT will slowly increase from 2014 to 2019 (Figure 14.2-3). Beyond 2019, reduced activity at the existing NWT mines, and their pending closures, will bring about an increase in out-migration that will stabilize briefly in 2022, before descending further into the foreseeable future. Between 2020 and 2025, the territory could lose over 1,500 residents<sup>6</sup>. The Gahcho Kué mine, while softening this out-migration to approximately just over 1,000 residents, does not offset the overall trend. Out-migration is predicted to continue until a new equilibrium in the labour market is established.

**Figure 14.2-3 Base Case Population, 2010 to 2025**



<sup>5</sup> Languages other than French or English are considered as unofficial languages in Canada.

<sup>6</sup> Population modelling is based on loss of employment in a no-new-economic growth scenario.

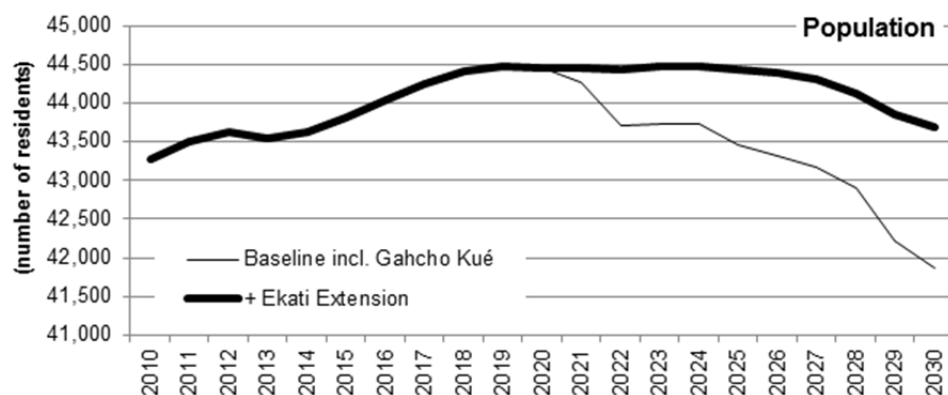
Existing intra-territorial migration patterns (i.e., from rural to urban) are expected to continue from 2014 onwards. Both Aboriginal and non-Aboriginal residents of the NWT may move south, and so the Aboriginal identity portion of the population is expected to remain proportionally similar to existing conditions in the Base Case. Similarly, with continued migration to Yellowknife and the south, the current trend associated with reduced knowledge of an Aboriginal language amongst the NWT Aboriginal population is expected to continue.

### 14.2.3 Project Effects on Population Demographics

The construction phase of the Project is not expected to have a noticeable impact on interprovincial migration and will not cause a change in the baseline population projection. The operations and closure phases of the Project will, however, alter out-migration and maintain population stability for a period.

The Base Case scenario results indicate that the NWT will see substantial out-migration from 2020 to 2025 because of the closure of the Ekati and Diavik mines. The Project offsets out-migration during this period. Instead of losing over 1,000 residents during this five year time period, the territorial population is expected to remain constant (i.e., just below 44,500) until 2025. In 2026, Gahcho Kué is expected to begin closure activities, and production at the Snap Lake mine will begin to taper (Figure 14.2-4), resulting in overall population decline. The Project softens this decline between 2026 and 2030.

**Figure 14.2-4 NWT Population Estimates, 2010 to 2030**



While the rural to urban migration trend is already occurring, and is not wholly attributable to mining employment, it is expected that as people take up positions with the Project made available by attrition, some will choose to move from rural LSA communities to Yellowknife to be closer to amenities. Project employment provides incomes needed for successful relocation and participation in the private housing market. Further, the inclusion of Yellowknife as a point of hire community removes the barrier associated with transportation to and from the Project.

Given that the Project will not result in inter-territorial in-migration, demographic changes in the NWT are not associated with the Project.





#### 14.2.4 Residual Impact Classification and Determination of Significance

The Project's residual effect on the population of the NWT is considered highly positive, given that it maintains Base Case population from 2019 to 2025, and softens out-migration and population decline thereafter until closure in 2030. The effect is regional to the NWT population, and is of long-term duration given that the effect occurs over 10 years – a substantial amount of time in the context of human experience. Without new development, following the closure of the Project in 2030, out-migration from the territory is expected to occur at a rate more substantial than during the final years of the Project.

The Project's residual effect on intra-territorial migration from rural LSA communities to Yellowknife is considered to be of low in magnitude. Project operation is expected to maintain the existing Ekati workforce, and so the uptake of employment by those currently not employed by the mine and living in small communities is limited to opportunities created by attrition. Further, not all those who take up employment at the mine will decide to migrate from rural LSA communities to Yellowknife. The effect may be negative for some communities where population decline threatens the demographic composition of the community, or the provision of services based on population linked funding from the territorial and federal governments<sup>7</sup>. Conversely, the effect may be positive for those who choose to move to Yellowknife. The effect will persist throughout Project operations and closure, and so is considered long term in duration. It is unlikely that, following closure of the Project, skilled workers employed at the mine would return to rural LSA communities, and so this effect is considered irreversible.

Residual Project effects are summarized in Table 14.2-2.

**Table 14.2-2 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on Population Demographics**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint
The Project would maintain the Base Case population from 2019 to 2025, and soften the trend of out-migration from the NWT to southern communities from 2026 to 2030	high	regional	long term	irreversible	<i>significant</i>
Project-induced out migration from rural LSA communities to Yellowknife (urban)	low	local	long term	irreversible	

<sup>7</sup> Refer to Sections 14.5.3, 14.6.3 and 14.7.3 for a discussion of the effect of the Project, overall, on educational, health and social services, and physical infrastructure, respectively.



While the Project's potential negative effect associated with out-migration from rural LSA communities to Yellowknife is low, the overall positive effect on the population of the NWT is high, and will continue into the long term. As a result, the Project's effect on Population Demographics is assessed as **significant**.

## 14.3 Economy

### 14.3.1 Existing Environment

This section concentrates on economic effects that are a result of the Project's planned activities. Discussions centres on capital investments, mineral production, gross domestic product, government fiscal performance, and inflation. These variables form the basis for understanding the existing conditions within the regional economy and are directly affected by the Project. For a full description of baseline economic conditions in the NWT, please refer to the socio-economic baseline (Annex XV, Section 3.3).

Resource development in the NWT has resulted in a major transformation of the territory's economy since the mid-1990s. Following the discovery of diamonds in the North Slave Region, the Ekati mine began production in 1998. Shortly thereafter, in 2003 Rio Tinto opened the Diavik mine, which overshadowed the negative economic effects of the division of the NWT and Nunavut, and the closures of the Giant and Con Mines. Production at the Snap Lake mine began in 2008, further supporting the territorial economy.

Participation in the workforce has grown considerably since diamond mining began in the NWT, and has attracted new labour. The larger workforce has resulted in fewer people drawing on social assistance and employment insurance. Governments have benefited through increased revenues generated at the corporate and personal taxation levels, resource royalties, and indirect taxes on products.

The decade and a half of diamond mining has not been associated with a large increase in population. The number of NWT residents grew initially from 1999 to 2004, but has changed little since then. As a result, the anticipated increase in demand for public services and infrastructure as it relates to population growth has not materialised.<sup>8</sup> Existing businesses have expanded, new ones have been created, and viable Aboriginal development corporations have emerged, furthering the size and extent of economic benefits flowing from the diamond mining industry. Through all this, inflation has also remained in line with the Canadian average.

#### 14.3.1.1 Capital Investment

Capital investments are an indicator of a region's future economic growth. The NWT's mining sector has been a major contributor to the territory's capital investments over the past 15 years (Table 14.3-1). In 2000, the three-year construction of the Diavik Diamond Mine began, bringing approximately \$1 billion of new private sector investment to the territory. In 2005, construction of the Snap Lake Diamond Mine began. Construction of this project also spanned three years, with a final cost in excess of \$1 billion. Since 2005, Ekati and Diavik have continued to expand their operations beyond the initial site development including further investments in pit operations and development of new underground projects.

<sup>8</sup> This does not suggest there has been no change in the demand for public services or infrastructure. However, any change that has occurred can be attributed to changing needs of the population, shifts in demographics including perhaps the ageing of the population, and from intra-territorial migration.



Over the past 15 years, capital investments made by the NWT's mining, oil, and gas sector has been consistently above 50% of total capital investments in the territory, and in select years has represented in excess of 75% of capital expenditures (Table 14.3-1).

Private-sector investment represents new money to the territory. This is unlike public-sector investment, which is a redistribution of Canadian taxpayers' wealth. In the NWT, most public sector spending represents new money to the territory as much of the financing is from taxpayers from southern Canada.

**Table 14.3-1 Public and Private Capital Expenditures, by Sector, Annual (\$, Millions)**

	1999	2000	2001	2002	2003	2004	2005	2006
Mining, Oil, and Gas	264	608	1,101	936	444	793	1,042	1,443
All Industries	554	824	1,401	1,350	817	1,248	1,469	1,848
Mining (% of Total)	48%	74%	79%	69%	54%	64%	71%	78%
	2007	2008	2009	2010	2011	2012	2013 <sup>p</sup>	2014 <sup>i</sup>
Mining, Oil, and Gas	1,469	1,052	568	x	563	769	905	850
All Industries	1,995	1,562	1,071	1,247	1,087	1,263	1,504	1,415
Mining (% of Total)	74%	67%	53%	x	52%	61%	60%	60%

Source: Statistics Canada (2014b).

Note: 'p' means preliminary data, 'i' means intentions. 'x' suppressed to meet the confidentiality requirements of the Statistics Act.

### 14.3.1.2 Mineral Production

Diamond mining has remained the most significant source of mineral production in the territory since 1999 (Table 14.3-2). The value of diamond mining production peaked in 2004 when the combined activities of Ekati and Diavik produced \$2.1 billion in diamonds. The value of production returned to this level in 2008 after the Snap Lake Diamond Mine opened. The drop in 2009 was due to temporary shutdowns at Diavik and Snap Lake following the worldwide economic recession. The value of production returned to peak levels a year later, but fell to \$1.6 billion in 2012.

**Table 14.3-2 Value of Mineral Production in the Northwest Territories, 1999 to 2012 (\$, Millions)**

Year	Diamonds	Oil and Gas	Other Minerals	Total
1999	606	243	47	896
2000	625	484	57	1,165
2001	718	545	61	1,323
2002	792	471	82	1,345
2003	1,588	515	79	2,182
2004	2,097	518	16	2,630
2005	1,762	581	28	2,371
2006	1,567	563	71	2,201
2007	1,765	543	66	2,374

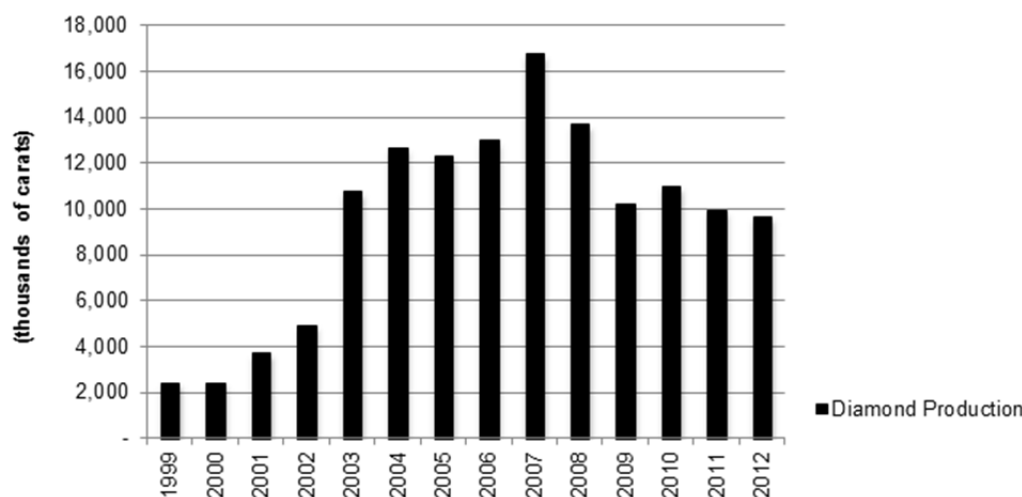
**Table 14.3-2 Value of Mineral Production in the Northwest Territories, 1999 to 2012 (\$, Millions)**

Year	Diamonds	Oil and Gas	Other Minerals	Total
2008	2,057	672	67	<b>2,795</b>
2009	1,448	405	59	<b>1,912</b>
2010	2,029	477	15	<b>2,522</b>
2011	2,053	416	86	<b>2,556</b>
2012	1,615	444	107	<b>2,166</b>

Source: GNWTBS (2013a).

Diamond production, in terms of carats, peaked in 2007 at 16.78 million carats, but has been on a downward trend since then. In 2012, the three operating diamond mines produced 9.67 million carats (Figure 14.3-1).

**Figure 14.3-1 Value of Diamond Production in the Northwest Territories, 1999 to 2012**



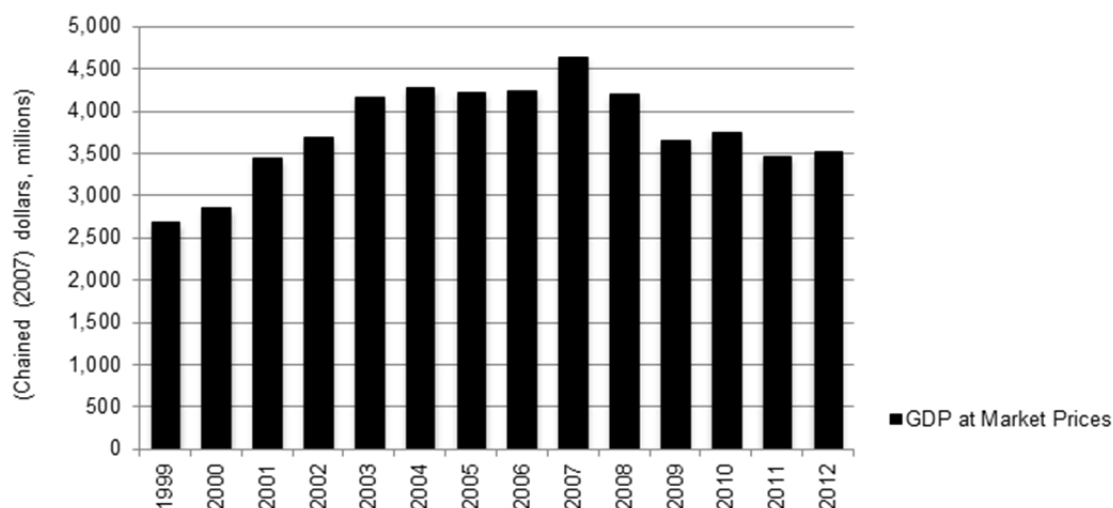
Source: GNWTBS 2013a.

### 14.3.1.3 Gross Domestic Product

Gross domestic product (GDP) is a measure of production or output within a region. There are several ways to measure GDP, including GDP by Market Prices, GDP by Income, and GDP by Industry (also referred to as GDP by Basic Prices). GDP by Basic Prices is calculated by summing labour income, mixed income, capital consumption allowance, indirect taxes (less subsidies levied on production), and other operating surplus. Adding indirect taxes on products less any subsidies on products yields GDP at Market Prices. 'Real' GDP at Market Prices, which is the most often cited measure of value-added production, removes the effects of inflation from the data.

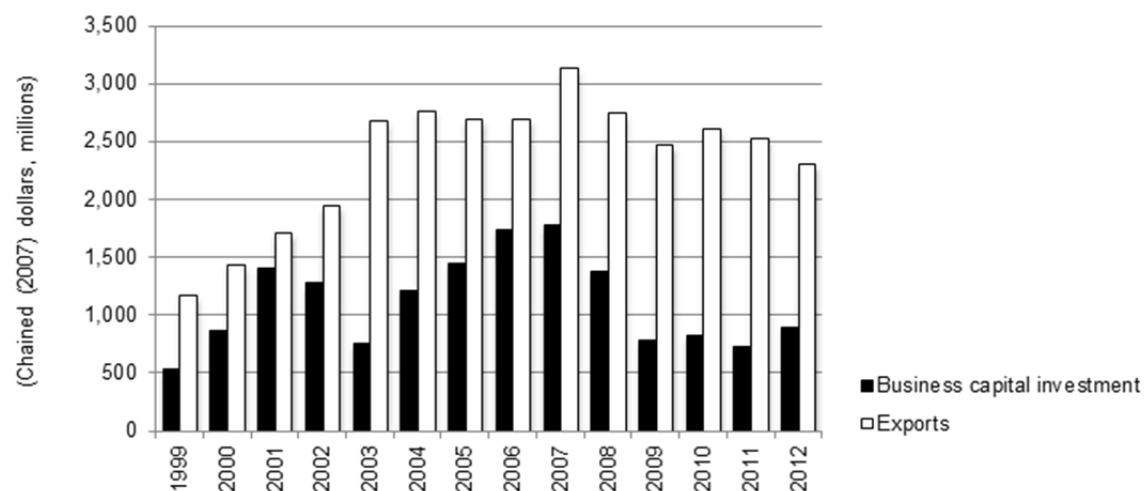
In the NWT, real GDP at Market Prices was equal to \$3.5 billion in 2012, having fallen from its peak in 2007 (Figure 14.3-2). Much of this decline is the result of lower private-sector capital expenditures and a drop in the value of exports (Figure 14.3-3). That peak year coincides with the peak carat production at the diamond mines, construction activities at Snap Lake Diamond Mine, and increased development expenditures at the Ekati and Diavik mines.

**Figure 14.3-2 Gross Domestic Product at Market Prices, Chained (2007) Prices, 1999 to 2012**



Source: Statistics Canada 2013a.

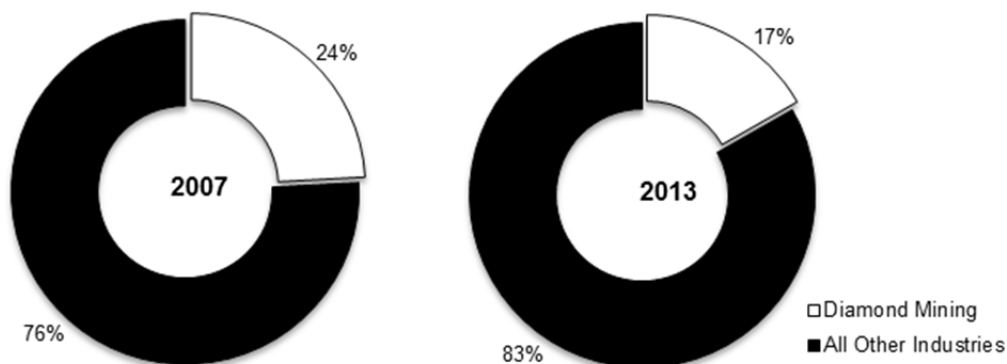
**Figure 14.3-3 Select Components of Gross Domestic Product at Market Prices, Chained (2007) Prices, 1999 to 2012**



Source: Statistics Canada 2013a.

GDP at Basic Prices provides further insight on the changes within the NWT's economy. At its peak, diamond mining represented 24% of the territory's total real output. Preliminary estimates for 2013 indicate its share has dropped to 17% (Figure 14.3-4). These figures do not include other contributions made by the diamond mines to the overall economy, namely, the contribution related to construction and ongoing development, and the indirect and induced effects of diamond mining. The 2010 Statistics Canada Interprovincial Input-Output Model includes a GDP multiplier for the indirect effects of diamond mining in the NWT equal to 1.09 and 1.15 when adding in the induced effects (Statistics Canada 2014c).

**Figure 14.3-4 Mining's Relative Contribution to the Northwest Territories Economy  
(Relative Gross Domestic Product at Basic Prices, Chained (2007)  
Dollars, 2007 and 2013)**

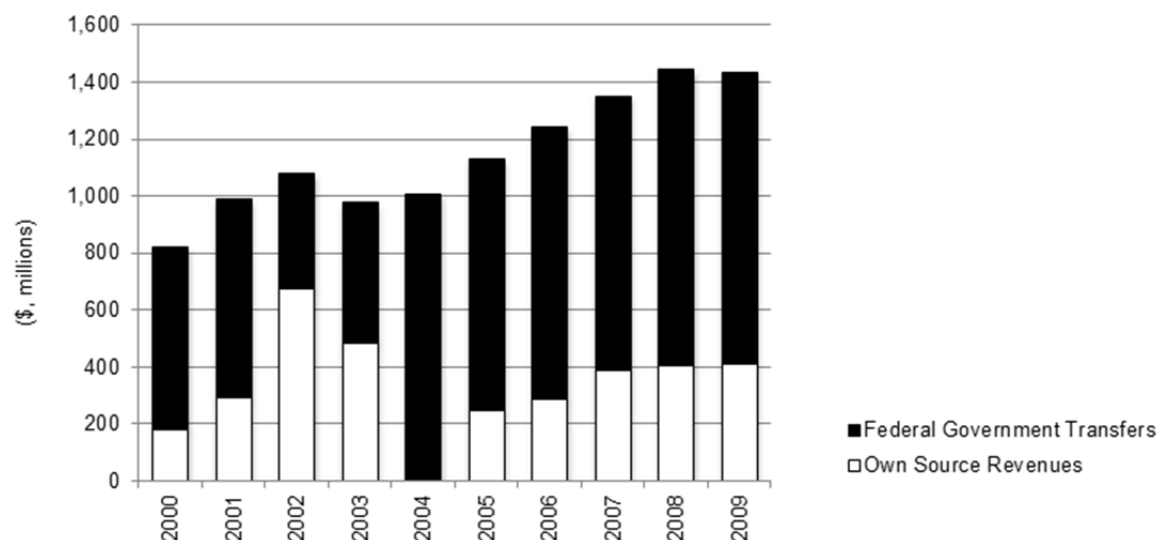


Source: Statistics Canada 2013a.

#### **14.3.1.4 Government Revenues**

The Government of NWT's (GNWT) total revenues have grown 74% from 2000 to 2009 to equal \$1.432 billion, or an average annual increase of 6.3%, compounded annually (Figure 14.3-5). This growth in revenue far outpaces that of inflation and population, both of which have, over the ten years from 2000, grown by 29%.

**Figure 14.3-5 Government of the Northwest Territories Total Revenues by Source, 1999 to 2009**



Source: GNWTBS 2010.

On April 1, 2014, the GNWT officially devolved from the Government of Canada. Among other things, the *Devolution Agreement* included a new approach to resource revenue sharing. “The GNWT will keep 50% of the revenues collected from resource development on public land up to a maximum amount. The Government of Canada will deduct its share from the GNWT’s federal transfer payments. The maximum benefit is a percentage of the GNWT’s annual budgetary needs. This means it will grow as the territory grows.” (GNWT 2014a).

The GNWT reported that the maximum amount it could receive in fiscal year 2014-15 is \$76 million, and that resource royalties over that period would amount to \$120 million. Under this scenario, the GNWT share of the revenues would be \$60 million (GNWT 2014a). These early predictions are subject to revision and may be lowered based on lower-than-expected profits from the mining sector in the 2014-15 fiscal year.

### 14.3.1.5 Inflation

A period of rapid economic expansion can influence inflation. There was an expectation before the rise of the diamond industry that its demands for labour and capital would lead to higher costs. This would be negative for anyone not benefiting from the economic growth.

There are several measures of inflation. The most commonly cited is the change in the Consumer Price Index (CPI), which represents the changing prices of goods and services. In the NWT, CPI is calculated for Yellowknife only. Therefore, price changes that occur elsewhere are not captured. It is nevertheless a good proxy for consumer price movements throughout the territory. CPI omits the prices for government and industry that could follow a different growth path. Depending on what is being studied, it might be relevant to include these non-consumer price effects.



A second measure of inflation is the Implicit Price Index (IPI) for the GDP. IPI is calculated by finding the difference between GDP and real GDP. Unlike the CPI, the GDP's IPI captures price movements of every sector of the economy. This makes it more complete, but introduces price movements of exports, which may not have any impact on NWT residents. For example, a substantial rise in the price of diamonds would be captured in this index but would falsely reflect a price impact for the territory beyond its effect on mining profits and corresponding taxes.

To address this issue, a third method is used. The IPI for the NWT's final domestic demand (FDD) is calculated in the same way as that for GDP. Final domestic demand includes the activities of consumers, government and industry and excludes exports. In this way, it is sheltered from price effects on the region's major exports.

Figure 14.3-6 displays data on the three measures of inflation for the NWT and Canada. The CPI for the NWT and Canada are shown to be following an almost identical path. There is extreme variation in the GDP IPI for the NWT that is almost entirely a function of the effect of export price fluctuation, which include diamonds and oil, and, prior to closure of Con and Giant Mines, Gold. The IPI for FDD is the only measure to show a clear separation from the national figure. Most of this deviation took place between 2003 and 2008. In the four years following 2008, the IPI of NWT's FDD has risen by 8.5% compared to a 6.5% rise across Canada.

### 14.3.1.6 Local Business Capacity

Diamond mining is the largest contributor to the NWT GDP, and supports other business sectors such as construction and transportation (GNWT 2014b). A summary of total registered businesses in the LSA communities between 2002 and 2012 is found in Table 14.3-3. Overall, between 2002 and 2012, the total number of registered businesses fell in the NWT, with decreases in Yellowknife and the rural LSA communities (GNWT 2013a). This trend may be reversing in rural LSA communities, with the total number of registered businesses increasing between 2010 and 2012.

**Table 14.3-3 Total Number of Registered Businesses, 2002 to 2012**

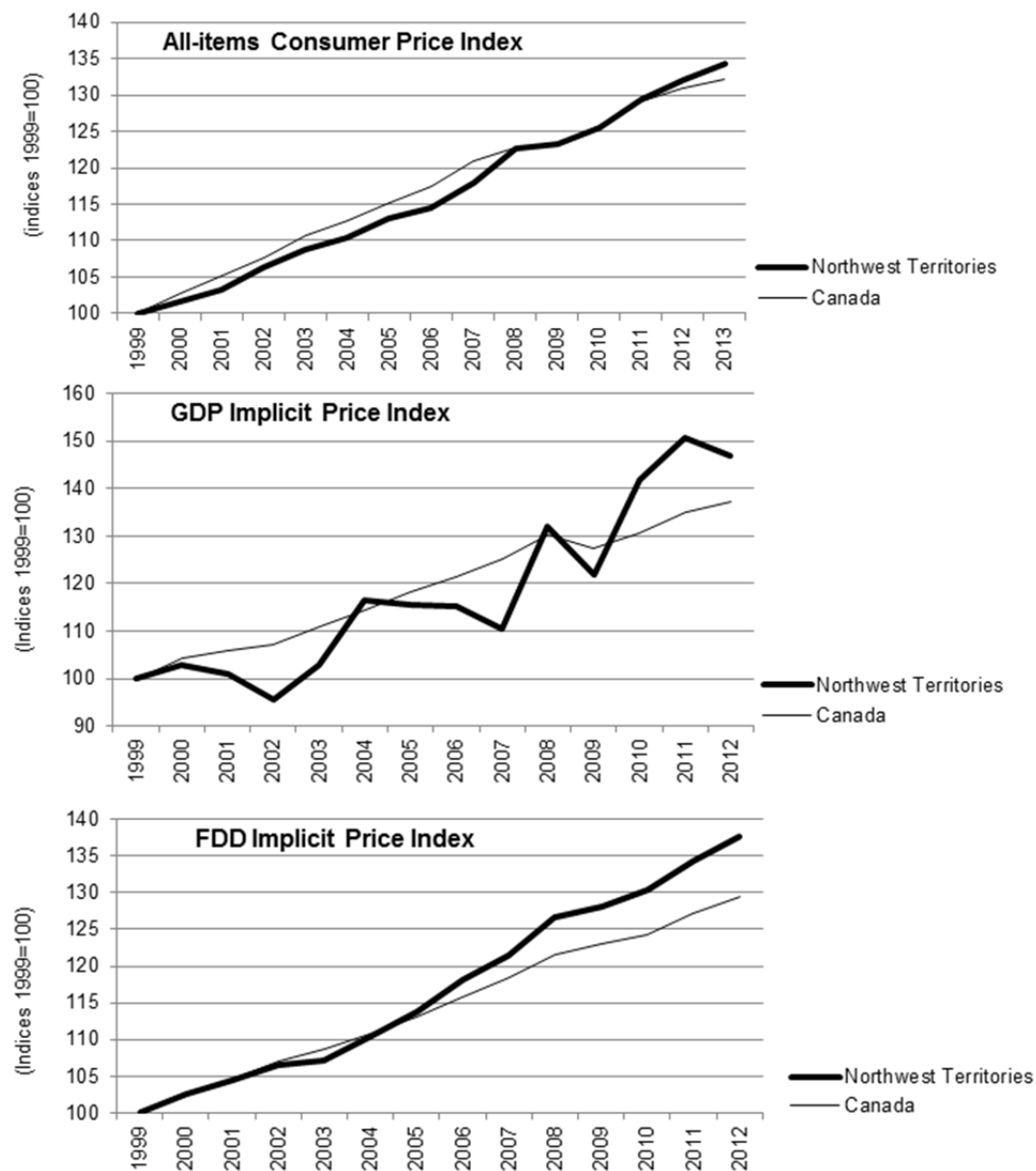
Communities	Total Number of Registered Businesses				
	2002	2006	2008	2010	2012
Yellowknife <sup>(a)</sup>	1,190	998	894	809	797
Remaining NWT Communities	994	867	781	669	673
Rural LSA Communities	81	46	43	33	38
Behchokq	36	19	18	14	14
Gamèti	10	5	3	1	3
Lutsel K'e	12	7	6	6	6
Wekweèti	6	4	5	5	5
Whati	17	11	11	7	10

Source: GNWT (2013a).

a) Includes community of N'Dilo, data for Dettah was not available.



**Figure 14.3-6 Measures of Inflation, Northwest Territories, and Canada, 1999 to 2012-13**  
(All-Items Consumer Price Index, GDP Implicit Price Index, FDD Implicit Price Index)



Source: Statistics Canada 2013a,b.

The Band councils of Behchokò, Gamètì, Wekweètì, and Whatì as well as the Treaty 11 Council business interests fall under the oversight of the Tłìchq Investment Corporation (TIC) (Tłìchq Government 2014). The mission of the TIC is to enhance the economic self-reliance, prosperity and certainty for Tłìchq citizens by creating sustainable economic development. The TIC is owned by the Tłìchq Government and includes businesses and joint venture partnerships with other groups and companies (Table 14.3-4).

**Table 14.3-4 Tłıchq Investment Corporation Businesses and Subsidiaries, 2014**

<b>Tłıchq Investment Corporation Business/Subsidiary</b>	<b>Main Office Location</b>	<b>Percent Owned by Tłıchq Investment Corporation</b>
5352 NWT Ltd. (Operating as Snare Lake Lodge)	Wekweèti	100% (Common Shares Only)
6224 NWT Ltd. (Operating as Lac La Martre Adventures)	Whati	40%
964053 NWT Ltd. (Tłıchq Land Tran Transport Ltd.)	Yellowknife	80%, (51%)
Aboriginal Diamonds Group Ltd. (DICAN Ltd.)	Yellowknife	ADG 51%, (33%)
Aboriginal Engineering Ltd.	Yellowknife	100%
Behchko Ko Development Corp. (Tłıchq Orica Blasting Services )Inc.	Behchokq	100%, (51%)
Denendeh Investments Limited Partnership	Yellowknife	22%
DLFN Holdings Ltd. (Tli Cho Domco Inc.)	Wekweèti	100%
Dogrib Power Corporation	Yellowknife	100%
Gamèti Development Corporation Ltd.	Gamèti	100%
Hozila Naedik'e Ltd.	Wekweèti	100%
Kete Whii Limited (Kete Whii Procon)	Yellowknife	50%, (50%)
Lac La Martre Development Corp. Ltd.	Whati	100%
Nishi-Khon Engineering Services Ltd.	Yellowknife	100%
Nishi-Khon/SNC Lavalin Ltd.	Yellowknife	(Nishi-Khon Engineering) 51%
Rae Band Construction Ltd.	Behchokq	100%
Rae Lakes General Store Ltd.	Gamèti	100%
Rae-Edzo Dene Band Dev. Corp	Behchokq	100%
Resolution Construction Inc.	Other	49%
Tli Cho Air Inc.	Yellowknife	52%
Tłıchq Clark Builders Corporation	Yellowknife	51%
Tli Cho Construction Ltd.	Behchokq	100%
Tli Cho Engineering and Environmental Services Ltd.	Behchokq	100%
Tłıchq Equipment Leasing Ltd.	Other	100%
Tli Cho Learning and Development Center	Behchokq	100%
Tli Cho Logistics Inc. (Ventures West Transport LP)	Yellowknife	100%, (60%)
Tli Cho McCaw North Drilling and Blasting Services JV	Yellowknife	n/a
Tli Cho Quantum Murray Incorporated	Other	51%
Tli Cho Road Constructors Ltd.	Behchokq	100%
Wekweèti Development Corporation Ltd.	Wekweèti	100%
Whati Ko Gha K'aode Ltd.	Whati	100%

Source: Tłıchq Investment Corporation (2014).

n/a = information was not available.



The Denesoline Corporation manages businesses and works to create economic benefits for the LKDFN. The corporation uses joint venture partnership and investment in private operating companies to provide employment opportunities for local residents. Examples of joint ventures include a partnership with ATCO Structures & Logistics (Nation Talk 2013) and Akaitcho Helicopters (GSH n.d.). The Denesoline Corporation is also a joint partner with Tlicho Investment Corporation in resource-based service companies like Ventures West Transport LP, Kete Whii Ltd., and Diamond International Canada (TIC 2014).

The Det'on Cho Corporation is the economic arm of the Yellowknives Dene First Nation, and operates a number of companies servicing the mining industry in the NWT (Table 14.3-5).

**Table 14.3-5 Det'on Cho Corporation Businesses and Joint Ventures**

Company	Main Office	Ownership
Bouwa Whee	Yellowknife, NWT	Subsidiary of Det'on Cho Corporation
Det'on Cho Construction	Yellowknife, NWT	Subsidiary of Det'on Cho Corporation
Det'on Cho Nahanni Construction	Yellowknife, NWT	Joint venture between Det'on Cho Corporation and Nahanni Construction Ltd.
Det'on Cho NewNorth	Yellowknife, NWT	Joint venture between Det'on Cho Corporation and NewNorth Projects Ltd.
Det'on Cho NUNA	Yellowknife, NWT	Joint venture between Det'on Cho Corporation and Nuna Logistics Limited
Det'on Cho Scarlet Security	Yellowknife, NWT	Joint venture between Det'on Cho Corporation and Scarlet Security Services
Det'on Cho Stantec	Yellowknife, NWT	Joint venture between Det'on Cho Corporation and Stantec Inc.
Det'on Cho Logistics	Yellowknife, NWT	Subsidiary of Det'on Cho Corporation
Det'on Cho Medic North	Yellowknife, NWT	Joint venture between Det'on Cho Corporation and Medic North Emergency Services
Det'on Cho Mining Supplies	Yellowknife, NWT	Subsidiary of Det'on Cho Corporation
Diamond International Canada (DICAN) / Aboriginal Diamonds Group	Yellowknife, NWT	Partnership between Aboriginal Diamonds Group Ltd. and WWW International Diamond Consultants Limited
Kete Whii / Procon	Yellowknife, NWT	Joint venture between Ke Te Whii Ltd., and Procon Mining and Tunneling Inc.
We Le Dai Corp (Vital Abel Boarding Home)	Yellowknife, NWT	100% Det'on Cho

Source: Det'on Cho Corporation 2010.

The mid-1990s saw the emergence of Aboriginal-owned mining-related businesses in areas such as trucking, air transportation, road construction and maintenance (NWT & Nunavut Chamber of Mines 2005). Since then, companies have cooperated to build partnerships to capture opportunities and build capacity in mining-related businesses such as drilling, blasting, project and environmental engineering. Companies like the TIC and the Lutsel K'e Dene economic arm, Denesoline Corporation, have formed to consolidate business interests and to create employment and business opportunities that include more technically oriented support services related to mining (TIC 2014; Denesoline 2014).



In 2013, the TIC formed five new joint ventures – Tłıchq Orica Blasting Services Ltd., Tłıchq McCaw North Joint Venture, Tłıchq Clark Builders Corporation, Tłıchq Quantum Murray Ltd., and Resolution Construction Inc. (TIC 2013). These business collaborations between Aboriginal organizations and mining service companies help contribute to the growth in business capacity for the mining industry.

The environmental contracting, emergency response and waste management company, Tłıchq Quantum Murray Inc., was created specifically to undertake project opportunities for the Giant Mine Remediation Project (TIC 2014). Another joint venture, the Resolution Construction Inc., was created specifically to address the economic opportunity of the Avalon Rare Earth Metal Inc. mine. Resolution Construction Inc. will also build capacity within the Fort Resolution Deninu K'ue First Nation and will be the initial vehicle to facilitate a skills transfer from the Tłıchq Group of Companies to the Deninu K'ue Development Corporation (TIC 2014).

Tłıchq Investment Corporation companies like Tli Cho Logistics Inc. provide site services and maintenance coverage to the Diavik Diamond Mine, Ekati Diamond Mine and Snap Lake Mine. According to the TIC's Board Report released in July 2014, Tli Cho Logistics Inc. is anticipated to work on new projects for De Beers' Gahcho Kué site in the near future (TIC 2014).

Some of the operational contracts that the Ekati Diamond Mine currently has in place with Northern and/or Aboriginal businesses are (Dominion Diamond 2013a):

- BBE – freight management and passenger movement services;
- Finning Canada – mobile equipment maintenance;
- First Air – charter aircraft services for cargo;
- Kete Whii/Procon Joint Venture – underground mining labour;
- Kingland Ford – light vehicle maintenance;
- Northern Industrial Sales – general hardware supplies;
- Polar Explosives – blasting material supply and services;
- Northcan Freighters – fuel transportation;
- Metcor – WR freight movement;
- Nuna Logistics – Equipment Operator Services and Winter Road construction;
- Tundra Site Services – personnel services;
- Tli Cho Air / Air Tindi – charter aircraft passenger services;
- Tli Cho Domco – catering and janitorial services;
- Tli Cho Landtran – winter road freight transportation services; and,
- Tli Cho Logistics / Ventures West – fuel transportation services.



The Kitikmeot Corporation in Nunavut has several businesses and joint ventures, most of which operate out of Cambridge Bay, Rankin Inlet and Iqaluit. Diamonds International Canada, Larga Kitimeot, Ryfan Nunavut and Top of the World Travel are all joint ventures operating out of Yellowknife in which the Kitikmeot Corporation holds stake. I&D Management: Human Resources Management and Employee Recruitment is 100%-owned by a consortium of Inuit and Dene development corporations, including the Kitikmeot Corporation (Kitikmeot Inuit Association n.d; Kitikmeot Corporation 2014).

### 14.3.2 Base Case

The **Base Case** considers how the existing environment will change in the future, and focuses on the changes in the mining industry from 2014 to 2030. The Base Case scenario considers the existing Ekati, Diavik, and Snap Lake diamond mines operating in the North Slave region of the NWT. The mines are expected to close in 2020, 2023, and 2029, respectively. The Gahcho Kué Project will begin its first full year of production in 2017, and closure in 2028.

#### 14.3.2.1 Capital Investment

De Beers is currently developing the Gahcho Kué diamond mine. The mine's cost of construction will exceed \$600 million (De Beers Group of Companies 2014). Other potential capital investments in the NWT are less certain.

In the Sahtu region, oil and gas exploration activities could attract large capital expenditures, though it is still not clear whether the proposed large-scale hydraulic fracturing will be permitted, or whether the active companies will continue with their exploration plans. Oil and gas developers have expressed interest in offshore exploration in the Beaufort Sea, though this development is not certain (LTLC Consulting 2013). Other mining developments, such as NICO, Nechalacho, and Prairie Creek are in advanced stages of exploration and the regulatory process, but development of these sites remains uncertain due to several constraints including commodity prices, infrastructure, and financing.

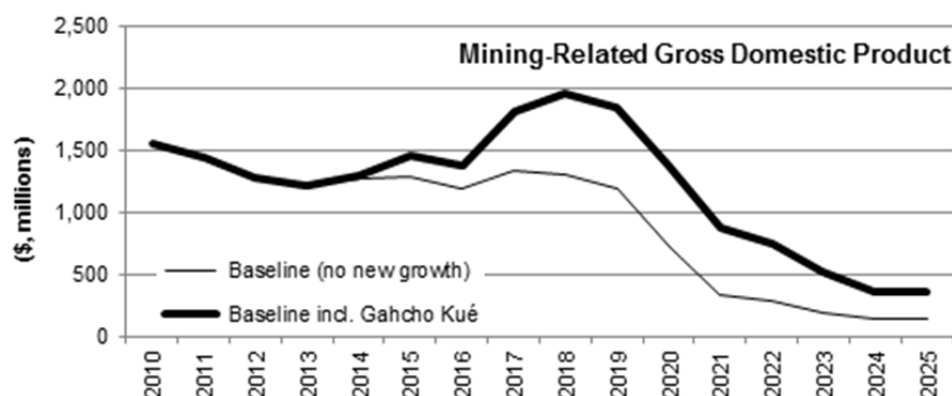
#### 14.3.2.2 Gross Domestic Product

The Base Case scenario includes the existing Ekati, Diavik, and Snap Lake Diamond Mines operating until their scheduled closures in 2020, 2023, and 2029 respectively, and then adds the Gahcho Kué Diamond Mine starting with initial construction in 2014.

Figure 14.3-7 shows Base Case GDP, including all direct, indirect, and induced effects. The existing diamond mines' contribution to GDP will remain relatively constant through 2015 with or without the addition of Gahcho Kué. Starting in 2016, development of the Lynx and Pigeon pits and production from the Misery Pit at Ekati will push GDP back to the level reached in 2010. Beyond 2018, the effects of a slowdown in production at Diavik will overshadow a continuation of production at Ekati and Snap Lake. By 2020, under the current (or no new growth) scenario, mining's contribution to GDP will come from Snap Lake, the last activities at Diavik, and the reclamation of Ekati.

If the Gahcho Kué Project is developed, its construction will coincide with the increased activity at Ekati in 2017 to 2018, causing GDP to rise close to its all-time high. This project would also compensate for the initial declines at Ekati and Diavik starting in 2019 through until 2021. Gahcho Kué is currently proposed as an 11-year mine, and so would close by 2027.

**Figure 14.3-7 Base Case Gross Domestic Product Effect from Northwest Territories Diamond Mining, 2010 to 2025**



### 14.3.2.3 Inflation

There has not been a clear, direct correlation between mining and increased inflation. In the Base Case scenario, as the diamond mining industry begins to slow in the NWT, the possibility of deflation and/or a decline in standard of living as total personal incomes fall relative to steady or slightly inflationary prices is a concern.

Most of the price effects experienced in the NWT are imported. That is, any increase in the price of goods and services that are imported into the territory will be passed onto consumers in the territory.

The concern is that this imported price inflation will have a greater effect on the standard of living of residents in a scenario where labour income falls. In the Base Case scenario including the addition of Gahcho Kué to the economy, the territory will lose 1,200 jobs from 2018 to 2025.

Deflation could occur in markets where NWT residents have some control over pricing. One such example is housing. In a scenario where Ekati and Diavik close and there are no other job options available, the expectation is that a portion of the effected workers and their families will leave the territory. This will increase the supply of homes for sale that will put downward pressure on prices.

## 14.3.3 Project Effects on the Economy

For the purpose of this assessment, economic effects of the Project are portrayed by phase.

### 14.3.3.1 Construction Effects

The Project is an extension of the existing Ekati Diamond Mine. Therefore, most of the construction-related activities are associated with accessing the new deposit, which will require the construction of a dyke on Lac du Sauvage and an access road. Other elements of a mine site, such as a processing plant, airstrip, power plant, and accommodations, are already in place.



### **14.3.3.1.1      *Capital Investment***

For the purpose of economic modelling, capital cost has been assumed to be US\$671 million (including US\$119 million in new equipment imported into the territory). Subtracting imports[1], this is equal to CDN\$613 million. For the purpose of the SEIA, this preliminary estimate has been used throughout. Pre-feasibility studies are ongoing, and will provide an updated estimate of the capital costs required for the Project once complete. The total cost of construction is currently expected to be between approximately US\$600 and US\$700 million.

### **14.3.3.1.2      *Gross Domestic Product***

The portion of Project construction spending that is value added (that is, the portion of gross output that will add to the territory's GDP) is estimated at \$180 million. The majority of that contribution will come in 2018 and 2019 when the dyke is constructed. The indirect effect on GDP from the spending is estimated to equal \$43 million. The induced effect on GDP from the spending of wages and salaries is estimated to equal \$10 million.

### **14.3.3.1.3      *Inflation***

The construction phase of the Jay Project will not, by itself, have an effect on inflation.

### **14.3.3.2      *Operations Effects***

Given that the Project is an extension of an existing operation, its effects on the NWT economy are more closely associated with a continuation of status quo than the creation of new effects. However, because the effects are being compared to a Base Case scenario that does not include this production, the results are presented as an addition to that Base Case.

#### **14.3.3.2.1      *Capital Investment***

Dominion Diamond has preliminarily estimated that the Project's operational costs will average \$357 million. This expenditure will pay for all goods and services needed to operate the mine including the cost of labour. Another \$20 million, on average, will be needed annually to cover the cost of sustaining capital.

#### **14.3.3.2.2      *Gross Domestic Product***

For the purpose of economic modelling, the average rate of production has been assumed to be 4.3 million tonnes of diamond-bearing kimberlite annually, with a grade of between approximately 1.3 and 2.1 carats per tonne, and a per carat value of between approximately US\$80 and US\$100. This results in an estimate for the Project's Gross Output equal to approximately CDN\$825 million annually, though there will be considerable variation between years. Actual production rates could range between approximately 4.3 million and 5.3 million tonnes per annum.

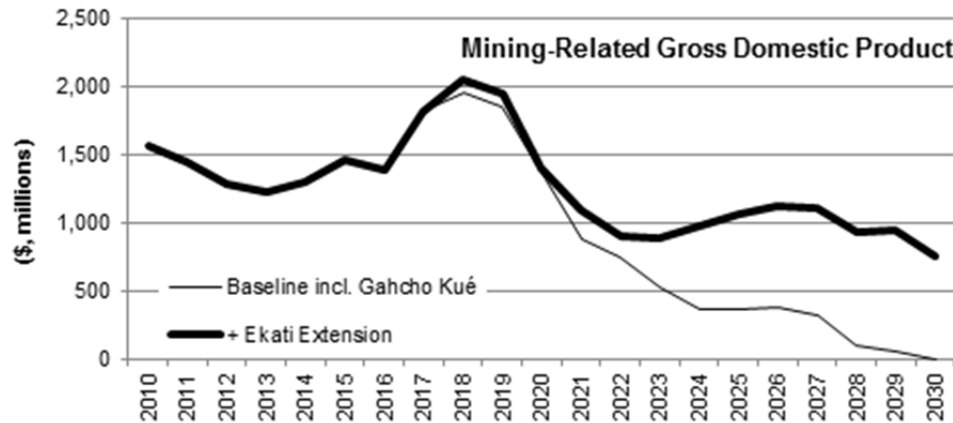
It is estimated that the Project will add \$6 billion to the NWT's GDP over its lifetime. Combining the indirect and induced GDP effects, this number climbs to \$6.8 billion (Figure 14.3-8).

In terms of annual averages, GDP is expected to grow by \$623 million, with the majority of that growth (\$551 million) coming from the direct contribution of diamond production to the territory's total output.



The indirect GDP effect is estimated to equal \$50 annually (average). The induced effect will raise GDP by a further \$21.6 million, annually.

**Figure 14.3-8 Estimated Gross Domestic Product Effect from Northwest Territories Diamond Mining, 2010 to 2030**



### 14.3.3.2.3 Government Revenues

The Project will generate revenues through several forms of taxation. These include direct personal and corporate tax, resource royalties (or mining tax), and taxes on products and on production. A summary of the estimated taxation revenues generated by the Project is provided in Table 14.3-6.

**Table 14.3-6 Estimated Tax Revenues from the Jay Project Operations**

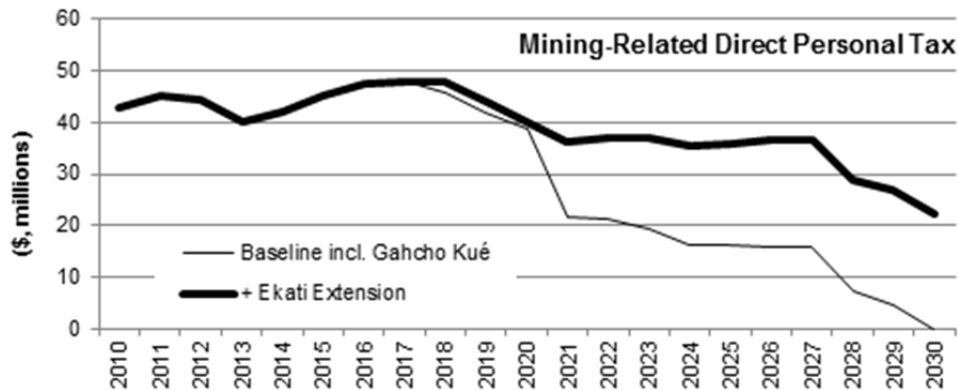
	Taxes Paid (\$ Millions)
<b>Direct Personal Tax</b>	
Territorial Income Tax	\$45
Federal Income Tax	\$84
Other Payroll Taxes	\$85
<b>Direct Corporate Tax</b>	
Territorial	\$273
Federal	\$356
<b>Indirect Tax</b>	
Resource Royalties	\$347
Tax on Products	\$66





Direct personal taxes, including Canadian and territorial income tax, payroll tax, employment insurance, Canada Pension Plan, and Workers Safety are calculated based on average tax rates applied at the different average income levels. These calculations show that the Project will generate \$19 million in direct personal taxes, on average, over the operations period (Figure 14.3-9).

**Figure 14.3-9 Estimated Direct Personal Tax Revenues from Northwest Territories Diamond Mining, 2010 to 2030**



The Project is expected to generate \$629 million in corporate taxes. The portion payable to the GNWT is estimated to equal \$273 million. Further, the Project is estimated to generate \$347 million in resource royalties.

Indirect taxes are paid at two stages within the production process, defined as taxes on production, which are a part of the GDP at Basic Prices, and taxes on products, which are added to generate an estimate of GDP at Market Prices. The System of National Accounts lists the common areas of taxation within the two indirect tax forms as follows:

- Taxes on products, on goods and services themselves, include the Goods and Services Tax, provincial sales taxes, federal and provincial taxes on sales volumes of gasoline and other motive fuel taxes, tobacco and alcohol. These taxes only arise as a result of the actual production or sale of goods and services (Statistics Canada. 2008).
- Taxes on production include property taxes, and the costs of business licences, permits and fees. These taxes are levied regardless of the current level of production of goods and services.

The estimated tax on products is calculated by the NWTEIM using information from Statistics Canada's *Interprovincial Input-Output Model*. It is estimated that the Jay Project will generate \$65.9 million in taxes on products, equal to an average of \$8.9 million annually.



### 14.3.3.2.4 *Inflation*

In the description of the Base Case scenario results, concern was raised not for inflation but for the possibility of deflation brought about by the out-migration of residents and lower disposable income across the territory. Project operations will not cause inflation since it is not expected to bring new people into the territory (net in-migration) or create new jobs. The Project will, however, serve to stabilize the population base of the territory by slowing the rate of out-migration by maintaining existing employment. As a result, the possibility of price deflation or the loss of standard of living is avoided.

### 14.3.3.3 *Reclamation Effects*

The majority of Project reclamation activities will take place in 2032 and 2033 at a cost of \$266 million. Lake back-flooding and monitoring will continue for several more years, however, the cost and labour associated with those activities is small and is not included in the economic effects calculations.

The reclamation activities will have a small but positive effect on GDP. It is estimated that GDP will rise by approximately \$100 million when including the direct, indirect, and induced effects of the two years of reclamation. Reclamation will not have a significant effect on inflation.

### 14.3.3.4 *Summary of Economic Effects*

A summary of the Project's economic effects is provided in Table 14.3-7. Total GDP effects include both direct Project contributions, as well as indirect and induced effects.

**Table 14.3-7 Summary of Economic Effects**

Economic Indicator	Construction (Total)	Operations (Average Annual)	Closure (Total)
	2018 to 2020	2021 to 2031	2032 to 2033
<b>Government Revenue (\$ millions)</b>			
Cost	\$613	\$357	\$266
<b>GDP (\$ millions)</b>			
Direct (Dominion Diamond)	\$176	\$551	\$78
Contractor/Exogenous <sup>10</sup>	\$49	\$72	\$22
<b>Total</b>	<b>\$225</b>	<b>\$623</b>	<b>\$100</b>

GDP = Gross Domestic Product

<sup>10</sup> Exogenous sources include those not directly associated with Dominion Diamond or their immediate contractor, but that would not exist without the Project.



### 14.3.4 Residual Impact Classification and Significance

The Project would result in capital expenditures within the NWT and abroad. Local business capacity developed in response to the mining industry in the NWT would be supported by Project expenditures. Thus the Project would add to the economic activity of the NWT, and local business. As the other NWT mines enter closure over the next decade and a half, the Project will play an important role in maintaining demand for local business, and expenditures within the NWT and abroad. The magnitude of the Project's effect on capital expenditures in the NWT is, therefore, considered high. The effect would be felt at both the local (i.e., local businesses) and regional (i.e., NWT) level, and would persist into the long term.

The Project's contribution to the territorial GDP would be large when considered against the NWT economy as a whole, and would play an important role in the territorial economy. The importance of the Project's contributions to GDP is particularly pronounced when considering the closures of the other NWT mines over the coming decades. For this reason, the magnitude of the Project's effects on GDP is assessed as high. The effect will be regional to the NWT, and would persist into the long term.

The Project will pay taxes and revenues to the GNWT, thereby adding to the government's revenue. This effect will serve to sustain government revenues at a more stable level than without the Project over the life of the mine, as the other existing NWT mines enter closure and thus cease to be revenue sources for the government. The effect is considered to be of high magnitude, given the proportionally large amount of taxes generated as a result of the Project when compared to the NWT tax base as a whole. The effect will be regional within the NWT, and will continue into the long term.

The Project would not increase inflation in the NWT. Rather, it will act to stabilize the threat of deflation in some markets (e.g., housing) associated with out-migration. Other markets not prone to deflation associated with out-migration may not experience this effect. As a result, the Project's effect will be moderate in magnitude, regional and long term.

Residual effects descriptions are summarized in Table 14.3-8. Overall, the Project itself is expected to contribute substantially to the economy of the NWT via capital expenditures, increased GDP and taxation. Further, the Project will act as a buffer on the economy of the NWT, softening the negative effects of the closure of Diavik, Snap Lake and Gahcho Kué on government revenues, inflation and the territorial GDP. As a result, the Project's effect on the NWT Economy is considered **significant**.

**Table 14.3-8 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on the Economy of the Northwest Territories**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint
Capital expenditure would add to the economic activity in the NWT, including investment	high	regional	long term	n/a	<i>significant</i>
The Project would contribute to the GDP of the NWT	high	regional	long term	n/a	
The Project would result in personal income tax, corporate tax and other taxes and revenues to the NWT	high	regional	long term	n/a	

**Table 14.3-8 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on the Economy of the Northwest Territories**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint
The Project would discourage out-migration from the territory as a result of the closure of the existing Ekati mine, thereby stabilizing inflation and avoiding deflation	moderate	regional	long term	n/a	

## 14.4 Employment and Incomes

### 14.4.1 Existing Environment

This section summarizes the existing employment, labour force and labour income conditions in the NWT. For a full discussion of these existing conditions in the NWT and LSA communities, please refer to the socio-economic baseline (Annex XV, Section 3.4).

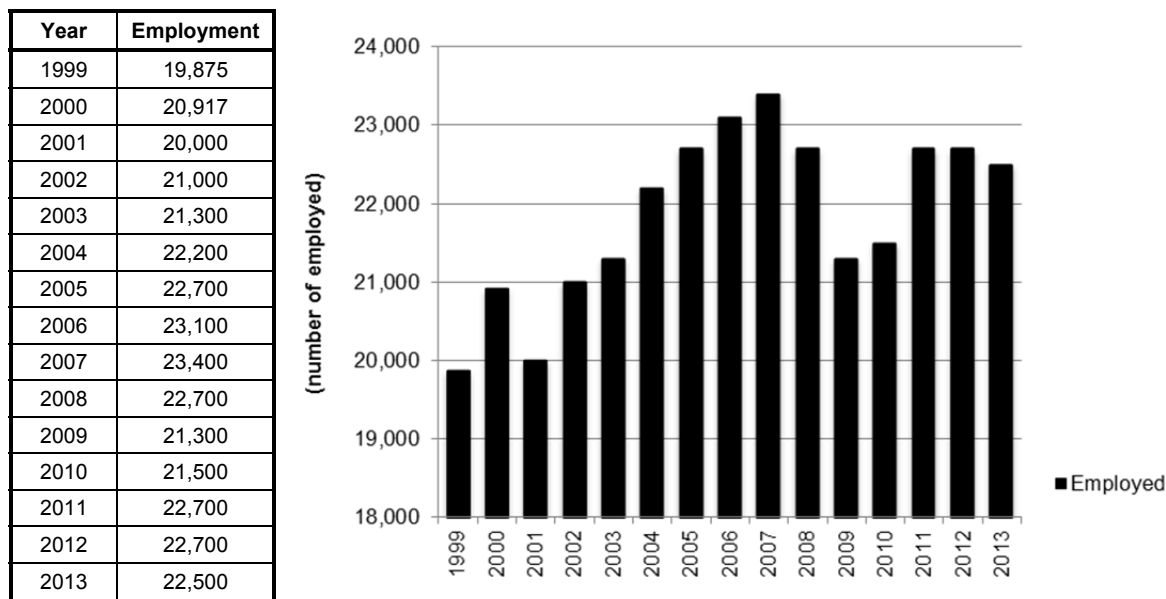
#### 14.4.1.1 Employment

A steady rise in employment occurred in the NWT from 1999 to 2007 as the diamond industry grew (Figure 14.4-1). The recession of 2008/2009 ended employment expansion, with the temporary closures of the Diavik and Snap Lake mines. The number of people employed in the NWT fell by 2,000 over the two-year period. Job numbers began to increase to pre-recession levels in 2011, but have not returned to the previous peak reached in 2007. Recently, employment has begun to again fall. In 2013, there were 200 fewer jobs in the NWT when compared to the previous year, and through the first seven months of 2014 (not shown in the Figure), job numbers are 700 below the first seven months of 2013.

While the public sector is the largest employer in the NWT, the diamond mining industry and its three operating mines provides a substantial relative portion of the employment opportunities in the territory. Employment at the three existing NWT diamond mines, in full time equivalent (FTE) terms, equalled 3,466 in 2012. Of that total, 1,551 were residents of the NWT (De Beers 2013, Dominion Diamond 2013b, Rio Tinto 2013).

In 2013, Ekati's workforce (including contractors) totalled 1,395 FTEs, included 1,162 in production and 233 in development. Of this, northern participation amounted to 655 FTEs (47%), with 608 working in production and 48 working in development.

**Figure 14.4-1 Northwest Territories Employment, 1999 to 2013**



Source: GNWTBS 2014a.

### 14.4.1.2 Labour Force Activity

Other measures of labour force activity exhibit a pattern similar to employment over the past decade. The complete labour force activity dataset from 1999 to July 2014 is included in Table 14.4-1. The recent trend shows a general weakening of the labour market, with fewer jobs, a smaller labour force, and higher unemployment rates. In 2012, the NWT unemployment rate grew to 8.1% while the unemployment rate for all of Canada fell to 7.2%. This marked the first time since 2001 that the NWT unemployment rate was higher than the national rate (Statistics Canada 2014d).

**Table 14.4-1 Labour Force Activity in the Northwest Territories, 1999 to 2014<sup>(a)</sup>**

Year	Population 15+	Labour Force	Employed	Unemployed	Not in Labour Force	Participation Rate	Unemployment Rate	Employment Rate
1999	28,417	21,733	19,875	1,875	6,675	76.5	8.6	69.9
2000	29,158	22,342	20,917	1,450	6,825	76.6	6.5	71.7
2001	28,500	21,800	20,000	1,900	6,600	76.5	8.7	70.2
2002	29,200	22,300	21,000	1,300	6,900	76.4	5.8	71.9
2003	30,200	22,900	21,300	1,600	7,300	75.8	7.0	70.5
2004	31,000	23,700	22,200	1,500	7,300	76.5	6.3	71.6
2005	31,200	24,000	22,700	1,300	7,300	76.9	5.4	72.8
2006	31,300	24,400	23,100	1,300	6,900	78.0	5.3	73.8
2007	31,700	24,800	23,400	1,400	6,900	78.2	5.6	73.8
2008	32,100	24,100	22,700	1,400	8,000	75.1	5.8	70.7

**Table 14.4-1 Labour Force Activity in the Northwest Territories, 1999 to 2014<sup>(a)</sup>**

Year	Population 15+	Labour Force	Employed	Unemployed	Not in Labour Force	Participation Rate	Unemployment Rate	Employment Rate
2009	32,100	22,800	21,300	1,400	9,300	71.0	6.1	66.4
2010	32,300	23,200	21,500	1,700	9,000	71.8	7.3	66.6
2011	32,100	24,500	22,700	1,800	7,600	76.3	7.3	70.7
2012	32,100	24,700	22,700	2,000	7,400	76.9	8.1	70.7
2013	32,000	24,500	22,500	2,000	7,500	76.6	8.2	70.3
2014*	31,900	23,800	21,700	2,100	8,100	74.6	8.7	68.1

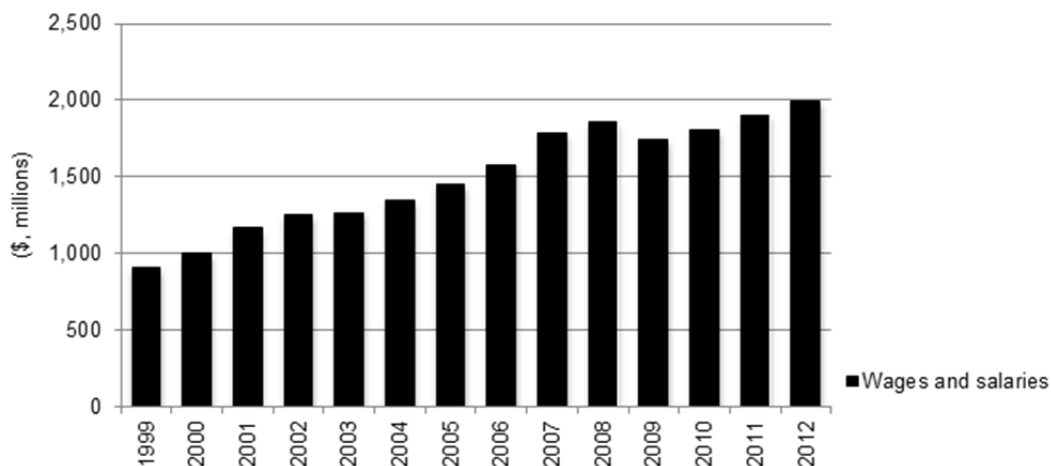
Source: GNWTBS (2014a).

a) The data for 2014 represents the average over the first seven months of the year.

### 14.4.1.3 Labour Income

The net employment growth over the past decade and a half has brought with it a rise in wages and salaries paid (Figure 14.4-2). Moreover, many of the jobs created over this time period have been higher paying than the average in the territory causing the growth in total wages to exceed the pace of inflation, which has seen prices grow by 34 per cent in Yellowknife from 1999 to 2013 (GNWTBS 2014b).

**Figure 14.4-2 Total Wages and Salaries Earned in the Northwest Territories, 1999 to 2012**



Source: Statistics Canada 2013c.

Average employment income levels throughout the LSA have grown along with the total wages and salaries in the NWT. In relative terms, most of the smaller communities have seen their income levels grow at a faster pace than that of Yellowknife (Table 14.4-2). Average employment incomes, historically, are shown in Figure 14.4-3.

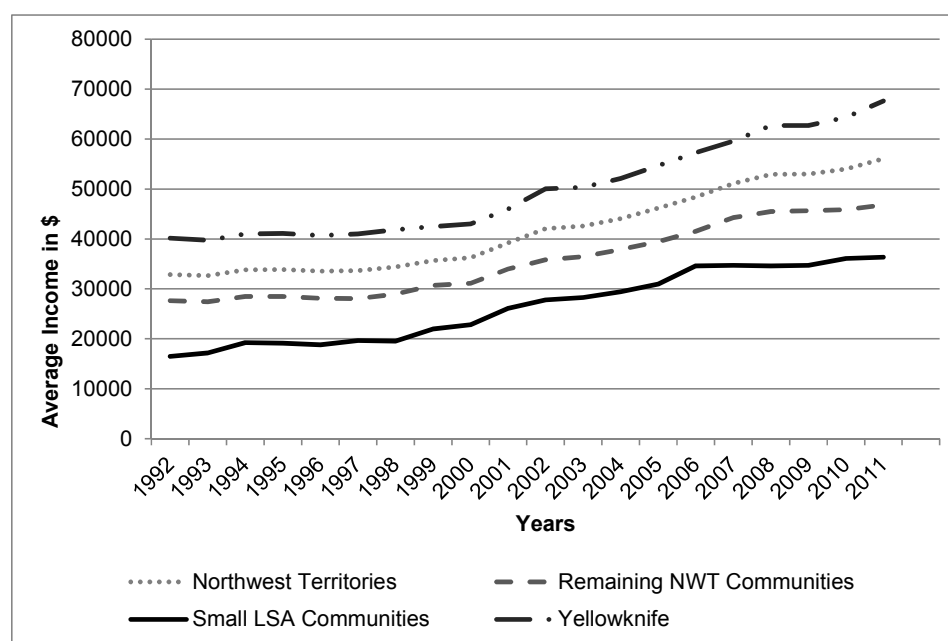


**Table 14.4-2 Average Employment Income from Selected Local Study Area Communities, indexed (1999=100), 1999 to 2011**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Behchokò	100	105	120	129	131	139	149	158	167	174	163	186	185
Gamètì	100	105	114	124	124	118	122	146	154	159	155	165	150
Whatì	100	90	107	122	131	130	142	138	155	157	154	157	172
Lutsel K'e	100	105	111	129	132	133	125	131	162	153	157	166	176
Fort Resolution	100	103	126	127	128	139	147	153	165	169	165	190	192
Yellowknife	100	102	108	117	118	123	129	133	140	147	147	151	157

Source: GNWTBS (2012a).

**Figure 14.4-3 Average Income 1991-2011**



Source: GNWT 2014b.

Note: Small LSA communities refer only to rural LSA communities in the NWT. Kugluktuk, Bathurst Inlet, and Umingmaktok are not included in the figure.



## 14.4.2 Base Case

The **Base Case** considers how the existing environment will change in the future, and focuses on the changes in the mining industry from 2014 to 2030. The Base Case scenario considers the existing Ekati, Diavik, and Snap Lake diamond mines operating in the North Slave region of the NWT. The mines are expected to close in 2020, 2023, and 2029, respectively. The Gahcho Kué Project will be introduced to the territory's economy, with the first full year of production being 2017, and closure in 2028.

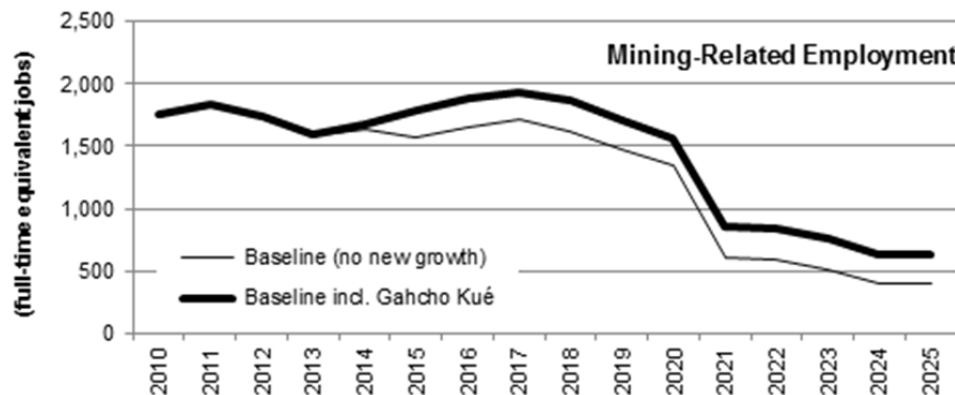
### 14.4.2.1 Employment

The Base Case scenario includes the development work at Ekati, including the construction work associated with the Lynx and Pigeon deposits. This work will not, however, have a significant effect on NWT employment. Construction work is typically short term and at times can be technical, and pushes the labour demand beyond the resident market's ability to supply the necessary workers. The result is that these construction jobs do not create a meaningful amount of employment for NWT residents.

Employment will decline in 2019 due to decreased labour needs at Ekati and Diavik. The weakened demand will continue until after 2021.

Adding Gahcho Kué will have a positive effect on the NWT labour market. The mine's construction and first year of operations coincides with development projects at Ekati that will cause mine-related employment to near previous highs seen between 2005 and 2008. Gahcho Kué is, however, small in comparison to Ekati and Diavik, with labour demand averaging 365 FTEs over the life of the mine. Once Ekati and Diavik begin closure activities, and reducing employment, the presence of Gahcho Kué will help but not fully compensate for those losses (Figure 14.4-4).

**Figure 14.4-4 Base Case Employment Effect from Northwest Territories Mining, 2010 to 2025**



The economic analysis contained in this report is concerned with changes in the mining sector only. Therefore, all other sectors within the economy are held constant relative to the size of the economy and adjust only if a change in the mining sector causes it to do so. This approach isolates the effects of the project being studied. And, because of the stability in territory's population, it is reasonable to assume any existing equilibrium within other components of the economy will be maintained.





#### **14.4.2.2      *Labour Force Activity***

In the Base Case scenario, the number of people employed in the economy would rise at a slow pace from its current (2014) level, with the employment rate remaining close to 70 per cent, until 2018.

Employment would then briefly stabilize for a year at 22,800, after which point, numbers of employed would begin to fall. Initially, this is the result of a slowdown at Diavik, followed by the closures of Ekati in 2020 and Diavik in 2023. Snap Lake, the only remaining operating mine in the Northwest Territories, would eventually close in 2029.

The labour market's response to closures would include the out-migration of residents and a decline in the participation rate. These changes would effectively lower the number of residents in the labour force. While this would soften the effect of closures on the unemployment rate, the rate would still increase to, eventually, about 12% (Table 14.4-3).

The addition of Gahcho Kué partially mitigates the decline in the labour market that would otherwise occur. The overall employment numbers in the NWT would climb above 23,000 by 2018 in this scenario. However, Gahcho Kué is not equal in size to either Ekati or Diavik and, following the closure of the two mines, the direction and rate of change in the NWT's unemployment and employment rates would be similar to that of the aforementioned scenario that excludes the mine. With the closures of Ekati and Diavik, unemployment rates would increase in the NWT, while employment rates go down.

**Table 14.4-3 Base Case Labour Market, 2010 to 2025**

Year	Pop15+		Labour Force		Employed		Unemployed		Employment Rate		Unemployment Rate		Participation Rate	
	Current	+Gahcho Kué	Current	+Gahcho Kué	Current	+Gahcho Kué	Current	+Gahcho Kué	Current	+Gahcho Kué	Current	+Gahcho Kué	Current	+Gahcho Kué
2010	32,300	32,300	23,200	23,200	21,500	21,500	1,700	1,700	66.6%	66.6%	7.3%	7.3%	71.8%	71.8%
2011	32,100	32,100	24,500	24,500	22,700	22,700	1,800	1,800	70.7%	70.7%	7.3%	7.3%	76.3%	76.3%
2012	32,100	32,100	24,700	24,700	22,700	22,700	2,000	2,000	70.7%	70.7%	8.0%	8.0%	76.9%	76.9%
2013	32,000	32,000	24,500	24,500	22,500	22,500	2,000	2,000	70.3%	70.3%	8.2%	8.2%	76.6%	76.6%
2014	32,000	32,000	24,200	24,200	22,100	22,100	2,100	2,100	69.1%	69.1%	8.6%	8.6%	75.6%	75.6%
2015	32,000	32,000	24,400	24,400	22,300	22,500	2,100	1,900	69.5%	70.2%	8.7%	7.8%	76.1%	76.1%
2016	32,100	32,200	24,500	24,600	22,500	22,700	2,000	1,800	70.0%	70.7%	8.4%	7.5%	76.3%	76.4%
2017	32,200	32,200	24,700	24,700	22,600	22,900	2,000	1,800	70.3%	71.0%	8.1%	7.3%	76.5%	76.6%
2018	32,300	32,300	24,800	24,800	22,700	22,900	2,100	1,900	70.2%	71.0%	8.5%	7.5%	76.7%	76.8%
2019	32,400	32,400	24,900	24,900	22,600	22,900	2,300	2,000	69.9%	70.7%	9.1%	8.1%	76.9%	77.0%
2020	32,400	32,400	24,900	25,000	22,500	22,800	2,400	2,200	69.6%	70.3%	9.6%	8.8%	77.0%	77.1%
2021	32,300	32,300	24,800	24,800	21,700	22,000	3,000	2,800	67.3%	68.1%	12.2%	11.3%	76.7%	76.8%
2022	31,600	31,900	23,700	24,200	21,300	21,700	2,500	2,500	67.2%	68.1%	10.5%	10.3%	75.1%	75.9%
2023	31,700	32,000	23,900	24,400	21,300	21,800	2,600	2,600	67.2%	68.0%	10.8%	10.6%	75.3%	76.1%
2024	31,700	32,100	23,900	24,400	21,200	21,700	2,700	2,700	66.8%	67.7%	11.3%	11.1%	75.3%	76.2%
2025	31,500	32,000	23,600	24,300	21,100	21,600	2,600	2,600	66.8%	67.7%	10.9%	10.8%	74.9%	76.0%

Note: numbers rounded to the nearest hundred.



### 14.4.2.3 Labour Income

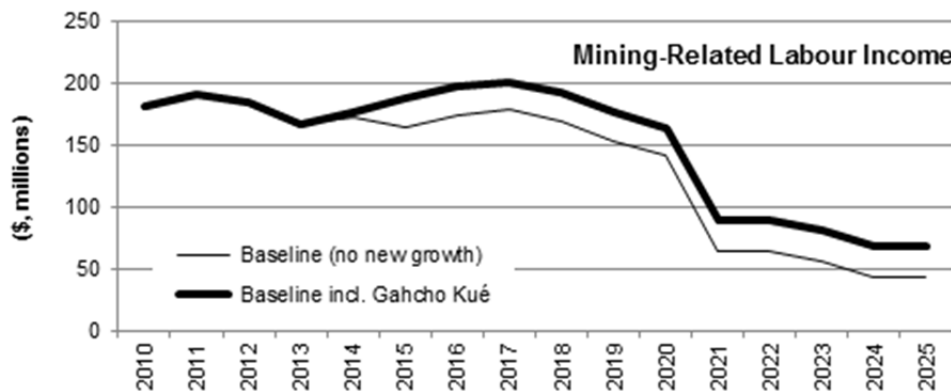
Labour Income is a component within GDP, alongside capital consumption allowance, indirect taxes on production, and other operating surplus. Therefore, it should follow a path similar to that of GDP.

Labour income results from the Base Case economic scenario with and without Gahcho Kué is found in Figure 14.4-5. This includes the direct, indirect, and induced income.

Labour income should remain relatively constant through 2017 under the current no-new-growth scenario. The labour force requirements for the existing Ekati Mine will remain similar to current levels through this period, with the majority of temporary construction jobs being filled by non-resident labour. The result is a relatively stable labour income in the NWT. Beyond 2018, a decline in mining jobs and consequently, a drop in labour income, would occur. These job losses would initially come from the slowdown at Diavik, and then beyond 2019, would also involve the closure of the existing Ekati Mine. The one-year decline in direct labour income from 2020 to 2021 is estimated at \$65 million.

Gahcho Kué would add between \$20 million to \$30 million in labour income to the NWT economy, raising the overall labour income from mining above current levels. This higher income would remain over the entire life of the mine, which is scheduled to continue operating for 11 years until 2028.

**Figure 14.4-5 Base Case Labour Income Effect from Northwest Territories Diamond Mining, 2010 to 2025**



## 14.4.3 Project Effects on Employment and Incomes

### 14.4.3.1 Employment

While construction of the Project is expected to begin in 2015, the majority of construction activity will take place from 2018 to 2020. As a result, this discussion focuses on this time period. During that time, 442 direct jobs will be created, the business demand will create 157 indirect jobs, while the spending of the direct and indirect wages and salaries will result in a further 36 induced jobs.

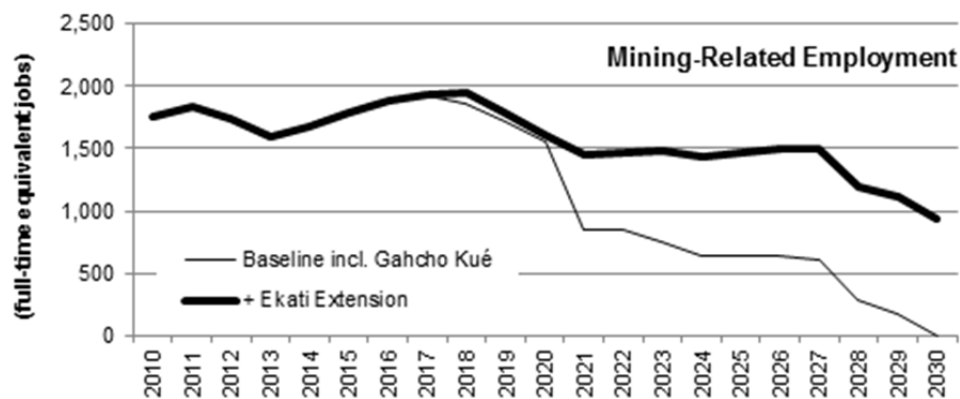


There are a number of key features to NWT mining sector that will influence the labour market from 2018 through to 2020. In 2018, the existing Ekati mine will be providing work for approximately 1,450 people (direct and indirect FTE employment) as a result of its ongoing operations and the development work at the Lynx and Pigeon deposits. By 2020, Diavik will be reducing the size of its workforce as operations at that mine begin to slow. The Project workforce initially offsets any reduction at Diavik, and as a result, the NWT participation in construction will equal 160 FTE jobs, or 27% of the overall workforce. When combining all direct, indirect, and induced effects of Project construction, northern participation will amount to 196 FTEs.

The Project will require approximately 1,100 to 1,200 FTE jobs annually to operate the mine once into full production. This number includes many of the jobs that already exist at the mine site, such as those associated with the processing plant. In that sense, the Project is not creating new jobs, but rather preserving existing jobs. During the transition period, from when the existing Ekati mine plan ends and the Project begins, a small number of jobs at the mine site remain associated with the original Ekati mine operations, including some reclamation activities and final production activities.

During Project operations, it is estimated that the average employment, including all direct and indirect jobs created by the Project, will amount to 1,132 FTE jobs (Figure 14.4-6). Northern participation in this workforce is estimated to average 700, growing from 55% of the workforce in 2021 to 68% by 2031, thereby maximizing employment benefits to the NWT and IBA communities. The growing participation is based on a rise in the number of available northern mining workers as other mines enter closure, and the associated upward pressure on NWT resident employment rate in the mining sector.

**Figure 14.4-6 Estimated Employment Effect from Northwest Territories Diamond Mining, 2010 to 2030**



Average induced employment during the 11-year time period is estimated to equal 120. It is assumed that, given the local nature of induced employment, northerners will fill all of these jobs.

The closure phase of the Project will create 282 full-time equivalent jobs during the two-year period. It is expected that NWT residents would fill a majority of the jobs during Project reclamation.



### **14.4.3.2      *Labour Force Activity***

The labour market during the 2020s, including the Project, is very different from the one shown in the Base Case scenario. The unemployment rate is estimated to equal 9.2% in 2021 rather than 11.3%, and will remain close to 9% until 2028. The year 2028 marks the closure of Gahcho Kué, and a slowing of operations at Snap Lake, and the associated reductions in employment and participation in the labour force, and increase in unemployment. While the Project serves to soften the downturn in the labour market, operations employment will not completely offset the closure of other mines (Table 14.4-4).

**Table 14.4-4 Estimated Northwest Territories Labour Market, 2010 to 2030**

Year	Pop15+		Labour Force		Employed		Unemployed		Employment Rate		Unemployment Rate		Participation Rate	
	Baseline	+ Ekati Extension	Baseline	+ Ekati Extension	Baseline	+ Ekati Extension	Baseline	+ Ekati Extension	Baseline	+ Ekati Extension	Baseline	+ Ekati Extension	Baseline	+ Ekati Extension
2010	32,300	32,300	23,200	23,200	21,500	21,500	1,700	1,700	66.6%	66.6%	7.3%	7.3%	71.8%	71.8%
2011	32,100	32,100	24,500	24,500	22,700	22,700	1,800	1,800	70.7%	70.7%	7.3%	7.3%	76.3%	76.3%
2012	32,100	32,100	24,700	24,700	22,700	22,700	2,000	2,000	70.7%	70.7%	8.0%	8.0%	76.9%	76.9%
2013	32,000	32,000	24,500	24,500	22,500	22,500	2,000	2,000	70.3%	70.3%	8.2%	8.2%	76.6%	76.6%
2014	32,000	32,000	24,200	24,200	22,100	22,100	2,100	2,100	69.1%	69.1%	8.6%	8.6%	75.6%	75.6%
2015	32,000	32,000	24,400	24,400	22,500	22,500	1,900	1,900	70.2%	70.2%	7.8%	7.8%	76.1%	76.1%
2016	32,200	32,200	24,600	24,600	22,700	22,700	1,800	1,800	70.7%	70.7%	7.5%	7.4%	76.4%	76.4%
2017	32,200	32,200	24,700	24,700	22,900	22,900	1,800	1,800	71.0%	71.0%	7.3%	7.3%	76.6%	76.6%
2018	32,300	32,300	24,800	24,800	22,900	23,000	1,900	1,800	71.0%	71.2%	7.5%	7.2%	76.8%	76.8%
2019	32,400	32,400	24,900	24,900	22,900	23,000	2,000	2,000	70.7%	70.9%	8.1%	7.8%	77.0%	77.0%
2020	32,400	32,400	25,000	25,000	22,800	22,900	2,200	2,100	70.3%	70.5%	8.8%	8.5%	77.1%	77.1%
2021	32,300	32,500	24,800	25,100	22,000	22,800	2,800	2,300	68.1%	70.1%	11.3%	9.2%	76.8%	77.2%
2022	31,900	32,600	24,200	25,200	21,700	22,900	2,500	2,300	68.1%	70.3%	10.3%	9.1%	75.9%	77.4%
2023	32,000	32,700	24,400	25,300	21,800	23,000	2,600	2,300	68.0%	70.6%	10.6%	9.0%	76.1%	77.6%
2024	32,100	32,700	24,400	25,500	21,700	23,100	2,700	2,400	67.7%	70.6%	11.1%	9.2%	76.2%	77.8%
2025	32,000	32,800	24,300	25,600	21,600	23,300	2,600	2,300	67.7%	70.9%	10.8%	9.1%	76.0%	78.0%
2026	31,900	32,900	24,200	25,700	21,600	23,400	2,600	2,300	67.7%	71.1%	10.7%	9.0%	75.8%	78.1%
2027	31,800	32,900	24,100	25,600	21,500	23,400	2,500	2,300	67.7%	71.1%	10.6%	8.9%	75.7%	78.1%
2028	31,700	32,800	23,900	25,500	21,100	23,000	2,800	2,500	66.6%	70.2%	11.6%	9.9%	75.3%	77.9%
2029	31,300	32,600	23,200	25,300	20,700	22,800	2,500	2,500	66.2%	69.9%	10.9%	9.8%	74.3%	77.5%
2030	31,100	32,600	23,000	25,300	20,400	22,600	2,600	2,700	65.6%	69.3%	11.2%	10.5%	73.9%	77.5%

Note: Figures rounded to the nearest hundred.

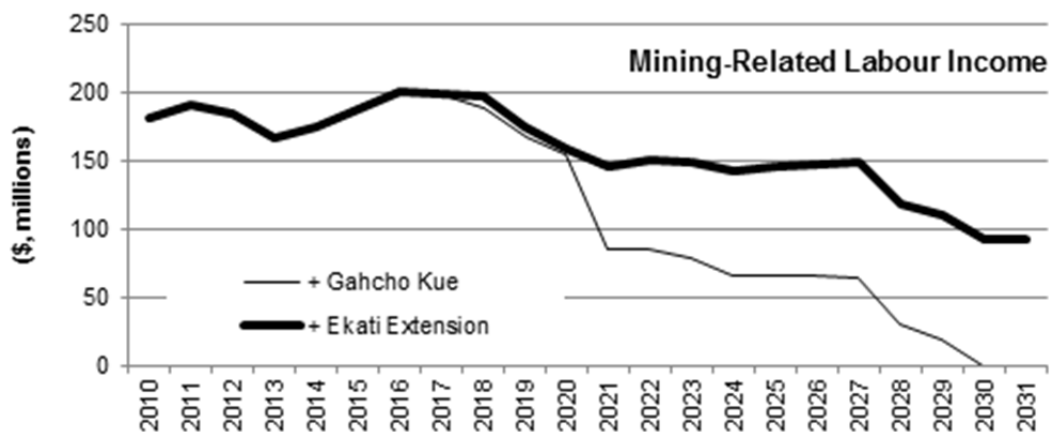


### 14.4.3.3 Labour Income

In line with the labour demand estimates, labour income in the NWT is expected to grow as a result of Project construction. From 2018 to 2020, total labour income in the NWT will grow by \$20.1 million, with the peak coming in 2018 when labour income will raise \$8.4 million over the Base Case scenario.

The direct and indirect labour income generated by Project operations from 2021 to 2031 will total \$1.55 billion, equal to \$141.7 million annually on average. Induced labour income during the 11-year time period will equal \$88.3 million, or \$8 million annually (Figure 14.4-7). NWT resident's share of the total labour income generated by the Project is estimated to equal \$835 million from 2021 to 2031. Their annual share will grow alongside their increased employment rate with the Project, growing from \$63 million in 2021 to \$95 million in 2031, thereby maximizing labour income benefits to NWT residents and IBA communities. The closure phase of the Project is expected to generate \$24 million in labour income. Positions associated with reclamation will be largely filled by NWT residents, maintaining labour income in the territory.

**Figure 14.4-7 Estimated Labour Income Effect from Northwest Territories Diamond Mining, 2010 to 2031**





### 14.4.3.4 Summary of Employment Effects

A summary of employment effects is provided in Table 14.4-5. Total Employment effects include direct, indirect and induced effects.

**Table 14.4-5 Summary of Project Effects on Employment**

Employment Indicator	Construction (Total)	Operations (Average Annual)	Reclamation (Total)
	2018 to 2020	2021 to 2031	2032 to 2033
<b>Labour Income (\$ millions)</b>			
Direct	\$43	\$108	\$19
<b>Total</b>	<b>\$54</b>	<b>\$149</b>	<b>\$24</b>
<b>Employment (person years of employment)</b>			
Direct (Dominion Diamond)	442	733	196
Contractor/Exogenous <sup>11</sup>	193	519	86
<b>Total</b>	<b>635</b>	<b>1,252</b>	<b>282</b>

### 14.4.4 Residual Impact Classification and Significance

One of the most pronounced effects that the Project has on the socio-economic environment is the continuation of employment at Ekati beyond the mine's current closure date (i.e., 2019). The Project would serve to maintain employment at a level similar to 2020, until 2027. Following 2027, with the closure of Gahcho Kué and the slowing of production at Diavik, the Project will soften the decline in mining employment in the NWT until final closure by taking up northern workers from closing mines to fill positions associated with attrition. Given the influence of the mining industry on private sector employment, the effect of the Project on employment in the NWT is considered to be of high magnitude, and will be regional to the NWT, and long term in duration.

The Project's effect on employment cascades into the labour market. By maintaining employment for over an additional decade, the Project will postpone peaks in the unemployment rate until 2027, and will keep employment and participation rates higher than current levels. In the face of waning mining activity in the territory, the Project's effect on labour force activity in the NWT is of high magnitude. Project support of labour force activity would affect the NWT as a whole, and so would be regional in extent, persisting into the long term.

Mining incomes are high incomes, contributing substantially to the NWT's overall labour income. The Project would, as with employment, continue to provide mining incomes throughout its operational life. Direct and indirect incomes would benefit both northern and southern workers, while induced incomes would be largely realised in the NWT. As other mines close, the Project would act to preferentially hire northern workers to fill positions made available by attrition. As more northerners are employed by the Project, an increasing amount of Project generated labour income would remain in the NWT, offsetting some of

<sup>11</sup> Exogenous sources include those not directly associated with Dominion Diamond or their immediate contractor, but that would not exist without the Project.



the decline associated with the closure of other mines. While this effect would be substantial for those who benefit from direct, indirect and induced labour income, the broader labour force would not benefit from Project income. As a result, this effect has been assessed as moderate in magnitude. Labour incomes would have a regional effect on the NWT as a whole, with direct labour incomes focused locally on LSA communities. The effect would last throughout the operational life of the mine, and so is considered long term.

Table 14.4-6 summarizes the Project's residual effects on employment, labour force activity and incomes. Given the high magnitude, regional and long-term nature of the Project's effects on employment levels, labour force activity and labour incomes, the Project's overall effect on employment and incomes is considered **significant**.

**Table 14.4-6 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on Employment and Income**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint
Project would maintain local employment during construction and operations	high	regional	long term	n/a	<i>significant</i>
Project would postpone spikes in unemployment rate	high	regional	long term	n/a	
The Project would maintain incomes for the local labour force, and add to labour income in the NWT	moderate	local to regional	long term	n/a	

## 14.5 Education and Training

### 14.5.1 Existing Environment

This section summarizes existing education and training in terms of educational attainment, opportunities and education and training infrastructure in the NWT. For a full discussion of existing social infrastructure in the NWT and LSA communities, refer to the socio-economic baseline (Annex XV, Section 3.5).

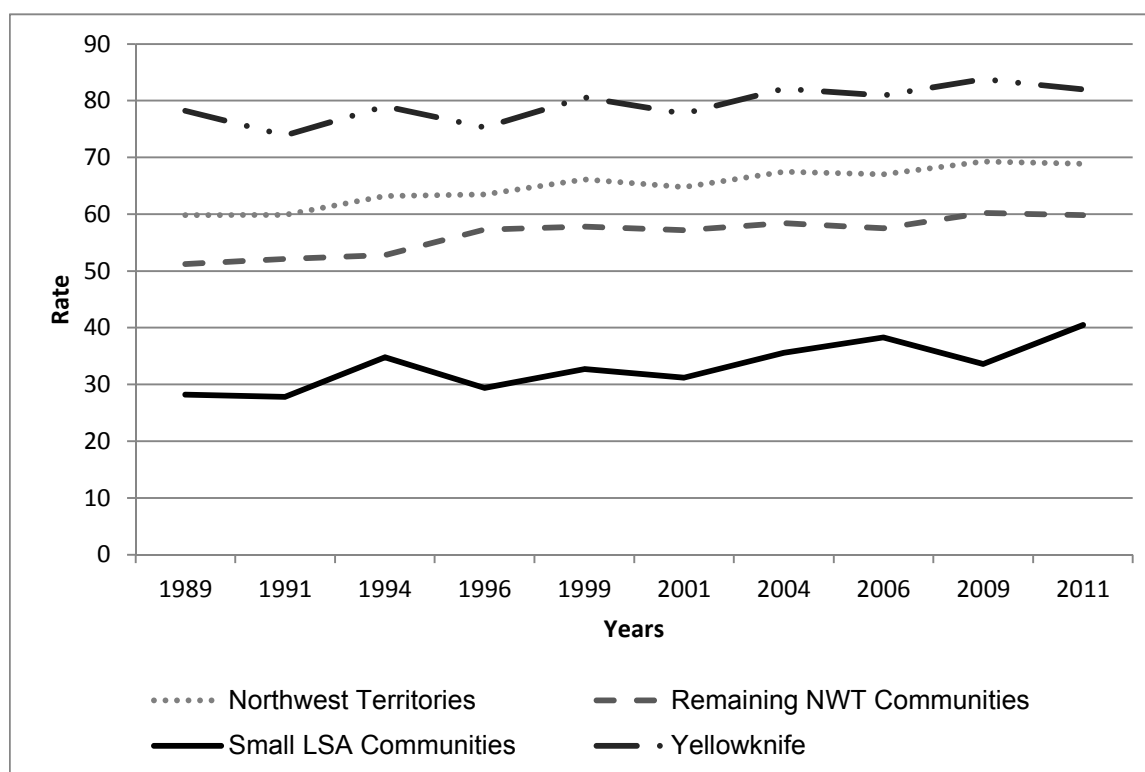
#### 14.5.1.1 Educational Attainment

Over the past two decades, educational attainment levels, especially completion of secondary school, have been gradually increasing in the NWT. The largest increase (over 10%) has occurred in the communities affected by diamond mining (i.e., the rural LSA communities) (Figure 14.5-1).

In 2011, 31,750 people over the age of 15 lived in the NWT, with slightly less than half located in the Yellowknife area (Statistics Canada 2011a). Nearly a third of residents over the age of 15 have not achieved a certificate, diploma, or degree (9,860 people, or 31.1% of the NWT population). Others have a high school diploma as their highest level of education (6,525 people or 20.6%). About a fifth of the population has a non-university certificate/diploma (5,810 people or 18.3%), and 20.1% (6,370) have a university certificate, diploma or degree (Statistics Canada 2011a).

Yellowknife has the highest percentage of educational attainment in every educational attainment category<sup>12</sup> for the LSA communities, with the exception of apprenticeship and trades (Statistics Canada 2011a). In Yellowknife, nearly a quarter of residents over the age of 15 have a high school diploma (3,595 or 23.9%) as their highest level of education, while one-fifth have a non-university certificate/diploma (2,955 or 19.7%). Almost one-fifth (2,710 or 18.0%) of the population has no certificate, diploma, or degree (Statistics Canada 2011a).

**Figure 14.5-1 Percent of Population with High School or Greater, 1989-2011**



Sources: GNWT 2014b.

In the rural LSA communities, the majority of residents aged 15 and over (50.7% to 67.6%) have not attained a certificate, diploma, or degree (Statistics Canada 2011a). This percentage is high compared to Yellowknife (18.0%) and the NWT (31.1%). These communities have a higher portion of the population in possession of a trade or apprenticeship certificate or diploma (7.0% to 16.4%). The LSA communities with the highest percentages of apprenticeship and trade certification are Fort Resolution (16.4%), Wekweètì (15.8%), and Whatì (11.6%) (Statistics Canada 2011a).

<sup>12</sup> Categories of educational attainment include a high school diploma, a college, vocational or other non-university diploma or certificate, a trade or apprenticeship certificate or diploma, university certificate or diploma below a bachelor level, a bachelor's degree, or a university certificate, diploma or degree above a bachelor level.



Though lower than the NWT and Yellowknife, the other LSA communities also have a noticeable portion (8.1% to 15.1%) of their populations with a college diploma. Small percentages of these communities also possess a university certificate, bachelor's degree, or graduate degrees (Statistics Canada 2011a). While rural LSA communities have higher rates of trades, apprenticeships and college diploma completion than Yellowknife, the actual number of college graduates is comparatively low given the small size of the rural LSA communities in relation to Yellowknife.

#### **14.5.1.2 Educational Infrastructure and Services**

The NWT has eight educational jurisdictions managed by education boards and councils, district education authorities, and district education councils. These boards oversee the management, administration, and implementation of curricula and programs. Most LSA communities have schools that provide education from kindergarten to Grade 12. The exceptions are Dettah (kindergarten to Grade 6) and Wekweètì (kindergarten to Grade 9).

High teacher turnover is a problem in the NWT, and can negatively affect student commitment, achievement, and school programming (GNWT-ECE 2007). In addition, turnover creates a burden on local and regional administration, reduces community confidence in schools, and impacts the education system as a whole in terms of costs. When out of province teachers are hired, there are high annual removal costs, as well as costs for orientation to the environment and culture (GNWT-ECE 2007).

#### **14.5.1.3 Labour Force Training**

The Mine Training Society (MTS) is a non-profit organization, which aims to address the need for training and development of a skilled northern workforce. The MTS' main objective is to assist Aboriginal people in finding employment in the mining industry. The society is a partnership consisting of Aboriginal representatives (YKDFN, Tłı̄ch̄ Government, LKDFN, Kete Whii/Procon Joint Venture, and the North Slave Métis Alliance), the GNWT, and the mining industry. Industry sponsors of MTS training initiatives are Dominion Diamond (Ekati Mine), Avalon Rare Metals, Canadian Zinc Corporation, Diavik Diamond Mines Inc., and De Beers Canada Inc.

Human Resources and Skills Development Canada (under the Aboriginal Skills and Employment Partnership program), the mining industry, government, and Aboriginal partners provide funding for the MTS. The latest agreement was entered into in late February 2013. Since 2004, the MTS has provided training and/or counselling for over 1,900 northerners, and has placed 830 northerners in high-paying jobs (MTS 2013). In August 2014, the MTS will have a 14-week underground miner training program with Aurora College (MTS 2014).

Aurora College is a post-secondary institution funded in part by the GNWT-ECE. In 2014, it was the only college in the NWT and the primary institution for adult and post-secondary education. Aurora College has three campuses: Aurora Campus in Inuvik; Thebacha Campus in Fort Smith; and the Yellowknife Campus (Aurora College 2014). The NWT has 23 Community Learning Centres (CLCs), with seven CLCs serving the LSA communities. The college offers a diverse range of programs including educational upgrading, certificates, diplomas, as well as apprenticeship opportunities and university degrees, many of which are focused on training pertinent to the mining industry.



#### **14.5.1.4 Ekati Mine's Contributions to Education**

The Ekati Mine has a history of contributing to the skill base in the NWT, both through financial investment in schools and education programs, and through training that employees receive at the mine (discussed further below). Dominion Diamond aims to create a positive legacy that will remain with the territory long after the mine has closed, and has identified culture and education as focal points for its community development strategy. In 2012, Ekati Mine provided \$3.4 million of investments in community development initiatives in the NWT and in Kugluktuk. Other investments included the Ekati Plus scholarship program, various traditional knowledge projects, and educational scholarships.

The Workplace Learning Program began at Ekati Mine in 2001 with the aim of enhancing the literacy of employees that have lower levels of educational achievement. Apprenticeship and General Education Diploma programs were added in 2003, a warehouse technician was added in 2004, and an "Introduction to Computers" program was added in 2005. During the span of the program, 160 employees received basic literacy training, 62 employees were assisted with obtaining a General Education Diploma, 60 employees received pre-trades math training, and 15 employees went on to complete apprenticeships. The outcomes of the program were increased literacy amongst employees and increased opportunities for further education and advancement. Eventually, as the workforce became more educated, and as educational achievement improved in the NWT labour force, demand for the program diminished (Beaulieu 2014).

Community and Aboriginal relations personnel from Ekati Mine have developed a presentation that is delivered by Ekati Mine staff to students in high schools and is aimed at encouraging educational achievement. The presentation brings workers from different areas of mining (e.g., tradespeople, administrative staff, professional staff) to talk about their jobs, and the associated educational requirements. It also presents the income potential of the various skill levels associated with positions at the mine, and notes the education requirements associated with each type of position. Dominion Diamond staff have noted that the presentation reminds students of the importance of education for furthering their careers, and that it receives positive responses from students. Dominion Diamond would like to see this presentation delivered earlier in the K-12 system, to help motivate students at an early age, thereby laying the foundation for future educational success (Beaulieu 2014).

The Ekati Mine has contributed to education and advancement in LSA communities in several ways. The operator is continuing a five-year partnership with Skills Canada NWT, and is investing \$300,000 in strengthening the trades and trades training within the NWT. Each year, Dominion Diamond also holds Trades Demonstrations in one of the IBA communities for high school students.

The Ekati Plus program provides scholarships for post-secondary education to students from LSA communities and invests in schools, Elder Centres, Out on the Land programs, the Trails Series films, a Heritage Centre, youth programs, and community initiatives aimed at preserving and teaching traditional knowledge and language. Dominion Diamond also makes annual community development investment contributions to initiatives in the schools in each of our IBA communities. Some of these initiatives are technology and software upgrades, literacy, wellness and healthy living, and programs aimed to increase attendance. Paid apprenticeships at the mines, many of which are filled by Northern Aboriginals, have built trades capacity in the labour force and many apprentices are employed at the mine today (Dominion Diamond 2013a).



### 14.5.2 Base Case

The **Base Case** considers how the existing environment will change in the future, and focuses on the changes in the mining industry from 2014 to 2030. The Base Case scenario considers the existing Ekati, Diavik, and Snap Lake diamond mines operating in the North Slave region of the NWT. The mines are expected to close in 2020, 2023, and 2029, respectively. The Gahcho Kué Project will begin its first full year of production in 2017, and closure in 2028.

The existing trend of increased educational attainment in the NWT is expected to continue into the future. Demand for skilled employees by all industries, including the mining industry, has reinforced the need to place a value on education in the territory. This focus on educational attainment is not likely to reverse or decline with the waning of the mining industry in the NWT.

As the existing mines close over the course of the next two decades, associated out-migration from the territory will likely result in lower enrolments, purely as a function of overall population decline and the associated drop in number of school-aged children. While schools are not subject to the same constraints of supply and demand as private sector institutions, there may come a point where it is no longer feasible to maintain certain facilities in some communities, due to out-migration and a reduced number of children.

Similarly, as the NWT mines close, mining contributions to government revenues used for educational infrastructure and services, as well as direct contributions to communities (such as those detailed in Section 14.5.1.4), will come to an end. This would place additional pressure on the GNWT to replace funding for at least some education infrastructure and services.

Labour force training, such as mining training offered through the MTS and apprenticeship programs through Aurora College may experience decreased demand as employment in the mining industry declines from 2020 onward. With reduced demand, these programs may need to re-evaluate their delivery options. Training programs with few students enrolled is expensive to maintain per student.

The development of the Gahcho Kué mine is expected to soften out-migration, and would continue some level of direct community contributions for educational initiatives and demand for skilled labour via IBA contributions and employment, but would not serve to completely offset the potential effect on educational services over the next two decades.

### 14.5.3 Project Effects on Education and Training

As noted in the Pathway Analysis (Section 14.1.4), the Project is not expected to have an effect on teacher retention, as it will not contribute to inflation and increased cost of living – which seem to be one factor in poor teacher retention. Thus, no residual effect on teacher retention is anticipated.

The Project would continue the Ekati Mine's revenue stream to the GNWT, and the direct contributions made by Ekati to communities through the Ekati Plus program, apprenticeships and other community involvement.



It is expected that, through primary and secondary school programs aimed at informing students about the importance of education in the pursuit of mining employment, and through apprenticeship programs, that the Project would continue to promote staying in school. The Project would, therefore, continue to encourage a positive attitude toward educational achievement, which, if effective, would discourage early school leaving and promote further education.

While not completely offsetting out-migration and reduced demand for skilled mining labour associated with the closure of the Diavik, Snap Lake and Gahcho Kué mines, the Project would act to soften out-migration, and to maintain mining employment. The existing Ekati Mine operations labour force would meet most of the Project's operational labour demand, however, natural attrition would continue some demand for skilled mining labour in the NWT. It is possible that the Project's demand for skilled labour would be substantial enough to maintain demand for mining-related training programs in the NWT.

The Project will continue to build capacity in the mining labour force through training. For employees, the Project will continue to implement Ekati workforce development programs aimed at developing job-specific progression and employee potential with the goal of advancement. The Project would continue the existing health and safety, leadership and supervision training programs including a Supervisory Development Program, the Ekati Leadership Program, and the Northern Leadership Development Program. The Project would also result in the re-institution of an on-site adult educator in an effort to provide ongoing educational support to employees, and a Workplace Learning Program designed to address gaps in employee education and training.

#### **14.5.4 Residual Impact Classification and Significance**

The existing trend in the NWT is one of increased educational attainment. This trend is unlikely to change simply as a result of the decline of the mining industry over the next two decades. The Project will largely continue existing Ekati educational initiatives, and will not generate a large demand for new, trained employees from the NWT. The Project will maintain awareness of the importance of the mining industry in the NWT economy, and education and training requirements needed for mining employment. The Project will preferentially source new employment from the NWT and LSA communities, and will provide educational contributions and programming to IBA communities. For these reasons, the Project's effect on educational attainment is considered to be local to regional in extent, and will extend beyond operations into the long term. The magnitude of the Project's effect on educational attainment in the NWT is not measureable, and so is cautiously considered low to moderate.

Project taxes, royalties and community contributions would be important sources (both direct and indirect) of funding for education in the NWT. Educational funding in the NWT would not, overall, reduce as a result of the closure of the other mines in the NWT. Rather, government funding allocations would likely offset decreased GNWT revenue associated with decreased mining activity. Property taxes paid by households in school districts, and by other local businesses, would continue to provide education funding as the mining industry wanes. The Project would continue to provide taxes and revenues to the NWT, but would not act to offset the closures of the other mines, and would not contribute at the same magnitude as other sources of educational funding (i.e., taxes). As a result, the magnitude of the Project's effect on funding for education is considered low. Community contributions (i.e., IBA contributions) would occur at the local level. This effect would continue throughout the Project's operational life, and so would be considered long term in duration.



Project demand for skilled labour would also maintain some level of demand for labour force training through NWT institutions (e.g., Aurora College, the MTS). This demand is expected to be of low magnitude, given that the majority of the Project's workforce will transition from the existing Ekati Mine, and thus have the requisite pre-employment training. Demand for training would extend beyond the LSA to institutions throughout the NWT and so is considered to be regional in extent. The demand would persist for the duration of Project operations and so is long term in duration.

The Project will continue to train and develop the existing Ekati workforce that transfers to Project operations. Further, the Project will contribute to the training of new employees filling attrition-related employment opportunities, and apprentices at the mine, thereby building capacity in the labour force. This effect, while important, is not of the same magnitude as the effect of a completely new mine that would require a new, trained work force. As a result, the Project's effect on building capacity amongst the workforce via training is assessed as moderate in magnitude. The Project would draw new employees primarily from LSA communities, but would also source labour from other parts of the NWT as needed. Further, apprentices would come from around the territory. As a result, the effect is local to regional in extent. The effect would persist for the operational life of the Project, and so is long term in duration.

Educational attainment, changing trends emphasizing the importance of education, and labour force training and skills development does not cease following the closure of a Project. Rather, these effects persist into the future with those who benefit from them. The Project will act to maximize education and training for communities in the NWT, building educational foundations, and capacity in the trained labour force. As a result, the Project's effect on education in the NWT is considered **significant** (Table 14.5-1).

**Table 14.5-1 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on Education and Training**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint
Project employment educational requirements could lead to increased interests in completing education and educational attainment	low to moderate	local to regional	long term	n/a	<i>significant</i>
The Project would continue to provide community contributions and tax revenue to the GNWT, thereby supporting educational funding	low	local	long term	n/a	
The Project would maintain some level of demand for mining-related educational services in the NWT	low	regional	long term	n/a	
Project training will continue to build capacity in the labour force, thereby strengthening the NWT population's ability to participate in the labour force	moderate	local to regional	long term	n/a	



## 14.6 Health and Well-being

### 14.6.1 Existing Environment

This section summarizes health and well-being conditions in the NWT from the point of initial diamond mining activities onward, and focuses on those aspects of health and well-being that may be affected by the Project. A full discussion of baseline health and well-being conditions in the NWT can be found in the socio-economic baseline (Annex XV, Section 3.6).

#### 14.6.1.1 *Mortality and Disease*

The NWT has one of the highest rates of chronic disease in Canada. Chronic diseases that have been identified as priority areas are diabetes, renal, and mental health diseases (GNWT-HSS 2013a). In 2009 (the most recent year of research), it was estimated that approximately 5.2% of the population were living with diabetes in the NWT, and approximately 200 new cases are diagnosed each year. Cardiovascular diseases and cancers are the leading causes of death in the NWT, each contributing to 23% of total deaths (46%). These are followed by injury (19%), respiratory diseases (14%), and digestive diseases (4%). Seventeen percent of deaths in the NWT are attributed to unknown causes. The four leading causes of death were the same for women and men.

The premature mortality rate (PMR) measures unfulfilled life expectancy, and calculates deaths occurring before the age of 75 years. In 2007, the PMR in the NWT was 25.1 deaths per 10,000, which was higher than the national PMR rate of 17.2 per 10,000 for Canada. Overall, the PMR from injuries and cardiovascular diseases has been on the decline, while the PMR from respiratory diseases has risen in NWT (GNWT-HSS 2011a).

The GNWT also measures potential years for life lost (or early deaths) due to health, well-being, and lifestyle choices. Findings suggest that “potential years of life lost” is reducing in Yellowknife and the small local communities that are potentially affected by diamond mining. This trend began before diamond-mining operations began, and has not substantially changed since, suggesting that there is no correlation between life expectancy and mining operations (GNWT 2013a).

The suicide rate in the NWT varies by region. The rate in Yellowknife and communities affected by diamond mining<sup>13</sup> has been increasing since the mid-1990s, and especially in the smaller communities. This increase is in contrast to the declines seen in smaller communities in regions outside of the LSA. The GNWT has put in place the Applied Suicide Intervention Skills Training program, which is aimed at building the capacity for suicide prevention amongst community members and health care workers (Northern News Service 2012a).

#### 14.6.1.2 *Substance Abuse and Gambling*

Almost 78% of people in the NWT, 15 years of over, consume alcohol. More men consume alcohol than women, and more non-Aboriginals drink than Aboriginals. People in Yellowknife report that they drink more than people in smaller communities (GNWT-HSS 2010). In 2009, 23% of people who reported drinking alcohol (aged 15 and over) reported at least one type of harm as a result of their consumption of alcohol. Fifty-one percent of the population also reported that they had experienced harm from someone else's drinking. The most common self-reported harmful effects of drinking were on friendships or social life (14%), physical health (10%), and home life or marriage (8%).

<sup>13</sup> The *Communities and Diamonds* reports track conditions in Behchokò, Dettah, Gamètì, Lutsel K'e, N'Dilo, Wekweètì, and Whatì.



The number of daily smokers, both males and females, declined in NWT between 1996 and 2009 (from 39% to 25%), and the proportion of people who have never smoked increased (from 30% to 41%). Few aged 15 to 24 are former smokers, with a relatively even split of this population being a current smoker (46%) or never having smoked (48%). Aboriginal people were more than twice as likely to smoke as non-Aboriginal people were, and were almost 4.5 times more likely to be occasional smokers.

Almost 60% of people in the NWT reported using cannabis (marijuana or hashish) at least once, and approximately 20% have used cannabis in the past 12 months. Men are more likely to have used cannabis than women (65% versus 55%), and Aboriginal people were more likely than non-Aboriginals (66% versus 53%). People in smaller communities were approximately twice as likely to have smoked cannabis in the last year compared to those living in Yellowknife. Approximately 23% of past year cannabis users self-reported experiencing harm. The most common types of harm reported were to physical health (12%), friendship and social life (8%), and home life and marriage (8%) (GNWT-HSS 2010).

Since 2002, there has been a marked increase in the number of NWT residents who have tried "hard drugs," including cocaine or crack, hallucinogens, speed, ecstasy, and heroin. The rate of use has increased from 16% in 2002 to 24% in 2009. Men were more likely to have tried hard drugs than women (30% and 17%). People in Yellowknife (26%) and larger regional centres (24%) were more likely to have used hard drugs in their lifetimes than people in smaller communities (19%) (GNWT-HSS 2010). Forty-three percent of regular hard drug users (within the past year) self-reported that they experienced harm from their drug use, and more than half the people reported that it affected their ability to maintain work or studies (GNWT-HSS 2010).

Addictions and associated mental health problems have been linked to increases in suicide (Northern News Service 2012a). Higher incomes from jobs in the mining industry have made alcohol and drugs more accessible; there is more money in communities. Abuse of alcohol and drugs can lead to people engaging in riskier activities such as crime, unprotected sexual intercourse, and further substance abuse, and can lead to depression and, in some cases, suicide (GNWT 2013a).

The prevalence of people who gambled occasionally (at least once per year) and those who gambled regularly (once a week) fell in the NWT between 1996 and 2009. For occasional gamblers, the rate reduced from 78% to 71%, and for regular gamblers the rate fell from 29% to 23%. People with lower levels of education were more likely to gamble occasionally than university graduates (81% versus 68%). Sixty-eight percent of people who lived in Yellowknife and small communities gambled, while the rate was much higher in regional centres with 81% of people engaging in gambling. Aboriginal people (31%) were more likely to gamble regularly than non-Aboriginals (16%). There was no substantial difference between the rate of gambling for males and females (GNWT-HSS 2010).

The most common types of gambling were lottery tickets (62%), scratch tickets (47%), bingo (31%), and card games (26%). Internet gambling accounted for only 6% of gambling in the NWT. On average, the amount spent in the NWT in a "typical" week gambling was \$40. People over the age of 60, however, spent approximately \$61 per week. People from smaller communities also spent higher amounts than the territorial average at \$86 per week (GNWT-HSS 2010).



### **14.6.1.3 Community Well-being and Culture**

Well-being refers to positive and sustainable characteristics that enable individuals, families, and communities to thrive and flourish (GNWT-HSS 2011a). A survey of perceived well-being in the NWT found that the majority of people (87.4%) were satisfied or very satisfied with their life. The demographic characteristics showed that younger people were on average more satisfied than older people, women more than men, non-Aboriginal people more than Aboriginal people, and wealthier people more than poorer people (GNWTBS 2012b).

Approximately three-quarters of the NWT population (78.5%) felt that they lived in a society with a sense of community. On this well-being indicator, older people were more likely to report perceived sense of community than younger individuals were. Aboriginal people were also more inclined to report that they experienced a greater sense of community than non-Aboriginals (GNWTBS 2012b).

Studies have shown that well-being is also related to the level of volunteerism that people undertake in their communities (Thoits and Hewitt 2001; United Nations Volunteers [UNV] 2011). Important attributes of volunteerism linked to well-being include the “level of solidarity, passion for a cause and wanting to give back to society” (UNV 2011). In 2008, 38% of people in the NWT engaged in volunteer activities. People living in rural LSA communities, on average, volunteered slightly less than the territorial average.

A further indicator of well-being is the use of Aboriginal languages and participation in traditional cultural activities such as hunting and fishing (Public Health Agency of Canada 2006; GNWT 2013; Kant et al. 2013). The *2012 Communities and Diamonds* report notes that language skills may be the most at risk from mine employment because English is the primary language used at work (GNWT 2013a). Aboriginal language use has declined over the last decade across the territory from 45% to 38% of the total Aboriginal population speaking a traditional language. In the LSA, there has been a decline in some, but not all of the communities. In Gamètì and Wekweètì, for instance, most people speak an Aboriginal language. In all the communities but Yellowknife, more than half the population still speak an Aboriginal language.

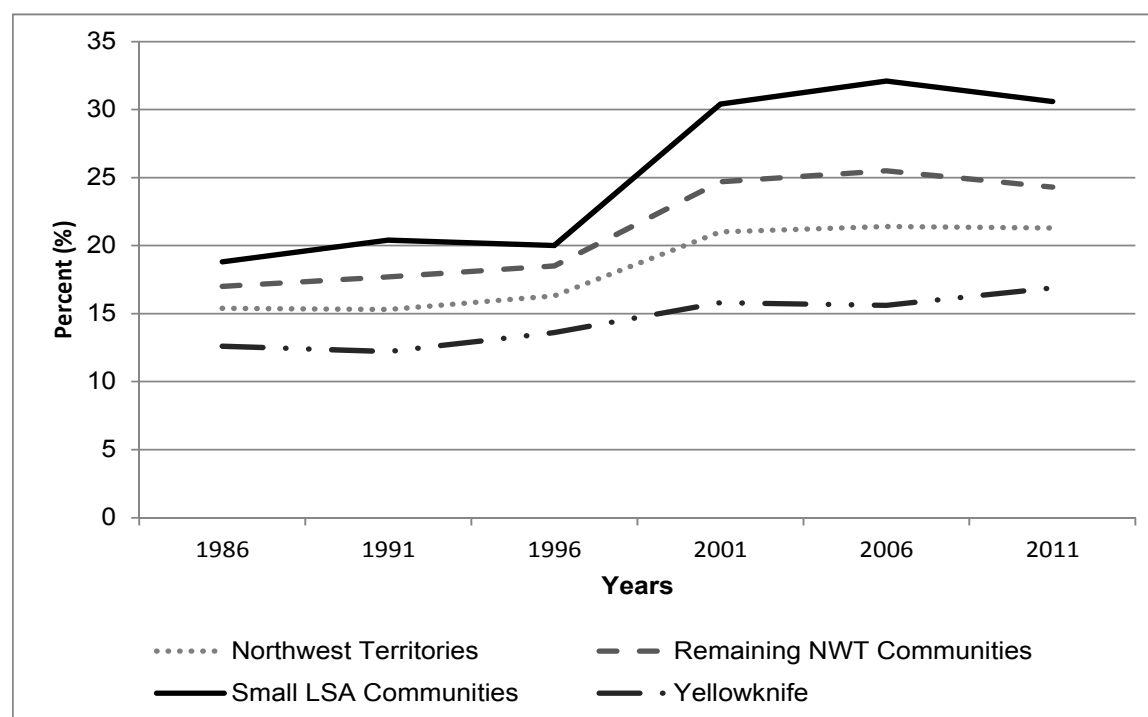
The level of participation in traditional activities is also considered an indicator of well-being in Aboriginal communities. For instance, the sharing of surplus harvest from hunting and fishing was part of a system of reciprocity or insurance against potential future misfortune, and ensured the well-being of the entire community (Bennet and Rowley 2004). In 2008, 45% of the NWT Aboriginal population reported that they had engaged in hunting and fishing activities. Participation in traditional hunting and fishing varied amongst LSA communities. Rates of participation were highest in the Aboriginal populations of the communities of Lutsel K'e (76%) and Wekweètì (60%), but were lower in Behchokò (36%), Dettah (38%), Yellowknife (38%), and Gamètì (39%) (GNWT 2013b).

### 14.6.1.4 *Vulnerability and Inequality*

The NWT has transitioned into a wage economy. This transition has been particularly noticeable over the past two decades with the development of the diamond mining industry. Mining activity has generated employment and incomes, which has in turn affected inflation and consumer prices in the territory. Those who stand to be the most vulnerable in this economic context are those with lower incomes in relation to their household costs. Single parent families, people living on fixed incomes (i.e. pensioners) and those dependent on income assistance fall into this category.

The prevalence of single-parent families in the NWT has increased since 1996. The sharpest increase has been in rural LSA communities, where the percentage of families headed by a single parent increased from about 20% in 1996 to over 30% in 2011. The prevalence of single parent families in the NWT and the LSA between 1986 and 2011 is displayed in Figure 14.6-1.

**Figure 14.6-1 Prevalence of Single-Parent Families**

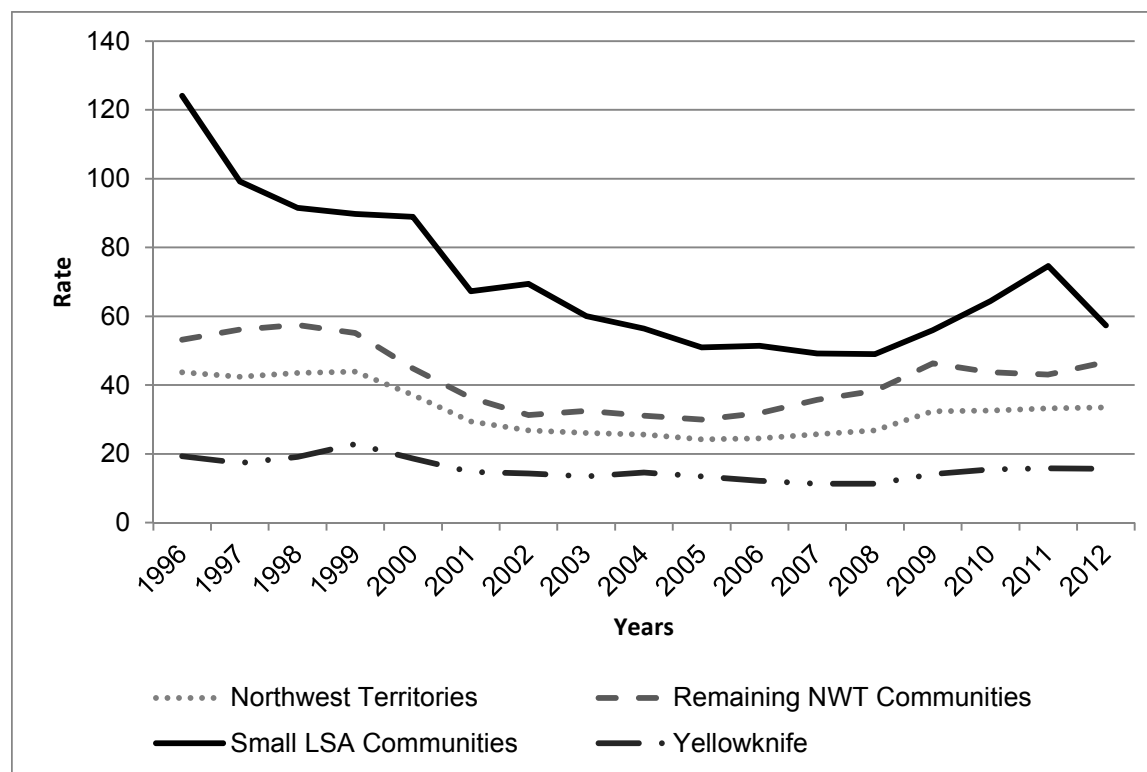


Source: GNWT 2014b.

Note: Small LSA communities refer only to rural LSA communities in the NWT. Kugluktuk, Bathurst Inlet, and Umingmaktok are not included.

The number of monthly income assistance cases has decreased in the NWT since 1996. The most noticeable decrease has occurred in the rural LSA communities, where the income assistance rate was halved between 1996 and 2012. Income assistance rates in the NWT and the LSA between 1996 and 2012 is displayed in Figure 14.6-2.

**Figure 14.6-2 Average Monthly Income Assistance Rate per 1,000 Persons, 1996-2012**



Source: GNWT 2014b.

Note: Small LSA communities refer only to rural LSA communities in the NWT. Kugluktuk, Bathurst Inlet, and Umingmaktok are not included in the figure.

The income gap between families in the LSA has closed over the past two decades (Table 14.6-1). Overall, there were fewer families with incomes below \$30,000 in 2011 than in 1994. In rural LSA communities, 55% to 73% of families had incomes under \$30,000. By 2011, this number had shrunk to 29% to 44% (depending on the community). The same pattern occurred in Yellowknife, where the number of families living with less than \$30,000 income a year reduced from 16% to 9%.

More families earned over \$70,000 per year in all LSA communities in 2011 than in 1994. This increase has been most noticeable (by proportion) in rural LSA communities, when the number of families with over \$70,000 in annual income increased from virtually none in 1994, to 29% to 44% of all families (depending on the community).

Proportionally, more families have been moving into the middle income bracket (i.e., between \$30,000 and \$70,000 annually) than the high income bracket (i.e., over \$70,000), indicating a trend towards overall income disparity reduction between 1994 and 2011.

**Table 14.6-1 Income Disparity Amongst Families in the Local Study Area**

Community	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Percent of Families with Incomes Lower than \$30,000 per year</b>																		
Fort Resolution	73.3	73.3	64.3	60.0	61.5	71.4	46.2	42.9	42.9	46.2	46.2	30.8	35.7	23.1	30.8	38.5	23.1	28.6
Lutsel K'e	62.5	62.5	71.4	62.5	77.8	66.7	50.0	40.0	40.0	22.2	44.4	44.4	55.6	55.6	37.5	33.3	50.0	44.4
Behchokò	55.3	52.6	50.0	50.0	47.6	46.5	41.9	31.1	34.8	31.9	31.3	29.8	28.6	25.5	27.1	30.6	32.0	30.0
Gamètì	60.0	66.7	66.7	40.0	50.0	57.1	42.9	42.9	42.9	42.9	20.0	42.9	42.9	42.9	42.9	42.9	42.9	-
Whatì	55.6	55.6	55.6	55.6	60.0	50.0	54.5	54.5	36.4	18.2	38.5	27.3	25.0	25.0	25.0	30.8	35.7	28.6
Yellowknife	16.2	16.3	17.5	17.0	16.0	17.2	16.7	12.8	11.4	12.5	12.1	12.1	10.6	9.5	9.8	10.1	9.4	8.8
<b>Percent of Families with Incomes Higher than \$70,000 per year</b>																		
Fort Resolution	-	-	-	-	15.4	-	-	14.3	14.3	15.4	15.4	15.4	21.4	23.1	23.1	30.8	30.8	35.7
Lutsel K'e	-	-	-	-	-	-	-	20.0	20.0	-	22.2	-	-	-	-	-	25.0	-
Behchokò	13.2	10.5	10.0	12.5	11.9	14.0	14.0	24.4	26.1	27.7	37.5	40.4	36.7	42.6	41.7	40.8	42.0	44.0
Gamètì	-	-	-	-	-	-	-	28.6	28.6	28.6	40.0	28.6	28.6	28.6	42.9	42.9	42.9	42.9
Whatì	-	-	-	-	-	20.0	18.2	18.2	18.2	27.3	23.1	27.3	33.3	33.3	33.3	30.8	28.6	28.6
Yellowknife	57.3	54.0	52.7	53.9	54.2	54.6	55.6	61.0	64.9	64.8	66.9	68.6	71.3	72.8	74.5	74.2	74.8	75.2

Source: GNWTBS (2012c).

Note:

Data is only available for communities with 100 tax filers or more

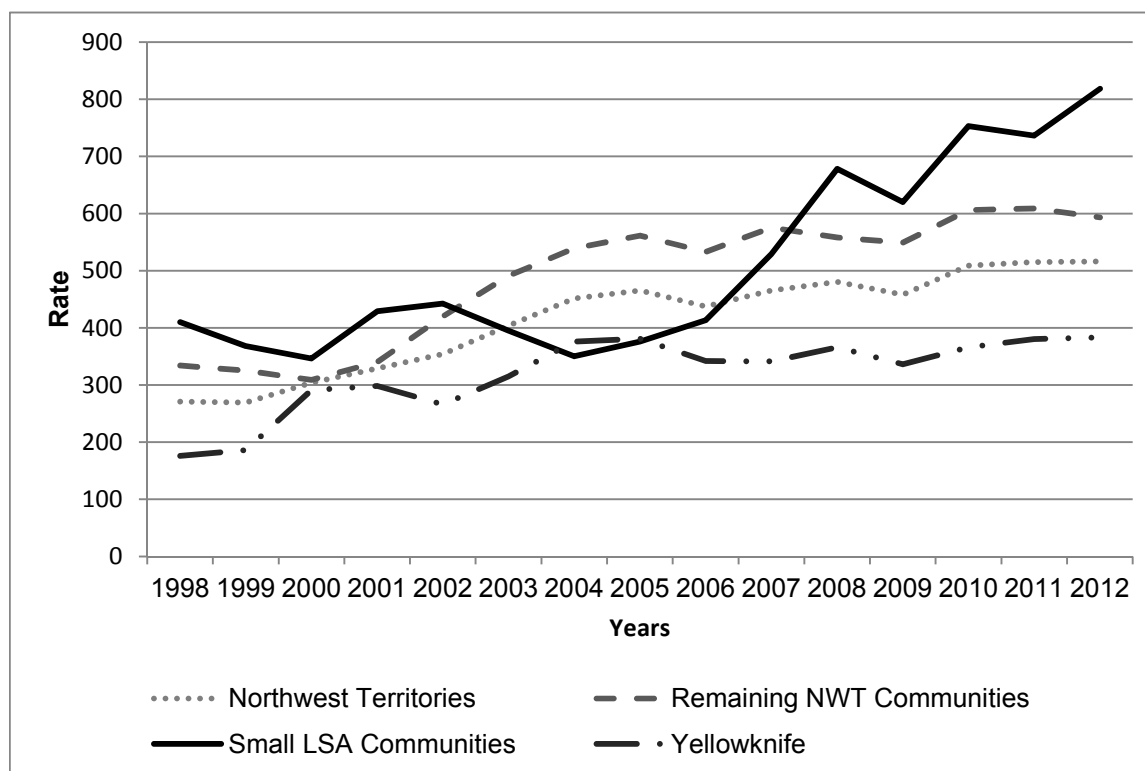
Information on Wekweètì, Dettah, N'Dilo, Bathurst Inlet and Umingmaktok is not available.

'-' means data is zero or too small to be expressed

### 14.6.1.5 Crime

Well-being is also related to public safety and security. Total crime levels in the NWT (and the Canadian North in general) are approximately four times higher than the Canadian national rate (CBC 2012), and rose markedly between 1998 and 2011 (Figure 14.6-3). The most noticeable increase in crime rates has occurred in the rural LSA communities where, since 2004, crime rates have more than doubled. In general, crime rates are higher in smaller NWT communities than in Yellowknife.

**Figure 14.6-3 Total Number of Police-Reported Crimes per 1,000 Persons, 1995-2012**



Source: GNWT 2014b.

Note: Small LSA communities refer only to rural LSA communities in the NWT. Kugluktuk, Bathurst Inlet, and Umingmaktok are not included in the figure.

The majority of crime in NWT was classified as violent crime, which ranges from harassment and threats to sexual assault and homicides. In addition, miscellaneous crimes constitute 29% of total crime, while property crimes make up another 14%. Crime rates in the LSA communities vary. From 2004 to 2011, property and violent crime rates have grown in the communities of Behchokq and Lutsel K'e. In contrast, crime rates have been reducing in Fort Resolution. In Whati, property crime rates have been reducing while violent crime rates have been increasing. Yellowknife has lower property and violent crime rates than the territorial average and is more in line with national rates.



A recent report that examined the causes of crime in NWT found that several factors contribute to the high levels of violent crime in NWT. Low educational attainment, addictions issues, housing issues and employment issues “all factor into people's ability to keep themselves productive and out of trouble”. In this report, the RCMP also acknowledged that the majority of crimes committed while under the influence of alcohol, and to a lesser extent, drug use, and that victims and perpetrators often know each other; very few crimes in the territory are random acts of crime (CBC 2012).

### **14.6.1.6 Health, Social and Protective Services**

The GNWT Department of Health and Social Services Authority (HSSA) administers a wide range of community and facility-based health care and social services in the NWT. Health and social service authorities, by community, are identified in Table 14.6-2. Under the supervision of each regional authority, local residents are able to access a variety of medical and community services such as primary health care clinics, public health services, homecare, and school/community health and education programs (GNWT-HSS 2014a).

**Table 14.6-2 Communities Served by Regional Health and Social Service Authorities**

<b>Health and Social Service Authorities</b>	<b>Study Area Communities</b>
Stanton Territorial Health Authority	Yellowknife
Tłıchǫ Community Services Agency	Behchokǫ, Gamèti, Wekweètì, Whati
Yellowknife Health and Social Services Authority	Dettah, Lutsel K'e, N'Dilo, Yellowknife
Kitikmeot Regional Health Board <sup>(a)</sup>	Kugluktuk

Source: GNWT-HSS (2014a).

a) Source: Government of Nunavut – Department of Health and Social Services (2012).

The NWT Health Care Plan is administered by the NWT Department of Health and Social Services. This plan provides health coverage to the residents of the NWT, and universal access to a wide range of health services and programs (GNWT-HSS 2014b). Residents of Nunavut are covered by the Nunavut Health Care Plan. The Nunavut Health Insurance Programs Office in Rankin Inlet manages this plan and ensures that enrolled Nunavut residents have access to necessary medical services (Government of Nunavut 2014).

Aboriginal and Inuit residents of the NWT and Nunavut access health services under Canada's Federal Non-Insured Health Benefits Program. This program includes coverage for pharmaceutical, eye and vision care, dental, medical supplies, short-term crisis intervention, mental health counselling, and medical transportation (Health Canada 2014).

The NWT provides Métis residents with a supplementary health benefits program. The Métis Health Benefits program is similar to the Non-Insured Health Benefits Program, but at a coverage level of 100%. The benefits under this program are administered by the Alberta Blue Cross on behalf of the GNWT (GNWT-HSS 2014c).



According to the GNWT Hospital Services Report 2013, the total cost of hospital services in the NWT for the entire population between 2008 to 2011 was an estimated \$68.6 million, which is an increase from \$54.2 million from the period of 2000 to 2003 (GNWT-HSS 2013b). The Stanton Territorial Hospital in Yellowknife is the only hospital within the RSA, and is the largest acute care facility (100 beds). The hospital provides services for the NWT and the communities in the West Kitikmeot region of Nunavut. These include services such as internal medicine, general and orthopaedic surgery, paediatrics, obstetrics, ophthalmology, radiology, and psychiatry. These services are available on-site or through community-based travel clinics (GNWT-HSS 2011b). In addition, the hospital also has five key medical clinics: Stanton Medical Clinic, Stanton Medical Centre, Stanton Eye Clinic, Stanton Mental Health Clinic, and the Stanton Health Promotion and Protection Office (GNWT-HSS 2011b).

The smaller communities in the LSA have health centres with nurses who can treat minor emergencies and illnesses. Patients requiring serious medical attention are flown to Yellowknife for treatment (GNWT-HSS 2014d). The HSSAs and other partner hospitals in the south operate the Telehealth program. This innovative program provides long-distance health care services through video conferencing to remote communities.

The GNWT Department of Health and Social Services and the Nunavut Department of Health deliver ambulance services to larger centres in the RSA. Except for inter-office hospital transfers, there is a charge for ambulance service to users (GNWT-HSS 2014e).

All LSA communities have access to medevac services. Medevac missions are contracted by the NWT Department of Health and Social Services and the Nunavut Department of Health to the company Advanced Medical Solutions (AMS), with aircraft and flight crews provided by Air Tindi in Yellowknife (AMS 2012). The medevac service operates out of bases in Yellowknife and Inuvik. In partnership with Aqsaqniq Airways Ltd., AMS provides medevac services for Kugluktuk out of its Nunavut base in Cambridge Bay (Discover Air 2011). In May 2013, the Air Operations Centre at the Edmonton International Airport began taking NWT patients via the GNWT medevac program (GNWT 2013b).

Mental health and addictions programs in the NWT are described in Table 14.6-3.

**Table 14.6-3 Government of Northwest Territories Mental Health and Addiction Programs, 2014**

Program	Function	Objectives	Beneficiaries
Community Counselling Program	Helps people deal with a variety of issues including mental health issues, addictions, and family violence	Helps determine client needs and develop a treatment plan; assess a client's readiness for treatment; supports development of skills to cope with stress and prevent relapse	All residents
Healthy Family Program	Voluntary home visitation program	Provides support to families with children, including children with special needs. Helps promote healthy childhood growth and development, positive parenting and parent-child bonding	Families
My Voice, My Choice	Drug and alcohol awareness campaign	Imparts prevention and awareness messaging and profiles "good news stories" of healing and recovery	Youth aged 13 to 18



**Table 14.6-3 Government of Northwest Territories Mental Health and Addiction Programs, 2014**

Program	Function	Objectives	Beneficiaries
National Aboriginal Youth Suicide Prevention Strategy	Addresses high rates of youth suicide and its risk factors among Aboriginal youth.	Provides opportunities for Aboriginal communities to design, develop and participate in projects to reduce suicide within their communities	First Nations, Inuit and Métis youth, their families, and communities.
Not US!	Raise awareness about drugs and encourage communities to get active and have youth involvement	Discourages substance abuse as well as the illegal sale of drugs	All residents, youth
On-the-land programs	To help support positive health by including a diverse range of cultural/traditional experiences traditional knowledge and the wisdom of elders as well as modern approaches and best practices for treating addictions.	Helps communities offer on-the-land and traditional healing options for mental health and addictions programming	All residents, specifically First Nations and Inuit

Source: GNWT-HSS (2014f).

Several federal and territorial government programs have been implemented to promote and meet the health and well-being needs of territorial residents, many of which are focused on the northern Aboriginal population. Health and wellness programs currently available in the NWT are listed in Table 14.6-4.

**Table 14.6-4 Government of Northwest Territories Health and Wellness Programs, 2014**

Program	Function	Objectives	Beneficiaries
Aboriginal Head Start	Early intervention program (preschool)	Prepares young children for school by meeting their spiritual, emotional, intellectual and physical needs	First Nations, Inuit and Métis children and families
Aboriginal Diabetes Initiative	Diabetes reduction program	Reduce type 2 diabetes among Aboriginal people by supporting health promotion and primary prevention activities and services.	Aboriginal residents
AIDS Community Action Program	Prevent the spread of HIV	Ensure treatment, care and support for people living with HIV and AIDS, their caregivers, families and friends; Minimize the adverse impact of HIV/AIDS on individuals and communities; and Minimize the impact of social and economic factors that increase risk for HIV infection.	All residents
Brighter Futures	Assist First Nations and Inuit in developing community-based approaches to health programs	Improve the quality of, and access to, culturally sensitive wellness services in the communities	First Nations and Inuit children from ages 0 to 6 years, their families
Canada Prenatal Nutrition Program	Helps communities develop improved and comprehensive services for pregnant women (Special First Nations and Inuit program)	Promote breastfeeding, improve diets and nutrition, help women feed their infants	Pregnant women who may be at risk for their own health or that of their child

**Table 14.6-4 Government of Northwest Territories Health and Wellness Programs, 2014**

Program	Function	Objectives	Beneficiaries
Children's Oral Health Initiative <sup>(a)</sup>	Address disparity between oral health of First Nations and Inuit and the general population	Prevention and treatment of dental disease and promotion of good oral health practices	First Nations and Inuit – pregnant women; children 0 to 7
Community Action Program for Children	Funds community-based coalitions for children at risk	Establish and deliver services to meet the developmental needs of children in conditions at risk	Low-income families; teenage-parents; at risk/neglected/abused children
Fetal Alcohol Spectrum Disorder (FASD) Program <sup>(a)</sup>	Address issues of FASD in community	Prevention, identification and awareness of FASD	First Nations and Inuit
Healthy Children Initiative	Supports development of children	Prevention and promotion, with primary intervention and therapeutic services	Families with children (from 0 to 6)
Health Promotion Strategy Fund	Assist communities with healthy promotion initiatives	Assist communities working on tobacco harm reduction/cessation, active living, healthy pregnancies and injury prevention	All residents
Hepatitis C Prevention, Support and Research	Prevent, support and research Hepatitis C	Prevent, support and research Hepatitis C	All residents
Home and Community Care	Provide home and community care services.	Assist with home/community care services for those with chronic and acute illnesses.	First Nations and Inuit communities
Population Health Fund	Provide project funding to improve population health	Increase community capacity for action on or across determinants of health	All residents

Source: GNWT-HSS (2014g), Health Canada (2012).

a) Funded by Health Canada.

HIV = human immunodeficiency virus; AIDS = acquired immunodeficiency syndrome; FASD = Fetal Alcohol Spectrum Disorder.

Mental health, addiction, and social services operated by the HSSA and nongovernmental organizations within the LSA communities are listed in Table 14.6-5. Each LSA community has some form of mental health and social services, many of which are focused on treatment of addictions.

**Table 14.6-5 Mental Health, Addiction, and Social Services, Northwest Territories and Local Study Area Communities, 2014**

Community	Name of Social Service Centre or Facility	Service	Beneficiaries
Behchokò	Behchokò Counselling Services	Counselling/support groups	All
	Behchokò Friendship Centre	Addiction needs	All
	Behchokò Housing Authority	Public housing agency	All
	Behchokò Social Services	Social services office	All
	Jimmy Erasmus Senior Citizens Home	Residential care	Elders
	Tłìchq Community Services Agency	Education, child welfare	All
Dettah	Use of Yellowknife Services		

**Table 14.6-5 Mental Health, Addiction, and Social Services, Northwest Territories and Local Study Area Communities, 2014**

Community	Name of Social Service Centre or Facility	Service	Beneficiaries
Fort Resolution	Community Counselling Program	Counselling/rehabilitation centre	All
	Deninu Health and Social Services Office	Social service office	All
	Fort Resolution Elders' Facility	Supported living	Elders
	Fort Resolution Social Services	Social service office	All
Gamèti	Gamèti Social Services	Serviced by Behchokò	All
Lutsel K'e	Lutsel K'e Community Wellness Agency	Addictions counselling/ programs	All
	Lutsel K'e Social Services	Social service office	All
N'Dilo	Use of Yellowknife Services		
Wekweètì	Dechi Laot'I First Nations	Addiction program counselling	All
	Wekweètì Social Services	Serviced by Behchokò	All
Whati	Whati Social Services	Social services office	All
Yellowknife	Adult Foster Care	Adult care services	Adult
	Bosco Home Territorial Treatment Centre	Crisis intervention/ assessment	Children
	Bosco Home Trailcross Treatment Centre	Crisis intervention/ assessment	Youths
	Native Women's Association	Assist in RCMP situations	Women
	Northern People First Ltd.	Independent living	Challenged
	STHA Meals on Wheels	Daily meals	Seniors/other
	Yellowknife Association for Community Living	Independent living	Challenged
	Yellowknife Association for Concerned Citizens	24 hour nursing care	Seniors
	Yellowknife Women's Centre	Emergency assistance, counselling	Women
	YMCA	Independent living, life skills training	Women/youth

Source: GNWT-HSS (2014h).

n/a = not available.

Several factors make the delivery of physical and mental health care in the North challenging. Some of these factors, such as the increasing costs of health technologies and drugs, and difficulty recruiting and retaining physicians, nurses and other health care professionals are largely beyond the Department of Health and Social Services' control (Office of the Auditor General of Canada [OAG] 2011). In addition, the distance and isolation between communities in the NWT limits and in some cases eliminates people's access to health care in their own community. The two major highways in the territory reach fewer than half of the RSA communities, and many remote communities can only be accessed by plane or on winter ice roads. Due to these geographical factors, there is heavy reliance on the health care system in Yellowknife and out-of-territory specialists, specifically in Edmonton.



The RCMP provides police protection and services including crime protection and public safety and emergency preparedness in the NWT and Nunavut. The NWT RCMP (G Division) headquarters are in Yellowknife. This division provides services through detachment offices in the LSA communities of Behchokò, Fort Resolution, Gamètì, Lutsel K'e, Whatì, and Yellowknife (RCMP 2014a, 2014b). Dettah and Wekweètì have services provided through Yellowknife or other communities when required. In Nunavut, the RCMP (V Division) has headquarters in Iqaluit and a detachment office in the LSA community of Kugluktuk (RCMP 2012). There were 45 RCMP officers in Yellowknife, and 12 in Behchokò. Most of the smaller communities have two to six officers, but there are no officers in Dettah, N'Dilo, and Wekweètì, which are policed by Yellowknife or Behchokò detachments.

Fire department sizes in the LSA vary, and are reflective of the diverse population sizes of the different communities. The Behchokò Fire Department has 12 firefighters and two fire trucks, while the Wekweètì Fire Department has two firefighters (GNWT-ENR 2012a). In Fort Resolution, there are 12 volunteer firefighters (Northern News Service 2012b). The Gamètì and Whatì Fire Departments are presently not active. The Lutsel K'e Fire Department has five or six members, but is currently inactive (GNWT-ENR 2012b). The Yellowknife Fire Division has 29 full-time positions and 30 paid on-call positions (Yellowknife 2014). In 2011, Kugluktuk had 12 firefighters and two fire trucks (Aarluk Consulting 2011; Northern News Service 2011).

The NWT Corrections Services is responsible for the correction and treatment of young and adult offenders. There is one adult and one youth correctional facility in Yellowknife and one adult correctional facility in Kugluktuk (Northern News Service 2009; GNWT-Justice 2013). The North Slave Correctional Centre provides institutional services for adult male offenders in Yellowknife, and North Slave Young Offender Facility provides services to male and female youth offenders. Institutional services for adult female offenders are located at the Fort Smith Correctional Complex (GNWT-Justice 2013). In Kugluktuk, the Ilavut Correctional Healing Centre is a minimum-security correctional facility for adult male offenders (Nunatsiaq Online 2007).

### 14.6.2 Base Case

The **Base Case** considers how the existing environment will change in the future, and focuses on the changes in the mining industry from 2014 to 2030. The Base Case scenario considers the existing Ekati, Diavik, and Snap Lake diamond mines operating in the North Slave region of the NWT. The mines are expected to close in 2020, 2023, and 2029, respectively. The Gahcho Kué Project will be introduced to the territory's economy, with the first full year of production being 2017, and closure in 2028.

There is difficulty in disentangling socio-economic change (particularly to less tangible socio-economic indicators such as health and well-being) resulting from mining specifically, as opposed to from other forces of change. It is, therefore, difficult to establish a direct correlation between the mining industry alone, and broad trends in health and well-being in the NWT.



The Communities and Diamonds monitoring initiative has tracked health and well-being indicators since 2002, and has monitored change to the physical and mental health and community well-being of the communities affected by mining (i.e., the LSA communities). The data presented in the Communities and Diamonds reports<sup>14</sup> does not, however, confirm the presence or absence of causal relationships between diamond mining and change in indicators. There are factors that prevent drawing definitive conclusions about the effects the diamond mines have had on health and well-being in affected communities. Elements such as pre-existing and coexisting trends, changes in data collection methodologies and government policies and programs all confound interpretation of the data. Further, the two groups identified in the report, affected (i.e., LSA) and unaffected communities, are not completely comparable as experimental and control groups. Ideally, the two groups would be as similar as possible except in relation to the causal and outcome variables. In reality, the oil and gas sector is having effects on unaffected communities similar in some respects to the diamond mine effects on affected communities.

There is not complete agreement on the approach employed by the Communities and Diamonds initiative to try to capture some of the effects of diamond mines in the Northwest Territories. Gibson (2008) for example argues that causal linkages suggested in the report can be tenuous as investigators primarily attempt to link change to mining instead of considering other causal factors, thus over or under estimating the industry's influence. For example, investigators in the report propose that higher income and rotational work may be the cause of an increase in hunting and fishing activity, without identifying alternative factors such as rising fur prices and community based programs for hunters, which could also account for this relationship. Gibson notes that effects on communities can be more complex than the use of quantitative indicators are able to capture, and that more effort is needed to fully understand how people experience the diamond mines.

While the initiative is valuable in terms of tracking health and well-being conditions in the LSA communities, drawing conclusions from the Communities and Diamonds reports on the future of health and well-being is not considered appropriate. Similarly, it is not possible to determine would happen to health and well-being indicators in the absence of mining in the years to come.

It is not unreasonable, however, to suggest *potential* changes to specific indicators of health and well-being in the current environment as a result of employment and incomes from the mining industry over the next two decades. These predictions do not take into consideration other factors and influences on health and well-being (e.g., personal choices, potential government initiatives). As a result, the discussion of the health and well-being Base Case effects is, to a large extent, speculative.

Between 2014 and 2019, employment and incomes<sup>15</sup> in the NWT will remain relatively stable<sup>16</sup>. The discussion below focuses on this initial period of stability. Predicting changes as a result of the decline of the diamond mining industry over the next two decades would be speculative, and it is assumed that investment in mining and other economic activity will continue, even if diamond mining falls into decline.

<sup>14</sup> Pertinent data from the Communities and Diamonds reports has been presented in Section 4.6.1.

<sup>15</sup> Employment and incomes are considered to be two of the main connections between the mining industry and individual health and well-being.

<sup>16</sup> Refer to Sections 14.2 and 14.4 for further discussion of population, employment and incomes.



While not directly correlated to participation in hunting and fishing, earning a regular and relatively high income can support traditional harvesting via equipment purchases. Having the resources to support family members pursue further education can have a positive effect on individuals, families and communities. There are obvious positive effects of income on various health parameters. However, people also raise concerns about negative impacts of jobs and incomes on well-being: increased alcohol and drug use is sometimes associated with violence, crime, domestic abuse, and risky behaviour (i.e., impaired driving). Concerns about income disparity and resultant tensions in closely-knit communities has come up in consultations.

Those who cannot participate in employment opportunities (e.g., some single parent families, the elderly,) do not benefit directly from a rise in income unless an employed person shares their incomes with them. In the early days of mining, there was concern about widening disparity between the employed (particularly, those with high incomes such as those offered by the mining industry) and those unable to participate in employment opportunities. While intra and inter-community income disparity has not played out as expected, and in fact, the gap between rural LSA communities and Yellowknife has narrowed, it is reasonable to suggest that there are inequities between people and communities and that these inequities are not easily mitigated, and so may persist.

For those employed in the mining industry and that work a rotation, schedule, there are reportedly both positive and negative effects (Intergroup 2005). The typical rotation is two weeks on and two weeks off. One of the positives is that going out on the land to hunt and fish can be accommodated during the two-week period at home. Rotational work, however, can also place stress on families, particularly those with young children. Rotational work can also affect a worker's participation in regular community activities (i.e., coaching soccer) and community and cultural events. The challenges of rotational work will remain, however, communities and families have more experience coping with the rotational employment than in the early days of the diamond mines. From an assessment perspective, effects from rotational work are the same going forward.

The health and safety policies, training and requirements of the mining industry may bring intangible benefits to communities. Health and safety training obtained on the job can be carried over by workers to their families and communities, enhancing public safety awareness. First aid training yields first responders in communities, and can provide basic medical emergency skills to employees that can be used in the home. Employee health benefits are extended to family members; the on-site health clinic may take the strain of health services in the community—the clinics at Ekati had more than 2000 patient visits for non-occupational illnesses in 2013. Private counselling programs (typically via employee and family assistance programs) may alleviate pressure on public mental health services. Many (if not all) operators in the mining industry encourage and support the hiring of women and Aboriginals in non-traditional roles, thereby building capacity in these demographic groups, reducing their vulnerability and dependence on income support (refer to Section 14.6.1 for further discussion on income disparity in the LSA). It is expected that the role that mine employment plays in family and community health well-being will persist into the early Base Case period, 2014 to 2019.



As the existing NWT mines close, some Base Case conditions associated with the mining industry may change. As employment starts to decline with closures after 2019, employment opportunities will decrease. Mining companies have retrenchment programs in preparation of closure that look to find new employment opportunities for employees at other operations. Further, the training and skill development obtained through mining employment is transferable to other sectors, creating employment options for workers following the closure of the mines. While some may experience job loss with the end of mining, positive effects, such as the capacity built in the Aboriginal and female labour force, health and safety training, and education attained while employed, will not disappear with the closure of the NWT mines, but will rather be retained, creating further opportunities for those who have benefited.

### **14.6.3 Project Effects on Health and Well-being**

The Project will maintain employment at the existing Ekati Mine at levels similar to those between 2014 and 2019 (i.e., early Base Case). Employment will be rotational for the majority of employees, and will continue to provide incomes at the same pay scale as those currently paid to Ekati employees. The mine will not result in an increased number of employment opportunities but there will be attrition and therefore opportunities (openings) for new workers. The effect of the Project on health and well-being in the NWT and LSA communities as expressed in statistics or in community consultations is, therefore, not expected to be different from that of the existing Ekati Mine. The Project is not expected to result in changes to the early Base Case scenario. It will, however, soften the effect of mining decline following 2019 on health and well-being by providing ongoing employment and income.

Project employment will continue to result in employee health and safety training. Health and safety awareness brought about by progressive future training is aimed to help employees to identify and avoid hazards that could result in injury, thereby averting accidents and removing the need for emergency medical treatment. Employee health and safety awareness is often passed on to family members, and the broader community. Project first aid training will continue to give employees basic medical skills that can be used in the home to treat minor injuries. Driver training will continue to improve employee awareness and driving skills, and may mitigate some risk of vehicular accidents in communities. As a result, the Project is expected to have a positive residual effect on the physical health of workers and their families.

The Project would continue to provide on-site medical services to employees, and private medical insurance to employees and their families. Private counselling services will also be maintained for employees and their immediate families via an EFAP (refer to the socio-economic management plan, Section 14.1.3). These services would offset some level of demand for public health and mental health services in the NWT, and would be beneficial to overall employee and family health and well-being. The Project will, therefore, have a positive residual effect on the provision of private medical services to employees and their families but is not expected to have a community level effect.



Rotational employment at the Project would continue to influence the time that employees have for traditional harvesting pursuits, and community involvement. While the two week off-work period of rotation could be used for uninterrupted traditional harvesting activities and community involvement, including volunteering, the two week on-period would continue to be challenging for some. These patterns are not, however, expected to be different from the existing scenario. Mining involves many well-paying jobs. Substance abuse associated with increased access to drugs and alcohol via Project incomes can result in detrimental effects to physical and mental health, and poor judgement and decision making, and have deleterious effects on family members, including children. The Project will offer counselling services for those struggling with gambling, substance abuse issues, and stress.

The Project will continue to preferentially hire northern and northern Aboriginal candidates for employment over the life of the mine, and will continue to actively encourage the employment of women in non-traditional roles. The Project will also provide scholarships in support of education for Aboriginals and women. These strategies are expected to build labour force capacity in both the Aboriginal and female populations of the NWT. The Project will thus have the residual effect of reducing the vulnerability of these groups to the high cost of living in the north and to poverty.

Project incomes benefit employees and their families. There are, however, those who have not been able to participate in mining projects and may not be supported by anyone working in mining. In some situations, this has led to inequities between communities and between families. Incomes paid by the Project bring many benefits to people employed and may support traditional harvesting activities by providing cash for purchase of gear and equipment. Incomes may be used to support family members outside the worker's immediate family, extending the benefit and improving the well-being of more people.

The Project is not anticipated to result in in-migration to the NWT, thus removing the pathway between Project-induced in-migration and increased demand for health, social and protective services by in-migrants. Intra-territorial migration from rural LSA communities to Yellowknife will be low, given that few new jobs will be created by the Project, and that not all people from rural LSA communities who fill these jobs will choose to migrate to Yellowknife. It is expected that the small amount of in-migration over the five year construction and 10 year operational phase of the Project would not be discernable from natural population change in the city, in terms of demand on existing health, social and protective services.

Health and social services are made available to employees by Dominion Diamond (refer to Section 14.3 for further discussion of health and social services available to employees and immediate families), thereby alleviating some pressure on government services. Existing employees and NWT residents who take up employment generated by attrition would not add additional demand for protective services in the NWT. For these reasons, the Project is not expected to affect health, social and protective services, and no residual effects are anticipated.





#### **14.6.4 Residual Impact Classification and Significance**

There is uncertainty around the prediction of residual effects on health and well-being. Almost all effects are dependent on the choices made by individuals, and are outside of the control of Dominion Diamond, regardless of health and well-being programs and initiatives put in place by the Project. Further, data on current health and well-being trends is not clearly correlated to mining, and so cannot be meaningfully used to predict future effects of mining. Because of this uncertainty, it is difficult to rule out potential pathways between a project, and effects on health and well-being. Pathways have, therefore, been carried forward into the residual effects analysis to be conservative. The assessment of the magnitude and significance of these pathways reflects the limited possibility for the Project to change existing conditions.

The Project's potential effects on health and well-being described above are not additive, but rather continue the existing effects of the Ekati Mine. As a result, the Project is not expected to bring about a material change in health and well-being from existing conditions.

Some Project effects on Health and Well-being are positive. The provision of an EFAP, on-site medical services, and health and safety training provide direct medical and counselling services to employees and their families. Programs aimed at helping employees with budgeting and other life skills, and to advance their education and training are also considered to have positive effects. The Project also makes a concerted effort to hire northern Aboriginals and women, building capacity in these populations and reducing their vulnerability. The Project contributes dollars to community development, including educational and TK programs, strengthening communities. A rotational schedule allows for time to harvest while off shift. While on shift, the camp accommodation includes fitness and sports facilities and cultural programming for workers.

Negative effects on the health and well-being of individuals, families and communities are often associated with rising incomes and access to alcohol and drugs. Rising incomes are also associated with increased inequities, although gaps are narrowing.

Residual effects of the Project on health and well-being are considered to be of negligible to low magnitude, and will manifest both at the community (i.e., local) and territorial (i.e., regional) level (Table 14.6-6). Residual effects to health and well-being will persist into the long term (i.e., until closure), with some continuing indefinitely. Given the limited possibility for the Project to result in change, however, the Project's effects on health and well-being are not assessed as significant.

**Table 14.6-6 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on Health and Well-being in the Northwest Territories**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint
Project health and safety training (e.g., defensive driving, first aid) could improve safety awareness, and provide skills for treatment of minor injuries	negligible to low	local to regional	long term	n/a	<i>Not Significant</i>
Project medical and counselling services would benefit the physical and mental health of employees and their families	negligible to low	local to regional	long term	n/a	
Rotational employment would provide time for traditional harvesting in the two week off period	negligible to low	local to regional	long term	n/a	
Rotational work would require employees to be away from their communities during the two week on period, preventing them from participating in community events and volunteering	negligible to low	local to regional	long term	n/a	
Preferential hiring of women and Aboriginals would build capacity in these groups, and provide employment, thereby reducing their vulnerability	negligible to low	local to regional	long term	n/a	
Employment income would provide support for traditional harvesting activities	negligible to low	local to regional	long term	n/a	
Employment income would contribute to income disparity between employee families and families not benefiting from employment	negligible to low	local to regional	long term	n/a	



## 14.7 Physical Infrastructure

### 14.7.1 Existing Environment

This section summarizes the existing physical infrastructure in the NWT. As identified in the Pathway Analysis (Section 14.4), most physical infrastructure is not expected to be affected by the Project. For a full discussion of existing physical infrastructure in the NWT and LSA communities, please refer to the socio-economic baseline (Annex XV, Section 3.7).

#### 14.7.1.1 Housing

There are two types of housing in the NWT: public (administered by the government) and private. Public housing in the NWT is administered by the NWT Housing Corporation. There are currently around 2,400 public housing units across the NWT. Much of the housing in rural LSA communities is publicly administered. Public housing rents are scaled based on income, and the community in which one resides. A summary of public housing rents is provided in Table 14.7-1.

**Table 14.7-1 Public Housing Rent Scale by Gross Monthly Household Income in the Northwest Territories**

Monthly Income (\$)	Monthly Rent (\$)		
	Zone A	Zone B	Zone C
1,667	80	75	70
1,667 - 2,499	160	150	140
2,500 - 3,749	365	345	325
3,750 - 4,999	610	580	555
5,000 - 6,674	890	845	790
6,675 - 8,333	1,295	1,230	1,155
8,334 and above	1,625	1,545	1,445

Source: NWTHC (2014).

Note: Zone A Communities: Yellowknife; Zone B Communities: Dettah, N'Dilo, Behchokò, Fort Resolution, Gamètì, Whatì, Wekweètì; Zone C Communities: Lutsel K'e.

\$ = Canadian dollars.

Private housing consists of houses and apartments that are either owned by the occupant, or rented on the private market. The average resale cost of a house in the NWT in 2012 was \$387,900, up by 22% from 2004. In 2014, the average cost of a detached home in Yellowknife was \$493,544. Housing sales have been high in recent years, with the number of home purchases in Yellowknife growing by 31% between 2011 and 2012 to 489 homes. Housing starts have been similarly high in the city, with 147 new homes being constructed over the same period.

Rental units are costly in Yellowknife, ranging from \$1,391 a month for a one bedroom apartment, to \$1,834 for a three bedroom apartment. This is in part a function of the low vacancy rate in the city (5.9% in 2014).



### 14.7.1.2 Utilities

Utilities in the LSA include water provision, sanitation and treatment, waste management and electricity. Water is trucked into all LSA communities. Yellowknife and Behchokò also have piped water systems in place. Most rural LSA communities have small treatment systems to deal with sanitization, while Yellowknife, Behchokò, Fort Resolution and Whatì all have treatment plants. Dettah, notably, does not have water treatment facilities. All LSA communities have landfills. Burning of waste occurs in Whatì, Wekweètì, Gamèti and Kugluktuk. Behchokò, Dettah, Fort Resolution and Yellowknife all have both hydro and diesel power generation systems, while Gamèti, Lutsel K'e and Kugluktuk rely solely on diesel generators. Wekweètì, conversely, uses hydro generation alone for electricity.

### 14.7.1.3 Transportation and Communication

Many rural LSA communities are not accessible by road, with air travel being the only way in and out of the community. Those closer to Yellowknife (e.g., Dettah, Fort Resolution, Whatì and Behchokò) are accessible by all-weather-access roads, winter roads, or Highways 3 and 6. A detailed breakdown of transportation infrastructure in the LSA is provided in Table 14.7-2.

**Table 14.7-2 Transportation Infrastructure, Local Study Area Communities, 2013**

Community	Highway Access	Marine Re-supply Facility	Airport or Airstrip	Air Terminal Building
Behchokò	all-weather access road Yellowknife Highway 3	no	no	no
Dettah	all-weather access road, winter access road, Yellowknife highway 3	no	no	no
Fort Resolution	all-weather access road, Fort Resolution Highway 6	no	yes	yes
Gamèti	winter access road	no	yes	yes
Lutsel K'e	no	yes	yes	yes
N'Dilo	n/a	n/a	n/a	n/a
Wekweètì	no	no	yes	yes
Whatì	winter access road	no	yes	yes
Yellowknife	all-weather access road, Yellowknife Highway 3	no	yes	yes
Bathurst Inlet	no	n/a	n/a	n/a
Kugluktuk	no	yes	yes	yes
Umingmaktok	no	n/a	n/a	n/a

Source: GNWTBS 2013c; Government of Canada 2013.

Note: there is no rail access to the LSA communities (GNWTBS 2013b; Access to Travel 2013).

n/a = information not available.



Despite their remoteness, the smaller communities in the LSA have multiple communication services, including postal services, internet, satellite television, and telephone. Northwestel, a subsidiary of Bell Canada, has had a near monopoly on telecommunications across the NWT, but competition is slowly expanding (Northwestel 2014). Ice Wireless, the Northern roaming provider of Rogers, and Telus Mobile have recently expanded cellular services to the Yellowknife. Northwestel is still the primary internet provider in the NWT, with SSI Micro providing some competition (Northern Journal 2014).

### 14.7.2 Base Case

The **Base Case** considers how the existing environment will change in the future, and focuses on the changes in the mining industry from 2014 to 2030. The Base Case scenario considers the existing Ekati, Diavik, and Snap Lake diamond mines operating in the North Slave region of the NWT. The mines are expected to close in 2020, 2023, and 2029, respectively. The Gahcho Kué Project will be introduced to the territory's economy, with the first full year of production being 2017, and closure in 2028.

As the NWT diamond mines close over the next two decades, some aspects of physical infrastructure could experience decreased pressure and demand.

Out-migration associated with the closure of the mines, and associated reduced employment opportunities, will likely have an effect on private housing in the NWT. As demand dwindles, housing starts are expected to fall. If the housing market becomes saturated, resale values may also be negatively affected. The construction and operation of the Gahcho Kué mine would serve to postpone some outmigration by creating new employment opportunities for workers from the Ekati, Diavik and Snap Lake mines, however this would not serve to fully offset the overall decline in the mining industry in the NWT, and the subsequent implications for private housing demand and subsequently value.

Given that the mines generate their own power, truck in their own water, and manage most of their own waste, provision of these types of infrastructure to NWT residents is not expected to change in the Base Case. The existing NWT mines may continue to make use of some NWT waste disposal facilities, but would not generate additional demand. Similarly, the closure of the mines would not hinder operation of waste management in the NWT.

It is expected that, over the next two decades, the existing mining operations in the NWT would continue to place demand on the existing air infrastructure in LSA communities to transport workers between point of hire and fly point communities and the respective mine sites. The Tibbitt to Contwoyto Winter Road (TCWR) would continue to experience traffic associated with the operation of the existing Ekati, Diavik and Snap Lake mines over the course of the next decade. The construction of the Gahcho Kué mine would result in increased traffic along the winter road, but would not likely result in noticeable degradation of the road beyond its intended use. As the mines close, traffic volumes on the road would decrease.

Communication infrastructure is not expected to change in the Base Case. It is not expected that out-migration over the next two decades would alter the provisions of cellular, television or internet services.



### 14.7.3 Project Effects on Physical Infrastructure

For the purpose of this assessment, an effect on physical infrastructure may occur through two main pathways. The first is increased demand for, and wear on, infrastructure as a result of in-migration. As described in the Pathway Analysis, there is no linkage between the Project and this pathway. The Project is not expected to result in inter-territorial in-migration to the NWT, and will yield limited intra-territorial in-migration from rural LSA communities to Yellowknife. What movement does happen is expected to be small, and within the bounds of natural population growth. As a result, Project-induced intra-territorial in-migration to Yellowknife is not expected to have a noticeable effect on physical infrastructure in the city. No residual effects are anticipated.

The other pathways through which physical infrastructure may be affected is via direct Project-demand. Much of the Project's infrastructure needs will be met on-site by Project-operated infrastructure, including utilities, water and sewage management, aspects of waste management, and accommodations. As such, there is no linkage between the Project and these types of infrastructure. These aspects of infrastructure are, therefore, not discussed further. There is, however, a linkage between direct Project demand and other aspects of physical infrastructure, including transportation and certain types of waste management. These features, and the Project's effects on them, are discussed further below.

The Project would not use ground transportation infrastructure in and around communities for the transportation of workers to and from site. Rather, air transportation from point of hire and fly point communities would be employed to transport Project personnel. This would require the use of existing air transportation infrastructure in point of hire and fly point communities. The Project would not, however, increase demand for air infrastructure beyond the existing demand, given that the operations workforce is expected to be similar to that of the existing Ekati Mine. The Project will pay all appropriate airport and airstrip fees, thereby supporting air infrastructure.

During construction, the Project would use both air transportation and the existing TCWR to transport workers, material and equipment to site. Construction activities would increase traffic on the winter road beyond levels associated with the existing Ekati Mine operation, potentially interacting with traffic associated with the Diavik Mine, and other users of the road. The Project will pay all appropriate tolls for use of the winter road, which contribute to upkeep and maintenance.

Some Project waste (e.g., industrial waste) would necessarily be disposed of at waste disposal centres in and around Yellowknife. Waste would be trucked from the Project site to disposal and storage facilities. The Project would pay all applicable fees associated with waste disposal, and adhere to all regulations associated with the transportation of dangerous goods, the NWT Guidelines for the General Management of Hazardous Waste (GNWT 1998), and the NWT Guidelines for Waste Management (GNWT 2010).



#### 14.7.4 Residual Impact Classification and Significance

Project construction would result in increased traffic on the TCWR. The road is designed with mining-related traffic in mind, and so would be able to accommodate Project construction traffic. Further, tolls paid by Project traffic would contribute to maintenance of the road. For these reasons, the Project's effect on the winter road infrastructure between Yellowknife and the mine is assessed as low magnitude. The effect is local to the TCWR. By Project operations, Project traffic on the road is expected to reduce to levels similar to the current Ekati mine operation. As a result, the Project's effect is considered medium term in duration and reversible following construction.

The Project will continue to use existing air infrastructure to transport workers and goods between communities and the mine. Given that Project air traffic is not expected to increase beyond the current usage of the existing Ekati mine, and that the Project will pay all appropriate fees in support of air infrastructure, this effect is considered of negligible magnitude. The effect will be regional in extent, with communities across the NWT used as points of hire and fly points, and will persist until after closure into the long term. The effect will be reversible following closure.

Industrial waste produced during construction and operations will be transported to appropriate disposal sites in the NWT. Transportation and disposal of waste will follow all applicable guidelines, and fees associated with waste disposal will be paid. Thus, the effect of the Project on waste disposal services is considered low magnitude. It is expected that waste disposal sites used will be largely within the LSA, and, in particular in and around Yellowknife, resulting in a local effect. The effect would last until after closure, and so is long term in duration, but reversible.

Because of the reversible, negligible to low magnitude of the Project's effects on select types of infrastructure in the NWT, the overall Project effect on physical infrastructure in the territory is assessed as **not significant** (Table 14.7-3).

**Table 14.7-3 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on Physical Infrastructure in the Northwest Territories**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint <sup>(a)</sup>
Project-related construction traffic may increase traffic volumes on the TCWR	Low	Local	Medium Term	Reversible Following Construction	<i>Not Significant</i>
The Project would use existing air infrastructure in point of hire and fly point communities to transport workers and goods to and from site	Negligible	Regional	Long Term	Reversible Following Closure	
Project construction and operations could generate waste and increase demand for waste management	Low	Local	Long Term	Reversible Following Closure	



## 14.8 Non-Traditional Land Use

### 14.8.1 Existing Environment

This section describes the existing environment in terms of NTLUs potentially affected by the Project. The Pathway analysis concluded that there is the potential for interaction between the Project and hunting, fishing and tourism in the NTLU LSA. For a full discussion of NTLU conditions in the NWT and the LSA, please refer to the socio-economic baseline Annex XV, Section 3.8. For a discussion NTLU (i.e., traditional land use by northern Aboriginals), please refer to the DAR Subject of Note Culture (Section 13).

Non-northern residents must use an outfitter to hunt big game in the NWT. Hunting licenses are also required for hunting small game, and wildlife tags are required for hunting big game. Hunting is not permitted within Territorial Parks, National Parks, Park Reserves, and Protected National Historic Sites. Hunting in the Tłıchq Wek'èezhìi Management Area is subject to terms and conditions in accordance with the Tłıchq Agreement. Gamètì, Wekweètì, Whatì, Behchokò, Yellowknife, N'Dilo, Dettah are located in Wildlife Management Unit R, while Lutsel K'e and Fort Resolution are located in Wildlife Management Unit U. Currently, hunting of barren-ground caribou is closed in Wildlife Management Units R and U. The hunting season for the LSA communities in the NWT is summarized in Table 14.8-1.

**Table 14.8-1 Hunting Summary for Residents of Local Study Area Communities in Northwest Territories**

Wildlife Management Unit	Animals	Season
R and U	Black Bear	August 15 to June 30
	Moose	September 1 to January 31
	Wolf	August 15 to May 31
	Wolverine	July 25 to April 30
	Ptarmigan and Grouse	September 1 to April 30
R (exclusively)	Woodland Caribou	July 15 to January 31

Source: GNWT- ENR (2013).

Fish stocks in the NWT are harvested for subsistence, commercial, and recreational use. Sport fishing in the RSA includes Arctic Char, Arctic Grayling, Brook Trout, Bull Trout, Burbot, Ciscoes, Dolly Varden, Goldeye, Inconnu, Lake Trout, Northern Pike, Rainbow Trout, Suckers, and Walleye. Sport fishing is very popular with residents of the NWT, and in 2010 to 2011, fishing tourists comprised over 25% of overall visitor spending.

Most hunting and fishing lodges in the LSA are concentrated in the Barrenlands, with a few near Great Slave Lake and Yellowknife. Peterson's Point Lake Lodge is located on Point Lake, which forms part of the Coppermine River system. Bathurst Arctic Services has a lodge located by the Coppermine River near Wekweètì. Fishing and hunting is also available at the Aylmer Lake Lodge. In addition, True North Safari Ltd. has hunting and fishing lodges on MacKay Lake and Warburton Bay. Enodah Wilderness Travel, True North Safari Ltd., and Arctic Safaris offer services for Barrenlands hunting of ducks, caribou, wolf, and wolverine.



Arctic Safaris also offers services in birding, wildlife viewing, and fishing, as well as camps on the Coppermine River system. There is a lodge on Lac de Gras; however, it has not been active for several years.

In addition to hunting and fishing, guiding, canoeing, hiking and nature viewing are all important forms of tourism in the NWT. Given its location near the north magnetic pole, the NWT is a popular destination for viewing the aurora borealis. Numerous operators offer tours for viewing the aurora borealis from outside Yellowknife's city limits with options such as heated, enclosed areas, and dog team excursions. These tours begin in the autumn and continue throughout the winter months.

Land use activity in the NTLU LSA is dominated by mining activities (Map 14.1-3). There are also several fishing lodges to the south of the existing Ekati Mine, namely the Courageous Lake, Treeline and MacKay Lake lodges. Pellatt Lake Cabin lies to the northeast of the Project along the TCWR. There is an inactive hunting camp along the coast of Lac de Gras, east of the Project, and a Traditional Knowledge camp associated with the Diavik Mine.

### **14.8.2 Base Case**

The NTLU LSA is not heavily used for non-traditional hunting, fishing or land-based tourism. Mining activity in the NTLU LSA is expected to have the same levels of ambient noise and visual disturbances in the NTLU LSA in the near future. Cessation of mining operations at the existing Ekati and Diavik mines will eventually lower ambient noise, and the removal of mining facilities is expected to reduce visual disturbances, enhancing wilderness character in the LSA. Further, reclamation of mining footprints is expected to return the land to a state usable by hunters, fishers and land-based tourists. Reclamation activities would, however, occur in the far future.

Hunting, fishing and tourism are expected to continue to be popular activities in the NWT into the future. Out-migration or economic decline in the face of the waning of the mining industry is not expected to contribute to a decline in outfitting and guiding in the NWT, given that the majority of this type of tourism is taken up by non-NWT residents, and that outfitters and guides are not necessarily dependant on miners.

### **14.8.3 Project Effects on Non-Traditional Land Use**

Species hunted by non-traditional hunters include black bear, moose, wolf, wolverine, ptarmigan and grouse. The Wildlife Subject of Note (SON) (DAR Section 13) discusses Project effects on wolverine, wolf (gray) and upland birds (including grouse and ptarmigan). Effects on black bear and moose – two other commonly hunted species in the NWT – were not assessed given their relative abundance and distribution. The Wildlife SON did not identify a primary linkage between the Project and abundance or distribution of wolf or upland birds. The Project is, therefore, not expected to have an effect on the abundance or distribution of these species for non-traditional hunting.

The Project is predicted to result in a disturbance of less than 0.1% of the suitable habitat for wolverine within the Wildlife Effects Study Area (ESA) for the species, relative to the 2014 baseline condition. The Project may, therefore, have a small negative effect on the abundance and distribution of wolverine in the NTLU LSA. It is not, however, likely that this will materialize in a noticeable effect on non-traditional hunters in the NTLU LSA.



The Project is expected to affect fishing in Lac du Sauvage, the Lac du Sauvage – Lac de Gras Narrows (Narrows) and Lac des Gras. A full discussion of the Project's effects on fish and fish habitat is provided in the Fish and Fish Habitat KLOI (DAR Section 9). Changes in fish habitat are expected to occur in Lac du Sauvage. Project water diversions, and changes in water levels and flows may also affect fish habitat or fish populations in Lac du Sauvage, the Narrows, and Lac de Gras. At closure, the dewatered portion of Lac du Sauvage will be back-flooded. Once the water within the diked area meets water quality acceptability criteria, the dikes, diversion channels and other associated infrastructure will be decommissioned and the back-flooded section will be reconnected to the undisturbed portions of Lac du Sauvage.

The Noise Impact Assessment (NIA) (Appendix 13B) concluded that the total noise from the Project construction phase will not exceed Health Canada thresholds for noise-induced hearing loss, sleep disturbance, interference with speech comprehension, complaints, or change in percentage "highly annoyed"<sup>17</sup>. The NIA also indicated that Project traffic on the TCWR during construction would not cause a quantifiable increase in noise levels along its length. Project operations are expected to comply with Directive 038 permissible sound level values at all receptors within a 1.5 km buffer around the Project. Operations traffic on the TCWR is expected to be the same as that associated with the operation of the current Ekati Mine.

While Project construction and operations is not expected to exceed guideline values, there is no established threshold of tolerance beyond which noise disturbances would materially affect a land user's ability to partake in activities such as hunting, fishing and land-based tourism, or enjoyment of said activities. As a result, Project construction and operations activities may impact non-traditional land users within the NTLU LSA.

To assess the maximum extent at which the Project may be seen by non-traditional land users in the surrounding area, visibility of the Project was based on the tallest and largest waste rock pile, as the most visible aspect of the Project. Land users located within a 2 km area surrounding the waste rock pile would likely be able to notice the visual disturbance. Noticeability of the waste rock pile is expected to diminish outwards within a distance of 30 km. In addition to the physical visual disturbance of the Project, there is the potential for additional light disturbance resulting from Project operations. While the Project is not expected to contribute additional light disturbance around the existing Ekati mine facilities and infrastructure, it will likely result in increased light disturbance northeast of the existing Misery Project facilities. The construction and operation of the Project is, therefore, expected to alter the wilderness character of the NTLU LSA, and may affect NTLU activities of potential users.

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<sup>17</sup> Health Canada defines "annoyance" as a state of being annoyed, disturbed or bothered, evoking upset of a person's composure, which can include some degree of wearing on the nerves, anger, or anxiety, difficulty enduring the source of annoyance and ensuing weariness or impatience of spirit, or interference with comfort or peace of mind. With "high annoyance" as a degree of annoyance based on the top two categories of annoyance (very or extremely) of an adjectival scale.



#### 14.8.4 Residual Impact Classification and Significance

The Project's effect on hunting in the NTLU LSA is considered to be of negligible magnitude, given that, of the hunted species in the area, only wolverine abundance and distribution would be affected. Further, the amount of suitable habitat for wolverine affected by the Project would be extremely small (i.e., less than 0.1% of the total suitable habitat in the Wildlife ESA), and likely not noticeable to non-traditional hunters. The effect would be local to the Project footprint, and would be long term in duration given that suitable habitat would not re-establish until after Project reclamation. The effect would be reversible in the far future following full reclamation and habitat regeneration.

The Project's effect on non-traditional fishing in the NTLU LSA is considered to be of negligible magnitude. While fishing opportunities are abundant in the NTLU LSA and RSA, lodges in the vicinity may be affected by changes in fish habitat in Lac du Sauvage, the Narrows, and Lac des Gras. Effects to these waterbodies, and associated fishing activities would be local to the waterbody itself, and would persist beyond closure into the long term. The effect would be reversible in the far future, following full reclamation and habitat regeneration.

The effect of Project noise on hunting, fishing and other land-based tourism activities in the NTLU LSA is considered to be of low magnitude because, while few people are expected to use the area, those that do may find that the noise-altered wilderness character of the area around the mine detracts from their land use experience. The effect will be local to the area around the mine, and would exist for the duration of Project construction and operations, into the long term. The effect would be reversible following Project reclamation.

The Project's visual disturbance on the landscape could, as is the case with noise, affect the wilderness character for people hunting, fishing and pursuing other land-based tourism activities. However, few non-traditional land users are expected to be partaking in these activities around the Project. As a result, the magnitude of the effect of Project-related visual disturbances is assessed as low. The effect would be local to the NTLU LSA, and would persist indefinitely into the long term following reclamation. Given that waste rock piles would likely alter the landscape permanently, this effect is not considered reversible.

Given the limited nature of NTLU in the area around the Project, and the negligible to low magnitude of the Project's effects, the overall Project effect on NTLU is assessed as **not significant** (Table 14.8-2).



**Table 14.8-2 Summary of Residual Impact Classification of Primary Pathways and Predicted Significance of Effects on Non-Traditional Land Use**

Pathway	Magnitude	Geographic Extent	Duration	Reversibility	Significance for Assessment Endpoint
The Project may affect the availability of wildlife for hunting in the LSA	Negligible	Local	Long Term	Reversible following Reclamation	<i>Not Significant</i>
The Project may affect the availability of fish for fishing in the LSA	Negligible	Local	Long Term	Reversible following Reclamation	
Project-related noise may have an effect on hunting, fishing and land-based tourism in the LSA	Low	Local	Long Term	Reversible following Reclamation	
Project-related visual effects may have an effect on hunting, fishing and land-based tourism in the LSA	Low	Local	Long Term	Not Reversible	

## 14.9 Summary and Conclusions

Overall, it is expected that the Project will have a net-positive effect on the socio-economic environment in the NWT, and LSA communities, maximizing economic, employment and educational benefits, while minimizing potential negative impacts on well-being, physical infrastructure and NTLU.

The Project will extend the life of the Ekati Mine by 11 years<sup>18</sup>, and will provide employment during construction and operations similar to the current mine. The Project will not result in an abundance of new positions, and so will not encourage migration to the NWT from southern communities. Instead, the Project will prevent migration out of the NWT by workers who would otherwise lose mining employment when the existing Ekati Mine closes in 2019. After 2019, migration out of the NWT will still occur as the Diavik, Snap Lake and the proposed Gahcho Kué mines close over the course of the next two decades. The Project will, however, soften the effect of this out migration.

The Project will pay taxes to the NWT, and will contribute to the territory's economy, softening the effect of the decline of the mining industry on capital expenditures and GDP. The Project will continue to use local business wherever possible, and will maintain community contributions through the Ekati Mine's existing Impact Benefit Agreements. The Project is not expected to result in increased prices of goods in communities. As with its effect on migration, the Project will act to soften the overall negative economic effect of the closure of the Diavik, Snap Lake and Gahcho Kué mines over the next two decades.

<sup>18</sup> Including some carry over operations activities during closure.



The Project will provide employment and incomes similar to those paid at the existing Ekati Mine. Dominion Diamond will continue to hire northern workers for positions that come up at the mine during construction, and will move the existing Ekati Mine workforce to Project positions. The Project will maintain existing points of hire and fly points in communities, and will continue to work towards meeting hiring targets identified in IBA and the Socio-Economic Agreement with the Government of the Northwest Territories. The Project is expected to soften the impact of the decline of the mining industry on labour force characteristics, prolonging spikes in unemployment, and will maintain labour incomes at levels similar to the current environment.

The Project is expected to continue some level of demand for a trained labour force, and will maintain community education contributions to IBA communities. On the job Project training and apprenticeship programs will continue to build capacity in the NWT labour force, maximizing the ability of trained workers to transition to other employment opportunities as the mining industry wanes over the next two decades.

It is difficult to correlate health and well-being characteristics with mining activity. It is similarly difficult to provide meaningful predictions regarding the effects of the Project on health and well-being. Many pathways of effect are dependent on the personal choices made by individuals in response to Project-related variables such as labour income and rotational work. In general, the Project will maintain existing employment, incomes, rotation schedules, and health and safety training and programs so is expected to continue the existing health and well-being trends associated with workers, rather than create new issues or effects.

Given that the Project is not expected to result in migration to the NWT from the south, it will not cause additional demand for public services and infrastructure, or change commercial land use in the area. Some direct Project demand will be placed on existing infrastructure, namely waste disposal and transportation. The Project will continue to provide funding (i.e., taxes and fees) and demand for existing services and infrastructure, and will partially offset the effect of the closure of the other NWT diamond mines over the next two decades. Some alterations to wilderness character via Project-generated noise and visual disturbances may affect land users in the immediate vicinity of the mine, however these users are expected to be few, and to have abundant other land areas to use.

Table 14.10-1 provides a summary overview of the Project's residual effects on socio-economic VCs. Overall, the Project is expected to have a significant, positive effect on population demographics, the economy, employment and incomes and education that extends into the long term for the duration of Project operations. The Project will have both positive and negative effects on health and well-being in the NWT and LSA communities, but this effect will be of negligible to low magnitude given its nature (i.e., an overall continuation of existing conditions, rather than an additive increase). Project effects on health and well-being are not considered significant. The Project's effect on physical infrastructure is expected to be neutral, given that it will use existing infrastructure designed to accommodate the current volume of mining activity in the NWT, and because the Project will pay all applicable fees used for the upkeep of this infrastructure. The effect on infrastructure is of negligible to low magnitude, and is not assessed as significant. The Project will have minimal effect on NTLU in the vicinity of the mine, and will not act to change the existing wilderness character in the NTLU RSA. As a result, Project effects on NTLU are not considered significant.



**Table 14.10-1 Summary of Overall Residual Impact Classification and Predicted Significance of Effects on Socio-Economic Valued Components**

<b>Valued Component</b>	<b>Magnitude</b>	<b>Geographic Extent</b>	<b>Duration</b>	<b>Reversibility</b>	<b>Significance for Assessment Endpoint</b>
Population Demographics	low to high	local to regional	long-term	irreversible	<i>significant</i>
Economy	moderate to high	regional	long-term	n/a	<i>significant</i>
Employment and Incomes	moderate to high	local to regional	long-term	n/a	<i>significant</i>
Education and Training	low to moderate	local to regional	long-term	n/a	<i>significant</i>
Health and Well-being	negligible to low	local to regional	long-term	n/a	<i>not significant</i>
Physical Infrastructure	negligible to low	local to regional	medium to long-term	reversible	<i>not significant</i>
Non-Traditional Land Use	negligible to low	local	long-term	reversible	<i>not significant</i>

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## 14.11 Glossary

Term	Description
Aboriginal	The descendants of the original inhabitants of North America. The Canadian Constitution recognizes three groups of Aboriginal people: Indians (First Nations), Métis and Inuit (Constitution Act 1982).
Baseline	A surveyed or predicted condition that serves as a reference point to which later surveys are coordinated or correlated.
Capital consumption allowances	The amount of money a country has to spend each year to maintain its present level of economic production. The capital consumption allowance (CCA) is calculated as a percentage of gross domestic product (GDP).
Capital financing	Using existing capital to fund an endeavour.
Census sub-division	The general term for municipalities (as determined by provincial/territorial legislation) or areas treated as municipal equivalents for statistical purposes (e.g., Indian reserves, Indian settlements and unorganized territories).
Chained dollars	Chained dollars is a method of adjusting real dollar amounts for inflation over time, so as to allow comparison of figures from different years.
Consumer Price Index	An indicator of changes in consumer prices experienced by Canadians. It is obtained by comparing, over time, the cost of a fixed basket of goods and services purchased by consumers.
Country Food	Dietary items from the local region, which are used for sustenance. Country food items include: fruit, vegetables, herbs, medicinal plants, fish and game.
CSR (Corporate Social Responsibility) Programs	Corporate initiatives to assess and take responsibility for the company's effects on the environment and impact on social welfare.
Deflation	A general decline in prices, often caused by a reduction in the supply of money or credit. Deflation can be caused also by a decrease in government, personal or investment spending.
Demographics	The study of changes (such as the number of births, deaths, marriages, and illnesses) that occur over a period of time in human populations.
Diavik Diamond Mine	A diamond mine located on East Island in Lac de Gras, approximately 30 km southeast of the Ekati main camp and 10 km southwest of the Misery Pit.
Direct jobs/positions/employment	Employment positions directly associated with an operation.
Employment rate	The number of persons employed in the week, before Census Day, expressed as a percentage of the total population 15 years of age and over.
Feasibility Studies	An evaluation and analysis of the potential of a proposed project, which is based on extensive investigation and research to support the process of decision making.
Final Domestic Demand (FDD)	Includes the activities of consumers, government and industry and excludes exports.
Footprint	The proposed development area that directly affects the soil and vegetation components of the landscape.
Full Time Equivalent (FTE)	A unit to measure employment in a manner that makes employment by number of hours comparable.
Gross Domestic Product (GDP)	Measures the value added to all goods and services produced in the economy, and is calculated by summing labour income, mixed income, the cost of depreciation, profits, and indirect taxes less subsidies levied on production.
GDP multiplier	A factor determining how much GDP increases as autonomous expenditures increase.
Impact Benefit Agreement (IBA)	A formal contract outlining the impacts of the project, the commitment and responsibilities of both parties, and how the associated Aboriginal community will share in benefits of the operation through employment and economic development.
Implicit Price Index (IPI)	Measure of inflation, calculated by finding the difference between GDP and real GDP
Import	A good or service brought into one country from another.
Income	Money that an individual or business receives in exchange for providing a good or service or through investing capital.



Term	Description
Inflation	The rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling.
Indirect jobs/positions/employment	Employment positions not directly associated with an operation, but created by other businesses that come into existence due to the economic growth of an operation.
Inflation	The rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling.
In-migration	To move into or come to live in a region or community especially as part of a large-scale and continuing movement of population.
Interprovincial migration	Sum of all movements from one province or territory to another, involving a change in the usual place of residence.
Labour force	Number constituting the total unemployed and unemployed, where the employed are persons having a job or business, and the unemployed are without work, are available for work, and are actively seeking work.
Labour income	Income derived from wage labour employment.
Local study area (LSA)	Defines the spatial extent directly or indirectly affected by the project.
Out-migration	To leave one region or community to settle in another especially as part of a large-scale and continuing movement of population.
Participation rate	Total portion of the labour force aged 15 years of age and over employed.
Person-Years	A person-year of employment is equivalent to 2,000 hours of labour per year.
points of hire and fly points	Communities from which workers will be picked up and transported to the mine site.
Procurement	The acquisition of goods, services or works from an outside external source.
Public Sector	Includes educational services, health care, and social assistance, and all levels (local, territorial, federal, and Aboriginal) of public administration.
Real GDP	An inflation-adjusted measure that reflects the value of all goods and services produced in a given year, expressed in base-year prices.
Recession	A significant decline in activity across the economy, lasting longer than a few months. It is visible in industrial production, employment, real income and wholesale-retail trade.
Regional study area (RSA)	Represents the area of study for the assessment of cumulative (combined) effects of the Project and other past, existing or planned developments.
Rural LSA Community	LSA communities excluding Yellowknife.
Self-reliance	Reliance on one's own efforts to achieve quality of life goals.
Small LSA Communities	Seven LSA communities in closest proximity to the mines, excluding Yellowknife, Kugluktuk, Bathurst Inlet and Umingmaktok.
Terms of Reference (TOR)	The Terms of Reference identify the information required by government agencies for an Environmental Assessment (EA).
Traditional Knowledge (TK)	Knowledge systems embedded in the cultural traditions of regional, indigenous, or local communities. It includes types of knowledge about traditional technologies, the environment and ecology.
Traditional Land Use (TLU)	Use of the land by Aboriginal groups for harvesting traditional resources such as wildlife, fish or plants, or for cultural purposes such as ceremonies or camping.
Treeline	The point (or imaginary line) beyond which tree growth dwindles.
Unemployment rate	The percentage of the total labor force that is unemployed but actively seeking employment and willing to work.
Valued component (VC)	Valued components represent biophysical, economic, social, heritage and health properties of the environment that are considered to be important by society.
Waterbody	An area of water such as a river, stream, lake or sea.
Watercourse	Riverine systems such as creeks, brooks, streams and rivers.
Watershed	The entire surface drainage area that contributes water to a lake or river.
Winter road	Roads, which are built over frozen lakes and tundra. Compacted snow and/or ice is used for embankment construction.