



# **Report of Environmental Assessment and Reasons for Decision**

**EA0809-004**

**Fortune Minerals Limited**

**NICO Project**

**January 25, 2013**

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## List of Abbreviations

AANDC	Aboriginal Affairs and Northern Development Canada
AEMP	Aquatic Effects Management Plan
CDF	Co-disposal facility
DAR	Developer's Assessment Report
DFO	Department of Fisheries and Oceans Canada
EA	Environmental assessment
EC	Environment Canada
ENR	Department of Environment and Natural Resources, GNWT
GNWT	Government of the Northwest Territories
MVEIRB	Mackenzie Valley Environmental Impact Review Board
NRCan	Natural Resources Canada
NWT	Northwest Territories
PR	Public registry
REA	Report of Environmental Assessment
SCP	Seepage collection pond
SSWQOs	Site specific water quality objectives
TC	Transport Canada
WEMP	Wildlife Effects Monitoring Program
WLWB	Wek'èezhìi Land and Water Board

## Review Board Decision

To make its decision in this environmental assessment, the Mackenzie Valley Environmental Impact Review Board (Review Board) has relied upon all the evidence and information on the public record. After considering the evidence, the Review Board has made its decision according to Section 128 of the *Mackenzie Valley Resource Management Act*.

Based on the evidence and information on the public record, it is the Review Board's opinion that the NICO Cobalt-Gold-Bismuth-Copper Project (NICO Project) proposed by Fortune Minerals Limited is likely to cause significant adverse impacts to the environment including water, wildlife and the cultural environment. The Review Board has set out measures in this report which will, if adopted, ensure that these impacts are no longer significant.

The Review Board therefore recommends, under subparagraph 128 (1)(b)(ii) of the *Mackenzie Valley Resource Management Act*, that this project be approved subject to the implementation of measures and commitments described in this Report.



Richard Edjericon  
Chairperson  
Mackenzie Valley Environmental Impact Review Board

January 25, 2013

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## Executive Summary

The Mackenzie Valley Environmental Impact Review Board (Review Board) conducted an environmental assessment of the NICO Cobalt-Gold-Bismuth-Copper Project (NICO Project) a proposed open pit and underground mine located approximately 50 km NE of Whati in the Wek'èezhìi area of the Northwest Territories. The developer of the proposed project is Fortune Minerals Limited (Fortune Minerals).

The Review Board considered all evidence and information on the public record in reaching its decision according to Section 128 of the *Mackenzie Valley Resource Management Act (MVRMA)*. The Review Board finds that, while the NICO Project has the potential to cause significant adverse impacts on the environment, the measures the Review Board has recommended will ensure that no significant adverse impacts will result from the development.

The Review Board therefore, concluded that an environmental impact review of this proposed development is not necessary and that the NICO Project should proceed to the regulatory phase for approvals subject to the measures set out in this Report.

The Review Board's decision depends on the implementation of the commitments made by Fortune Minerals during the proceedings and the measures set out in this Report of Environmental Assessment. In the Review Board's opinion, it is therefore important that the developer, appropriate regulatory authorities and government agencies ensure that the commitments listed in Appendix B and the measures listed in Appendix A and described throughout this document are all fulfilled.

## Measures and suggestions

The Review Board has found that significant adverse impacts on the environment are likely to occur if Fortune Minerals does not follow through on its commitments or carry out additional measures to reduce or prevent the potential effects of the NICO Project. The Review Board has recommended a series of measures and suggestions that will reduce or eliminate the potential impacts from this development. This can be accomplished by improving the management of project effects and monitoring mitigation results in order to ensure appropriate outcomes.

## Proposed development

The proposed development involves:

- Construction and use of a 27 km NICO Project access road;
- Mining cobalt, gold, bismuth and copper for an expected period of 18 years, initially from underground mine workings and after year 2 from an open pit;

- Construction, management and closure of a tailings and mine rock co-disposal facility;
- Construction, operation and maintenance of the following:
  - a crusher and mineral processing plant to produce concentrate for shipping;
  - a fresh water intake and potable water treatment plant;
  - open pit dewatering pumps;
  - a reverse osmosis effluent treatment plant;
  - a rotary biological contactor sewage treatment plant; and
  - site buildings and facilities; and
- Mine site closure and reclamation.

During this environmental assessment (EA), Fortune Minerals has proposed design modifications and mitigation measures to the mine site and access road to improve the Project and minimize potentially adverse impacts to the environment. A key design modification includes the developer's commitment to limit the footprint and visibility of the mine by developing a combined tailings and mine rock co-disposal facility. The NICO Project has been designed to have little or no visibility from the Įdaà Trail, Hislop Lake or the Marian River. Fortune Minerals has also proposed to construct and operate a reverse osmosis water treatment plant designed to ensure all treated waters meet the identified site specific water quality objectives (SSWQOs) for the receiving environment. In response to parties' concerns about a 120-year passive filling of the open pit, Fortune Minerals also committed to actively fill the open pit over a period of approximately 12 years. These changes are central components of the scope of development set out in this report of environmental assessment.

The final list of commitments can be found in Appendix B. Implementation of these commitments is fundamental to the Review Board's decision on the significance of adverse impacts.

### **Environmental assessment process**

The Review Board has heard from the Tłįchų Government, community members, Elders, government organizations and other groups and individual members of the public. Parties raised various issues including:

- Impacts to water quality and aquatic life in Nico Lake, Peanut Lake, Burke Lake, and the Marian River;
- Management of tailings and mine rock in the co-disposal facility at the mine site;
- Impacts to air quality as a result of Project operations and the transportation of materials to and concentrate from the mine site;
- Impacts of the Project on barren ground caribou and boreal caribou (nationally recognized as a Threatened Species);

- Impacts to the land and wildlife from construction and use of the NICO Project access road; and
- Socio-economic and cultural impacts of the Project on the region, specifically on the nearby Tłıchʼo communities and traditional land use activities.

### **Water quality objectives**

The Review Board heard concerns from parties about potential impacts from the mine on water quality in the downstream environment. In particular, Aboriginal Affairs and Northern Development Canada (AANDC), Environment Canada (EC), the Tłıchʼo Government, and the North Slave Métis Alliance stressed the importance of SSWQOs and implementing an aquatic effects monitoring program to minimize and monitor the potential effects to water quality and provide a higher level of confidence in the protection of the downstream aquatic ecosystem.

The Tłıchʼo Government and AANDC recommended that the Review Board identify the level of protection expected in the receiving environment while EC and Fortune Minerals agree that the establishment of the numeric SSWQOs could wait until the regulatory (water licencing) phase, provided that the proposed reverse osmosis treatment system, wetland treatment systems, and water quality mitigation commitments were carried through the environmental assessment. Based on an examination of the evidence, the Review Board is of the view that the identification of numeric SSWQOs can wait until the regulatory phase. Relevant water quality mitigation commitments by the developer are found in Appendix B and Review Board measures and suggestions can be found in Appendix A.

### **Water management and treatment**

A water management plan will be developed to address on-site surface waters. Runoff water from the mine site and water from the open pit will be captured and treated or re-used in the mineral processing plant. Any water that cannot be released will be impounded in the water management ponds (i.e. surge pond, seepage collection ponds) prior to further treatment.

During the EA process, Fortune Minerals committed to upgrading the initially proposed ion exchange water treatment system to a reverse osmosis treatment system. In addition to the active treatment of effluent waters, Fortune Minerals has proposed the development of constructed wetlands to further clean water in order to avoid the need for active post-closure management over the long-term.

During the public hearings, parties expressed their concern with the proposed constructed wetlands. Environment Canada has recommended that Fortune Minerals commit to using the reverse osmosis treatment for all mine effluent until the ability to adequately treat runoff waters of the proposed wetlands has been (independently) proven. Fortune



Minerals plans on a phased approach for development of the wetlands consisting of indoor and outdoor pilot facilities to test predictions for the treatment of specific contaminants of concern. Information from these pilot projects will be used to design a demonstration-scale wetland that will be built on site during mine operations. The full-scale wetland would then proceed after the demonstration-scale wetland has been proven to function for some time.

The Review Board finds that significant adverse impacts to water are likely and has recommended measures so that the adverse impacts to water are no longer significant.

### **Mine rock and tailings**

With respect to mine rock and tailings management, the developer commits to develop a co-disposal facility in which all tailings and mine rock will be placed by the end of mine operations. The developer presented evidence that this novel approach to mine rock and tailings management can be achieved. Fortune Minerals plans to capture runoff water for recycling or treatment during operations. Post-closure runoff will be directed into the open pit. Fortune Minerals has also committed to sequestering any potential acid-generating mine rock within the interior of the co-disposal facility and covering it with overburden to reduce infiltration. This approach not only minimizes the Project footprint, it also reduces impacts of mine rock and tailings on water quality so that they are not likely to be significant. In order to ensure the success of the co-disposal facility, Fortune Minerals has committed to work with the parties to develop a co-disposal facility management and monitoring plan.

### **Caribou**

The Review Board heard from many parties throughout the course of this EA and during the hearings. The Review Board is mindful that barren ground caribou are currently at low population levels and that harvest restrictions to aboriginal and non-aboriginal people are in force to address the decline in the number of Bathurst caribou over the last decade. The Review Board is of the opinion that there will be significant adverse impacts to caribou and has recommended measures which, if implemented, will reduce these adverse impacts so that they are no longer significant.

### **Culture**

The Tłıchǫ Government and other parties provided compelling evidence of the traditional use and cultural significance of the area surrounding the NICO Project. The Marian River, Hislop Lake, Burke Lake, and the İdaá Trail are vital and significant aspects of the cultural landscape in the area affected by the Project. The traditional knowledge evidence from these parties, supported by the Yellowknives Dene First Nation, clearly sets out both the tangible and intangible values associated with these areas and the importance of the transmission of these cultural practices and perspectives. The history of mining in this region shows how traditional lands can be effectively removed from use as a result of real and perceived impacts to the environment from development. The Review Board heard

about how historical developments such as the Rayrock Mine affected water, wildlife, land use and the cultural landscapes important to Tłıchǵ and other harvesters. The Review Board is convinced that such events were from an older era and notes that Fortune Minerals has committed to working with the Tłıchǵ Government to continue the collection and documentation of traditional knowledge and to identify management options for the mitigation of potential effects on cultural land use values. The Review Board has recommended measures so that impacts from the Project on the cultural environment are no longer likely to be significant.

### **Socio-economics**

Fortune Minerals has committed to the development of a community relations plan to address socio-economic concerns. Such concerns will also be addressed through plans that support the environmental health and safety management system. An Impact Benefits Agreement will be negotiated between Fortune Minerals and the Tłıchǵ Government. A socio-economic agreement will be entered into between Fortune Minerals and the Government of the Northwest Territories to formalize monitoring and reporting of social and economic impacts and benefits of the Project.

Hiring preferences will be given to Aboriginal and Northern residents as part of Fortune Minerals' commitment to provide employment and business opportunities in the Northwest Territories. Professional development and training opportunities will also be made available to Fortune employees and prospective employees.

In the Review Board's view, socio-economic impacts and benefits can be satisfactorily addressed through an Impact Benefits Agreement between Fortune Minerals and the Tłıchǵ Government and a socio-economic agreement between Fortune Minerals and the Government of the Northwest Territories.



## 1 Introduction

This is the Mackenzie Valley Environmental Impact Review Board (Review Board)'s *Report of Environmental Assessment and Reasons for Decision* (REA) for the proposed Fortune Minerals Limited (Fortune Minerals) NICO Cobalt-Gold-Bismuth-Copper Project (NICO Project). The purpose of this report is to:

- a) review the relevant evidence on which the decision is based;
- b) document relevant parts of the environmental assessment;
- c) convey the Review Board's reasons for decision, addressing whether the proposed development is likely to be the cause of significant adverse impacts on the environment or be a cause for public concern; and
- d) satisfy the reporting requirements of the *Mackenzie Valley Resources Management Act* (the *Act*) sections 121 and 128.

This REA includes four sections and three appendices, set out as follows:

- **Section 1** - provides background information on the regulatory history and referral of this development to the Review Board. This section also sets out the requirements of the Act and provides a brief description of the development proposal.
- **Section 2** - describes the Review Board's environmental assessment process for this Project. It provides information about the parties to this assessment and the steps the Review Board took to identify any significant adverse impacts or public concern as required by section 128 of the *Act*. Section 2 also describes the scope of the assessment and sets out the Review Board's determination of the scope of development as required by subsection 117(1) of the *Act*. The scope of development includes the changes to the project design that occurred during the assessment.
- **Section 3** - outlines selected environmental components that the Review Board examined during the impact assessment. This section includes a summary of the evidence, the Review Board's analysis and conclusions, and any mitigations and suggestions by the Review Board. It also considers the extent of, the reasons for, and the significance and likelihood of any public concern resulting from the proposed development.
- **Section 4** – conclusion.
- **Appendix A** - summarizes the Review Board's recommended measures and suggestions to avoid or reduce impacts.
- **Appendix B** - list of developer commitments.
- **Appendix C** - public registry index.

## 1.1 Requirements of the *Mackenzie Valley Resource Management Act*

The Review Board administers Part 5 of the *Mackenzie Valley Resource Management Act* (the *Act*) and therefore has responsibilities to make decisions in relation to the proposed development. The Review Board is responsible for conducting an environmental assessment that considers the proposed development's biophysical, socio-economic and cultural impacts on the environment, in accordance with section 114 and section 115 of the *Act*. The Review Board conducted this environmental assessment based on its *Rules of Procedure* and *Environmental Impact Assessment Guidelines*.

Under subsection 117(1) of the *Act*, the Review Board must decide on the scope of the development. The Review Board must also consider the factors set out in subsection 117(2), which are further described in Section 2 of this report. Although the parties have submitted evidence regarding a variety of impacts, the Review Board is required to conduct a particular test: to determine whether the proposed development is likely to cause a significant adverse impact on the environment or to be a cause of significant public concern.<sup>1</sup> The Review Board must then prepare a Report of Environmental Assessment.<sup>2</sup>

Once the federal and responsible Ministers accept the Review Board's Report of Environmental Assessment, the developer, government and regulatory authorities must ensure that any approved measure is carried out.<sup>3</sup> If the Review Board determines the development is not likely to have any significant adverse impact on the environment or be a cause of significant public concern,<sup>4</sup> the *Act* delegates the following:

- no regulatory authority can issue a license, permit or other authorization before the expiration of ten days after receiving the Report of Environmental Assessment from the Review Board;<sup>5</sup> and
- the federal Minister and Responsible Ministers may order an environmental impact review of the proposal, notwithstanding the Review Board's determination.<sup>6</sup>

## 1.2 Regulatory history

Fortune Minerals submitted the following Land Use Permit and Water License applications to the Wek'èezhìi Land and Water Board on November 5, 2008:

- W2008L2-0004: Type A Water License, NICO Project
- W2008D0016: Type A Land Use Permit, NICO Project

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<sup>1</sup> Subsection 128(1)

<sup>2</sup> Subsection 128(2)

<sup>3</sup> Section 62 and subsection 130(5)

<sup>4</sup> Paragraph 128(1)(a)

<sup>5</sup> Subsection 129(a)

<sup>6</sup> Paragraph 130(1)(a)

The Wek'èezhìi Land and Water Board notified the Review Board and other interested parties on January 30, 2009 that the applications were complete and that it had commenced its preliminary screening of the development. On February 27, 2009, Aboriginal Affairs and Northern Development Canada (AANDC) referred the NICO Project to environmental assessment. The referral was based on the Project's potential to adversely impact the environment (PR#1 p. 1). On March 2, 2009, the Review Board notified the developer that it had initiated an environmental assessment of the NICO Project.

### **Request for ruling – scope of development**

The NICO Project is located approximately 160 km northwest of Yellowknife and 10 km east of Hislop Lake. With the exception of the Fortune Minerals leases, all of the land surrounding the proposed development is part of the Tłıchǵ settlement lands. As identified in the Fortune Minerals' Developer's Assessment Report (DAR), the proposed NICO Project includes the construction and operation of the NICO Mine which consists of underground and open pit mine workings, camp facilities, a processing plant, a co-disposal waste management facility, a water treatment facility, an all-weather access road to the mine site, and use of a proposed Tłıchǵ road route to be built and maintained by a third-party (PR#116 p. 1.11-1.14).

On May 28, 2010, the Review Board received a Request for Ruling from the Tłıchǵ Government, which asked that the Review Board postpone the environmental assessment until all essential components of the NICO Project are included in the applications accepted by the Wek'èezhìi Land and Water Board. In their Request, the Tłıchǵ Government noted that Fortune Minerals did not include the construction and use of an all-season Tłıchǵ road route and NICO Project access road in their existing land use permit and water licence applications. The Tłıchǵ Government argued that since these roads are required for the successful construction and operation of the NICO Project and since there are no existing access agreements in place between Fortune Minerals and the Tłıchǵ Government, any discussion of such future roads would be "speculative or hypothetical." As a result, the Tłıchǵ Government argued that the applications were inconsistent with the Tłıchǵ Agreement and Part 5 of the *Mackenzie Valley Resource Management Act*. The Tłıchǵ Government felt that the inclusion of the NICO Project access road and the effects of use of the Tłıchǵ road in the scope of the NICO Project's environmental assessment were beyond the Review Board's jurisdiction (PR#92).

In order to make an informed decision on the Request, the Review Board asked, on June 4, 2010, that the parties to the environmental assessment and the developer provide comments in response to the Tłıchǵ Government's Request for Ruling. By July 8, 2010 Fortune Minerals and several other parties had provided their comments. The Tłıchǵ Government were also provided an opportunity to respond to the submissions. These documents were placed on the public registry for the Review Board's consideration.

In correspondence dated August 27, 2010, the Review Board denied the Tłıchǫ Government's Request for the following reasons:

"Upon review of the *MVRMA*, the Review Board's Guidelines and the *CEAA* case law on scoping, it appears to the Review Board that the anticipated access road and the all-land winter road were properly scoped into the NICO development and that the Review Board did so in a proper exercise of its s. 117(1) discretion under the *MVRMA*. The Review Board therefore concludes that it had the jurisdiction to scope the roads into the NICO development pursuant to the *MVRMA*" (PR#108, p. 12).

As a result of its Ruling, the Review Board determined that the environmental assessment could continue as originally planned.

### Judicial review

On September 22, 2010, the Tłıchǫ Government filed a notice of application for judicial review. This application requested the following relief with respect to the Review Board's decision on the Tłıchǫ Request for Ruling :

*... 2. An Order in the nature of certiorari quashing the decision of the Respondent, the Mackenzie Valley Environmental Impact Review Board (the "Review Board") published August 27, 2010, denying the Request submitted by Tłıchǫ Government on May 28, 2010, for a Ruling that environmental assessment EA0809-004 respecting Fortune Minerals Limited, NICO Project (the "Proposal") is premature and will therefore be postponed and placed in abeyance until all essential components of the Proposal are included in applications accepted as complete by the Wek'eezhii Land and Water Board ("WLWB");*

*3. A Declaration that the Review Board does not have jurisdiction to conduct the environmental assessment of the Proposal ("EA0809-004") in accordance with the Terms of Reference that it issued on November 30, 2009 ("TOR");*

*4. An Order remitting to the Review Board, for reconsideration on the basis of the Court's Reasons, its decision to not exercise its administrative discretion to adjourn EA0809-004 until all essential components of the Proposal are included in applications accepted as complete by the WLWB; [and]*

*5. An interlocutory injunction requiring the Review Board to suspend EA0809-004 until the Court decides this application... (PR# 109, p. 1-2)*

On June 2, 2011, the Supreme Court of the Northwest Territories released its Reasons for Judgement dismissing the Tłıchǫ Government's application for Judicial Review. The essence of the Court's decision was:

*This judgement concluded that the Review Board was facing [a] unique situation that was fraught with complexities. But the issues it had to resolve were at [sic]*



*within its area of expertise, and indeed, at the heart of the mandate that Parliament has entrusted to it. It is not for this Court to substitute its view about what course of action should have been taken, provided that the one chosen fell, in the words of the Supreme Court of Canada in Dunsmuir, “within the range of possible, acceptable outcomes.”*

*On balance, despite the concerns about certain aspects of the decision, [one] cannot say that it does not fall within a range of possible, acceptable outcomes. For that reason, this Court’s intervention is not warranted and the application must be dismissed (PR#117, p. 24).*

On June 30, 2011, the Tłıchǵ Government appealed the Northwest Territories Supreme Court’s decision on the grounds that the learned Justice:

1. Erred in concluding that the Mackenzie Valley Environmental Impact Review Board had jurisdiction to make the decision complained of; and
2. Erred in concluding that the impugned decision was reasonable (PR#119).

The Tłıchǵ Government discontinued its appeal on February 29, 2012.

### **1.3 Environmental setting**

The following description of the proposed development’s biophysical setting is summarized from the information provided in Fortune Minerals’ DAR.

The NICO Project site is situated about 10 km east of Hislop Lake, about 160 km northwest of Yellowknife, and within the Marian River drainage basin. Waters from the Marian River drain into Marian Lake which in turn drains into the North Arm of Great Slave Lake. Great Slave Lake is drained by the Mackenzie River which flows north to discharge into the Beaufort Sea. Absolute elevations at the NICO Project site range from 150 to 350 m above sea level. The Project site is located within the taiga shield and taiga plains eco-regions which are dominated, generally, by bedrock, jack pine, and mixed spruce forests (PR#116, p 7.8-9.).

The mean precipitation estimate for the NICO Project mine site is 343.5 millimeters (mm) per year. Approximately 48.2% (165.5 mm) of this precipitation is expected to fall as snow. Average summer temperatures are around 15° C. Winter temperatures typically range from -15 to -30° C. The catchment area from the NICO Project is shared by two local watersheds. The Burke Lake watershed drains an area of 90.8 km<sup>2</sup> and the Lou Lake watershed drains an area of 58.5 km<sup>2</sup> (PR#116, p. 9.12). Flow from these two watersheds contributes a relatively small proportion of discharge to the Marian River.

Important wildlife species that can be found near the NICO Project site and access road include barren ground caribou of the Bathurst herd, boreal caribou, moose, wolverine, lynx, grey wolf, black bear, martin, muskrat, beaver, and some species of migratory birds





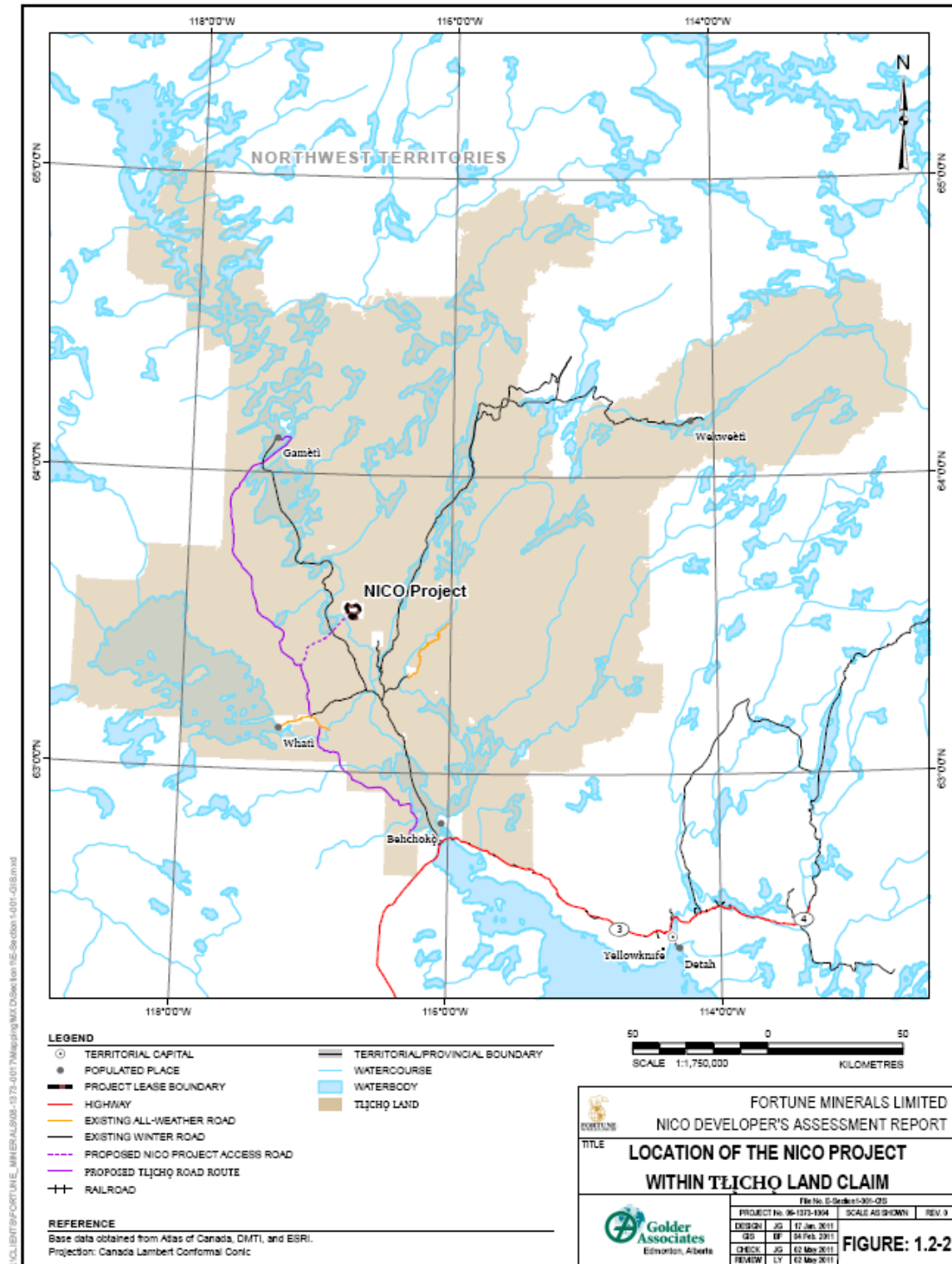
including upland breeding birds such as the common nighthawk, olive-sided fly catcher, and rusty blackbird (PR#116, p. 15.8). Potential spawning, rearing, holding, and over-wintering habitats for northern pike, lake whitefish, white sucker, longnose sucker, cisco, burbot and walleye were identified in the NICO Project local study area. Northern pike and lake whitefish were the most commonly found species. Grid Pond, Little Grid Pond, and Ponds 8, 10, and 11 are assumed to be non-fish bearing waterbodies (PR#116, p. 9.13).

The Tłıchǵ and Métis have traditionally used the Marian River and the surrounding drainage basins, including the NICO Project area, for harvesting fish and wildlife. Areas along portions of the NICO Project access road and near the Project site have cultural importance and were traditionally used as travel corridors, with seasonal camps for harvesting furbearers and other wildlife (PR#116, p. 5.12).

## 1.4 The unique context for this development

This mine development is entirely surrounded by Tłıchǵ land, and is the core cultural and historical area of the Tłıchǵ people. The mine site is within the Fortune Minerals mining lease and the NICO Project access road is entirely on Tłıchǵ land. The study areas for various valued ecosystem components in the environmental assessment outside of the mining lease are on Tłıchǵ land. This is the first major development to be proposed and subject to environmental assessment on wholly-owned Tłıchǵ lands since the land claim came into force.

The Tłıchǵ Government plays a role in the environmental assessment as a party, and under Section 128(2)(c) of the Mackenzie Valley Resource Management Act it also receives a copy of the Report of Environmental Assessment as a decision-maker too. For all these reasons this is an important environmental assessment for all concerned.



**Figure 1:** Map of the NICO Property location  
(PR#116 p. 1.7)

## 1.5 Description of development

### NICO Project history

Fortune Minerals Limited (Fortune Minerals) has been the majority owner of the existing NICO exploration project and associated land leases since 1992. Surface geology and geophysical programs conducted in 1995 identified the gold-cobalt-bismuth-copper mineralization and drilling in 1996 confirmed that the potentially commercial mineralization was extensive. In 2007, Fortune Minerals completed a positive feasibility study for the NICO Project and subsequently applied to the Wek'èezhii Land and Water Board for permits and licences to construct, operate and reclaim the NICO Project Mine. This proposed Project includes camp facilities, a processing plant, open pit and underground mine workings, a co-disposal tailings and waste rock management area, water treatment facilities, and an all-weather access road. Existing developments onsite include temporary exploration infrastructure and an underground decline or adit from which bulk samples were acquired (PR#116).

Since 1994, Fortune Minerals has conducted surface and underground exploration at the NICO Project site under several authorizations. They currently hold a land use permit and water license for the purposes of care and maintenance.

### Existing infrastructure

The NICO camp site is currently in care and maintenance with no mining operations occurring, pending completion of this environmental assessment and approvals process for the proposed mine. Current activities include camp maintenance, landfarm operation and monitoring, surveillance network program station sampling and analysis, and geochemical test cell sampling.

The existing infrastructure at the NICO Project site includes an exploration camp, several fuel storage areas, roads, offices, storage sheds, an incinerator, a maintenance garage, a contaminated soil remediation site and sewage settling and exfiltration ponds. There is also a small waste mine rock pile, the resulting of the underground workings that occupy an area in the immediate vicinity of the portal. The ore remaining on site was combined into three piles and covered with impermeable composite geotextile and geomembrane liners to prevent the potential for metal leaching. The covered piles are inspected regularly and maintained, as required.

### Proposed development

The proposed NICO Project will consist largely of an underground and open pit cobalt, gold, copper, and bismuth mine, co-disposal facility for mine rock and tailings, and processing plant. The existing ore bodies at the NICO Project site lay in three sub-parallel zones in a poly-metallic, IOCG (iron-oxide-copper-gold) type deposit. As proposed, the ore will be mined through both underground mine workings and an open pit. The underground mine

workings will be operational for the first two years of mining only. The open pit will begin at the same time and continue throughout the operational period of the mine, which is an estimated 18 years. Ore reserves in the area total 31 million tonnes, of which, 2.2 Mt will be mined through the underground networks and 28.8 Mt from the open pit. Mining rates will vary but maximum production rates out of the combined underground and open pit will be 4650 metric tonnes per day.

## **Construction**

The present proposal for mining operations takes advantage of existing facilities. Early construction will be supported by the existing exploration camp until significant completion of the NICO access road allows for the construction of a permanent camp to support a larger construction crew. Early work that will be supported by the existing site facilities and/or temporary accommodations in Whati include the construction of the NICO access road, site preparation and roads, temporary mobile crushing plant and concrete batch plant, construction of the permanent camp, fresh water intake set-up, potable and sewage water treatment facilities, and establishment of back-up power supplies. The processing plant and mining infrastructure will be constructed once camp construction and related services are completed. This will include permanent fuel storage areas, a materials sorting facility, a recreational facility, a truck shop and offices, dry and assay laboratory, and camp accommodations.

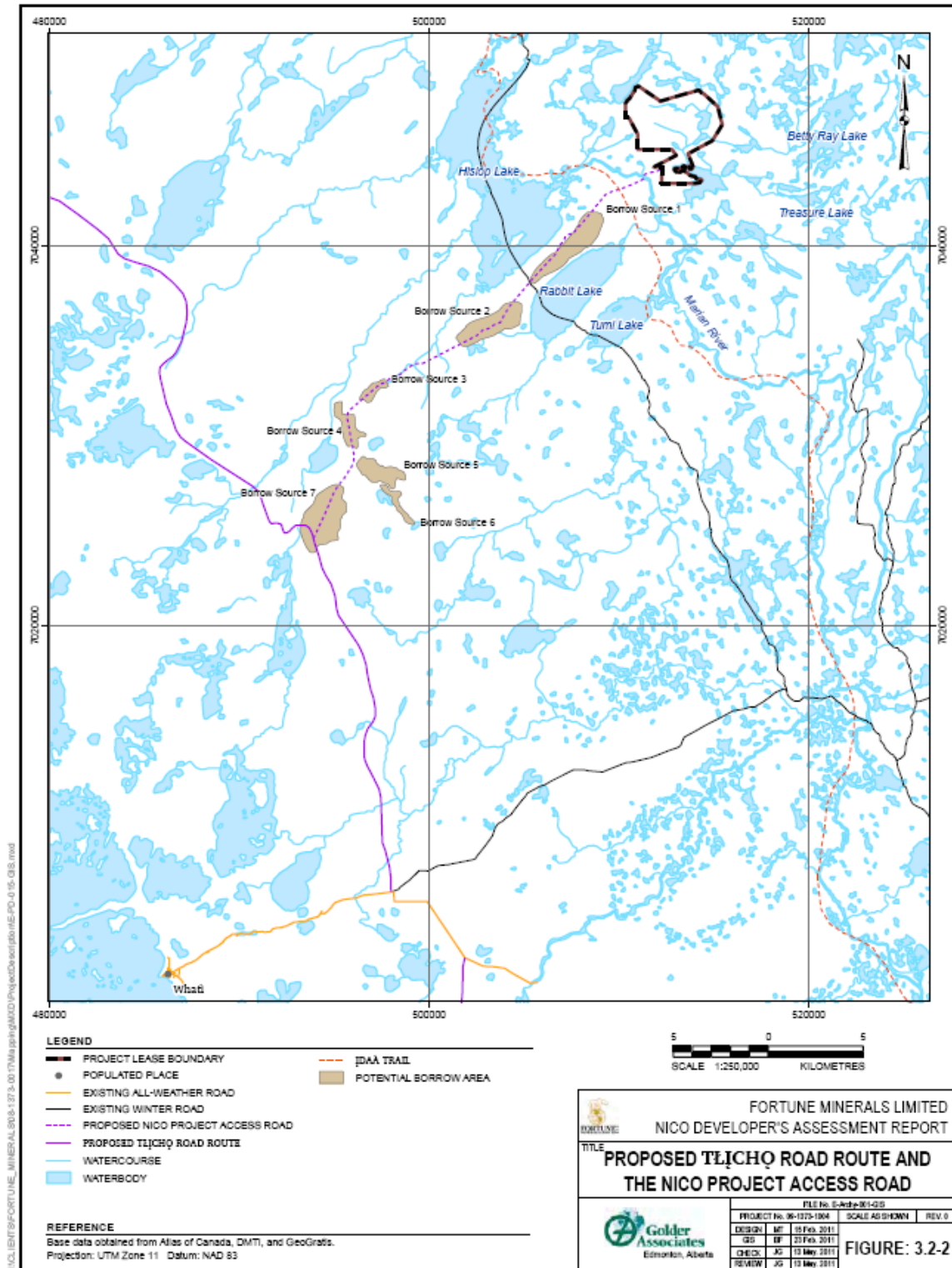
The existing mine site is currently connected to the Northwest Territories winter road network. The proposed Project depends upon the construction of an all-weather NICO access road with a connection to a future all-weather Tłıchq road route (See Figure 2: Anticipated Tłıchq Road Route and NICO Project Access Road). The anticipated Tłıchq road route is a realignment of the existing Northwest Territories winter road system through the Wek'èezhìi Settlement Area. The anticipated realignment will proceed north from Highway #3 west of Behchoko, through Whati and on to Gameti. The NICO access road would connect to the Tłıchq road route north of Whati and extend east for approximately 27 km to the NICO Project site. The proposed NICO access road crosses many minor diffuse drainage paths which are dry most of the year. At a minimum, 600 mm culverts will be installed along these drainage paths and sediment control structures will be installed and maintained until re-vegetation has been completed. A major crossing at the Marian River will be traversed using a girder-type bridge structure. Fortune Minerals expects the concentrate haul between the mine and along the access roads to the Canadian National Railway facility in Hay River to be in the range of five trucks per day for a total of approximately 180 metric tonnes of concentrate transported each day. Incoming fuel and mine operating supplies along the access road are estimated at three to four trucks per day (PR#116, p 3.81 and PR#170).

Fortune Minerals states in its DAR that it will not initiate construction of the NICO Project until it receives confirmation that the Tłıchq road route will be built and a schedule for construction has been prepared (PR#116, p. 1.3-1.9). During the October 11, 2012 public



hearings in Behchoko, the developer confirmed that “Fortune has made it clear that the mine cannot operate without an all-season road” (PR#359 p295). At the October 10 hearings, Fortune Minerals notes that it has had initial discussions with the Government of the Northwest Territories and the Tłıchǫ Government regarding upgrading of an all-land winter road to an all-season road or an all-weather road (PR#358 p20). Later at the same public hearing Mr. Russell Neudorf, the Deputy Minister of Transportation with the Government of the Northwest Territories, spoke on the subject of improving access to Whati and Gameti (PR#358 p123-132). Mr. Neudorf stated that Government of the Northwest Territories had entered into an Memorandum of Understanding with the Tłıchǫ Government to study realigning the existing winter road over ice to an overland winter road. Mr. Neudorf further stated that they are not studying an all-weather road at this time (PR#358 p125).

During the October 10 hearings, Review Board counsel Mr. John Donihee questioned the developer regarding project economics if the developer was required to construct the all-weather access road without 3<sup>rd</sup> party assistance. Fortune Minerals responded that “it would probably have some pretty severe impact on the project economics if Fortune Minerals did have to build that road”. When asked by Review Board counsel if it was fair to say that the additional cost of constructing all of the access for the project would have a significant negative impact on project economics, Fortune Minerals responded that it was a fair statement. (PR#358 p37)



**Figure 2: NICO Project Access Road**  
(PR#116, p. 1.8)

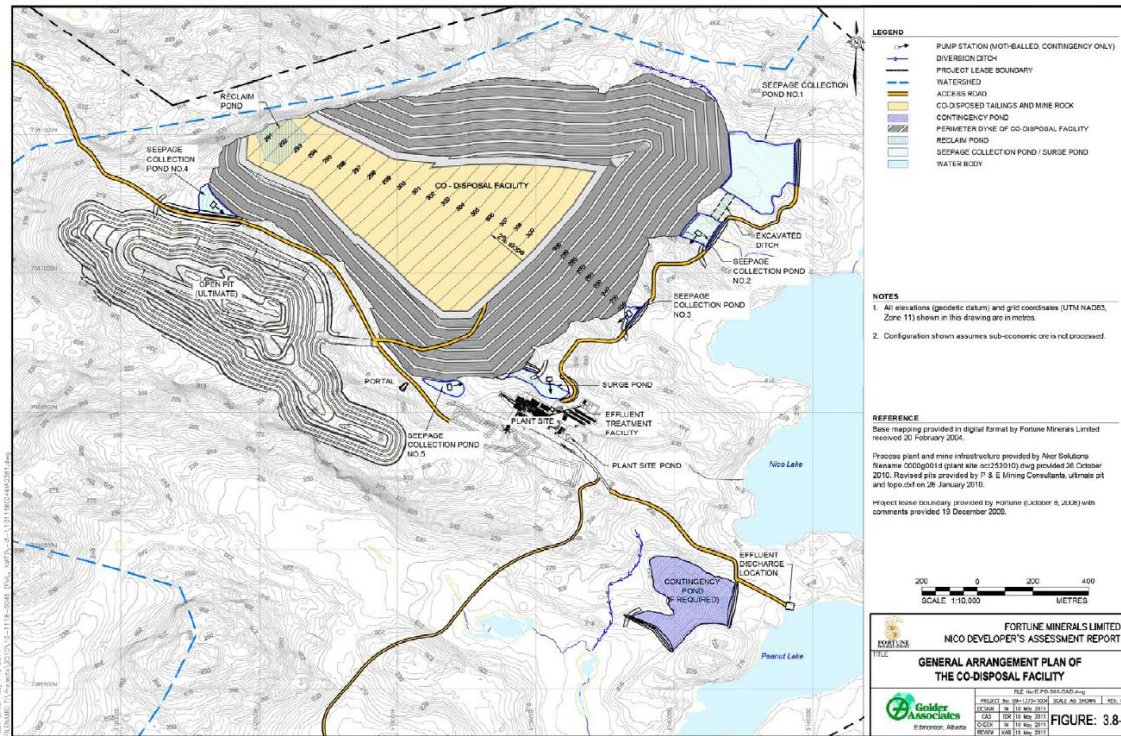




Construction of the underground mine will involve extending the existing underground access decline (5 m x 5 m), lateral development, and the development of two small stope areas. Concurrently, construction of the open pit will begin to an expected maximum size of 1450 m long, 500 m wide, and 230 m deep. The open pit walls will consist of a series of horizontal benches, blasted into the rock. A road into the pit will be constructed for heavy equipment to transport rock from the bottom of the pit to the surface for disposal or processing.

The mine rock and tailings co-disposal facility will need to be constructed during the summer prior to process plant commissioning. Type 1 mine rock has a low potential for acid generation and metal leaching. It will be sourced from some open pit mining and borrow sources and will be used in the construction of the water containment dykes. Type 2 mine rock, with low acid generation potential and limited metal leaching potential, will be used in the construction of the perimeter dykes which will be designed to limit erosion and movement of fine tailings. The co-disposal facility will be constructed progressively in layers from east to west with a northwest slope to facilitate runoff into seepage collection pond No. 4 and away from Nico Lake. The co-disposal facility will be developed by depositing alternating layers of mine rock and thickened tailings into polygonal tailings cells that are approximately 200 m x 200 m in size. During the first five years of operation, the mine rock to tailings ratio will be high due to open pit stripping activities. This ratio will decrease as operations proceed, meaning that the base of the co-disposal facility will be predominantly mine rock while the top will have a higher concentration of tailings. In total, it is estimated that approximately 84.5 Mt of mine rock and 17.2 million cubic meters of tailings will be deposited into the co-disposal facility during the life of the mine. The footprint of the co-disposal facility will be 139 ha with a maximum height of 80 m from a base elevation of 220 m at the starter dyke to 310 m (PR#116, p. 3.46-3.47, figure 3.8-1).

Five seepage collection ponds and a reclaim pond will be established to collect runoff from the co-disposal facility. This water will be pumped to the surge pond where it will be recycled for use in the processing plant or treated prior to final disposal into Peanut Lake. Seepage collection ponds (SCP) No. 1, 2 and 3 will be located in three topographic lows adjacent to the southeast end of the co-disposal facility and are designed to intercept any seepage that would otherwise flow to Nico Lake. The dams forming these SCPs will be water retaining structures lined with geomembrane. SCP No. 4 and 5 are located north and southwest of the co-disposal facility. SCP No. 4 will be a water retaining structure with a geomembrane liner and SCP No. 5 is a simple natural depression (PR#116, p. 3.49-3.50).



**Figure 3:** General Arrangement of the Co-Disposal Facility and Seepage Ponds  
(PR#116, p. 3.48)

## Operations

The underground workings of the NICO Project will be operated on a continuous basis using a retreat-transverse and longitudinal blast hole, open-stopping method, and generally mined from the bottom up, and from east to west to the centre of the ore body. Access to all the principal underground mine levels will be from the surface mine ramp. Typical underground mining will consist of development mining, drifting, and stope development, followed by stope production and ore haulage to surface. The ultimate depth of the underground mine workings will be approximately 170 m below ground surface at the portal elevation.

It is estimated that approximately 50,000 cubic meters (m<sup>3</sup>) of water will have to be pumped from the currently flooded underground workings before underground rehabilitation and mining operations can commence. After the dewatering of the underground is complete, it is anticipated that approximately 40 m<sup>3</sup>/day of inflow water will still need to be pumped to surface. All water which has come into contact with ore or mine waste will be pumped to the seepage collection ponds, the open pit sump, or the reclaim pond from where it will be sent to the surge pond for use in the processing plant or for treatment in the effluent treatment facility.





The open pit design includes a three-phase process. Phase 1 begins in the central part of the designed pit, moving northwest. Phase 2 moves the mining southeast to the designed pit walls, and Phase 3 mines to depth. Mine rock will be blasted, loaded and hauled to the co-disposal facility. An explosives supplier will provide an on-site an ANFO(ammonium nitrate fuel oil) and emulsion storage facility that will be located 0.6 km from the open pit. Mining rates will vary based on the mill feed requirements and the stripping ratio. Waste tonnage will vary based on the stripping ratio which will range from 29,000 metric tonnes /day (year 3) to 3000 metric tonnes/day (year 15). Blast hole drilling and blasting will be based on tonnage requirements and drilling will comprise between 30 to 50 holes per day with up to 600 m in drilling depth (PR#116, p. 3.31-3.32).

The on-site processing plant will consist of four main components: a primary crusher and transfer tower, a second and tertiary crushing building and fine ore bin, a grinding bay and chemical processor. Ore processing at the NICO Project will be limited to crushing, grinding, and primary and secondary stage floatation to produce bulk concentrate. The resulting bulk concentrate will be thickened, filtered, packaged, and shipped to Saskatchewan for further processing.

During operations, the proposed water management strategy will make use of the open pit, five seepage collection ponds, a surge pond, a plant site surface runoff pond, and a new effluent treatment facility (ETF). Mine water, site runoff, and process water effluent will be stored in the surge pond and recycled as feed water for processing or sent to the ETF for treatment. The ETF will consist of a reverse osmosis/chemical/biological treatment system designed to remove and concentrate contaminants into a brine stream. This treatment scenario consists of the following process steps: equalization; microfiltration to reduce total suspended solids; reverse osmosis to reduce contaminants of concern (dissolved metals); chemical precipitation of the waste brine stream to remove the majority of metals; biological treatment of the brine to remove selenium and ammonia; and filtration to remove the precipitated metals. Site specific water quality objectives (SSWQOs) for the receiving environment have been identified and should be met using this treatment process (PR#116, p. 3.32-3.41).

Sewage will be treated using one to two Biodisk BJ-250 units, packaged rotary biologic contactors. Effluent levels should be lower than the SSWQOs. Effluent flows will be discharged to Peanut Lake. Treated sewage sludge from the sewage treatment plant will be dewatered with a filter and incinerated. Ash from the incinerator will be placed in the co-disposal facility (PR#116, p. 3.73-3.74).

Power for mine operations will be provided by eight 1450 kW(e) (electric power) diesel-fuelled, prime rated generator sets. A heat recovery loop system will be installed to heat various site facilities. Diesel fuel consumption at the mine site is estimated at 54 million litres per year. The existing four fuel tanks in the tank farm have a combined capacity of approximately 6.8 million litres (PR#116, p. 3.76-3.77, 3.79).

Other proposed new developments at the mine site include camp accommodations, offices, recreation, dry and assay laboratory, and other site facilities, crushing plant and concrete batch plant, materials sorting facility, ammonium nitrate storage facility, fresh water intake from Lou Lake and potable water treatment facility, fuel storage and laydown areas, and a truck shop.

## **Closure**

Fortune Minerals' closure and reclamation plan has been developed based on the concepts of "progressive reclamation" and "design for closure". The overall goal is to limit the residual impacts of the Project to the extent practicable and eventually achieve a maintenance free, self-sustaining ecosystem with land uses similar to pre-development conditions (PR#116, p. 9.11).

After mining has ceased, closure and reclamation of the plant site will begin. Mobile mining equipment and construction equipment not needed for closure will be shipped off-site. Where economically feasible, processing equipment, generators, camp trailers, pumps, valves, etc. will be decommissioned and shipped off-site for salvage. Materials with scrap value will be removed from site and sold. Buildings will be demolished and debris will be hauled to an industrial non-hazardous waste landfill to be established in the co-disposal facility. Equipment that cannot be salvaged or sold will also be placed in the landfill. The landfill will be covered once it is no longer required. Building foundations and slabs on grade will be left in place, punctured to allow drainage and covered with till or gravel (PR#116, p. 9.35).

The ETF, including the pumps and pipelines and the Peanut Lake diffuser, will be decommissioned and mothballed. It will remain in place as a contingency in case it becomes necessary to treat any site water prior to release into Peanut Lake. If the ETF system is not required after 10 years, it will be demolished. Should active treatment of the open pit overflow water become necessary, a new ETF system will be constructed.

A boulder wall will be erected around the flooded open pit to prevent inadvertent access by wildlife and people. Initially, Fortune Minerals planned to cease pumping water out of the open pit at closure and allow the pit to slowly and passively fill with water. Prior to overflow, the water quality at the top of the flooded open pit would have been evaluated, and a decision made about post-overflow treatment. Modelling indicated that it would take approximately 120 years for the pit water level to rise to elevation. During technical sessions, it became clear that parties were not comfortable with the 120-year closure period and, based on input from the parties, Fortune Minerals has committed to actively filling the open pit with water pumped from the Marian River over a period of approximately 12 years (PR#340, p. 19).

A constructed wetland water treatment system remains the preferred option for post-closure management of the open pit and other site runoff waters. Use of such wetland

treatment systems will be tested off- and on-site during operations to demonstrate its ability to achieve a maintenance free, self-sustaining ecosystem with land uses similar to pre-development conditions (PR#116, p. 3.59).

Approximately five years after mine operations have stopped, Fortune Minerals will offer the NICO access road to the Tłı̄chǫ Government. If it is not wanted, the company will close and reclaim it. Reclamation of the NICO access road and other site roads will involve scarifying and loosening the surface to encourage natural revegetation and contouring slopes to a stable profile to reduce the influence of erosion, where necessary.

A cover will be placed over the entire surface of the co-disposal facility, encapsulating the tailings and mine rock. Some objectives of the closure cover are to limit wind and water erosion, limit infiltration of water into the co-disposal facility and prevent the uptake of arsenic and other metals by vegetation on the surface. The selected cover design for the top surface of the co-disposal facility will comprise two layers: overburden on the exposed surface, underlain by a layer of sand. The cover overtop the perimeter of the co-disposal facility will comprise only one layer of overburden since it is not anticipated to be a large source of pore water. The top of the co-disposal facility will be graded towards the west at a slope of approximately 2% to promote runoff waters to collect in seepage collection pond No. 4. From there, seepage will be directed into the open pit (PR#116, p. 3.50).

To support on-site personnel during the initial closure and reclamation phase of the NICO Project, suitable site services, including potable water treatment, sewage treatment, and communications will be maintained. It is expected that these site facilities will not be needed after approximately ten years. At that time, they will be decommissioned, dismantled, and disposed of as appropriate (PR#116, p. 9.36).

## **Post-closure**

Most of the active closure activities are expected be completed within two years of operations. Post-closure monitoring and maintenance will continue for ten years after mine closure and may include maintaining the effluent treatment facility, if required.

Three types of monitoring are planned for the post-closure period. These include: compliance inspections, environmental monitoring, and follow-up monitoring.

Compliance inspection will consist of programs designed to confirm the implementation of approved design standards and the environmental design features described in the DAR.

Environmental monitoring is used to track conditions or issues that arise during the lifespan of the NICO Project when adaptive management techniques can be applied if required. Examples of environmental monitoring include:

- monitoring the effectiveness of the co-disposal facility during construction and operations to determine if the structure is functioning as designed;
- verifying the modelling made on water quality predictions in the downstream environment during construction, operations and closure; and
- determining the effectiveness of the constructed wetland treatment systems in treating water downstream of mine components.

Follow-up monitoring programs are designed to test impact predictions, reduce uncertainty, determine the effectiveness of environmental design features and mitigation, and provide appropriate feedback to operations for modifying or adopting new mitigation designs, policies, and practices. Follow-up or effects monitoring will involve programs focused on the receiving environment, with the objective of verifying the conclusions of the DAR, evaluating the short-term and long-term effects on the terrestrial environment and the effectiveness of mitigation on the physical, chemical, and biological components of the aquatic ecosystem of local lakes, estimating the spatial extent of effects, and providing the necessary input to adaptive management (PR#116, p. 3.101-3.102).

### **Employment**

During the construction phase of the NICO project there will be approximately 300 employees. The first two years of operations will include underground mining and will require a peak of 269 employees. Mine operations after the second year will be open pit mining and will require a total of 188 employees (PR#315 p7).

Hiring preferences will be given to local Aboriginal and Northern residents as part of Fortune Minerals' commitment to provide employment and business opportunities to Northerners. Priority will be given to the residents of Tłıchq communities (PR#116, p. 16.51-16.52).

### **Development phases and schedule**

Once Fortune Minerals has obtained the necessary approvals, construction will take approximately 12 to 18 months to complete. The commissioning of the plant is subject to permitting, financing, agreements with the Tłıchq for access to the NICO Project site, and use of the Tłıchq Road Route. Fortune Minerals will not initiate construction of the NICO Project until it receives confirmation that the Tłıchq road route will be built and a schedule for construction has been prepared (PR#116, p. 1.3-1.9). Operations will begin in year two and continue for 18 years. Once operations cease, active mine closure, reclamation and post-closure monitoring will continue for two years (PR#116, p. 3.8-3.9). The final closure condition will not be reached until approximately 12 years after closure, which is the time estimated for the open pit to fill with water and begin a small discharge (PR#340, p. 19).

## 2 Environmental assessment process

This section describes the Review Board's environmental assessment process for this Project. It provides information about the parties to this assessment and the steps of the process the Review Board took to identify any significant adverse impacts or public concern. This section also describes the scope of the assessment and the changes to the proposed development's design that occurred during the assessment.

### 2.1 Parties to the environmental assessment

Eleven organizations participated as registered parties in this environmental assessment. According to the Review Board's *Rules of Procedure*, the developer is a registered party. The other registered parties were:

- Tłıchǫ Government
- Yellowknives Dene First Nation
- Akaitcho IMA Office
- North Slave Métis Alliance
- Department of Fisheries & Oceans
- Government of the Northwest Territories
- Aboriginal Affairs and Northern Development Canada
- Environment Canada
- Transport Canada
- Natural Resources Canada

During the environmental assessment process, representatives of government departments and other interested groups had the opportunity to identify their interests and to notify the Review Board of their intent to participate in the proceeding as an interested party. Parties to the environmental assessment had the opportunity to attend and actively participate throughout the process. Though some parties did not actively participate in all the stages, all information exchanges between the developer and parties can be found on the public registry. Table 1 below illustrates the involvement of the parties throughout this environmental assessment process, including information request responses and the public hearing.

**Table 1: Participation of the parties**

Party	Information requests, technical sessions (Yellowknife)	Hearing
Tłıchǫ Government	✓	✓

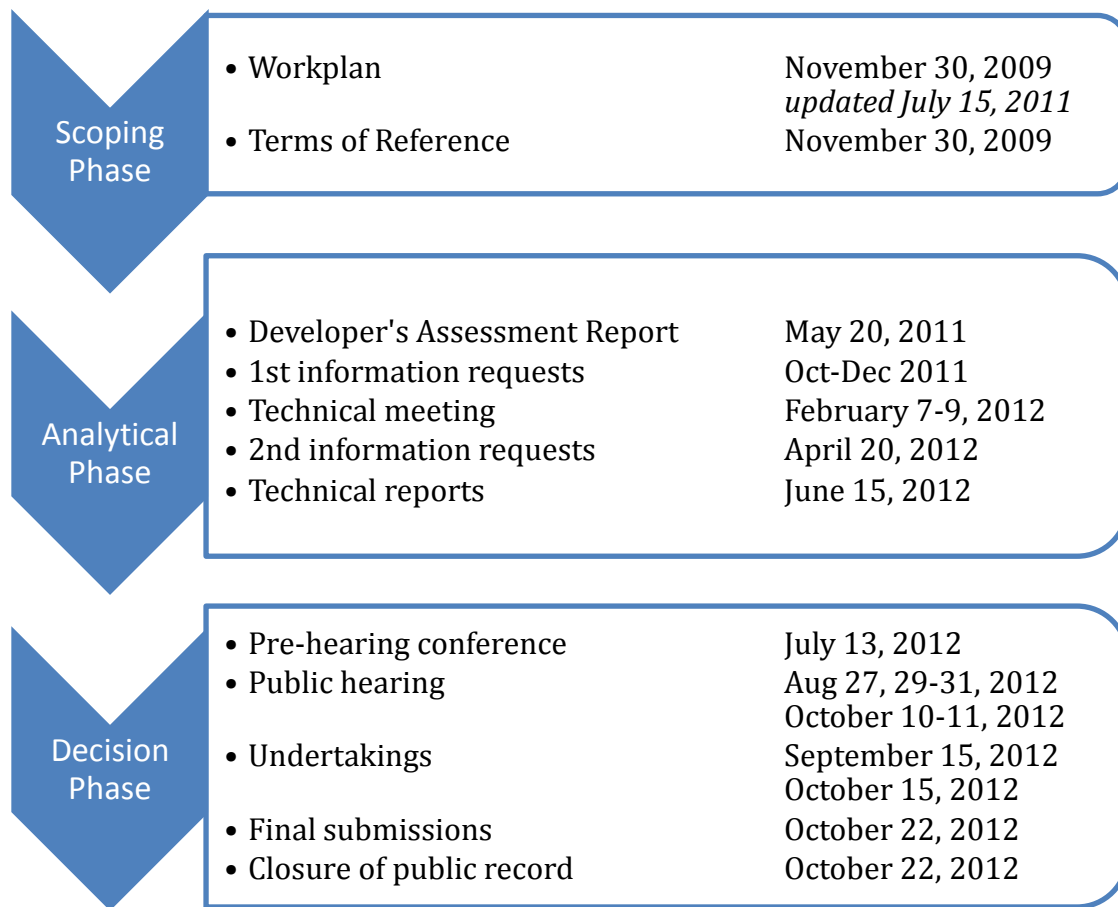
Party	Information requests, technical sessions (Yellowknife)	Hearing
Yellowknives Dene First Nation	✓	✓
Akaiicho IMA Office	✓	
North Slave Métis Alliance	✓	✓
Fisheries & Oceans Canada	✓	✓
Government of the Northwest Territories	✓	✓
Aboriginal Affairs and Northern Development Canada	✓	✓
Environment Canada	✓	✓
Transport Canada	✓	✓
Natural Resources Canada	✓	✓

✓ = actively participated in this phase of the environmental assessment

The Terms of Reference for the DAR outlined the parties' roles and responsibilities. The developer was responsible for producing the information necessary to meet its burden of proof and to satisfy the Review Board and parties' queries in order to evaluate the potential impacts that the proposed Project might have on the environment.

## 2.2 Environmental assessment phases

After the referral to MVEIRB in February 2009 and the initial environmental assessment start-up activities, the Review Board conducted this environmental assessment in three phases: a scoping phase, an analytical phase, and a decision phase. See Figure 4: NICO Project environmental assessment process for tasks associated with each phase of the environmental assessment.



**Figure 4:** NICO Project environmental assessment process

The Review Board notes that considerable delay in this environmental assessment was due to the judicial review initiated by the Tłıchǵ Government in 2010 and described elsewhere in this REA. In addition, the developer chose to submit its Developer's Assessment Report 18 months after the Review Board issued its Terms of Reference.

#### Development of Work Plan and Terms of Reference

The Review Board issued a draft Work Plan in October 2009. This document established milestones and identified the Review Board's timelines and expectations for the completion of the environmental assessment. Parties to the environmental assessment submitted comments on the draft Work Plan during October and November 2009. After considering these comments, the Review Board issued the final Work Plan at the end of November 2009. The Review Board revised the Work Plan in July 2011 to reflect changes to the DAR submission date.

The Review Board issued the draft Terms of Reference to the distribution list for comment, in September 2009. The Review Board considered all comments from parties and issued



the final Terms of Reference in November 2009. The Terms of Reference defined the scope of development, the scope of assessment and provided direction to Fortune Minerals and the parties about their roles and responsibilities in the environmental assessment process.

### **Developer's assessment report**

Fortune Minerals submitted the Developer's Assessment Report (DAR) to the Review Board (PR# 116), according to the Terms of Reference, in May 2011. On July 15, 2011, after receiving the DAR, the Review Board issued a conformity statement to Fortune Minerals stating that the DAR and associated appendices were in conformity with the Terms of Reference. On September 30, 2011 Fortune Minerals sent a letter to the Review Board notifying parties of some changes and updates to the DAR (PR#127).

### **Information requests and technical sessions**

In October 2011, the Review Board asked parties to provide written information requests outlining their questions and needs for clarification of the DAR. Fortune Minerals was requested to respond to the parties' information requests and provide reasons to the Review Board in the event that they could not answer any given request. In December 2011, Fortune Minerals provided the responses to the information requests.

On February 7-9, 2012 Review Board staff hosted a three-day technical session in Yellowknife so that parties to the environmental assessment could seek clarification on responses to the information requests and discuss remaining issues face-to-face with Fortune Minerals representatives and their consultants. Fortune Minerals responded to undertakings from the technical session on February 23, 2012.

At the request of ANND and the Tłıchǫ Government, the Review Board gave parties the opportunity for a second round of information requests focused on issues that remained unresolved from the technical session, specifically regarding the newly-proposed reverse osmosis water treatment system, closure water quality concerns, and impacts of the Project on caribou (PR#212). Second round information requests were issued on April 20, 2012 and Fortune Minerals submitted responses on May 11, 2012.

After the second round of information requests, the Review Board set a deadline of June 15, 2012 for parties to submit their final technical reports. The Review Board also set out an initial public hearing schedule for July 27-August 2, 2012, which, for logistical reasons, was postponed to the week of August 27-31, 2012.

### **Pre-hearing conference**

Review Board staff hosted a pre-hearing conference on July 30, 2012 and invited parties to participate. The purpose was to discuss hearing procedures and to set an agenda for public hearings in Yellowknife and Behchoko.



## Public hearings

On August 27, 2012, the Review Board held a community hearing in Whati; on August 29, 2012, the Review Board held a public hearing in Yellowknife; and on August 30-31, the Review Board held community and public hearings in Behchoko. Radio, posters, newspapers and webpage announcements notified the public prior to the hearings. The main purpose of the hearing was to allow the public an opportunity to hear and participate in a discussion of the issues related to the proposed development during the environmental assessment. The hearing was an opportunity for the community members to bring up important concerns directly to the Review Board.

The developer and several other parties gave presentations to the Review Board. All parties had the opportunity to question both the developer and the other parties involved. The parties highlighted direct and indirect impacts of the proposed development and presented final impact predictions and mitigation suggestions to the Review Board.

During the public hearing in Behchoko, the Tłı̨chǫ Government advocated for extra hearing days so that the information in its Traditional Knowledge Study could be considered. The Tłı̨chǫ Government advised that its Traditional Knowledge Study would be completed by September 15. There was support for adding hearing days for this purpose from the Yellowknives Dene First Nation (YKDFN) and the North Slave Métis Alliance (NSMA). Accordingly, the Review Board agreed to reconvene for additional public hearing sessions in Behchoko in October, 2012 in order to consider the Tłı̨chǫ Government's Traditional Knowledge and Use Study and hear from members of the community. The second round of public hearings was held in Behchoko on October 10-11, 2012.

## Hearing follow-up, final submissions and closure of the public record

During the hearings, a number of undertakings for submission of additional information were required from parties. Responses to these undertakings were submitted to the Review Board by September 15, 2012.

The Review Board received final submissions from the parties on October 17, 2012 and reply submissions from Fortune on October 22, 2012. The Review Board closed the public record on October 22, 2012.

## Environmental assessment decision

After the closing of the public record, the Review Board deliberated on the evidence considered all the evidence and submissions on the public record in order to arrive at its decision. The Review Board has prepared this *Report of Environmental Assessment & Reasons for Decision* for submission to the Minister of Indian Affairs and Northern Development as required by subsection 128(2) of the *Mackenzie Valley Resource Management Act*.

## 2.3 Decisions on significance

Section 128 of the *Mackenzie Valley Resource Management Act* requires the Review Board to decide, based on all the evidence on the public record, whether or not in its opinion the proposed development will likely have a significant adverse impact on the environment or be a cause for significant public concern.

During the course of the environmental assessment, the Review Board asked the registered parties to assist by providing their own views of the predicted impacts and their significance. The Review Board considered the following characteristics of all environmental impacts identified:

- magnitude
- geographic extent
- timing
- duration
- frequency
- nature of the impact
- reversibility of the impact
- probability of occurrence
- predictive confidence level

Section 3 of this report describes the Review Board's analysis and the reasons for its decisions on the significance of adverse impacts that are likely to result from the proposed development.

In addition, the *Mackenzie Valley Resource Management Act* paragraph 128 (1)(c) requires the Review Board to identify whether the proposed development is likely to be the cause of significant public concern. The Project was referred to environmental assessment on the basis of the potential for significant adverse impacts on the environment. During the environmental assessment it became apparent that public concern existed as well so the Board focused on impacts of the Project on the environment as well as public concern.

## 2.4 Scope of development

The scope of development outlined in this REA describes the elements of the proposed Project that the Review Board considers in the environmental assessment. The scope of development identifies and takes into account both principal and accessory development activities. It also outlines activities within this scope of development that will occur under the land use permit, water license or other regulatory instruments. These activities cannot exceed the scope of environmental assessment without requiring further preliminary screening.

The scope of development was initially based on water licence and land use permit applications submitted by Fortune Minerals to the Wek'èezhìi Land and Water Board during preliminary screening and which was subsequently included in the Terms of Reference issued by the Review Board in November 2009. The scope of development was subsequently updated several times by the developer to improve project design during the course of the environmental assessment to reflect changes that Fortune Minerals made to

the Project. Section 2.4.1 describes some of the more important changes. The scope of development identified in section 2.4.2 includes all relevant changes and, in the Review Board's opinion, accurately reflects the NICO Project as currently proposed.

### Development description amendments

During the analytical phase of the environmental assessment, the developer proposed several beneficial Project modifications which modified the scope of development and its potential impacts on the environment. A summary of the key Project modifications is set out in Table 2 below.

**Table 2: Key beneficial modifications to the development description**

<b>Original Developer's Assessment Report component</b>	<b>Alternative chosen component</b>	<b>Benefits of chosen alternative in relation to the likelihood of significance of adverse impacts</b>
Airstrip construction and operation at NICO Project site	Use of airstrip at Whati	<ul style="list-style-type: none"> <li>• Fortune Minerals will invest funds to improve the infrastructure and employment opportunities at the Whati airport</li> <li>• Reduces the cost and environmental impact associated with construction and maintenance of the airstrip at the NICO Project site, including dust and noise</li> <li>• Reduces the NICO Project footprint</li> </ul>
Ion exchange effluent treatment system	Reverse osmosis (RO)/chemical treatment/biological effluent treatment system	<ul style="list-style-type: none"> <li>• Reduces selenium concentrations to below the SSWQOs</li> <li>• More robust to changes in influent water quality</li> <li>• Produces a secondary waste form that is more stable and compatible for disposal at site</li> </ul>
Contingency pond	No contingency pond	<ul style="list-style-type: none"> <li>• Reverse osmosis effluent treatment facility should not require additional settling of treated waters</li> <li>• Reclaim ponds and co-disposal facility will have enough storage capacity to divert any unacceptable discharge</li> <li>• Reduction of Project footprint</li> </ul>

Original Developer's Assessment Report component	Alternative chosen component	Benefits of chosen alternative in relation to the likelihood of significance of adverse impacts
Long-term passive/natural filling of the open pit	Active filling of the open pit	<ul style="list-style-type: none"> <li>Reduces time until final closure from ~120 years to ~12 years</li> </ul>

The Review Board has accepted Fortune Minerals' rationale for the Project modifications and the scope of development has been changed to include these Project modifications. This REA is based on the scope of development for this Project as defined in this document. The Review Board's conclusions about the impacts of the NICO Project and Section 128 *Mackenzie Valley Resource Management Act* determination are based on the inclusion of these design changes in the scope of development.

The Review Board finds that the modifications to the Project description are likely to decrease the potential adverse impacts of the proposed development on the environment. In particular, design modifications related to enhancements to the water treatment plant are important to the Review Board's findings.

Portions of the May 2011 DAR are out of date as a result of the Project design modifications that Fortune adopted into the scope of development during the environmental assessment. The following section sets out the final scope of development.

### Final scope of development

The Review Board identified the principal scope of development to include those components in Table 3 below, after reviewing the evidence submitted by the developer during the course of this environmental assessment. Changes made by Fortune Minerals during the course of the environmental assessment are indicated in bold. The scope of development includes commitments made by Fortune Minerals which are described in Appendix B.

**Table 3: Final scope of development**

Phase	Components/Activities
Construction	Construction of a single co-disposal tailings/mine rock facility, including water management systems
	Construction of a waste disposal facility
	Construction of facilities for milling, initial separation and concentration of ore
	Construction of power generation and heat recovery facilities
	Construction of the <b>reverse osmosis</b> effluent treatment facility that will treat effluent from the tailings pond and other sources
	Construction of drainage control structures, process pipelines and waste water pipelines from mine to surface and on surface at the NICO Project mine site, run-off collection trenches and sedimentation pond



Phase	Components/Activities
	Construction of the demonstration and full-scale wetland treatment cells
	Construction of any new roads at the mine site
	Construction of water management facilities, including the pump house and water intake, water discharge system (including seasonal water storage areas, all drainage ditches and discharge points), potable water supplies for the camp, a sewage treatment plant, <b>and infrastructure required for active refilling of the open pit after operations.</b>
	Construction of fuel storage facilities on-site
	Construction of the permanent camp west of Nico Lake
	Construction of NICO Project Access Road to the mine site
	Construction of the NICO Project Access Road bridge over the Marian River
	<b>REMOVED - Construction of the airstrip</b>
	Development of borrow sources for aggregate production at the mine site or along the NICO access road
	Development of underground workings and open pit, including use of the existing decline and crosscut and drift development
Mining and materials storage	Extraction and crushing of ore-bearing rock
	Transport, storage and use of explosives
	Use of the Tłıchǫ road route
	Use of the NICO Project access road
	Mine dewatering
	Transportation of materials, management of ore and tailings, the co-mingled deposition of rock and tailings, including waste management systems
	Management of a waste disposal facility within the tailings management area
	Management of initial separation and concentration reject materials, ore and tailings stockpiles on surface, including construction of any associated foundations, buildings, and water treatment and management systems
	Mining equipment operation, including vehicles and materials conveyance systems
Milling	Use of facilities for milling, initial separation and concentration of ore including: <ul style="list-style-type: none"> <li>• conventional concentrator with ball mills;</li> <li>• initial flotation, secondary flotation of bulk rougher concentrate, bulk cleaner flotation and any other processing;</li> <li>• extraction, transportation, consumption, recycling, treatment and discharge to the environment of mine water and process water;</li> <li>• storage, handling, use and disposal of milling process additives and chemicals; and</li> <li>• thickening, filtration and packaging of concentrate for transportation.</li> </ul>
Other on-Site	Power generation and heat recovery facilities

Phase	Components/Activities
facilities and activities	Use of the <b>reverse osmosis</b> effluent treatment facility that will treat effluent from the tailings pond and other sources
	Use of drainage control structures, process pipelines and waste water pipelines from mine to surface and on surface at the NICO Project mine site, run-off collection trenches and sedimentation pond
	Use of the constructed wetlands
	Use of roads at the mine site
	Use during mine operations of the pump house and water intake, water discharge system (including seasonal water storage areas, all drainage ditches and discharge points) and potable water supplies for camps, <b>and infrastructure required for active refilling of the open pit after mining operations have ended</b>
	<b>Active refilling of the open pit after operations</b>
	Use of fuel storage facilities on-site
	Use of the pioneer camp at Lou Lake and permanent camp west of Nico Lake
	Sewage treatment plant
	Service complex and mine equipment management building
	Use of vehicles and all other emissions sources at the NICO mine site
	Use of waste incinerator
Support/ancillary facilities and activities	Transportation activities by air and road (including the NICO access road, the potential realignment of the winter road through the Wek'èezhii Settlement Area <b>and the Whati airport</b> ) that support the NICO Project's operation, including transportation of goods, fuel, contractors and employees in to and out of the mine
	Removal and disposal of wastes or other materials
	<b>REMOVED - Use of the airstrip at the mine site</b>
	Use of borrow sources for aggregate production at the mine site or along the access road
Closure and reclamation	Removal or stabilization of all structures and equipment
	Reclamation of tailings pond, tailings management area, and all other site water management facilities
	Reclamation of the mine rock management area
	Reclamation of the NICO Project access road proposed by Fortune, and all roads on the NICO Project mine site
	Reclamation of infrastructure foundations, piping, and all built structures at the mine site
	Reclamation of any stockpiles and materials storage locations
	Re-vegetation of areas affected by mining, access road or support activities
	Bulkhead installation and other capping of the underground works
	<b>Active re-filling of the open pit</b> including mine water outflow monitoring and water management around the mine site

## 2.5 Scope of environmental assessment

The scope of the environmental assessment identifies which issues and items the Review Board will examine during the process. The scope of assessment includes all potential impacts on valued components of the biophysical and the human environment (e.g. wildlife species or heritage resources) and public concern from the development, by itself and in combination with other past, present and reasonably foreseeable future developments as well as factors listed under subsection 117(2) of the *Mackenzie Valley Resource Management Act*.

To determine the scope of assessment, the Review Board reviewed Fortune Minerals' Project Description Summary and the public registries of the preliminary screening and ongoing environmental assessment. The Review Board also hosted scoping sessions in Whati, Gameti, Behchoko, Wekweètì and Yellowknife.

After considering the relevant information available on the public record, the Review Board made decisions on the scope of the assessment. The geographic scope includes all areas that may be affected by activities within the NICO Project scope of development. The geographic scope for each valued component must be appropriate for the characteristics of that component, or the impact and nature of the impact source. For example, consideration of impacts on air should reflect the airshed, wind patterns and mobility of airborne contaminants, while the habitat ranges of wildlife using the area may be relevant from a Project specific and cumulative effects perspective. All of these areas together have been considered in the environmental assessment.

The approximate temporal scope of the NICO Project includes the following:

- construction of new mine facilities and the NICO Project access road (1-2 years);
- mine operations (18 years);
- closure activities (2 years); and
- post-closure monitoring (12-15 years minimum).

### Valued components

The Review Board identified the following potentially affected valued components for the Terms of Reference:

#### Key lines of inquiry

- water quality
- caribou and caribou habitat
- closure and reclamation

#### Subjects of note (biological)

- air quality
- water quantity



- fish and aquatic habitat
- terrain
- vegetation
- wildlife

Subjects of note (socioeconomic)

- human environment

### Traditional knowledge

The Review Board recognizes the important role that Aboriginal cultures, values and traditional knowledge play in its decision making. In accordance with the requirements of subsection 115(1) of the *Mackenzie Valley Resource Management Act*, the Review Board considered all traditional knowledge that parties shared during the environmental assessment.

Both the Tłıchǵ Government and the North Slave Métis Alliance prepared traditional knowledge and use studies and submitted reports to the Review Board on September 15, 2012 (PR#349, PR#350). The Review Board hosted two days of public hearings on October 10-11, 2012 to discuss these reports and gave careful consideration to the traditional knowledge and use studies submitted by both parties.

The traditional knowledge and use studies provide an overview of available knowledge and land use data in the vicinity of the NICO Project within the traditional lands of the Tłıchǵ . Baseline summaries and assessments of anticipated Project effects on site-specific and non-site-specific valued components and residual effects are presented. Recommendations to address concerns were also submitted (PR#349 and PR#352).



### 3 Assessment of impacts

This section of the report considers specific issues related to impacts that arose during the environmental assessment. For each issue the Review Board describes:

- the developer's submissions and predictions, based on the DAR, response to information request documents, hearing statements, final submissions and other evidence from Fortune Minerals on the public record;
- other relevant items on the public record such as submissions from parties to the environmental assessment;
- the analysis and conclusions of the Review Board pertaining to each issue; and
- any measures or suggestions by the Review Board.

The Review Board has considered all issues that parties and the public raised in this environmental assessment, pursuant to the requirements of s.117 of the *Mackenzie Valley Resource Management Act*. The Review Board considered evidence from the hearings as well as written evidence on the public record. This report does not discuss issues that the Review Board has decided were resolved by reference to the evidence on the public record.

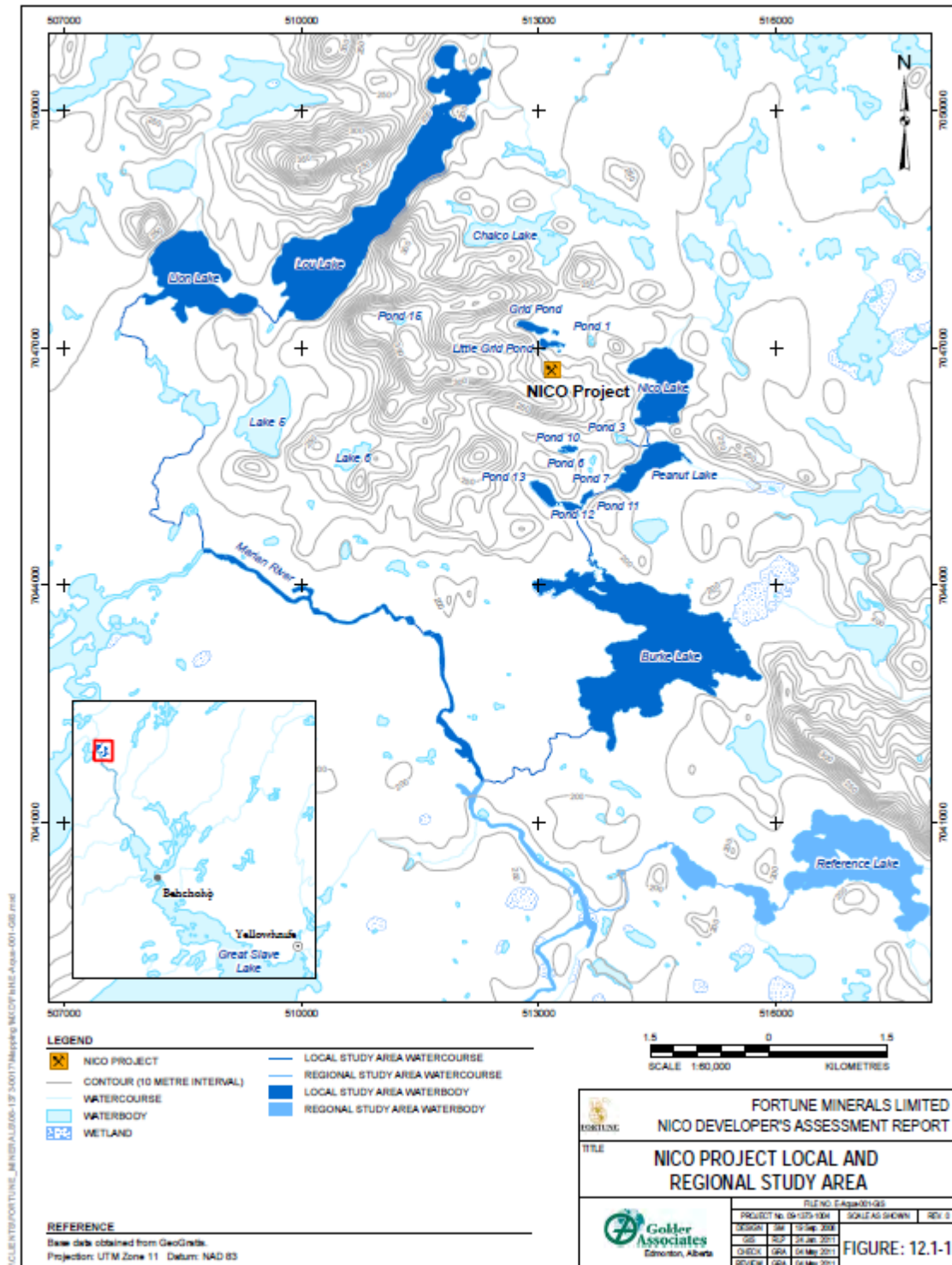
The issues discussed in detail in this REA are those that the Review Board decided warranted further consideration for the purposes of its decision under section 128 of the *Act* because of impact significance and public concern. The Review Board notes that within the framework of the *Act*, the significance determinations described in this report are not intended to limit regulators from drawing their own conclusions when carrying out their regulatory duties.

The outstanding issues addressed in this section of the report involve impacts to water quality, impacts to caribou and caribou habitat, long-term care and maintenance of the project site, and socio-economic issues.

#### 3.1 Impacts on water quality

The Review Board identified water quality as a key line of inquiry in the Terms of Reference based on information gathered during scoping meetings held in Tłı̨chʔ communities and from parties to this environmental assessment. During public hearings in Whati, Yellowknife and Behchoko, Aboriginal leaders confirmed in their statements to the Review Board the high value placed on clean water for drinking, fishing and other traditional land use activities.

This section of the REA examines the evidence on the potential impacts to water quality and the aquatic environment downstream of the NICO Project including Burke Lake and the Marian River. The Board notes that while the Tłı̨chʔ Government stressed the importance of Hislop Lake as traditional and recreational areas, Hislop Lake is upstream of the NICO Project and should not be affected by effluent from the NICO Project.



**Figure 5: Waterbodies within the Local and Regional Study Areas of the NICO Project**  
(PR#116, p. 12.7)

Fortune Minerals assessed potential impacts to local and downstream water quality as the key line of inquiry in the DAR. The Terms of Reference required Fortune Minerals to address potential impacts from the NICO Project on water quality including:

- the likelihood and consequence of contaminants from all sources at the NICO mine site;
- a prediction of water quality and quantity in the final effluent during all Project phases;
- impacts from naturally occurring arsenic and how the NICO Project will affect the range of natural variation;
- impacts from effluent discharge in Peanut Lake, NICO Lake, Burke Lake, Marian River and Marian Lake;
- impacts to groundwater;
- a description of and evaluation of water treatment alternatives;
- the likelihood and consequences of accidents and malfunctions; and
- description of water quality monitoring and management during operations (PR#87, p. 24-26).

### **Impacts to water quality**

The Review Board considered changes to water quality resulting from the construction, operation and closure of the NICO Mine. Submissions from parties and Fortune Minerals during information requests, at technical sessions, in technical reports, at the public hearings, and in final submissions focused on impacts to water quality of Peanut Lake, NICO Lake, Burke Lake, the Marian River and the downstream aquatic environment. The following is a summary of the sources of potential impacts to water quality from the proposed development:

- discharge of water from the effluent treatment facility and sewage treatment plant during operations;
- seepage from the co-disposal facility during operations and post closure;
- flooding of the open pit during post-closure and management and discharge of storm water runoff;
- emissions of chemicals to the air from the combustion of fuel in vehicles and generators that is deposited into water;
- generation of road dust during mine construction and operations that is deposited into water; and
- mining, crushing and disposal of mine rock during mine operations contributing to dust emissions that are deposited into water.

During the hearings in Whati, Yellowknife and Behchoko, Review Board members heard from the Grand Chief of the Tłıchǫ Government, Chiefs of the communities, elders, and other community members on the importance of water to the Tłıchǫ people.

At the community hearing in Whati, elder Pierre Beaverho, member of the Tłıchǫ Advisory Elder Committee, spoke to the Review Board about the importance of water. A summary of his statements include:

*“So everything in this world depends on the water. The animal that lives on the surface of the earth, they depend on the water. Even the fish that lives under the water depends on the water. Every animal we can imagine depends on the water. So for us as a Dene people, even our childrens, even our young ones, they all depend on-they all drink waters. If the waters been damaged and contaminated, what’s going to happened to us? That’s the reason why the water is so important to us.” (PR#337, p. 114-115).*

Other community members at the Wahti hearing also spoke about the value of water including elder Louie Zoe who stated:

*“The water we’re talking about is really important to us. Not only for us, for us, for (the) environment, our lands, our water, geese, animals. We want to make sure it’s safe” (PR#337, p. 135).*

In his opening statement on behalf of the Tłıchǫ Government at the hearing in Yellowknife, Chief Edward Chocolate of Gameti stated that:

*“Since so many families live there, our water needs to be protected for drinking water and for the fish. The Tłıchǫ agreement requires that water is protected. We want the water to be protected in the lakes and the rivers that we use, all the way to Deto Tia, or Burke Lake, as you call it in English. That water goes all the way to Behchoko. It is the water for all those families downstream.” (PR#338, p. 21).*

The Review Board has considered all of the evidence relating to impacts of mine effluent on water quality and reviewed the various mine components and Project design elements individually and in combination. In its review of impacts to water quality, the Review Board has considered Project design mitigations proposed by Fortune, commitments from the developer related to water quality. The Review Board’s conclusions set out below address:

- site specific water quality objectives during mine operations; and
- water quality monitoring and management at mine site during operations.

The following subsections also consider water quality objectives as well as operational aspects of the Project and mine components that are relevant when considering the impacts of mine effluent on water quality. This approach addresses the issues separately, while recognizing that they are inter-connected. These Project components are viewed collectively in the Review Board’s consideration of the impacts to water quality from the NICO Project.



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### Objectives for water quality in the receiving environment

The term “water quality objective” is defined by the Canadian Council for the Ministers of the Environment (CCME) as “a numerical concentration or narrative statement that has been established to support and protect the designated uses of water at a specified site.”<sup>7</sup> In the environmental assessment of a project, water quality objectives for the receiving environment are compared to the predicted impacts to water quality. If project-related water quality changes in the receiving environment are predicted to be lower than water quality objectives, then it is likely that the project will have no significant effect with respect to water quality impacts. If predicted impacts are higher than some or all of the water quality objectives, then further information gathering and risk assessments may be necessary to determine significance.

As explained above, water quality objectives can be either numeric or narrative. The CCME has defined numeric water quality objectives for Canadian waters for different uses including the protection of aquatic life as well as agricultural and recreational uses of water. The CCME guideline values for aquatic life are derived from an extensive amount of existing toxicity data performed on laboratory strains of various aquatic organisms (e.g., benthic invertebrates, fish, aquatic plants etc.) and intended “to be protective of the most sensitive species, in the most sensitive life stage, over an indefinite period of exposure.” (PR#208, p. 12)

Guideline values are considered generic and useful for all water bodies; however, the CCME also defines methods for modifying water quality objectives to reflect site-specific considerations including baseline concentrations, toxicity modifying factors and resident species of aquatic organisms. These site-specific water quality objectives (SSWQOs) are used in the regulatory phase to assess and/or calculate effluent discharge limits (i.e., effluent quality criteria or EQC) for a project as per the Mackenzie Valley Land and Water Board’s Water and Effluent Quality Management Policy.

As discussed below, both numeric and narrative water quality objectives have been proposed by parties during this environmental assessment that are intended to protect identified current and future water uses in downstream water bodies including Peanut Lake, NICO Lake, Burke Land and the Marian River.

### Site specific water quality objectives

Site specific water quality objectives (SSWQOs) apply to the concentration of a chemical in a receiving water body and are not normally regulatory control points. During the

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<sup>7</sup> CCME (1999), Canadian Environmental Quality Guidelines, Guidelines and Standards Division, Winnipeg, MB

regulatory approvals phase, the Wek'eezhii Land and Water Board will use SSWQOs to calculate effluent quality criteria in a water license. Effluent quality criteria are end-of-pipe discharge limits. When making the determination on water quality objectives, the Review Board considers the acceptability of SSWQOs to decide on the significance of impacts. The Review Board will not provide a recommendation on effluent quality criteria because it is the responsibility of the Wek'eezhii Land and Water Board.

This section describes the methodology used by Fortune Minerals to derive SSWQOs for water bodies downstream of the mine site including Peanut Lake, NICO Lake, Burke Lake and the Marian River.

Fortune Minerals describes the approach to the development of SSWQOs in their Aquatic Risk Assessment submitted in April 2012 as being adopted from approaches developed by the CCME and provincial agencies in the development of Canadian Water Quality Guidelines (CWQGs) for the protection of aquatic life. Fortune Minerals' Aquatic Risk Assessment references the overall objective for the CWQGs as "to be protective of the most sensitive species, in the most sensitive life stage, over an indefinite period of exposure" (PR#208, p. 12).

In its Aquatic Risk Assessment, Fortune Minerals acknowledges that direct toxicity tests cannot be done at this time due to the difficulty in simulating the variation experienced in natural conditions in a laboratory setting, so their development of SSWQOs followed the following steps:

- available toxicity literature was reviewed to characterize biological effect levels that correspond to concentrations of toxicity modifying parameters specific to each metal of concern;
- existing water quality was characterized with respect to these substances in NICO Lake and Peanut Lake;
- baseline aquatic ecology data was reviewed to identify species of aquatic biota that are present within NICO Lake and Peanut Lake; and
- site-specific toxicity concentrations that are protective of the most sensitive receptor in NICO Lake and Peanut Lake were developed for each metal of concern (PR#208, p. 13).

In its Technical Report, AANDC references a selection of national and Northwest Territories specific policy documents that provide guidance on the development of SSWQOs for mine developments. These documents include the Mackenzie Valley Land and Water Board Water and Effluent Quality Management Policy, which states that:

*"The Boards expect developers to identify and implement waste prevention and/or minimization measures, whenever feasible."*

and



*“Note that in accordance with the Board’s objective to minimize waste discharge, proponents are expected to minimize and, where feasible, to prevent waste from entering water in the NWT. Therefore, and consistent with the CCME non-degradation policy, the Boards may set EQC that are more stringent than what is necessary to meet water quality standards in the receiving environment.”*  
(PR#247, p. 7-8).

### **3.1.1.1 Developer position and submissions**

As presented in Section 7.0 and Appendix 7.V.11 of the DAR, Fortune Minerals derived water quality objectives that, in its opinion, would protect the aquatic ecosystem and ensure the continued opportunity for traditional and non-traditional use of fish and wildlife.

Details on the developer’s approach to the derivation of the SSWQOs and water quality model predictions are fully described in its Aquatic Risk Assessment document (PR#208). The risk assessment was completed to determine potential impacts on aquatic life from Project-related emissions to surface water bodies. Water quality was predicted for NICO Lake and downstream water bodies including Peanut and Burke Lakes, and the Marian River and considered chemical releases from the Project associated with dust generation and deposition to surface water as well as mine water discharges to surface water (PR#208, p. 57). Based on the results of the Aquatic Risk Assessment, Fortune Minerals concluded that the risks to aquatic life from contaminants of potential concern are either negligible or low and likely negligible (PR#208, p. 57) during all phases of the Project (i.e., construction, operation, active closure, post-closure).

The conclusions of the original aquatic risk assessment were based on the use of ion-exchange technology to treat the effluent during operations. However, after submission of the DAR, Fortune Minerals conducted an evaluation of effluent treatment options and subsequently selected reverse osmosis technology as the preferred water treatment option. In a September 2011 Project update, the reverse osmosis treatment system is described as a Project design improvement using best available technology for removing contaminants (PR#127). Further detail on the system was provided in an undertaking after the February 2012 technical sessions (PR#191). The developer states further that this is one of the best water treatment systems available and that it has demonstrated, during the course of the environmental assessment and at the hearings, that water from the Project will meet discharge requirements and be protective of the aquatic environment, wildlife and people (PR#373, p4).

As a result of the commitment by Fortune Minerals to use the reverse osmosis water treatment system, contaminants of potential concern changed and SSWQOs were updated as part of the human health and aquatic risk assessments (PR#211, PR#208). In response to second round information requests from parties, Fortune Minerals provided a revised SSWQO table on June 15, 2012 (PR#242).



Meetings took place between the developer and parties in April and May of 2012 to discuss the contribution of dust emissions as a source loading input into the model for the derivation of SSWQOs. The developer states, in correspondence dated July 5, 2012, that during these meetings concerns were raised by parties regarding the extent to which water quality objectives may be the result of conservatively stated dust deposition assumptions (PR#270, p.1).

Fortune Minerals acknowledged that modeling in the DAR did not account for dust mitigation strategies that it could use to reduce emission rates particularly during the winter (PR#146, p. 65). At the request of parties, Fortune re-ran the receiving water quality model with a revised winter dust deposition model of 50% based on winter dust mitigation measures to estimate metal loading to receiving water bodies. Findings were, that despite the winter emission reductions, fugitive dust deposition still accounts for the majority of the Project-related loading of contaminants of potential concern to receiving water bodies relative to contributions from the effluent treatment facility and seepages from the co-disposal facility (PR#270).

In section 10.9.2 of the DAR, Fortune Minerals committed to developing a best management practices plan to control fugitive dust and metals emissions. (PR#116, p. 10-85). In its response to a first round information request from the Tłı̨chǫ Government, Fortune Minerals committed to a series of specific mitigation measures to reduce the impacts of fugitive dust and contaminant loading on receiving waters (PR#146, p. 62). The developer repeats these commitments in the July 5, 2012 Technical Memorandum (PR#270, p. 3).

During operations, all water from the site (e.g., runoff, seepage etc.) will be collected and treated by reverse osmosis prior to discharge. Fortune Minerals' closure objective is to dismantle the water treatment plant and restore natural drainage systems in the area. Predicted seepage quality coming from the co-disposal facility may have high concentrations of some metals; therefore, Fortune Minerals has proposed to build a constructed wetland system between the co-disposal facility and Nico Lake to naturally treat the seepage and ensure that downstream water quality is not negatively affected into the future. Fortune has also proposed a constructed wetland as a contingency in the event that the water that will eventually overtop the open pit post-closure will not be of sufficient quality to directly discharge to the receiving environment. Potential post-closure effects of the co-disposal facility and the open pit on water and mitigations for those effects are further discussed in Section 3.2.

During the public hearings in Behchoko on August 31, 2012, Fortune Minerals responded to a question from Grand Chief Eddie Erasmus seeking clarity on the wetlands function by stating that:

*"You need to remember the results of the risk assessment that showed when we did it without the wetlands in place, that there was still no change in risk to the environment without wetland treatment. The wetlands are there to add a measure*



*of safety to the environment as a buffer, to add extra confidence to people that there will be no impacts, but we already know that there won't be based on our rigorous modeling" (PR#340, p.42).*

Fortune Minerals stated further that water from the mine site would be at safe levels even without passing through the wetlands, but that the wetlands can reduce contaminant level even lower than predicted (PR#340, p. 43).

In its final submission, Fortune Minerals acknowledged that water quality downstream of the NICO Project is the primary concern to the Tłıchǫ people. Fortune Minerals emphasized that treated water from the mine is discharged into the Burke Lake watershed, downstream of Hislop Lake.

Fortune Minerals says it has developed site specific water quality objectives based on components of the ecosystem that are most sensitive to changes in the aquatic ecosystem such as fish and benthic invertebrates. The proposed SSWQOs can be measured and assessed during mine operations and if the objectives are approached, adaptive management actions can be triggered to address the change (PR#373, p. 4).

Fortune Minerals concludes that with mitigations, there will be no measurable impacts on Marian River and that changes in Burke Lake that are not great enough to affect aquatic life. Fortune Minerals' conclusion, with respect to water quality, is summed up in the developer's words as follows:

*"Together with Fortune's environmental management plans, we are confident that the NICO Project will not have significant adverse impacts on water quality and the people will be able to use the water in Burke Lake, the Marian River as they have in the past" (PR#373, p. 5).*

Fortune Minerals has made commitments specific to protecting water quality during Project construction, operations, closure and post-closure in its final submission dated October 22, 2012. These commitments form part of the scope of the NICO Project and can be found in Appendix B.

#### **3.1.1.2 Parties' submissions and recommendations**

In its Technical Report, AANDC states that SSWQOs are the standard for water and must consider factors such as use of the water by aquatic life and people as well as background conditions. In AANDC's view, SSWQOs should also consider objectives that are reasonably achievable through use of effluent treatment technologies or best management practices. Based on these principles, AANDC believes that the SSWQO proposed by Fortune Minerals are unnecessarily high because they rely predominantly on toxicity data and do not fully consider mitigation measures such as effluent treatment or other contaminant source reductions, notably dust mitigations (PR247, p. 5-6).

Discussion took place on April 18, 2012 between AANDC and Fortune Minerals after the February 2012 technical meetings on the issues of overestimation of dusting and SSWQOs. A meeting report was submitted (PR#232). In its Technical Report, AANDC notes that the use of very conservative assumptions in modeling predictions relating to the contributions of dusting and aerial deposition is responsible for increases in modeled water quality parameters in Peanut Lake. AANDC believes that this conservatism resulted in higher proposed SSWQOs (PR#247, p. 8). AANDC believes that dust management strategies can be used to reduce impacts on the aquatic environment and that Fortune Minerals has committed to implementing dust suppression strategies. More realistic modeling is therefore possible with the use of dust mitigation to more accurately predict the implications from the contribution of dust loadings to water bodies.

AANDC fully supports the decision by Fortune Minerals to treat mill effluent with reverse osmosis treatment technology and believe that the system will produce good quality effluent during operations. AANDC and EC both note that the predicted treated effluent quality will be so good that receiving water quality will likely be well below the proposed SSWQO at least during operations.

AANDC notes that the Tłıchǫ people actively use the area downstream of the Project site for traditional activities including fishing, harvesting and drinking water and that the Marian River system, in particular, has cultural values. The protection of these specific uses needs to be taken into account when deriving SSWQOs for the NICO Project. AANDC states that it cannot propose specific numerical values for SSWQOs during this environmental assessment and therefore believes that narrative statements are more appropriate in determining the level of protection for water downstream of the Project during operations and closure. AANDC believes that setting SSWQOs at the levels proposed in its recommended narrative statements will minimize degradation of the aquatic environment and protect the intended downstream uses through mine operations and into the future (PR#247, p. 9). SSWQOs are proposed for a specified location or assessment boundary, in some cases at the edge of a mixing zone in the aquatic environment. With respect to this assessment boundary, AANDC suggests that the SSWQOs should be met at the outlet of Peanut Lake.

In its Technical Report, AANDC provides specific narrative statements for SSWQOs and recommends: “the Report of EA should include narrative statements and describe the level of protection to be afforded to the aquatic receiving environment downstream of the Initial Dilution Zone.” These statements could include:

- water quality changes due to mining activities will not significantly affect benthic macro-invertebrates and plankton abundance, taxonomic richness or diversity;
- water quality changes due to mining activities will not significantly alter fish abundance or diversity or fish consumption at current levels;
- water quality changes due to mining activities will not negatively affect areas utilized as traditional drinking water sources;

- water quality changes due to mining activities will not significantly affect mammals or wildfowl using the area as a drinking water, food source or habitat, or the current ability for people to harvest these animals; and
- water quality in the Marian River remains unchanged (PR#247, p. 10).

When asked during the August 29 public hearing in Yellowknife for clarification on the exact meaning of “significantly affect”, “significantly alter”, or “negatively affect”, AANDC acknowledged that these terms were subjective and that the term “substantially unaltered” might be more appropriate as it is consistent with land claim language in the Tłıchǫ Agreement (PR#338 p145 and103).

AANDC further recommends in its technical report that the final SSWQOs developed during the regulatory phase should be based on the downstream uses now and into the future and provides examples of how this could be achieved in its Technical Report. AANDC recommends that as a first step in deriving SSWQOs, the developer should consider practically achievable concentrations demonstrated for the reverse osmosis effluent treatment system (PR#247, p. 10).

In its Technical Report, Environment Canada (EC) concludes that the SSWQOs proposed by Fortune Minerals do not represent objectives that can best protect downstream uses of receiving waters. While EC does not agree with how the SSWQOs were derived, it notes that the predicted effluent quality due to the reverse osmosis treatment plant is excellent and should result in concentrations of contaminants that meet national guidelines. Despite the treatment of wastewater from the mill to a high standard, EC believes that the SSWQOs proposed by Fortune Minerals are higher than warranted due to conservative assumptions and modeling inputs, primarily for fugitive dust contributions.

EC supports the use of best management practices, formalized management plans and follow-up monitoring to address contributions of dust to the aquatic environment (PR#246, p. 6-7). In response, Fortune Minerals states in its final submission that it commits to preparing an incineration management plan and an air quality management plan (PR#373, p. 26). Fortune Minerals has committed to air emission and dust suppression mitigation measures to limit the effects of dust deposition on surface waters. These commitments can be found in the developer’s final submission (PR#373, p.3, 7 and 25) and in Appendix B of this Report.

EC states in its Technical Report that they do not support the SSWQOs proposed by the developer. EC further recommends that they not be used as a basis for developing effluent quality criteria. It is EC’s opinion that deferring further discussions of the SSWQOs to the regulatory stage would not compromise the assessment of discharge-related potential impacts provided the proposed treatment system and mitigation commitments go forward (PR246, p. 8). In its Technical Report Recommendations and Responses, Fortune Minerals accepts this recommendation from EC (PR#273).

The Tłıchq Government submitted information and recommendations to the Review Board on SSWQOs in two separate Technical Report documents (PR#264, #265). The risk assessment document in particular proposes recommendations on water quality.

The Tłıchq Government provides information and context for its view of the intrinsic value of water related to current and future traditional water use in its Traditional Knowledge and Use Study and in its closing arguments document. The Tłıchq people use water in the region of the NICO Project for many purposes as they travel along traditional trails and transportation corridors. The Tłıchq Government wants its people to be able to continue to safely use water in the area now and into the future. In its closing argument document, examples of these uses of water for Tłıchq people include:

- drink water when they travel through;
- canoe to all the areas travelled by the ancestors;
- eat the fish in all areas; and
- make snow tea as they travel through the area (PR#369, p. 21).

The *Tłıchq Land Claims and Self-Government Agreement* came into force in 2005. It is a land claims agreement within the meaning of Section 35 of the *Constitution Act*, 1982. Chapter 21 of the Tłıchq Agreement addresses water rights and management. It includes provisions granting the Tłıchq people a right to waters that remain substantially unaltered. Section 21.2.3 specifically states that:

*The Tłıchq First Nation has the right to have waters which are on or flow through or are adjacent to Tłıchq lands remain substantially unaltered as to quality, quantity and rate of flow when such waters are on or flow through or are adjacent to Tłıchq lands (PR#369 p21).*

The Tłıchq Government therefore states that in order to maintain the traditional values and in keeping with the Tłıchq Agreement, water needs to be protected for future generations. The Tłıchq Government provides recommendations for measures related to water quality objectives because it believes that the developer's commitments for water quality do not ensure that use of Burke Lake and the downstream watershed will remain protected. In its closing arguments document, the Tłıchq Government proposes the following measures in order to address the likelihood of significant adverse impacts:

- *Measure 10: The proponent will specifically set out the objectives that, for all areas outside of the mixing zone, which includes all of Burke Lake (Datoti) water quality changes throughout all states of Project (construction, operation, active closure, post-closure) will not significantly negatively affect:*
  - *Benthic invertebrate and plankton abundance, taxonomic richness or diversity;*
  - *Fish abundance or diversity or fish consumption at current levels;*
  - *Areas utilized as traditional drinking water sources; and*



- *Mammals or wildfowl using the area as a drinking water, food source or habitat, or the current ability for people to harvest these animals.*
- *Measure 11: The proponent will ensure that final site-specific water quality objectives (SSWQOs) are based upon the Tłıchǫ Peoples' traditional use of the downstream aquatic environment (including Burke or Datoti), now and into the future.*
- *Measure 12: The proponent will ensure that the Tłıchǫ Government and Tłıchǫ citizens actively participate in the development, approval and implementation of the environmental monitoring program, as the downstream receiving environment is located on Tłıchǫ owned lands, with mandatory warning of spills and strong communication with the Tłıchǫ Government (PR#369, p. 22).*

During the hearing in Behchoko on August 30, 2012, Brett Wheler, technical advisor to the Review Board, asked the Tłıchǫ Government whether the descriptive narrative statements proposed by AANDC would suffice in the determination of significant adverse impacts to water quality (PR#340, p. 131). Tłıchǫ Government responded by advising that they support the narrative statements. In their closing arguments document, they repeated that these qualitative expressions should be a foundation for future work on SSWQOs (PR#340, p. 132, PR#369, p. 23).

The Tłıchǫ Government stated repeatedly in submissions to the Review Board that full protection of Burke Lake is critical because it is culturally important. The Tłıchǫ Government stated that if the measures they proposed to protect impacts to water quality are not imposed on the developer, it remains likely that significant adverse impacts on the environment will result from the Project (PR#369, p. 25).

### **3.1.1.3 Review Board's analysis and conclusions**

The Review Board has considered all of the views and recommendations of parties and the developer in its consideration of impacts to water quality from the NICO Project. The Review Board finds that the Project as proposed by the developer, despite the incorporation of commitments related to water quality, is likely to have significant adverse impacts on water quality and that measures to mitigate those impacts to an acceptable level are required.

Water quality was the focus of concern throughout the various stages of this environmental assessment from the scoping phase, through information requests, technical meetings and hearings. In particular, the Review Board heard of the value placed on water by the Tłıchǫ



people in Whati and Behchoko during hearings in those communities. The Review Board believes that the protection of water from impacts of the NICO Project on downstream water bodies is paramount.

The Review Board is mindful that the Tłıchq Agreement grants the Tłıchq people rights to water on or adjacent to their lands, described in the Agreement as substantially unaltered as to “quality, quantity and rate of flow”. Ensuring that water and waterbodies are substantially unaltered by the construction, operation and closure of the NICO Project is therefore necessary in order to comply with Tłıchq rights as stated in the Tłıchq Agreement.

Project design improvements to the NICO Project during the course of the environmental assessment have been important to various parties and have been critical in the Review Board’s findings. The Review Board notes in particular that the developer has modified its mine effluent treatment technology from ion exchange to the superior reverse osmosis. Fortune Minerals commits to meeting site specific water quality objectives at the outlet of Peanut Lake. The Review Board accepts this commitment and agrees with the developer, AANDC and the Tłıchq Government that use of Peanut Lake as a mixing zone is appropriate, provided traditional uses of downstream water bodies are protected. As discussed below, Fortune Minerals’ commitments with respect to mitigations and contingencies for closure are also necessary to ensure that water quality objectives are met post-closure as well.

The Review Board acknowledges the disagreements between parties as to how Fortune Minerals has derived numerical SSWQOs and accepts that the values may be more akin to “toxicity thresholds” as suggested by AANDC. Nevertheless, the Board agrees with parties that the ultimate goal is to ensure protection of traditional water uses in the area now and in the future. Based on their Traditional Knowledge and Use Study, the Tłıchq Government was clear with respect to what traditional uses they wanted to protect and in what water bodies downstream of the mine. In the Review Board’s opinion, if these uses are protected, then no significant adverse effects due to Project related water quality changes will occur.

In the Review Board’s opinion, use of narrative statements to describe the level of protection required downstream of the mine is appropriate for environmental assessment purposes. The Review Board agrees with the AANDC submission that it should use narrative statements that “represent qualitative objectives that would guide the development of numerical objectives and provide the accepted level of protection and the standard for downstream waters” (PR#338 pp143-144). The Review Board notes that Fortune Minerals has confirmed that it has planned for and will implement those mitigations and contingencies necessary to ensure that water uses are protected and that the qualitative objectives proposed by AANDC can be met in Burke Lake and downstream during all phases of the Project. Despite Fortune Minerals’ apparent agreement, the Review Board believes that in the absence of clear narrative statements to protect water quality, set out in the form of measures, potentially significant adverse impacts to traditional uses of water bodies downstream of the mine are likely.



Several parties have made detailed recommendations about how final numeric SSWQOs should be set during the regulatory phase, including what factors should be considered (e.g., background values, CCME guidelines etc.). The Review Board notes that these recommendations are already consistent with the Mackenzie Valley Land and Water Board's Water and Effluent Quality Management Policy and that no further measures are required in this regard. The Review Board also notes that this Policy is clear in its objective of ensuring that waste discharges are minimized. In the Review Board's opinion it is unnecessary to restate this objective in a measure in the report of environmental assessment.

After considering the evidence on the public record, in the Review Board's view there is likely to be significant adverse impacts from the NICO Project to water quality including the use of Burke Lake and downstream water bodies now and in the into the future. In order to mitigate significant adverse impacts to water quality from the NICO Project the Review Board recommends the following measures:

#### **Measure 1**

The NICO Project will be designed and operated by Fortune Minerals throughout all Project stages (construction, operation, active closure, post closure), so that the Tłıchǫ people's traditional water uses, now and into the future, are not adversely affected by mining activities. These uses include:

- use of traditional drinking water sources; and
- use of traditional areas for fishing.

#### **Measure 2**

The NICO Project will be designed and operated by Fortune Minerals throughout all Project stages (construction, operation, active closure, post closure), so that the following water quality objectives are met in any area downstream from Peanut Lake, including all of Burke Lake (*Datoti*):

- water quality changes due to mining activities will not substantially alter benthic invertebrate and plankton abundance, taxonomic richness or diversity;
- water quality changes due to mining activities will not substantially alter fish health, abundance or diversity or impact the ability of traditional users to harvest or consume fish;
- water changes due to mining activities will allow for safe use of water by wildlife and waterfowl; and
- water quality, quantity and rate of flow in the Marian River is to remain substantially unaltered.

### Measure 3

In order to reduce significant adverse impacts of contaminant loading in receiving waters during construction and mine operations, Fortune Minerals will prepare a dust mitigation and monitoring plan. This Plan will incorporate Fortune Minerals' commitments for fugitive dust suppression and dust suppression techniques and apply lessons learned about dust suppression from other Northwest Territories mine sites.

This plan will be developed in collaboration with aboriginal users of the area and will be incorporated into the NICO water licence issued by the Wek'eezhii Land and Water Board.

### 3.1.2 Water quality monitoring and management

#### 3.1.2.1 Developer's position and submissions

The developer's approach to biophysical monitoring and management plans is presented in Section 18 of the DAR. In this section, Fortune Minerals describes:

- a summary of community engagement activities;
- an overview and approach to adaptive management through implementation of an environmental management system;
- the principles and practices of effective monitoring; and
- operational management plans and monitoring programs.

Appendix 18.I of the DAR describes the conceptual aquatic effects monitoring program. The aquatic effects monitoring program explains how Fortune Minerals proposes to monitor aquatic effects from the NICO Project. Detailed study designs, methods, procedures and data sheets will be developed during the permitting phase. Fortune Minerals notes that communities, the public and regulatory authorities are all involved in monitoring.

Goals of the aquatic effects monitoring program specific to community and public involvement are to:

- provide a process for regulators, communities and other people interested in the NICO Project to participate in the development and review of aquatic effects monitoring; and
- develop a process to provide results of monitoring to communities, government and the public (PR#116, Appendix 18.I, p. 18.I.1).

Fortune Minerals states that the aquatic effects monitoring program will be implemented in order to mitigate effects to the aquatic ecosystem, including fish habitat, fish health and fish use to test impact predictions. The aquatic effects monitoring program will include a provision prescribed by the Mine Metal Effluent Regulations of the *Fisheries Act*. Fortune Minerals further states that they will "consider" the AANDC "Guidelines on Designing and Implementing Aquatic Effects Monitoring Programs in the Northwest Territories" (2009) and

the draft Adaptive Management (Monitoring Response) guidelines from the Wek'eezhii Land and Water Board (2010) (PR#116 p. 18-11).

The objective of the aquatic effects monitoring program of particular relevance to this discussion is the objective to:

- consider existing regional and collaborative programs, such as the NWT Cumulative Impact Monitoring Program or the proposed Marian River watershed community monitoring program (PR#116 p. 18-21).

### 3.1.2.2 Parties' submissions and recommendations

In its Technical Report, AANDC agrees with Fortune Minerals that an aquatic effects management plan and adaptive management framework are required for the NICO Project. AANDC would prefer that the developer commit to a stronger statement rather than to just "consider" recommended guidelines on designing and implementing aquatic effects monitoring programs (2009 *Guidelines*). In particular, the 2009 *Guidelines* include a mechanism to incorporate traditional knowledge in an efficient and effective manner. AANDC also describes the eight-step program for designing and conducting monitoring of the water environment in its Technical Report (PR#247, p. 12-15).

For these reasons, AANDC recommends that the developer be required to follow the "*Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories, June 2009*" in the development of its aquatic effects monitoring program, action levels, and related management response framework.

The Traditional Knowledge and Use Study submitted by the Tłıchǫ Government describes traditional use values and activities within the NICO lease boundary, in the local and regional study areas. Section 5.1.1 of the Study refers to general loss of use areas that Tłıchǫ people avoid due to past industrial activities. This section describes areas that are partly or fully avoided due to perceived contamination, particularly to water, related to the Rayrock mine site, an abandoned mine site under the care of the federal government, located approximately 15 km to the southeast of the NICO Project. (PR#349 p. 34-35).

The Study further states that it is a perception of participants in the Tłıchǫ Government Traditional Knowledge and Use Study that the NICO Project is likely to expand the area of avoidance by people and increase loss of use areas for traditional activities. The Study quotes Alphonse Apples as follows:

*"Rayrock mine...(I) wouldn't drink the water up there...up to Hislop. After that we can drink water, we're scared to drink water from Rayrock mine...Concerned about this area, it's a good fishing area. If they spoil the water what is going to happen to the fish, this is what the people are worried about, the fish around that area"* (PR#349 p35).

In its closing argument, the Tłıchǵ Government identifies that monitoring, and responses if required to that monitoring, is an information gap despite commitments from the developer. Monitoring and the developer's reaction to monitoring results is identified by the Tłıchǵ Government as a key to ensuring that waterways remain protected for traditional uses now and into the future (PR#369, p. 22).

The Tłıchǵ Government observes that during the hearings in Whati and Behchoko, Tłıchǵ citizens made several statements of concern regarding water quality downstream from the proposed mine. As a result of these concerns, the Tłıchǵ Government believes that it is vital that people's confidence in water quality be maintained throughout operations and closure of the NICO Project. This can be achieved through Tłıchǵ Government-controlled, community-based water monitoring programs that connect with the Marian River Watershed Program (PR#369, p. 23).

The Tłıchǵ Government recommends a specific measure regarding monitoring in order to address the likelihood of significant adverse impacts as follows:

*The proponent will ensure that the Tłıchǵ Government and Tłıchǵ citizens actively participate in the development, approval and implementation of the environmental monitoring program, as the downstream receiving environment is located on Tłıchǵ owned lands, with mandatory warning of spills and strong communication with the Tłıchǵ Government (PR#269 p. 23).*

### **3.1.2.3 Review Board's analysis and conclusions**

During the hearings in Behchoko and Whati, the Review Board heard from the Tłıchǵ Grand Chief, the Chiefs of Wekweètì, Whati, Gameti and Behchoko as well as members of the communities. Many of the statements made at the hearings relate to concerns with water quality downstream of the mine during operations and after the mine closes. The Board notes that many of the fears from people are due to experiences with past mine developments. The former Rayrock mine was referenced numerous times at the October 11, 2012 public hearing by people as an example of an unregulated Project whose impacts, both real and perceived, remain relevant today.

The Review Board recognizes that concerns about past mining activities in the Tłıchǵ Region are relevant to this development. It is worth noting that many of these concerns are based on fears from events that took place a long time ago when mining regulations did not exist as they do today. However, even though a modern mining company may make commitments and describe mitigation to protect the water, land, wildlife and people, some Tłıchǵ people view these steps with skepticism because of past experiences and the legacy of abandoned mine sites that scar parts of the Wek'eezhii settlement area landscape to this day.

The Review Board is aware that the NICO Project may result in loss of use for Tłıchǵ people of the area immediately downstream of the development due to perceptions of

contamination from the new mine unless steps by the developer and the Tłıchǵ Government are taken to mitigate the concern.

During the last day of hearings in Behchoko, the Review Board heard Fortune Minerals commit to use the results of the Tłıchǵ Government's Traditional Knowledge and Use Study in the development of monitoring plans in order to mitigate impacts from the project (PR#359, p. 286). The Review Board understands that it is the developer's goal to pursue community-based monitoring in collaboration with the Tłıchǵ people. Fortune Minerals suggests the formation of an elder's advisory committee to provide advice on what and where to monitor (PR#359, p. 288).

The Review Board acknowledges these efforts by the developer to work with the Tłıchǵ Government and its people to develop monitoring that has community approval and responds to mine-related changes in the environment with concrete actions. The Review Board heard the views of the Tłıchǵ people during the hearings and is mindful of the peoples' concerns with past mining activity. The Review Board is also cognizant that the NICO Project is located in the centre of Tłıchǵ titled land and an important cultural landscape.

In the Review Board's opinion, monitoring of water will be adequately addressed through the developer's commitments and monitoring that takes place as part of an Aquatic Effects Monitoring Program. The Review Board offers the following suggestions:

#### **Suggestion #1**

The developer should follow the AANDC document titled, *Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories, June 2009* in the development of its aquatic effects monitoring program, action levels, and related management response framework.

#### **Suggestion #2**

In order to keep the Tłıchǵ people informed on potential changes to water quality due to construction and operation of the mine, an Aquatic Effects Monitoring Program should include:

- consultation between Fortune Minerals and Tłıchǵ Government on how best to include Tłıchǵ people in monitoring;
- involvement of the Tłıchǵ people in water quality monitoring both upstream and downstream of the Project;

- communication of monitoring results to the Tłıchq people;

## 3.2 Impacts to the environment at closure

The Terms of Reference for the NICO Project describe closure and reclamation as a key line of inquiry for the developer to consider in the preparation of its developer's Assessment Report (PR# 87 p13). During scoping sessions in the Tłıchq communities, closure and reclamation of the NICO site was identified as a high priority because of past experience with abandoned mines in Wek'eezhii.

This section describes impacts of various mine components on the environment during the closure and post-closure phases of the mine. In planning for closure, it is important to design, construct and operate the mine with long-term objectives in mind. The construction and operation of key project components are therefore described in this closure section because construction and operation decisions made early on and throughout mine life have long-term implications. This section discusses some of the uncertainty on how key project components may influence long-term predictions on impacts to water quality and the environment. The key project components discussed are the co-disposal facility, the open pit and constructed wetlands.

### 3.2.1 Co-disposal facility

#### 3.2.1.1 Developer's position and submissions

Fortune Minerals has proposed the relatively new concept of a co-disposal facility for tailings and waste rock at the NICO mine site. Fortune Minerals states that the objective of co-disposing mine rock and tailings is to reduce infiltration of water and oxygen through the mixed mine rock and tailings matrix (PR#116 p 3-46). The DAR provides details for co-disposal facility design and operations. At its full extent, the co-disposal facility occupies a footprint of 139 ha in the Grid Ponds Valley and will not be visible from the Îdaà Trail or Hislop Lake (PR#116 p3-50, p9, p18). Fortune Minerals provided comprehensive details about the co-disposal facility in answers to information requests, in technical reports and during hearings. The co-disposal facility is discussed below in terms of new technology in the north, tailing and mine rock characteristics, water management from the facility and closure and reclamation.

#### Co-disposal facility as new technology

In its Co-disposal Case Histories technical memorandum, Fortune Minerals defines that "co-disposal refers to the disposal of tailings and mine rock stream in one integrated facility." (PR# 171) In Section 1.3 of the memorandum, Fortune Minerals describes the benefits of co-disposal over traditional disposal of tailings and mine rock, as follows:





- inclusion of tailings reduces oxygen flux and infiltration through mine rock to control acid mine drainage plus metal leaching;
- stability improvement via the inclusion of mine rock;
- reduction in footprint and thus closure costs;
- single facility simplifies water management, monitoring and closure; and
- reduced rates of erosion. (PR#171)

While Fortune Minerals states that co-disposal is a relatively new technique, they advise that there are a number of co-disposal facilities located in northern environments, and provide examples in sections 5.2, 5.8, and 5.5 of the technical memorandum on Co-Disposal Case Histories.

Section 5.2 references Green's Creek, Alaska, a mine that produces Zn, Ag, Au, and Pb. Green's Creek started relocating mine rock to a filtered tailings disposal facility in 2009 for co-disposal. Section 5.8 references Snap Lake Mine in Northwest Territories where processed kimberlite and mine rock are to be placed in a co-disposal facility comprising of 3 cells. Section 5.5 references Nunavik Nickel Mine in northern Québec, where it is planned that tailings and mine rock will be placed in a multi-cell facility. (PR# 171)

### Tailings and mine rock

In the DAR, Fortune Minerals states that mine rock will be either used in construction (mostly within the co-disposal facility) or strategically place within the co-disposal facility depending on its potential for acid and/or metal leachate generation. Fortune Minerals classifies the NICO mine rock into the following 3 categories and describes their uses within the project site as follows:

#### Type 3 mine rock

- high potential for acid generation and metal leaching;
- rock stored within the co-disposal facility and be placed with a 20 m offset from the exterior of the perimeter dyke.
- 

#### Type 2 mine rock

- low potential for acid generation;
- rock used for construction of the co-disposal facility perimeter dyke.

#### Type 1 mine rock

- low potential for acid generation and metal leaching;



- rock used for of site construction including seepage collection pond dams, site roads, the mine road, the service road, fill, and in the production of aggregate for concrete. If excess Type 1 rock is available, it can also be used in place of Type 2 rock for construction of the perimeter dyke. (PR#116 p. 3-46)

Fortune Minerals has been and is currently conducting field cell tests to characterize the rate of reaction of sub-economic mineralized mine rock. Fortunes Minerals states in its Developer's Assessment Report that acidity has not been generated in the field cell leachates after 3 years of monitoring; however, elevated concentrations of some trace metals were measured. (PR#116 p. 3-23)

In 2011, Fortune Minerals constructed a co-disposal field test composed of mine rock designated for the co-disposal facility to evaluate acid and metal leachate and subsequently provided details to the Tłıchǫ Government in an information request response (PR#146 p. 53). The test consisted of three field cells: one composed of mine rock only (to serve as the control for the co-disposal tests); a second with thoroughly mixed mine rock and tailings; and a third with layered mine rock and tailings. Fortune Minerals specified that interim results will be reported when they are available.

The DAR states that all contact water from the co-disposal facility will be pumped to the surge pond for re-use in the mill or for treatment in the effluent treatment facility and released (PR#116 p. 3-46). After mine operations are complete, Fortune Minerals proposes that all contact water will flow from the co-disposal facility to seepage collection ponds and then through constructed wetlands.

#### Water management of the co-disposal facility

Compared to conventional tailings disposal (e.g. tailings ponds), Fortune Minerals presented the following water management benefits of co-disposing tailings with waste rock:

- reduced environmental risk because a large tailings water pond is not required;
- minimal liquids/solids separation during deposition;
- minimal particle separation resulting in the increase of deposition density and storage volume;
- reduced footprint; and
- less tailings contact water to manage, treat and discharge (PR# 171).

The DAR states that all contact water from the co-disposal facility will be pumped to the surge pond for re-use in the plant or for treatment in the effluent treatment facility and released during operations (PR#116 p. 3-46). At closure, Fortune Minerals proposes that

contact water from the co-disposal facility will flow either to the open pit or into constructed wetlands prior to release into NICO or Peanut Lake.

Section 3.8.2.3 of the DAR (PR#116 p. 3-49-50) describes water management of the co-disposal facility during operations and closure. During operations, tailings water will seep through the tailings cell berms and form the reclaim pond at the northwest corner of the co-disposal facility. The reclaim pond will move westward in response to the progression of the co-disposal facility. Fortune Minerals states that in later years it may be necessary to dress the inside surfaces of the perimeter dyke with tailings to reduce seepage losses and to maintain a suitably sized reclaim pond. Reclaim pond water is pumped to the surge pond.

Seepage from the southwest end of the perimeter dyke will collect in seepage collection ponds 1, 2 and 3. These ponds are designed to be water-retaining structures and will be lined with a geo-membrane. Seepage collection pond No. 5 is in a natural depression on the southwest side of the co-disposal facility.

Seepage collection pond No.4, also a water retaining structure with a geo-membrane, will collect surface runoff water and seepage. Seepage collection pond No. 4 is located on the north side of the co-disposal facility. Water collected in the seepage collection ponds will be pumped to the surge pond either by using a floating barge pump or a barge placed on a trolley. Water not recycled to the plant will be treated at the effluent treatment facility.

At closure, Fortune Minerals states that water from the seepage collection pond No. 4 will flow to the open pit. Water from seepage collection ponds 1, 2 and 3, as well as from the surge pond will flow to the constructed wetland treatment system prior to discharge into Nico Lake (PR#116 p. 3-50).

Baseline data reveals that permafrost is prevalent at the NICO site (PR#116). Fortune Minerals claims that the co-disposal facility technology does not rely on permafrost for stability and is stable during freeze and thaw cycles. As well, Fortune Minerals states that the co-disposal facility may cause permafrost to aggrade.

In their response to Natural Resources Canada's technical report recommendations, Fortune Minerals gave the following statement with regards to permafrost in the co-disposal facility area:

*"It should be noted that thermistor readings and attempts to read water levels at standpipe piezometers in the vegetated wetlands of the co-disposal facility in the summer and fall of 2011 and 2012 indicate that the discontinuous permafrost layer appears to extend to all monitoring wells. All have remained frozen throughout the above-freezing months. Thermistor readings suggest the active layer is on the order of 4m thick. In this context the overburden layers of the numerical model can be seen as conservative because the frozen ground is better*

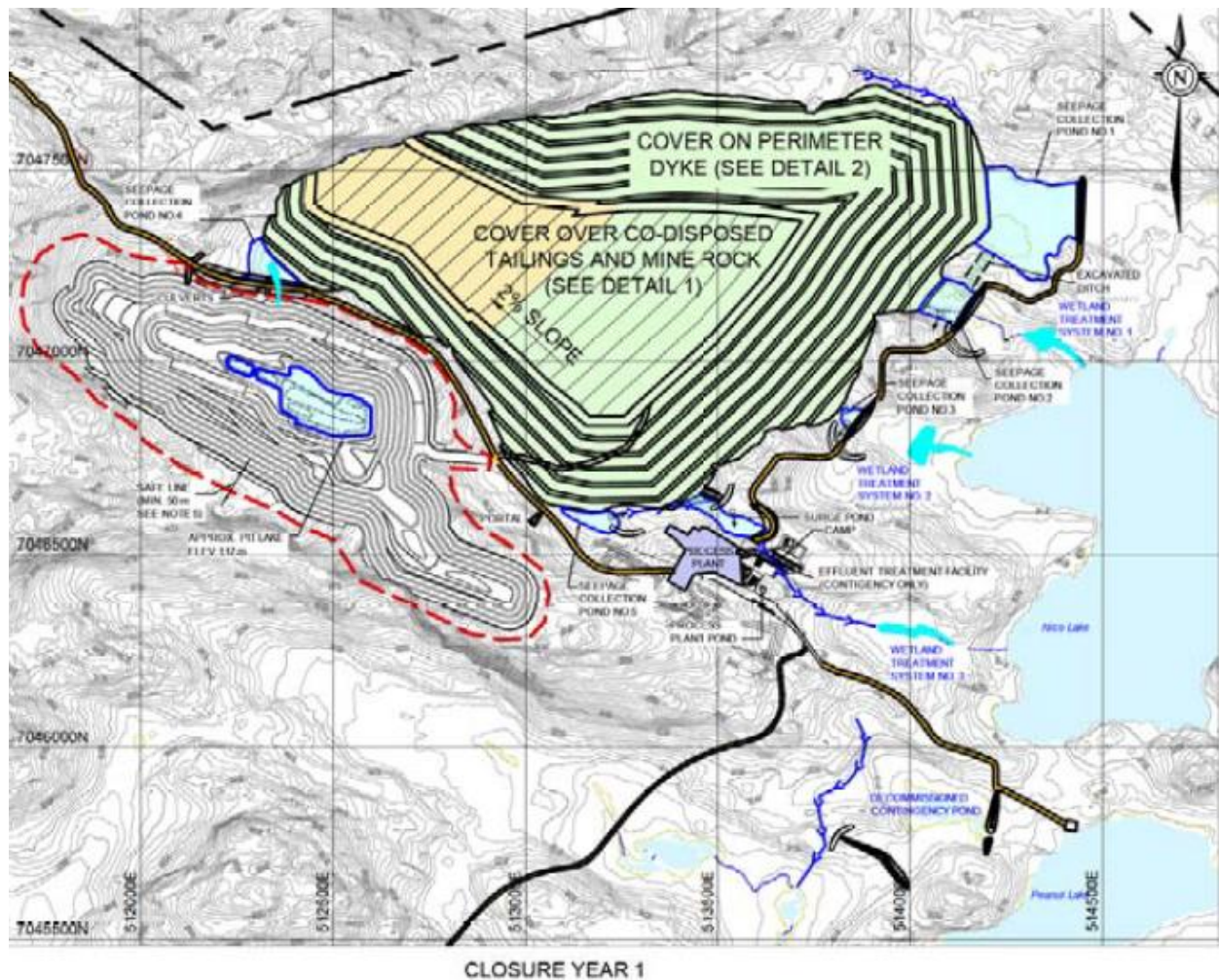
*represented as a no-flow layer rather than a low permeability layer, as it has been simulated” (PR#322 p. 11/22).*

#### Closure and reclamation of the co-disposal facility

Fortune Minerals submitted a co-disposal facility management plan as part of the DAR. It stated that progressive reclamation of the co-disposal facility will occur shortly after the start of mine operations and is made possible by the depositional scheme of the facility. The co-disposal facility cover will be subdivided into 2 segments: cover for the perimeter dyke and cover for the co-disposed mine rock and tailings. In section 3.II.9 of the co-disposal facility management plan, Fortune Minerals indicates that the Plan will include the following:

- progressive grading of the co-disposal facility during operations to promote runoff into the open pit after closure;
- progressive placement of the closure cover over the perimeter dyke during operations;
- placement and vegetation of closure covers over the top surface of the co-disposal facility;
- drainage of runoff water from the surface of the co-disposal facility into the open pit to increase the rate of pit filling; and
- collection and management of water that seeps out of the toe of the co-disposal facility (PR#116).

Re-vegetation was also incorporated into the co-disposal facility cover strategy as it minimizes erosion while also decreasing infiltration by evapo-transpiration (PR#116 p. 2-19).



**Figure 6:** Progression of cover system (PR#116 figure 9.4-1)

In the DAR, Fortune Minerals provides details on the proposed cover system and states that they will undertake a program to enhance the co-disposal facility cover design. Fortune Minerals states that the cover design program will include:

- laboratory testing of proposed cover materials plus tailings;
- test pitting;
- modeling of cover performance with respect to climate; and
- pilot plots that will be constructed and monitored in the early stages of the mine.

Fortune Minerals states in its closure scenario submission that the cover is estimated to limit rain water infiltration into the co-disposal facility to about 15% of the mean annual precipitation and predicts that the cover system will develop a steady rate of infiltration. (PR# 297)

During the August 31 hearings in Behchoko, Fortune Minerals gave the following statements with regards to the operations of the co-disposal facility cover and seepage through the facility:

*“For the CDF the cover will be placed over a portion of the surface. We will use locally available glacial till. This will minimize wind and water erosion. It will also limit infiltration of rainwater, and will provide adequate store and release capacity.”* (PR#340 p 17)

*“The layered system and blending of the fine grain materials or the layering of the fine grain material, actually really helps to reduce seepage rate through the materials. It also helps reduce oxygen diffusion and puts the entire CDF into a very stable physical state and also a stable geochemical state as well with respect to the consistency of the seepage that we would expect coming out of this facility.”* (PR#340 p 55)

During the public hearings, Fortune Minerals provided the following rationale for why a synthetic cover was not chosen for the co-disposal facility as “synthetic covers are not a walk-away type of solution” and “they require periodic maintenance, and they do require replacement approximately every 100 years.” (PR#340 p 54)

### **3.2.1.2 Parties’ submissions and recommendations**

Despite the northern and southern examples of co-disposal facilities provided by Fortune Minerals, some parties continued to question co-disposal technology throughout information requests, technical meeting and during the public hearings.

In their closing comments, the Tłı̨chǫ Government dismisses all co-disposal facility examples. They state that the examples Fortune Minerals provided are not relevant as they are either in southern locations or from facilities not entirely in operation. (PR# 369)

At the hearings, the Tłı̨chǫ Government also presented their rationale to have a peer review committee for this new technology. During the hearings, the Tłı̨chǫ Government also gave the following statements pertaining to uncertainties of the co-disposal technology:

*“Two major experimental technologies are being tested in the Tłı̨chǫ region, co-disposal and wetlands treatment. We have studied these carefully and we see major uncertainties with the implications of these technologies for the Tłı̨chǫ land.”* (PR#338 p 23)

*“...have brought forward the idea that there be an oversight body established for the early years of a peer-review mechanism, both for the co-disposal facility but also for wetlands.”* (PR#340 p 121)





The Tłıchǵ Government, in information requests, questioned why rocks with acid generating potential are to be used for construction purposes (PR#141 p 34, PR#218 p37) and questioned the overall characterization of waste rock in their closing comments. The Tłıchǵ Government contends in closing arguments that the 0.3% safe sulphur cut off value is too high, and questions the developer's sampling methodology and comment on the limited amount of data collected to date from the humidity cell tests (PR#369 p31-32).

During the first round of information requests, NRCan questioned the developer's classification of at least one type of sub-economic mineralized mine rock (PR#133 p2).

In their information requests NRCan discussed the influence of ground water flow through seepage, stating that "characterization of the hydraulic properties of geologic materials and identification of potential groundwater pathways is essential to determine the effects that the project may have on water quantity as well as quality." Due to the importance of determining the hydrogeological properties of the site, NRCan requested that Fortune Minerals provide additional information on this subject, to which they complied (PR#133).

At the Yellowknife hearing, NRCan gave the following statement with regards to seepage from the co-disposal facility:

*"For the co-disposal facility, or CDF, NRCan agrees with Fortune that its seepage impacts can be minimized following appropriate design and an effective management plan. NRCan is supportive of Fortune's approach and commitments for the final design." (PR#338 p 44)*

EC asked in their information request that Fortune Minerals describe the anticipated water quality of the co-disposal facility, seepage collection ponds, surge pond and drainage ditches and flooded open pit. EC was concerned about the potential impacts of the water quality on the health of waterfowl and migratory birds (PR# 139). Fortune Minerals submitted a Wildlife Health Risk Assessment (PR#150) in response.

In their closing comments, the Tłıchǵ Government reviewed thiosalt formation and its correlation to seepage from the co-disposal facility. They state that the developer's analysis and commitments do not go far enough to draw a conclusion that there will not likely be a significant adverse impact on the environment from thiosalts formation (PR# 369).

The Tłıchǵ Government also gives the following measure with respect to thiosalt formation:

*"The proponent will include monitoring, assessment and management of thiosalts in an independently peer reviewed mine waste management plan, to be approved by the MVLWB prior to the start of milling." (PR# 369)*

### Closure and reclamation of co-disposal facility

Throughout the EA process, the Tłıchq Government voiced concerns about the co-disposal facility cover and the cover's correlation to water quality. During the second round of information requests, the Tłıchq Government also expressed concerns about the functioning of the proposed co-disposal facility cover with respect to seepage (PR#218 TG 14). At the hearings, the Tłıchq Government gave the following statement while contending the need for an impermeable cover to minimize infiltration into the co-disposal facility:

*"that the use of an impermeable cover on the CDF would reduce infiltration, essentially eliminate seepage coming out of the CD" (PR#340 p 53).*

The developer's response is that a synthetic cover is not a walk-away solution and would require maintenance and ultimately replacement approximately every 100 years (PR#340 p54).

#### **3.2.1.3 Review Board's analysis and conclusions**

The Review Board recognizes that the mining industry has no long term operational experience with co-disposal facilities and that there are no examples of co-disposal facilities in the closure and post-closure phases to study long-term effectiveness. In the Review Board's opinion there is considerable uncertainty with the operation and closure of the co-disposal facility proposed by the developer. The Review Board views this uncertainty as an unacceptable risk for the project that needs to be addressed.

The Review Board is of the opinion that a peer review committee for the co-disposal facility is required to mitigate significant adverse impacts of the project on water quality during operations and closure.

#### **Measure #4**

In order to mitigate significant adverse impacts to water quality and the environment downstream of the project site, the developer will fund an expert peer review panel for the co-disposal facility. This panel of three people is to be established under the water license in consultation with Fortune Minerals and the Tłıchq Government and consist of one appointee from each party and the Wek'eezhii Land and Water Board.

The peer review panel will be established prior to the start of mine operations and will be in place for the operational life of the mine. It will:

- consist of technically qualified individuals capable of reviewing the design and performance of the co-disposal facility;



- assess Fortune Minerals' Co-disposal Facility Monitoring and Management Plan;
- provide recommendations intended to reduce adverse impacts and improve the operations and effectiveness of the co-disposal facility to the Wek'eezhii Land and Water Board, Fortune Minerals and the Tłıchǫ Government; and
- address any questions from any of the three parties in relation to its assessments and recommendations.

The Board accepts the developer's evidence that a synthetic cover has a limited 100-year life. The Board understands that the till cover is able to diminish water infiltration to approximately 15%. As well, the Board accepts that it is not practical to replace a synthetic cover every 100 years. The Review Board finds that a synthetic cover does not represent a "walk away" scenario. The Board respects the Tłıchǫ Governments rationale for placement of a synthetic cover over the co-disposal facility as well.

There are advantages and disadvantages to whatever type of cover is to be installed upon closure of the co-disposal facility. The Review Board is, however, of the view that strong measures put in place to prevent significant adverse impacts to water quality downstream of the co-disposal facility will ensure that the environment and traditional uses are protected regardless of the final decision on a natural versus synthetic cover system.

### **Suggestion #3**

In order to address the concerns of the Tłıchǫ Government regarding infiltration into the co-disposal facility during closure and post-closure, further research of cover options should be undertaken by Fortune Minerals as part of the closure and reclamation planning process during the regulatory phase of the project.

### **3.2.2 Open pit**

After mining operations are complete, pumping will cease and the open pit will fill with water. Options for re-filling the open pit were discussed by parties and the developer throughout all stages of this environmental assessment, from information requests stage to the formal technical meeting, bi-lateral meetings between Fortune Minerals and individual parties as well as during the public hearings. Discussion focussed on parties' concerns with passive filling of the pit which results in a long post-closure phase with uncertainty regarding pit water quality predictions lasting for more than a century. An alternative proposal is active filling of the pit, which will reduce the timeframe to determine whether post-closure pit water quality predictions are correct to slightly more than one decade.

#### **3.2.2.1 Developer's position and submissions**

In the closure and reclamation section of the DAR, Fortune Minerals states that the main sources of water that will contribute to passive filling of the open pit will include

precipitation, runoff from the pit walls, groundwater inflow, up gradient runoff, and runoff from the co-disposal facility. Using the passive filling approach, Fortune Minerals predicts that the pit lake will overflow by closure year 120. Fortune's decision to allow the open pit to fill passively was originally made because modeling demonstrated that active filling would not remove the need for treatment of the overflow water in a constructed wetland system and that the cost of active filling of the pit was not justified (PR#116 p9-23-24, p9-44).

The developer's hydrodynamic model for the open pit suggests that a limited monolimnion will form with the remaining volumes of water being fully mixed. The water quality predictions for the flooded open pit were also performed assuming fully mixed conditions.

Furthermore, Fortune Minerals states that the parameters that could occur at concentrations in excess of the SSWQOs after the open pit has reached the spill-point elevation include aluminum, arsenic, cobalt, copper and selenium (PR# 116).

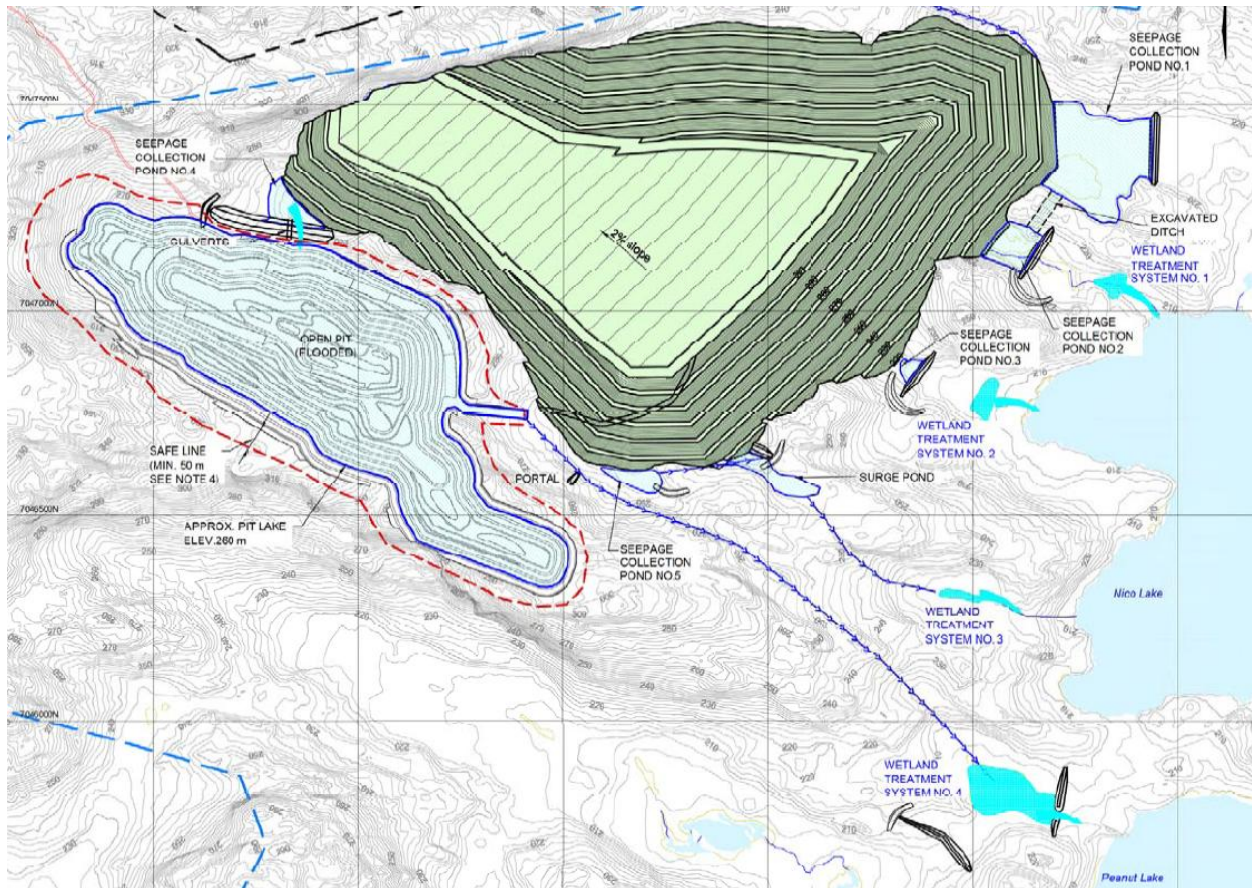


Figure 7: Layout of post-closure water management after pit overflow (PR#116 figure 3.III.7-2)

At the August 27 hearing, Fortune Minerals committed to active filling of the open pit to achieve pit over flow in approximately 12 years. The water would come from the Marian River (PR# 373).

With respect to active filling of the pit, Fortune Minerals gave the following statements during the public hearings in Behchoko and Yellowknife:

*“Based on input from a variety of concerned parties, including the Tłıchǫ, we have now committed to actively filling the open pit” (PR#340 p 19).*

*“Fortune was requested to consider the active filling of the open pit as part of its closure scenario. This would require that water from the Marian River would be used to supplement the inflow of the open pit” (PR#338 p 52).*

Fortune Minerals predicts that pit water quality upon filling and closure will be an issue, but acknowledges the uncertainty in its originally-proposed passive filling of the pit, and agrees to actively fill the pit so that there is time to ensure that the pit water quality is sufficient to allow water to top over and flow into the receiving environment.

In the DAR, Fortune Minerals states that it will be necessary to analyse water quality of the flooded open pit prior to overflow. At the hearings, Fortune Minerals commented that they are “fairly confident that the open pit won’t require treatment” (PR#340 p 32). As well, Fortune Minerals fully expects that the open pit will stratify (PR# 340 p 32). In Commitment #14, Fortune Minerals commits to active treatment of water from the open pit after operations have ceased if wetland treatment results are not acceptable (PR#373).

The DAR closure and reclamation section describes several alternatives to treating the overflow water including treating the water by chemical or biological means. Fortune Minerals’ base assumption in the DAR is that the overflow water will be amendable by passive treatment in wetland treatment system No. 4 (PR#116 p9-24).

### **3.2.2.2 Parties’ submissions and recommendations**

In the first round of information requests, AANDC requested that Fortune Minerals provide a cost comparison between passive and active filling of the open pit. As well, they requested that Fortune Minerals discuss the difference between closure scenarios with respect to environmental impacts (PR#134).

In its technical report, AANDC stated that its primary concerns with the passive filling are the length of time required for the pit to fill naturally and the need for passive or active water treatment post closure.

AANDC gave the following statement with regards to its view on the passive filling of the pit:

*“AANDC strongly prefers to see the pit filled actively over a period of approximately 10 years. The Department believes this is more manageable from a mine development perspective and ensures that the proponent addresses outstanding reclamation liabilities as efficiently as possible.” (PR# 247)*

The Tłıchǵ Government also expressed concerns about the passive filling of the pit, and stated in its technical report risk assessment:

*“The developer has presented two options for closure of the pit, including active re-filling and passive re-filling. The latter option could delay the proof of the wetlands concept for up to a century. This causes worry and concern for current Tłıchǵ Elders that they may leave a legacy of contamination for future generations, and may lead to significant concerns for future generations of Tłıchǵ citizens.” (PR# 265)*

The Yellowknives Dene First Nation (YKDFN), in its technical report, expressed their concern over the lengthy closure timelines. They stated that the extremely long closure timeline introduced a very large element of risk. (PR# 251)

Regarding treatment of the actively filled open pit, parties requested that Fortune Minerals provide further details on in-pit treatment techniques such as the addition of fertilizer to the open pit. (PR# 338) Fortune Minerals submitted the document titled “In-Pit Treatment References” in response. (PR# 332)

### **3.2.2.3 Review Board’s analysis and conclusions**

In the opinion of the Review Board, passive filling of the open pit over a 120-year timeframe is likely to cause significant public concern. Such a timeline for refilling the pit raises a variety of other practical, environmental, management and monitoring concerns. It is uncertain what the quality of pit-water will be when over-topping occurs at a time far into the future when decision makers of today will no longer be present. In the Board’s view, it is not acceptable to pass down this high level of environmental uncertainty and risk to future generations. The Board agrees with concerns from parties that not knowing what pit water quality will be like by the time overflow from the pit into downstream water bodies occurs after more than century beyond mine closure is a significant concern.

The Review Board recognizes that Fortune Minerals made a commitment prior to the public hearings to actively fill the open pit with water in an 8-14 year timeframe once mining operations in the pit cease. The Review Board’s understanding of the commitment is that at mine closure, water will be pumped from the Marian River and directed through a pipeline uphill and deposited in the pit. This active filling will take place only during the summer months and is predicted to likely take just over a decade.

In the Review Board’s view, this commitment for active filling of the open pit to lessen the post-closure timeline is of great importance to the Tłıchǵ people as well as regulators. In



the Review Board's opinion the original long timeframe for post-closure is likely to result in significant adverse impacts to the environment and the requirement for active pit filling requires greater level of certainty than can be satisfied through a developer's commitment.

#### **Measure #5**

In order to reduce significant adverse impacts and the risk and uncertainties of a long-term post-closure timeframe, the developer will actively fill the open pit within an 8-14 year time range after mine operations. The developer will do this in a way that does not, in the view of regulators, result in adverse impacts to the Marian River or the downstream watershed.

### **3.2.3 Constructed wetlands treatment system**

Fortune Minerals proposes a passive constructed wetland treatment system to receive seepage from the co-disposal facility and to receive over flow from the open pit. Long and short term performance of constructed wetlands during closure and long-term is of key importance to parties, the Tłı̨chǫ people and the Review Board.

#### **3.2.3.1 Developer's position and submissions**

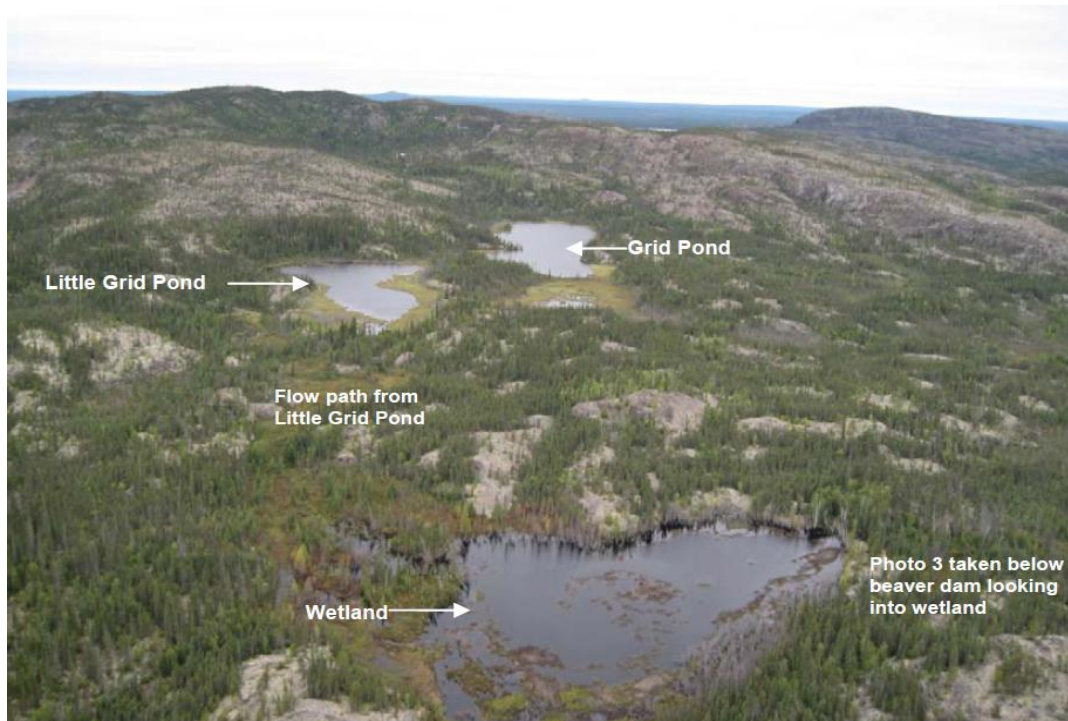
The goal of the constructed wetlands treatment system is to remove a variety of contaminants from the water, with emphasis on arsenic, while providing a walk-away solution. At the public hearings, Fortune Minerals contended that "the design of these constructed wetlands are such that they require no active management and only periodic monitoring" (PR#340 p58).

The Bench Scale Passive Wetlands Testing Results submitted by Fortune Minerals, received May 7th, 2012, detailed the first feasibility test of the passive treatment system. The pilot system was situated at the Golder Water Treatment Laboratory in Denver, Colorado and used water generated during pilot operations and processing of ore from the NICO Project (PR#222). The "conclusion from the bench-scale testing program is that the "proof-of-principle" was confirmed and the metals of concern in the water are treatable to low levels by passive mechanisms" (PR#222 p6).

The design strategy of the constructed wetlands treatment system involves indoor and outdoor pilot scale tests, an on-site demonstration scale test followed by the full scale on-site constructed wetlands.

Fortune Minerals described the constructed wetlands during the hearing in Behchoko on August 31. The on-site constructed wetlands are "built with cells and each cell is in a rectangular shape in order to ensure that there's a uniform water flow" so that performance across the entire cell can be predicted. The "size of each cell will be dependent upon the actual data from the demonstration and pilot scales, as well as the topography of

the site and input from hydrologists and engineers on the best layout for the particular site.” (PR#340 p 37)



**Figure 8:** This is an aerial view of the grid ponds and wetland at the NICO Project. These wetlands will be covered by the co-disposal facility (PR#297).

During the hearings, Fortune Minerals stated that the wetland would be tailored to attenuate arsenic, or aluminum, or cobalt, or any other metals in the water. Fortune commented that the design would be such that “the cells would be set up in order to specifically treat the levels of metals that we anticipate to see in that water” (PR#340 p 71). Fortune Minerals describes the flexibility of wetland design as follows:

“We can adjust the type of plant we use, the type of soil that we use, as well as the depth of the water and the flow rate of the water to accomplish and achieve the right environment for the reactions to occur to clean the water” (PR#338 p 58). Fortune further stated during the public hearings that they “do not allow the plants to accumulate the contaminants”(PR#338 p 58).



The Tłıchǫ Government raised concerns with the issue of thiosalts (thiosulphate) leachate in its technical report risk assessment and closing statement (PR# 265 p4). At the Yellowknife hearing on August 29<sup>th</sup>, Fortune Minerals stated that:

“And what happens when those thiosalts would hit a wetland is, instead of oxidizing they may oxidize fully to a sulphate or they may reduce fully into a -- back into a sulphide mineral, which get -- would get retained in the soils of the wetland” (PR#338 p 63).

In its response to an information request from the Tłıchǫ Government, Fortune Minerals states that it intends to conduct on-going monitoring during operations to determine if thiosalts are being formed (PR#225 p35).

Fortune Minerals stated at the hearings that: “It's actually part of our design plan to use sulphates to remove the arsenic, and in order to accomplish this, we require reducing conditions. So we anticipate that the long winters may actually improve our design through the reducing conditions that are maintained through that period. This, of course, will be confirmed through our pilot and demonstration scales” (PR#340 p 46).

With respect to wetland arsenic mobility, Fortune Minerals stated that the “arsenic is deposited into the soil or sediment of the wetland and it is in a mineral form there that is non-soluble” (PR #338 p272). Fortune Minerals concluded in their August 20, 2012 response for closure analysis document, that the wetlands will provide a walk-away solution to water treatment at the NICO site (PR#297 p 1/72).

#### Co-disposal facility wetlands

Fortune Minerals described, in their technical memorandum on the response to request for closure scenario analysis, specifics on the natural wetlands found within the NICO Project Site. Lowland data primarily focused on the co-disposal facility, Grid Pond, the Little Grid Pond and an anonymous wetland east of the Little Grid Pond. Tables 3-1 and 3-2 of the technical report detail the baseline surface water quality in the Grid Pond and Little Grid Pond wetlands. The tables reveal that arsenic, iron and sulphur values fluctuate seasonally. (PR#297) Dissolved oxygen values for the Grid Ponds also express seasonality as they greatly fluctuate with open water and under ice conditions (PR#297 p 7/72).

The DAR describes construction plans for the co-disposal facility wetlands: “The configuration and performance of the wetland treatment systems needs to be established before closure. Wetland treatment systems Nos. 1, 2, and 3 will be constructed in year 17 of the operating life of the mine. A monitoring program will be established to test and verify their performance. The results will be used to optimize the design and operation of these systems” (PR#116 9- 21).

At the August 31st hearing, Fortune Minerals stated that they “will be building the wetland treatment system for the co-disposal facility early in operations to demonstrate the technology throughout operations and into closure” (PR#340 p 31). In their post developer’s assessment submission, Fortune Minerals indicated that:

“Pilot testing will be conducted over several seasons during the active mining period to characterize seasonal performance of the aerobic wetland” (PR#373 p13).

“Conceptual design of the post-closure passive treatment options will take place prior to the detailed design stage of the NICO Project and will be submitted during water licensing. .... Field trials, based on actual site conditions and detailed from conceptual designs, will take place during mine operations. The detailed engineering design will be completed following scale-up of the field trial cells, using design criteria and operating parameters optimized from those trials” (PR#373 p24).

“During the passive treatment development program a second type of passive system will also be evaluated in the event the desired treatment cannot be effectively implemented with a strictly wetlands type approach” (PR#373 p24).

The April 2009 site development map showed that wetland treatment system No. 4 was originally designated as the “sedimentation pond”. A revised map entitled “Project Footprint” (PR#116 Figure 9.1-2 Section 9-10) illustrates a contingency pond in the same location. Wetland treatment system No. 4 appears in place, post-closure, in Figure 9.4-5 of the DAR.

The DAR states in that testing and construction of wetland treatment system No. 4, the receiving wetland for pit lake overflow, will commence in closure year 118. (PR#116) As requested by parties, Fortune Minerals later committed to active pit filling, and in response, the testing and construction of wetland treatment system No. 4 will also occur early in operation. Fortune Minerals made no guaranteed commitments as to when the testing and construction of wetland treatment system No. 4 will occur.

Wetland treatment system No. 4 will have contingencies for freshet, freezing and wet year scenarios. Data collected from the co-disposal facility wetlands will be used to design the wetland for the open pit (PR#297 41/72). Fortune Minerals provides the following commitments relevant to wetland treatment system No.4:

“Fortune Minerals committed to actively filling the open pit in order to reach its final closure condition earlier than 120 years. This would take approximately 12 years, and the water would come from the Marian River” (PR# 337 p 64).

“Active treatment of water from the open pit after operations if wetland treatment results are not acceptable”(PR#373 p27).

“From a practical standpoint, the CWTS cannot be put into operation until there is flow from the open pit” (PR#297 41-72).

### 3.2.3.2 Parties’ submissions and recommendations

Uncertainties over the construction and operation of the wetlands were the focus of many discussions by the parties. Proven ability to perform in the North as well as monitoring and maintenance were key elements of discussion.

During the August 31 hearing in Behchoko, the Tłıchǵ Government raised concerns regarding the uncertainties surrounding the initial phases of wetland assessment and the design and function of wetlands in the northern climate (PR#340 p44). In detail, the Tłıchǵ Government sought answers on how the effects of extended winters, typical of this region, on wetland chemical processes would be mitigated (PR#340 p47). The Tłıchǵ Government requested that they would like to see case studies that focus on constructed wetlands in northern environments at similar flows in similar sub-Arctic conditions (PR#340 p47).

During the Yellowknife hearing, Chief Clifford Daniels expressed his concerns over the wetlands and saw “major uncertainties with the implications of these technologies on Tłıchǵ land.” (PR#338 23) Furthermore, in Behchoko Elder Charlie Apple described his unease over the wetlands by stating:

*“So if it goes through the soils and if it goes through the wetlands, would all of the water be cleansed? What if the water is not cleansed properly the way it should? What if it contaminates the land, the soil, the wildlife in that area?”* (PR#340 p 114)

AANDC questioned Fortune Minerals on wetland monitoring and asked the developer if they “could identify what you would know as the longest period of record on performance” (PR#340 p 26). AANDC further asked “what type of monitoring and at what frequency is being proposed for the wetlands?” (PR#340 p 37).

In its technical report, AANDC quoted from the Mine Reclamation Principles the following:

“Ensuring the site is left in a condition which will minimize or eliminate long-term care and maintenance requirements” (PR#247 p 20) .

AANDC adds that:

“While the passive treatment systems proposed for the NICO Project may require less maintenance and monitoring than an active system, the need for maintenance and monitoring has not been eliminated” (PR#247 p 20).

As with overall construction and operations of wetlands, parties expressed concerns over uncertainties regarding the co-disposal facility wetlands during technical meetings through information requests and at the hearings.

At the October 10<sup>th</sup> hearing in Behchoko, Chief Clifford Daniels voiced his skepticism about the wetlands, calling for:

*“careful management, peer review and design of new hills and wetlands with Tłıchǫ people, as there are strong concerns that these two project elements will impact on animals and their movement. And to ensure the return of water fowls to the area safely in the wetlands.”* (PR# 358 p188-189)

From the Tłıchǫ Government document titled *Mitigation Measures from Traditional Knowledge Study*, Recommendation #6 states:

*“Careful management, peer review and design of the new hill and wetlands with Tłıchǫ people, as there is strong concern that these two project elements will impact on animals and their movements”. Point 6 c. asks for “Specific monitors while they are building the co-disposal site and wetlands site”* (PR#355 p 2).

Overall, the Tłıchǫ Government contended the need for a peer-review mechanism not only for the co-disposal facility but also for wetlands (PR#340 p 121). In their list of mitigation measures from the October hearings in Behchoko, the Tłıchǫ Government stated that expert peer review has to be articulated with community-based monitoring, maintaining that having experts study water quality parameters and providing feedback without people in the community being engaged in that system is relatively worthless (PR# 358 p 217).

Through an information request, AANDC raised questions pertaining to long-term predictions of expected trends in parameters over time. They note that certain metals associated with seepage from the co-disposal facility and directed through the wetland treatment system are expected to remain elevated post-closure. They state that Fortune Minerals only provided predictions up to mine year 33. Given this information, they requested that more material be provided on expected long-term trends (PR#134 p12). This relationship between the finite amount of metals in the co-disposal facility and the degree of certainty of the passive wetland treatment was also raised (PR# 134 p12). In another information request AANDC, inquired about wetland performance in cold climates (PR#134 p13).

Regarding the certainty of lowlands studies at the NICO site, which includes wetlands, NRCan, in their technical recommendations, asked for clarification on how groundwater levels were estimated in the lowlands, if ground water levels were measured during packer tests, and if vertical hydraulic gradients were estimated (PR#266 p 9-10). In response to the technical recommendation, Fortune Minerals stated that there was insufficient data from lowland areas to draw a conclusion about vertical gradients in these areas (PR# 322

p6/22). Fortune Minerals also stated, with regard to thermistor readings, that attempts to read the water levels at standpipe piezometers within lowlands of the co-disposal facility in both the summer and fall of 2001 and 2012 indicated that the discontinuous permafrost layer extends to all monitoring wells. It is then stated that “the frozen ground is better represented as a no-flow layer rather than a low permeability layer” (PR# 322 p11/22).

### 3.2.3.3 Review Board’s analysis and conclusions

The Review Board believes that the ability of the constructed wetlands to work at the NICO site must be proven early in the mine’s operating life. In the Review Board’s opinion, a long-term post-closure period where environmental liabilities remain is not acceptable. The Board believes the NICO Project should only be allowed to proceed if it is a “walk away project”. This means that after the post-closure phase, there should be no company or government liabilities remaining at the site.

During the public hearings the Review Board heard concerns from Tłıchǫ individuals, the Tłıchǫ Government and other parties regarding uncertainty with the proposed constructed wetlands. The Review Board believes that the developer must provide proof that the constructed wetlands will work to reduce metal contamination of water as proposed.

In the opinion of the Review Board, a long-term closure scenario for the NICO Project is likely to cause significant impacts to the environment and be a cause for significant public concern.

#### Measure #6

In order to mitigate significant adverse impacts to water quality and the environment downstream of the project site, the developer will fund an expert peer review panel to review and advise on the design and construction for the proposed constructed wetlands. This panel of three people is to be established under the water license in consultation with Fortune Minerals and the Tłıchǫ Government and consist of one appointee from each party and the Wek’eezhii Land and Water Board.

The peer review panel will be established at the start of mine operations and will be in place for the operational life of the mine. It will:

- consist of technically qualified individuals capable of reviewing the design and performance of constructed wetlands;
- assess Fortune Minerals’ constructed wetlands pilot and field scale wetlands trials;
- provide recommendations intended to reduce adverse impacts from and improve the operation and effectiveness of the constructed wetlands to the Wek’eezhii Land and Water Board, Fortune Minerals, and the Tłıchǫ

Government; and

- address any questions from any of the three parties in relation to its assessments and recommendations.

#### **Suggestion #4**

The Wek'eezhii Land and Water Board should report on the technical outcomes of the expert peer review committee on constructed wetlands in plain language so that the people of the Wek'eezhii area can understand how the constructed wetlands will work.

The Review Board believes that the ability of the constructed wetlands to work as planned for mitigating the effects of contaminants in seepage from the co-disposal facility must be clearly demonstrated before the developer can walk away from the site. The Review Board is of the view that seepage from the co-disposal facility may cause significant adverse impacts to water quality in the environment.

The Review Board recognizes that the proposed wetlands for pit overflow can only be constructed and tested after operations, in the active pit filling phase once pit water quality can be more accurately predicted. The Review Board is of the view that the Wek'eezhii Land and Water Board will address water quality predictions in the open pit, water quantity expected to overtop the pit and any options for in-pit treatment if required during the active pit filling phase.

The Review Board believes that the ability of the constructed wetlands to work as planned to treat overflow from the open pit must be clearly demonstrated before the developer can walk away from the site.

The Review Board is of the view that overflow from the open pit is likely to cause significant adverse impacts to water quality in local receiving water bodies and the environment.

#### **Measure #7**

In order to mitigate significant adverse impact to water quality in local receiving water bodies during the closure and post-closure phase of the NICO Project, the developer will:

- demonstrate, using a pilot study, that the constructed wetlands will work as predicted;
- construct wetlands early during operations and test them during the first half of mine life to determine effectiveness in treating seepage from the co-disposal facility;
- demonstrate the ability of wetlands to work for both the co-disposal facility and the



pit overflow to the satisfaction of regulators before the developer is released from its mine closure and reclamation requirements.

### 3.3 Impacts on caribou and caribou habitat

The guiding principles of Part 5 of the *Mackenzie Valley Resource Management Act* require the protection of the environment from the significant adverse impacts of proposed developments in the Mackenzie Valley during every environmental assessment. In the Terms of Reference issued by the Review Board for this environmental assessment, caribou and caribou habitat were identified as a key line of inquiry.

Fortune Minerals was instructed to describe potential impacts of the NICO Project and mitigation measures for the protection of barren ground and boreal caribou and their respective habitats. The Review Board's instructions included:

- the assessment of effects of habitat degradation and fragmentation;
- potential for increased mortality;
- effects of sensory disturbance, disruption to movement, energetic costs from disturbance or displacement; and
- contamination of food and water sources (PR#87, p12).

Fortune Minerals submitted the DAR on May 20, 2011. Section 8 of this report included an assessment of potential impacts from the NICO Project on barren ground and boreal caribou, including traditional and non-traditional uses of caribou (PR#116, p8.1).

Based on potential overlap with seasonal ranges, the Bathurst, Bluenose East, and Ahiak barren ground, and boreal caribou herds were identified as having the potential to interact with the proposed NICO Project (PR#116, p8-1). In the DAR, Fortune Minerals included physical, biological, cultural, social, and economic properties of caribou and caribou habitat as valued components in the assessment of the Project's potential impacts. Fortune Minerals acknowledged that disturbances and contamination of caribou habitat have the potential to adversely affect caribou health and population, while contaminants in the caribou meat and changes to the population can have the potential to adversely affect human health and the continued use of caribou by people (PR#116, p8.5).

The DAR identified the following assessment endpoints in its evaluation of the Project's impacts on local caribou habitat and populations:

1. the persistence of the caribou populations; and
2. the continued opportunity for traditional and non-traditional use of caribou.

The measureable expression of impacts to these endpoints included changes to:

- habitat quantity and fragmentation;
- habitat quality;
- relative abundance and distribution of caribou;
- survival and reproduction;
- access to caribou; and
- availability of caribou (PR#116, p8.5).

Based on an analysis of the satellite collar data, differences in caribou responses to human disturbance on the tundra and the forest, and the life history attributes of the caribou populations potentially affected by the Project, Fortune Minerals identified three distinct study areas for the predicted spatial extent of NICO Project-related effects:

1. *The Caribou Study Area* – used to assess the incremental and cumulative effects from the NICO Project and other developments on caribou. It consists of the Northwest Territories south boreal caribou range and the Bathurst caribou winter range (below the treeline), a total area of 211,821 km<sup>2</sup>;
2. *The Regional Study Area (RSA) or zone of influence (ZOI)* – used to assess the combined direct and indirect effects from the NICO Project on caribou (including noise, lights, smells, etc.). It consists of a 15 km radius from the center of the proposed mine site (706 km<sup>2</sup>) and a 6.5 km buffer around an old 50 km proposed access road; and
3. *The Local Study Area (LSA)* – used for small-scale direct and indirect effects from the NICO Project (including dust deposition). It consists of the NICO mine site plus a 500 m buffer and the 27 km proposed NICO Project Access Road with a 1 km buffer (PR#116, p. 8.8, 8.12).

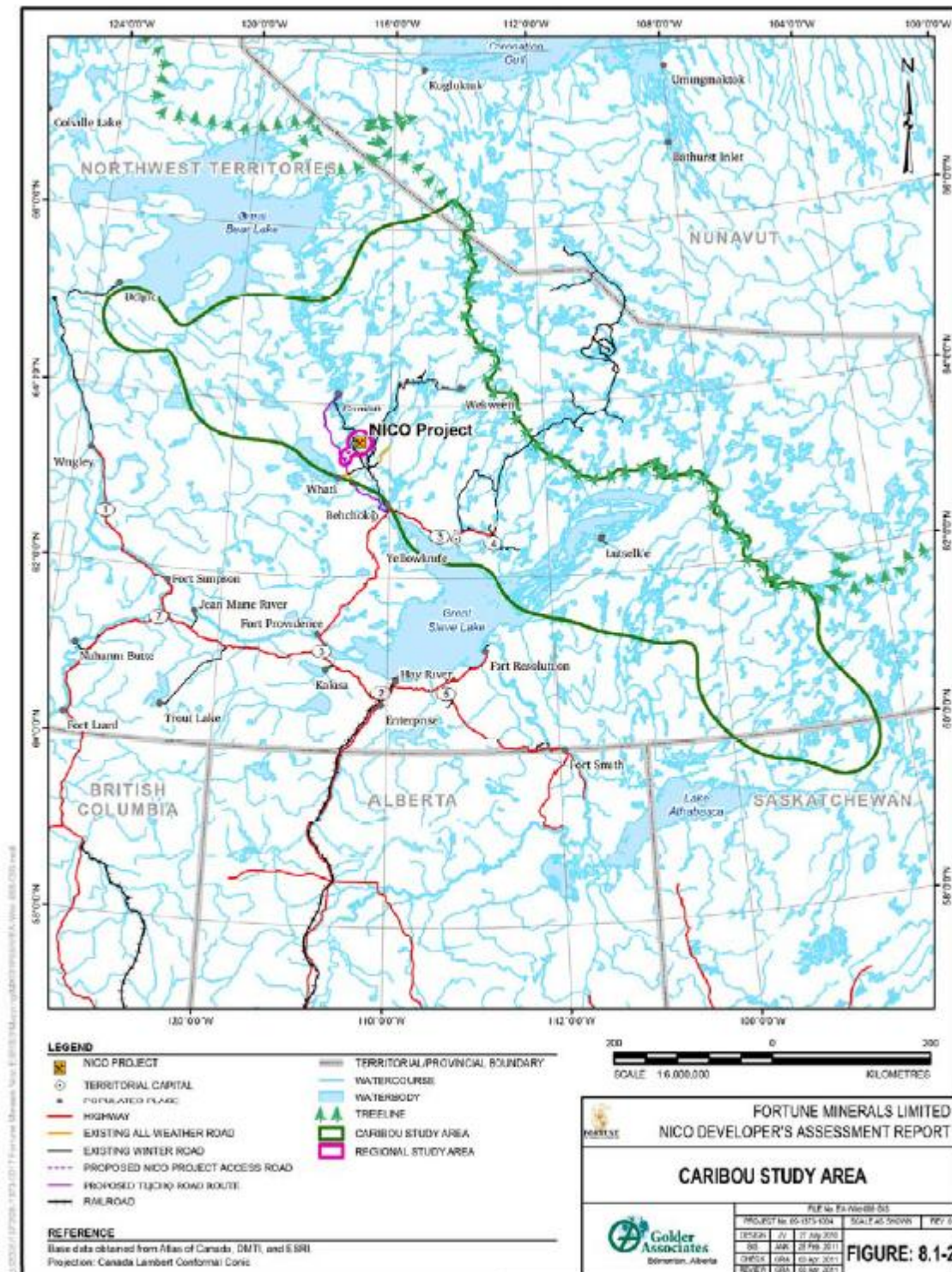


Figure 9: NICO Project Caribou Study Area (PR#116, p. 8.10)





### 3.3.1 Barren ground caribou

#### 3.3.1.1 Developer position and submissions

The annual seasonal ranges of barren ground caribou herds were calculated using Government of the Northwest Territories satellite collar data and a 95% kernel (probability) density estimate. Kernel density estimation is a statistical method of smoothing data. Analysis of the data indicated that the Bathurst herd has the greatest possibility of being affected by the NICO Project. Only one collared Bluenose East caribou was recorded within 50 km of the NICO Project from 1996 through 2010, and no collared Ahiak caribou have been recorded in this vicinity. For this reason, Fortune Minerals chose not to complete a full assessment of Project-related or cumulative effects on the Bluenose East or Ahiak populations, anticipating instead that the Bathurst results could be used as a conservative estimate of effects to all caribou herds – barren ground and boreal included (PR#116, p8.8).

Fortune Minerals identified four potential primary pathways for potential adverse impacts on caribou and human use of the caribou from the proposed NICO Project:

##### 1. Direct loss and fragmentation of habitat

The DAR includes the entire NICO Project lease boundary in its calculation of the NICO Project footprint. The total conservatively represents less than 0.1% of the total caribou study area, defined as the winter range of the Bathurst herd within the tree line. Direct cumulative habitat disturbance from the NICO Project plus previous, existing, and reasonably foreseeable developments throughout this study area is predicted to be less than 0.5%, relative to reference conditions. Fortune Minerals concluded that total direct habitat loss as a result of the NICO Project should have *negligible impacts* on the Bathurst caribou (and by extension, other barren ground caribou) (PR#116, p8.14). However, Fortune Minerals also predicted that cumulative indirect impacts from the NICO Project and previous, existing and reasonably foreseeable future developments would be expected to reduce good and high quality caribou habitat by 6.1% (low magnitude)(PR#116 p8.99). Fortune Minerals noted that while care is needed in applying thresholds from other wildlife, this projected change in habitat disturbance is below the 40% threshold for wildlife habitat loss identified in studies on mammals, birds and insects (Swift and Hannon, 2010) for self-sustaining populations. Fortune Minerals linked the rate of habitat loss below the threshold with the results of long-term monitoring from other mining operations which has not shown any direct or significant effect on caribou abundance as a result of mine-related mortality (PR#209, p5).

Despite its conclusions, in an effort to minimize the direct loss and fragmentation of caribou habitat caused by the proposed NICO Project, Fortune Minerals has designed the current layout of the mine so as to limit the area disturbed and committed to minimize the

width of the right of way of the NICO Project access road as much as is safely possible. Fortune Minerals has also committed to discuss opportunities and possibilities for offsite caribou habitat compensation with parties in the development of their Wildlife Effects Monitoring Program and Wildlife and Wildlife Habitat Protection Plan (PR#358, p51-53). To minimize potential effects on soils, vegetation and existing caribou habitat, additional Project design features that reduce changes to local flow and drainage patterns have been incorporated. The proposed constructed wetland treatment system and co-disposal facility cap should also help mitigate potential post-closure impacts to water quality, soils, vegetation and caribou habitat from the flooded open pit and mine site seepage (PR#272, p4). All caribou interactions and incidents will be reported and caribou will be given the right-of-way across the NICO access road and other site roads (PR#272, p19).

In response to concerns raised during the technical meetings regarding Fortune Minerals limiting its assessment of cumulative effects on the Bathurst herd to the winter range, Fortune Minerals undertook to analyse the relative density of developments including four additional reasonably foreseeable development projects on the Bathurst herd's current annual range. Including all existing and reasonably foreseeable developments, Fortune Minerals found that 10.7% (footprint plus zone of influence) of the Bathurst annual range has been or will be potentially affected by exploration and development activities. The amount of landscape expected to be *directly* disturbed by development, however, is estimated to be less than 0.5%.

Fortune Minerals' interpretation of these results, notwithstanding the impacts to caribou habitat from natural events, indicates that the predicted direct effects to caribou from direct habitat losses should remain negligible since the results of habitat disturbance calculations remain well below the ecological thresholds identified from scientific literature. Fortune Minerals concludes that the seasonal and annual ranges of the Bathurst herd remain substantially intact, that direct mortality from vehicle collisions is low, and that the physical barriers introduced by winter roads at the NICO Project site should have negligible effects on the movement of the Bathurst caribou since winter season activity is low and migration to the calving grounds begins after road closure (PR#209, p4-5).

## **2. Sensory disturbance**

Fortune Minerals has estimated that, relative to reference conditions within the regional study area, the cumulative direct and indirect impacts from noise and other sensory disturbances from the NICO Project plus previous, existing, and reasonably foreseeable future developments are expected to present a low impact on caribou. The developer predicts that sensory disturbances as a result of its development will impact 6.1% of the existing good and high quality caribou habitat within the RSA (PR#116, p8.15).

To mitigate on-site physical hazards, Fortune Minerals has committed to:

- train its employees in environmental awareness;
- to monitor and communicate the presence of caribou;



- to establish reasonable on-site speed limits;
- to suspend surface blasting when caribou are identified within a 'danger zone'; and
- to remove all physical hazards during decommissioning.

To reduce the potential impacts caused by predator attraction to the site, Fortune Minerals has committed to conduct all activity from one NICO site camp, to educate all employees and visitors about proper waste management practices, to skirt all buildings and stairs, to prohibit littering and the feeding of wildlife, to develop and implement a Domestic and Industrial Waste Management Plan and Wildlife Effects Monitoring Program (WEMP), a Wildlife and Wildlife Habitat Protection Plan, and to conduct ongoing reviews of the efficiency of the waste management program and to address improvements through adaptive management (PR#272, p4).

To mitigate the potential impacts from indirect sensory disturbances, Fortune Minerals has committed to use noise suppressors on equipment, house stationary equipment indoors, to ensure regular maintenance of equipment, (PR#272, p. 5) and to look into alternatives for the satellite communication tower currently proposed (PR#373 p31).

### **3. Change in energetic costs from disturbance and displacement**

In its assessment of changes in energetic costs as a result of disturbance and displacement caused by the proposed NICO Project, Fortune Minerals concluded that the effects of human disturbance in the winter range would be relatively small compared to natural weather-related factors, such as hard and deep snow or freezing rain. As an example, Fortune Minerals estimated that the fall calf:cow ratio could decrease by 7.1% if female caribou encountered all 40 existing disturbances within the Bathurst winter range. Comparatively, it estimated that severe spring conditions could decrease the fall calf:cow ratio by up to 26.6% (PR#116, p8.15).

The mitigation measures Fortune Minerals has identified to address potential changes in energetic costs to caribou from disturbance or displacement caused by the NICO Project are the same as those proposed for the management of sensory disturbances (PR#272, p5).

### **4. Improved access for harvesting**

With the development of the NICO Project access road and the proposed Tłıchʼo road route, Fortune Minerals concluded that hunters would be able to access more areas within the Bathurst winter range. Fortune Minerals predicts that the number of caribou harvested in the region from improved access due to the NICO Project access road and the proposed Tłıchʼo road route will be similar to or slightly more than baseline harvesting values. They determine this to be a moderate impact on caribou (PR#116, p8.16).

To mitigate the effects that improved access for harvesting might have on caribou populations, Fortune Minerals has committed to develop and enforce a "no hunting,

trapping, harvesting, or fishing policy” for on-site employees and contractors, and to prohibit the use of recreational vehicles at the Project site (PR#272, p5). Fortune Minerals has also committed to working with the Tłıchǫ Government, the Wek’èezhìi Renewable Resources Board, and the Government of the Northwest Territories to address access management on the NICO Project access road (PR#260, p37).

### **3.3.1.2 Parties’ submissions and recommendations**

Despite the assessments completed by Fortune Minerals and included in the Developer’s Assessment Report and subsequent memoranda, the YKDFN continued to express concerns, especially about the cumulative impacts on the Bathurst caribou population. They stated that even “low magnitude effects” on caribou habitat can introduce significant impacts to an already fragile and culturally valuable population. The YKDFN stated that the impacts from development across the annual range have not been fully and clearly assessed in terms of existing and reasonably foreseeable developments, caribou population and distribution and in terms of barriers to herd recovery. The YKDFN suggested that Fortune Minerals be required to submit an updated cumulative effects analysis that fully considers all reasonably foreseeable Projects across the entire annual range of the Bathurst caribou herd, the relative scale of impacts from developments across that range, and the impacts and responses of caribou to barriers of movement within their range (PR#251, p6-8).

Fortune Minerals is of the opinion that the work they have completed to date adequately addresses the YKDFN concerns (PR#271, p7). The YKDFN also expressed concerns about the uncertainty associated with the development and enforcement of a Wildlife Effects Monitoring Program and requested that the Board consider measures to ensure its timely and collaborative development and implementation so as to ensure consensus on the methods to be used to monitor, evaluate and respond to impacts on wildlife (PR#251, p9).

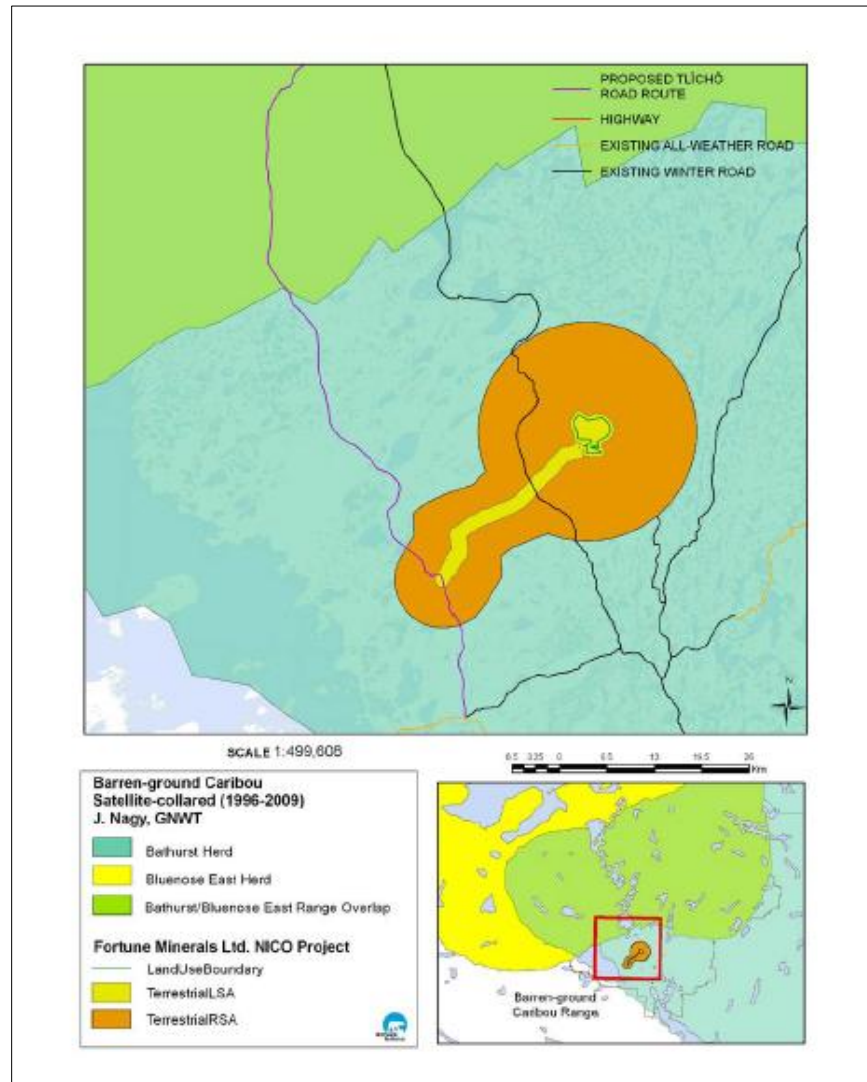
The Government of the Northwest Territories Department of Environment and Natural Resources (ENR) provided Fortune Minerals and the Review Board with a map<sup>8</sup> showing that the entire NICO Project is located within the long-term range of the Bathurst caribou herd. Concerns raised by ENR included the potential for increased harvesting as a result of improved vehicle access to more remote areas and the cumulative effects of the NICO Project and other mine and road developments within the Bathurst caribou range. ENR emphasized the fact that impacts from all-season roads could persist long after mine closure (PR#260, p32-33). As a result, ENR indicated that it would be important for Fortune Minerals to work with parties to develop an effective Wildlife Effects Monitoring Program (PR#260 p34-35). It supported Fortune Minerals’ intention to design its caribou

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<sup>8</sup> The range of the Bathurst and Bluenose East caribou herds in the vicinity of the NICO Project using satellite collar data from 1996-2010 and aerial survey data from 2008-2012. ENR indicates that these results likely show a smaller range than what would be expected if populations were higher and if more caribou wore radio collars (PR#260, p. 32-33).

monitoring programs so that it could contribute to existing and planned monitoring programs in the region. It suggested that Fortune Minerals clearly address predicted environmental impacts in the development of management plans and to include all the predicted environmental design features and mitigation in the planned wildlife monitoring (PR#260, p34).

The Tłıchǵ Government Traditional Knowledge and Use Study identified changes which have occurred to the caribou population and to the continued ability of Tłıchǵ citizens to hunt in the area of the NICO Project as some of the main community concerns. Study participants described the historical and present uses of the NICO Project footprint area, the LSA and the RSA for hunting and expressed their concerns about the impacts of noise from the Project and contaminated water and vegetation on the caribou that use the area (PR#349, p41-44). Community members also expressed their concern about the development's effect on the Tłıchǵ people's desire to continue using the site for traditional hunting practices (PR#349, p45). At the public hearing, the Tłıchǵ people expressed real concern about how the NICO Project might negatively affect the availability of the Project area for continued traditional pursuits (PR#359).



**Figure 11:** Barren ground caribou Range in relation to Fortune Minerals Ltd. NICO Project location  
(PR#260, p. 30)

Overall, the Tłıchǫ Government identified concerns about increased and continuing access to the Bathurst range as a result of the proposed development. They expressed fears of a delayed recovery of the Bathurst caribou herd as a potential adverse impact of the NICO Project and other projects within the herd's annual range. They also identified concerns about the need for a review of the impacts of noise and disturbance thresholds, a need for revised assessment endpoints using Tłıchǫ knowledge and questions about whether caribou had returned to the Colomac and Rayrock mine areas (PR#265, p13).

In order to address their concerns and better engage traditional knowledge in tracking the impacts on caribou, the Tłıchǫ Government recommended that Fortune Minerals discuss the establishment of an independent oversight body for environmental monitoring at the NICO site. In response to this recommendation, Fortune Minerals has indicated that it "is of

the view that there are sufficient oversight monitoring processes and mechanisms in place through existing regulatory systems and does not see the need for the creation of Project specific oversight mechanisms that operate outside of the regulatory framework” (PR#271 p15).

At the public hearings, the North Slave Métis Alliance expressed its concerns about cumulative impacts to caribou and the effects it has on Aboriginal harvesting success. They have requested to be included in the discussions and development of the Wildlife Effects Monitoring Program and expressed concerns about the impacts of even ‘negligible’ effects on an already fragile population. They requested that the Project be subject to environmental impact review and recommended the establishment of an independent monitoring agency mandated to consider and incorporate traditional knowledge into program design and communicate the results of monitoring back to the communities (PR#339, p300-303).

Closing arguments from the YKDFN recommend the establishment of an “extra-regulatory agreement” designed to provide resources for the collaboration, review, reporting and approval of Project-related monitoring and management programs. It believes that such an agreement could help alleviate existing concerns and contribute to the prevention of significant impacts on caribou and caribou habitat. The YKDFN remain concerned about the impacts associated with the construction of the NICO Project, are not satisfied with the level of detail included in Fortune Minerals’ cumulative effects assessment, and are of the opinion that impact thresholds were set far too high for meaningful assessment conclusions (PR#371).

The YKDFN recognized the developer’s commitment to collaboratively develop and implement a Wildlife Effects Monitoring Plan but underscore the limitations of the existing regulatory system’s ability to enforce many wildlife related mitigations. They therefore request that the Review Board include in its report enforceable measures requiring the collaborative development and timely implementation of a Wildlife Effects Monitoring Plan so as to avoid significant public concern (PR#371).

According to the YKDFN, current traditional knowledge strongly suggests that the existing mines have had an impact on the Bathurst Caribou herd and have contributed to the decline in the population. The YKDFN fear that new developments may further isolate parts of the Bathurst caribou herd’s traditional range, provide increased and uncontrolled access for hunters, and further increase the levels of sacrifice traditional harvesters have been forced to make. The YKDFN also expressed concerns about the lack of range-wide cumulative effects monitoring, evaluation, and analysis and have asked the Review Board to develop a measure that ensures cumulative effects are being properly addressed – by either the developer and/or the federal and territorial governments (PR#371).

ENR’s closing comments provide support for the wildlife mitigation commitments that Fortune Minerals has made throughout the EA process, including collaborative approaches

to regional scale caribou monitoring programs. ENR stated their willingness to discuss options for managing road access concerns.

In its closing statement, ENR distinguished the differences between a Wildlife Effects Monitoring Program and a Wildlife and Wildlife Habitat Protection Plan. ENR further stated that more detailed outlines that distinguish between wildlife monitoring programs and wildlife and wildlife habitat protection plans would be developed in the near future. ENR recommended that the developer separate out the steps necessary to protect personnel, wildlife and wildlife habitat within the project development area into the Wildlife and Wildlife Habitat Protection Plan to facilitate permitting of the NICO Project in the regulatory phase. ENR reasoned that a Wildlife and Wildlife Habitat Protection Plan would fall under the authority of the Wek'eezhii Land and Water Board for the protection of wildlife habitat under section 26(1)(h) of the *Mackenzie Valley Land Use Regulations* while other wildlife protection measures could be addressed through developer commitments, waste management plans, and other territorial and federal legislation.

ENR specified that a Wildlife Effects Monitoring Program should include both local and regional monitoring; use adaptive management to revise mitigation and that regional monitoring should be based on collaboration between governments, developers, Aboriginal groups and other interested parties.

In response to parties' requests for independent monitoring, ENR believes that the primary authority for confirming proper environmental monitoring and reporting at the NICO Project, overall, is the Wek'eezhii Land and Water Board. If any additional environmental monitoring is required, ENR suggested this could best be achieved through agreements between Fortune Minerals and affected communities as opposed to the establishment of an environmental monitoring agency. ENR's opinion is that since any proposed all-weather road would likely require a its own preliminary screening separate from the NICO Project, concerns related to increased road access are alleviated (PR#370, p4-7).

Closing arguments from the Tłı̨ch̨ Government highlight the pre-existing concern about the barren ground caribou population and the cultural significance of the species to the Tłı̨ch̨ people. They emphasize the importance of the project area for barren ground caribou movements and winter use and for hunting as part of the high values for Tłı̨ch̨ culture and well-being. In light of the current decline and harvest restrictions, they ask that the Review Board use a precautionary approach in its assessment of impacts on the Bathurst caribou. The Tłı̨ch̨ Government requested that the Review Board impose a measure to ensure the timely and collaborative development of an enforceable Wildlife Effects Monitoring Program prior to the permitting stage. This would ensure that monitoring is designed to predict and respond to changes using science and traditional knowledge. It has also requested that the Review Board impose two further measures to create a Tłı̨ch̨ land and water monitoring program and an independent monitoring agency to contribute to and examine monitoring results and management decisions (PR#369, p 35-39).



In its closing arguments, the North Slave Métis Alliance reiterated their concerns about cumulative impacts to caribou and the effects they have on Aboriginal harvesting success. The North Slave Métis Alliance have recommended that the Project proceed to environmental impact review in order to better assess the duration and extent of impacts on traditional harvesting and Aboriginal rights (PR#366, p3-6).

Fortune Minerals' Developer's Assessment Report concluded that:

*"[t]he duration of incremental and cumulative impacts from the NICO Project on caribou populations and distribution, and traditional and non-traditional use of caribou for the majority of pathways is anticipated to be reversible over the long-term (26 to 31 years [approximately 2 to 3 caribou life spans<sup>9</sup>])."*

It further concluded that the:

*"resilience in caribou populations suggests that the impacts from the NICO Project and other developments should be reversible and not significantly affect the future persistence of caribou populations... [or] have a significant adverse effect on continued opportunities for use of caribou by people" (PR#116, p8.16).*

In its final submission, Fortune Minerals focused on its efforts to reduce the NICO Project footprint, to restrict hunting on access roads, and its plans for reclamation in its final determination of the Project's negligible impacts on caribou (PR#373, p8).

Fortune Minerals has committed to continuously engage the Tłı̨chǫ Government and other parties in discussion and involvement in the monitoring of caribou in the region of the NICO Project, to host a workshop to re-examine caribou assessment endpoints, to refine management plans, to conduct post-closure caribou monitoring (PR#272 p27), and to further develop its Wildlife Effects Monitoring Program (WEMP) and Wildlife and Wildlife Habitat Protection Plan during the regulatory phase (PR#260 p. 34). In response to recommendations for an independent monitoring agency, Fortune Minerals believes that the Wek'eezhii Renewable Resources Board has the legislated authority to fulfill a stronger role in monitoring and management of wildlife, including caribou, than an independent advisory agency would (PR#373 p8).

### **3.3.1.3 Review Board's analysis and conclusions**

The Review Board has considered all information available on the public registry in its analysis of the evidence and its deliberations on the potential impacts to barren ground caribou and habitat as a result of the proposed NICO Project.

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<sup>9</sup> For the purposes of the assessment and to be conservative, the duration of impacts from increased access associated with the NICO access road and Proposed Tłı̨chǫ Road Route is expected to be permanent (PR#116, p. 8.16).

The YKDFN made several points about the inadequacy of the developer's cumulative effects assessment on the annual range of the Bathurst caribou. The Review Board recognizes both the shortcomings identified by the YKDFN, ENR and the Tłıchq Government and the challenges presented when attempting to predict future development as part of cumulative effects assessments. Nevertheless, several reasonably foreseeable projects on the winter and annual ranges of the Bathurst caribou were not included in Fortune Minerals' assessment and the range-wide cumulative assessment was limited to consideration of how the density of developments reduced caribou habitat.

The Review Board understands the parties' concerns about the project's contribution to cumulative effects and the growing impacts that combined development has, or is likely to have, on the biophysical and socio-cultural environment. The Board notes that the developer's estimate of measurable effects on caribou cows and habitat from a landscape with no development, compared to the current landscape, is also consistent with the points made by Tłıchq elders. Fortune Minerals has made commitments to participate and contribute to regional caribou monitoring and management programs initiated by ENR and other co-management authorities. The Review Board notes that ENR's submissions do not address managing and mitigating cumulative effects for the Bathurst herd, concerns identified by YKDFN and the Tłıchq Government. Measures identified below will further ensure that this development contributes to regional cumulative effects programs that will improve the assessment, mitigation and management of cumulative effects on caribou at the regional level.

The Review Board recognizes the current vulnerability of the Bathurst caribou and its importance to the Aboriginal people who rely on it for food and cultural identity. The herd population, which was over 450,000 in 1986, dropped to approximately 126,000 in 2006, and declined further to approximately 32,000 in 2009 (PR#369, p35). Almost all community members who spoke during the public hearing reinforced the importance of the Hislop Lake area and the resources it provides, including a healthy caribou population, to their cultural identities. Chief Edward Chocolate explained that:

*A lot of people had stayed at that place, people used to come from other places and – and we used to share whatever we catch like fish; that's a knowledge that was brought down from our ancestors and we go out hunting for -- we'd trap and hunt for caribou and just all kinds of things that we had done. We want to keep our knowledge and tradition and knowledge strong and we love our land, the water, environment, it's so valuable to us (PR#358, p147).*

The Review Board understands the parties' concerns about cumulative effects and the growing impacts that expanding development can have on the biophysical and socio-cultural environment. The Review Board accepts as a fact that caribou are essential to the cultural identities, wellbeing and diet of the Aboriginal groups that have participated in this EA.

Considering the great cultural and ecological importance of caribou as a keystone species, and the tremendous drop in caribou numbers from 1986 to present (PR#369), the concern expressed by the Aboriginal groups that are parties to this EA is understandable.

Regardless of the size of the direct Project footprint, the zone of influence of this project, or the on-site mitigations proposed, there is legitimate concern about the increasing levels of industrial activity and access affecting the range of the Bathurst herd. Based on the evidence from Aboriginal groups and the Tłıchǫ Government, the Board is of the view that more needs to be done now to protect the Bathurst caribou herd.

In its hearing presentation (PR#311), the developer emphasized that, with respect to cumulative effects, the project's "combined and indirect impacts will be low in magnitude". That might be a reasonable conclusion for the Bathurst herd's population in 1986 or even at 2006 levels. But the current status of the herd has been called a crisis and in the Board view, reasonably so. The Review Board has concluded that at this vulnerable level of caribou population, any additional impacts are cause for concern. A cumulative impact of low magnitude might not be considered significant in a time of high populations, but it is significant given the current condition of the Bathurst herd. The proposed Project's contributions to cumulative impacts on caribou are therefore, in the Review Board's opinion, significant.

In the Review Board's view, much of the responsibility for managing cumulative effects on the Bathurst herd belongs to the Government of the Northwest Territories and ENR. The Board notes that ENR did not substantially address this subject in its environmental assessment submissions. Although it is evident that efforts are being made to monitor impacts on the Bathurst herd, right now, monitoring is not enough. These cumulative impacts require urgent attention, in particular active management and mitigation.

To date, ENR has addressed the caribou crisis by managing the harvest. Aboriginal and non-aboriginal people have been required to reduce their harvest, and are working at doing their part. However, harvest is only one of the sources of mortality affecting the Bathurst herd. Other sources of cumulative impacts on the Bathurst caribou need equal attention and effort.

The Review Board is aware of ENR's Barren Ground Caribou Management Strategy 2011-2015 and understands that management planning for the Bathurst caribou herd is occurring among ENR, the Tłıchǫ Government, the Wek'eezhii Renewable Resources Board and other co-management partners. Further, the Review Board is aware that the Tłıchǫ Agreement, 2005, requires in Section 12.11.3, the preparation of a comprehensive proposal for the management of the Bathurst caribou herd. The section is as follows:

"Within the first year after the effective date, the Wek'eezhii Renewable Resources Board and the Parties shall meet for the purpose of preparing a comprehensive proposal for the management of the Bathurst caribou herd. The Board shall invite any body with jurisdiction over any part of the caribou range

and representatives of any Aboriginal peoples who traditionally harvest the Bathurst caribou herd to participate.”

The Review Board wants to encourage the completion of this initiative but is concerned that over seven years have elapsed since the coming in to force of the Tłıchǵ Agreement and yet it is still not clear when a completion date of this management proposal will take place. While the parties may continue to work on this initiative, the Review Board believes that more immediate action is required.

The Review Board heard concerns about cumulative effects from the Government of the Northwest Territories, the Tłıchǵ Government and YKDFN. Although ENR agreed to work with Fortune Minerals to define regional monitoring requirements, there was no mention of how the monitoring would contribute to decisions about mitigation and management of cumulative effects. The Review Board is of the opinion that a working group is required to describe a response framework which clearly links mitigation and monitoring to herd management in order to minimize significant adverse cumulative impacts of the project on barren ground caribou during construction, operations and closure.

The following measure is intended to partially mitigate the significant cumulative impact of the proposed project in combination with those of all past, present and reasonably foreseeable future activities on the Bathurst caribou herd range:

**Measure #8**

To mitigate and manage significant adverse cumulative impacts to barren ground caribou, the Government of the Northwest Territories and Tłıchǵ Government will establish and co-chair at their own expense an expert working group to develop a response framework for cumulative impacts. This response framework can be used to inform the Bathurst Caribou Management Plan and the Government of the Northwest Territories Barren ground Caribou Management Strategy and provide direction to Fortune Minerals to manage its project related to cumulative effects on caribou. Participants in this working group should include the Wek’eezhii Renewable Resource Board, Fortune Minerals, YKDFN and North Slave Métis Alliance.

The working group will:

- include persons holding traditional knowledge and persons with scientific knowledge
- design a response framework to ensure that proposed cumulative effects monitoring is adaptively linked to mitigation for cumulative impacts
- a report on the response framework will be completed by the Government of the Northwest Territories and Tłıchǵ Government within 6 months of the federal Minister’s approval of this Report of EA
- recommend ways to incorporate the response framework into regional caribou

management strategies or plans

The response framework will:

- demonstrate the linkage between project-specific mitigation and monitoring and cumulative impacts monitoring and mitigation.
- demonstrate how cumulative effects mitigation and monitoring will be integrated with comprehensive herd management planning.

The Board has considered the evidence put forward by all parties. In the Board's opinion, any measureable change in caribou health or population resulting from the NICO Project would constitute a significant impact on the already susceptible Bathurst herd.

The Review Board finds that the project is likely to contribute to significant adverse cumulative impacts to caribou and caribou habitat, primarily from increased hunting from the access road and displacement due to disturbance from project activities and components. In the Review Board's opinion, these impacts can be mitigated by careful design of the monitoring, mitigation and management plans. These plans must be collaboratively designed and developed, prior to the regulatory phase. In the Board's view, early discussion about caribou monitoring, mitigation and management is an essential part of avoiding these impacts. Proactive development and implementation of these monitoring plans will support decisions about mitigation through collaboration with traditional knowledge holders and will:

- help reduce or avoid any significant impacts on caribou and caribou habitat;
- help inform the regulatory process;
- allow for the early inclusion of traditional knowledge in plans;
- identify key concerns and management approaches;
- set triggers and thresholds for adaptive management;
- identify best practices for monitoring and mitigation; and
- provide assurance to the Tłı̄chǫ, Métis and Dene people that Fortune Minerals' intentions and commitments to protect the caribou (and other wildlife) from further decline are real.

Fortune has stated that it will not start mine construction until it sees that plans for the needed all-weather Tlı̄cho Road Route are definitely underway. Fortune will not want to spend money on a caribou monitoring plan until they know they actually have a project to build, since without the Tlı̄cho Road there is no project.

The Review Board considered submissions from ENR's closing arguments that recommended the separation of the proposed Wildlife Effects Monitoring Program into a Wildlife Effects Monitoring Program and a Wildlife and Wildlife Habitat Protection Plan.

The Review Board supports this recommendation for the following reasons:

- the creation of a Wildlife and Wildlife Habitat Protection Plan will contribute to the establishment of a common language in the development of industry-wide best practices and guidelines;
- it helps to clearly separate Project-site-specific mitigations, employee and contractor policy and procedures, and monitoring/reporting (the habitat protection plan) from a wildlife follow-up program that sets triggers and tests predictions and tests the effectiveness of mitigation (the effects monitoring plan); and
- discussions on, and implementation of, these systems will mitigate potentially significant impacts and support the development of sound regulatory approvals as the contents of the habitat protection plan would be within the authority of the Mackenzie Valley Land and Water Board under section 26(1)(h) of the *Mackenzie Valley Land Use Regulations*.

The Review Board recognizes that this separation is new and ENR has not yet developed guidance for developers or Land and Water Boards on how this separation will work. It is not certain, for example, which components of how mitigation and monitoring will be assigned to the Wildlife and Wildlife Habitat Protection Plan or Wildlife Effects Monitoring Program. It is also uncertain whether the Wek'eezhii Land and Water Board will be able to manage habitat protection for wildlife. The Review Board notes that ENR indicated in its Closing Comments that it intends to provide more detailed outlines to assist developers in preparing both the Wildlife and Wildlife Habitat Protection Plan and the Wildlife Effects Monitoring Program.

#### **Measure#9**

To reduce or prevent significant adverse impacts on caribou and caribou habitat from project activities, and, to inform adaptive management through active monitoring that will further prevent significant impacts from the mine and NICO Project access road, the Board requires the timely and collaborative development of a Wildlife and Wildlife Habitat Protection Plan by the developer.

At a minimum, this plan is to include:

- the use of both traditional and scientific knowledge;
- an adaptive management approach designed to assess how well mitigation measures perform and support the adoption of new mitigation, if necessary;
- best practices for mitigation and monitoring;
- development of clear protocols and standard operating procedures for Project employees and contractors to ensure the implementation of site-specific mitigation; and
- instructions and training to mine staff to reduce the potential for interactions



between people and wildlife.

In addition to a Wildlife and Wildlife Habitat Protection Plan, the Review Board requires the collaborative development of the Wildlife Effects Monitoring Program as specified below:

#### **Measure#10**

To reduce or prevent significant adverse impacts on caribou and caribou habitat from project activities and to use monitoring to inform adaptive management of mitigation that will further prevent significant impacts, the Board requires the timely and collaborative development of a Wildlife Effects Monitoring Program by the developer.

Before starting construction, Fortune Minerals will collaborate with others including the Tłıchǫ Government, the North Slave Métis Alliance, the YKDFN, the GNWT, and the Wek'eezhii Renewable Resources Board to complete and implement a Wildlife Effects Monitoring Program.

At a minimum, this program is to include:

- the use of both traditional and scientific knowledge;
- an adaptive management approach designed to use monitoring to test impact predictions, assess how well mitigation measures perform, and support the adoption of new approaches, if necessary;
- best practices for monitoring and mitigation;
- monitoring to test effect predictions and effectiveness of mitigation related to sensory disturbances, energy costs, the estimated zone of influence, and caribou and harvester use of the road through all mine phases;
- monitoring that involves people in Tłıchǫ communities;
- monitoring that can be readily integrated into regional cumulative effects programs; and
- a communications component to ensure Wildlife Effects Monitoring Program results are being reported back to community members and the Tłıchǫ Government on at least an annual basis.

Fortune Minerals has already committed to working with parties in the development and design of the Wildlife and Wildlife Habitat Protection Plan as well as the Wildlife Effects Monitoring Program. The Review Board stresses the importance of involving people from the Tłıchǫ communities in the Wildlife Effects Monitoring Program.

The Review Board heard concerns from the Tłıchǫ Government and Tłıchǫ people during the public hearings about the potential impacts on caribou and caribou habitat from the mine and access to the mine.

Elder Charlie Apples compared the NICO Project to the Rayrock Mine saying:

*That (Rayrock) area was a good fish lake. And that area is not useable to the Dene -- us people anymore. It was a good area for caribou. It's nice land, good timbers, good trees, all of that area. If that (NICO) mine and the road ever opened, it's going to have the impact on a lot of -- see that's one of the reasons why we're talking about it (PR#358, p135).*

Increased access, noise, contamination of food and water, habitat disturbance, and fragmentation were all identified as posing potential impacts to an already fragile and culturally important caribou population.

With respect to the arguments heard regarding independent monitoring, the Review Board agrees with those put forward by ENR and the developer. Commitments and measures have been identified for the collaborative and timely development of a Wildlife Effects Monitoring Program and Wildlife and Wildlife Habitat Protection Plan. The Review Board believes that the above measures, in addition to existing mechanisms through the Wek'eezhii Land and Water Board process, federal and territorial legislation, and Wek'eezhii Renewable Resources Board authority for monitoring, management and reporting provides adequate oversight for NICO Project-related impacts to caribou and caribou habitat.

The Review Board also heard concerns about impacts to traditional harvesting and the effects of increased access into remote areas of the Bathurst caribou range. Fortune Minerals has committed to implementing a no-hunting policy within its lease boundary for all on-site staff. It has also committed to discussing options for access management with the Tłıchǫ Government, the Government of the Northwest Territories, and the Wek'eezhii Renewable Resources Board for the Tłıchǫ road route.

Despite the commitments and measures listed above, the Board finds that there will likely be significant adverse impacts to caribou and caribou habitat as a result of improved access around the Project area. The Review Board believes that increased access is likely to result in increased hunting activity along the NICO Project access road route. First Nations have treaty rights that cannot be prohibited by the developer. In isolation, monitoring and restricting road access by Fortune Minerals is unreliable as mitigation for impacts related to hunting access.

<b>Measure#11</b>
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In order to mitigate significant adverse impacts from the project on caribou, the Tłıchǫ Government and Fortune Minerals will collaborate in ensuring that harvesting of caribou
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along the NICO Project Access Road does not occur.

The Review Board believes that the monitoring, mitigation and adaptive management measures above will prevent significant adverse impacts to the traditional harvest, caribou habitat and caribou populations as a result of the NICO Project. Additional project-specific impacts caused by the construction of a Tłıchq road route will be assessed in greater detail if and when an application from a third-party for that road is submitted to the Wek'eezhii Land and Water Board.

### 3.3.2 Boreal caribou

#### 3.3.2.1 Developer position and submissions

The NICO Project regional study area (RSA) is within the North Slave Boreal caribou population range identified by the Government of the Northwest Territories. Fortune Minerals' efforts to categorize local use by the boreal caribou, however, indicated that the boreal populations are more commonly present west of the RSA, beyond Whatı. For this reason, Fortune Minerals did not complete a full assessment of Project-related or cumulative effects specifically on the boreal population in the DAR. Instead, Fortune Minerals anticipated that the assessment results for Bathurst caribou could be used as a conservative estimate of Project effects on all herds. Fortune Minerals indicated that all mitigation efforts to reduce Project-related effects to Bathurst caribou would be equally effective for the boreal subspecies and that year-round environmental monitoring would help to better identify boreal caribou abundance in the area. Fortune Minerals stated that if summer and early fall caribou observations were recorded, adaptive management for the subspecies could be implemented through the environmental management system (PR#260, p37).

In response to parties' concerns during the environmental assessment process, Fortune Minerals committed to carry out more work to calculate the level of disturbance that the proposed NICO Project may have on boreal caribou habitat (as identified in the *National Recovery Strategy for Woodland Caribou, Boreal Population, in Canada 2011*) (PR#272, p 26) and to hosting a workshop to further discuss Project impacts with parties (PR#271, p 7). In response to undertaking #4 from the Feb 7-9, 2012 technical meetings, Fortune Minerals calculated the level of boreal caribou habitat disturbance from the proposed NICO Project footprint, NICO access road, Tłıchq road route and a 500 m buffer. It determined that the Project would contribute a total of 27,260 ha of new disturbance within the boreal caribou NWT south range (PR#179, p1). Fortune Minerals says that it has designed the site to have the smallest physical footprint possible (PR#271, p15) and has committed to discuss opportunities and possibilities for offsite caribou habitat compensation with parties during discussions for the development of the Wildlife Effects Monitoring Program (PR#358, p. 51-53).

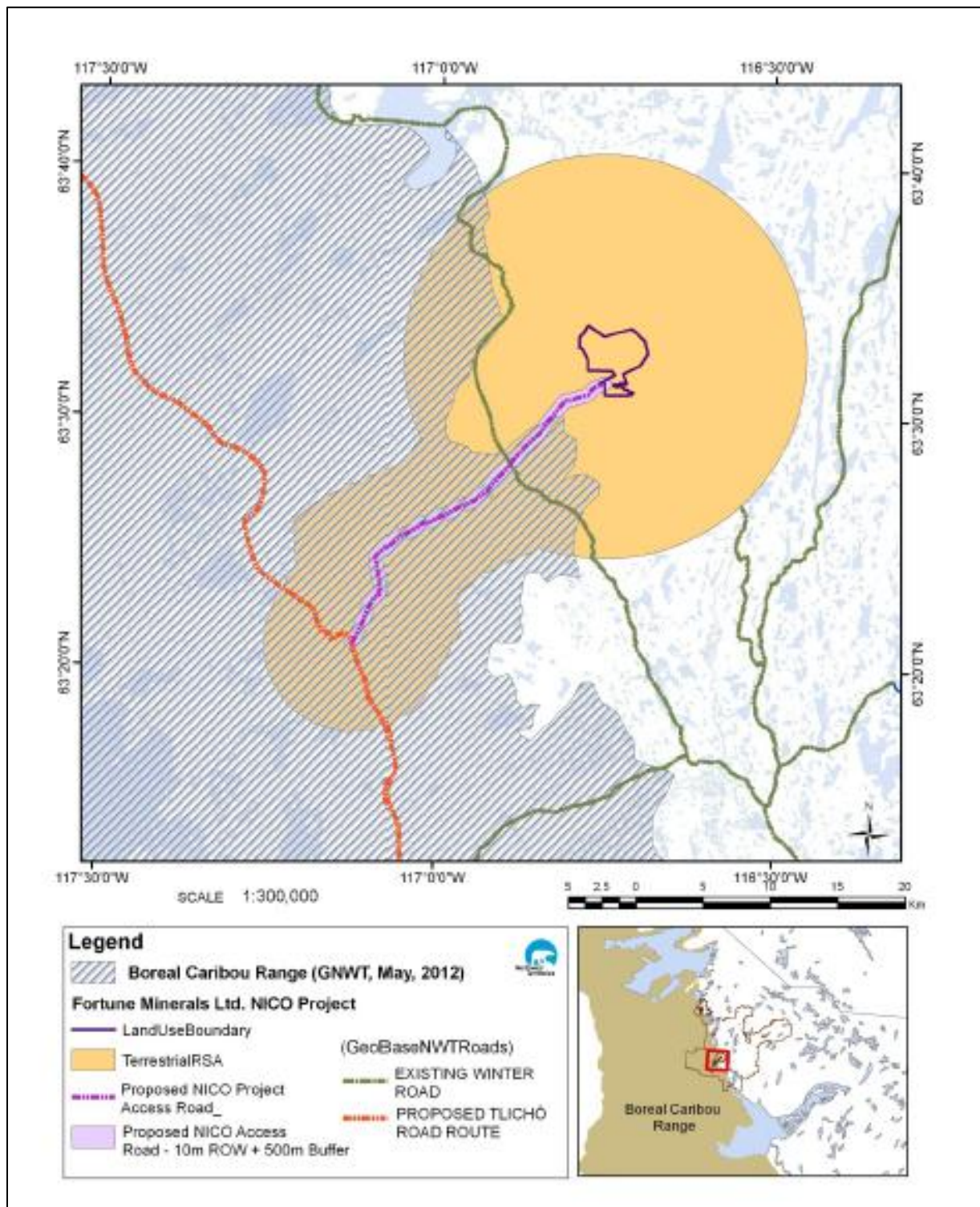
### **3.3.2.2 Parties' submissions and recommendations**

Throughout the EA process, the YKDFN argued that Fortune Minerals did not adequately address impacts to boreal caribou through the collection of traditional knowledge or through the assessment of Project impacts. They recommended that the Review Board require Fortune Minerals to collaboratively develop an assessment to better evaluate the impacts of the NICO Project on boreal caribou. YKDFN asked the Review Board to delay the closing of the public record so as to consider the Tłıchǫ Government's Traditional Knowledge and Use Study (PR#251, p 5). YKDFN also expressed concern about Fortune Minerals' use of non-subspecies specific research in the assessment of Project-related effects on the different caribou populations in the area. In response, it recommended that Fortune Minerals carry out behavioural studies on both boreal and Bathurst caribou, identify occurrences of the "non-subspecies specific" assessments in the DAR, and provide a better analysis, incorporating traditional knowledge and behaviour studies, of the uncertainties that such "non-subspecies specific" analysis might create (PR#251, p6).

ENR provided Fortune Minerals and the Review Board with a map identifying the May 2012 version of the boreal caribou range boundary in the vicinity of the NICO Project. This boundary, which ENR qualifies as approximate, shows that at least 23.6 km of the NICO Project access road falls directly within the identified boreal caribou range.

After a review of the commitments made by Fortune Minerals during the EA process, ENR had no specific recommendations with regard to caribou and caribou habitat for the NICO Project. It did, however, express its expectations for further discussions of the Wildlife Effects Monitoring Program with the developer, including mitigation alternatives for Project-specific and cumulative effects and highlighted the goals of the National Recovery Strategy and the Action Plan for the Boreal Woodland Caribou (PR#260, p. 25-28).





**Figure 12:** Boreal caribou range in relation to Fortune Minerals Ltd. NICO Project location  
(PR#260, p. 26)

In its technical report, EC provided an analysis of caribou habitat disturbance in the NWT south range. It estimated that the existing total habitat disturbance for the area is currently at 38%. This is 3% above the critical habitat disturbance threshold for the maintenance of self-sustaining local populations, which has been identified at 35% (EC, 2011). The addition of the proposed Project footprint, the NICO access road, the Tłıchq road route, plus a 500 m buffer, it calculated, would add 0.11% of new disturbance to this total. As a result of these impacts, EC recommended that Fortune Minerals work with ENR and the Wek'èezhii Renewable Resources Board (WRRB) to identify management plans for the protection of undisturbed caribou habitat in the Project area. EC also recommended that Fortune Minerals discuss how the Project and its monitoring programs can align with existing territorial management strategies and action plans for the protection of boreal caribou and caribou habitat (PR#246, p. 7).

The Tłıchq Government identified concerns about total disturbance on boreal caribou habitat as described in the *Boreal Caribou Habitat and Habitat Use in the Wek'èezhii* report issued by the WRRB. This report identifies the loss of prime habitat, largely through forest fires, as the main threat to self-sustaining caribou populations within the Wek'èezhii area and describes this as the likely reason for the recent shift in boreal caribou distribution north and west. The report states that the current level of disturbance to boreal caribou habitat in the Wek'èezhii area from existing natural and anthropogenic impacts is currently at the 35% critical threshold identified by EC (2011). Increased risk to this habitat from mineral exploration and development can push this disturbance level beyond this threshold of disturbance (PR#229, p. 12). As a result of these findings, the Tłıchq Government recommends that Fortune Minerals re-evaluate its estimates of Project impacts on boreal caribou and requests that the Review Board identify measures requiring Fortune Minerals to minimize total disturbance on the land (PR#265, p. 13).

In its closing arguments, the Tłıchq Government repeated earlier concerns about the adequacy of the boreal caribou impact assessment completed by Fortune Minerals. In order to identify more rigorous monitoring methods to detect impacts specifically on boreal caribou and habitat, it requested that the Review Board consider measures directing the developer to create monitoring and mitigation programs. These programs, they argue, should be designed with the ability to assess both species of caribou independently to ensure there are no likely significant impacts on either population (PR#369, p. 39-40).

ENR noted the *National Recovery Strategy for the Woodland Caribou, Boreal Population, in Canada* was posted to the Federal Species at Risk Registry on October 5, 2012 and emphasized the requirement to maintain the 65% minimum for undisturbed habitat within the Northwest Territories range (PR#370, p. 7-8).

EC also provided a brief summary of the recently-posted *National Recovery Strategy for the Woodland Caribou, Boreal Population, in Canada*. In its closing arguments, EC concludes that the proposed NICO Project “would not add sufficient new disturbance to compromise the ability of the range to maintain 65% undisturbed habitat” but encourages Fortune



Minerals to continue consultations with ENR and the WRRB to determine how the Project aligns with existing management strategies and action plans for the boreal caribou. EC also recommends that Fortune Minerals consult with the Tłıchq Government, ENR and AANDC to determine the implications of the Project for boreal caribou in the context of current and future development activities within the range, and to assess the cumulative impacts on undisturbed habitat (PR#368, p. 1-3).

### 3.3.2.3 Review Board's analysis and conclusions

The *Species at Risk Act* creates responsibilities for the Review Board in addition to those of the *Mackenzie Valley Resource Management Act*. If a project is likely to affect a listed wildlife species or its critical habitat, the Review Board must identify the adverse effects of the project on the species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them (*Species At Risk Act* ss. 79(2)).

The Review Board kept the public record open and scheduled a second set of public hearings from October 10-11, 2012 in order to allow for the submission, review and discussion of the NICO Project access road and the Tłıchq Government's Traditional Knowledge and Use Study. During this time, the *National Recovery Strategy for the Woodland Caribou, Boreal Population, in Canada* was posted to the Federal Species at Risk Registry. Given the Board's responsibilities under s.79 of the *Species at Risk Act*, the judicial notice of this document and substantial reference to it by ENR and EC in closing comments, the Review Board has considered the findings in its deliberations.

Critical habitat in the Northwest Territories range totals 44,166,546 ha, 31% of which has been identified as disturbed through anthropogenic and natural impacts. Given that the majority of this disturbance (24%) has been caused by fire and total undisturbed habitat is currently above the 65% threshold identified by the *National Recovery Strategy for Woodland Caribou, Boreal Population, in Canada* the Review Board does not see the proposed NICO Project as posing a significant adverse effect to boreal caribou and caribou habitat. Further consideration of impacts to boreal caribou will be done during the assessment of the Tłıchq Road which is required before this project can proceed.

Because a portion of the NICO Project access road is within the boreal caribou range, the project has the potential to cause significant impacts. The Review Board notes that while some measures above requiring the collaborative development of a Wildlife Effects Monitoring Program and Wildlife and Wildlife Habitat Protection Plan apply equally to the boreal caribou populations, as well as to the Bathurst barren ground herd, other considerations apply including different monitoring techniques. The Review Board also notes commitments made by Fortune Minerals to explore opportunities for off-site mitigation of local habitat disturbances (PR#358, p. 52). The Review Board is of the opinion that these will prevent significant impact on boreal caribou from the project.

In addition to these measures and commitments, the Review Board suggests that the following actions be completed prior to construction of the NICO Project access road.

**Suggestion #5**

Fortune should work with the Tłı̨chǫ Government, and especially elders, to discuss opportunities and possibilities for offsite caribou habitat compensation in the development of their Wildlife Effects Monitoring Program and Wildlife and Wildlife Habitat Protection Plan.

**Suggestion #6**

Responsible wildlife co-management authorities should begin implementing actions described in the “Action Plan for Boreal Woodland Caribou Conservation in the Northwest Territories 2010-2015”, as well as developing and implementing range management plans and a comprehensive monitoring program that will track boreal caribou population indicators and landscape activities across the boreal caribou range in the Northwest Territories. The NICO Project footprint, including the access road, should be reviewed by responsible co-management authorities under the principles defined in the Action Plan.

The Review Board recognizes the merit in Fortune Minerals’ commitments to work with parties to develop collaborative approaches to regional scale caribou monitoring and management programs. The Board agrees with EC’s conclusions that cooperative monitoring can help contribute to the successful implementation of the recovery strategy and help mitigate any potential adverse effects to caribou and caribou habitat in the Project area.

### 3.4 Cultural, social and economic impacts

The *Mackenzie Valley Resource Management Act* (MVRMA) lists social impacts, cultural impacts, impacts on heritage resources, and impacts on wildlife harvesting in the definition of impacts on the environment. Subsection 115(c) specifically requires the Review Board to have regard for the wellbeing and way of life of Aboriginal peoples of Canada. In addition, the guiding principles of Part 5 of the MVRMA require the consideration of social, economic and cultural wellbeing of residents and communities of the Mackenzie Valley during every environmental assessment (PR#87, p. 17).

#### 3.4.1 Cultural values

The NICO Project is located on the traditional lands of the Tłı̨chǫ First Nation. The Tłı̨chǫ and other Dene groups in the region, such as the YKDFN, employ traditional land use practices that focus on the seasonal movements of the barren ground caribou as well as on

the widely dispersed resources of the boreal forest (PR#116, p. 16.110). Throughout the fur trading period, the Métis participated in a very wide variety of occupations and dominated the transportation industry that was the lifeline of fur trade expansion into the north and west (PR#116, p. 111).

The Tłıchǵ Government and community members demonstrated that the location of the proposed NICO Project – the *ase ede t'seda dile* or the “place we go to survive” – is a central part of the Tłıchǵ cultural landscape. During the public hearings, many Tłıchǵ citizens spoke to the Board to support evidence provided in the Tłıchǵ Traditional Knowledge and Use Study that the Hislop Lake area and lands in the vicinity of the proposed NICO Project have been and continue to be used for the practice and transmission of cultural ideas and activities. The North Slave Métis Alliance also assert aboriginal rights and title to the Project area, claiming that it is within their own traditional lands.

In an effort to address public concern and the potential for significant adverse impacts to the traditional use, cultural values and the perception of safety associated with the surrounding landscape, the Review Board required Fortune Minerals to conduct an analysis of potential impacts to both tangible and intangible cultural and heritage resources in the DAR (PR#87, p. 37). In the Terms of Reference issued by the Review Board, Fortune Minerals was instructed to assist in the collection of traditional knowledge and incorporate the information into its evaluation of impacts from the NICO Project. The developer was instructed to “describe potential cultural impacts, including impacts on physical heritage [and] traditional land use such as hunting, fishing, gathering, use of the traditional İdaá Trail and any impacts on activities at Hislop Lake” (PR#87, p. 17). On October 10-11, 2012 the Review Board held a second round of public hearings in Behchokò to discuss the traditional knowledge and land use studies submitted by the Tłıchǵ Government and North Slave Métis Alliance after the conclusion of the August 2012 public hearings.

In the DAR, Fortune Minerals identified the following assessment endpoint in its evaluation of the Project’s impacts on culture:

1. the persistence of long-term cultural properties.

Through consultation, culture was identified as a valued component (VCs). The measureable expression of impacts to this endpoint included changes to:

- language use;
- heritage resources;
- tourism potential and wilderness character;
- access to wildlife; and
- availability of wildlife (PR#116, p. 16.11).

The NICO Project is within the traditional land use areas of the Tłıchǵ and Métis people. As part of its assessment, Fortune Minerals identified two distinct study areas for which to

describe potential disturbance to traditional land use activities and cultural values of NICO Project:

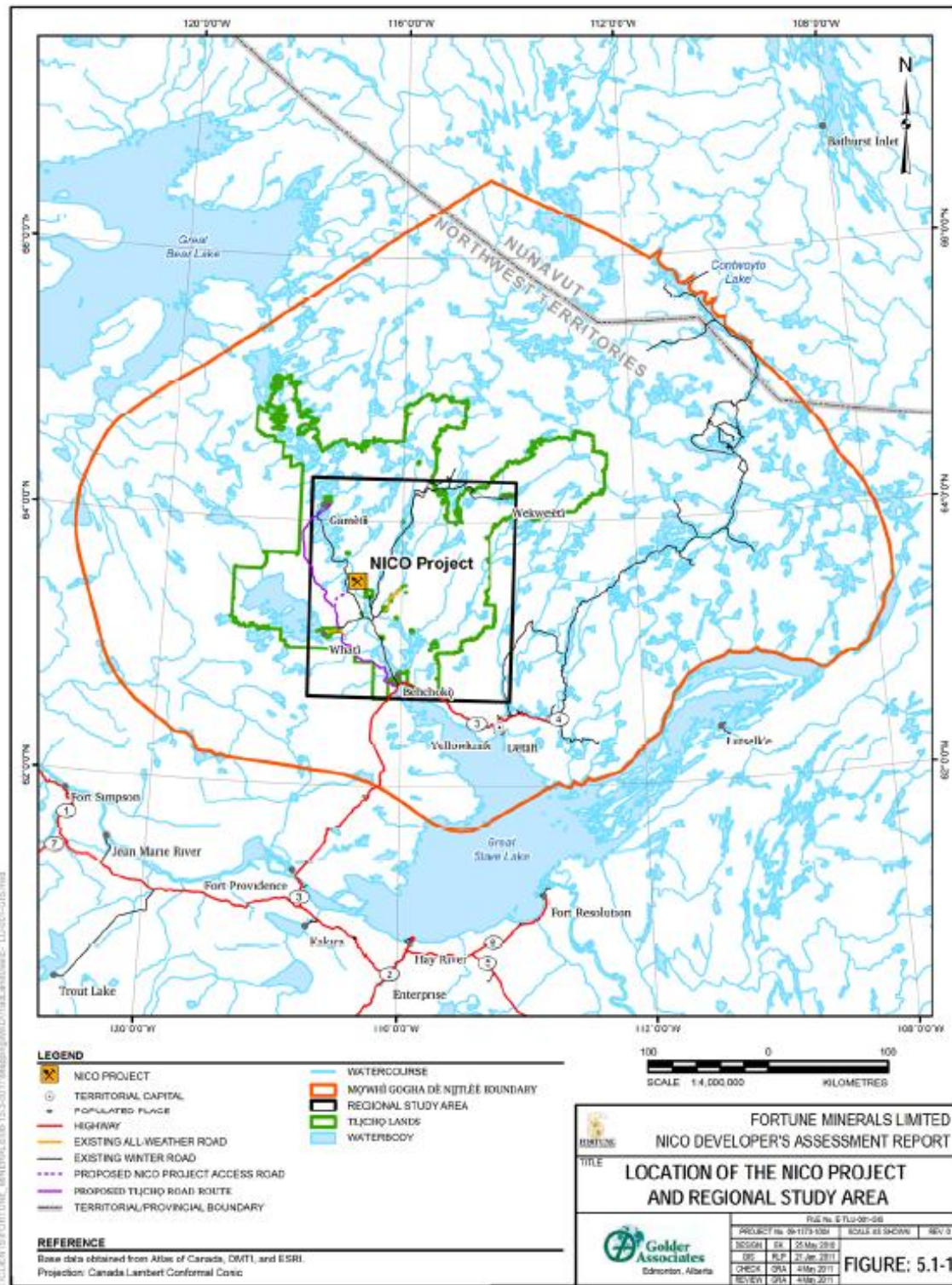
1. *The Regional Study Area (RSA)* – used to assess the combined direct and indirect effects from the NICO Project on traditional land use and cultural values beyond the Project lease boundary.

It consists of the Local Study Area, the proposed NICO access road, the communities of Behchokò, Whatì, Gametì, and Wekweètì, Hislop Lake and a portion of the Įdaá Trail, and other surrounding waterbodies (PR#116, p. 5.3). For heritage resources, the RSA was selected to quantify baseline conditions at a scale that was large enough to assess the maximum predicted geographic extent of direct and indirect aesthetic effects from all phases of the NICO Project on VCs (PR#116, p. 16.106).

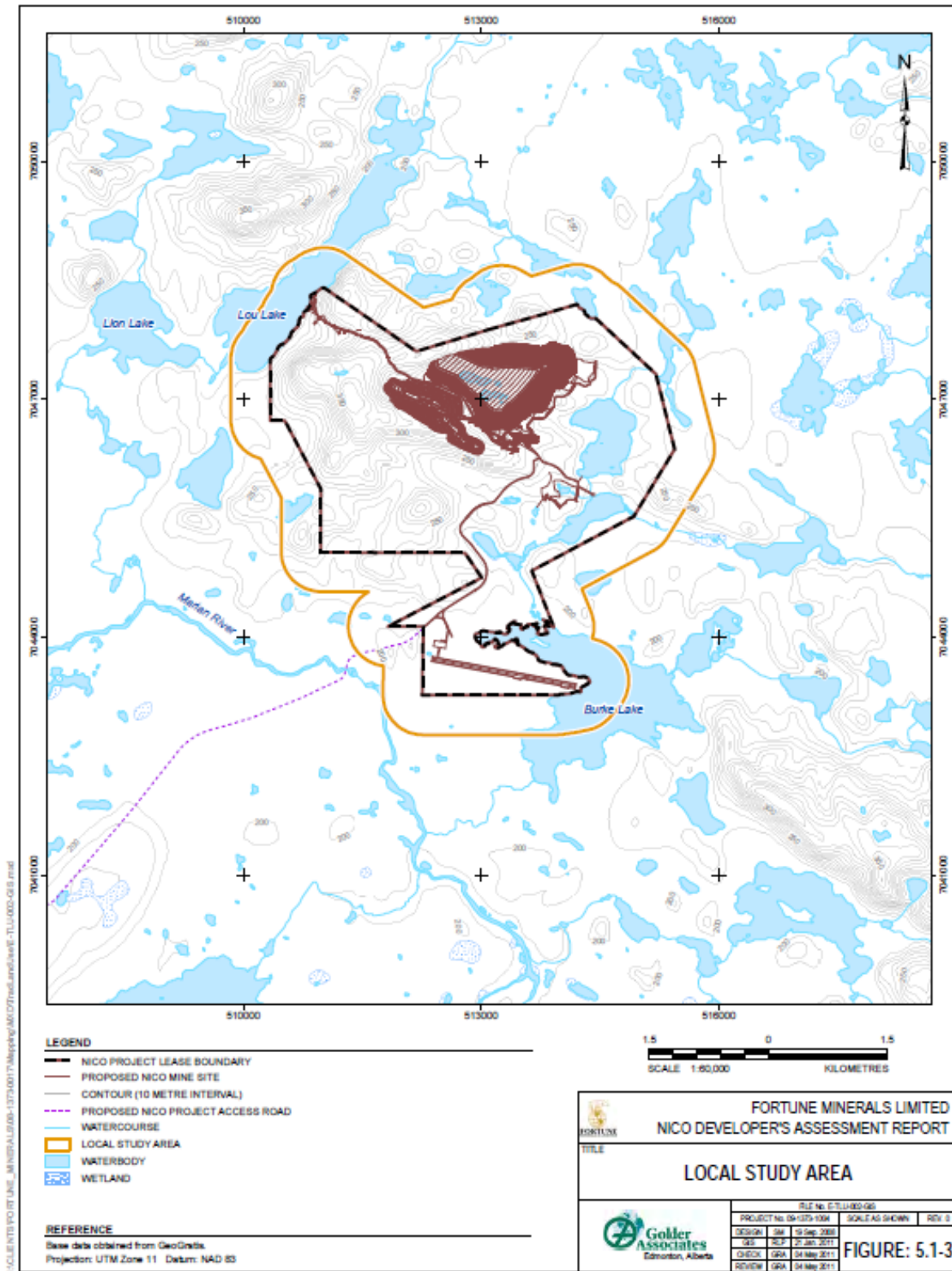
2. *The Local Study Area (LSA)* – used to describe and discuss traditional activities, sites and resources that overlap the NICO Project and the immediate area surrounding it.

It consists of the NICO Project lease boundary plus a 500 m buffer and the 27 km proposed NICO Project Access Road with a 1 km buffer (PR#116, p. 5.3). For heritage resources, the LSA is defined as the NICO Project footprint only since no direct effects are expected to occur beyond that (PR#116, p. 16.106).





**Figure 13:** Location of the NICO Project and the TK Regional Study Area  
(PR#116, p. 5.4)



**Figure 14:** Location of the NICO Project lease boundary and the TK Local Study Area, (PR#116, p. 5.6)



#### 3.4.1.1 Developer position and submissions

The DAR presented information from studies Fortune Minerals initiated to gather traditional land use information and traditional knowledge in an effort to determine potential effects of the NICO Project on traditional use and cultural values of the Project area. The scope of the study included interviews with Tłıchǵ participants from Gamètì and Whatì and a review of available literature pertaining to traditional activities of the Tłıchǵ and the Métis within Tłıchǵ lands (PR#116, p. 5.1).

Fortune Minerals documented some information regarding past and present hunting and trapping activities, fishing activities, water use, plant harvesting, and other cultural uses including camps, burial sites, trails and travel routes in the NICO Project vicinity. Concerns, as reported by Fortune Minerals, about the Project's impacts centered on the availability of a healthy environment and healthy resources from which the Tłıchǵ people could continue to practice and teach cultural values and traditional land use activities. Tłıchǵ participants in Fortune Minerals' traditional land use and traditional knowledge studies, expressed concern about the risks of the Project, impacts on wildlife, and insufficient benefits for Tłıchǵ communities from the proposed development (PR#116, p. 5.11).

Fortune Minerals identified several Project design features which were modified in response to the concerns expressed by Tłıchǵ community members:

- an initially-proposed hydrometallurgical facility was relocated to Saskatchewan to reduce impacts on water use and quality;
- the co-disposal facility was designed to have a smaller footprint, to be entirely contained within the Grid Pond area, and to not be visible from the Įdaá Trail or Hislop Lake;
- the open pit will be surrounded by boulders instead of a fence in order to prevent inadvertent access by people or animals; and
- a capillary break will be included in the design of the co-disposal facility cover to prevent the uptake and intake of arsenic by plants and animals.

Results from the North Slave Métis Alliance were not available for consideration at the time Fortune Minerals wrote the Developer's Assessment Report (PR#116, p. 5.38, 5.41).

Fortune Minerals made commitments for monitoring and mitigation, based on the collection and analysis of traditional knowledge, as follows:

- have discussions with hunters and trappers who believe that their hunting and trapping practices have been compromised by the NICO Project;
- restrict traffic onto the NICO Project site for safety reasons;
- hire Tłıchǵ people to perform on-site monitoring whenever possible, and assist in the design of monitoring programs;

- continue site visits for the Elders to assist in the design of site monitoring plans (e.g., Aquatic Effects Monitoring Program, and Wildlife Effects Monitoring Program);
- burial sites and archaeological sites will be avoided or mitigated according to acceptable procedures;
- find ways to mitigate dust generation on the road to limit potential impacts on plant and animal life;
- have a monitoring program in place to monitor water quality;
- add a baseline water quality station at Behchokò that will be monitored now and during mine operation;
- two water quality stations on Hislop Lake have already been added to satisfy concerns over water quality in that lake; and
- commit to developing a monitoring program with the help of the Tłìchʔ that will examine the health of streams and lakes potentially affected by the NICO Project (PR#116, p. 5.40).

In its assessment of pathways between NICO Project components or activities and potential impacts on cultural values, Fortune Minerals identified several potential linkages, and has proposed mitigation in the form of environmental design features such as Project design elements, best practices, management policies and procedures, and social programs (PR#116, p. 16.40). Key examples are described below:

Mitigation for reduced time at home for mine workers:

- work/life balance is considered in shift design;
- potential for shorter shift rotations may offer more opportunities for women with young children to enter workforce;
- employees from nearby communities will be better able to optimize values important to them outside the workplace, such as family and cultural activities; and
- communication links provided for employees to maintain relationships with their families while at site, such as telephone and internet.

Mitigation to prevent loss of use of traditional languages and culture:

- cultural awareness programs;
  - more Tłìchʔ speaking counsellors for employees and their families;
  - translation of policies and important documents to Tłìchʔ language (PR#116, 16.44); and
  - encouraging use of traditional languages at the worksite, when safe to do so.
- (PR#116, p. 16.94)

Mitigation to prevent impacts on wildlife and harvesting:

- hunting, trapping, or recreational fishing will be prohibited by staff or contractors at the NICO mine site, or when on the NICO Project;

- the recreational use of all-terrain vehicles at site will be prohibited;
- have discussions with hunters and trappers who approach Fortune Minerals with a case that their hunting and trapping practices have been compromised by the NICO Project; and
- Tłıchǫ people will be hired to perform the monitoring on-site whenever possible, and assist in the design of monitoring programs.

#### Mitigation to minimize impacts on traditional activities at Hislop Lake

- hunting, trapping, or recreational fishing will be prohibited by staff or contractors at the NICO mine site, or when on the NICO Project access road for work purposes; and
- two water quality stations have been added in Hislop Lake to satisfy concerns over water quality.

#### Mitigation for visual and noise impacts:

- co-disposal facility designed to not be higher than the surrounding hills and so the NICO Project will not be visible from Hislop Lake or the İdaà Trail;
- sound mufflers will be used on mining equipment; and
- blasting will be limited to one blast per day.

#### Mitigation for impacts on physical heritage resources

- completed archaeological assessment for areas that are considered likely to contain heritage resources;
- avoid previously recorded heritage resource sites;
- complete additional archaeological assessment for any changes to NICO Project footprint in areas considered to have moderate to high potential to contain heritage resources; and
- provide awareness training and a manual for recognizing heritage resources to construction crews (PR#116, p. 16.116).

Fortune Minerals states that the duration of cumulative and incremental impacts from the NICO Project on caribou population abundance and distribution, and traditional and non-traditional use of caribou for the majority of pathways, is anticipated to be reversible over the long-term (PR#116, p. 16.124).

According to Fortune Minerals, project-related impacts on other wildlife will be similar to those anticipated for caribou. Access to harvesting areas within the NICO Project area will not be available for traditional activities during the construction and operation phases of the NICO Project. A measurable change in the abundance and distribution of wildlife populations is predicted within 1 to 2 km of the NICO Project and other developments,

which may influence the availability of animals for trapping and hunting. Fortune Minerals predicts that the decrease in the availability of wildlife for harvesting from NICO-Project-related effects is predicted to be within the range of baseline values (PR#116, p. 16.133-134).

Fortune Minerals states that a measurable change in the abundance and distribution of fish populations is predicted for Nico Lake, and possibly Peanut Lake, which may influence the availability of fish for harvesting for traditional and non-traditional users. The magnitude of the decrease from the NICO Project on fish populations is expected to be within the range of existing conditions (PR#116, p. 16.128).

Fortune Minerals states that the overall effect from the NICO Project on the use of vegetation resources is expected to be within the range of baseline conditions. Effects from dust deposition and air emissions on vegetation are also expected to be mostly confined to the NICO Project footprint. The RSA outside the LSA is not expected to be impacted (PR#116, p. 16.131).

On behalf of Fortune Minerals, an archaeologist conduct baseline studies to identify any previously recorded physical heritage resources within the NICO Project area. An archaeologist and members of the Tłıchǵ and Métis communities also participated in field investigations to determine if any additional sites might be threatened by the Project. Two previously recorded sites within the LSA were revisited but no new archaeological sites were identified. Community participants identified four historical and cultural use sites which included mine claim posts, hunting camps, and a possible portage trail.

Results of the heritage resource impact assessment concluded that the sites threatened by the NICO Project were of limited scientific heritage resource value and no further work was recommended (PR#116, p. 16.111-114). Fortune Minerals found that construction and operation of the NICO Project should not impact intangible cultural resources and values associated with the Įdaá Trail and Hislop Lake since the Project will not be visible from these locations and should pose no environmental threat to the land and waters (PR#116, p. 16.118). Impacts on traditional harvesting activities in the Project area have been summarized above.

#### **3.4.1.2 Parties' submissions and recommendations**

On June 12, 2012, the Tłıchǵ Government submitted an "Insufficiency Report" which found the traditional knowledge study presented in the DAR as "an insufficient and inadequate base from which to make an informed decision regarding the potential effects of the NICO Project." The lack of quality in the developer's TK study was the primary reason that the Tłıchǵ Government requested funds to conduct its own traditional knowledge and traditional land use study (PR#240, p. 1-2).

The YKDFN expressed its concerns about the overall collection of traditional knowledge and fully supported the inclusion of the Tłıchǫ Government's Traditional Knowledge and Use Study into the Board's deliberations (PR#251, p. 8).

The Tłıchǫ Government's Traditional Knowledge and Use Study was submitted to the Review Board on September 15, 2012. It provides information based on Tłıchǫ knowledge, land use, and values in the vicinity of the NICO Project. The Tłıchǫ call the general region surrounding Hislop Lake, *k'ìàgoti* and the proposed Project site *asi ede t'seda dile* – “the place we go where we can survive”. This area is also located along the main travel route of the İdaá Trail which is collectively considered a major part of the Tłıchǫ traditional and cultural landscape (PR#349, p. 18).

The Tłıchǫ Study provides evidence such as place names, site-specific uses such as environmental features, burial locations, campsites and kill sites, and values such as subsistence, habitation, cultural/spiritual, transportation, and environmental, and non-site-specific values such as transportation corridors, wildlife, water, plants, knowledge and language to represent the complex, dynamic, and fragile relationship the Tłıchǫ people have with the land in the project area. The Tłıchǫ view site-specific values as reflections of specific instances of use that anchor the wider practice of livelihood within a particular landscape, while non-site-specific values often represent the critical conditions or elements that must be present for the continued practice of aboriginal rights (PR#349, p. 20-21).

During the technical sessions, the Tłıchǫ Government asked Fortune Minerals to identify whether it had included any questions relating to the loss of use or areas of avoidance by harvesters in its traditional knowledge study, including questions about the psycho-social impacts associated with perceived contamination. The Tłıchǫ Study also highlighted the loss of use due to real and perceived industrial impacts as a significant source of concern for the Tłıchǫ people. Both Fortune Minerals and the Tłıchǫ Government acknowledge that the impact of the former Rayrock Mine has significantly altered Tłıchǫ use and awareness of land and wildlife in the area (PR#180). The area is now considered unhealthy and has been essentially removed from the landscape for traditional use activity (PR#369, p. 11).

Based on the collection of Tłıchǫ knowledge, the Tłıchǫ Government is convinced that the proposed NICO Project will destroy and/or render unusable preferred and site-specific Tłıchǫ hunting, fishing, harvesting, trapping, habitation, and transportation areas including the values, culturally important wildlife populations, and cultural and spiritual values within the local and regional study areas. They are also concerned that the development may destroy or impact unique environmental features and reduce or eliminate opportunities for the transmission of Tłıchǫ knowledge specific to areas within the local study area (PR#349, p. 45-50). Recommendations made by the Tłıchǫ Government in the Study included the protection of resources for the continuation of Tłıchǫ knowledge and use into the future, the integration of mitigation and monitoring programs agreeable to the Tłıchǫ , and ongoing traditional knowledge research for the area (PR#349, p. 55).



During the public hearings, the Review Board heard extensively from Tłıchq community members, many of whom expressed real and considerable fear of impacts, especially to water and the continued traditional use of the area (PR#369, p. 6), similar to the results documented in the Tłıchq Study.

In a statement on October 10, 2012, Chief Charlie Football expressed his feelings about the Tłıchq connection to the land:

*We have our own ancestors. They survive with the fur bearing, trapping, and all the animals that roam on the land. And with that, we survive, and that's how they pass on the knowledge. And that's how we survive, and that's how we taught one another, generation after generation. And with that, we don't want our land to be ruined (PR#358, p. 149).*

Chief Alfonz Nitsiza said:

*[W]e, as Aboriginal people, the way we were brought up and how we were taught, how we were taught on the land, on the water, the animal, everything living on this land, we have to respect it. That's how our forefathers taught us, our Elders (PR#358, p. 159).*

During the community comments, Mary Zoe-Chocolate explained:

*So we, as the Dene people, we need to be strong and work on the -- on the land - on our land. If we lose our traditions, we will lose our culture (PR#359, p. 116).*

In his closing statement on October 11, 2012, Grand Chief Eddie Erasmus explained:

*There are no stories without the lands. The land is the base for our identity, our culture, our language and way of life. The land is the story, and the people's activity on the land reminds them of these stories. The land cannot be separated from language, culture and way of life (PR#359, p. 280).*

The North Slave Métis Alliance also submitted a Traditional Land Use, Occupancy and Knowledge study on September 15, 2012. This report provides information based on the North Slave Métis Alliance's knowledge, land use, and occupancy in the vicinity of the NICO Project. Members of the North Slave Métis community identified the lands and waters between Behchoko, Wekweètì, Whati and Colomac as valuable hunting, trapping, fishing, and harvesting areas (PR#350, p. 7-15), and identified the existence of cabins, the use of trails and other special features such as burial sites in the vicinity of the proposed development (PR#350, p. 16). The North Slave Métis Alliance study provides evidence of site-specific uses and values to represent its use and occupancy of the Project area and identified the negative impacts of past developments as being responsible for the

discontinued use of some of its traditionally used lands, emphasizing the need to return the land to a natural condition post-closure (PR#350, p. 18-19).

In its technical report, the North Slave Métis Alliance expressed its concerns with the proposed development's impacts on traditional uses of water, air, land, wildlife, culture and economy in the Project area. They disagree with Fortune Minerals' conclusions about the significance of the impacts from the Project, and instead believe that any change in water quality, quantity or rate of flow is significant, that any impact on use, aesthetics and occupation of the land is significant, and that any influence on caribou or other harvestable resources is significant without proper consultation and accommodation. It believes that measurements of Project-related effects must include cultural perceptions before significance and extent are identified. They recommend that the Project be referred to environmental impact review to allow Fortune Minerals to better identify impact predictions, improve proposed mitigation measures, and reduce residual impacts to an 'acceptable' level (PR#294).

In its final argument, the Tłı̨chǫ Government emphasises the importance of managing the overall health and the public perception of health of the environment around the NICO Project area. The Tłı̨chǫ Government are worried that if the lands affected by this Project, which is in the heart of Tłı̨chǫ lands, are removed from traditional use, even for one generation, it would be unlikely that it could be re-integrated into Tłı̨chǫ traditional use and imagination in the future. They would like assurances that if this Project is approved they will be able to continue their traditional pursuits in the area they have "gone to survive" for now and for the future (PR#369, p. 4-6).

The Tłı̨chǫ Government provided four recommendations for the Review Board to consider for preventing or reducing potentially significant impacts on Tłı̨chǫ cultural practices in the Project area. They include:

- Fortune Minerals' funding for additional and ongoing traditional knowledge and traditional land use studies;
- funding for independent Tłı̨chǫ monitoring of water and wildlife;
- integration of this knowledge with other regional monitoring programs; and
- funding of a cultural camp on the land at *k'iàgoti* (PR#369, p. 12-13).

In its closing statement, the North Slave Métis Alliance echoed Tłı̨chǫ concerns about real and perceived impacts to water, impacts on the availability of traditional lands for carrying out Aboriginal rights, impacts on the traditional use of wildlife and impacts on the traditional economy. They recommended that the Review Board consider the continued inclusion of traditional knowledge into the assessments of the Project's cumulative effects on water and air quality (PR#366, p. 3-4).

As noted above, they requested that the Review Board refer this Project to environmental impact review in order to address the remaining public concern regarding the unknown socioeconomic and cultural cumulative impacts, including the recognition and accommodation of North Slave Métis Aboriginal rights (PR#366, p. 5).

In its final written submission, Fortune Minerals' addressed the fear of loss of use due to real and perceived contamination by attempting to distinguish between past development Projects, such as the Rayrock Mine and Colomac Mine, and its own Project. Fortune Minerals argues that the current regulatory regime provides much stricter regulations for mining and has committed to work with the Tłıchq Government to inform people about how mining has changed and about the existing design and regulatory safeguards in place to protect the environment. Fortune Minerals also plans to further discuss opportunities for documenting and protecting traditional knowledge through the IBA process (PR#373, p. 1).

Acknowledging the special significance of Hislop Lake and the Įdaá Trail, Fortune Minerals notes its efforts to design the NICO Project so as to have no physical or visual impacts to Hislop Lake or the Įdaá Trail, with the exception of a bridge across the Marian River. Fortune Minerals is of the opinion that the Tłıchq people will continue to have access to the area around the NICO Project to carry out traditional pursuits. The company has committed to use the Tłıchq Government Traditional Knowledge and Use Study and continue to engage the Tłıchq Government in the development of monitoring and mitigation plans (PR#373, p. 2).

#### **3.4.1.3      Review Board's analysis and conclusions**

The NICO Project is located within the Hislop Lake area. During the course of the environmental assessment, and especially during the public hearings, the Tłıchq and Métis clearly articulated their connections to land, identifying many cultural values and uses of the Project area which have been passed down over generations. This area is part of an important travel and trade route, as a place to meet friends and family, to camp, to hunt, to fish, to trap, and to share stories and resources. The importance of the cultural and traditional use values of this area was clearly demonstrated to the Review Board.

Many Tłıchq elders, leaders, youths and traditional land users have persuasively argued that, based on a history of contamination of the land, despite best assurances from mining companies, from mining, they will have serious reservations about using the Hislop Lake area once a mine is there. The Tłıchq people have told the Board that this is partly due to people's perception. They have made it clear that they expect this to happen regardless of the chemical composition the water. Regardless of sensory disturbance, even if it cannot be seen, heard, or smelled from nearby, the knowledge of the mine nearby is likely to reduce the cultural value and active use of the surrounding Hislop Lake area.

The Review Board finds as a fact that this area is culturally and spiritually significant to the Tłıchq people and that it is used, has been used and will be used in future to support the



continuation of these important cultural and spiritual activities. The Board accepts the arguments from the Tłıchǵ presenters about the effects of development on use. Having carefully considered the evidence, the Board is of the opinion that it is likely that community perceptions of environmental contamination and persistent avoidance may result in reduced use of the Hislop Lake area. Because the Hislop Lake area is part of the Įdaá Trail, one of the most important traditional routes, this loss is likely to adversely affect culture of the Tłıchǵ overall. In the view of the Board, unless mitigated, these are likely to be significant adverse impacts on the maintenance of Tłıchǵ traditional and cultural values if measures are not implemented to prevent or reduce the effects of the Project on the Tłıchǵ connection to and knowledge of the land in the Hislop Lake area.

The Review Board believes these impacts can be best mitigated by traditional knowledge gathering. In the Board's view, an increased number of traditional knowledge studies, and increased sharing of studies' results, will both minimize the reduced use of the Hislop Lake area and will offset the greater overall loss to Tłıchǵ culture described above. Traditional knowledge provides an appropriate mechanism for recording, communicating, and protecting traditionally used components of the landscape and preserving and transmitting the values associated with them to future generations. This includes traditionally important species and environmental features such as caribou, water, traditional trails, names, stories, lessons and heritage resources.

The increased number of traditional knowledge and use studies, including field components, will encourage continued use of the area and likely help further identity or document historic uses of the area. Adding to the collective cultural knowledge will adequately mitigate the above-described significant adverse impacts that are otherwise likely. It will also contribute to the building of confidence in the NICO Project and the continued use of the area by Tłıchǵ people throughout the mine life and into the future.

The Review Board considered the Tłıchǵ Government's request that Fortune Minerals provide funding for additional traditional knowledge and use studies prior to the finalization of the mine plan and permitting process. While the Review Board considers these studies valuable, it does not agree that funding for these must precede Project permitting. The Board has reached this conclusion considering that:

- a significant amount of funding has already been provided for the collection and compilation of traditional knowledge and land use in the area;
- the timelines for the progress of this Project through the permitting phase are undefined due to lack of all-season access;
- the Project requires third party construction the Tłıchǵ Road Route prior to mine development; and
- the ongoing consultation already required for the development of the Wildlife Effects Monitoring Program and Wildlife and Wildlife Habitat Protection Plan.

The Review Board heard recommendations from the Tłıchǫ community and Tłıchǫ Government for the establishment of a monitoring program. The North Slave Métis Alliance requested that traditional knowledge be continually integrated into monitoring and mitigation programs for the NICO Project.

In the Board's opinion, evidence from parties and Tłıchǫ residents during the public hearings indicated that there is concern about the potential impacts of the proposed NICO Project on the environment and on cultural and traditional values and activities. Impacts on fish, wildlife, vegetation, air, and especially water were all identified as posing potential threats to the cultural values and active and ongoing traditional use of the Project area. Concerns about the Project during the hearings were expressed by elders, community leaders, youth and traditional land users.

The Review Board recognizes the importance of preserving and transmitting the traditional land use and cultural values associated with the Project area during construction, operation and closure of the NICO Project. As stated by parties, it would be unlikely that the land, its resources, and values could be fully reintegrated into the cultural imagination of future generations if it is removed, if even for one generation, from traditional use. The Review Board agrees that this loss would be a significant adverse cultural impact to the Tłıchǫ

Actively encouraging the continued use of the land for the pursuit of cultural activities would mitigate this potential impact on the cultural transmission. An on-the-land cultural camp in the area would help do this, and would also help implement traditional knowledge gathering.

**Measure #12**

In order to mitigate significant adverse impacts of the NICO Project on traditional use and transmission of cultural values, Fortune Minerals will support, during the construction and operations phases of the mine, an on-the-land culture camp in the Hislop Lake area, (*k'ìàgotì*). The culture camp will be used by harvesters, families, and the Tłıchǫ Government for ongoing traditional knowledge research, education, and traditional land use activities.

The Tłıchǫ Government will share traditional knowledge information gathered at the culture camp with Fortune Minerals and make recommendations to the developer in order to improve mine management and mitigate impacts to cultural values from the mine.

Finally, the Review Board considered the North Slave Métis Alliance recommendation that the Project be referred to environmental impact review. The Review Board believes that the implementation of the commitments and imposition of measures outlined throughout this Report will satisfactorily prevent significant adverse impacts on the environment - ecological and human - and address public concern raised as a result of the proposed Project.

The Board is of the opinion that the above measures will encourage and facilitate the continued use and stewardship of the land by the traditional land users. The initiation of an on-the-land cultural camp in order to allow for the continuation of traditional knowledge and use studies should provide improved opportunities for youth and elders to teach, practice, and share traditional use values and activities both on the land and in the communities.

### **3.4.2 Social and economic values**

This section describes impacts from the proposed NICO Project on the social and economic values of the Tłıchǫ people and the communities they live in. The four communities of the Wek'eezhii area are Behchoko, Gameti, Whati and Wekweètì and are included in the social and economic study area. Yellowknife, along with the Yellowknives Dene communities of N'dilo and Dettah are also within the study area and are included for the purposes of economic benefits.

#### **3.4.2.1 Developer position and submissions**

The DAR included an effects assessment of the project-related changes to the economic and social components of the human environment. Examples of economic benefits include employment, business and training opportunities during mine construction, operations and closure. Examples of adverse social changes include health and wellness impact (PR#116 Section 16). The developer also considered cumulative social and economic impacts of reasonably foreseeable projects such as the Tłıchǫ Road, a third-party development that is required infrastructure for the NICO Project. (PR#116 p16-47)

Fortune Minerals anticipates that Tłıchǫ communities will benefit from the economic and financial opportunities that the NICO Project will provide. While the developer recognizes that the mine will bring change to the social and economic conditions of the region, the changes are anticipated to be mostly positive and the project's activities will leave residents in the local study area with a higher and more sustainable quality of life (PR# 116 p16-98).

The Developer's Assessment Report describes commitments to enhance social and economic benefits as well as commitments and mitigation measures to minimize adverse impacts (PR#116 p16-99 to 16-105). The table in the Appendices to this REA includes all of Fortune Minerals' commitments (PR#373).

During the August 31, 2012 public hearings in Behchoko, Fortune Minerals' presented its socio-economic findings to the Review Board (PR#340 pp159-270, PR#315). Fortune Minerals described socio-economic monitoring and a socio-economic monitoring plan is outlined briefly in the DAR (PR#315 p15, PR#116 p16-103-105). The developer's



conclusion is that there will be positive socio-economic benefits from the project and limited negative socio-economic impacts (PR#340 p171).

#### **3.4.2.2 Parties' submissions and recommendations**

The Government of the Northwest Territories' (GNWT) Technical Report provides a detailed analysis of the developer's predictions on socio-economics impacts of the mine as well as commitments made by Fortune Minerals in the DAR, information request responses and technical meetings. (PR#260) In addition, Fortune Minerals made commitments to increase benefits economic benefits and reduce adverse impacts during meetings with the GNWT. These meetings were documented and submitted in writing to the Review Board (PR#261, PR#292, PR#178). The Technical Report of the Government of the Northwest Territories provides recommendations on:

- clarifying employment predictions for aboriginal and northern workers;
- pick-up points for travel to the mine site;
- mitigating competition with other mines for trained and experienced employees;
- considering a flexible rotation work schedule;
- education and training opportunities;
- career advancement strategies;
- human resource policies;
- traditional language use and cultural support;
- opportunities for Northwest Territories' businesses;
- contracting policies;
- closure planning to assist employees in transitioning; and
- monitoring and follow-up (PR#260).

In its response to Technical Report recommendations, Fortune Minerals agreed with or accepted the majority of the GNWT recommendations (PR#271). An important exception to this is that Fortune Minerals declined to enter into a formalized socio-economic agreement, with monitoring and reporting, as requested by the GNWT because the company would like to first sign a socio-economic agreement with the Tłı̨chǫ Government (PR#271 p6).

The GNWT emphasized the need for a follow-up program due to the difficulty in predicting and assessing socio-economic effects from resource development projects. For this reason, it recommended that a follow-up program, in the form of a socio-economic agreement between the GNWT and Fortune Minerals, be a condition of project approval (PR#260 p17). It is further stated that the Socio-economic Monitoring Plan proposed by Fortune Minerals (PR#116 p116-103-105) could be a starting point for this socio-economic agreement and follow-up program (PR#260 p19). In its presentation to the Board and discussion during the August 31 hearings in Behchoko, the GNWT reiterated that a socio-economic agreement between itself and the developer as a follow-up program is imperative to ensure that there will not be significant socio-economic effects from the project (PR#340 p231-243). Further, the agreement should be designed to assess the

effectiveness of mitigation and include adaptive management that responds to shortcomings in predictions or unintended results over the life of the mine. In its Final Argument prior to closure of the public record, the GNWT again stressed the requirement for a socio-economic agreement and noted that Fortune Minerals indicated a willingness to discuss the issue (PR#370).

As part of its Technical Report, the Tłıchǵ Government included a document titled, *Analysis of Project Economics*. The document describes project risks and opportunities, considers the feasibility of the project and states that an impact- benefits agreement between Fortune Minerals and the Tłıchǵ Government will need to be negotiated (PR#250). In its Technical Report, the Tłıchǵ Government requested clarification on predicted employment numbers specifically for Tłıchǵ citizens, in or out migration to or from Tłıchǵ communities, and a recommendation to consider rotation shift schedules other than the standard “two weeks in – two weeks out” schedule that can more effectively attract and retain Tłıchǵ citizens as mine employees.

In its Closing Argument, the Tłıchǵ Government states that they do not have an Impact Benefit Agreement with Fortune Minerals (PR#369 p15), although the Tłıchǵ Government noted that Fortune Minerals commits to negotiating such an agreement (PR#272 p11). The commitment by Fortune is repeated in its final table of commitments and states in full that “an Impact Benefits Agreement that is satisfactory to all parties is being considered with the Tłıchǵ communities. This agreement may include measures to protect social and cultural values as well as addressing training, employment and business opportunities”. (PR#373 p11) According to the Tłıchǵ Government, an Impact Benefits Agreement is necessary if the NICO Project is to be permitted (PR#369 p16).

### 3.4.2.3 Review Board’s analysis and conclusions

The Review Board agrees with the GNWT on the value and importance of socio-economic agreements between mine (or other resource) developers and the territorial government. The importance of these agreements has been demonstrated with the three existing diamond mines. The GNWT stated that it expects significant social impacts to arise if a socio-economic agreement is not signed.

The Review Board views these agreements as a key tool to test socio-economic predictions made by the developer, to identify what has worked and to focus on any gaps where predictions were not met. During the public hearing, numerous community members and the Tłıchǵ Government described their concerns regarding out-migration, social issues in communities related to rotation, shift schedules and substance abuse.

The Board notes that socio-economic agreements are an industry best practice, and adds the following Measure:

<b>Measure #13</b>
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In order to mitigate significant adverse social and economic impacts from the development, Fortune Minerals shall formalize a socio-economic agreement with the Government of the Northwest Territories as a follow-up program. This agreement will include monitoring and public reporting of results each year, with the results distributed to the Tłıchǵ Government and all communities in the local study area.

The Review Board is aware that an Impact Benefits Agreement is typically signed between a mine developer and an aboriginal organization in order to for the developer to gain a social license to operate. An Impact Benefits Agreement is confidential between the signing parties, and can enhance the benefits arising from this project, including jobs, training and procurement for Tłıchǵ people, while reducing adverse social impacts to the satisfaction of the Tłıchǵ Government. The need for an Impact Benefits Agreement is particularly important for the NICO Project because the mine is surrounded by Tłıchǵ titled land and the NICO Project Access Road is on Tłıchǵ titled land. At this time, the Review Board is unaware of the status of negotiations between the Tłıchǵ Government and Fortune Minerals for an Impact Benefits Agreement.

The Review Board agrees with the Tłıchǵ Government and the GNWT concerning uncertainties in Fortune Minerals' employment predictions and other benefits for Tłıchǵ people, other aboriginal organizations and Northerners. In the Review Board's opinion it is important that benefits to from the project to the Tłıchǵ and Northerners are maximized and that these benefits, through monitoring and reporting, must be shown to have been achieved.

Since the project is located in the heart of Tłıchǵ territory and is completely surrounded by Tłıchǵ titled land, the Review Board believes that there must be a net benefit to the Tłıchǵ people, and so makes the following suggestion:

**Suggestion #7**

In order to ensure that long-term socio-economic benefits of the NICO Project for the Tłıchǵ people are maximized, the developer should work with the Tłıchǵ Government to develop an effective human resource monitoring system. This system should include baseline monitoring and reporting related to:

- the numbers of Tłıchǵ people employed and trained;
- the advancement of Tłıchǵ people into supervisory roles;
- the number of summer students employed and the relevant measurable progress of recruitment; and
- retention and advancement of Tłıchǵ people at the NICO Project.

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## 4 Conclusion

The Review Board finds that the NICO Project is likely to have significant adverse impacts on the environment and be a cause of significant public concern. The Review Board has carefully considered the evidence put forward by the developer and parties, and believes that if Fortune Minerals fulfills its commitments and if the measures described in this Report are implemented, the project can proceed without significant impacts to the environment or significant public concern.

The Review Board's decision depends on the promise made by senior corporate officials of Fortune Minerals that the company will fulfill all of the commitments it made during the proceedings and that it will adhere to the measures as laid out in this REA. In the Review Board's opinion, it is therefore important that appropriate regulatory authorities and government agencies ensure that the commitments listed in Appendix B and the measures listed in Appendix A and described throughout this document are fulfilled.

The Review Board concludes that the NICO Project should proceed to the regulatory phase for approvals subject to the measures set out in this Report.

## Appendix A: Summary of measures and suggestions

### Impacts to water quality

#### Measure #1

The NICO Project will be designed and operated by Fortune Minerals throughout all Project stages (construction, operation, active closure, post closure), so that the Tłı̨chǫ people's traditional water uses, now and into the future, are not adversely affected by mining activities. These uses include:

- use of traditional drinking water sources; and
- use of traditional areas for fishing;

#### Measure #2

The NICO Project will be designed and operated by Fortune Minerals throughout all Project stages (construction, operation, active closure, post closure), so that the following water quality objectives are met in any area downstream from Peanut Lake, including all of Burke Lake (*Datoti*):

- water quality changes due to mining activities will not substantially alter benthic invertebrate and plankton abundance, taxonomic richness or diversity;
- water quality changes due to mining activities will not substantially alter fish health, abundance or diversity or impact the ability of traditional users to harvest or consume fish;
- water changes due to mining activities will allow for safe use of water by wildlife and waterfowl; and
- water quality, quantity and rate of flow in the Marian River is to remain substantially unaltered.

#### Measure #3

In order to reduce significant adverse impacts from contaminant loading in receiving waters during construction and mine operations, Fortune Minerals will prepare a dust mitigation and monitoring plan. This plan will incorporate Fortune Minerals' commitments for fugitive dust suppression and dust suppression techniques and apply lessons learned about dust suppression from other Northwest Territories mine sites.

This plan will be developed in collaboration with aboriginal users of the area and will be incorporated in the NICO water licence issued by the Wek'eezhii Land and Water Board.

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## **Impacts to the environment at closure**

### **Measure #4**

In order to mitigate significant adverse impacts to water quality and the environment downstream of the project site, the developer will fund an expert peer review panel for the co-disposal facility. This panel of three people is to be established under the water licence in consultation with Fortune Minerals and the Tłı̨ch̨ Government and consist of one appointee from each party and the Wek'eezhii Land and Water Board.

The peer review panel will be established prior to the start of mine operations and will be in place for the operational life of the mine. It will:

- consist of technically qualified individuals capable of reviewing the design and performance of the co-disposal facility
- assess Fortune Minerals' Co-disposal Facility Monitoring and Management Plan;
- provide recommendations intended to reduce adverse impacts and improve the operations and effectiveness of the co-disposal facility to the Wek'eezhii Land and Water Board, Fortune Minerals, and the Tłı̨ch̨ Government; and
- address questions from any of the three parties in relation to its assessments and recommendations.

### **Measure #5**

In order to reduce significant adverse impacts and the risk and uncertainties of a long-term post-closure timeframe, the developer will actively fill the open pit within an 8-14 year time range after mine operations. The developer will do this in a way that does not, in the view of regulators, result in adverse impacts to the Marian River or the downstream watershed.

### **Measure #6**

In order to mitigate significant adverse impacts to water quality and the environment downstream of the project site, the developer will fund an expert peer review panel to review and advise on the design and construction for the proposed constructed wetlands. This panel of three people is to be established under the water licence in consultation with Fortune Minerals and the Tłı̨ch̨ Government and consist of one appointee from each party and the Wek'eezhii Land and Water Board.

The peer review committee will be established at the start of mine operations and will be in place for the operational life of the mine. It will:



- consist of technically qualified individuals capable of reviewing the design and performance of constructed wetlands;
- assess Fortune Minerals' constructed wetlands pilot and field scale wetlands trials;
- provide recommendations intended to reduce adverse impacts from and improve the operation and effectiveness of the constructed wetlands to the Wek'eezhii Land and Water Board, Fortune Minerals, and the Tłıchǫ Government
- address questions from any of the three parties in relation to its assessments and recommendations

### **Measure #7**

In order to mitigate significant adverse impact to water quality to local receiving water bodies during the closure and post-closure phase of the NICO Project, the developer will:

- demonstrate, using a pilot study, that the wetland will work as predicted;
- construct wetlands early during operations and test them during the first half of mine life to determine effectiveness in treating seepage from the co-disposal facility;
- demonstrate the ability of wetlands to work for both the co-disposal facility and the pit overflow to the satisfaction of regulators before the developer is released from its mine closure and reclamation requirements.

### **Impacts on caribou**

#### **Measure #8**

To mitigate significant adverse cumulative impacts to barren ground caribou, the Government of the Northwest Territories and Tłıchǫ Government will establish and co-chair at their own expense an expert working group to develop a response framework for managing cumulative impacts. This response framework will inform the Bathurst Caribou Management Plan and the Government of the Northwest Territories Barren ground Caribou Management Strategy and provide direction for Fortune Minerals to manage its project related to cumulative effects on caribou. Participants in this working group should include the Wek'eezhii Renewable Resource Board, Fortune Minerals, Yellowknives Dene and North Slave Metis Alliance.

The working group will:

- include persons holding traditional knowledge and persons with scientific knowledge
- design a response framework to ensure that proposed cumulative effects monitoring is adaptively linked to mitigation for cumulative impacts

- a report on the response framework will be completed by the Government of the Northwest Territories and Tłıchʼo Government within 6 months of the federal Minister's approval of this Report of EA
- recommend ways to incorporate the response framework into regional caribou management strategies or plans

The response framework will:

- demonstrate the linkage between project-specific mitigation and monitoring and cumulative impacts monitoring and mitigation.
- demonstrate how cumulative effects mitigation and monitoring will be integrated with comprehensive herd management planning.

### Measure #9

To reduce or prevent significant adverse impacts on caribou and caribou habitat from project activities, and, to inform adaptive management through active monitoring that will further prevent significant impacts from the mine and NICO Project access road, the Board requires the timely and collaborative development of a Wildlife and Wildlife Habitat Protection Plan by the developer.

At a minimum, this plan is to include:

- both traditional and scientific knowledge;
- an adaptive management approach designed to assess how well mitigation measures perform and support the adoption of new mitigation, if necessary;
- best practices for mitigation and monitoring;
- the development of clear protocols and standard operating procedures for Project employees and contractors to ensure the implementation of site-specific mitigation; and
- instructions and training to mine staff to reduce the potential for interactions between people and wildlife.

### Measure #10

To reduce or prevent significant adverse impacts on caribou and caribou habitat from project activities and to inform adaptive management of mitigation that will further prevent significant impacts, the Board requires the timely and collaborative development of a Wildlife Effects Monitoring Program by the developer.

Before starting construction, Fortune Minerals will collaborate with others including the Tłıchʼo Government, the North Slave Métis Alliance, the YKDFN, the GNWT, and the

Wek'eezhii Renewable Resources Board to complete and implement a Wildlife Effects Monitoring Program.

At a minimum, this program is to include:

- both traditional and scientific knowledge;
- an adaptive management approach designed to use monitoring to test impact predictions, assess how well mitigation measures perform, and support the adoption of new approaches, if necessary;
- best practices for monitoring and mitigation;
- monitoring to test effect predictions and effectiveness of mitigation related to sensory disturbances, energy costs, the estimated zone of influence, and caribou and harvester use of the road through all mine phases;
- monitoring that involves people in Tłıchǫ communities;
- monitoring that can be readily integrated into regional cumulative effects programs; and
- a communications component to ensure Wildlife Effects Monitoring Program results are being reported back to community members and the Tłıchǫ Government on at least an annual basis.

#### **Measure #11**

In order to mitigate significant adverse impacts from the project on caribou, the Tłıchǫ Government and Fortune Minerals will collaborate in ensuring that harvesting of caribou along the NICO Project Access Road does not occur.

### **Impacts on cultural values**

#### **Measure #12**

In order to mitigate significant adverse impacts of the NICO Project on traditional use and transmission of cultural values, Fortune will support, during the construction and operations phases of the mine, an on-the-land culture camp in the Hislop Lake area, (*k'iàgoti*). The culture camp will be used by harvesters, families, and the Tłıchǫ Government for ongoing traditional knowledge research, education, and traditional land use activities.

The Tlıcho Government will share traditional knowledge information gathered at the culture camp with Fortune Minerals and make recommendations to the developer in order to improve mine management and mitigate impacts to cultural values from the mine.

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## Impacts on social and economic values

### Measure #13

In order to mitigate significant adverse social and economic impacts from the development, Fortune Minerals shall formalize a socio-economic agreement with the Government of the Northwest Territories as a follow-up program. The socio-economic agreement will include monitoring and public reporting of results each year, with the results distributed to the Tłıchǵ Government and all communities in the local study area.

## Summary of suggestions

### Impacts to Water Quality

#### Suggestion #1

The developer should follow the AANDC document titled, *Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories, June 2009* in the development of its Aquatic Effects Monitoring Program, action levels, and related management response framework.

#### Suggestion#2

In order to keep the Tłıchǵ people informed on potential changes to water quality due to construction and operation of the mine, an Aquatic Effects Monitoring Program should include:

- consultation between Fortune Minerals and Tłıchǵ Government on how best to include Tłıchǵ people in monitoring;
- involvement of the Tłıchǵ people in water quality monitoring both upstream and downstream of the Project;
- communication of monitoring results to the Tłıchǵ people;

### Impacts to the environment at closure

#### Suggestion #3

In order to address the concerns raised by the Tłıchǵ Government regarding infiltration into the co-disposal facility during closure and post-closure, further research of cover

options should be undertaken by Fortune Minerals as part of the closure and reclamation planning process during the regulatory phase of the project.

#### **Suggestion #4**

The Wek'eezhii Land and Water Board should report on the technical outcomes of the expert peer review committee on constructed wetlands in plain language so that the people of the Wek'eezhii area can understand how the constructed wetlands will work.

#### **Impacts on caribou**

#### **Suggestion #5**

Fortune Minerals should work with the Tłıchǫ Government, and especially elders, to discuss opportunities and possibilities for offsite caribou habitat compensation in the development of their Wildlife Effects Monitoring Program and Wildlife and Wildlife Habitat Protection Plan.

#### **Suggestion #6**

Responsible wildlife co-management authorities should begin implementing actions described in the "Action Plan for Boreal Woodland Caribou Conservation in the Northwest Territories 2010-2015", as well as developing and implementing range management plans and a comprehensive monitoring program that will track boreal caribou population indicators and landscape activities across the boreal caribou range in the Northwest Territories. The NICO Project footprint, including the access road, should be reviewed by responsible co-management authorities under the principles defined in the Action Plan.

#### **Impacts on social and economic values**

#### **Suggestion #7**

In order to ensure that beneficial impacts of the NICO Project to the Tłıchǫ people are maximized, the developer should work with the Tłıchǫ Government to develop an effective human resource monitoring system. This system should include baseline monitoring and reporting related to:

- the numbers of Tłıchǫ people employed and trained;
- the advancement of Tłıchǫ people into supervisory roles;
- the number of summer students employed and the relevant measurable progress of recruitment; and
- retention and advancement of Tłıchǫ people at the NICO Project.

## Appendix B: List of Developer's commitments

Section	Commitment #	Commitment Description
<b>1 – Introduction</b>		
1.1.4.1 – Environmental Policy	1.1	Fortune Minerals is committed to conducting its business activities in an environmentally sound manner and takes responsibility to minimize effects on the environment at all stages of development. Fortune Minerals will:
		• comply with all environmental laws and regulations, and in absence of regulation, apply relevant best management practices;
		• establish and maintain clearly defined environmental management programs to guide its operations from exploration to final reclamation;
		• ensure that its directors, officers, and employees understand and adhere to its environmental management programs;
		• provide its managers and supervisors at each operation, with the authority and resources necessary to carry out the applicable environmental management programs;
		• develop an adaptive management system that will periodically review environmental management programs as scientific knowledge and stakeholder expectations evolve;
		• openly communicate and work with governmental, indigenous people, employees, business partners, suppliers and local communities to develop mutual understanding of environmental issues and awareness that may affect the Company;
		• minimize and mitigate its environmental impacts and support environmental enhancement programs of common benefit;
		• continuously review environmental achievements and technology to seek and implement methods for further improvement;
		• conduct regular environmental response plan reviews to verify compliance with the corporate policy and applicable regulations. Identify revisions or improvements to current practices to minimize environmental impacts; and
		• allocate sufficient resources to meet the corporation's environmental goals.
1.1.4.2 – Health and Safety Policy	1.2	The management of Fortune Minerals is committed to preserving the health and safety of employees, client's employees, and any other personnel that interact with operations. Fortune will foster a culture conducive to reporting of unsafe acts or conditions in order that we may identify and negate those conditions before injuries occur. Fortune Minerals develops and maintains site-specific, comprehensive safety programs for each of its Projects and offices. Fortune Minerals emphasizes proper implementation of programs and expects participation by all employees. Fortune Minerals will:
		• comply with or exceed all health and safety laws and regulations, requirements and industry standards applicable to activities;
		• identify and mitigate health and safety hazards arising from activities;
		• ensure that staff understands that working safely is a condition of employment and that all workers are responsible for their own health and safety, as well as the health and safety of those around them;
		• ensure the competency of staff is maintained and provide staff with training,



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		<p>knowledge, and resources to achieve health and safety excellence;</p> <ul style="list-style-type: none"> <li>commit to the continual improvement of safety programs by setting health and safety objectives and targets, and measure and monitor performance through regular inspections, audits, and investigation of all incidents;</li> <li>integrate health and safety into business planning and decision making;</li> <li>commit to protect the health and safety of staff and the public; and</li> <li>commit to always doing what is right when it comes to health and safety of staff and the public; if it cannot be done safely it should not be done at all.</li> </ul>
1.1.4.3 – Sustainable Development	1.3	<p>It is Fortune Minerals' goal to demonstrate that high standards of environmental stewardship and a commitment to sustainable development can be applied to all business activities undertaken by Fortune Minerals. Fortune Minerals is committed to making a positive difference in the communities in which we live and work. Fortune Minerals will:</p> <ul style="list-style-type: none"> <li>maintain, communicate, and monitor its Code of Business Conduct guidelines established to set ethical standards for business practices in compliance with applicable laws, rules, and regulations and to promote responsible behaviour by the Company, its directors, officers, and employees;</li> <li>observe the fundamental tenets of human rights, safety and non-discrimination in the workplace for all Company employees and commit to developing their full potential and encourage employment and business opportunities for indigenous peoples and local community members;</li> <li>consider and evaluate social, cultural, environmental, governmental and economic factors in its exploration, development and mining activities with priority given to open dialogue and interaction with indigenous peoples and local community members to facilitate long-term and beneficial resource development; and</li> <li>provide stakeholders with accurate, appropriate and timely information on Company activities.</li> </ul>
1.1.4.4 – Community Engagement Policy	1.4	Through community investment, Fortune Minerals aspires to have a positive and meaningful impact by supporting: education, community, and environment.
<b>4 – Engagement</b>		
4.2.1 – Engagement Planning and Objectives	4.1	Fortune Minerals' approach to engagement for the NICO Project was, and continues to be, based on informing potentially affected communities and land users about the NICO Project, engaging community members in a dialogue about the NICO Project itself and their concerns, and informing them of the potential effects and opportunities. Fortune maintains an expressed openness to any community or meeting at any time with the Tłı̨chǫ Government's consent. Fortune Minerals values the input of the elders and land users and Fortune Minerals is committed to develop the NICO Project in the most environmentally logical manner possible taking into account the traditional and future uses of the land by the people on the land.
4.2.2 - Engagement Approaches for Traditional Knowledge Holders	4.1	Fortune Minerals remains committed to information sharing and dialogue with the First Nation and Métis communities beyond the Developer's Assessment (DAR) community engagement program as the Project moves through the approvals, permitting, development, operation, and closure phases. Fortune Minerals has offered to fund a Traditional Knowledge (TK) study by the Tłı̨chǫ to provide the information that Fortune requires for the Environmental Assessment (EA) process. Fortune Minerals has negotiated an agreement with the North Slave Métis Association (NSMA)

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		to conduct its own Métis TK research to provide the information Fortune requires for its EA.
4.3 - Engagement Activities Proposed Community Engagement	4.3	Fortune Minerals proposed plans for community engagement include:
		<ul style="list-style-type: none"><li>direct community consultation meetings to further discuss the NICO Project using the 3-dimensional physical models developed to help demonstrate the NICO Project and its natural setting once consent from the Tłı̨chǫ Government is provided.</li></ul>
		<ul style="list-style-type: none"><li>plans to form a Tłı̨chǫ advisory board, or being subject to a board formed by the Tłı̨chǫ Government that will become the primary conduit for consultation between Fortune and the Tłı̨chǫ people; however, this has not been negotiated.</li></ul>
		<ul style="list-style-type: none"><li>plans that the environmental monitoring of the NICO Project will be either undertaken by a Tłı̨chǫ owned company or government agency, funded by Fortune and mandated by the Wek'èezhii Land and Water Board (WLWB).</li></ul>
5 - Traditional Knowledge		
5.4.3 - Monitoring and Mitigation	5.1	In addition to the monitoring and mitigation plans detailed in the following sections for the NICO Project, Fortune Minerals has committed to including the following:
		<ul style="list-style-type: none"><li>Fortune Minerals is committed to having discussions with hunters and trappers who approach Fortune Minerals with the belief that their hunting and trapping practices have been compromised by the NICO Project;</li></ul>
		<ul style="list-style-type: none"><li>Fortune will hire Tłı̨chǫ people to perform on-site monitoring whenever possible, and assist in the design of monitoring programs;</li></ul>
		<ul style="list-style-type: none"><li>Fortune Minerals has completed initial site visits for the Elders of all communities to assist in the design of site monitoring plans;</li></ul>
		<ul style="list-style-type: none"><li>burial sites will be avoided, and archaeological sites will be avoided or mitigated according to acceptable procedures;</li></ul>
		<ul style="list-style-type: none"><li>Fortune Minerals will examine ways to mitigate dust generation on the road to limit potential impacts on plant and animal life;</li></ul>
		<ul style="list-style-type: none"><li>Fortune Minerals will have a monitoring program in place to monitor water quality;</li></ul>
		<ul style="list-style-type: none"><li>Fortune Minerals has added a baseline water quality station at Behchokö that will be monitored now and during the operation of the NICO Project to check water quality;</li></ul>
		<ul style="list-style-type: none"><li>Fortune Minerals has added two water quality stations in Hislop Lake and will add another in Behchokö to satisfy concerns over water quality in that lake; and</li></ul>
		<ul style="list-style-type: none"><li>Fortune Minerals has committed to developing a monitoring program with the help of the Tłı̨chǫ that will examine the health of streams and lakes potentially affected by the NICO Project.</li></ul>
7 - Key Line of Inquiry: Water Quality		
7.5.2.1 - Pathway with No Linkage	7.1	Sediment releases from road construction including watercourse crossings can affect surface water quality of nearby surface waters. The following mitigation steps will be undertaken:
		<ul style="list-style-type: none"><li>sediment and erosion control measures (e.g., silt curtains, runoff management) will be used to control sediment releases during construction; and</li></ul>
		<ul style="list-style-type: none"><li>in-stream work during road crossing construction will either be avoided or be limited to when watercourses within or adjacent to the construction area are not flowing or during low flows conditions.</li></ul>
		Sediment releases from land disturbance during mine construction can affect surface

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		water quality of nearby surface waters. The following mitigation steps will be undertaken:
		<ul style="list-style-type: none"> <li>sediment and erosion control measures (e.g., silt curtains, runoff management) will be used to control sediment releases during construction, and during reclamation; and</li> </ul>
		<ul style="list-style-type: none"> <li>construction runoff will be captured and discharged into a polishing pond (e.g., surge pond), to settle out suspended sediments prior to release to Peanut Lake.</li> </ul>
	7.2	<p>Sediment releases during the construction of the water intake in Lou Lake and the effluent outfall in Peanut Lake can affect surface water quality in Lou Lake and Peanut Lake.</p> <ul style="list-style-type: none"> <li>construction work will be under dry conditions (i.e., a cofferdam will be constructed to isolate the construction area in the lake) and sediment and erosion control measures (e.g., silt curtains, runoff management) will be used to control sediment releases during construction.</li> </ul>
7.5.2.1 – Pathway with No Linkage	7.3	Spills and leaks from equipment operation (e.g., petroleum products, reagents, wash-down) on the mine site or along the NICO Project Access Road can affect groundwater, surface water, and sediment quality of nearby surface waters. The following mitigation steps will be undertaken:
		<ul style="list-style-type: none"> <li>hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Materials and Waste Management Plan);</li> </ul>
		<ul style="list-style-type: none"> <li>smaller storage tanks (e.g., engine oil, hydraulic oil, and waste oil, and coolant) will be double walled, or located in lined and bermed containment areas;</li> </ul>
		<ul style="list-style-type: none"> <li>separate areas will be established for the handling and temporary storage of hazardous wastes;</li> </ul>
		<ul style="list-style-type: none"> <li>reagents and fuel Enviro-Tanks will be located in larger, double-walled containers;</li> </ul>
		<ul style="list-style-type: none"> <li>domestic and recyclable waste dangerous goods will be stored on-site in appropriate containers to prevent exposure until they are shipped off-site to an approved facility;</li> </ul>
		<ul style="list-style-type: none"> <li>individuals working on-site and handling hazardous materials will be trained in the Transportation of Dangerous Goods;</li> </ul>
		<ul style="list-style-type: none"> <li>soils from petroleum spill areas will be deposited and spread in a lined landfarm cell for bioremediation;</li> </ul>
		<ul style="list-style-type: none"> <li>an Emergency Response and Spill Contingency Plan has been developed and will be implemented;</li> </ul>
		<ul style="list-style-type: none"> <li>emergency spill kits will be available wherever toxic materials or fuel are stored and transferred; and</li> </ul>
7.5.2.2 – Secondary Pathways	7.4	<ul style="list-style-type: none"> <li>construction and mining equipment, machinery, and vehicles will be regularly maintained.</li> </ul>
7.5.2.2 – Secondary Pathways	7.5	If water quality does not meet site-specific water quality objectives, water will be impounded in the surge pond or in seepage collection ponds (SCPs) No. 1, 2, and 3 until the effluent treatment facility (ETF) is commissioned where it will be treated prior to release to Peanut Lake.
		Process and potable water requirements for the NICO Project may decrease drainage flows and surface water levels, and affect surface water quality. To mitigate these possibilities the following will be done:
		<ul style="list-style-type: none"> <li>capture and reuse site water to reduce fresh water requirements;</li> <li>recycle water from tailings thickener and from the Open Pit for grinding operations; and</li> </ul>

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		<ul style="list-style-type: none"> <li>recycle excess water from the SCPs and treat prior to entering the receiving environment.</li> </ul>
7.5.2.2 – Secondary Pathways	7.6	The following mitigation steps will be undertaken for site water management:
		<ul style="list-style-type: none"> <li>the Water Management Plan will control surface water on-site;</li> </ul>
		<ul style="list-style-type: none"> <li>runoff from the mine site will be captured and will either be treated in the ETF and discharged to Peanut Lake or will be re-used in the Mineral Processing Plant (Plant);</li> </ul>
		<ul style="list-style-type: none"> <li>any water that cannot be released will be impounded in the water management ponds (e.g., surge pond, SCPs);</li> </ul>
		<ul style="list-style-type: none"> <li>the site will have sufficient storage capacity in surge ponds to store both operating flows and storm event;</li> </ul>
		<ul style="list-style-type: none"> <li>water from the open pit will be pumped to the surge pond and then either to the plant for re-use or to the ETF for treatment prior to discharge to Peanut Lake; and</li> </ul>
		<ul style="list-style-type: none"> <li>sewage and grey water will be treated with a rotary biologic contactor and the effluent will be pumped to the reclaim pond in the co-disposal facility (CDF), only if unsuitable for discharge. Water from the reclaim pond will be treated in the ETF prior to discharge.</li> </ul>
7.5.2.2 – Secondary Pathways	7.7	The CDF will prevent vertical and lateral seepage by:
		<ul style="list-style-type: none"> <li>capturing runoff from the CDF in SCPs and diverting it to the plant for recycling or to the ETF;</li> </ul>
		<ul style="list-style-type: none"> <li>sequestering any potential acid-generating Mine Rock within the interior of the CDF;</li> </ul>
		<ul style="list-style-type: none"> <li>covering any areas in the core of the pile with overburden where potential acid-generating mine rock is to be sequestered to reduce any infiltration; and</li> </ul>
		<ul style="list-style-type: none"> <li>directing runoff flow at closure and post-closure to the open pit.</li> </ul>
7.5.2.2 – Secondary Pathways	7.8	To mitigate the possibility that water quality in the flooded open pit and outflow affecting surface water quality in downstream surface waters, Fortune will treat water from the flooded open pit using a wetland treatment system (if required) prior to discharge into Peanut Lake.
7.5.2.3 – Primary Pathways	7.9	Fortune Minerals will employ the following air emissions and dust deposition mitigation measures at the NICO Project to limit the effects to surface water:
		<ul style="list-style-type: none"> <li>water roads to suppress dust production;</li> </ul>
		<ul style="list-style-type: none"> <li>use of upswept exhausts on construction equipment;</li> </ul>
		<ul style="list-style-type: none"> <li>enforce speed limits to assist in reducing dust;</li> </ul>
		<ul style="list-style-type: none"> <li>ensure equipment and fleet are equipped with industry-standard emission control systems;</li> </ul>
		<ul style="list-style-type: none"> <li>enclose conveyance systems and processing facilities;</li> </ul>
		<ul style="list-style-type: none"> <li>ensure processing equipment have high efficiency bag houses to reduce emissions of particulate matter;</li> </ul>
		<ul style="list-style-type: none"> <li>develop operating procedures that reduce dust generation and air emissions (e.g. regular maintenance of equipment to meet emission standards);</li> </ul>
7.5.2.3 – Primary Pathways	7.10	<ul style="list-style-type: none"> <li>limit the road footprint disturbance area while maintaining safe construction and operation practices.</li> </ul>
		<p>The discharge of effluent from the ETF can affect surface water quality in Peanut Lake and in downstream surface waters. The following mitigation steps will be undertaken:</p> <ul style="list-style-type: none"> <li>treated water from the ETF will be pumped through a diffuser directly to Peanut</li> </ul>

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		Lake; or
		<ul style="list-style-type: none"> <li>if additional settling, polishing, or further treatment is required, then the treated water from the ETF will be discharged to the contingency pond.</li> </ul>
7.5.2.3 – Primary Pathways	7.11	<p>Long-term seepage from the CDF can affect surface water quality in downstream surface waters. The following mitigation steps will be undertaken:</p> <ul style="list-style-type: none"> <li>the CDF will be capped during closure to isolate mine rock and tailings and minimize leaching.</li> <li>any seepage from the CDF will be intercepted in passive wetland treatment systems prior to discharge to Nico Lake.</li> </ul>
7.14 Monitoring and Follow-up	7.12	<p>Upon approval of the NICO Project, an Aquatic Effects Monitoring Program (AEMP) will be implemented to limit effects to water quality and other aquatic components and to test impact predictions. The final AEMP will include provisions for environmental effects monitoring as required under the Metal Mining Effluent Regulations of the Fisheries Act. Specific objectives of the AEMP include the following:</p> <ul style="list-style-type: none"> <li>provide information to test predicted impacts from the NICO Project DAR and reduce uncertainty;</li> <li>incorporate local traditional and ecological knowledge, where applicable and available;</li> <li>propose action levels or adaptive management triggers that can be used as early warning signs for reviewing and implementing mitigation practices and policies;</li> <li>design studies and data collection protocols that are consistent with other programs in the region; and,</li> <li>consider existing regional and collaborative programs, such as Cumulative Impact Monitoring Program.</li> </ul>
<b>8 – Key Line of Inquiry: Caribou and Caribou Habitat</b>		
8.4.2 Results Table 8.4-1	8.1	To mitigate direct loss and fragmentation of caribou habitat the current layout of the mine footprint will limit the area that is disturbed and the NICO access road will be as narrow as possible; and
	8.2	To reduce potential of the NICO Project footprint to cause changes to soils, vegetation and caribou habitat, culverts and other design features to reduce changes to local flows and drainage patterns and drainage area have been added.
8.4.2.1 - Pathways with No Linkage Changes to Habitat Quality, Movement, and Behaviour	8.3	See 7.7 for commitments related to vertical and lateral seepage which can affect surface water quality, soils, vegetation, caribou habitat and caribou mortality
	8.4	See 7.6 for commitments related to site water management which can affect surface water quality, soils, vegetation, caribou habitat and caribou mortality
8.4.2.1 - Pathways with No Linkage Changes to Habitat Quality, Movement, and Behaviour	8.5	See 7.3 for commitments related to spills on the mine site or along the NICO access road that can affect surface water quality, soils, vegetation, caribou habitat, and caribou mortality.
	8.6	See 7.9 for commitments related to air emissions and dust deposition that can cause changes to chemical properties of surface water, soils, vegetation, wetlands, and caribou habitat.
	8.7	To mitigate the possibility that water quality in the flooded open pit and outflow affecting caribou health or long-term seepage from the CDF impacting groundwater

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Changes to Survival and Reproduction		and surface water quality, which can affect soils, vegetation and caribou habitat Fortune Minerals will:
		<ul style="list-style-type: none"> <li>treat water from the flooded open pit using a wetland treatment (if required) system prior to discharge into Peanut Lake;</li> </ul>
		<ul style="list-style-type: none"> <li>use wetland treatment systems prior to discharging water from the CDF into Peanut Lake; and</li> </ul>
		<ul style="list-style-type: none"> <li>cap the CDF during closure to isolate tailings and mine rock and prevent leaching.</li> </ul>
8.4.2.2 - Secondary Pathways Changes to Habitat Quality, Movement, and Behaviour	8.8	See 7.5 for commitments related to the process and potable water requirements for the NICO Project that may decrease drainage flows and surface water levels, and affect vegetation, wetlands, and caribou habitat.
8.4.2.2 - Secondary Pathways Changes to Survival and Reproduction	8.9	Physical hazards on the mine site and collisions with vehicles and aircraft will be mitigated using the following measures:
		<ul style="list-style-type: none"> <li>temporarily suspending surface blasting when caribou is spotted within the danger zone identified by the blast supervisor;</li> </ul>
		<ul style="list-style-type: none"> <li>speed limits will be established;</li> </ul>
		<ul style="list-style-type: none"> <li>the presence of caribou will be monitored and communicated to site personnel;</li> </ul>
		<ul style="list-style-type: none"> <li>all employees will be provided with environmental awareness training; and</li> </ul>
		<ul style="list-style-type: none"> <li>removal of physical hazards will be part of the decommission plan.</li> </ul>
	8.10	Attraction to the NICO Project may increase predator numbers and predation risk, which can affect caribou populations. To mitigate this Fortune will:
		<ul style="list-style-type: none"> <li>base most of the construction of the NICO access road out of the NICO site to reduce the number of camps along the route;</li> </ul>
		<ul style="list-style-type: none"> <li>skirt all buildings and stairs to the ground to limit opportunities for use as shelter;</li> </ul>
		<ul style="list-style-type: none"> <li>development and implement a Domestic and Industrial Waste Management Plan;</li> </ul>
		<ul style="list-style-type: none"> <li>collect food wastes in suitable receptacles that limit attraction;</li> </ul>
		<ul style="list-style-type: none"> <li>store recyclables and waste hazardous materials on-site in appropriate containers to prevent exposure until shipped off-site to an approved facility;</li> </ul>
		<ul style="list-style-type: none"> <li>prohibit littering and feeding of wildlife;</li> </ul>
		<ul style="list-style-type: none"> <li>education and reinforcement proper waste management practices with all workers and visitors to the site;</li> </ul>
		<ul style="list-style-type: none"> <li>education on the risk associated with feeding wildlife and careless disposal of food garbage;</li> </ul>
		<ul style="list-style-type: none"> <li>conduct ongoing reviews of the efficiency of the waste management program and improvement through adaptive management; and</li> </ul>
		<ul style="list-style-type: none"> <li>develop and implement a Wildlife Effects Monitoring Program (WEMP) (see Section 8.10).</li> </ul>
8.4.2.3 - Primary Pathways	8.11	Sensory disturbances can change the amount of different quality habitats and alter caribou movement and behaviour (distribution), or change energetic costs to caribou and wildlife from disturbance or displacement. Fortune Minerals NICO Project design will:



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8.10 - Monitoring and Follow-up		<ul style="list-style-type: none"><li>• use conventional insulation, baffles and noise suppressors on equipment;</li><li>• temporarily suspended surface blasting if caribou are observed within the danger zone identified by the blast supervisor;</li><li>• house stationary equipment inside buildings;</li><li>• ensure regular maintenance of equipment to limit emissions; and</li><li>• provide all employees with environmental awareness training.</li></ul>	
		8.12	To mitigate the effect that improved access for harvesting can have on caribou population size Fortune will:
			<ul style="list-style-type: none"><li>• develop and enforce "no hunting, trapping, harvesting, or fishing policy"; and</li><li>• prohibit the use of recreational all-terrain vehicles at site.</li></ul>
		8.13	Fortune's NICO Project WEMP specific objectives include the following:
	<ul style="list-style-type: none"><li>• provide a process for regulators and communities to participate in the development of caribou effects mitigation and monitoring;</li><li>• consider and incorporate, where possible, traditional knowledge;</li><li>• provide mine managers with clear reasons for making decisions regarding NICO Project environmental management;</li><li>• provide the proposed environmental design features, and mitigation policies and practices;</li><li>• assess the effectiveness of mitigation; and</li><li>• verify the accuracy of impact predictions made in the DAR, reduce uncertainty of impact predictions, and identify unanticipated effects.</li></ul>		
9 – Key Line of Inquiry: Closure and Reclamation			
9.4.1.1 - Progressive Closure and Reclamation and Goals	9.1	The NICO Project Closure and Reclamation (C&R) goals and principles include the following:	
		<ul style="list-style-type: none"><li>• progressive reclamation will be undertaken whenever practical;</li><li>• landforms will be geotechnically stable;</li><li>• drainage systems will be designed to minimize erosion rates and substance loadings;</li><li>• reclaimed areas will eventually develop into self-sustaining ecosystems with an acceptable degree of biodiversity;</li><li>• on-site public health and safety will be protected; and</li><li>• natural colonization and recruitment of native vegetation will be encouraged in ecologically receptive areas.</li></ul>	
9.4.1.1 - Progressive Closure and Reclamation and Goals	9.2	Fortune's corporate policies relevant to the ongoing closure process include the following:	
		<ul style="list-style-type: none"><li>• final land use objectives will be developed in consultation with stakeholders;</li><li>• there will be an ongoing consultation process with regulators and local stakeholders; and</li><li>• adaptive management of the C&amp;R Plan will be pursued through the incorporation of results from Fortune's site specific studies and any available regional research.</li></ul>	
9.4.1.1 - Progressive Closure and	9.3	Fortune's basic end land use goals for the NICO Project include the following:	
		<ul style="list-style-type: none"><li>• reclaim the landscape to optimize the value of watershed, wildlife habitat, fish habitat, or other resources and taking into account stakeholder preference;</li></ul>	

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Reclamation and Goals		<ul style="list-style-type: none"> <li>protect the aesthetic qualities of the landscape; and</li> <li>provide for traditional land uses (e.g. hunting and trapping) as preferred by key stakeholders.</li> </ul>
		<p>9.4 Areas where Fortune's progressive reclamation and closure is planned for the NICO Project include the following:</p>
	TO HERE	<ul style="list-style-type: none"> <li>the cover on the side slopes of the CDF (i.e., the CDF perimeter dyke) will be placed and re-vegetated progressively throughout the operational life of the NICO Project;</li> </ul>
		<ul style="list-style-type: none"> <li>when underground mining is completed, the mobile equipment will be removed, decommissioned and shipped off-site;</li> </ul>
		<ul style="list-style-type: none"> <li>the underground mine workings will be backfilled in strategic locations; and</li> </ul>
		<ul style="list-style-type: none"> <li>Wetland Treatment Systems No.1, 2, and 3 will be constructed and tested during the operational life of the NICO Project to confirm they are fully operational when closure occurs.</li> </ul>
9.4.4.2 - Design Objectives	9.5	<p>Short-term C&amp;R objectives for Fortune's NICO Project include the following:</p> <ul style="list-style-type: none"> <li>progressively reclaim disturbed areas during operations as soon as they are no longer required;</li> <li>establish physical and chemical stability at the site, consistent with conditions existing prior to the start of operations;</li> <li>minimize the risk of erosion and sediment loss as a result of on-site runoff;</li> <li>stabilize slopes on all structures to maintain safe working conditions and facilitate reclamation activities;</li> <li>cover ground to prevent soil drifting and dust production; and</li> <li>maintain an environmentally safe site.</li> </ul>
		<p>9.6 Long-term C&amp;R objectives for the NICO Project include the following:</p> <ul style="list-style-type: none"> <li>return the site to a state similar to other habitats in the same region that are not affected by the NICO Project, which should facilitate similar wildlife use to baseline conditions; and</li> <li>create, to the extent practicable, an aesthetically pleasing final landscape.</li> </ul>
	9.7	<p>Fortune Minerals' general mitigation measures to reduce the potential for permafrost degradation and subsequent subsidence of areas around the NICO Project mine site include the following:</p> <ul style="list-style-type: none"> <li>during winter months, clear areas for construction using a snow packed surface;</li> <li>re-vegetate disturbed areas as soon as possible;</li> <li>manage drainage around infrastructure to reduce pooling of water at the surface;</li> <li>insulate thaw-sensitive slopes;</li> <li>limit the mine footprint disturbance area;</li> <li>limit the road footprint disturbance area, while maintaining safe construction and operation practices;</li> <li>use coarser materials for road construction to minimize frost effects;</li> <li>building foundations will be built on bedrock not susceptible to frost heave to minimize thawing of permafrost in sensitive areas; and</li> <li>stripping of organic horizons containing ice-rich permafrost will be limited to areas where it is absolutely necessary to reduce the potential for an increase in thaw</li> </ul>
	9.7	
	9.7	
9.4.4.3 - Role of Climate Change in Development of Closure and Reclamation Plan	9.7	

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		depth and related thaw subsidence.
9.4.4.4 - Wildlife Considerations	9.8	Environmental design features and mitigation that will be implemented by Fortune Minerals at the NICO Project to limit wildlife injury and mortality include the following:
		<ul style="list-style-type: none"><li>• blasting will be temporarily suspended when wildlife (ungulates and carnivores) are spotted within the "safe zone";</li></ul>
		<ul style="list-style-type: none"><li>• the CDF will be regularly monitored for wildlife activity and wildlife hazards;</li></ul>
		<ul style="list-style-type: none"><li>• reflectors or other deterrents will be installed to discourage wildlife from crossing the roads;</li></ul>
		<ul style="list-style-type: none"><li>• ditches will be contoured at closure as appropriate to remove any hazards to wildlife;</li></ul>
		<ul style="list-style-type: none"><li>• wildlife deterrent actions will be implemented by knowledgeable and trained personnel; and</li></ul>
		<ul style="list-style-type: none"><li>• at mine closure, borrow pits, the Plant area, stockpile areas, etc. will be re-contoured to reduce hazards to wildlife.</li></ul>
9.4.4.5 - Key Closure and Reclamation Activities 9.4.4.5.6 - Erosion Control	9.9	Specific erosion control practices available for the general NICO Project area include the following:
		<ul style="list-style-type: none"><li>• minimize soil exposure and control surface runoff, especially during wet weather and in areas close to watercourses;</li></ul>
		<ul style="list-style-type: none"><li>• construct temporary cross ditches to redirect surface runoff;</li></ul>
		<ul style="list-style-type: none"><li>• construct temporary berms of imported logs, construction timbers, sandbags, or other material as appropriate and available;</li></ul>
		<ul style="list-style-type: none"><li>• construct roads so natural drainage patterns are not impeded and in a manner that runoff to road ditches enters natural drainage systems or contoured containment areas;</li></ul>
		<ul style="list-style-type: none"><li>• use temporary erosion control measures such as mulches, mats, and netting, to control erosion prior to establishment of a protective vegetation cover;</li></ul>
		<ul style="list-style-type: none"><li>• apply tackifiers, where necessary, to stabilize soils and use hydro-seeders for seeding on steep slopes; and</li></ul>
		<ul style="list-style-type: none"><li>• promptly seed exposed areas and topsoil stockpiles with a self-sustaining, erosion controlling seed mix appropriate to the region.</li></ul>
9.6.2.4 - Terrestrial Monitoring Wildlife (Appendix 18.II)	9.10	See 8.13 for commitments relevant to the specific objectives of the WEMP.
10 – Subject of Note: Air Quality		
10.3.2.1 - Good Practices to Mitigate and Reduce Emissions	10.1	Fortune Minerals is committed to the following general management approaches for air emissions from the NICO Project:
		<ul style="list-style-type: none"><li>• mine equipment and haul vehicles will be regularly maintained to reduce emissions and maximize fuel efficiency;</li></ul>
		<ul style="list-style-type: none"><li>• low sulphur (15 parts per million by weight) diesel will be used in fleet vehicles;</li></ul>
		<ul style="list-style-type: none"><li>• site road surfaces will be regularly maintained for operational efficiencies and to minimize fuel consumption; and</li></ul>
		<ul style="list-style-type: none"><li>• NICO Project waste will be screened. Material containing metal and chlorinated organic waste will be segregated and shipped off-site. The remainder will be</li></ul>

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		combusted in an approved incinerator. The waster incinerator will be engineered and operated to meet the Canadian Council of Ministers of the Environment emission standards for dioxins and furans.
	10.2	Fortune Minerals will minimize nitrogen oxide emissions through the following measures:
		<ul style="list-style-type: none"> <li>• using corporate fleet vehicles that meet applicable emission standards at the time of purchase and encouraging contractors to do the same with their vehicles;</li> </ul>
		<ul style="list-style-type: none"> <li>• considering nitrogen oxide emissions as a criterion in future engine and boiler upgrades;</li> </ul>
		<ul style="list-style-type: none"> <li>• consider energy conservation initiatives such as maintaining site road surfaces to improve the energy efficiency of the fleet; and</li> </ul>
	10.3	See 7.9 for commitments for transport-related dust and particulate emissions
10.9.1 - Monitoring Program and Mitigation and Adaptive Strategies	10.4	The following monitoring programs and mitigative and adaptive management strategies will employed by Fortune Minerals at the NICO Project:
		<ul style="list-style-type: none"> <li>• regulatory review that identifies legislation, regulatory, and policy requirements considered in the program;</li> </ul>
		<ul style="list-style-type: none"> <li>• scope that provides a description of the scope of the program;</li> </ul>
		<ul style="list-style-type: none"> <li>• goals that outline all of the goals of the program;</li> </ul>
		<ul style="list-style-type: none"> <li>• air quality monitoring program (Section 10.9.1.1);</li> </ul>
		<ul style="list-style-type: none"> <li>• emissions monitoring program (Section 10.9.1.2);</li> </ul>
		<ul style="list-style-type: none"> <li>• mitigative and adaptive strategies (Section 10.9.1.3);</li> </ul>
		<ul style="list-style-type: none"> <li>• response planning describing strategies for responding to events of significant emission rates or air quality impacts; and</li> </ul>
		<ul style="list-style-type: none"> <li>• annual report describing procedures for the preparation of annual reports and their ancillary components (e.g. references, glossary, concordance tables).</li> </ul>
<b>11 – Subject of Note: Water Quality</b>		
11.5 - Monitoring and Follow-up	11.1	Fortune Minerals will conduct hydrological monitoring at the NICO Project as part of AEMP.
<b>12 – Subject of Note: Fish and Aquatic Habitat</b>		
Table 12.3-1 Potential Pathways for Effects to the Persistence of Fish and Condition of Aquatic Habitat	12.1	Environmental design features and mitigation will be incorporated by Fortune Minerals into the design of the NICO Project to mitigate a potential impact or limit changes to fish and aquatic habitat during construction includes:
		<ul style="list-style-type: none"> <li>• construction runoff will be captured and discharged into a polishing pond to settle out suspended sediments prior to release to Peanut Lake;</li> </ul>
		<ul style="list-style-type: none"> <li>• a single clear-span bridge will be installed at the Marian River crossing to mitigate impact to fish habitat;</li> </ul>
		<ul style="list-style-type: none"> <li>• appropriately-sized fish screens which meet DFO guidelines will be fitted to Lou Lake intake line to limit fish access and to protect fish from entrainment and impingement;</li> </ul>
		<ul style="list-style-type: none"> <li>• See 7.3 for commitments related to spills on the mine site or along the NICO access</li> </ul>

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		road PAR hazardous materials
		<ul style="list-style-type: none"> <li>changes to local surface waters and drainage patterns will be minimized through use of constructed ponds;</li> </ul>
		<ul style="list-style-type: none"> <li>See 8.2</li> </ul>
		<ul style="list-style-type: none"> <li>rip-rap and aggregate placed on top of the intake structure will create higher quality habitat than what is affected;</li> </ul>
		<ul style="list-style-type: none"> <li>if required, fish habitat compensation will be developed in consultation with DFO and other regulatory agencies;</li> </ul>
		<ul style="list-style-type: none"> <li>See 7.7. for commitments related to the CDF and vertical and lateral seepage</li> </ul>
		<ul style="list-style-type: none"> <li>See 7.5 for commitments related to the process and potable water requirements for the NICO Project</li> </ul>
		<ul style="list-style-type: none"> <li>See 7.1 for sediment and erosion control measures</li> </ul>
		<ul style="list-style-type: none"> <li>if water quality in the discharge from the open pit does not meet water quality standards at the time of discharge, then discharge water will be treated using an active (water treatment plant) or passive (wetland treatment system) prior to discharge into Peanut Lake;</li> </ul>
		<ul style="list-style-type: none"> <li>See 9.1 for C and R commitments</li> </ul>
12.3.2.2 - Primary Pathways Mine Infrastructure and Access Road Footprint Mine General Operation		<ul style="list-style-type: none"> <li>See 7.12 for commitments related to long-term seepage of the CDF</li> </ul>
		<ul style="list-style-type: none"> <li>See 8.7 for mitigation related to the flooded open pit;</li> </ul>
		<ul style="list-style-type: none"> <li>See 8.1</li> </ul>
		<ul style="list-style-type: none"> <li>see 7.9 for commitments regarding air emissions and dust mitigation</li> </ul>
		<ul style="list-style-type: none"> <li>See 7.6 for commitments related to site water management</li> </ul>
		<ul style="list-style-type: none"> <li>site staff will not be permitted to fish; and</li> </ul>
		<ul style="list-style-type: none"> <li>the use of recreational all terrain vehicles will be prohibited at site;</li> </ul>
12.10 - Monitoring and Follow-up	12.2	See 7.12 for commitments related to the AEMP
<b>13 - Subject of Note: Terrain and Soils</b>		
13.3.2.1 - Pathways with No Linkage Mine Infrastructure Footprint and NICO Project Access Road Footprint	13.1	See 7.7. for commitments related to the CDF and vertical and lateral seepage
		See 7.6 for commitments related to site water management which can affect surface water quality and soil quality
13.3.2.1 - Pathways with No Linkage Mine Infrastructure	13.2	See 7.3 for commitments related to spills on the mine site or along the NICO access road hazardous materials
	13.3	See 7.11 for commitments related to the water quality in the flooded open pit and outflow that may affect soil or long-term seepage from the CDF
	13.4	See 9.7 for general mitigation measures to reduce the potential for permafrost



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Footprint and NICO Project Access Road Footprint  13.3.2.2- Secondary Pathway Permafrost Melting and Subsequent Subsidence Effects		degradation and subsequent subsidence to terrain and soil
Flows and Drainage	13.5	See 8.2
Air Emissions and Dust Deposition	13.6	See 7.9 for commitments related to air emissions and dust deposition that can cause changes to chemical properties of soils
13.4.1 - Effects to Terrain Units, Soil Quality and Distribution	13.7	Environmental design features and mitigation incorporated by Fortune Minerals into the design of the NICO Project to mitigate changes to terrain and soils include:
		<ul style="list-style-type: none"> <li>See 8.1</li> <li>erosion control practices will limit wind and water erosion on soil and overburden stockpiles (e.g. vegetation, erosion mats);</li> <li>admixing of topsoil with subsoil during salvage and reclamation will be limited;</li> <li>topsoil horizons may be stripped from the mine area and then stored in stockpiles along the perimeter of the site for eventual replacement upon decommissioning and closure of the NICO Project;</li> <li>organic and/or topsoil horizons will not be stripped in areas containing ice-rich permafrost to reduce potential for an increase in thaw depth and related thaw subsidence; and</li> <li>the underground mine will be backfilled in strategic locations.</li> </ul>
Physical loss or alteration of local soils from the NICO Project footprint		
Residual ground disturbance from permanent NICO Project components.	13.8	Environmental design features and mitigation incorporated by Fortune Minerals into the design of the NICO Project to mitigate changes to terrain and soils include:
		<ul style="list-style-type: none"> <li>See 8.1</li> <li>soil salvage and reclamation;</li> <li>continue to refine a C&amp;R Plan;</li> <li>See 8.7</li> </ul>
<b>14 – Subject of Note: Vegetation</b>		
14.3.2 - Results Mine Infrastructure Footprint and NICO Project Access Road Footprint	14.1	Environmental design features and mitigation incorporated by Fortune Minerals into the design of the NICO Project to mitigate a potential impact or limit the effects to vegetation are listed in Table 14.3-1. These include commitments from the following commitment #:
		<ul style="list-style-type: none"> <li>See 8.1</li> <li>See 8.2</li> <li>See 7.6</li> </ul>



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14.3.2.1 - Pathways with No Linkage Co-Disposal Facility	14.2	See 7.7. for commitments related to the CDF and vertical and lateral seepage
Spills and Hazardous Materials	14.3	See 7.3 for commitments related to spills on the mine site or along the NICO access road hazardous materials
Outflow from Flooded Open Pit or Seepage	14.4	See 7.11 for commitments related to the t water quality in the flooded open pit and outflow that may affect soil or long-term seepage from the CDF.
14.3.2.1. - Secondary Pathways Permafrost Melting and Subsequent Subsidence Effects	14.5	See 9.7 for Fortune Minerals’ general mitigation measures to reduce the potential for permafrost degradation and subsequent subsidence effects to vegetation:
Air Emissions and Dust Deposition	14.6	See 7.9 for commitments related to air emissions and dust deposition to limit the effects to vegetation:
Introduction of Non-Native Species	14.7	Fortune Minerals will employ the following measures to limit the introduction of non-native plant species at the NICO Project:
		• regular cleaning of construction equipment/vehicles; and
		• develop and implement an invasive plant management strategy.
14.3 - Pathway Analysis 14.3.2 - Results Process and Potable Water Requirements	14.8	To mitigate the possibility of process and potable water affecting vegetation on the NICO Project site the following will be done:
		• capture and reuse site water to reduce fresh water requirements;
		• recycle water from tailings thickener and from the open pit for grinding operations; and
		• recycle excess water from the SCPs and treat prior to entering the receiving environment.
14.3.2.3 - Primary Pathways	14.9	The following mitigation steps will be undertaken to prevent/limit the residual ground disturbance effect on vegetation at the NICO Project site and along the access road:
		• See 8.1
		• salvage and store growth media for re-vegetation;
		• See 13.8; and
		• develop a re-vegetation plan.
14.10 - Monitoring and Follow-up	14.10	Environmental monitoring will include the implementation of a vegetation management plan designed to work in conjunction with other programs (e.g., soils, closure and reclamation, and biophysical management and monitoring plans). The monitoring activities would include the monitoring of re-vegetation following reclamation and weed surveys. More information on the vegetation management plan can be found in Section 18.
15 – Subject of Note: Wildlife		
15.3.2.1 -	15.1	For the NICO Project site and along the NICO access road, all vegetation clearing would

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Pathways with No Linkage Changes to Habitat Quality, Movement and Behaviour		take place outside of the migratory bird season where possible. In the event that construction activities must be completed during the migratory bird breeding season, then the vegetation and growth media will be removed prior to the nesting season.
15.3.2.2- Secondary Pathways Changes to Survival and Reproduction	15.2	See 8.9 for commitments that relate to mitigation that will be implement to decrease risk to animals from physical hazards
Section 15.10 - Monitoring and Follow-up	15.3	See 8.13 for commitments relevant to the specific objectives of the WEMP.
<b>16 – Subject of Note: Human Environment</b>		
16.2.4.2.1 - Employment	16.1	Hiring preferences will be given to Wek'èezhìi Settlement Area residents, Aboriginal peoples, and other Northerners. Priority will be given to the residents of Tłı̨chǫ communities.
	16.2	A Tłı̨chǫ human resources professional will be hired to lead the recruitment process to facilitate the ability to recruit people from the area. All job postings will be given to the Tłı̨chǫ community employment coordinators to give them first opportunity to source an appropriate candidate from their communities.
16.2.4.2.1 - Employment: Employability	16.3	The NICO Project will mainly require workers with prerequisite skills to do the job rather than using trainees. Fortune Minerals is committed to finding ways to attract and retain local study area community members to work at the NICO Project, particularly Tłı̨chǫ residents. As community interests and basic skills are well-suited to the majority of skilled and semi-skilled positions required during mine construction, Fortune Minerals will focus its pre-employment training around developing skills in those areas.
16.2.4.2.3 - Mitigation Measures for Employment and Contracting	16.4	Fortune Minerals has developed several plans, strategies, and commitments for the NICO Project to maximize direct employment, contracting, advancement, and retention of Wek'èezhìi Settlement Area residents and other Aboriginal and Northerners. General mitigation measures are, as follows:
		<ul style="list-style-type: none"> <li>Fortune will be flexible with the entry requirements, where possible, and make every effort to support employees or community residents to upgrade their skills.</li> </ul>
		<ul style="list-style-type: none"> <li>Rosters may vary, influenced by the nature of the work, the level of responsibility, and the place of residence of the employee. A flexible shift roster, as well as the relatively close proximity of the mine, may be attractive to Tłı̨chǫ residents and potential new entrants to the labour market.</li> </ul>
		Employees will be provided with free scheduled round-trip, work-related transportation from the following local study area communities: Yellowknife, Behchokö, Wekweètì, Whatì, and Gamètì. The daily bus service (including weekends) will be scheduled for employees. Care and maintenance workers will be based out of Whatì and will be brought by bus to and from Whatì daily on 10-hour shifts. Workers from Wekweètì would be transported to and from site via small aircraft.
		<ul style="list-style-type: none"> <li>Equivalent skills and qualifications will be considered when recruiting and hiring. As long as safety can be maintained, and in accordance with specific position</li> </ul>

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		<p>requirements, Fortune Minerals will try to hire workers at all levels of proficiency, including pre-literate workers. Fortune Minerals will attempt to overcome these challenges by incorporating essential skills into safety training, technical training, and production planning.</p> <ul style="list-style-type: none"> <li>• Fortune Minerals will provide and encourage opportunities for apprenticeships where there are sufficient available journeymen and eligible apprentices.</li> <li>• Fortune Minerals will seek opportunities to encourage and support Aboriginal workers who would like to pursue supervisory or management roles.</li> <li>• Fortune Minerals will develop a strategy directed at women to create more opportunities or remove barriers to women working at the site.</li> <li>• Fortune Minerals will communicate clearly the criminal record check policy so that no one is unjustly denied a job due to a criminal record.</li> <li>• Fortune Minerals will encourage employees and contractors affected by substance abuse to seek assistance with the assurance of their support and confidentially through that process.</li> <li>• Fortune Minerals will make information available to local study area schools and other community organizations so that female youth, in particular, become more knowledgeable about the various types of available jobs and the required education and training to fill these positions.</li> <li>• Fortune Minerals will provide summer employment for students on the NICO Project, giving priority to those from the Tłı̨chʼo communities.</li> <li>• All contractors and employees will be expected to participate in a cultural awareness training workshop.</li> <li>• An Employee and Family Assistance Program will be offered to support all employees when working at the mine site. Fortune Minerals will liaise with the communities to support the issues with shift rotations and the difficulties of home life. If an employee terminates his/her employment due to family or personal issues, then every reasonable opportunity will be given to re-hire the employee after a reasonable period. Consideration will be given to work with the provider to make available more Aboriginal speaking counselors for employees and their families.</li> <li>• Fortune Minerals will monitor the effectiveness of its local hiring and contract policies and programs.</li> </ul>
16.2.4.2.4 - Employment Policies for Aboriginal and Other Northern Women	16.5	<p>In consultation with the Tłı̨chʼo people, Fortune Minerals will develop specific strategies for the employment of Aboriginal and other northern women at the NICO Project site. These strategies include an on-the-job training program during the construction phase, student achievement awards, work term placement opportunities, and summer employment with priority for students from the Tłı̨chʼo communities. Where possible, work rosters will be made flexible to provide opportunities to women who have not previously been able to seek employment outside of the community.</p> <p><b>Security:</b> It is imperative that all women feel safe and secure at the worksite. Trained security staff will be on-site overseeing any concerns. The enforcement of a zero tolerance policy for drugs and alcohol will contribute to a respectful and comfortable workplace. Arrangements will be in place for separate women's quarters to give women a more secure environment. Supervisory staff will be trained to be sensitive and communicative with women to maintain a respectful workplace. A buddy system will be in place for women who use the outdoor recreational trails.</p> <ul style="list-style-type: none"> <li>• In addition, access on-site by non-employees will be restricted. Most transportation to the site will be by company-operated vehicles. No other mines or industry are</li> </ul>



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		currently on, or expected to be on, the NICO access road. Site access will be controlled by security professionals.
		<b>Safety:</b> Work safety will be paramount on-site with qualified safety professionals providing direction and oversight. Safety will be the responsibility of all employees, contractors, and visitors. Training will be provided for all employees before commencing work to provide a safe work environment. Thus, training will be appropriate to each position.
		<b>Anti-harassment:</b> Anti-harassment policy and procedures are currently in place. These will be communicated to all employees and contractors and strictly enforced. Communications links will be implemented for workers to report any incidents of harassment without reprisal. Fortune Minerals will implement a process for reporting any cases of harassment and how to manage and resolve the situation.
16.2.4.2.5 - Training Commitments	16.6	<p>Fortune Minerals is committed to designing plans, strategies, and other commitments meant to increase the mine-ready workforce, support career paths in mining, and offer training programs. Fortune Minerals is currently making plans and preparations to begin pre-employment training. The following mitigation steps for training will be implemented:</p> <ul style="list-style-type: none"> <li>Fortune Minerals will partner with the Mine Training Society, which has likewise teamed up with Aurora College, to consider the Underground Miner Training Program. Recruitment of an Aboriginal workforce may be accomplished through a dedicated underground/open pit training program. Fortune Minerals also expects to develop an apprenticeship program where there are sufficient available journeyman and eligible apprentices.</li> <li>Fortune Minerals will support potential employees from the Tłı̨chʼı̨ communities to attend Class 1 Driver Training in Fort Smith. Training will be focused on specific job skill development.</li> <li>Fortune Minerals will offer workplace orientation sessions in the community for new workforce entrants. Mine orientation will also include money management and adapting to mine lifestyle and work habits.</li> <li>Several people in the communities have had heavy equipment experience or training, although not necessarily with mining. If hired, they will be provided with site-specific on-the-job training. Community meetings will be held about training and job opportunities with the NICO Project. Community leaders will be consulted on recruitment and education support decisions. The company will increase community visits, on-site information presentations, and tours as the NICO Project is approved, as well as before and during construction.</li> </ul>
		<ul style="list-style-type: none"> <li>An Impact Benefit Agreement (IBA) that is satisfactory to all Parties is being considered with the Tłı̨chʼı̨ communities. This agreement may include measures to protect social and cultural values as well as addressing training, employment, and business opportunities.</li> <li>A Tłı̨chʼı̨ human resources professional will be hired to lead Fortune Minerals' recruitment program. Opportunities will be sought for new work entrants to be further developed for more advanced or diverse roles through on-the-job training and support for educational upgrading.</li> </ul>
16.2.4.2.6 - Employment: Drugs and Alcohol	16.7	<p>Fortune Minerals' strategies to maximize employment of Aboriginals and Northerners through its contractors include:</p> <ul style="list-style-type: none"> <li>Preference will be given to Tłı̨chʼı̨ businesses that have the capacity to perform the work, followed by Aboriginal, Northern, and other companies, in this order of priority. Fortune's procurement practices will particularly benefit Tłı̨chʼı̨</li> </ul>

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		businesses, with human resource and labour force development activities directed to Tłıchǫ communities and people. This support will result in stronger communities and individuals with increased entrepreneurial, business, and technical skills.
		<ul style="list-style-type: none"> <li>Fortune Minerals will expect its contractor companies to have and implement Aboriginal hiring policies and procedures similar to its own. Every effort will be made with all contractors to maximize hiring from the Tłıchǫ communities, Aboriginal people, and across the regional study area. To the extent possible contractors will be expected to draw their labour from qualified local sources, support training and recruitment initiatives at the pre-employment phase, provide employee development, and focus on employee retention, particularly of Aboriginal people.</li> <li>Orientation meetings will be held with contractors to make sure that they understand Fortune Minerals' policies, procedures, and commitments. All contractor personnel will complete the orientation process on-site. Penalties will be built into the contracts to improve compliance.</li> </ul>
16.2.6.2.1 - Public Infrastructure and Services	16.8	During construction, equipment and supplies will be hauled to the NICO Project site locally using a combination of the proposed NICO access road, the existing Whati and Gamètì winter roads, the proposed Tłıchǫ road route, and regionally, using the NWT highway system. Fortune Minerals will pay royalties and taxes to all levels of government that will be allocated as appropriate, including most likely for road infrastructure.
16.2.6.2.2 - Labour Shortages for Local Services	16.9	<p>Fortune has proposed the following environmental design features for the NICO Project that relate to demands on infrastructure, including any effect on social services from immigration.</p> <ul style="list-style-type: none"> <li>Fortune Minerals will offer pick-up points throughout the local study area communities.</li> <li>The mine camp will include the necessary facilities to sustain the workforce at the site, including having medical personnel accessible on a continuous basis, reducing demand on transport of material and people.</li> <li>Fortune Minerals will offer a volunteer incentive that employees can apply for; it will be provided to those employees interested in volunteering their time for social or cultural programs or activities in their home communities.</li> </ul>
16.2.7.2.2 - Education Completion Rates	16.10	Fortune Minerals' aim is to fill as many of the skilled positions and semi-skilled positions as possible with Aboriginal and Northerners during the NICO Project. Unskilled workers will receive on-the-job training to bring them up to an acceptable productivity level. As vacancies in skilled and semi-skilled positions occur, concerted efforts will be made to fill these positions with Northern Aboriginal workers. Fortune Minerals will consider the experiences of individuals not meeting minimum education requirements for entry-level positions on a case-by-case basis.
	16.11	<p>Education completion rates are expected to be positively affected by the NICO Project with the following mitigation steps:</p> <ul style="list-style-type: none"> <li>Employees will be brought in at a level so that the person is able to do the work and remain safe. Fortune Minerals will be flexible with its minimum literacy requirement for employment for residents of the Wek'èezhii Settlement Area and as long as safety can be maintained, workers will be accepted at all levels of proficiency, including pre-literate workers. Fortune Minerals will attempt to overcome these challenges by incorporating essential skills into safety training, technical training, and production planning.</li> <li>Opportunities will be sought for new work entrants to be further developed for</li> </ul>



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		<p>more advanced or diverse roles through on-the-job training and support for educational upgrading. On-the-job training will be provided in as many situations as possible to provide opportunities for Tłıchǫ residents.</p> <ul style="list-style-type: none"> <li>Fortune Minerals will try to carry out relevant training programs that are offered in cooperation with other agencies in the NWT, such as the Mine Training Society and Aurora College. Discussions have begun with the Mine Training Society to seek training opportunities, although issues about academic preparedness still need to be addressed.</li> <li>Fortune Minerals will work diligently to engage with youth, particularly those who are Tłıchǫ. Fortune Minerals plans to attend career fairs, participate in classrooms, and develop relationships with schools. Summer employment will be offered to young people as well as work terms, and apprenticeship and training opportunities.</li> <li>Fortune Minerals will contribute to student achievement awards.</li> </ul>
16.2.7.2.3 - Alcohol and Drug Access and Use	16.11	<p>Fortune Minerals is committed to maintaining a drug-free workplace and promoting high standards of health and safety, and recognizes alcohol or drug dependency as a treatable condition. Several mitigation and benefit enhancement strategies will be implemented to reduce potential negative effects of substance abuse, as follows:</p> <ul style="list-style-type: none"> <li>Fortune Minerals will provide workshops on money management, alcohol and substance abuse, family adaptation, and coping mechanisms.</li> <li>Employees who suspect they have an alcohol or drug dependency will be encouraged to seek advice and to follow appropriate treatment promptly before it results in job performance problems. Medical staff will advise and assist in securing treatment.</li> <li>Fortune Minerals will conduct “for cause” testing; circumstances might include such things as reasonable suspicion that an employee may be in violation of the policy, reports from any witnesses, bizarre, unsafe, or threatening behaviour on the employee’s part, or involvement in a work-related accident.</li> <li>No employee with alcohol or drug dependency will be terminated due to the request for help in overcoming that dependency or because of involvement in a rehabilitation; however, an employee who has had or is found to have a substance abuse problem will not be permitted to work in designated positions identified as being critical to the safety and wellbeing of employees, the public, or Fortune Minerals.</li> <li>Even with these mitigation measures, some substance abuse can be expected to occur, particularly when an employee or contractor is off-site. This situation is not the responsibility of Fortune Minerals or within its power to prevent. As such, Fortune Minerals will work with local study area communities to develop and implement strategies to limit negative health outcomes such as increased alcohol and drug consumption.</li> </ul>
16.2.7.2.5 - Crime Rates	16.12	<p>Fortune Minerals will continue to engage with the communities and their leadership throughout the operational life of mine. Sponsorship of community events and promotion of activities will improve life for community members. Fortune Minerals believes that its role in helping to bring greater health and vibrancy to the local study area is their best approach to mitigating negative social outcomes, which includes the rate and severity of crime.</p>
16.2.7.2.6 - Access to Childcare	16.13	<p>Fortune Minerals will implement the following mitigation and benefit enhancement strategies to reduce potential negative effects of limited access to childcare and to maximize women’s participation in the NICO Project:</p>



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		<ul style="list-style-type: none"> <li>The potential for shorter shift rotations due to the proximity of the site to some local study area communities may offer more opportunities for women with young children to enter the workforce.</li> <li>Potential exists for secondary employment that may be generated in the communities themselves as a result of the NICO Project; this possibility may add flexibility for women to enter the workforce.</li> <li>Fortune Minerals will develop a strategy directed at women to create more opportunities or remove barriers to women working at the site.</li> </ul>
16.2.7.2.7 - Language Retention and Other Key Indicators of Cultural Maintenance	16.14	<p>Mitigation measures by Fortune Minerals for language retention and other key indicators of cultural maintenance include the following:</p> <ul style="list-style-type: none"> <li>Fortune Minerals will make every effort to support the culture and language on the worksite, including offering cultural sensitivity workshops, which will be done in collaboration with the Tłıchǫ.</li> <li>Any Tłıchǫ employee who does not have knowledge of the English language, either written or verbal, will be given reasonable opportunities, where the lack of language does not compromise the safety of the individual or of others or work performance.</li> <li>Tłıchǫ speaking counselors will be hired for employees and their families, and translation of policies and important documents to Tłıchǫ language will be done, where feasible.</li> <li>Through policy development and practices, Fortune Minerals will also be sensitive to the culturally-extended family kinship ties; in other words, absence from the site for cultural or family needs will be considered on a case by case basis.</li> </ul>
16.2.7.2.8 - Community Cohesiveness and Pride in Cultural Identity	16.15	<p>Fortune Minerals requires that all employees take cultural awareness and cross-cultural training. Fortune Minerals will take the following specific mitigation steps to reduce negative effects related to cultural interactions and to enhance links to community to the extent possible:</p> <ul style="list-style-type: none"> <li>through its employee benefits package, offer counseling and mentoring to employees who pursue it;</li> <li>allow employees to continue speaking their traditional language on-site if it does not pose a health or safety issue;</li> <li>provide quality accommodations for permanent employees on-site with two people per room during construction and single individual rooms after the construction phase;</li> <li>provide quality food services with nutritional food, with options that will include country food (when available);</li> <li>provide communication links for employees to maintain relationships with their families while at site, such as telephone and internet; there will also be cell phone satellite coverage;</li> <li>provide indoor and outdoor recreation and leisure options on-site for a relaxing and healthy lifestyle while away from home;</li> <li>provide a family and employee assistance program should they encounter stress associated with their work or other family concerns, including relationships, family, youth, and elder care;</li> <li>hold annual open house days; community members and employee families will be invited to visit the site and see where people work;</li> <li>provide workshops on money management, alcohol and substance abuse, and family adaptation and coping mechanisms;</li> </ul>

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		<ul style="list-style-type: none"> <li>provide cultural sensitivity training to all employees to reduce work-related stress in a cross-cultural work environment; and</li> <li>offer a volunteer incentive, which employees can apply for; these will be provided to those employees interested in volunteering their time for social or cultural programs or activities in their home communities.</li> </ul>
16.2.8 - Effects to Public Safety	16.16	Fortune Minerals will consider several mitigation measures to reduce the risk of accidents and improve public safety, including the following:
		<ul style="list-style-type: none"> <li>offering driver training for truck drivers;</li> <li>making road improvements (if determined to be necessary) on the NICO access road;</li> </ul>
		<ul style="list-style-type: none"> <li>applying and monitoring strict controls on speed limits;</li> <li>advising communities about approximate time trucks will be passing;</li> <li>minimizing commuter traffic, especially at night;</li> <li>implementing contingency and emergency response procedures, including for spill clean-up and medical emergencies, to reduce the consequences of an accident;</li> <li>using only transportation contractors with proven safety records; and</li> <li>mitigation measures applied for the local roads will also be applied to the regional highways.</li> </ul>
	16.17	Fortune Minerals' mitigation strategy is a plan designed to help potentially-affected communities adjust to economic fluctuations, including unforeseen early closure or Project hiatus, and to assist the post-closure transition for mine employees, Fortune Minerals commits to the following measures:
		<ul style="list-style-type: none"> <li>design and implement a targeted communications strategy, including a media management program, for an effective, ongoing community consultation and engagement process;</li> <li>regularly meet with different business, educational, civil, and local government organizations to begin and/or maintain two-way communication, including providing information on and discussing the NICO Project operations, lifecycle, and closure plans;</li> <li>hold company-community meetings with all three levels of government (community, territorial, federal), and build consensus through meaningful discussions that foster trust and collaboration;</li> <li>support sustainable communities to the extent possible by investing in communities and employees;</li> <li>improve employee and business capacity building through continued training and transferable skills development;</li> <li>develop a human resources closure plan and a sustainable development strategy;</li> <li>form a mine closure committee during operations. The committee will consist of staff and employees, with responsibilities that include how to best support employees with mine downsizing and eventual closure. This committee will also deal with any issues related to unforeseen early closure or Project hiatus;</li> <li>establish a transition centre with the following tasks and objectives:</li> <li>maintain a database of all employees and their respective skills and training;</li> <li>provide access to government programs for further training or for Employment</li> </ul>

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		Insurance;
		<ul style="list-style-type: none"> <li>• arrange financial planning and employment information sessions for all employees;</li> <li>• help with resume writing, job searching, and job interviewing skills;</li> <li>• contact other mining companies to recommend employees and contractors to other Projects; and</li> <li>• involve all potentially-affected communities in the process.</li> </ul>
16.2.12 - Uncertainty	16.18	Fortune Minerals will liaise with relevant federal, territorial, and Tłı̨chǫ Government agencies, and relevant transportation, health, social, education, and other regional agencies in the planning process and during construction and operations.
16.2 - Socio-Economic Impacts 16.2.13 - Ongoing Engagement and Follow-up	16.19	Fortune Minerals will work to support sustainable communities as much as possible. Capacity building, training, and development will be designed for mobility. Employability will be a key element of the opportunities that are offered to employees or prospective employees.
	16.20	As part of the closure planning, a closure committee will be formed in adequate time prior to closure to plan for some of the issues that employees would be facing because of the closure. The committee will consist, in part, of employees. Some of their key responsibilities will be to consider how to best support employees with the downsizing. A Transition Centre will be set up (specific location subject to negotiations with the Tłı̨chǫ ) to include the following:
		<ul style="list-style-type: none"> <li>• create a database of all employees and their skills and training;</li> <li>• practice interview skills;</li> <li>• provide access to government programs for further training or for Employment Insurance;</li> <li>• help transition employees to other mining Projects;</li> <li>• arrange financial planning and employment information sessions for all employees; and</li> <li>• help with resume writing, job searching, and job interviewing skills.</li> </ul>
	16.21	All Wek'èezhii Settlement Area communities will be involved in the process with meetings involving the communities and all three levels of government, and there will be a building of consensus through meaningful discussions that foster trust and collaboration.
16.2.13.1.1 - Income and Money Management	16.22	Fortune Minerals will assist new employees with opening a bank account if they do not already have one.
16.2.13.1.2 - Stress Management and Support Programs	16.23	Consideration will be given to work with the provider to make available more Aboriginal speaking counselors for employees and their families. Fortune Minerals will try to re-hire the employee after a reasonable period. The NICO Project will also be providing transportation by road for the employees in the communities that are accessible by road (i.e., Whatì and Behchokö early in the NICO Project and likely Gamètì later on as the road goes through to the community).
	16.24	Other specific mitigation steps will be taken to reduce negative effects associated with long-distance commuting and stress management, and to support community and family relationships, including the following:
		<ul style="list-style-type: none"> <li>• Provide quality accommodations for permanent employees on-site with two people per room during construction and single individual rooms after the construction phase.</li> <li>• Fortune Minerals will provide quality food services with nutritional food in</li> </ul>

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		consultation with the employees.
		<ul style="list-style-type: none"> <li>Fortune Minerals will provide communication links for employees to maintain relationships with their families while at site, such as the internet (e.g., Skype, e-mail). There will also be cell phone satellite coverage. Computers will be available for ongoing learning and training through computer-based programs.</li> </ul>
		<ul style="list-style-type: none"> <li>Fortune Minerals will provide indoor and outdoor recreation and leisure options on-site for a relaxing and healthy lifestyle while away from home. A recreation coordinator will be responsible for scheduling a varied daily program that will appeal to those looking to exercise before or after their shift. A gymnasium will be part of the living complex to provide workers with opportunities for exercise.</li> </ul>
		<ul style="list-style-type: none"> <li>A living complex will be available, and decorated with traditional art from the Tłı̄chǫ communities. A library will be part of the living complex with reading materials and movies, some of which will be based on the Tłı̄chǫ culture.</li> </ul>
		<ul style="list-style-type: none"> <li>Fortune Minerals will hold annual open house days to invite community members and employee families to visit the site and see where people work.</li> </ul>
		<ul style="list-style-type: none"> <li>Fortune Minerals will provide workshops on money management, alcohol and substance abuse, and family adaptation and coping mechanisms.</li> </ul>
		<ul style="list-style-type: none"> <li>Fortune Minerals will provide cultural sensitivity training to all employees so as to reduce work-related stress in a cross-cultural work environment.</li> </ul>
16.2.13.1 - Human Environment Monitoring and Management Plans	16.25	Fortune Minerals is committed to maintaining a drug-free workplace and promoting high standards of health and safety. It will be a violation for any employee to use, possess, distribute, manufacture, sell, trade, or otherwise engage in the illegal use and/or consumption of prohibited and mood altering substances (including, but not limited to, alcohol, marijuana, and other illegal substances) at or in the workplace. Fortune Minerals will conduct "for cause" testing.
16.2.13.1.3 - Substance Abuse and Treatment Policies	16.26	Fortune Minerals recognizes alcohol or drug dependency as a treatable condition. Employees who suspect they have an alcohol or drug dependency will be encouraged to seek advice and to follow appropriate treatment promptly before resulting in job performance problems. The NICO Project medical staff will advise and assist in securing treatment. No employee with alcohol or drug dependency will be terminated if they request help in overcoming that dependency or because of involvement in a rehabilitation effort. An employee who has had or is found to have a substance abuse problem, however, will not be permitted to work in designated positions identified by management as being critical to the safety and well-being of employees, the public, or Fortune Minerals.
16.2.13.1.4 - Cross-Cultural Training	16.27	Fortune Minerals will employ the services of elders from the Tłı̄chǫ communities for this purpose as well as Aboriginal companies. Training opportunities that are being reviewed currently include the following:
		<ul style="list-style-type: none"> <li>community education;</li> </ul>
		<ul style="list-style-type: none"> <li>community wellness events;</li> </ul>
		<ul style="list-style-type: none"> <li>cross-cultural strategic planning and training;</li> </ul>
		<ul style="list-style-type: none"> <li>front-line skill development;</li> </ul>
		<ul style="list-style-type: none"> <li>peer support and counseling;</li> </ul>
		<ul style="list-style-type: none"> <li>professional development;</li> </ul>
		<ul style="list-style-type: none"> <li>team building and facilitating community partnerships; and</li> </ul>

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		<ul style="list-style-type: none"> <li>workplace wellness training.</li> </ul>
16.2.13.1.5 - Employment and Training	16.28	Fortune Minerals will implement human resources information systems to effectively capture any changes to recruitment, vacancies, training received, shifts and rosters, and any information related to employees. While information about any individual will be confidential, cumulative summaries will be developed monthly and reported on a regular basis.
		<ul style="list-style-type: none"> <li>All employees will be asked, at hiring time, to self-disclose information on their ethnicity, place of residence and Aboriginal status to determine the total number of workers and the numbers and percentages of those from the Tłıchǫ communities and other Aboriginal or Northern workers. During construction these will be monitored on a “number of days worked” basis. Training hours will be tracked and reported by categories such as on-the-job training, external training, and apprenticeships.</li> </ul>
		<ul style="list-style-type: none"> <li>In addition, an IBA to be negotiated with the Tłıchǫ will be a comprehensive tool to include hiring and training of Aboriginal people.</li> </ul>
16.2.13.1.6 - Local Businesses	16.29	All businesses providing goods and services to the NICO Project will be tracked including types of businesses participating in construction and the value of that business. Semi-annually, this information will be reviewed and gaps identified to maximize Aboriginal business participation.
		Issues and concerns associated with the socio-economic environment will be addressed through plans that support the environmental health and safety management system, such as the community relations plan. Potential adverse effects will be monitored such as new business opportunities that, while positive for contractors and their employees, may generate a shortage of local skilled workers in the community.
		In addition, an IBA to be negotiated with the Tłıchǫ will be a comprehensive tool that will address the benefits for local and regional businesses. Implementation and monitoring of the IBA will assist organizations and businesses servicing the region, particularly helping them to counter mobilization of local skilled labour away from the Tłıchǫ communities and associated impacts on maintenance of infrastructure and basic service provision. This can be done through training, rotational flexibility, and other measures to be developed with the smaller communities in the local study area.
16.2.13.1.7 - Employee Retention	16.30	Employee retention will be monitored and analyzed monthly through human resource information systems. The company will review hiring and termination of workers to determine an annual rolling forward turnover rate. Particular attention will be given to address any increase in turnover rates for Aboriginal people.
16.2.13.1.8 - Worker and Family Wellness	16.31	Fortune Minerals will meet with the local staff of the service providers and agencies on an ongoing basis to both provide and share relevant information. The site medical staff will make ongoing contact with local health officials to both report any relevant concerns and also to make Fortune Minerals aware of any issues.
		Through its adaptive management system, Fortune Minerals will incorporate knowledge about worker and family wellness from multiple sources, make use of multiple systems models, and support new forms of cooperation among stakeholders. At the site level, Fortune Minerals will monitor concerns brought forward by the medical staff, by community employees, and information gathered at community visits.
		Worker and family wellness will be specifically monitored in several ways, including the following:
		<ul style="list-style-type: none"> <li>monthly reports from the Employee and Family Assistance program will be prepared, advising the number and type of contacts and any notable patterns or concerns;</li> </ul>

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		<ul style="list-style-type: none"> <li>Fortune Minerals will communicate and collaborate with community health care providers in the potentially affected communities for any concerns or changes to worker and family wellness that might require mitigation.</li> <li>Work site medical personnel will provide support services to those with health issues. They will also monitor Fortune Minerals' commitment to healthy diet and nutrition and the availability of country food;</li> <li>Fortune Minerals will monitor time lost due to illness; and</li> <li>statistics on the termination of Fortune Minerals employees related to homesickness, rotational employment, and emotional stress factors will be gathered through exit interviews and follow up.</li> </ul>
16.2.13.2 - Contributions to Beneficial and Adverse Social Impacts	16.32	A socio-economic monitoring plan will be designed to determine the effectiveness of Fortune's mitigation measures. The socio-economic monitoring plan will supplement, not duplicate, areas covered by the IBA to be negotiated for this Project. In particular, the plan will be designed to include the following:
		<ul style="list-style-type: none"> <li>monitoring will be done through proactive policies and procedures early in the NICO Project;</li> <li>determine the effectiveness of the measures in reducing adverse effects and enhancing positive ones associated with the NICO Project;</li> <li>show where adjustments in those measures need to be made;</li> <li>help Fortune Minerals adjust, augment, or replace measures to correct any adverse effects; and</li> <li>work in partnership with government and Aboriginal organizations to collect, analyze, and interpret information related to the impacts of the NICO Project.</li> </ul>
	16.33	A key feature of the socio-economic monitoring plan will be its ability to be modified and improved through experience and input. The plan will direct those responsible for its implementation to undertake the following actions throughout the lifetime of the NICO Project:
		<ul style="list-style-type: none"> <li>verify the accuracy and completeness of the socio-economic effects described in the DAR;</li> <li>monitor the effectiveness of planned mitigation measures;</li> <li>identify additional adverse effects;</li> <li>review the effectiveness of data gathering;</li> <li>modify the socio-economic monitoring plan to improve its effectiveness; and</li> <li>share information about the effectiveness of the plan with Fortune Minerals personnel, contractors, community service agencies, and Tłı̨cẖ community residents.</li> </ul>
	16.34	A committee to oversee the effectiveness of Fortune Minerals' mitigation procedures and monitor socio-economic effects will be convened after a favourable decision to proceed with the NICO Project is given. The committee will be comprised of representatives from interest groups affected by the construction, operation, and closure of the NICO Project. Representatives will include personnel from Fortune Minerals, Department of Health and Social Services, the RCMP, representatives from some or all of the Tłı̨cẖ communities, and representatives of associations and organizations, and territorial, regional, and local and Tłı̨cẖ governments. Those who serve on the Committee must agree to contribute to data gathering and information sharing in their "sphere of influence".



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		In its ongoing work with the Tłıchǫ, Fortune Minerals has been communicating with the Tłıchǫ Government's Kwe Beh Working Group, recently established to manage relationships with mining companies in Mowhi Gogha De Niitl'ee. Fortune Minerals will continue to build its relationship with the Kwe Beh Working Group, whose mandate includes matters of direct relevance to the NICO Project.
16.3.3.2 - Mitigation Proposed Mine Site Development	16.35	Fortune Minerals environmental design features for effects to physical heritage due to the NICO Project include:
		<ul style="list-style-type: none"> <li>• construction and operation activity leading to ground disturbance that affects physical heritage resources;</li> </ul>
		<ul style="list-style-type: none"> <li>• completed archaeological assessment for areas that are considered likely to contain heritage resources;</li> </ul>
		<ul style="list-style-type: none"> <li>• avoid previously recorded heritage resource sites;</li> </ul>
		<ul style="list-style-type: none"> <li>• complete additional archaeological assessment for any changes to NICO Project footprint in areas considered to have moderate to high potential to contain heritage resources;</li> </ul>
		<ul style="list-style-type: none"> <li>• monitor condition of known heritage resource sites near the NICO Project footprint; and</li> </ul>
		<ul style="list-style-type: none"> <li>• provide awareness training and a manual for recognizing heritage resources to construction crews</li> </ul>
16.3.3.2 - Mitigation Proposed NICO Project Access Road  16.3.3.2 - Mitigation Proposed Borrow Source	16.36	Fortune Minerals environmental design features for effects to physical heritage due to the proposed NICO access road and NICO footprint include:
		<ul style="list-style-type: none"> <li>• completed archaeological assessment for areas that are considered likely to contain heritage resources;</li> </ul>
		<ul style="list-style-type: none"> <li>• avoid previously recorded heritage resource sites;</li> </ul>
		<ul style="list-style-type: none"> <li>• complete additional archaeological assessment for any changes to NICO Project footprint in areas considered to have moderate to high potential to contain heritage resources;</li> </ul>
		<ul style="list-style-type: none"> <li>• monitor condition of known heritage resource sites near the NICO Project footprint; and</li> </ul>
		<ul style="list-style-type: none"> <li>• provide awareness training and a manual for recognizing heritage resources to construction crews.</li> </ul>
16.3.3.2 - Mitigation Proposed NICO Mine Site Development, NICO Project Access Road, and Borrow Source	16.37	Fortune Minerals environmental design features for construction and operation activity leading to impacts on heritage resource sites in the vicinity of the Įdaà Trail or Hislop Lake include:
		<ul style="list-style-type: none"> <li>• reduce visibility of the NICO Project components from identified physical heritage resource (Įdaà Trail, Hislop Lake);</li> </ul>
		<ul style="list-style-type: none"> <li>• monitor condition of known heritage resource sites near the NICO Project footprint; and</li> </ul>
		<ul style="list-style-type: none"> <li>• provide awareness training and a manual for recognizing heritage resources to construction crews</li> </ul>
16.3.3.2 - Mitigation Construction and Operation Activity Leading to Impacts on	16.38	Construction and operation activities of the proposed NICO Project will avoid known physical heritage resources in the vicinity of the Įdaà Trail and Hislop Lake



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Heritage Resource Sites in the Vicinity of the Iḁa̱ Trail and Hislop Lake: Proposed NICO Mine Site Development, Access Road, and Borrow Sources		
16.3.7 - Monitoring	16.39	Monitoring of the condition at known heritage resource sites near the NICO Project footprint will also occur.
16.4 - Traditional Land Use General construction and operation of mine and supporting infrastructure	16.40	Fortune Minerals is planning the following design features and mitigations plans to address the possibility that the NICO Project may affect the availability of wildlife (including fish) for harvesting or viewing.
		<ul style="list-style-type: none"><li>cultural awareness programs;</li></ul>
		<ul style="list-style-type: none"><li>impacts on wildlife will be managed by site environmental staff and through meetings and interviews with the local residents;</li></ul>
		<ul style="list-style-type: none"><li>See 8.12</li></ul>
Table 16.4-1 Potential Pathways for Traditional Land Use Effects	16.41	<ul style="list-style-type: none"><li>See 5.1 for commitments related to use of Traditional Knowledge</li></ul>
16.4 - Traditional Land Use General construction and operation of mine and supporting infrastructure	16.42	See 8.12
		Fortune Minerals is committed to having discussions with hunters and trappers who approach Fortune with a case that their hunting and trapping practices have been compromised by the NICO Project.
17 – Subject of Note: Accidents and Malfunctions		
17 – Accidents and Malfunctions Appendix 3.VI	17.1	The preliminary ERSCP addresses human-caused emergencies and natural disasters that threaten life, the environment and/or property, and that are beyond routine operational control. The document continues to be refined. As a minimum, the final ERSCP will address the following:
		<ul style="list-style-type: none"><li>on-site and off-site spills;</li></ul>
		<ul style="list-style-type: none"><li>tailings pipeline rupture;</li></ul>
		<ul style="list-style-type: none"><li>failure of the CDF;</li></ul>
		<ul style="list-style-type: none"><li>pit wall failure;</li></ul>
		<ul style="list-style-type: none"><li>underground head failure;</li></ul>

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		• extreme drought;
		• extreme precipitation, including effects on the CDF and Open Pit;
		• plane crash;
		• bus crash;
		• pressure vessel failure;
		• facility fires;
		• serious injury or fatality on-site and off-site;
		• earthquakes; and
		• on-site forest fires.
18 - Biophysical Management and Monitoring Plans		
18.2 - Summary of Community Engagement	18.1	See 4.1 for engagement related commitments
	18.2	Fortune Minerals believes it is essential that communities be involved with monitoring to judge how well Fortune is doing at reducing effects and improving environmental management. Fortune Minerals plans to involve communities in environmental monitoring by:
		• developing monitoring programs that include input from communities, including people holding local and traditional knowledge;
		• developing monitoring programs that reflect community priorities and values;
		• including community members in monitoring activities and hiring local residents as environment staff;
• presenting the results of monitoring with the communities; and		
18.3.1 - Proposed Framework	18.3	• providing an opportunity for communities to comment on the findings.
		Fortune Minerals intends to implement an environmental management system incorporating the principles of adaptive management that reviews all monitoring information, identifies areas of concern, and then makes appropriate changes to the operation of the mine to reduce or remove effects to the biophysical environment. Results from all monitoring would flow into a monitoring response plan, which would. require documentation of the following information:
		• a summary of environmental pathways and effects predictions from the NICO Project;
		• a description of how changes to the biophysical environment will be measured and considered;
		• a description of action levels and significance threshold, where available, for measurement endpoints (or indicator variables) of valued components; and
18.5.2 - Monitoring Programs	18.4	• a description of the mitigation and management actions that will need to be submitted if action levels are reached.
		For the NICO Project, Fortune Minerals is proposing four biophysical monitoring programs which will be developed and completed with input from the communities and government and regulatory agencies. These include. See 7.12, 8.13, 10.4 and 14.10
Appendix 8.III - Noise Assessment		
8.III.3.2 - Environmental Design Features	8.III.1	During the development of the NICO Project, environmental design features were incorporated by Fortune Minerals that reduce or eliminate potential impacts from noise, these include:
		• terrain changes (i.e., height of CDF and slopes of the open pit) to partly deflect or



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		<p>reduce noise by physical impediment;</p> <ul style="list-style-type: none"> <li>noise is partly deflected or reduced by buildings or other structures (i.e., structures situated between noise source and receptor); and</li> <li>stationary equipment is housed inside buildings, thereby reducing the amount released into the environment provided doors are kept close.</li> </ul>
<b>Appendix 18.II - Conceptual Wildlife Effects Monitoring Program</b>		
18.II.1 - Introduction	18.II.1	See 8.13 for commitments related to Fortune Minerals' conceptual WEMP
18.II.1.1 - Objectives	18.II.2	<p>The WEMP for the NICO Project will be designed to achieve the following objectives:</p> <ul style="list-style-type: none"> <li>provide information to test predicted impacts from the NICO Project DAR, and reduce uncertainty;</li> <li>implement environmental design features and mitigation to reduce the risks and disturbance to wildlife and wildlife habitat;</li> <li>determine the effectiveness of environmental design features and mitigation;</li> <li>incorporate local traditional and ecological knowledge, where applicable and available;</li> <li>propose action levels or adaptive management triggers that can be used as early warning signs for reviewing and implementing wildlife mitigation practices and policies;</li> <li>design studies and data collection protocols that are consistent with other programs in the region; and</li> <li>consider existing regional and collaborative programs, such as Cumulative Impact Monitoring Program and the NWT Environmental Stewardship Framework.</li> </ul>
18.II.3.1 - General Mitigation	18.II.3	<p>Fortune Minerals is committed to remove or limit effects to wildlife and wildlife habitat. A summary of the environmental design mitigation that will be implemented for the NICO Project include the following:</p> <ul style="list-style-type: none"> <li>limit the spatial extent of NICO Project footprint (i.e., anticipated mine site and NICO access road);</li> <li>promote natural re-vegetation and practice progressive reclamation;</li> <li>remediate and decommission the site when mining operations are complete;</li> <li>skirt all buildings to the ground to limit opportunities for animals to find suitable shelter;</li> <li>locate noisy equipment inside buildings or underground;</li> <li>house the incinerator in an enclosed structure to improve combustion and reduce the availability of attractants while garbage awaits incineration;</li> <li>use double-walled containers or single-walled container in lined containment areas for all fuel storage;</li> <li>provide spill containment supplies in designated areas;</li> <li>use a fuel transfer house with double-locked mechanisms;</li> <li>use culverts and other design features that reduce changes to local flows, drainage patterns and drainage areas;</li> <li>capture and reuse site water to reduce fresh water requirements;</li> </ul>

Section	Commitment #	Commitment Description
		<ul style="list-style-type: none"> <li>• recycle and treat excess water from the SCPs prior to release;</li> </ul>
		<ul style="list-style-type: none"> <li>• use high efficiency scrubbers in processing equipment to limit emissions of particulate matter;</li> </ul>
		<ul style="list-style-type: none"> <li>• use dust control systems on rock crushing and other dust generating equipment;</li> </ul>
		<ul style="list-style-type: none"> <li>• enforce speed limits and use water on roads during summer and fall to suppress dust;</li> </ul>
		<ul style="list-style-type: none"> <li>• manage and isolate attractants, particularly food waste;</li> </ul>
		<ul style="list-style-type: none"> <li>• report raptor nesting activity observed within 1.5 kilometres of the NICO Project to the Department of Environment and Natural Resources (ENR);</li> </ul>
		<ul style="list-style-type: none"> <li>• if feasible, clear land only outside of the breeding season for migratory birds (15 May through 31 July) for all facilities where migratory birds may nest;</li> </ul>
		<ul style="list-style-type: none"> <li>• report all relevant observations of wildlife (particularly of caribou, fox, wolverine, and black bear) to environment staff;</li> </ul>
		<ul style="list-style-type: none"> <li>• implement an effective waste management plan, particularly as it related to the disposal of food waste;</li> </ul>
		<ul style="list-style-type: none"> <li>• identify and monitor birds nesting on NICO Project infrastructure;</li> </ul>
		<ul style="list-style-type: none"> <li>• prohibit hunting, trapping, harvesting, and fishing by site employees and contractors;</li> </ul>
		<ul style="list-style-type: none"> <li>• contact ENR to receive additional direction regarding new issues that arise;</li> </ul>
		<ul style="list-style-type: none"> <li>• provide wildlife the right-of-way;</li> </ul>
		<ul style="list-style-type: none"> <li>• enforce a minimum flying altitude of 300 metres above ground level (except during take-off and landing and aerial surveys) for cargo and passenger aircraft outside of the NICO Project;</li> </ul>
		<ul style="list-style-type: none"> <li>• enforce a minimum flying altitude of 300 metres for helicopters, whenever possible;</li> </ul>
		<ul style="list-style-type: none"> <li>• restrict vehicle use to designated roads and prohibit recreational off-road use of vehicles;</li> </ul>
		<ul style="list-style-type: none"> <li>• use signage and radio to warn drivers when wildlife move through an area; and</li> </ul>
		<ul style="list-style-type: none"> <li>• suspend surface blasting temporarily if large mammals are observed within the danger zone identified by the blast supervisor.</li> </ul>
8.II.3 - Mitigation 18.II.3.2 - Deterrent Actions	18.II.4	<p>Fortune Minerals is committed to using humane wildlife control methods that keep both humans and wildlife safe including wildlife deterrent actions. For deterrents to be successful there must be:</p>
		<ul style="list-style-type: none"> <li>• knowledgeable, trained personnel who will select corrective deterrent actions based on each wildlife situation;</li> </ul>
		<ul style="list-style-type: none"> <li>• consistent application of deterrents;</li> </ul>
		<ul style="list-style-type: none"> <li>• effective implementation of the waste management plan;</li> </ul>
		<ul style="list-style-type: none"> <li>• safe and effective methods to prevent the presence of continuous presence of wildlife within the anticipated NICO Project lease boundary;</li> </ul>
		<ul style="list-style-type: none"> <li>• procedures to remove wildlife from the airstrip or roads during an emergency;</li> </ul>
		<ul style="list-style-type: none"> <li>• the absence of food, shelter and other rewards for animals that investigate the site; and</li> </ul>
		<ul style="list-style-type: none"> <li>• evaluation of every deterrent action to determine the reason for the animal's</li> </ul>



Section	Commitment #	Commitment Description
		presence and the method it used to gain access to a hazardous area.
18.II.3.3 - Caribou Protection Section 8	18.II.5	Fortune Minerals commits to the following mitigation to protect caribou:
		• hunting by NICO Project staff and contractors will be prohibited while on-site;
		• all incidents involving deterrent action, interaction and injury of caribou will be reported;
		• all sightings of caribou will be reported to the environment staff on-site;
		• caribou will not be blocked from crossing NICO Project roads and the airstrip;
		• if caribou are crossing or attempting to cross the NICO access road or site roads, then traffic will stop and wait for them to cross; and
		• caribou will only be herded away from roads or the airstrip in specific circumstances, such as an emergency.
18.II.3.4 - Waste Management Section 3	18.II.6	The waste management plan for the NICO Project contains the following wildlife-specific mitigation strategies:
		• follow procedures outlined in the waste management plan and the emergency response and spill contingency plan;
		• no littering policy;
		• no feeding of wildlife policy;
		• separate food waste and non-food waste at source;
		• disposal of food waste and non-toxic combustible waste according to the waste management plan to limit the presence of food attractants;
		• providing contained areas for lunch and coffee breaks with waste containers for food waste;
		• clearly identifying all food waste containers and those for which food waste is not permitted; and
18.II.4 - Monitoring	18.II.7	store food waste in an isolated area and incinerate quickly.
		Fortune Minerals' WEMP for the NICO Project includes:
		• recording the presence of all wildlife within and around the NICO Project footprint;
		• mitigate hazards to wildlife within the NICO Project site;
		• identify non-compliance with the waste management plan; and
18.II.5 - Reporting and Adaptive Management	18.II.8	continually improve waste management practices to limit the potential for risks to wildlife.
		If negative effects to wildlife are detected at the NICO Project, Fortune Minerals will review the situation and consider the use the following options:
		• increase monitoring effort;
		• implement new monitoring programs to further understand the effects; or
		• implement additional mitigation to reduce the effects.



## Appendix C: Public registry index

PR Item #	Document Name	Date Received	Originator
1	Referral Letter	27-Feb-09	AANDC
2	Developer Notification	02-Mar-09	MVRB
3	General Notification	02-Mar-09	MVRB
3	Distribution Return	02-Mar-09	MVRB
4	Water License Application W2008L2-0004	02-Mar-09	FORTUNE
5	Land Use Permit Application W2008D0016	02-Mar-09	FORTUNE
6	Additional Technical Information	02-Mar-09	FORTUNE
7	Additional Community Engagement Information	02-Mar-09	FORTUNE
8	NICO Scoping Letter-April 2 09	02-Apr-09	MVRB
9	NICO Project Summary-April 2 09	02-Apr-09	FORTUNE
10	NICO Project Summary-Figure 1-Project Study Area	02-Apr-09	FORTUNE
11	NICO Project Summary-Figure 2-Drainage Areas	02-Apr-09	FORTUNE
12	NICO Project Summary-Figure 3-Topo and Exploration Facilities	02-Apr-09	FORTUNE
13	NICO Project Summary-Figure 4-Site Development	02-Apr-09	FORTUNE
14	NICO Project Summary-Figure 5-Roads	02-Apr-09	FORTUNE
15	NICO Issues Scoping Sessions Scheduling Letter	09-Apr-09	MVRB
16	NICO Community Scoping Schedule Letter - UPDATE	15-Apr-09	MVRB
17	NICO Scoping Brochure-YK Session April 20 2009	16-Apr-09	MVRB
18	NICO Project Description Presentation	23-Apr-09	FORTUNE
19	NICO Environmental Overview Presentation-April 20 09	23-Apr-09	FORTUNE
20	Request for Clarification-NICO EA, May 1 2009	01-May-09	MVRB
21	Issues Identified in NICO Scoping – Yellowknife Session	13-May-09	MVRB
22	NICO EA Scoping – Sign-In Yellowknife Session	13-May-09	MVRB
23	NICO Project Overview-Community Scoping Sessions	03-May-09	FORTUNE
24	NICO Environmental Overview Community Presentation	03-May-09	FORTUNE
26	Whati Scoping Session Sign-In	13-May-09	MVRB
27	Developer's Response to Request for Clarification	13-May-09	FORTUNE
28	Scoping Submission Deadline Extension for Fortune Minerals NICO Project Environmental Assessment- Note to File 001	14-May-09	MVRB
29	MVEIRB Letter to Fortune re: Processing Plant Location	26-May-09	MVRB
30	Fortune's Response to Questions Raised in Scoping	01-Jun-09	FORTUNE
31	Aboriginal Affairs and Northern Development Canada Scoping Comments-NICO Project	15-May-09	AANDC
32	Department of Fisheries and Ocean's Scoping Comments-NICO Project	14-May-09	DFO
33	Natural Resources Canada's Scoping Comments-NICO Project	14-May-09	NRCan
34	Tłı̨chǫ Government Scoping Comments-NICO Project	01-Jun-09	TG

35	North Slave Metis Alliance Scoping Comments-NICO Project	01-Jun-09	NSMA
36	Wekeezhii Renewable Resources Board Scoping Comments-NICO Project	01-Jun-09	WRRB
37	Issues Identified in NICO Scoping- Behchoko Session	10-Jun-09	MVRB
38	Environment and Natural Resources Scoping Comments-NICO Project	01-Jun-09	ENR
39	Letter from Fortune-Location of Processing Plant	17-Jun-09	FORTUNE
40	NICO Scoping Issues-Gameti Session (May 7 '09)	19-Jun-09	MVRB
41	NICO Scoping Issues-Whati Session (April 27 '09)	13-May-09	MVRB
42	Letter to Fortune re: Transportation Route Details	23-Jun-09	MVRB
43	Letter from Tłıchǫ re: Road Route	23-Jul-09	TG/ARKTIS
44	Fortune Press Release re: Southern Processing	27-Jul-09	FORTUNE
45	Response from Fortune re: Transportation Route	11-Aug-09	FORTUNE
46	Mapsheet Overview	11-Aug-09	FORTUNE
47	Mapsheet 1	11-Aug-09	FORTUNE
48	Mapsheet 2	11-Aug-09	FORTUNE
49	Mapsheet 3	11-Aug-09	FORTUNE
50	Mapsheet 4	11-Aug-09	FORTUNE
51	Mapsheet 5	11-Aug-09	FORTUNE
52	Mapsheet 6	11-Aug-09	FORTUNE
53	Mapsheet 7	11-Aug-09	FORTUNE
54	Mapsheet 8	11-Aug-09	FORTUNE
55	Mapsheet 9	11-Aug-09	FORTUNE
56	Mapsheet 10	11-Aug-09	FORTUNE
57	Mapsheet 11	11-Aug-09	FORTUNE
58	Mapsheet 12	11-Aug-09	FORTUNE
59	Mapsheet 13	11-Aug-09	FORTUNE
60	Mapsheet 14	11-Aug-09	FORTUNE
61	Letter from Developer re: Processing Plant Changes at NICO Site	02-Sep-09	FORTUNE
62	Letter from Developer re: Processing Plant Changes-Appendix I	02-Sep-09	FORTUNE
63	Covering Letter for Draft Terms of Reference-NICO	15-Sep-09	MVRB
64	Draft Terms of Reference-NICO Project	15-Sep-09	MVRB
65	Wekeezhii Renewable Resources Board -Comments on Draft ToR	15-Oct-09	WRRB
66	NICO Draft Work Plan	16-Oct-09	MVRB
67	NICO Draft Terms of Reference Extension	16-Oct-09	MVRB
68	Department of Fisheries and Ocean's Comments on Draft ToR	16-Oct-09	DFO
69	Fortune Minerals Comments on Draft ToR	16-Oct-09	FORTUNE
70	Natural Resources Canada's Comments on NICO Draft ToR	16-Oct-09	NRCan
71	GNWT Comments on Draft ToR	16-Oct-09	GNWT
72	Aboriginal Affairs and Northern Development Canada Comments on ToR	19-Oct-09	AANDC
73	Tłıchǫ Government Comments on Draft ToR	22-Oct-09	TG

74	Transport Canada Comments on Draft ToR	22-Oct-09	TC
75	North Slave Metis Alliance Comments on Draft ToR	22-Oct-09	NSMA
76	Fortune Minerals Ltd. NICO Project Environment Assessment-Note to File 002	27-Oct-09	MVRB
77	Fortune Minerals Ltd. NICO Project Scoping Agenda - Wekweeti	27-Oct-09	MVRB
78	Environment Canada Comments on Draft ToR	13-Oct-09	EC
79	Fortune Minerals Ltd. Comments on Draft Workplan	30-Oct-09	FORTUNE
80	Aboriginal Affairs and Northern Development Canada Comments on Draft Workplan	30-Oct-09	AANDC
81	North Slave Metis Alliance Comments on Draft Workplan	30-Oct-09	NSMA
82	GNWT Comments on Draft Workplan	30-Oct-09	GNWT
83	Tłıchǫ Government Comments on Draft Workplace	06-Nov-09	TG
84	Scoping Session Wekweeti- NICO Project	10-Nov-09	MVRB
85	Wekweeti Sign-in Sheet	10-Nov-09	MVRB
86	Cover Letter-NICO Terms of Reference and Work Plan	30-Nov-09	MVRB
87	Final Terms of Reference-NICO Project	30-Nov-09	MVRB
88	Final Work Plan-NICO Project	30-Nov-09	MVRB
89	Note to File-Meeting with Developer	07-Dec-09	MVRB
90	NICO Scoping Session Presentation-Environmental Overview	09-Dec-09	FORTUNE
91	NICO Scoping Session Presentation-Project Description	11-Dec-09	FORTUNE
92	Request for Ruling – Tłıchǫ Government	03-Jun-10	TG
93	Request for Ruling – Tłıchǫ Government-Map	03-Jun-10	TG
94	Request for Ruling Notification to Parties	04-Jun-10	MVRB
95	Note to File from 3-June-10 Meeting Between Review Board Staff and Fortune Minerals	10-Jun-10	MVRB
96	Letter from Fortune Minerals Limited Regarding Tłıchǫ Government Request for Ruling	10-Jun-10	FORTUNE
97	Fortune Minerals Letter Requesting Map Corrections	09-Jun-10	FORTUNE
98	Tłıchǫ Letter to Fortune on Map Corrections	10-Jun-10	TG
99	Fortune Minerals Follow-Up Letter on Map Corrections	14-Jun-10	FORTUNE
100	Aboriginal Affairs and Northern Development Canada Request for Extension to Deadline for Comments	17-Jun-10	AANDC
101	Letter Regarding an Extension to the Deadline for Comments	24-Jun-10	MVRB
102	Justice Canada – Request for Ruling Submission	08-Jul-10	JC
103	North Slave Metis Alliance-Request for Ruling Submission	09-Jul-10	NSMA
104	Tłıchǫ Government-Final Request for Ruling Submission	15-Jul-10	TG
105	Information Concerning Proposed Roads	19-Jul-10	FORTUNE
106	Information on Request for Ruling	23-Jul-10	MVRB
107	Tłıchǫ Government- Further Information on Proposed Roads	23-Jul-10	TG
108	Reasons For Decision on Tłıchǫ Government Request for Ruling	27-Aug-10	MVRB
109	Application for Judicial Review	22-Sep-10	TG
110	Judicial Review Affidavit-Exhibits A-H	22-Sep-10	TG

111	Judicial Review Affidavit-Exhibits I-Q	22-Sep-10	TG
112	Ecology North Scoping Comments-NICO Project	15-May-09	EN
113	EA Update, DAR Submission Date	10-Feb-11	MVRB
114	DAR Submitted to the Review Board	20-May-11	FORTUNE
115	DAR Available on Public Registry and Hard Copy	25-May-11	MVRB
116	NICO Developer's Assessment Report Including Appendix and Annex	20-May-11	FORTUNE
117	Reasons for Judgment in Tłıchǵ Government and MVEIRB	06-Jun-11	SCNT
118	Note to File on Conformity Check	17-Jun-11	MVRB
119	Appeal in Tłıchǵ Government and MVEIRB	30-Jun-11	SCNT
120	DAR Conformity Determination	15-Jul-11	MVRB
121	Work Plan Updated July 15, 2011	15-Jul-11	MVRB
122	Party Status and Information Request Instructions	18-Jul-11	MVRB
123	Party Status Granted	18-Aug-11	MVRB
124	Updated Party Status List	01-Sept-11	MVRB
125	Information Request Reminder-Due October 7	08-Sept-11	MVRB
126	Audio File-Tłıchǵ Plain Language Summary of the DAR	23-Sept-11	FORTUNE
127	DAR Update Letter-Sept 30 2011	30-Sept-11	FORTUNE
128	Lou Lake Bathymetry 29 Sept 11	30-Sept-11	FORTUNE
129	Department of Fisheries and Ocean's Information Requests	07-Oct-11	DFO
130	Department of Fisheries and Ocean's Information Request Cover Letter	07-Oct-11	DFO
131	Note to File-Response to Information Requests	07-Oct-11	MVRB
132	Yellowknives Dene First Nation Information Requests	07-Oct-11	YKDFN
133	Natural Resources Canada's Information Requests	07-Oct-11	NRCan
134	Aboriginal Affairs and Northern Development Canada Information Requests	07-Oct-11	AANDC
135	GNWT Information Requests	07-Oct-11	GNWT
136	Transport Canada Information Requests	07-Oct-11	TC
137	North Slave Metis Alliance Information Requests	11-Oct-11	NSMA
138	Review Board Information Requests	11-Oct-11	MVRB
139	Environment Canada Information Requests	11-Oct-11	EC
140	CWS Tech Report 433-NWT Waterfowl Populations	11-Oct-11	EC
141	Tłıchǵ Government Information Requests	14-Oct-11	TG
142	Information Requests from Tłıchǵ Government to Department of Fisheries and Ocean's and GNWT	17-Oct-11	MVRB
143	Department of Fisheries and Ocean's Response to Tłıchǵ Government Information Request 33	09-Nov-11	DFO
144	GNWT Response to Tłıchǵ Government	10-Nov-11	GNWT
145	Technical Meetings-Tentative Dates Jan 17-19, 2012	06-Dec-11	MVRB
146	Information Request Response-Fortune Minerals	13-Dec-11	FORTUNE
147	Information Request Responses Cover Letter-Fortune Minerals	13-Dec-11	FORTUNE
148	Technical Meeting Dates Confirmed for Jan 17-19, 2012	13-Dec-11	MVRB

149	Information Request Response Aboriginal Affairs and Northern Development Canada _14-Attachment A	13-Dec-11	FORTUNE
150	Information Request Response EC_3-Attachment A	13-Dec-11	FORTUNE
151	Information Request Response EC_11-Attachment A	13-Dec-11	FORTUNE
152	Information Request Response TG_1-Attachment A	13-Dec-11	FORTUNE
153	Information Request Response TG_14 Attachment A Socio-Economic	13-Dec-11	FORTUNE
154	Information Request Responses NRCan_1-4 Attachment A	13-Dec-11	FORTUNE
155	Information Request Responses NRCan_1-4 Attachment B	13-Dec-11	FORTUNE
156	Information Request Responses NRCan_1-5 Attachment A	13-Dec-11	FORTUNE
157	Information Request Responses NRCan_1-7 Attachment A	13-Dec-11	FORTUNE
158	Information Request Responses NRCan_1-9 Attachment A	13-Dec-11	FORTUNE
159	Information Request Responses NRCan_1-9 Attachment B	13-Dec-11	FORTUNE
160	Information Request Responses NRCan_1-9 Attachment C	13-Dec-11	FORTUNE
161	Information Request Responses NRCan_1-9 Attachment D	13-Dec-11	FORTUNE
162	Information Request Responses NRCan_1-11 Attachment A	13-Dec-11	FORTUNE
163	Information Request Response NRCan_1-11 Attachment B	13-Dec-11	FORTUNE
164	Information Request Response Department of Fisheries and Ocean's _5-Attachment A	13-Dec-11	FORTUNE
165	Information Request Response TC_1- Attachment A	13-Dec-11	FORTUNE
166	Information Request Response TC_2-Attachment B	13-Dec-11	FORTUNE
167	Aboriginal Affairs and Northern Development Canada Responses to Yellowknives Dene First Nation Information Request 1.3	19-Dec-11	AANDC
168	Technical Meeting Agenda Feb 7-9, 2012	22-Dec-11	MVRB
169	Response to Department of Fisheries and Ocean's Additional Information Requests	10-Jan-12	FORTUNE
170	Transcripts: Technical Meeting Feb 7,8 & 9, 2012	07-Feb-12	MVRB
171	Co-disposal Case Histories	08-Feb-12	FORTUNE
172	MSDS for Methyl Isobutyl Carbinol	10-Feb-12	FORTUNE
173	MSDS for Potassium Amyl Xanthate	10-Feb-12	FORTUNE
174	Linking EA to Environmental Regulation Through Adaptive Management	10-Feb-12	WLWB
175	Change in NICO Project Contact	10-Feb-12	MVRB
176	Fortune Minerals NICO Technical Meetings Presentation	07-Feb-12	FORTUNE
177	Undertakings & Commitments from Technical Meetings Feb 7-6, 2012	17-Feb-12	MVRB
178	GNWT and Fortune Minerals Socio-Economic Meeting Feb. 8, 2012	20-Feb-12	GNWT
179	Fortune Response to Undertaking 4- Woodland Caribou Disturbance	21-Feb-12	FORTUNE
180	Fortune Response to Undertaking 13 – Loss of Use TK Study	21-Feb-12	FORTUNE
181	Fortune Response to Undertaking 8 – Range of Shift Rotations	21-Feb-12	FORTUNE
182	Fortune Response to Additional Information Requests from Natural Resources Canada	21-Feb-12	FORTUNE
183	Fortune Response to Undertaking 9- In Mitigation Case Studies	22-Feb-12	FORTUNE
184	Fortune Response to Undertaking 11- All Season Road Case Studies	22-Feb-12	FORTUNE
185	Fortune Response to Undertaking 6-CDF Covers	22-Feb-12	FORTUNE

186	Fortune Response to Undertaking 2-Toxicological Data for Flocculants	09-Feb-12	FORTUNE
187	Fortune Response to Undertaking 7-Rational for All-Season Road	22-Feb-12	FORTUNE
188	Fortune Response to Undertaking 5- Impacts on Upland Species At Risk	22-Feb-12	FORTUNE
189	Fortune Response to Undertaking 3-Significance of Effects on Caribou	22-Feb-12	FORTUNE
190	GNWT Response to Undertaking 10-Nothorn Aboriginal Engagement	23-Feb-12	GNWT
191	Fortune Response to Undertaking 1-Effluent Treatment Facility Information	23-Feb-12	FORTUNE
192	Fortune Response to Undertaking 14-Predicted NO <sup>2</sup> Values	23-Feb-12	FORTUNE
193	Fortune Response to Undertaking 12-Metal Prices and NICO Project Viability	23-Feb-12	FORTUNE
194	Undertaking Clarification Request	24-Feb-12	MVRB
195	Yellowknives Dene First Nation Security Concerns	24-Feb-12	YKDFN
196	Aboriginal Affairs and Northern Development Canada Letter Re:Water Treatment, Request for Information Request round 2	29-Feb-12	AANDC
197	Tłı̨chǫ Letter Requesting Second Information Request Round	24-Feb-12	TG
198	Fortune Clarification for Undertaking 4-Woodland Caribou Disturbance	27-Feb-12	FORTUNE
199	Fortune Clarification for Undertaking 1 and 14-ETF and NO <sup>2</sup>	29-Feb-12	FORTUNE
200	Fortune and Natural Resources Canada's Side Meeting Memo	09-Mar-12	FORTUNE
201	NICO Project Technical Meeting Sign-in Sheets	09-Feb-12	MVRB
202	Notice of Discontinuance of Appeal	29-Feb-12	TG
203	NICO Project Process Concerns	13-Mar-12	Public
204	Second Round Information Request Notification	14-Mar-12	MVRB
205	Information Request to Wekeezhii Renewable Resources Board on Woodland Caribou	14-Mar-12	MVRB
206	2012 Supplementary Baseline Plankton Study Plan	03-Apr-12	MVRB
207	Proposed Bridge, Marian River Crossing	10-Apr-12	FORTUNE
208	Aquatic Risk Assessment	13-Apr-12	FORTUNE
209	Disturbance to Caribou from Future Development	13-Apr-12	FORTUNE
210	Update on Receiving Water Quality Predictions	13-Apr-12	FORTUNE
211	Reverse Osmosis Treatment-Risk Assessment Update	13-Apr-12	FORTUNE
212	Note to File-2 <sup>nd</sup> Round Information Request	16-Apr-12	MVRB
213	Human Health Risk Assessment	20-Apr-12	FORTUNE
214	Human Health Risk Assessment Cover Letter	20-Apr-12	FORTUNE
215	Aboriginal Affairs and Northern Development Canada Meeting With Fortune Minerals, April 18, 2012	19-Apr-12	FORTUNE
216	Yellowknives Dene First Nation Information Request-Round 2	20-Apr-12	YKDFN
217	EC Information Requests-Round 2	20-Apr-12	EC
218	Tłı̨chǫ Government Information Requests-Round 2	20-Apr-12	TG
219	North Slave Metis Alliance Information Requests-Round2	20-Apr-12	NSMA
220	Meeting Report- Yellowknives Dene First Nation and Fortune Feb 7,2012	23-Apr-12	FORTUNE
221	GNWT Information Requests-Round 2	25-Apr-12	GNWT



222	Bench Scale Passive Wetland Testing Results	07-May-12	FORTUNE
223	Aboriginal Affairs and Northern Development Canada Response to Yellowknives Dene First Nation Information Request 3.1	10-May-12	AANDC
224	GNWT Response to Yellowknives Dene First Nation Round 2 Information Request Re CE	11-May-12	GNWT
225	Responses to Second Round Information Requests from Fortune Minerals	11-May-12	FORTUNE
226	Cover Letter for Information Request 2 Responses from Fortune Minerals	11-May-12	FORTUNE
227	Aboriginal Affairs and Northern Development Canada Response to Yellowknives Dene First Nation Information Request 2.5	14-May-12	AANDC
228	Technical Report Deadline-June 15, 2012	17-May-12	MVRB
229	Boreal Caribou in Wek'eezhii Final Report May 2012	24-May-12	WRRB
230	NICO Project DAR Plain Language Summary in Tłıchq̓ Language	31-May-12	FORTUNE
231	Tłıchq̓ Government Letter to MVRB Regarding Public Hearing	05-Jun-12	TG
232	NICO Meeting Aboriginal Affairs and Northern Development Canada Fortune April 18, 2012	05-Jun-12	FORTUNE
233	Hearing Dates-Parties Asked to Comment on Tłıchq̓ Government Letter	07-Jun-12	MVRB
234	Fortune Minerals Response to Informal 2 <sup>nd</sup> Information Requests from Aboriginal Affairs and Northern Development Canada	07-Jun-12	FORTUNE
235	Fortune Minerals Limited Public Hearing Dates Letter	08-Jun-12	FORTUNE
236	North Slave Metis Alliance Comments on Public Hearing Dates	11-Jun-12	NSMA
237	Aboriginal Affairs and Northern Development Canada Comments on Hearing Dates	11-Jun-12	AANDC
238	Tłıchq̓ Government Letter Regarding Hearings	12-Jun-12	TG
239	Hearing Dates Jul 27-Aug 2 & Technical Report Due Date June 15	13-Jun-12	MVRB
240	Tłıchq̓ Government Insufficiency Technical Report	12-Jun-12	TG
241	Public Notice-NICO Project Hearings	13-Jun-12	MVRB
242	Revised SSWQOs-Final Tech Memo	15-Jun-12	FORTUNE
243	Fortune Minerals Limited Response to TK Study Letter	15-Jun-12	FORTUNE
244	Review Board to Tłıchq̓ Government Re Information From TK Study	15-Jun-12	MVRB
245	Transport Canada Technical Report	15-Jun-12	TC
246	Environment Canada Technical Report	15-Jun-12	EC
247	Aboriginal Affairs and Northern Development Canada Technical Report	15-Jun-12	AANDC
248	Department of Fisheries and Ocean's Technical Report	15-Jun-12	DFO
249	Tłıchq̓ Government Technical Report Whati Transportation Summary	15-Jun-12	TG
250	Tłıchq̓ Government Technical Report NICO Project Economics Update	15-Jun-12	TG
251	Yellowknives Dene First Nation Technical Report	17-Jun-12	YKDFN
252	North Slave Metis Alliance Technical Report Cover Page	18-Jun-12	NSMA
253	North Slave Metis Alliance Can't Live Without Work-2001	18-Jun-12	NSMA
254	North Slave Metis Alliance DCAB Toolkit Survey Report-2005	18-Jun-12	NSMA
255	North Slave Metis Alliance Socio-Economic Baseline Report	18-Jun-12	NSMA
256	2007 UN Declaration on Rights of Indigenous Peoples	18-Jun-12	NSMA

257	Appendix E-Human Rights Assessment of Goldcorp's Marlin Mine	18-Jun-12	NSMA
258	What is Well-Being?	18-Jun-12	NSMA
259	Pre-Hearing Conference Notification-July 13	19-Jun-12	MVRB
260	GNWT Technical Report	19-Jun-12	GNWT
261	GNWT and Fortune Socio-Economic Meeting Report	19-Jun-12	GNWT
262	Request for Updated Commitments Table and Response to Technical Reports	19-Jun-12	MVRB
263	Tłıchǫ Government Letter to MVEIRB Re: Technical Reports	19-Jun-12	TG
264	Tłıchǫ Government Technical Report Re: Fortune SSWQO	19-Jun-12	TG
265	Tłıchǫ Government Technical Report Risk Assessment	20-Jun-12	TG
266	Natural Resources Canada's Technical Report	22-Jun-12	NRCan
267	Note to File-Draft Hearing Agenda and Presentations	28-Jun-12	MVRB
268	NICO Public Hearings-Updated Draft Agenda	29-Jun-12	MVRB
269	Fortune Minerals Announces FEED Study and New Mineral Reserves	03-Jul-12	FORTUNE
270	Update of Receiving Water Quality and Source Loading Predictions	05-Jul-12	FORTUNE
271	Responses to Parties' Technical Reports	05-Jul-12	FORTUNE
272	Updated Commitments Table	05-Jul-12	FORTUNE
273	Updated Commitments Table and Response to Technical Reports	05-Jul-12	FORTUNE
274	Tłıchǫ Government Letter to Review Board Regarding Hearing Dates	06-Jul-12	TG
275	NICO Project Public Hearings Postponed	06-Jul-12	MVRB
276	Fortune Minerals Limited Response to Postponement of Public Hearings	10-Jul-12	FORTUNE
277	Letter from Tłıchǫ Government to MVEIRB Re: Hearing Dates	16-Jul-12	TG
278	NICO Pre-Hearing Conference Re-Scheduled to July 30	18-Jul-12	MVRB
279	NICO Project Hearings Re-Scheduled to August 27-31	18-Jul-12	MVRB
280	Tłıchǫ Government Brochure on Hearings	19-Jul-12	TG
281	Letter to Fortune Regarding Closure Scenario Analysis	24-Jul-12	MVRB
282	Letter Aboriginal Affairs and Northern Development Canada on Perpetual Treatment Post-Closure	25-Jul-12	MVRB
283	Letter from Tłıchǫ Government to MVRB After Pre-Hearing Conference	30-Jul-12	TG
284	Letter to GNWT Re: Review Board	31-Jul-12	MVRB
285	Letter to Tłıchǫ Government Regarding MVRMA Requirements	31-Jul-12	MVRB
286	Information Request to NPMO on Tłıchǫ Government Consultation	31-Jul-12	MVRB
287	Information Request to GNWT on Tłıchǫ Government Consultation	01-Aug-12	MVRB
288	Hearing Directive-Post-Hearing Process Steps and Due Dates	01-Aug-12	MVRB
289	Public Hearing Procedures-Presentations Due Aug 22	01-Aug-12	MVRB
290	Revised Agenda for Public Hearings Aug 27-31	01-Aug-12	MVRB
291	EA0809-004 Notice of Rescheduled Public Hearing	02-Aug-12	MVRB
292	GNWT-Fortune Minerals Meeting Minutes	02-Aug-12	GNWT
293	GNWT Letter to Review Board Re Tłıchǫ Road Route	02-Aug-12	GNWT
294	North Slave Metis Alliance Technical Report	02-Aug-12	NSMA

295	Aboriginal Affairs and Northern Development Canada Response to MVEIRB - Perpetual Treatment Post-Closure	16-Aug-12	AANDC
296	Fortune response cover letter to July 24th MVRB letter	20-Aug-12	FORTUNE
297	Fortune response to MVRB July 24th closure scenario letter	20-Aug-12	FORTUNE
298	Aboriginal Affairs and Northern Development Canada presentation for NICO hearing - Water Quality	22-Aug-12	AANDC
299	Aboriginal Affairs and Northern Development Canada presentation for NICO hearing - Closure and Rec	22-Aug-12	AANDC
300	Transport Canada presentation for the NICO hearings	22-Aug-12	TC
301	Yellowknives Dene First Nation presentation for NICO hearings	22-Aug-12	YKDFN
302	Environment Canada presentation for NICO hearings	22-Aug-12	EC
303	GNWT presentation for NICO hearings - Wildlife	22-Aug-12	GNWT
304	Department of Fisheries and Ocean's presentation for NICO hearing - water and fish	22-Aug-12	DFO
305	Department of Fisheries and Ocean's presentation for NICO hearings - Road crossings	22-Aug-12	DFO
306	North Slave Metis Alliance presentation for NICO hearings	22-Aug-12	NSMA
307	North Slave Metis Alliance letter to Fortune Minerals re IBA	22-Aug-12	NSMA
308	GNWT presentation for NICO hearings - Air Quality	22-Aug-12	GNWT
309	GNWT presentation for NICO Hearings- Socio economic	22-Aug-12	GNWT
310	Fortune presentation - Air Quality	23-Aug-12	FORTUNE
311	Fortune presentation - Caribou	23-Aug-12	FORTUNE
312	Fortune presentation - Closure and Reclamation	23-Aug-12	FORTUNE
313	Fortune presentation - Constructed Wetlands	23-Aug-12	FORTUNE
314	Fortune presentation - Nico Project Access Road	23-Aug-12	FORTUNE
315	Fortune presentation - Socio-Economics	23-Aug-12	FORTUNE
316	Fortune presentation - Project Description	23-Aug-12	FORTUNE
317	Fortune presentation - Wildlife Effects Monitoring Program	23-Aug-12	FORTUNE
318	Fortune presentation - WQ Conceptual Model Closure	23-Aug-12	FORTUNE
319	Fortune presentation - WQ Operations	23-Aug-12	FORTUNE
320	Natural Resources Canada - Fortune July 26 meeting report	24-Aug-12	NRCan
321	Response letter from Tłı̨ch̓ Government to MVRB re MVRMA requirements	24-Aug-12	TG
322	Responses to Natural Resources Canada's Technical Recommendations	24-Aug-12	FORTUNE
323	Natural Resources Canada's presentation for NICO hearing - access road	24-Aug-12	NRCan
324	Natural Resources Canada's presentation - NICO hydrogeology and geotech	24-Aug-12	NRCan
325	Tłı̨ch̓ Government Socio-Economic presentation	24-Aug-12	TG
326	Tłı̨ch̓ Government Caribou Presentation	24-Aug-12	TG
327	Tłı̨ch̓ Government Water Quality presentation	24-Aug-12	TG
328	Tłı̨ch̓ Government Closure Presentation	24-Aug-12	TG
329	Tłı̨ch̓ Government Traditional Knowledge presentation	24-Aug-12	TG
330	Tłı̨ch̓ Government Access Road Presentation	24-Aug-12	TG

331	GNWT - Fortune Meeting Minutes - August 28 2012	29-Aug-12	GNWT
332	In-Pit Treatment References - Hearing follow-up task	30-Aug-12	FORTUNE
333	Independent Environmental Oversight report	31-Aug-12	MVRB
334	Constructed Wetland Treatment Systems - hearing commitment	30-Aug-12	FORTUNE
335	Updated Hearing Directive	03-Sept-12	MVRB
336	Request to Parties re Traditional Knowledge Study	03-Sept-12	MVRB
337	Fortune Minerals NICO Hearing Whati Transcript August 28, 2012	4-Sept-12	MVRB
338	Fortune Minerals NICO Hearing Yellowknife Transcript August 29, 2012	4-Sept-12	MVRB
339	Fortune Minerals NICO Hearing Behchoko Transcript August 30, 2012	4-Sept-12	MVRB
340	Fortune Minerals NICO Hearing Behchoko Transcript August 31, 2012	4-Sept-12	MVRB
341	GNWT Request to Review Tłıchǫ Gov. TK Study	7-Sept-12	GNWT
342	Aug 27-31 Hearings – Undertakings and Commitments	7-Sept-12	MVRB
343	IR to GNWT and NPMO re TG Consultation – Revised Due Date	7-Sept-12	MVRB
344	Note to File-TK Study Presentation Due Sept 25	10-Sept-12	MVRB
345	GNWT Response to Undertaking #4-Aug 31 Hearing	10-Sept-12	GNWT
346	NICO Project Hearing Agenda October 10-11, 2012	10-Sept-12	MVRB
347	Tłıchǫ Government Response to Undertaking #2 Aug 31 Hearing	14-Sept-12	TG
348	Tłıchǫ Government Response to Undertaking #1 Aug 30 Hearing	14-Sept-12	TG
349	Traditional Knowledge and Use Study, Tłıchǫ Knowledge	15-Sept-12	TG
350	Traditional Land Use and Knowledge Study-North Slave Metis Alliance	15-Sept-12	NSMA
351	Tłıchǫ Government Undertaking #2 Aug 31 re Island Copper Mine	15-Sept-12	TG
352	Traditional Knowledge Presentation-Tłıchǫ Government	25-Sept-12	TG
353	NICO Hearing Agenda – October 10-11 2012 (updated)	26-Sept-12	MVRB
354	GNWT Response to Undertaking #3 – NICO Commitment Clarification	2-Oct-12	GNWT
355	Tłıchǫ Government Mitigation from TK Report	10-Oct-12	TG
356	Letter from Community Member Oct 11 Hearing	11-Oct-12	PUBLIC
357	GNWT IR Response Regarding Tłıchǫ Government Consultation	12-Oct-12	GNWT
358	Transcript October 10, 2012 hearing Behchoko	15-Oct-12	MVRB
359	Transcript October 11, 2012 hearing Behchoko	15-Oct-12	MVRB
360	Northern Projects Management Office Response to Board IR re: Consultation	15-Oct-12	NPMO
361	Aboriginal Affairs and Northern Development Canada Closing Comments	16-Oct-12	AANDC
362	Letter from Lucy Lafferty	16-Oct-12	PUBLIC
363	GNWT New Archeology Commitment Wording	16-Oct-12	GNWT
364	Transport Canada Closing Comments	17-Oct-12	TC
365	Department of Fisheries and Ocean Closing Comments	17-Oct-12	DFO
366	North Slave Metis Alliance Closing Comments	17-Oct-12	NSMA
367	Natural Resource Canada Closing Comments	17-Oct-12	NRCan
368	Environment Canada Closing Comments	17-Oct-12	EC

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369	Tłıchǫ Government Closing Comments	17-Oct-12	TG
370	GNWT Closing Comments	17-Oct-12	GNWT
371	Yellowknives Dene First Nation Closing Comments	18-Oct-12	YKDFN
372	Letter from Leon Lafferty	22-Oct-12	PUBLIC
373	Fortune Minerals Closing Comments	22-Oct-12	FORTUNE
374	Closure of the public record	22-Oct-12	MVRB