

## 8.12 LAND AND RESOURCE USE

Land and Resource Use as a valued environmental component (VEC) includes current and future proposed occupation, and public and private use, of the lands and resources within and adjacent to the Project. Land and Resource Use was selected as a VEC because of the potential for interactions between the Project and the use of the land and resources in the Project Development Area (PDA, Figure 1.2.1) and their intrinsic value for recreation, sustenance, industry, economic development, and other purposes. Environmental effects on Land and Resource Use can be felt in the day-to-day lives of New Brunswick residents. The Project is located on forested Crown land in a sparsely populated area that is currently primarily used for forest resource harvesting and recreation, among other uses. The focus of this VEC is on the central New Brunswick region and the rural communities in that region, and on the recreational campsite leases (some of which includes cabins) near the Project. Note that the Aboriginal use of land and resources in and around the PDA is addressed in Section 8.13 (Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons).

The potential of the Project to result in a change in Land and Resource Use is evaluated using several measurable parameters including the Project footprint, change in sound level, change in air quality, total area with changed viewshed, and change in property values. Emphasis is placed on the recreational use and enjoyment of land in and around the PDA.

The Project will change the primary land use within the PDA from primarily forestry to industrial mining. As the Project is located on Crown land and will result in substantive economic benefits to New Brunswick, this land use appears to be an acceptable use of Crown land according to the New Brunswick Department of Natural Resource's Crown Land Management Principles (NBDNR 2010). The Project will also result in a loss of recreational land use that occurs at the convenience of the Crown within the PDA. However, land in the surrounding areas has the capacity to accommodate any recreational land use that is displaced by the Project. As the closest permanent residence is approximately 10 km from the Project, localized sound and air emissions are unlikely to result in nuisance-related environmental effects. Recreational cabins are located approximately 1.5 km to the east of the open pit location. However, nuisance environmental effects on recreational cabins and other human uses of the land and resources in the area as a result of air contaminant and sound emissions are not expected to be substantive.

Project components like the open pit and tailings storage facility (TSF) may alter the nature of the local viewshed substantively compared to its current condition, but residual environmental effects will be low in magnitude as the Project will only be visible from a small number of local receptors, and will not be visible from the nearby recreational campsites or from any permanent residence. The environmental effect on property values due to the Project is also expected to be low in magnitude and localized; although actual changes to property values are difficult to predict because of the multiple contributing factors such as local market conditions, economic conditions, and the social and cultural context.

With mitigation, including communication with Crown timber license holders, maintenance of vegetated buffers, and communication with recreational campsite lease holders, the residual environmental effects of the Project on Land and Resource Use have been rated not significant.

### **8.12.1 Scope of Assessment**

This section defines the scope of the environmental impact assessment (EIA) of Land and Resource Use in consideration of the nature of the regulatory setting, issues identified during public and stakeholder engagement activities, potential Project-VEC interactions, and existing knowledge. The influence of Aboriginal engagement activities on the scope of the EIA is addressed in Section 8.13 (Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons).

#### **8.12.1.1 Rationale for Selection of Valued Environmental Component, Regulatory Context, and Issues Raised During Engagement**

Land and Resource Use was selected as a VEC to assess the interaction between the Project and current and future proposed occupation, and public and private enjoyment, of the land and resources within and adjacent to the Project. Land and Resource Use in an area play an important role in shaping nearby communities and can affect the day-to-day quality of life of residents. As such, the potential environmental effects of the Project on Land and Resource Use is a public concern, particularly considering the potential for changes to economic drivers in the area, outdoor recreational use and enjoyment of the land, changes to the visual character of the area, and changes to local property values.

The Final Guidelines (NBENV 2009) and the Terms of Reference for the Project (Stantec 2012a) require an assessment of the potential environmental effects on the current and future proposed use of land and resources by the public and private sectors. In particular, these required that consideration must be given to existing outdoor recreational activities, residential property values, and visual aesthetics.

There were relatively few public concerns raised in relation to Land and Resource Use during engagement activities conducted for the Project; issues raised included most notably the potential loss of access to land in the PDA and surroundings for recreational purposes, and the ability to continue to enjoy the use of provincial campsite leases in relatively close proximity to the Project. The perceived industrialization of what largely consists of rural land, and attendant changes to Land and Resource Use as a result of that industrial development, was also noted by several members of the public during engagement activities carried out in support of the Project.

Some members of the public also expressed concern that the Project would be prominently visible from the nearby recreational campsites and from Crabbe Mountain (a local ski hill). The nearby recreational campsites are included in the viewshed analysis. To further address concerns, the view from Crabbe Mountain was modelled from the top of the mountain during the last year of Operation, when the open pit and TSF will be the largest.

### 8.12.1.2 Selection of Environmental Effect and Measurable Parameters

The Project site is on rural provincial Crown land near the communities of Napadogan, Juniper, Stanley, and Millville, and construction of a new transmission line to service the Project will widen an existing linear corridor between the Project and an existing terminal in Keswick. Development of these areas will result in reduced land access. Use of the land for recreational purposes (e.g., hunting, trapping, fishing, all-terrain vehicle (ATV) and snowmobile use, and trail development) may be altered in the immediate vicinity of the Project.

Construction and Operation of the Project may cause nuisance environmental effects such as increases in sound and dust levels in the area, thereby potentially affecting the enjoyment and use of residential and recreational properties in the area. The visual environment near the Project may also be affected, as the addition of Project facilities may alter the visual environment from certain vantage points. These nuisance environmental effects and change in viewsapes may also affect residential property values relative to other areas of central New Brunswick.

Accordingly, the environmental effects assessment of Land and Resource Use is focused on the following environmental effect:

- Change in Land and Resource Use.

The measurable parameters used for the assessment of a Change in Land and Resource Use and the rationale for their selection is provided in Table 8.12.1.

**Table 8.12.1 Measurable Parameters for Land and Resource Use**

Environmental Effect	Measurable Parameter	Rationale for Selection of the Measurable Parameter
Change in Land and Resource Use	Project Footprint (ha)	<ul style="list-style-type: none"> <li>• Provides a measure of the direct environmental effects of a change in Land and Resource Use on current recreational use of the land.</li> </ul>
	Change in Property Values (\$)	<ul style="list-style-type: none"> <li>• Used as an indicator of the extent of the environmental effects on the use and enjoyment of properties.</li> </ul>
	Total Area with Changed Viewshed (ha)	<ul style="list-style-type: none"> <li>• The Project's components and facilities will be visible from a variety of areas, altering the nature of the viewshed.</li> </ul>
	Change in Sound Level (dBA)	<ul style="list-style-type: none"> <li>• Sound generated from Project facilities may contribute to nuisance experienced by residential and recreational campsite owners, and other recreational land users.</li> </ul>
	Change in Air Quality ( $\mu\text{g}/\text{m}^3$ of particulate matter)	<ul style="list-style-type: none"> <li>• Dust generated from the Project, as well as other air emissions, may contribute to nuisance experienced by residential and recreational campsite owners, and other recreational land users.</li> </ul>

### 8.12.1.3 Temporal Boundaries

The temporal boundaries for the assessment of the potential environmental effects of the Project on Land and Resource Use include the three phases of Construction, Operation, and Decommissioning, Reclamation and Closure of the Project as defined in Chapter 3.

#### 8.12.1.4 Spatial Boundaries

The spatial boundaries for the environmental effects assessment of Land and Resource Use are defined below.

**Project Development Area (PDA):** The PDA (Figure 8.12.1) is the most basic and immediate area of the Project, and consists of the area of physical disturbance associated with the Construction and Operation of the Project. Specifically, the PDA consists of an area of approximately 1,253 hectares that includes: the open pit; ore processing plant; storage areas; TSF; quarry; the relocated Fire Road and new Project site access road; and new and relocated power transmission lines. The PDA is the area represented by the physical Project footprint as detailed in Chapter 3.

**Local Assessment Area (LAA):** The LAA is the maximum area within which Project-related environmental effects can be predicted or measured with a reasonable degree of accuracy and confidence. For this VEC, the LAA includes the PDA and adjacent areas, including nearby recreational campsite leases and communities surrounding the PDA (*i.e.*, Napadogan, Juniper, Stanley, and Millville) where Project-related environmental effects may reasonably occur (Figure 8.12.1).

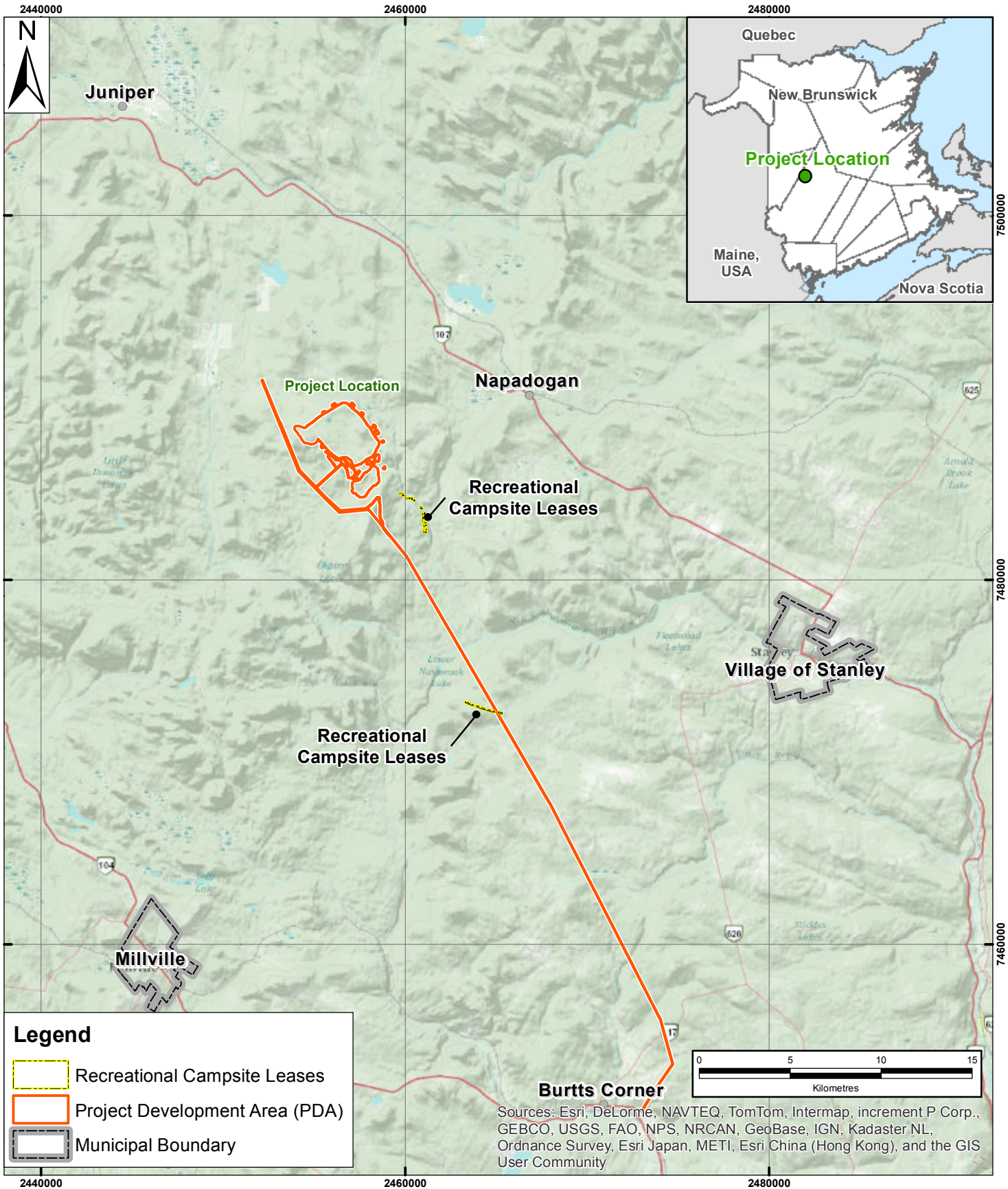
**Regional Assessment Area (RAA):** The RAA is the area within which the Project's environmental effects may overlap or accumulate with the environmental effects of other projects or activities that have been or will be carried out. The extent to which cumulative environmental effects for Land and Resource Use may occur depend on physical and biological conditions and the type and location of other past, present, or reasonably foreseeable future projects or activities that have been or will be carried out, as defined within the RAA. For this VEC, the RAA is limited to and includes the central New Brunswick region (Figure 8.12.2).

#### 8.12.1.5 Administrative and Technical Boundaries

In terms of administrative boundaries, the Project is not located within the boundaries of an incorporated municipality or a Local Service District (LSD). Private land in the LAA is administered by the New Brunswick *Community Planning Act*, under the jurisdiction of the Rural Planning District Commission (RPDC) which is responsible for development and planning services for unincorporated private lands. There is currently no rural plan in place for the LAA.


Crown land in the LAA falls under the *Crown Lands and Forests Act*, administered by the New Brunswick Department of Natural Resources (NBDNR). The Act regulates the development, use, protection and management of the resources of Crown lands in New Brunswick. NBDNR issues dispositions for Crown lands including leases and licences of occupation. Most Crown land leases including camp lot leases cover a period of 10 years, while commercial, communication, and industrial leases are extended to cover a 20-year period. All Crown land lease holders must pay annual rent and property tax as a condition of the lease. Provincial camp lot leases must be within a NBDNR designated camp lot cluster (*i.e.*, minimum of four leases with shared boundaries) or group (*i.e.*, minimum of four leases with no shared boundaries) (NBDNR 2012a).





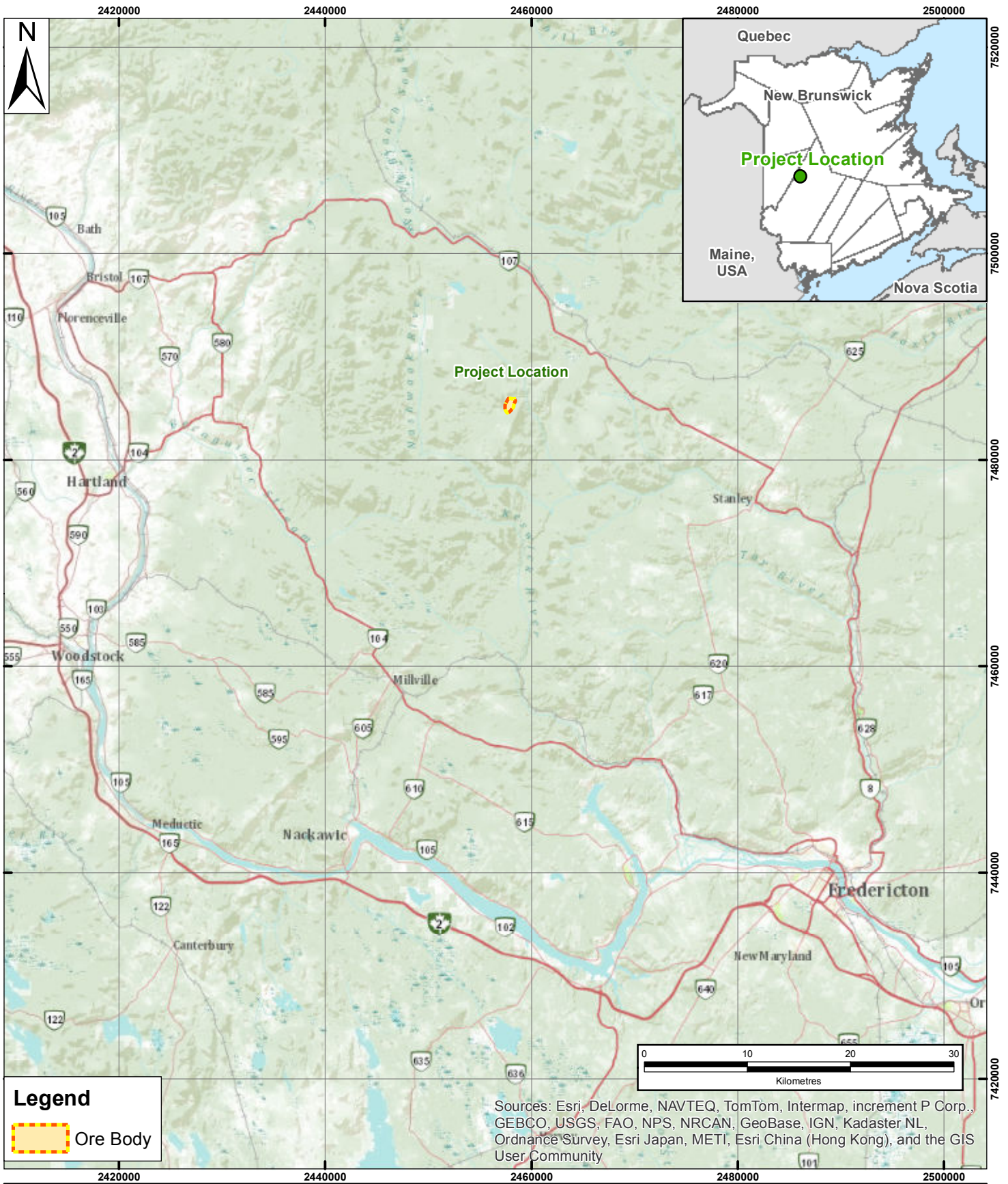
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NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<b>Project Development Area (PDA), and Local Assessment Area (LAA) for Land and Resource Use</b> Sisson Project: Environmental Impact Assessment (EIA) Report, Napadogan, N.B. Client: Northcliff Resources Ltd.		Scale: 1:285,000	Project No.: 121810356	Data Sources: SNB NRCAN, ESRI	Fig. No.: 8.12.1	 <b>Stantec</b>
		Date: (dd/mm/yyyy) 08/03/2013	Dwn. By: JAB	Appd. By: DLM		








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**Legend**

 Ore Body

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<b>Regional Assessment Area (RAA) for Land and Resource Use</b>  Sisson Project: Environmental Impact Assessment (EIA) Report, Napadogan, N.B.		Scale:	Project No.:	Data Sources:	Fig. No.:	 <b>Stantec</b>
		1:500,000	121810356	SNB NRCAN, ESRI	8.12.2	
Client:	Northcliff Resources Ltd.	Date: (dd/mm/yyyy)	Dwn. By:	Appd. By:		
		05/03/2013	JAB	DLM		





There are several technical boundaries for Land and Resource Use. The value of a residential property can be affected by many complex and interconnected factors. It is challenging to determine the environmental effect of a single factor on residential property value, or to attribute a change in residential property value to a single event or activity. The complexity of this determination creates a technical boundary to predicting the environmental effect of the Project on property value. Technical boundaries are also present in nuisance predictions, as individual perception creates high variability and subjectivity in what is considered a nuisance, causing difficulty in predicting the nuisance level of Project activities. The results of air and sound modelling are used to describe nuisance environmental effects of Project activities. As such, the technical boundaries of this modelling, as described in Section 8.2 and 8.3, also apply to the Land and Resource Use VEC. Modelling is required to predict the potential environmental effects of the Project on the local viewshed. The inherent uncertainties in the model present technical boundaries.

#### **8.12.1.6 Residual Environmental Effects Significance Criteria**

A significant adverse residual environmental effect on Land and Resource Use is one where the proposed use of land for the Project and related facilities is not compatible with adjacent land use activities as designated through a regulatory land use process, and/or the proposed use of the land will create a change or disruption that widely restricts or degrades present land uses to a point where the activities cannot continue at current levels and for which the environmental effects are not mitigated or compensated.

#### **8.12.2 Existing Conditions**

Existing conditions were compiled from a variety of sources including existing maps, aerial photography, and as was summarized in Section 4.3.1.1.1, consultation with the general public, recreation groups and forestry businesses.

The land in the PDA and adjacent areas is forested Crown land, with the exception of portions of the proposed new 138 kV transmission line that are private. The new 138 kV transmission line from the Keswick Terminal parallels an existing right of way for a 345 kV transmission line. The installation of the transmission line will widen the existing corridor by 25 m. At the southern end of the line, near Burtts Corner, a small portion of the line follows the property boundaries of 17 private land parcels. Easement or some other mutually agreeable land tenure agreement will be obtained from these private land owners by NB Power to allow for the construction and operation of the transmission line.

The mine site portion of the PDA is located entirely on Crown land which is routinely used by the forestry industry. The PDA is located within two Crown timber licenses, licenses No. 8 and 9. Adjacent areas in the LAA are sparsely populated. Napadogan is the closest community, located along Route 107, approximately 10 km away from the PDA. It is a rural community with several houses and a veneer mill. The PDA falls within Douglas Parish; Stanley and Aberdeen Parishes are adjacent. The closest communities to the PDA are Juniper and Napadogan, and the villages of Millville and Stanley. The largest major city in the RAA is Fredericton, approximately 60 km directly south of the PDA.

Statistics for Napadogan and Juniper are reported by Statistics Canada by the parishes in which they are located. Napadogan, along with Burtts Corner, is included in the statistics for Douglas Parish, and Juniper is included in the statistics for Aberdeen parish. According to Statistics Canada, the total

population in Stanley, Millville, Aberdeen Parish, and Douglas Parish is approximately 8,855. Residential land use in the LAA consists primarily of single-unit family residential dwellings. Many of the dwellings are located in Stanley, Millville, and Juniper, which are located approximately 23 km to the southeast, 25 km to the southwest, and 20 km to the northwest of the mine, respectively. In these three communities and the surrounding areas, there are approximately 1,230 occupied residential dwellings; 720 in Stanley Parish, 115 in Millville, and 395 in Juniper/Aberdeen Parish (Statistics Canada 2007a, e, f). The PDA contains no permanent residences.

Home ownership in the parishes of Stanley, Douglas, and Aberdeen averages 88%. This level of ownership is relatively high compared to the remainder of the province. On average 94% of all dwellings in the area are single detached homes with average value ranging from \$74,530 in Millville (Statistics Canada 2007f) to \$137,827 in Douglas Parish, which is 14% above the provincial average, likely due to portions proximal to the city of Fredericton (Statistics Canada 2007a). Average rent ranges from \$470/month in Aberdeen Parish (Statistics Canada 2007e) to \$601/month in Douglas Parish (Statistics Canada 2007a).

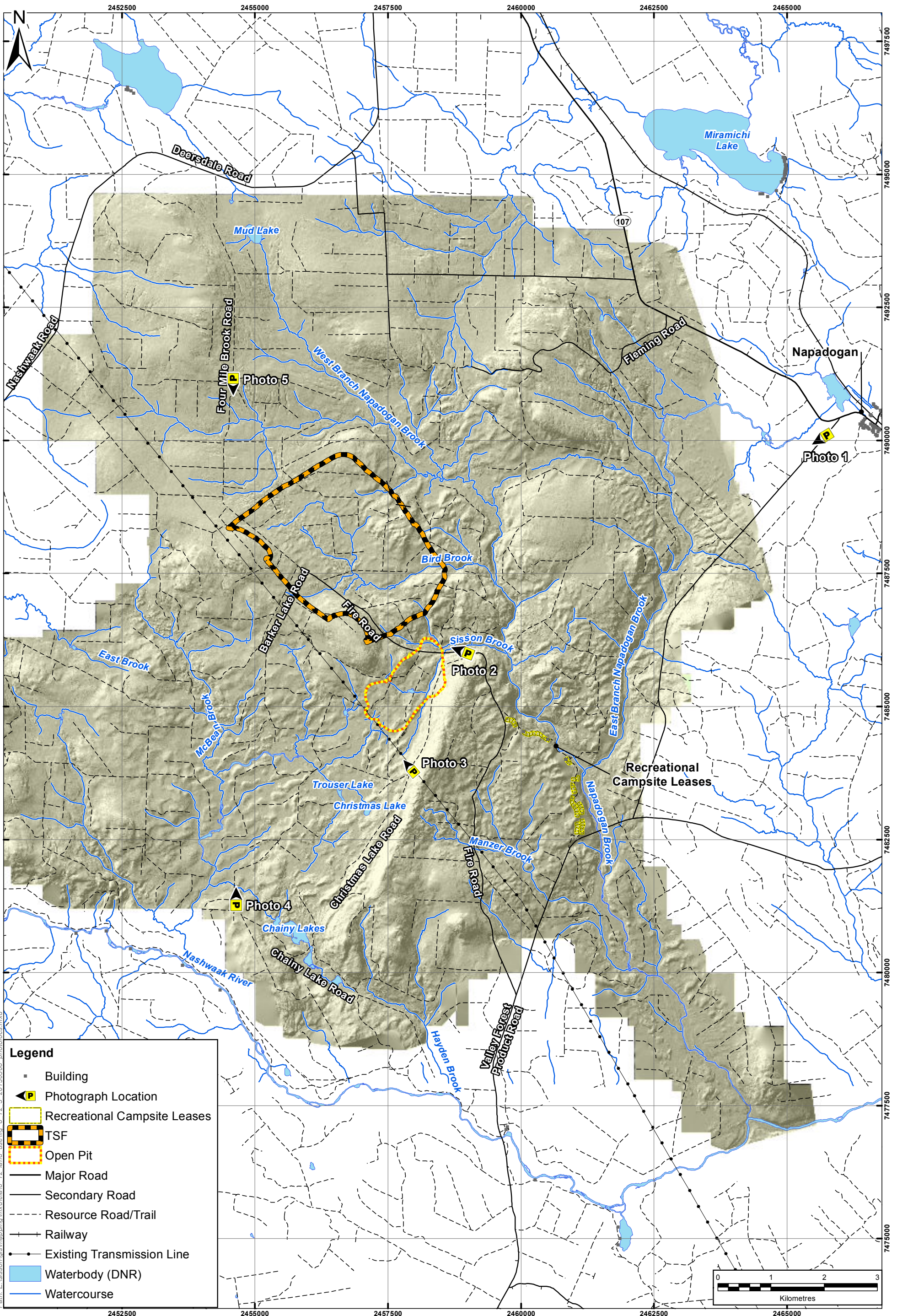
In 2006 the number of private dwellings occupied by residents in Fredericton totaled 22,120, of which 61% were owned and 39% rented. The average value of an owned dwelling in Fredericton was \$169,468 in 2006 and average monthly rent was \$709 (Statistics Canada 2007d). Levels of ownership were lower than average in the province, which may relate to the fact that the cost of living is generally higher than the rest of the province, and housing affordability is lower in cities than elsewhere in the province.

MLS sales in Fredericton during the first three quarters of 2011 were slightly higher than during the same period in 2010. This is not expected to continue in 2012 because of decreased demand for existing homes, particularly in the higher price ranges. Despite the weakening demand, house prices were predicted to increase modestly with the average MLS sale price expected to reach \$172,000 by the end of 2011 and to increase slightly in 2012 to \$175,000 (CMHC 2011c).

There are approximately 39 recreational Crown campsite leases, some of which include cabins, in the vicinity of the mine. The closest recreational campsite to the mine is located approximately 1.5 km to the east of the location of the open pit, on the other side of a topographical ridge (Nashwaak Ridge) separating the Project from these campsite locations. These campsites are not serviced by the New Brunswick electrical grid, and are used at any time during the year. A second cluster of NBDNR recreational campsite leases is located near the PDA on both sides of the Project's new 138 kV electrical transmission line, about 4 km south of the Nashwaak River. Crown campsite leases in the vicinity of the PDA are shown in Figure 8.12.1.

Commercial land and resource use within the LAA consists primarily of forestry-related activities such as timber harvesting on Crown land. There are also several outfitting and guiding businesses offering services during the hunting season within and surrounding the LAA. There is a small amount of commercial activity that includes cabins available for short- and long-term rental, convenience stores, and several restaurants, none of which are located in the PDA.





**Legend**

- Building
- Ⓟ Photograph Location
- ▭ Recreational Campsite Leases
- ▭ Trench Slope Footprint (TSF)
- ▭ Open Pit
- Major Road
- Secondary Road
- - - Resource Road/Trail
- Railway
- Existing Transmission Line
- Waterbody (DNR)
- Watercourse

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<p><b>Location and Direction of Photographs of the PDA</b></p> <p>Sisson Project: Environmental Impact Assessment (EIA) Report, Napadogan, N.B.</p>				<p>Scale: 1:65,000</p>	<p>Project No.: 121810356</p>	<p>Data Sources: NBDNR</p>	<p>Fig. No.: 8.12.3</p>	<p><b>Stantec</b></p>
<p>Client: Northcliff Resources Ltd.</p>				<p>Date: (dd/mm/yyyy) 08/03/2013</p>	<p>Dwn. By: JAB</p>	<p>Appd. By: DLM</p>		







Industrial land use in the LAA, though outside of the PDA, is limited to the Napadogan veneer mill. The Deersdale Sawmill and Juniper Lumbermill recently ceased operation.

Evidence of recreational land use is present throughout much of the LAA. There are no municipal, provincial or federal parks or other designated recreational areas within the LAA. However, forestry roads and trails are used informally for snowmobiling, ATV use, hiking, and other recreational and resource use activities, although there are no formally managed, groomed trails. Recreational fishing occurs seasonally on various watercourses within the LAA.

The LAA is used for hunting during hunting seasons. Trapping also occurs in the vicinity of the Project. The hunters and trappers using the LAA generally are residents of the surrounding communities, though some tourists also use the area, especially through the services of local guides and outfitters.

A variety of photographs were taken of the PDA from various vantage points. Figure 8.12.3 shows the location and direction from which these photographs were taken, and the photographs are shown in Figures 8.12.4 through 8.12.8.

Views of the PDA are primarily limited to wooded scenes, with evidence of forestry activity. Vantage points from which the PDA is visible are relatively uncommon, with many consisting of cleared right of ways for roads or transmission lines. Figures 8.12.4 and 8.12.5 show recent clear cuts, but despite the lack of mature trees, the longer view is obscured by topography and vegetation beyond the foreground. Figures 8.12.6, 8.12.7 and 8.12.8 are typical forest-obscured views facilitated by man-made right-of-ways that provide some of the few more distant glimpses of regional viewsheds.



**Figure 8.12.4**      **Photograph Looking West Toward PDA from Napadogan  
(Photo 1 in Figure 8.12.3)**



**Figure 8.12.5**      **Photograph Taken Within PDA, Looking Northwest Toward Future Location of TSF (Photo 2 in Figure 8.12.3)**



**Figure 8.12.6**      **Photograph Taken Along Existing 345 kV Electrical Transmission Line, Looking Northwest Toward the PDA (Photo 3 in Figure 8.12.3)**





**Figure 8.12.7** Photograph Taken from Chainy Lakes Road, Looking North Toward the PDA (Photo 4 in Figure 8.12.3)



**Figure 8.12.8** Photograph Taken Along Four Mile Brook Road, Looking South Toward the TSF (Photo 5 in Figure 8.12.3)

Existing conditions with respect to air quality and sound quality, important factors related to Land and Resource Use, are described in Sections 8.2.2 and 8.3.2.

### **8.12.3 Potential Project-VEC Interactions**

Table 8.12.2 below lists each Project activity and physical work for the Project, and ranks each interaction as 0, 1, or 2 based on the level of interaction each activity or physical work will have with Land and Resource Use.

**Table 8.12.2 Potential Project Environmental Effects to Land and Resource Use**

Project Activities and Physical Works	Potential Environmental Effects
	Change in Land and Resource Use
<b>Construction</b>	
Site Preparation of Open Pit, TSF, and Buildings and Ancillary Facilities	2
Physical Construction and Installation of Project Facilities	2
Physical Construction of Transmission Lines and Associated Infrastructure	2
Physical Construction of Realigned Fire Road, New Site Access Road, and Internal Site Roads	2
Implementation of Fish Habitat Compensation Initiatives	1
Emissions and Wastes	1
Transportation	1
Employment and Expenditure	0
<b>Operation</b>	
Mining	2
Ore Processing	0
Mine Waste and Water Management	2
Linear Facilities Presence, Operation, and Maintenance	1
Emissions and Wastes	1
Transportation	1
Employment and Expenditure	0
<b>Decommissioning, Reclamation and Closure</b>	
Decommissioning	1
Reclamation	1
Closure	1
Post-Closure	1
Emissions and Wastes	1
Transportation	1
Employment and Expenditure	0
<b>Project-Related Environmental Effects</b>	
<b>Notes:</b>	
Project-Related Environmental Effects were ranked as follows:	
0 No substantive interaction. The environmental effects are rated not significant and are not considered further in this report.	
1 Interaction will occur. However, based on past experience and professional judgment, the interaction would not result in a significant environmental effect, even without mitigation, or the interaction would clearly not be significant due to application of codified practices and/or permit conditions. The environmental effects are rated not significant and are not considered further in this report.	
2 Interaction may, even with codified mitigation and/or permit conditions, result in a potentially significant environmental effect and/or is important to regulatory and/or public interest. Potential environmental effects are considered further and in more detail in the EA.	

The potential environmental effects of the activities ranked as 2 in Table 8.12.2 are considered further and in more detail following this section as they represent the greatest interaction of the Project with Land and Resource Use. These activities and physical works contribute most substantially to the direct environmental effects of changing the land and resource use to support the Project primarily during Construction but also during Operation as the TSF expands. Direct change in land and resource use in Construction is not considered again in Operation to avoid double-counting the environmental effects in Operation, except as noted, for the TSF ongoing expansion during Operation.

Use of land and resources for traditional purposes by Aboriginal persons is assessed separately in Section 8.13.



The interactions of Employment and Expenditure, and Ore Processing with Land and Resource Use are ranked as 0 in Table 8.12.2. During all phases of the Project, no interaction with the Project is expected from these activities and related physical works. Direct change in land and resource use due to the ore processing facility were already accounted for during Construction under the Site Preparation of Open Pit, TSF, and Buildings and Ancillary Facilities activities and physical works. During Operation there will be no substantive interaction between Ore Processing and Land and Resource Use, and consequently no significant environmental effects.

The Water Resources (Section 8.4), Aquatic Environment (Section 8.5), Terrestrial Environment (Section 8.6), and Vegetated Environment (Section 8.7) assessed the environmental effects of the Project on resources, including surface and groundwater, fish, animals, and plants. The assessment of each of these VECs concluded that the Project would not result in significant environmental effects on the VEC. As such, the availability and sustainability of resources in the general Project area will not be substantively affected by the Project, and these resources will continue to be available for use, whether by recreational campers, fishers, plant or timber harvesters, hunters, or trappers. Hence, the environmental effects of the Project on Land and Resource use, while they may occur, are clearly not significant and not considered further beyond this section.

The Implementation of Fish Habitat Compensation initiatives during Construction will temporarily restrict access to the compensation areas during construction activities for this initiative; however, once these activities are complete, areas of fish habitat will be created or improved, resulting in the ability for the fisheries resources in these expanded areas to be used for recreational fishing. Hence, the environmental effects related to this activity and physical works is ranked as 1 in Table 8.12.2 and is not considered further in this section. Related environmental effects on Land and Resource Use are not significant.

Emissions and Wastes during Construction that have the potential to interact with Land and Resource Use, including air and sound emissions, are ranked as 1 in Table 8.12.2. The assessment of the Atmospheric Environment (Section 8.2) predicted that during Construction, despite some exceedances of the ambient air quality objectives of some contaminant at certain receptors, the predicted ground-level concentrations will be well below the applicable objectives and standards at the nearest residences and campsites, and elsewhere most of the time. As discussed in Section 8.3, sound generated by Construction will not be audible at the recreational campsites nearest the Project, which are the closest noise sensitive receptor to the Project. Wastes will be managed on-site within the TSF, and non-mining wastes will be managed through conventional domestic waste disposal and recycling programs. Consequently, the environmental effects of the Project on Land and Resource Use due to Emissions and Wastes during Construction are not significant, and not considered further beyond this section.

Transportation during Construction is ranked as 1 in Table 8.12.2 as it will result in an increase in traffic on highways and forestry roads in the area as a result of Project-related traffic, and may cause land users to alter travel patterns. Traffic wait times are not expected to increase substantively and roads will be maintained to prevent unacceptable degradation in quality. Bussing will be provided to Construction workers, which will mitigate environmental effects as a result of transportation by lowering the total number of vehicles on Project access roads. The environmental effects of the Project on Transportation are rated not significant as described in Section 8.15. Emissions related to Transportation (contaminants and sound) are assessed in Section 8.2 and Section 8.3, and as noted

above are not significant, nor a major concern for Land and Resource Use. Transportation is not considered beyond this section. The environmental effects of Transportation on Land and Resource Use are not significant.

The presence of linear facilities during Operation is ranked as 1 in Table 8.12.2 as it may result in the use of these new right-of-ways as a travel corridor by off-road vehicle, snowmobile, and ATV users. This is expected to primarily be prevalent along the new 138 kV electrical transmission line, given its length. However, as the new electrical transmission line will be parallel to an existing electrical line transmission line, such traffic is likely already present in the area, and as the Project will not create a new right of way but rather expand an existing one, overall recreational traffic levels would not be expected to increase. The environmental effects of the presence, operation and maintenance of these facilities will be not significant.

Emissions and Wastes during Operation will include air from equipment operation and fugitive dust, and sound emissions will include sound from equipment and blasting events that are ranked as 1 in Table 8.12.2. As discussed in Section 8.2, no exceedances of the ambient air quality objectives are predicted at nearby residences or recreational campsites during Operation, or elsewhere most of the time. Particulate matter ground-level concentration predictions are below the applicable objectives and standards at the nearest residences and recreational campsites, and thus similarly not significant on Land and Resource Use. With the exception of blasting events which may be audible at the nearest recreational cabins, sound from the Project will not be distinguishable over background sound levels at the nearest receptors. As discussed in Section 8.3, blasting noise is very brief (approximately 2 seconds at a time), and will occur approximately every second day. However, due to the infrequent and very short-term nature of blasting noise, annoyance will be low. Communication of blast times to camp owners will provide advance warning and minimize annoyance. Sound pressure levels at the nearest residential receptor in Napadogan during a blasting event will be difficult to notice over background sounds. Vibration from blasting events is expected to be noticeable at the nearest recreational campsites, but well below the significance criterion (*i.e.*, PPVs will be less than a quarter of the significance criterion) and environmental effects are thus similarly not significant on Land and Resource Use.

Transportation during Operation is ranked as 1 in Table 8.12.2 as Project-related traffic during Operation will include trucking of materials and products to and from the PDA, maintenance vehicles, and passenger vehicles driven to and from the PDA by Project workers. The primary and secondary site access routes (see Section 8.15) are currently forestry roads used primarily by logging trucks. Traffic volumes along the primary and secondary access routes will increase over current levels. Mitigation measures, as described in Section 8.15, will minimize additional traffic safety risks, and the access routes will be maintained to higher levels than they are currently to allow for this increase in truck and passenger vehicle traffic. These improved forest roads will result in a positive interaction with Land and Resource Use as it will allow for better and easier access to the LAA, including the recreational cabins. Overall, the environmental effects of Transportation activities on Land and Resource Use are not significant.

Project activities and physical works during Decommissioning, Reclamation and Closure are ranked as 1 in Table 8.12.2 as the PDA is rehabilitated and access to certain parts of the PDA is restored. The conceptual reclamation and closure plan was developed in consideration of end land use goals, thus reclamation will ameliorate conditions in the PDA for land and resource users. Decommissioning,

Reclamation and Closure is therefore expected to result in a positive interaction with Land and Resource Use relative to the adverse environmental effects of preceding Project phases. As the PDA is reclaimed, facilities are removed, areas are re-vegetated, and the pit fill with water to form a lake, the visual environment will become more natural in appearance in some places, though TSF embankments will become a permanent feature of the landscape. Additional positive interactions between Decommissioning, Reclamation and Closure and Land and Resource Use include the reduction in air and sound emissions as traffic and equipment operation decrease and blasting ceases, and the reduction in Project-related traffic along Project access roads. Overall, the environmental effects of Decommissioning, Reclamation and Closure are rated not significant and not considered further beyond this section.

Thus, in consideration of the nature of the interactions and the planned implementation of known and proven mitigation, the potential environmental effects of all Project activities and physical works that were ranked as 0 or 1 in Table 8.12.2, including cumulative environmental effects, on Land and Resource Use during any phase of the Project are rated not significant.

#### **8.12.4 Assessment of Project-Related Environmental Effects**

A summary of the environmental effects assessment and prediction of residual environmental effects resulting from interactions ranked as 2 on Land and Resource Use is provided in Table 8.12.3.

**Table 8.12.3 Summary of Residual Project-Related Environmental Effects on Land and Resource Use**

Potential Residual Project-Related Environmental Effects	Project Phases, Activities, and Physical Works	Mitigation / Compensation Measures	Residual Environmental Effects Characteristics						Significance	Prediction Confidence	Likelihood	Cumulative Environmental Effects?	Recommended Follow-up or Monitoring
			Direction	Magnitude	Geographic Extent	Duration and Frequency	Reversibility	Ecological/Socioeconomic Context					
Change in Land and Resource Use	Construction <ul style="list-style-type: none"> <li>• Site Preparation of Open Pit, TSF, and Buildings and Ancillary Facilities.</li> <li>• Physical Construction and Installation of Project Facilities.</li> <li>• Physical Construction of Transmission Lines and Associated Infrastructure.</li> <li>• Physical Construction of Realigned Fire Road, New Site Access Road, and Internal Site Roads.</li> </ul>	<ul style="list-style-type: none"> <li>• Forestry management plans will be revised by Crown licensees to incorporate the harvesting of forestry resources in the PDA as part of Site Preparation. Northcliff will provide information to licensees well in advance of Construction to facilitate planning in collaboration with NBDNR.</li> <li>• Where possible in accessible areas (i.e., along cleared right-of-ways), trees and other vegetation will be left in place or encouraged to grow to obstruct the view of Project facilities, reducing the change in the nature of the viewshed and muffling nuisance noise.</li> <li>• The Proponent will communicate with local campsite and land owners regarding Project schedule, and the timing of blasting events to minimize surprise and nuisance.</li> <li>• Mitigation measures and guidelines outlined in the Environmental and Social Management System (ESMS) to reduce nuisance noise and air contaminant emissions, and changes to the viewshed.</li> <li>• No trespassing signs will be posted along the perimeter of the Project site to alert local land users of the presence of the Project and its facilities.</li> <li>• Additional mitigation measures relating to air and sound emissions are described in Section 8.2 (Atmospheric Environment) and Section 8.3 (Acoustic Environment).</li> </ul>	A	L	L	MT/C	R	D	N	H	-	N	None recommended.
	Operation <ul style="list-style-type: none"> <li>• Mining.</li> <li>• Mine Waste and Water Management.</li> </ul>		A	L	L	LT/C	R	D	N	H	--	Y	None recommended.



Table 8.12.3 Summary of Residual Project-Related Environmental Effects on Land and Resource Use

Potential Residual Project-Related Environmental Effects	Project Phases, Activities, and Physical Works	Mitigation / Compensation Measures	Residual Environmental Effects Characteristics						Significance	Prediction Confidence	Likelihood	Cumulative Environmental Effects?	Recommended Follow-up or Monitoring	
			Direction	Magnitude	Geographic Extent	Duration and Frequency	Reversibility	Ecological/Socioeconomic Context						
	Decommissioning, Reclamation and Closure													
	Residual Environmental Effects for all Phases							N	H	--	Y			
<b>KEY</b> <b>Direction</b> P Positive. A Adverse.  <b>Magnitude</b> L Low: Adjacent land and resource use activities are not affected by the Project, and/or land and resource use of specific groups are not restricted or degraded and can continue. M Medium: Adjacent land and resource use activities are affected by the Project but can continue, and/or land and resource use activities of specific groups are restricted or degraded but can continue if mitigation or compensation is applied. H High: Land and resource uses are incompatible with adjacent land use activities, and/or land and resource use of a broad range of groups is restricted or degraded such that they cannot continue and for which the environmental effects are not mitigated or compensated.  <b>Geographic Extent</b> S Site-specific: Within the PDA. L Local: Within the LAA. R Regional: Within the RAA.			<b>Duration</b> ST Short term: Occurs and lasts for short periods (e.g., days/weeks). MT Medium term: Occurs and lasts for extended periods of time (e.g., years). LT Long term: Occurs during Construction and/or Operation and lasts for the life of Project. P Permanent: Occurs during Construction and Operation and beyond.  <b>Frequency</b> O Occurs once. S Occurs sporadically at irregular intervals. R Occurs on a regular basis and at regular intervals. C Continuous.			<b>Reversibility</b> R Reversible. I Irreversible.  <b>Ecological/Socioeconomic Context</b> U Undisturbed: Area relatively or not adversely affected by human activity. D Developed: Area has been substantially previously disturbed by human development or human development is still present. N/A Not Applicable.  <b>Significance</b> S Significant. N Not Significant.			<b>Prediction Confidence</b> Confidence in the significance prediction, based on scientific information and statistical analysis, professional judgment and known effectiveness of mitigation: L Low level of confidence. M Moderate level of confidence. H High level of confidence.  <b>Likelihood</b> If a significant environmental effect is predicted, the likelihood of that significant environmental effect occurring, based on professional judgment: L Low probability of occurrence. M Medium probability of occurrence. H High probability of occurrence.  <b>Cumulative Environmental Effects?</b> Y Potential for environmental effect to interact with the environmental effects of other past, present or foreseeable projects or activities in RAA. N Environmental effect will not or is not likely to interact with the environmental effects of other past, present or foreseeable projects or activities in RAA.					

#### 8.12.4.1 Potential Project Environmental Effects Mechanisms

During Construction and Operation, the Project will interact with Land and Resource Use as follows.

- Construction will change the land use in the PDA from primarily forestry-related uses to industrial (mineral resource extraction and processing).
- Construction will displace recreational land users from the PDA as this portion of Crown land becomes inaccessible to the public. Furthermore, members of the public may perceive the parts of the LAA nearest the Project to be industrial and not favourable for recreational activities. As such, individuals may decide to carry out recreational activities (e.g., hunting, trapping, fishing, ATV'ing) elsewhere.
- The PDA will be inaccessible throughout Operation for public use, preventing its use for informal recreation.
- The Project may affect property values both adversely and positively in the vicinity of the Project, particularly in the communities of Napadogan, Juniper, Stanley, and Millville. The perception of nuisance, environmental, or health and safety concerns associated with the Project, and increased employment resulting from the Project, are two of many contributing factors to this complex potential environmental effect. The demand for housing for potential Project employees may cause property values to rise.
- Changes to the visual landscape (viewshed) will increase as ongoing Project activities increase the size and visibility of prominent Project infrastructure such as the open pit and TSF.

There is no known agricultural land use in the PDA.

#### 8.12.4.2 Mitigation of Project Environmental Effects

The following mitigation measures, through careful design and planning, will be employed during Construction and Operation to reduce the environmental effects of the Project on Land and Resource Use potentially resulting from the environmental effects mechanisms described above.

- Forestry management plans will be revised by Crown Timber License Holders to incorporate the harvesting of forestry resources in the PDA as part of Site Preparation. Northcliff will provide information to licensees well in advance of Construction to facilitate planning in collaboration with NBDNR.
- Where possible in accessible areas (e.g., along cleared right-of-ways), trees and other vegetation will be left in place or encouraged to grow to obstruct the view of Project facilities, reducing the change in viewshed and muffling nuisance noise.
- The Proponent will communicate with local recreational campsite owners and land owners regarding Project schedule, and the timing of blasting events, to minimize surprise and nuisance.

- Construction and Operation activities will follow mitigation measures and guidelines outlined in the Environmental and Social Management System (ESMS; Appendix D) to reduce nuisance noise, air contaminant emissions, and changes to the viewshed.
- No trespassing signs will be posted along the perimeter of the Project site to alert local land users of the presence of the Project and its facilities.

Additional mitigation measures relating to air and sound emissions are described in Section 8.2 (Atmospheric Environment) and Section 8.3 (Acoustic Environment).

#### **8.12.4.3 Characterization of Residual Project Environmental Effects**

Construction will change the predominant land use within the PDA from forest resource harvesting to industrial mining and mineral processing. The mine site portion of the PDA is located entirely on Crown land that is managed as a part of several Crown timber licences under the New Brunswick *Crown Lands and Forests Act*. Crown timber licenses are managed by licensees under forest management agreements between licensees and the Minister of Natural Resources for multiple values including timber, employment levels, watershed protection, fish and wildlife habitat, and forest recreation. Prior to Construction, NBDNR will work with forestry licensees active in the area to revise cut quotas such that merchantable timber located in the PDA is harvested and used as part of Site Preparation and to modify cutting plans. Northcliff will provide information to Crown licensees (including Aboriginal licensees) well in advance of Construction to facilitate planning in collaboration with NBDNR. Pursuant to the New Brunswick *Crown Lands and Forests Act*, forestry operating plans are revised on a yearly basis, and describe the quantities and locations from which timber is to be harvested from Crown land, and the conditions under which harvesting will be carried out. Future operating plans for local Crown timber licensees will reflect the change so that future wood supply targets may be adjusted or met through changes in the cutting plan and/or increased purchase of wood from private woodlots.

The PDA is located within two Crown timber licenses, No. 8 and 9. The PDA occupies 0.017% (43 ha) of the total area of Crown land within Crown timber license No. 8, and 0.88% (1179 ha) of the total area of Crown land within Crown timber license No. 9. The remaining portion of the PDA is private land along the 138 kV electrical transmission line. The PDA occupies only a small amount of the two Crown timber licenses, and the loss of this area is expected to be manageable within the Crown timber management process. The area of land lost to forestry will likely amount to considerably less than the annual allowable cut (AAC) of each license. By adjusting the cutting plans and five-year management plans, licensees can plan for the change. Northcliff will communicate with the license holders sufficiently in advance of cutting to facilitate this planning. Given the relative small size of the PDA in comparison to the total Crown land in these Crown timber licenses, the loss of this area from the timber harvesting cycle will not likely result in a substantive economic change to the local forestry companies.

The PDA is located on Crown land. Crown lands are publicly-owned assets, managed by NBDNR for the economic, social, and environmental benefit of the residents of New Brunswick, which are to be managed in the best interest of the people of New Brunswick (NBDNR 2010). The Project will directly employ hundreds of New Brunswick residents and will result in royalties and taxes paid to the Province of New Brunswick in excess of approximately \$742 million over its life (Section 8.10; EcoTec 2013). In approving the licence of occupation for the Project, NBDNR would, in its role and administrator of



Crown lands, determine that the use of the PDA for the Project is in the best interest of New Brunswick and is an acceptable use of Crown land.

With the Project, the PDA will be inaccessible and recreational land and resource use (e.g., ATV and snowmobile use, hunting, fishing, trapping, hiking) will be displaced to other similar areas in the LAA and RAA. Tourists using the portions of the PDA through the services of outfitters or guides will also be displaced; however, they will be easily able to relocate to other areas within the LAA and RAA such that environmental effects to tourism are not substantive. In addition to the inaccessibility of the PDA, some individuals may choose to avoid a portion of the LAA due to perceived environmental, aesthetic, or safety concerns. Land and resource users will relocate to other areas within the LAA or RAA. There are no aspects of the PDA and LAA that are unique to the area, and similar lands and resources are abundant throughout the RAA. Recreational land users will be able to find alternative locations to carry out their activities. Central New Brunswick has vast expanses of remote, forested Crown lands similar to the PDA. As such, the displacement of limited recreational land use from the PDA to other areas in the LAA and RAA is not expected to lead to overcrowding in these other areas. Accordingly, this change in recreational land and resource use is expected to have only a small interaction with Land and Resource Use in the LAA and beyond.

The presence of the Project, nuisance-related changes in the environment, and/or public perceptions of environmental or health and safety concerns may result in the potential for both positive and negative changes in local property values. Housing prices are a reflection of a number of factors that include market conditions, location, property attributes, the characteristics of houses or other structures on the property, local and regional economic conditions, and social and cultural context. Several studies have explored the relationship between proximity of real property to mining activities, and the resulting change in property value.

Literature relating to the environmental effect of mining activity on residential real estate is divided between those who view mining activity as negatively affecting property values because of associated real or perceived nuisance or negative environmental effects, and those who view the broader economic benefits arising from such developments as leading to positive changes. A study of quarry operations in Ohio, USA by Willingham Associates (2002) determined, using traditional appraisal methods that properties within the area of influence of four selected quarry operations did not vary in value when compared to properties outside the quarry's areas of influence. The study concluded that quarry operations caused no substantive environmental effects on property values, and credited this in part to the mitigation measures adopted by quarry operators. A study by Gamby and Reid (2005) examined the environmental effect of the reopening of a gold mine on property values in Waihi, New Zealand. The study "*compared sales data for houses and vacant residential land at Waihi*" with two nearby towns over a period of approximately 20 years. The towns were similar in size to Waihi but had no mining activity. The study concluded that the reopening of the mine had an overall positive environmental effect on property values of both occupied and vacant residential land. Kern *et al.* (2002) examined longwall coal mining in western Pennsylvania and found that while distance from mining operations was reflected in assessed values on properties, actual sale prices did not appear to be influenced by proximity to longwall mines. A similar study by Ohio State University Professor Diane Hite found a strong correlation between the environmental effect of mining activities on property value and distance between the property and mine site. Regarding potential effect of the proposed Rockfort

quarry in Caledon, Ontario, the relationship was described as follows (The Center for Spatial Economics 2009):

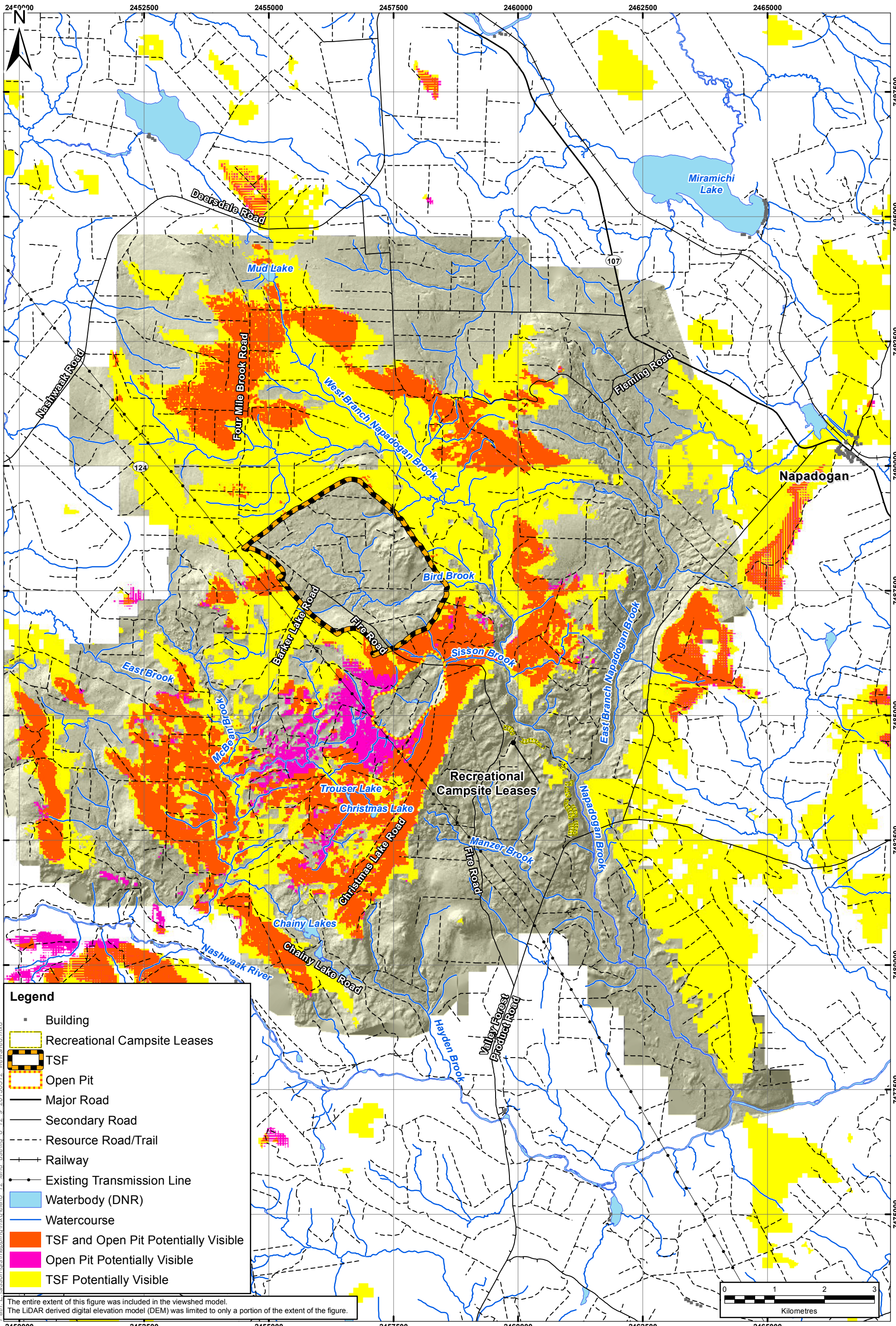
- properties within 0.5 kilometres (km) of the mine dropped in value by 25 percent or more;
- the property value decline 1.0 km away from the mine was between 15 and 20 percent;
- the property value decline 1.5 km away from the mine site was just under 15 percent;
- the property value decline 2.0 km away from the mine site was just over 10 percent;
- the property value decline 3.0 km away from the mine site was just under 10 percent; and
- the property value decline 4.0 to 5.0 km away from the mine site was between 5 and 7 percent.

As there are no houses or residential land within 10 km of the mine, property values are unlikely to be negatively affected by the presence of the Project. Properties close to the PDA may increase in value as demand will increase. Some Project workers will likely want to live in close proximity to their place of employment to reduce commuting time and will seek to purchase existing homes and undeveloped land. Property owners may see this increase in property value as positive since it will raise the value of their asset, while others may see it negatively as associated property taxes may increase. Given the limited number of proximal residences, this positive pressure may be greater. There are very few houses within 20-30 km of the mine and, hence, should workers in the longer term wish to locate closer to work, existing houses and residential properties are likely to increase in value. Thus, since there are no properties in the immediate vicinity of the mine that could be negatively affected in the way that the literature body suggests, the Project is likely to have an overall positive environmental effect on property values within the LAA.

Viewshed analysis of the Project was conducted in two parts. First, GIS technology, in consideration of local topography, was used to develop a map showing areas within the LAA from which the Project is likely to be visible (Figure 8.12.9). The analysis focuses on the two main features of the Project that are likely to be prominently visible, the TSF and the open pit. Figure 8.12.9 differentiates between areas from which the open pit, the TSF, or both are likely to be visible. It is important to note that the viewshed analysis considered only topography and not land cover (*i.e.*, trees). Further, as the TSF expands during Operation, its embankments will block the view of the open pit from several areas. As such, the viewshed presented in Figure 8.12.9 is very conservative and over-estimates the areas from which Project components will be visible. Trees and other vegetation will obscure the line of sight from many of the locations within the viewshed, hiding the Project from view. However, the Project may be visible from many locations within a few kilometers of the PDA. The Project will not be visible from the nearby recreational campsites, as a ridge completely blocks the line of sight. In total, it is very conservatively estimated that the TSF may be visible from up to approximately 298 km<sup>2</sup>, the open pit from 51 km<sup>2</sup>, and both may be visible from an additional 44 km<sup>2</sup>. Because the viewshed model is based on topography and conservatively does not include trees and other vegetation, it is likely that the Project will be visible from a smaller area in actuality.

The second part of the viewshed analysis created computer-modelled views from several vantage points illustrating what the Project may look like, towards the end Operation when the open pit and TSF are the largest. GIS tools were used to superimpose Project infrastructure, using geospatial control points, into digital photographs. Figure 8.12.3 shows the location and direction from which these digital photographs were taken. During the last year of Operation when the footprint will be the largest, Figures 8.12.10 through 8.12.14 show the potential view from these vantage points. Figure 8.12.15 shows the likely view from the top of Crabbe Mountain looking north towards the PDA; Project features are not expected to be visible from this location.





**Legend**

- Building
- Recreational Campsite Leases
- ▭ TSF
- ▭ Open Pit
- Major Road
- Secondary Road
- - - Resource Road/Trail
- Railway
- Existing Transmission Line
- Waterbody (DNR)
- Watercourse
- TSF and Open Pit Potentially Visible
- Open Pit Potentially Visible
- TSF Potentially Visible

The entire extent of this figure was included in the viewshed model.  
 The LIDAR derived digital elevation model (DEM) was limited to only a portion of the extent of the figure.

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<p><b>Viewshed Map</b></p> <p>Sisson Project:          Environmental Impact Assessment (EIA) Report, Napadogan, N.B.</p>		Scale: 1:70,000	Project No.: 121810356	Data Sources: NBDNR LIDAR: Leading Edge Geomatics Ltd.	Fig. No.: 8.12.9	
Client: Northcliff Resources Ltd.		Date: (dd/mm/yyyy) 12/03/2013	Dwn. By: JAB	Appd. By: DLM		







**Figure 8.12.10** Modelled View from Napadogan, Looking West Toward PDA (from Photo 1 in Figure 8.12.3, inset)



**Figure 8.12.11** Modelled View from Within PDA, Looking Northwest Toward TSF (from Photo 2 in Figure 8.12.3, inset)





**Figure 8.12.12 Modelled View Looking Northwest Toward Open Pit and TSF (from Photo 3 in Figure 8.12.3, inset)**



**Figure 8.12.13 Modelled View From Chainy Lakes Road, Looking North Toward TSF (from Photo 4 in Figure 8.12.3, inset)**





**Figure 8.12.14 Modelled View From Four Mile Brook, Looking South Toward TSF (from Photo 5 in Figure 8.12.3, inset)**



**Figure 8.12.15 Modelled View From Top of Crabbe Mountain, Looking North Toward Project**

As shown in Figures 8.12.10 through 8.12.15, the Project will primarily be visible along clear right of ways, such as roads and electrical transmission lines. The local topography and land cover generally obstruct views of the Project from many locations. Members of the public had expressed concern that the Project would be prominent in the view from Crabbe Mountain, a local ski hill. As shown in Figure 8.12.15, this will not be the case.

The closest environmentally significant area (ESA) to the PDA is the Miramichi Lake ESA, which is located approximately 9 km to the northeast of the PDA. The Project will not be visible from this ESA, and Project sound emissions will not be distinguishable above background. Given the distance between the ESA and the Project, it is not expected that the Project will result in any changes to the use of lands or resources within the ESA.

**8.12.5 Assessment of Cumulative Environmental Effects**

In addition to the Project environmental effects discussed above, an assessment of the potential cumulative environmental effects was conducted for other projects or activities that have potential to cause environmental effects that overlap with those of the Project, as identified in Table 8.12.3. Table 8.12.4 below presents the potential cumulative environmental effects to Land and Resource Use, and ranks each interaction with other projects or activities as 0, 1, or 2 with respect to the nature and degree to which important Project-related environmental effects overlap with those of other projects or activities.

**Table 8.12.4 Potential Cumulative Environmental Effects to Land and Resource Use**

Other Projects or Activities With Potential for Cumulative Environmental Effects	Potential Cumulative Environmental Effects
	Change in Land and Resource Use
<b>Past or Present Projects or Activities That Have Been Carried Out</b>	
Industrial Land Use (Past or Present)	0
Forestry and Agricultural Land Use (Past or Present)	0
Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons (Past or Present)	0
Recreational Land Use (Past or Present)	0
Residential Land Use (Past or Present)	0
<b>Potential Future Projects or Activities That Will Be Carried Out</b>	
Industrial Land Use (Future)	0
Forestry and Agricultural Land Use (Future)	1
Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons (Future)	0
Recreational Land Use (Future)	0
Planned Residential Development (Future)	1
<b>Cumulative Environmental Effects</b>	
<b>Notes:</b>	
Cumulative environmental effects were ranked as follows:	
0 Project environmental effects do not act cumulatively with those of other projects or activities that have been or will be carried out.	
1 Project environmental effects act cumulatively with those of other projects or activities that have been or will be carried out, but are unlikely to result in significant cumulative environmental effects; or Project environmental effects act cumulatively with existing significant levels of cumulative environmental effects but will not measurably change the state of the VEC.	
2 Project environmental effects act cumulatively with those of other projects or activities that have been or will be carried out, and may result in significant cumulative environmental effects; or Project environmental effects act cumulatively with existing significant levels of cumulative environmental effects and may measurably change the state of the VEC.	

The interactions between the environmental effects of the Project, in combination with past and present land uses, on Land and Resources Use have been ranked as 0 in Table 8.12.4. These past and present land uses form the basis of the existing conditions that were considered as part of the assessment of the Project environmental effects on Land and Resource Use. They have therefore already been considered in this EIA.

The interaction between the environmental effects of the Project in combination with future Industrial Land Use has been ranked as 0 on Table 8.12.4 because planned Industrial Land Uses are relatively limited within the RAA, and are therefore not predicted to act cumulatively with the Project based on known information at the time of writing.

Future Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons and future Recreational Land Use are expected to occur within the RAA. Other than in the PDA itself (assessed in Section 8.12.4 above), these would not result in environmental effects on Land and Resource Use that overlap with the Project. These future uses would not affect the availability of land or resources, would not produce nuisance environmental effects such as dust or noise, would not alter property values, and would not alter the local viewshed in the RAA. Accordingly, the interactions between the environmental effects of Future Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons and future Recreational Land Use with the environmental effects of the Project on Land and Resource Use have been ranked as 0 in Table 8.12.4.

The interaction between the environmental effects of future Forestry and Agricultural Land Use and those of the Project on Land and Resource Use has been ranked as 1 in Table 8.12.4. Forestry in particular has shaped the landscape in much of the RAA, and will continue to do so in the future. As areas are cut and replanted, the nature of local viewsheds will change. This interaction will not be substantive, however, because views of forestry operations are common throughout the RAA and these forestry practices are subject to extensive forest management plans and objectives that are reviewed frequently so that they do not adversely affect the viability of this industry or biodiversity. Cut areas are replanted to ensure forest regeneration, and the natures of the viewsheds are constantly changing as a result.

Planned future Residential Development in the RAA may overlap with the Project in two ways. First, additional residential development in the RAA will increase housing supply. As housing demand is expected to increase with the Project, additional development may buffer property value increases, thus mitigating the environmental effects of the Project. Secondly, it is possible that as residential development occurs, and individuals and families move to the RAA increasing the local population, it will become a more attractive area for yet more individuals and families to live. As such, property values of undeveloped land may increase as demand increases. Accordingly, the interaction between the environmental effects of Planned Residential Development in combination with the environmental effects of the Project on Land and Resources Use is ranked as 1 in Table 8.12.4.

In summary, for those projects or activities for which the interaction with the Project has been ranked as 0 or 1 in Table 8.12.4, the cumulative environmental effects of the Project in combination with those other projects or activities that have been or will be carried out are rated not significant for all Project phases, with a high level of confidence. They are not discussed further.



## **8.12.6 Determination of Significance**

### **8.12.6.1 Residual Project Environmental Effects**

The Project will change the primary land use within the PDA from forestry to industrial mining, but relatively few changes to the LAA will occur as a result of the Project. The majority of the PDA, including the open pit and TSF, are located on Crown land, and the Project will result in substantive economic benefits to the residents of New Brunswick; this change in the use of Crown land is consistent with the Crown Land Management Strategy (NBDNR 2010). The Project will prevent access to the PDA by the public. However, there is more than adequate land within the LAA and RAA for recreational land and resource users to carry out activities at current levels. Portions of the open pit and TSF will be visible from areas in the LAA. However given the local landscape they will not be visible from the nearby recreational campsites or other recreational areas in the LAA. Therefore, with the proposed mitigation and environmental protection measures, the potential residual environmental effects of a Change in Land and Resource Use during all phases of the Project are rated not significant. This conclusion has been reached with a high level of confidence.

### **8.12.6.2 Residual Cumulative Environmental Effects**

The cumulative environmental effect of a Change in Land and Resource Use of the Project in combination with other projects or activities that have been or will be carried out will be limited in extent, and with respect to future Planned Residential Development, may even serve to mitigate the environmental effects of the Project. As such, the residual, cumulative environmental effects of a Change in Land and Resource Use in combination with other projects or activities that have been or will be carried out, are rated not significant. This determination has been made with a high level of confidence, given the limited spatial nature and magnitude of the potential residual cumulative environmental effects.

### **8.12.7 Follow-up or Monitoring**

No follow-up or monitoring is proposed to verify the environmental effects prediction or the effectiveness of mitigation with respect to Land and Resource Use.