Torngat Metals

AECOM

Strange Lake Rare Earth Mining Project

Summary (Part F)

Submitted to:

Impact Assessment Agency of Canada (IAAC, Federal Government) Government of Newfoundland and Labrador (NFL)

Nunatsiavut Government (NG)

60697132

September 2023

Delivering a better world

Strange Lake Rare Earth Mining Project

Initial Project Description (IPD) and Registration Document

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Signatures

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List of Acronyms and Abbreviations

ACS+ :	Analyse comparative entre les sexes plus
ATV:	All-terrain vehicle
BAT:	Best Available Technology
BFS:	Bankable feasibility study
BGGP:	Bureau de gestion des grands projets
BOD:	Biological oxygen demand
CCME:	Canadian Council of Ministers of the Environment
CEAA:	Canadian Environmental Assessment Agency
CEAEQ:	Centre d'Expertise en Analyse Environnementale du Québec
CH4:	Methane
CISSSCN:	Centre intégré de santé et de services sociaux de la Côte-Nord
CLSC:	Centre local de services communautaires
CNSC:	Canadian Nuclear Safety Commission
CO_2:	Carbon dioxide
COSEWIC:	Committee on the Status of Endangered Wildlife in Canada
dBA:	Ambient noise level
DFO:	Department of Fisheries and Oceans
DY:	Dysprosium
ECCC:	Environment and Climate Change Canada
EDO:	Environmental Discharge Objectives
EIA:	Environmental Impact Assessment
EIS:	Environmental impact statement
EPA:	Environment Protection Act
EPR:	Environmental preview report
EQA	Environmental Quality Act
ESG:	Environmental, social and governance
ESIS:	Environmental and Social Impacts Study
EV:	Electric Vehicle
FAFH	Fish and Fish Habitat
Fe	Iron
GBA+ :	Gender-based Analysis Plus
GHG:	Greenhouse gas emissions
GSC:	Geological Survey of Canada

HFC:	Hydrofluorocarbon
HHERA:	Human Health and Environmental Risk Assessment
IAA	Impact Assessment Act
IAAC:	Impact Assessment Agency of Canada
IAAC:	Impact Assessment Agency of Canada
IBA:	Impact and Benefit Agreement
IDLP:	Innu Development Limited Partnership
IDP:	Initial Project Description
INSPQ:	Institut national de santé publique du Québec
IOCC:	Iron Ore Company of Canada
IPCC:	Intergovernmental Panel on Climate Change
IPS:	Indigenous Peoples Survey
ISAQ	Inventory of Archaeological Sites in Quebec
JBNQA:	James Bay and Northern Quebec Agreement
JBRHSSC	James Bay Regional Health and Social Services Centre
KEAC:	Kativik Environmental Advisory Committee
KEQC:	Kativik Environmental Quality Commission
KRG:	Kativik Regional Government
LIL:	Labrador Inuit Lands
LILCA:	Labrador Inuit Lands Claims Agreement
LISA:	Labrador Inuit Settlement Area
LOD:	Limit of detection
LOM:	Life of Mine
LQE:	Loi sur la qualité de l'environnement au Québec
LRC:	Limited radius count
MCC:	Ministère de la Culture et des Communications du Québec
MDDEFP:	Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs (2012-2014)
MDDELCC:	Ministère du Développement durable, de l'Environnement et la Lutte contre les Changements climatiques (2014-2018)
MDDEP:	Ministère du Développement durable, de l'Environnement et des Parcs (2005-2012)
MELCC:	Ministère de l'Environnement, la Lutte contre les changements climatiques (2018-2022)
MELCCFP	Ministère de l'Environnement, de la Lutte aux Changements climatiques, de la Faune et des Parcs (2022-…)
MERN:	Ministère de l'Énergie et des Ressources naturelles (now MRNF)
MMDMER	Metal Mining and Diamond Mining Effluent Regulations
MOU:	Memorandum of understanding
MPMO:	Major Projects Management Office

MRC:	Regional County Municipality
MRNF:	Ministère des Ressources naturelles et des Forêts (formerly MERN)
MSSS :	Ministry of Health and Social Services
N_2O:	Nitrogen dioxide
NAPS:	National Air Pollution Surveillance
Nd:	Neodymium
NdFeB:	Alloy of neodymium, iron and boron
NEQA:	Northeastern Quebec Agreement
NG:	Nunatsiavut Government
NL:	Newfoundland and Labrador Government
NMEF:	Nunavik Mining Exploration Fund
NO_2:	Nitrogen dioxide
NORM:	Naturally Occurring Radioactive Materials
NRCan:	Natural Resources Canada
NTS:	National Cartographic Reference System
OEL:	Occasional effect level
PEA:	Preliminary Economic Assessments
PFC:	Perfluorocarbon
PFS:	Pre-Feasibility Study
Pr:	Praseodymium
QMEA:	Quebec Mineral Exploration Association
RDL:	Reported detection limits
REE:	Rare Earth Elements
RLS:	Réseau local de services
RRSSN:	Régie régionale de la santé et des services sociaux Nunavik
SARA:	Species at risk act
Scope 1:	Direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organization.
Scope 2:	Indirect GHG emissions from consumption of purchased electricity, heat, cooling or steam.
SECP:	Southeast Churchill Province
SF_6:	Sulfur hexafluoride
SLAC:	Strange Lake Alkali Complex
SLBZ:	Strange Lake B-Zone
SM:	Suspended matter
SO_2:	Sulfur dioxide
SPA	Saguenay Port Authority

SS	Suspended solids
t	Tonne
t/d	Tons per day
Tb:	Terbium
TEK:	Traditional Ecological Knowledge
TEL:	Threshold effect level
TPM:	Total Particulate Matter
TSP:	Total Suspended Particles
TSS:	Total suspended solids
UDI:	Undetermined distance index
US:	United States
VBA:	Voisey Bay Area
VEC:	Valuable Ecosystem Component
VOC:	Volatile Organic Compound
WC:	Water crossing

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This document is a summary of an Initial Project Description as required by the Impact Assessment Agency of Canada (IAAC) in recognition of Schedule 1, paragraph 25 of the 2019 Information and Management of Time Limits Regulations (SOR / 2019-283) and the Guide to Preparing an Initial Project Description and a Detailed Project Description under the Impact Assessment Act (IAA) (LC 2019, c. 28 s.1). This Summary also complies with article 31 (Part 3) of the Environmental Review Regulations and the Regulations regarding environmental reviews of initiatives on Labrador Inuit Lands for English and Inuktitut. Finally, this Summary, presented as a separate file, complies with Section 3(1) of the Environmental Assessment Regulations (A Guide to the Process) and Appendix 2 Guidelines for preparing computerized copies of Environmental Assessment Documents.).

1 Project Name

The title of the project is “Strange Lake Rare Earth Mining Project”.

In this document, the short title “Stange Lake Project" is used to simplify the text.

2 Identification of Proponent and Representative

2.1 Proponent Identification

The promoter is **Torngat Metals Ltd.** (hereinafter named Torngat Metals), a Canadian exploration company currently focused on developing its main project, the Strange Lake property in northeastern Quebec. A current update statement has been made to formalize the corporate name change from Quest Rare Minerals Ltd. to Torngat Metals Ltd or Métaux Torngat Ltée.

Name of promoter:	**Torngat Metals Ltd.**
Address (head office):	625, Avenue du President Kennedy, suite 605 Montreal, Quebec H3A 1K2

Chief Executive:

Name:	Dirk Naumann, Ph.D.
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2.2 Representative Identification

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Quebec entreprise number (NEQ): 1161553129

3 Applicable Provisions

The following section present the Strange Lake project activities and some activities which will be under the responsibility of third parties.

3.1 Physical Activities

Under the schedule to the *Physical Activities Regulations* (SOR/2019-285), the following physical activities will be undertaken by Torngat Metals:

- New Strange Lake rare earths mine with a maximum ore production capacity of 55,000 t/day (QC).
- New beneficiation pant with a maximum capacity of 17,000 tonnes of ore per day (QC).
- New aerodrome with a 1,500 m runway (QC).
- New private seasonal road between the mine site and the new container storage and handling facility in Anaktalak Bay on the east coast of Labrador, NL (see below).
- New container storage and handling facility at the existing port of Vale's nickel-copper mine in Anaktalak Bay on the east coast of Labrador, NL.
- Transport of ore concentrate by road from the mine (QC) to Vale's port (NL), then by ship to the existing port of Sept-Îles (QC).
- New rare earth process and high purity separation plant in an existing industrial port area in Sept-Îles, Quebec.

Section 6 of this summary details the project description and outlines the other activities related to Strange Lake Project that will be under the responsibility of third party companies and are:

- Construction and operation of wind turbines at Mine Site
- Handling facilities at an existing port in Sept-Îles

As it stands, the current Project is not a component of a larger project. Under Section 7(1) of the IAAC, subject to subsection (3), the proposed project elements may cause:

(a) a change the following components of the environment that are within the legislative authority of Parliament:

(i) *fish* and *fish habitat*, as defined in subsection 2(1) of the Fisheries Act,

(ii) *aquatic species*, as defined in subsection 2(1) of the Species at Risk Act,

(iii) *migratory birds*, as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994, and

(iv) any other component of the environment that is set out in Schedule 3;

(b) a change to the environment that would occur:

(ii) in a province other than the one in which the act or thing is done, or

(c) with respect to the Indigenous peoples of Canada, an impact — occurring in Canada and resulting from any change to the environment — on

(i) physical and cultural heritage,

(ii) the current use of lands and resources for traditional purposes, or

(iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;

(d) any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada; or

(e) any change to a health, social or economic matter within the legislative authority of Parliament that is set out in Schedule 3.

It is noteworthy that the Project involves the construction of infrastructures such as mine residue stockpiles (section 6.2.6 of this summary) that may disrupt drainage and modify fish habitat and as such, a modification of Schedule 2 of the Metal Mining and Diamond Mining Effluent Regulations (MMDMER) may be required for the Project. Should such a scenario arise, appropriate consultation and studies will be undertaken.

In addition to respecting the Canadian laws and regulations, the Strange Lake Project will ensure that it respects those of Newfoundland and Labrador, Quebec and the Nunatsiavut government (section 14) as well as international standards in terms of environmental, social and governance (ESG) issues. Finally, its environmental follow-up/monitoring and restoration programs will be developed in such a way as to aim for carbon neutrality by 2050, all with a view to sustainable development.

4 Background

Torngat Metals Ltd. (hereinafter referred to as “**Torngat Metals**”) is a private Canadian company headquartered in Montreal. The project is a rare earth elements mining project in the Strange Lake deposit in Quebec, located 235 km northeast of Schefferville and 125 km west of Vale's nickel-copper mine near Nain in Labrador. Guided by ESG-I standards, Torngat Metals Ltd. aims to be recognized as a socially and environmentally responsible supplier of rare earths for the electric mobility, renewable energy, and other low-carbon footprint markets.

The Strange Lake Rare Earth Mining Project (hereinafter referred to as “**Strange Lake Project**”) has been known for many years as a world-class rare earth deposit in both quantity and quality. The timing for the Strange Lake Project now is ideal. Firstly, responsibly produced rare earths are urgently needed as part of the solution for climate change. Secondly, the timing is ideal since the all the components for a responsible plan to bring the Strange Lake Project into production are ready and in place. In partnership with Indigenous communities, the plan is to implement innovations with world-leading technical and engineering partners, to maximize social, environmental and financial benefits, while reducing any negative impacts and risks.

The products that will be produced are separated rare earth oxides. The focus is specifically on the rare earth oxides needed for high performance permanent magnets, namely the light rare earths neodymium (Nd) and praseodymium (Pr), and the heavy rare earths dysprosium (Dy), and terbium (Tb). Strange Lake is particularly important for providing a new supply of Dy and Tb. Currently, China supplies almost all of global Dy and Tb needs. The Strange Lake Project once in operation, is expected to be the largest global Dy and Tb supplier outside of China. The other 11 rare earths also have important value in their applications, however many of them are oversupplied. Torngat Metals will refine other valuable rare earths based on market conditions and production costs.

The rationale for the development of rare earth mining and refining in production is clearly described in the Canadian Critical Minerals Strategy (Natural Resources Canada, 2022). The US Department of Energy has recently published a report titled “Critical Materials Assessment (July 2023), in which the four rare earth elements targeted by the Strange Lake Project are highlighted as critical in both the short term or mid term. There are 15 rare earth elements (table below), plus 2 additional elements that are included due to their similar properties (yttrium and scandium). Rare earth are metallic elements that are not rare per se, but rare to be found in economically attractive deposits. In deposits, they are always found together, but in proportions unique to each deposit. They have valuable properties that make them essential in many applications. In fact they are ubiquitous across may common products– everyone interacts with rare earth elements everyday.

Applications and example end uses in daily life are presented at Table 4-1.

Table 4-1: Applications and example end uses in daily life of rare earth elements (REE)

Critical minerals	Applications	Example end uses	Critical minerals	Applications	Example end uses
La	NiMH batteries, phosphors, catalysts, alloying, ceramics	Smart-phones, gasoline	Tb	Phosphors, lighting, X- rays, magnets	Electric vehicles, smart-phones, wind turbines
Ce	Polishing powder, optical glass, pigments, ceramics, catalysts, mischmetal	Screens, gasoline	Dy	NdFeB magnets, ceramics, lasers, nuclear fuel, phosphors, ceramics	Electric vehicles, smart-phones, wind turbines
Pr	Glass and ceramics, CAT scans, magnets	Electric vehicles, smart-phones, wind turbines	Ho	Lasers, medical and dental tech, pigments	Medical equipment
Nd	NdFeB magnet, optical and lasers		Er	Ceramics, pigments, optics, lasers	Screens, smartphones
Pm	Radiation source, FCC catalysts	Petroleum products	Tm	Lasers, x- rays, ceramics	Medical equipment
Sm	SmCo magnet, electric motors	High temperature motors	Yb	Fibre optics and lasers, radiation for x-rays	Telecommunications, medical equipment
Eu	Computer and TV displays, medical tech, lasers, fluorescent lighting	Smart-phones, vehicles	Lu	X-ray phosphors, baggage scanners, oil exploration	Medical equipment
Gd	MRI, CT and X- rays	Medical equipment, screens, smartphones			

Source: Project Blue, 2022 https://projectblue.com/

Project Blue's[1] long-term outlook for rare earth demand is for permanent magnets to be the key area of growth for the industry, which is forecast to account for over 47% of demand by volume by 2050. Since permanent magnets are the most important application driving the economic attractiveness of developing a rare earth project, it is important to understand what they are. Rare earth permanent magnets are everywhere and critical to each application:

- Electric vehicle drivetrain motors for passenger cars, trucks, buses
- Dozens of motors in all types of vehicles (power steering, windows, seats, etc.)
- Drones, planes
- Wind turbines
- Defense industry
- Industrial robots
- Industrial equipment (e.g. pumps)
- Air conditioners
- Elevators
- Appliances
- Medical imaging equipment
- Smartphones

[1] Project Blue is an organization providing market intelligence on energy transition supply chains and the critical materials which underpin them (https://projectblue.com/)

- Headphones and speakers
- Hard drives (computers and servers)
- Sensors
- Consumer goods (jewellery, toys, etc.)
- And others.

Of particular importance are the permanent magnets that are essential for high efficiency motors used in electric vehicles, drones, robotics and increasingly in wind turbine generators. Electric vehicles (EVs) require a high-performance battery to store energy and a high-performance drive train motor to use the energy to move the vehicle. The battery system is unavoidably larger and more expensive than the drive train motor. This means that motor efficiency, enabled by permanent magnets, is critical because a less efficient motor requires a larger battery, which adds significant cost and weight.

The type of permanent magnet used in EVs contains the rare earths neodymium, praseodymium, dysprosium and in some cases terbium. The light rare earths—neodymium and praseodymium— are the key magnetic elements for producing a permanent magnet. Less understood though is the critical role that heavy rare earths—dysprosium and terbium—play in high performance applications such as a drivetrain motor. Heavy rare earths create a stronger magnet and allow the magnet to retain its magnetic properties in elevated temperatures during motor operation. (More technically, dysprosium and terbium increase the energy density of the magnet and improve the thermal stability, resulting in increased power, size efficiency and long-term reliability.) Dysprosium and terbium do not occur in significant quantities in most rare earth deposits, causing serious challenges matching supply to demand. Despite higher prices, dysprosium and terbium continue to be a cost-effective drive train motor solution considering the combined cost of the battery and motor system.

With the rapid acceleration of the production of EVs, dysprosium and terbium have risen to the top of the criticality list because they work so much better than any other options. However, due to the risks and uncertainty of supply security, there have been efforts to remove dysprosium and terbium entirely, or even to move to non-permanent magnet motors. These alternatives inevitably come with compromises to efficiency, performance, reliability, and costs. This means that companies and countries who can establish a long-term supply security for these two heavy rare earth elements will have a distinct and significant competitive advantage.

China controls almost 100% of the dysprosium and terbium supply. China's dysprosium and terbium supply comes from their domestic mining and up to 50% comes from ore concentrate from Myanmar. China is also increasingly importing concentrate from other countries. Despite progress underway on other aspects of the supply chain, such as developing new magnet manufacturing facilities in North America, production will remain dependent on China unless secure dysprosium and terbium supply can be increased to support the rapidly growing demand for high efficiency permanent magnet motors.

Due to the urgent need to close the supply gap of all rare earths, and critically the heavy rare earths, rare earth projects that have high quantities of dysprosium and terbium, are economically attractive, meet ESG criteria, and have social license, should be considered for development. Meeting climate change and decarbonization targets requires manufacturing of products that use critical minerals sourced from a responsible, traceable, fully independent and diverse supply chain.

Unlike most other rare earth projects, the Strange Lake deposit contains the full suite of critical light— neodymium and praseodymium, and heavy rare earths—dysprosium and terbium needed for permanent magnets. Most projects lack mineable quantities of these two heavy rare earths. The permanent magnet supply chain starts from high purity separated rare earth oxides, conversion to their metal form, production of magnet alloys, production of magnets and finally assembly into finished electric motors.

The Strange Lake project is also dedicated to lower to the minimum its environmental footprint. Many of its initiatives are being implemented to prevent as best as possible biodiversity loss and ensure the sustainability of the whole project. The revised Strange Lake Project includes a physical concentration step at the mine site, which considerably reduce the amount of material to be transported to the process plant. This decrease will result in approximately 125,000 to 350,000 tonnes per year of ore concentrate to be shipped from the mine, compared to approximately 1,500,000 tonnes in the previous version of the Project (AECOM, 2013a). Pre-feasibility study Strange Lake B-Zone). This decrease will reduce the various impacts generated by ore transportation. The project is also studying the possibility of using wind turbine and electric vehicles to reduce the use of fossil fuels in the project. At every step of the development of the project, mitigation measures are planned to lower as much as possible the main anticipated impacts on the receiving environment (northern habitat, flora, wildlife, soil and air quality) and surrounding communities (human health, quality of life, land uses). Discharge in the environment will be as low as possible with recycling and recovery channels being favoured as a way of managing water and solid waste, and potential reuse of waste rock will be assessed. Topsoil, soil and materials suitable for revegetation will be stockpiled for progressive site rehabilitation.

Finally, the project will also be a creator of high-quality and paying jobs in Sept-Îles, Northern Quebec and Labrador areas, especially for the Indigenous communities in proximity with the project.

In general terms, the Strange Lake Project includes the following elements:

- **Mine site:** (Quebec, north of the 55th parallel):
  - Construction, operation, closure and restoration of a new mining complex, including:
    - Open-pit mining of a rare earth elements deposit (Zone-B): 30 years of operation is currently being considered.
    - Beneficiation plant.
    - Related infrastructure: waste rock and overburden stockpiles, low and medium-grade ore stockpiles, beneficiation residues stockpile, effluent treatment facilities, permanent camp, office and warehouse buildings).
    - Aerodrome with a runway length of 1 500 m.
- **Access road:** The access road is approximately 160 km long. It extends between the mining site and an existing port and will facilitate the transportation of ore by trucks to the ships.
  - Province of Quebec: The first 18 kilometers from the mine site are located within the territory of the province of Quebec.
  - Province of Newfoundland and Labrador, and LIL (Labrador Inuit Land): Outside the mine site, the preliminary design includes a seasonal access road of approximately 140 km. The road includes three major water crossings.
  - Optimisation of the road corridor is still underway and is expected to be completed by Q3 2024. Currently, there are a total of 287 water crossings: 13 out of the 287 being in Québec (4,5%), and 274 being in Labrador (95,5%). Strange Lake Rare Earth Mining Project main components are shown on Map 4-1.
- **Storage and handling facilities at an existing port:** The ore concentrate packed in bags and then in containers, will be transported by trucks to a storage and handling facility on the east coast of Labrador.
  - The proposed site is a new container depot near the existing port of Vale's nickel-copper mine in Anaktalak Bay, NL[2].
- **Sea transportation of the ore concentrate to a process plant:** The ore concentrate, still packed in bags and then in containers, will be transported to a pre-existing industrial port area in Sept-Îles, QC.
  - Transportation by ships from the existing port on the eastern coast of Labrador to a pre-existing industrial port area in Sept-Îles, QC.
- **High purity rare earth process and separation plant:** The rare earth elements will be separated into oxides at a new process plant that will be built in the “Parc industriel ouest – Jonction Arnaud” of the Sept-Îles industrial port facility (QC).

[2] Although the Vale mine site is named Voisey's Bay, its port is located in Anaktalak Bay, just to the north.

MÉTAUX TORNGAT METALS

PROJET MINIER DE TERRES RARES DU LAC STRANGE

STRANGE LAKE RARE EARTH MINING PROJECT

Composante du projet / Project component

- Aire d'entreposage et de manutention des conteneurs au Port de VALE / Container storage and handling facilities at Vale's Port
- Site de la mine / Mine site
- Site potentiel de l'usine de séparation des métaux de terres rares de haute pureté / Potential Site of the rare earth processing and high purity separation plant
- Route d'accès saisonnière proposée / Proposed seasonal access road
- Route maritime projetée / Potential Shipping Route

Autre / Other

- Frontière provinciale / Province Boundary

0 100 200 km

North America Lambert Conformal Conic

Produit: Map 4-1 - Overall project map

Date : 2023-09-28 15:58

Source:
Données topographiques / Topographic Data: NRCan, (2022)

PRÉLIMINAIRE / PRELIMINARY

Carte 4-1
Carte globale du projet

Map 4-1
Overall project map

AECOM

4.1 Official Land Description

All the mineral claims covering the B-Zone of the Strange Lake Project are owned in totality by Torngat Metals. The project is covered by 209 individual mineral claims in Québec and 63 “cells” in the Newfoundland and Labrador claims licence system. Those claims are covering a total area of approximately 9 994,65 ha (MICON, 2019). The current Torngat Metals claims cover the known extent of the Lac Brisson Pluton also known as Strange Lake Alkaline Complex (SLAC). There is no permanent inhabited building within the project footprint related to the proposed mine site, road corridor and handling and storage facilities in Edward’s Cove (Anaktalak Bay). The closest non-Indigenous community to these 3 projects component are Schefferville, which is located 235 km southwest of the mine site and Northwest River, located around 345 km south of the handling and storage facilities in Edward’s Cove. However, Nain is located 156 km east of the proposed mine site and 26 km northeast of the handling and storage facilities, making it the closest community to these components.

The proposed rare earth processing and high purity separation plant will be located in the “Parc industriel ouest – Jonction Arnaud” in the industrial port facility of the City Sept-Îles (QC). In this case, the closest inhabited area (a portion of the city of Sept-îles) is located less than 3 km south of the proposed process plant site. In addition, the Sept-Îles detention facility is less than 2 km southwest of the planned plant site.

4.2 Proximity to Indigenous Communities

The proposed mine site is located in Nunavik, a territory administered by the Kativik Regional Government, located in Kuujjuaq, which is located 325 km northwest of the proposed mine site. The closest communities from the proposed mine site are mainly Indigenous communities:

- Nain (Newfoundland and Labrador), 156 km to the east;
- Natuashish (Newfoundland and Labrador), 194 km to the southeast;
- Hopedale (Newfoundland and Labrador), 263 km to the southeast
- Postville (Newfoundland and Labrador), 317 km to the southeast
- Makkovik (Newfoundland and Labrador), 341 km to the southeast
- Kawawachikamach (Quebec), 230 km to the southwest
- Matimekush-Lac John (Quebec), 237 km southwest;
- Kangiqsualujjuaq (Quebec), 343 km northwest;
- Sheshatshiu (Newfoundland and Labrador), 404 km to the southeast
- Kuujjuaq (Quebec), 425 km to the northwest.
- Rigolet (Newfoundland and Labrador), 434 km to the southeast

The closest communities from the handling and storage facilities in Edward’s Cove are also Indigenous communities.

- Nain (Newfoundland and Labrador), 26 km to the northeast;
- Natuashish (Newfoundland and Labrador), 81 km to the southeast;
- Hopedale (Newfoundland and Labrador), 151 km to the southeast
- Postville (Newfoundland and Labrador), 217 km to the southeast
- Makkovik (Newfoundland and Labrador), 225 km to the southeast
- Rigolet (Newfoundland and Labrador), 340 km to the southeast
- Kawawachikamach (Quebec), 341 km to the southwest
- Kangiqsualujjuaq (Quebec), 343 km to the northwest
- Sheshatshiu (Newfoundland and Labrador), 345 km to the south
- Matimekush-Lac John (Quebec), 347 km southwest
- Kuujjuaq (Quebec), 424 km to the northwest.

The closest Indigenous communities from the proposed process plant in Sept-Îles are Uashat located 7 km to the south and Mani-utenam located 15 km to the southeast.

Portions of the corridor identified for the proposed temporary road are located a few kilometers north of the lands concerned by the New Dawn Agreement. This corridor is joining the Voisey's Bay Area (VBA), in which, Labrador Innu must be consulted and give their consent for any development projects.

To our knowledge, there is no federal land within the study area.

Labrador Inuit land (LIL)

The project involves two Labrador Inuit Lands (LIL). First, the proposed mine site (in Quebec) borders on Labrador Inuit Land 4B-27. In addition, the corridor identified for the proposed seasonal road crosses Labrador Inuit Land 4B-28, which lies west of Voisey's Bay and Anaktalak Bay.

4.3 Previous Studies and Programs

Several baseline studies were completed between 2011 and 2013 for the mine project on behalf of Torngat Metals Ltd. (formerly Quest Rare Minerals LTD). Table 4-2 presents the available reports and they will either be updated with more recent data or their validity will be re-confirmed.

Table 4-2 : Reports completed between 2012 and 2014 as part of the pre-feasibility study

Report Title	Project Component	Report Title	Project Component
Geochemistry Baseline	Mine Site	Surficial Geology, Geomorphology and Permafrost (Mine, Road and Port)	Northern Components
HHERA - Human Health and Ecological Risk Assessment	General	2013 Groundwater and Soil Technical Report - Mine	Mine Site
Landscape (Quebec & Labrador)	Northern Components	Surface Water Quantity (Hydrology)	Mine Site
Local Services Analysis	Northern Components	Government and Community Relations – Preliminary Communication and Engagement Plan	Northern Components
Mine and Port Site Potable Water Resources	Mine Site	Government and Community Relations – Stakeholder Mapping and Analysis - Mine Site, Road Corridor and Port Site	Northern Components
Asbestiform Amphibole Analysis (CO-16)	General	Government and Community Relations – Housing Infrastructure and temporary Accommodation Analysis - Mine Site, Road Corridor and Port Site	Northern Components
Weather - Environment Baseline Climate	Northern Components	Government and Community Relations – Local Services Analysis - Mine Site, Road Corridor and Port Site	Northern Components
Workforce and Recruitment Analysis	Northern Components	Government and Community Relations – Workforce and Recruitment Analysis – Mine Site, Road Corridor and Port Site	Northern Components
Consideration of Sustainable Development in the Strange Lake B-zone REE Project (with a Sustainability Matrix)	General	Government and Community Relations – Preliminary Strategic Plan for Training of Aboriginal Workforce – Mine Site, Road Corridor and Port Site	Northern Components
2013 Nighttime Illumination – Technical Memorandum	General	Social Baseline Studies - *Land Use and Traditional Ecological Knowledge (TEK) – Mine Site, Road Corridor and Port Site*	Northern Components

Table 4-2: Reports completed between 2012 and 2014 as part of the pre-feasibility study (Cont'd)

Report Title	Project Component	Report Title	Project Component
Secular equilibrium and radioactive decay	General	Social Baseline Studies - *Archeological Inventory – Mine Site*, Strange Lake B-Zone	Mine Site
Consideration of Climate Change Adaptation in the Strange Lake B-Zone REE Project	General	Social Baseline Studies - *Socio-Economic Profile, Northern Communities*	Northern Components
Mine Site Hydrogeology - Ground Water and Soil Investigation 2011-2012	Mine Site	Social Baseline Studies - *Landscape – Mine Site*, Strange Lake B-Zone	Mine Site
Ambient Air Quality, 2011	Mine Site	Social Baseline Studies - *Landscape – Road Corridor and Port Site*	Access Road
Background Noise Study, 2011	Mine Site	Semi-aquatic and Terrestrial Wildlife 2011-2013 -Biological Environment Baseline Surveys - **Amended Version**	Northern Components
Fluvial Geomorphology	Access Road	Social Baseline Studies - *Archeological Inventory – Road Corridor and Port Site -* **Amended Version**	Access Road

5 Project Location

5.1 Geographical Coordinates

Mine site:

The Torngat Metals Strange Lake property is covered by maps from the National Topographic system map sheets (NTS: 24A08, 24A09, and 14D05). The project is located at the following geographical coordinates (decimal degrees, NAD83):

- B-Zone Deposit centroid: Latitude: 56.323 N; Longitude: - 64.166 W

Seasonal access road:

- Start of the access road in Québec: Latitude: 56.332 N; Longitude: - 64.125 W
- End of the access road in Eastern Labrador: Latitude: 56.353 N; Longitude: - 62.095 W

At the Québec-Labrador border, the Road corridor correspond to 18+000 kilometric point, at coordinates 56,270274 N; -64,089263 W. The total alignment of the Road corridor is approximately 162 km long, and ends in the vicinity of the Anaktalak Bay on the eastern coast of Labrador near Nain.

Optimisation of the Road corridor is still underway and is expected to be completed by Q3 2024. Currently, there are a total of 287 water crossings: 13 out of the 287 being in Québec (4,5%), and 274 being in Labrador (95,5%). From these, the current alignment would require the construction of three main water crossings at the following geographical coordinates:

1. Main Water Crossing #1 (#WC 116): 29 m span bridge at 56° 10' 50.70" North 63° 28' 55.32" West
2. Main Water Crossing #2 (#WC 177): 16 m span arch culvert at 56° 20' 19.99" North 62° 59' 25.46" West
3. Main Water Crossing #3 (#WC 555): 16 m span arch culvert at 56° 21 ’16.63’’ North 62° 06’ 14.93" West

Container storage and handling facilities at Vale’s Port (Edward’s Cove):

The new container storage and handling facilities would be built in Edward’s Cove (Anaktalak Bay), near the existing Vale’s Port, in Labrador. The exact location is still to be determined in collaboration with Vale.

Rare earth processing and high purity separation plant (“Process Plant”):

The new process plant will be built in the “Parc industriel ouest – Jonction Arnaud” of the Sept-Îles industrial port facility, on the north shore of the St-Lawrence River in the province of Quebec, at the following geographical coordinates (decimal degrees, NAD83):

- Process plant site centroid: Latitude: 50.292 N; Longitude: - 66.385 W

6 Project Description

The project components in the North are detailed at Map 6-1, whereas projects components in Sept-Îles are detailed at Map 6-2.

6.1 Brief Description of the Project

The Strange Lake rare earth mining project is divided into three project phases: 1) Development and construction phase; 2) Operational exploitation phase (30-year operation); and 3) Closure and restoration phase.

During the 30-year operation phase, approximately 170 million tonnes of mining material will be extracted from an open pit, and between 2.5 to 6.0 million tonnes per year of crushed ore will be fed to the onsite beneficiation plant. Between 150,000 to 350,000 tonnes per year of rare earth ore concentrate will then be produced by on-site beneficiation plant with a processing capacity of 17,000 tonnes of crushed ore per day. The ore concentrate will be transported by road from the mine site to Vale's Port in Anaktalak Bay (NL) and then by ship to a rare earth processing and high purity separation plant to be built in the existing industrial port area in Sept-Îles, Quebec. The ore concentrate will be fed to the process plant at a maximum rate of 1,000 tonnes per day, which will produce between 2,800 and 5,500 tonnes per year of separated rare earth oxides (REO).

6.2 Project components at the mine site

The Strange Lake alkaline complex occupies a total area of 3,600 ha, whereas Lake Brisson occupies a total surface area of 3,200 ha. Lake Brisson flows into Napeu Kainut Lake, and then into the Déat River. The primary hydrographic basin is that of the George River, which is located about 100 km downstream of the mine site considering the waterflow (the George River is approximately 30 kms due West of the mine site).

6.2.1 Mine pit

The project's mineral resources are contained in a single deposit identified as the B-Zone. The current mining plan developed over a 30-year period is to mine as much ore as possible in the first 18 years, in order to first process the ore containing a higher concentration of the desired elements (high-grade ore), and to stockpile the lower-grade ore for further processing in the remaining 12 years. The design of the mine pit accounts for a minimum distance without activities to ensure the protection of the Lake Brisson water. Given the proximity of the deposit to the surface, the mine is designed to be operated as a standard open pit using trucks and mechanical shovels.

During operation and maintenance, mining will be operated by Torngat Metals with its own equipment and personnel. The mine will be operated according to an optimal ore extraction sequence developed over a period of 30 years. Mine operations include drilling and blasting; ore excavation and transportation (hauling) to the processing area; the crushing of large blocks; excavation and transportation of waste rock to the waste rock pile, as well as the excavation and transportation of low/medium-grade ore to the ore stockpiles.

In addition, during operation pumping of water from and around the pit will be required to prevent flooding that would delay mining operations and to ensure the health and safety of the workers. The in-pit water originates from three sources: surface water (precipitation and runoff), infiltration of groundwater and potentially infiltration from Lake Brisson through a fault. Sumps will be constructed and maintained at the bottom of the pit in order to pump the water and direct it, if necessary, to the treatment system. Groundwater flowing towards the pit (and which will not have been in contact with the ore of the deposit) can be intercepted by a network of wells on the periphery of the pit from which it can be pumped and discharged into the environment or used as a source of water, should it meet applicable criteria.

6.2.2 Explosives

The explosives manufacturing and storage facilities will be in the vicinity of the mine pit, within a radius of less than 5 km, on a junction of the main access road. The exact location of these facilities will be determined by ensuring that they are located at safe distances from other infrastructure and activity areas. Due to the proximity of the lake and water features, emulsion will be used as explosive. During operation, the explosive supplier that will be selected will be responsible for supplying emulsions, non-electric detonators and other blasting accessories that will be used by the blasting team in the pit.

6.2.3 Ore concentration facilities (beneficiation plant)

The ore concentration facilities at the mine site include a series of physical separation processes that will significantly reduce the quantity of concentrate to be shipped to the high purity rare earth processing and separation plant. The crushing and x-ray sorting units will be designed to operate 365 days a year, 12 hours a day. The fine grinding, electromagnetic separation, flotation and dewatering equipment at the mine is designed to operate 365 days a year, 24 hours a day. The ore concentrate will be packed in “super-bags”, and these will then be placed in containers for shipping. No material will be shipped in bulk. Each super-bag can contain 1 to 2 tonnes.

6.2.4 Ore pile

The low and medium grade ore mined will be stockpiled for processing after year 18 of the mine plan. The lower grade ore stockpile will be placed to facilitate future reclaiming. The exact location will be determined following an on-site verification considering technical and environmental constraints aimed at minimizing the potential effects on fish habitat. The environmental design of the piles, to ensure groundwater protection and wastewater treatment, will be developed according to the *in-situ* conditions and the Directive 019 (MDDEP, 2012).

6.2.5 Waste rock and overburden piles and soils

The volumes of waste rock and overburden to be stockpiled are coming from excavations for the construction of the collection pond(s) as well as for any surface infrastructure required for the operation site. The site currently studied for the location of the waste rock storage area, that future studies should refine, is shown on map 2-1. Wherever possible, overburden and waste rock will be placed in separate piles east of the mine pit.

The potential for reusing waste rock will be assessed based on geotechnical and geochemical data to establish its technical and environmental feasibility. Ideally, the waste rock will also be used to backfill the open pit once mining is complete. Waste rock that does not leach metals or generate acid may also be used for the construction of dikes, roads and/or storage platforms.

Similarly, topsoil or other soil suitable for revegetation will be characterised and stockpiled nearby for progressive or future site rehabilitation. Soil stockpiles will be protected against erosion by vegetating the surface with site appropriate seeds.

To ensure the protection of the groundwater and to facilitate water treatment, the environmental design of the piles, will be developed based on the *site* conditions and on the Québec’s Directive 019 (MDDEP, 2012). At a minimum, the design of the stockpiles will ensure that runoff is collected and directed to a settling pond for the treatment of suspended solids before discharge into the environment, should the water meet criteria. Should the water not meet criteria, it will be piped to the water treatment plant for further treatment. Stockpile characterisation such as geochemical and geotechnical studies are scheduled to commence in September of 2023 and will inform further design of the waste rock and overburden pile.

6.2.6 Mine residue stockpile area

The dry residues from the first separation steps (primary crushing and X-ray sorting) will mainly be waste rock, which will be stored in the waste rock storage area; depending on their characteristics, some material rejected during this first sorting could also be stored temporarily for potential subsequent use, in the low- and medium-grade ore storage area.

The residues from the concentration processes, which includes fractions from the magnetic separation and the flotation processes generated in a wet environment, will be deposited in the mine residue stockpile. In order to prevent the resuspension of fine particles during rain or snowmelt and minimize the potential environmental impact, and subject to the approval of the authorities, the residues will be thickened, filtered, mixed with a cementing agent, transported by truck and deposited in the residuals management area, which will be designed and managed in accordance with the requirements of Québec's Directive 019 (MDDEP, 2012). Generally, cemented backfill are inert, however, studies will be performed in order to determine the percentage of cement to be used, the potential for long term metal leaching and other parameters that will be added in the water quality model. Five alternative locations for the mine residue stockpile have been studied to date. Additional geochemical and geotechnical studies will be conducted to inform the design of the mine residue stockpile area and the retention basin that will be used for sedimentation and/or retention for associated water treatment.

Contact between residues and groundwater will be minimized by installing a drainage system within the mine residue stockpile area. The mine residue stockpile area will also be surrounded by a system of non-contact water ditches, drains and dikes to collect noncontact surface water runoff and diverting it from the stockpile area. Additional drains/ditches will be installed as needed during successive construction stages.

Any potential seepage will be collected and transported via pipeline to a collection pond or to the water treatment plant where it will be treated, if necessary, before being discharged into the environment or reused.

6.2.7 Discharges into the environment

6.2.7.1 Air

The main sources of atmospheric emissions (greenhouse gases, particles, etc.) will be generated by mining, blasting, crushing, concentrate storage, stockpiles, electricity production (generators) as well as vehicles traffic for the transportation of ore, concentrate and other transportation activities on the site.

6.2.7.2 Liquid Effluents

Mine water and runoff water within the activity areas (contact water)

Several ponds will be needed to receive the contact water runoff within the various mine activity areas (pit, mining areas, ore piles, concentrate piles, mine residue stockpiling area, etc.). They will be located at the lowest elevation of each concerned area and will be positioned to avoid the mixing of water from different sources before the sampling points. After the sampling point, the water discharged from these retention ponds may be routed, if required, to a treatment system to ensure that any water discharged complies with the requirements of Directive 019. The possibility of reusing the water collected for the needs of the ore concentration facilities will be assessed to minimize the use of freshwater.

Wastewater from concentration processes (process wastewater)

It is expected that all water will be recirculated, and the process will not generate a liquid discharge, except during sporadic events or plant upsets. A certain amount of freshwater may however be necessary (to be confirmed during the pre-feasibility and feasibility studies). Any discharge from the process will be treated appropriately before being released into the environment in order to ensure compliance with quality criteria. A complete water treatment plant, capable of treating to the required criteria will be built on site and all contact water not meeting criteria, including seepage from the stockpiles and processing water from the beneficiation plant will be treated before discharge. The discharge point of the WTP, potentially in Lake Brisson, will be assessed and will meet regulatory requirements.

Washing water

Washing and maintenance water in the buildings will be managed separately from mine water and sent to a water treatment unit before discharge. An oil-water separator (oil skimmer) will be installed.

Domestic wastewater

A modular wastewater treatment system will include septic and holding tanks and equalization tanks. The preferred technology will meet suspended matter (SM) and biological oxygen demand (BOD) criteria. A domestic wastewater treatment unit will be installed to serve all camps, buildings, sanitary facilities and living environments.

Final effluent

Treated water will meet the applicable requirements and will be discharged into Lac Brisson. Although the bathymetry of the part of the lake bordering the mine site has been mapped, the exact location of the discharge point will not be determined until the final site development plan has been completed and a proper water discharge/diffusion study and impacts on the receiving environment has been conducted.

6.2.8 Access/haul roads

Access/haul roads will connect the mine to the various infrastructures within the site, i.e., the beneficiation plant, the camp site, other buildings as well as the stockpiles (ore, waste rock, overburden, and topsoil), the settling ponds, the residuals management area, the landfill site, and the airstrip. These roads will be unpaved and will have ditches collecting runoff water.

6.2.9 Aerodrome with a 1,500 m airstrip

A total of seven potential locations at the mine site have been identified for the airstrip, also within a 10 km radius of the mine pit. Only two options were retained after a more in-depth examination of the topography, drainage conditions, limitations related to surface obstacles, prevailing winds, and other environmental constraints (proximity to observed habitats of harlequin ducks, caribou, etc.), the distance of the facilities from the mine site and the alignment of the road. These options, both located in the southern part of the 10 km radius, were compared with each other in a preliminary manner, according to technical and environmental criteria. Subject to validation during future consultations and studies, the preferred site (Map 6-1) located approximately 12.5 km from the camp and processing facilities is the best option based on the following criteria:

- Prevailing winds – highest percentage of favourable prevailing winds.
- Environmental analysis – less potential impact on ecological systems and water resources.

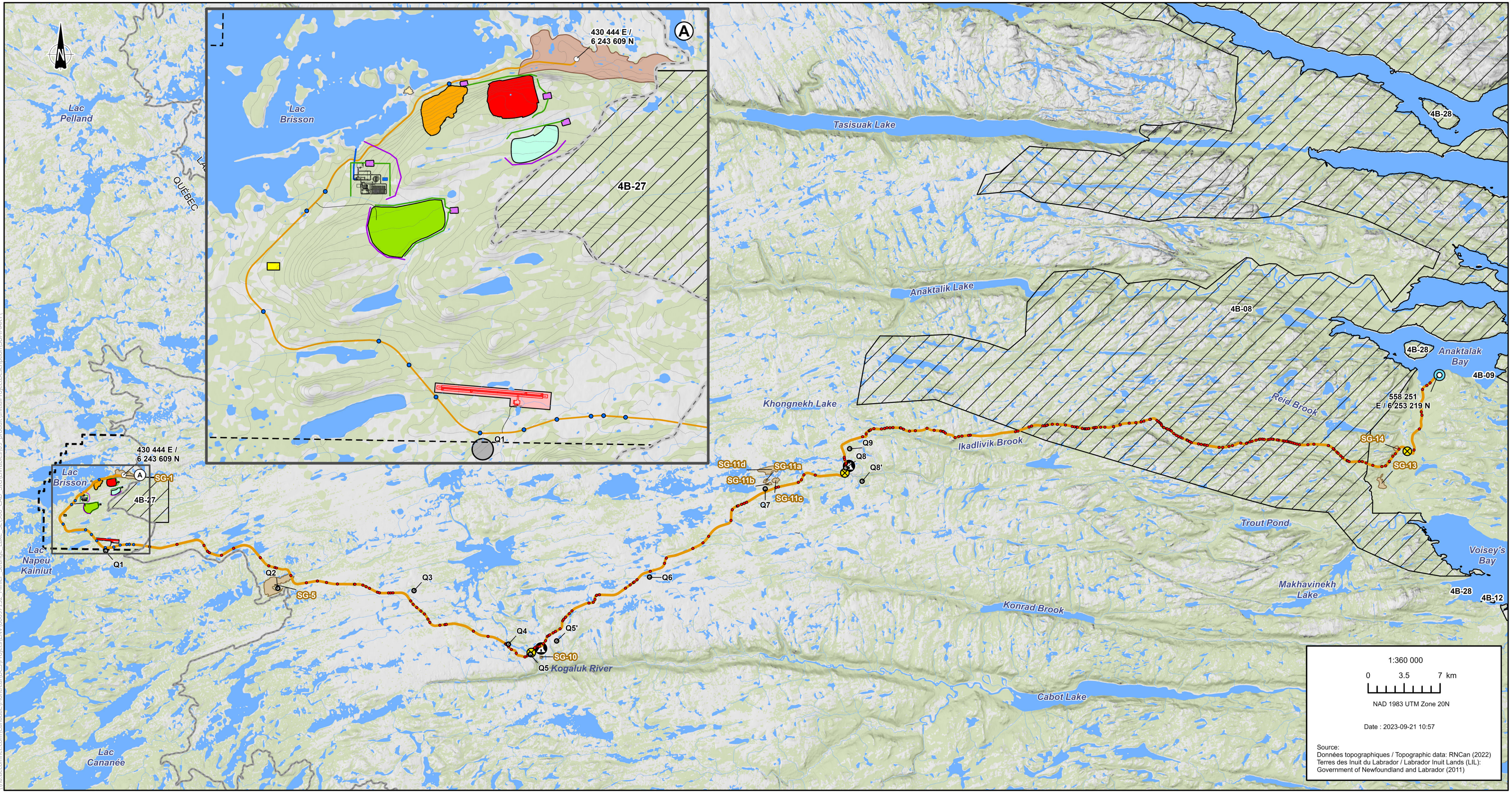
The airfield facilities can be operational 24 hours a day. The runway and taxiway will be made from gravel. The aerodrome building will have a capacity to accommodate approximately 60 passengers, including washrooms, storage area and office space. The new airfield will also include a building for aircraft storage and servicing, a private runway and fuel storage facility.

The runway is currently planned to be 1,500 m long by 30 m wide and made of gravel in the initial construction phase of the project, which would accommodate aircraft models such as the Bombardier Q400. The option to expand the runway to accommodate larger aircraft during the construction phase or later during the operation of the mine will be assessed as part of the pre-feasibility, feasibility, and impact assessment studies.

MÉTAUX TORNGAT METALS

PROJET MINIER DE TERRES RARES DU LAC STRANGE

STRANGE LAKE RARE EARTH MINING PROJECT



Composante du site de la mine / Mine site component

- Limite de propriété / Property limit
- Chemin d'accès des composantes de la mine / Mine site component access road
- Fossé d'eau de contact / Contact water ditch
- Fossé d'eau sans contact / Non contact water ditch
- Prise d'eau / Water intake piping
- Piste potentielle / Potential airstrip
- Aire d'accumulation des résidus miniers / Mine Residue Stockpile Area
- B-Zone minéralisée (30 ans) / B-Zone Mineral Deposit (30 years)
- Banc d'emprunt (sablière et gravière) / Borrow Pits (Sand and gravel pit)
- Bassin proposé / Proposed Pond
- Camp d'exploration existant / Existing Exploration Camp
- Halde de stérile / Waste Rock Stockpile Area
- Minérai à basse teneur / Lower Grade Ore
- Piste d'atterrissage / Air strip
- Site d'enfouissement / Landfill Site
- Usine de traitement des effluents / Effluent treatment plant
- Camp et aire de traitement principaux / Main Camp and Ore Processing Area

Route d'accès / Access road

- Route d'accès saisonnière proposée / Proposed seasonal access road
- Traversée / Crossing (Labrador)
- Traversée / Crossing (Québec)
- Traversée majeure (Pont) / Major crossing (Bridge)
- Camp mobile / Mobile camp
- Banc d'emprunt / Borrow pit (SG-xx)
- Carrière / Quarry (Qx)
- Aire d'entreposage et de manutention des conteneurs au Port de VALE / Container storage and handling facilities at Vale's Port

Autre / Other

- Frontière Québec et Labrador / Quebec and Labrador border
- Terres des Inuit du Labrador / Labrador Inuit Lands (LIL)

Carte 6-1
Composantes du projet au Nord

Map 6-1
Project components in the North

PRÉLIMINAIRE / PRELIMINARY

AECOM

6.2.10 Other buildings

The workers' camp will be modular in design and will meet industry standards for long-term and permanent accommodation for mine personnel, with additional space for truck drivers and other visitors. It is expected that enclosed walkways will connect the buildings, where possible. Its footprint in the environment includes the consideration of a protection zone around Lake Brisson. The width of this protection zone will be established based on the results of the hydrogeological modelling that will be carried out at the mine.

A multi-purpose building will include heated and unheated storage areas, a locker room, lockers, laundry, medical and fire protection facilities, laboratory, offices, and conference rooms as well as garages for maintenance, emergency vehicles and storage of emergency response equipment.

6.2.11 Water supply

Lake Brisson is expected to be the main source of process water. The required water treatment for this industrial use will be established during the feasibility study. A pumping station will be installed on the shore of Lake Brisson, with a water intake deep enough to avoid problems related to the accumulation of ice during the winter. A heat traced pipeline of approximately 1.5 km will bring the water to the treatment plant. A 5-meter-wide access path will also be built along side the pipeline to facilitate inspections and repairs.

Lake Brisson is also a potential source of drinking water for human consumption. The SG-1 esker located to the east of the ore processing complex and the base camp is an underground water source which constitutes a second source of drinking water.

More detailed analysis will be completed to confirm the source of drinking water that will be used, and the treatment required. Drinking water will be analyzed and treated before use according to Health Canada and Quebec's Standards.

Groundwater from the esker will likely be the source of fire water. A fire water tank will be provided and connected to the fire protection system of the multi-purpose building and the camp. The water required for maintenance and for dust suppression will have separate containers.

6.2.12 Power supply

The electrical requirements of the mine, ore processing and milling facilities and all other on-site facilities are expected to be met by a combination of two types of electrical generating equipment, namely:

- a bank of diesel generators.
- wind turbines (project under study by third party). The use of renewable energy sources will reduce the use of fossil fuels in the Project. Renewable energy generation would not be under Torngat Metals but rather under a separate developer.

The power requirements of the mine, ore beneficiation plant and all other on-site facilities are estimated at 5 to 10 MW. The aerodrome will have its own source of electrical energy supplied by a 250 kW diesel generator.

6.2.13 Fuel storage and supply

The arctic diesel tank as well as the unloading station will be placed in a containment area equipped with a geomembrane. Double-walled aboveground pipes will connect the reservoir to the generators. A fuel distribution station will be installed for the supply of heavy and light vehicles. Subject to validation by the feasibility and pre-feasibility studies, a 30 m^3 capacity tank will be installed at the airfield for the storage of aviation fuel. This fuel reserve is intended for emergencies.

Fuel supply will be primarily by fuel tanker to the mine site, as required. At the mine site, the fuel will be transferred from the fuel tankers to an unloading and storage area which will be equipped with an appropriate containment area.

6.2.14 Stormwater management (outside activity areas)

All stormwater that has not been in contact with the ore or mine activities will be diverted away from the work areas by a network of non-contact drainage ditches.

6.2.15 Waste management

Waste reduction at source, recycling and recovery channels will be favoured. To the extent practical, recyclable materials will be compacted on site before being transported to secondary materials markets using the same means of transportation as for supply. Residual hazardous materials and special waste will be stored on site in secure storage areas equipped with containment areas, before being shipped to authorized facilities for treatment or disposal. A northern landfill that complies with the requirements of division 4 of chapter II of the Quebec Regulation respecting the landfilling and incineration of residual materials will also be set up along the road to access between the airfield and the mine pit to landfill residual materials that cannot be recycled or recovered. An area will also be set up to carry out the bioremediation of contaminated soil and snow.

6.2.16 Emergency Response

Medical and emergency response facilities, including fire trucks, will be in the multipurpose building near the workers' camp. An ambulance will be available and parked in a dedicated space and an infirmary will be set up in the workers' camp. A storage area for environmental emergency equipment will also be provided in a centralized location in case of a potential major incident (i.e., spill).

Qualified personnel trained in first aid and emergency response will be on site. When required, an air ambulance will be available to transport patients to a hospital facility located in a major center such as the Labrador Health Center located in Happy Valley-Goose Bay. These same centers may be called upon to provide support in the event of an environmental emergency.

6.2.17 Construction

All shipping and associated activities (crews, provisions, refueling and other supplies, waste management, etc.) will be contracted to a third party for both the Construction and Operations Phases of the Project. The potential shipping route(s) would be the same used by construction supply ships accessing the current port installation. Shipping during the Construction period would transport incoming equipment, materials and fuel. Recyclable materials, hazardous wastes, other materials and returning rental equipment would be periodically shipped off-site.

Construction work at the mine site will begin with the completion of the last portion of the access road located in Québec (0 to 18 kilometres of the road chaining) and the development of the airstrip.

In addition to expanding the existing exploration camp as required, temporary camps may be established as part of site preparation and road construction at the mine site. Temporary worker camps might be established outside the mine site during construction, in particular during construction of the road on the Labrador portion.

Excavation at the mine site will follow the road construction and will begin with the development of the water treatment plant, the maintenance facilities area and the fuel storage area as well as the construction of the various access roads to the site. The ore transport roads will be 8 meters wide between berms and will therefore be designed for trucks with a capacity of 55 tonnes. A borrow pit is located approximately 2 km east of the B-Zone. This zone will first be mined for sand and gravel required for the civil works related to roads and preparation of the ore stockpiling area. Once levelled, part of this area can also be used as a temporary storage area.

Subsequently, the construction of the beneficiation plant, buildings, fuel storage tanks and the installation of temporary generators can be undertaken. In addition, the civil work to lay out the foundation of the various storage areas and the settling pond(s) will be carried out. These facilities will allow the start of stripping operations of the mine site.

Next, the steel structures and mechanical equipment will be installed at the beneficiation plant and the residue thickening/filtration area. Finally, the electrical and instrumentation work will be completed, and the commissioning of all systems will take place.

A drainage system consisting of contact water ditches and retention ponds will be built to receive the runoff water drained within the various stockpile areas (ore piles, concentrate piles, mine residue stockpiling area, etc.) and to prevent mixing with non-contact water runoff from outside the operating areas. Retention ponds will be located at the lowest elevation of each associated watershed and will avoid the mixing of water from different sources before the sampling points. A water treatment plant will also be installed, as well as a network of pipelines to convey the effluent from the ponds to this system.

The development of a borrow pit area is currently planned at the mine site to provide construction materials. In addition, secondary access roads will be constructed that will connect the plant, the borrow and stockpile areas.

6.2.18 Closure and Restoration

Torngat Metals will prepare a conceptual closure plan that meets the requirements of the Québec *Loi sur les mines* – Mining Act and the *Guidelines for preparing mine closure plans in Québec* (*MERN, 2022*). The initial conceptual closure plan will be refined as the mine activity progresses. It is anticipated that the plan will be updated every five years.

It anticipated that the end land use will be to provide wildlife habitats and that disturbed areas will return to their pre-mining condition such that traditional uses of the site can resume. It is also expected that there will be progressive restoration for the mine residue stockpile area, and any other suitable areas throughout its operation. According to the current mining plan scenario, the rehabilitation of the open pit will not begin until the end of its development, i.e., after year 18. Water treatment will be maintained until the water and seepage areas have achieved criteria. Typically, the closure plan is divided into sections:

1. Progressive restoration, throughout the LOM;
2. Active closure, where the buildings and ancillary structures are deconstructed, restoration is accelerated, and water treatment is maintained;
3. Passive closure, where water treatment is not required anymore, all areas are restored and periodical sampling occurs.

6.3 Seasonal Road between the mine and the existing port facility

The containers of ore concentrate will be shipped by road and then by boat to a high purity rare earth separation plant using a hydrometallurgy process that will be located in Sept-Îles, Quebec (Map 6-2).

6.3.1 Construction

A new road will be built to connect the mine site to a new container storage and handling facilities at the existing port of Vale’s nickel-copper mine in Anaktalak Bay on the eastern coast of Labrador, NL. The total length of the access road is estimated at 160 km. The first 18 kilometres from the mine site are located on the territory of the province of Québec. Outside the mine site, the preliminary design envisions a seasonal access road with the following characteristics: a crushed rock or gravel surface capable of withstanding the expected traffic; a single lane with a width of between 5.4 and 8 m (with a right-of-way of 0.5 m on each side); no excavation in permafrost areas; a balance between cuts and fills as much as possible; minimal stream crossings and slopes of 11% maximum.

Studies are underway to optimise the Road corridor. Currently, a total of 287 water crossings is reported: 13 out of the 287 being in Québec (4,5%), and 274 being in Labrador (95,5%). Three main water crossings are planned (span bridge, arch culvert).

Standard road construction methods would be adapted to northern conditions. Partial cleaning of vegetation would occur, permafrost would be protected as potential areas are mapped since the planning design phase. Reuse of material excavated at the Mine Site would be prioritized for the Québec Access Road. Any extra materials needed for the roadbed would be obtained from borrow pits (sand and gravel) and rock quarries. Temporary worker camps might be established outside the mine site during construction.

6.3.2 Operation and maintenance

Overall, three main types of cargo will be shipped to and/or from Torngat Metals's operations: ore concentrate in superbags and containers, fuel and raw materials/general cargo mainly in containers. The latter would include incoming supplies such as food, chemicals used in the flotation process and in the water treatment, consumables used for machinery and facility maintenance, material, equipment and outgoing waste, other excess materials and any equipment no longer in use.

The ore concentrate will never be transported in bulk. Trucking of ore concentrate from the mine site will involve transportation of mining material placed into superbags, and they will be loaded into maritime containers having a 30 tonnes capacity. Although mining activities would occur from 9 to 12 months annually, the road transportation of mining material would rather be seasonal, for an estimated period of 8 to 9 months outside of the warmer months (approximately June to August).

Preliminary estimates of ore concentrate trucking capacities and flows, subject to validation during the pre-feasibility and feasibility studies, are as follows:

- Trucking capacity: 90 tonnes/truckload
- Truck loads per day: between 12 and 24 roundtrips
- Truck loads per year: between 1667 and 3333 roundtrips

Raw materials and general cargo, also packed into maritime containers, will be sent from the Port to the mine in general by the same trucks (roundtrip). Fuel will be transported by tanker trucks from the Port to the mine.

Truck operations and road maintenance will be done either by Torngat Metals directly or contracted to a local Indigenous owned business. Road maintenance would include grading, resurfacing and plowing-scarifying-sanding.

Torngat Metals aims to construct a private single-user mine access road with a minimal footprint while maintaining safe operations. Torngat Metals is open to consider future modifications to the design of this road, for instance if other users are interested in using the road. **However, any modifications to this effect are not included in the present project.**

6.4 Container storage and handling facilities at Vale's Port and transportation of the concentrate to Sept-Îles

During operations, the containers of ore concentrate will be shipped by trucks along the seasonal road corridor from the mine to the Vale's Port in Anaktalak Bay on the Labrador coast and then by boat to a rare earth processing and high purity separation plant in Sept-Îles.

PROJET MINIER DE TERRES RARES DU LAC STRANGE

STRANGE LAKE RARE EARTH MINING PROJECT

Composantes du projet / Project components

- Site potentiel de l'usine de séparation des métaux de terres rares de haute pureté / Potential Site of the rare earth processing and high purity separation plant

Chemin de fer / Railroad

- Iron Ore Company of Canada
- Société ferroviaire et portuaire de Pointe-Noire SEC

Autre / Other

- Zone industralio-portuaire de Sept-Îles / Sept-îles industrial port area
- Route principale / Primary road
- Limite municipale / Municipal boundaries
- Aire de concentration d'oiseaux aquatiques / Waterfowl concentration area

PRÉLIMINAIRE / PRELIMINARY

1:90 000

0 1 2 km

NAD 1983 UTM Zone 20N

Date : 2023-09-28 16:16

Source:
Données topographiques / Topographic Data: NRCan (2022)
Chemin de fer / Railroad: MRNF (2023)
Limite municipale / Municipal boundaries: MRNF (2023)
Aire protégée / Protected area: MELCCFP (2023)
Zone industralio-portuaire de Sept-Îles / Sept-îles industrial port area: Gouvernement du Québec (2018)

Carte 6-2
Composantes de projet à Sept-Îles

Map 6-2
Project components in Sept-Îles

The infrastructure upgrades at the Port would include:

- Container storage area;
- Container crane;
- Other storage facilities (to be confirmed by the feasibility study and the agreement with the owner): fuel storage tank with spill containment, warehouse;
- No work will be done in or near the water, and no terminal expansion or modification is required.

Port operations will be contracted either directly by Torngat Metals, or Port owner, or to local Indigenous owned businesses.

The current estimate of the number of shipments by boat from Vale's Port to Sept-Îles Port is the following:

- 5 to 10 shipments per year, during the summer period (no ice cover in the bay, approximately June to October);
- 30 kt payload per shipment (approximately 1,000 containers per shipment).

The increase on maritime transportation will be considered in the cumulative effects of the project.

6.5 Rare Earth processing and high purity separation Plant

Torngat Metals plans to set up a high purity rare earth processing and separation plant to receive and process the ore concentrate produced at the mining site This process plant will be sized and optimized for the feed that will be extracted from the B-Zone of Strange Lake. The maximum daily capacity of this process plant would be between 1,000 tonnes of ore concentrate per day and up to 350,000 tonnes of ore concentrate per year. It would produce between 2,800 and 5,500 tonnes of separated rare earth oxides per year, as well as 14,000 tonnes of mixed rare earth oxides per year. However, these capacities are hypothetical at this stage and will be determined by the pre-feasibility and feasibility studies to be carried out for this facility.

The new process plant would be built in the "Parc industriel ouest – Jonction Arnaud" of the Sept-Îles industrial port facility (QC). In terms of Port infrastructures, there are two Port areas potentially available for Torngat Metals' shipping needs, which are Pointe-aux-Basques (east of the bay) and Pointe-Noire (west of the bay). Both can be used for freight and are linked to the Jonction-Arnaud industrial park by rail. At this stage, the preferred option would be to use Pointe-Noire gateway and transport the closed containers of ore concentrate to the plant by using the existing SFPPN rail.

At this stage, it assumed that:

- The residues from the process plant will be permanently stored in a dry stockpile. The residue storage area will be located on the same site than the plant, on the eastern side;
- The final treated effluent will be discharged to the St-Lawrence River through a dedicated pipe and outlet. The Figure 6.1 presents the general layout of the plant site.

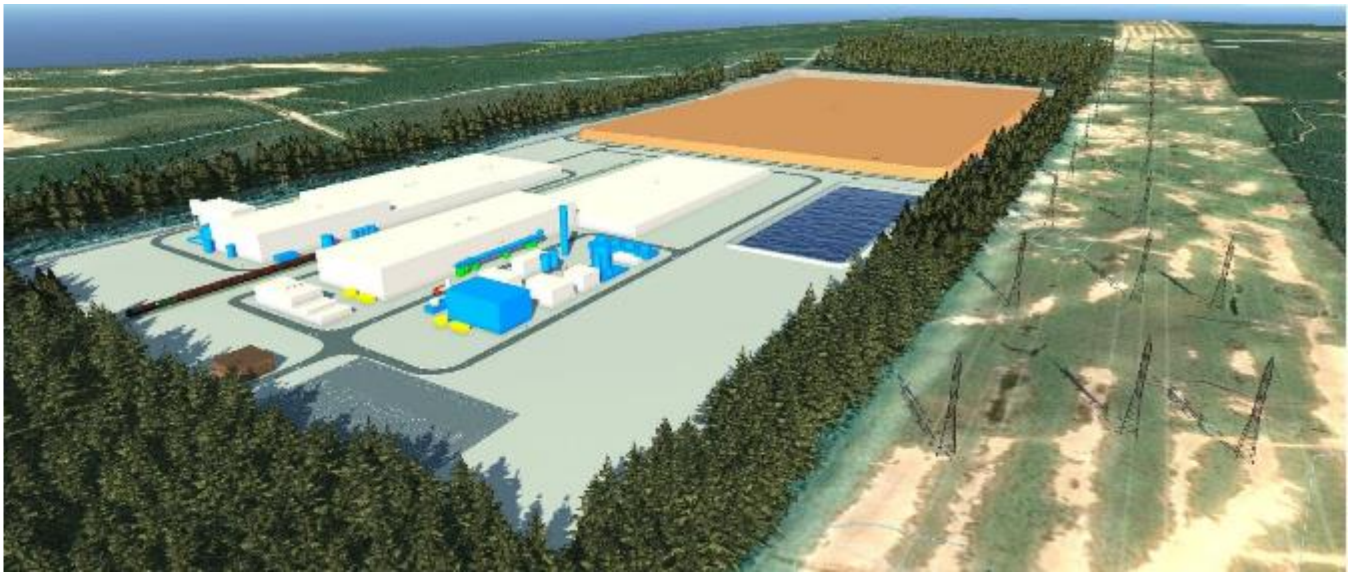


Figure 6-1 : Overview of the process plant site and of the residue storage area.

6.6 Third parties Activities

In order to diminish the dependence to diesel and reduce the carbon footprint of the project, wind turbines, or in combination with other renewable energy, might be constructed at the Mine Site under the responsibility of third parties. Torngat Metals aims to use as much renewables as possible to reduce diesel consumption. Torngat Metals will contract out the development of a wind turbine(s) including design, permitting, procurement, installation, and maintenance. Torngat Metals plans to seek bids from Indigenous owned businesses and companies committed to Indigenous hiring and procurement.

6.7 Health, Safety and Environmental Management Policy

Torngat Metals is committed to ensuring the health and safety of all personnel, contractors, suppliers and the communities and environment within which they operate. As part of their Health, Safety and Environmental Management initiatives, Torngat Metals will fulfil all statutory HSE requirements, including employer "duty of care" obligations Torngat Metals' Health and Safety Policy relies on the individual commitment of each employee to ensure that safety standards are upheld at all times.

6.7.1 Site-Specific Training Requirements

Torngat Metals will develop and implement educational and training tools the ensure that all administrative and operational personnel have the appropriate knowledge and training to adhere to their HSE policies. Torngat Metals will:

- Develop site-specific training programs tailored to the conditions and risks of each location.
- Ensure that all personnel, subcontractors, and suppliers receive training relevant to their roles and responsibilities.
- Regularly update training modules to incorporate new information and best practices.

6.7.2 Emergency Spill Response

In the event of an accidental release within the environment on any of Torngat Metal's sites, personnel will:

- Maintain a detailed spill response plan outlining containment, cleanup, and reporting procedures.
- Conduct regular spill response drills to ensure readiness and familiarity with protocols.
- Utilize advanced spill prevention technologies and practices to minimize the likelihood of spills.

6.7.3 Incident Response Protocols

In the event of any incident, Torngat Metals' priority is to swiftly respond, mitigate impacts, and safeguard personnel. The company's approach includes:

- Clear communication lines to promptly report incidents and activate response teams.
- Trained emergency response teams equipped with appropriate equipment and resources.
- Regular review and enhancement of incident response procedures based on lessons learned.

6.7.4 Evacuation Procedures

Safety is paramount, and evacuation procedures are designed to protect everyone involved. Torngat Metals will:

- Establish evacuation routes and assembly points, regularly communicated to all personnel.
- Conduct evacuation drills to ensure familiarity with procedures and safe assembly.
- Collaborate with local authorities to ensure coordinated and effective evacuation efforts.

6.7.5 Risk Management Practices

To proactively address potential risks, Torngat Metals' risk management practices encompass:

- Comprehensive risk assessments conducted before commencing operations and regularly thereafter.
- Implementation of engineering controls, administrative measures, and personal protective equipment to mitigate identified risks.
- Continuous monitoring and review of risks, with adjustments made to procedures and protocols as needed.

6.7.6 Safety Commitments towards Employees and Community Members

Torngat Metals' commitment to safety extends beyond its workforce to the communities it engages with. Torngat Metals pledges to:

- Provide comprehensive health and safety training to employees, contractors, and community members.
- Collaborate with local communities to develop culturally sensitive safety programs and initiatives.
- Regularly engage with community members to address concerns and improve safety measures.

6.7.7 Regulatory Compliance

Torngat Metals is committed to upholding all relevant laws, regulations, and standards governing health, safety, and environmental protection. The company's efforts include:

- Regular audits to ensure compliance with local, regional, and national regulations.
- Continuous training to keep our workforce informed about evolving regulatory requirements.
- Collaboration with regulatory authorities to maintain open communication and ensure mutual understanding.

Torngat Metals understands that the success of its operations depends on a healthy and safe environment. This policy is an ongoing effort, subject to continuous review and improvement to ensure the highest standards of health, safety, regulatory compliance, and site-specific training. By adhering to these principles and working together, the company wishes to create a safer and more sustainable future for all.

6.8 Employment and Workforce

6.8.1 Construction

Upon the prefeasibility and feasibility studies, detailed engineering design will be more precise, and workforce required for construction established. Thus, workforce will be presented in the impact assessment study, based on the National Occupational Classification (NOC, 2021). Torngat will hire an EPC (Engineering, Procurement, Construction) Contractor to oversee all construction, including the mine site, the road and the plant site. Therefore, a precise estimate of the workforce is not available at the present time. The estimated contract labor force for civil, structural steel, mechanical and platework, piping, electrical, instrumentation and control, with likely peak at 1000 workers for a duration of 12 to 24 months.

6.8.2 Operations

During the operation phase, it is estimated that the total workforce will be 401workers considering full-time and part-time positions. It will be divided as follows:

- 127 workers in the North for the mine site, including road, supply chain and assay lab;
- 261 workers in Sept-Îles at the process plant;
- 35 workers for corporate.

The total annual wages and benefits costs for the total workforce is estimated to be $93,700,000 or an average annual income of $161,000.

6.8.3 Equity, Diversity and Inclusion

Torngat Metals understands the importance of having a diverse, equitable, and inclusive workforce that is better able to respond to challenges, attract top talent, and accomplish the Company's business goals, by benefiting from diverse backgrounds and experiences. Torngat Metals is committed to creating a working environment that provides all employees, particularly groups that have been historically underrepresented, with the opportunity to achieve their personal career goals in a fair and just manner, while fostering a culture of belonging and integration. These groups include, but are not limited to, Indigenous peoples, women, persons with disabilities, and visible minorities.

7 Production Process and Capacity

The total amount of material mined over 30 years is estimated at 160,000,000 – 200,000,000 tonnes (dry basis). The quantity of material extracted annually will be of the order of 9 - 13 million metric tonnes. Mining will be carried out over periods that may vary from 9 to 12 months per year, depending on the year. The amount of material mined annually could vary significantly, however, as the mining strategy is to mine as much ore as possible in the first 18 years, in order to first process the ore containing a higher concentration of the desired elements (high-grade ore), and to stockpile the lower-grade ore for further processing in the remaining 12 years. Thus, it is currently planned that substantially all of the material will be mined during the first 18 years of mine operation, at a rate of 9.0 to 13.0 million metric tonnes per year.

The maximum quantity of material mined per day at any time over 30 years of operation is 55,000 tonnes per day.

7.1 Ore concentration process (Beneficiation plant)

The beneficiation plant will be fed with high grade ore for the first 18 years at a rate of between 2.5 and 3.0 million tonnes per year. For the remaining 12 years, the mill will be fed with lower grade stockpiled ore at a rate of 5.0 to 7.0 million tonnes per year. The separation processes that will be used in the beneficiation plant are currently being optimized. The dry residues will be stockpiled in the waste rock storage area. The ore concentration processes, generated in a wet environment, are thickened and filtered before being transported to the mine residue stockpile area.

The water from the ore and residue decanting and filtration processes is treated, then reused in these same processes; this reuse in close circuit makes it possible to reduce the consumption of freshwater and the mine water discharge as much as possible.

The beneficiation plant will be designed to operate 9 to 12 months per year at a design production rate of 150,000 to 350,000 tonnes of concentrate annually (dry basis), over the 30 years of the project. It is estimated that in its expanded version, the beneficiation plant will have the capacity to process up to 17,000 tonnes per day of crushed ore.

7.2 Rare Earth processing and high purity separation (Process plant)

As for the beneficiation plant, the processes that will be used in the rare earth processing and high purity separation plant are currently being optimized. The characteristics of the water effluent will be highly dependent on the hydrometallurgical option selected, which will be done as part of the pre-feasibility study.

Under the current plan, the feed rate of concentrate ore to the process plant will vary between 150,000 to 350,000 tonnes per year depending on the rare earth concentration in the ore. It is estimated that the process plant will have the capacity to process up to 1,000 tonnes per day of concentrate ore.

7.3 Materials Handling

Table 7-1 presents an estimate of the quantities of materials that will be generated by the project (ore, concentrate, products, waste rock and residues). However, this operating scenario is subject to change based on pilot tests.

Table 7-1 : Estimated quantities by type of material (30 years of operation) at the Mine and the Process Plant sites

Project Site Component	Mining material type	Annual average – Low estimate (Years: 0 to 18)	Annual average- High estimate (Years: 0 to 18)	Annual average – Low estimate (Years: 19 to 30)	Annual average – High estimate (Years: 19 to 30)	Maximum per day at any time over 30 years	Total over 30 years (Mine life)
Mine Site	Mined material (tonnes)	9,000,000	13,000,000	0	0	55,000	170,000,000
	Mill feed (beneficiation plant) (tonnes)	2,500,000	3,000,000	6,000,000	6,000,000	17,000	120,000,000
	Waste rocks from mining (tonnes)	500,000	1 000,000	0	0	4,200	10,000,000
	Low/medium grade ore (tonnes) (stockpiled for future use yr 19-30 as feed)	6,000,000	9,000,000	0	0	38,000	115,000,000
	Final Concentrate (tonnes)	150,000	200,000	300,000	350,000	1,000	6,000,000
	Concentrate % rare earth	10%	12%	8%	10%	n/a	n/a
	Mine residues (tonnes)	2,350,000	2,800,000	5,700,000	5,650,000	16,000	113,000,000
Process Plant (Sept-Îles)	Process plant feed (tonnes)	150,000	200,000	300,000	350,000	1,000	6,500,000
	Separated Rare Earth Oxides (tonnes)	2,800	3,200	5,000	5,500	16	115,000
	Residuals (tonnes)	147,200	196,800	295,000	344,500	980	7,000,000

7.4 Radionuclides

The radionuclides naturally found in the Strange Lake deposit are Thorium and Uranium. These naturally occurring radioactive materials will not be modified at atomic level by either the concentration processes (beneficiation plant at mine site), the acid baking process or the hydrometallurgical process. Therefore, the natural radioactivity of these elements won't be modified by the processes.

At the process plant, all the radionuclides will be separated from the rare earth elements.

8 Project Schedule

Torngat Metals has developed a schedule outlining the duration and timing of key project phases including preparation, construction, operation, closure, and restoration, as well as environmental monitoring (post-operational, restoration phase) of the site. Following construction and start-up, the expected life of the mine is 30 years. Regular operations during this period will include maintenance, if necessary, replacement of certain original facilities.

A list of the main steps is provided below (Table 8-1).

Table 8-1 : Strange Lake Project Milestones and Dates

Key milestone	Scheduled dates
Submission of the Initial Project Description and Registration document to NG and NL	September 2023
Start of the final phase of the Pre-Feasibility Study	October 2024
Issuance of the Pre-Feasibility Study (PFS)	December 2024
Start of Feasibility Study (FS)	January 2025
Submission of the Environmental Impact Assessment report	May 2025
Feasibility Study completed	May 2025
Environmental Impact Assessment decision (IAAC)	2026
Development and construction phases	**2026-2027**
Detailed engineering, applications for certificates of authorization, obtaining certificates and construction work (in phases)	2026-2027
Beginning of mining operations and start of mining processing	End of 2027
Operational phase (30-year operation)	**2027-October 2057**
Closure and restoration phase	**2057-2062**
Active Closure: Restoration, re-vegetation and environmental monitoring ; Water Treatment in used until water quality has reached guidance	2057-2062
Passive Closure: periodical monitoring	2062-2072 (minimum duration)

9 Potential Alternatives

9.1 Alternatives for carrying out the project

Alternative designs have been considered for several components of the project and these have been and will be part of a comparative technical, environmental, social, and economic analysis process in order to select the best alternatives for the project.

For example, the following variants, and possibly other options, could therefore be considered for the optimization of the project:

- **Development phases:** During mine site preparation, a temporary winter road from the Labrador coast, or other means of transportation during the winter period (i.e., winter airstrip), will be evaluated to transport materials and heavy equipment to site prior to the start of construction.
- **Construction phase:** For buildings and equipment, options based on the use of modules, containers or prefabricated sections will be considered given the constraints associated with climatic conditions and restrictions related to available modes of transport.
- **Operational mining phase (30-year operation):** Alternatives to the mining plan could be developed and analyzed as part of the feasibility study. Similarly, since the ore concentration processes on the mine site is currently being optimized, this work could lead to the development of new variants.
- **Closure and restoration:** The current closure concept is based on the premise that the site will need to be returned to the pre-project conditions, i.e., as a wildlife habitat allowing traditional activities (hunting, fishing, and gathering) to resume. Depending on the results of the consultations with the communities and government authorities, options related to the ultimate use of the territory could be considered, for example, leaving in place the airstrip or a portion of the roads that could be used for regional development purposes.

9.2 Project alternatives

There is no alternative or economically viable alternative to developing a mine site in order to extract the Strange Lake rare earth deposit. The current targeted mining plan significantly reduced (10 fold) the environmental footprint from previous prefeasibility study.

Torngat Metals aims to incorporate the environmental sensitive areas at the planning phase in order to minimize the impact on biophysical and social environments. The development of Strange Lake Mining Project will be achieved using alternatives technically and economically feasible.

Torngat Metal’s environmental management program, will be developed iteratively using the hierarchy of mitigation. The mitigation hierarchy is a tool or framework commonly used to anticipate and manage biodiversity risks and opportunities relating to a specific development project, which consist of the following steps:

1. Avoid the impacts;
2. Minimize the impacts:
3. Restore and rehabilitate impacts, and
4. Offset residual impacts

10 Engagement Activities and Plans

10.1 Information and Consultation Activities Carried Out

10.1.1 List of consultation activities carried out for the northern components of the Project

As part of the Strange Lake Project, Torngat Metals has presented the Project to various government stakeholders at the federal and provincial (Quebec and Newfoundland and Labrador) levels and to Indigenous governments (Nunavik and Nunatsiavut) since 2011. Several engagement activities have also been carried out with various stakeholders, mainly Indigenous groups from Quebec and Labrador (engagement activities carried out with Indigenous groups are presented in section 11 of this summary).

Engagement activities have also been carried out with some non-Indigenous stakeholders, such as government representatives, outfitters and businesses that may have an interest in participating in the Project, but most of the consultations with non-Indigenous communities and groups that may show an interest in the Project have not yet been initiated.

Table 10-1 provides a summary of government, and other stakeholder groups consulted to date, as well as their main comments.

Table 10-1: Government agencies and other stakeholders consulted since 2011

Type of consulting activities	Date	Stakeholders	Comments
Federal government Initial project presentation, follow-up meetings and communications, environmental assessment process	2011 – 2023 (ongoing)	– Bureau de gestion des grands projets (BGGP) – Representatives of the Canadian Environmental Assessment Agency (CEAA) / Impact Assessment Agency of Canada (IAAC) – Natural Resources Canada (NRCan) – Innovation, Science and Economic Development Canada – NSERC – Canadian Nuclear Safety Commission (CNSC) – Minister of Labour – Minister of Rural Economic Development – Atlantic Canada Opportunities Agency (ACOA) – Canada Infrastructure Bank	– Project seen as important for the Canadian Critical Minerals Strategy – Interest in understanding all the potential project benefits, including exploring potential strategic opportunities that the project could enable, e.g. foundation of rare earth industry and downstream supply chain; future opportunity for an access road to become a resource corridor and route for electricity transmission – Project seen as potentially meeting criteria of multiple funding programs

Table 10-1: Government agencies and other stakeholders consulted since 2011 (Cont'd)

Type of consulting activities	Date	Stakeholders	Comments
Quebec government Initial project presentation, follow-up meetings and communications, environmental assessment process	2011 – 2023 (ongoing)	– Division des mines du ministère des Ressources naturelles – Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs (MDDEFP) – Ministère de l'Environnement, de la lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP) – Secrétariat aux Affaires autochtones du Québec – Investissement Québec – Société du Plan Nord	– Project seen as important for the Quebec Plan for the Development of Critical and Strategic Minerals – Interest in understanding all the potential project benefits, including exploring potential strategic opportunities that the project could enable, e.g.foundation of rare earth industry and downstream supply chain – Project seen as potentially meeting criteria of multiple funding programs
Newfoundland and Labrador government Presentation of the proposed project; consultation plans; mobilization plans for Indigenous populations; environmental assessment process	2011 – 2023 (ongoing)	– Premier of Newfoundland and Labrador – Minister, Deputy Minister, Assistant Deputy Minister of Industry, Energy and Technology responsible for Mining and Mineral Development – Minister, Deputy Minister, Assistant Deputy Minister, and Director of the Department of Indigenous Affairs and Reconciliation; Labrador Affairs; Assistant Parliamentary Leader; Secretariat of Labrador Affairs – Executive Council – Director of Environmental Assessment and officials from the Department of Environment and Climate Change	– Project seen as important, and to have input into the Province's critical minerals strategy in development
Other stakeholders	2014 – 2023 (ongoing)	– Outfitters – Businesses interested in participating in the Project including Labrador North Chamber of Commerce, Indigenous business groups – Quebec Mineral Exploration Association (QMEA) – Other mining and metallurgical companies – Several universities and colleges, e.g. College of North Atlantic (CNA) – Building Trades Council – Senator of Newfoundland and Labrador; Chairman of the Fisheries and Oceans Committee – Newfoundland and Labrador Hydro	– Employment opportunities – Indigenous employment – Business and procurement – Innovation in mining (CNA) – Industrial participation in research projects – Opportunity to assess core samples (CNA) – Access to and availability of electricity

10.1.2 List of consultation activities carried out for the process plant

Consultation activities were carried out as part of the site selection process for the high purity rare earth processing and separation plant. Three potential sites were initially identified in the industrial port zones of Sept-Îles, Baie-Comeau and Saguenay. Meetings have been held with the relevant authorities between November 2022 and mid-2023, which allowed for onsite meetings with site managers, local and administrative authorities in each region. Preliminary contacts were also made with some Indigenous representatives of Sept-Îles area, although not exhaustive at this early stage. After a comparative evaluation of the sites, it was decided to concentrate efforts on two sites, namely Sept-Îles and Saguenay, and the discussions continue with the stakeholders. In July of 2023 several meetings were held with representatives, Sept-Îles was designated as the preferred site. Discussions with the local authorities are underway in order to sign a letter of understanding in order to negotiate terms. An engagement program will also be developed and carried out.

Table 10-2: Government agencies and other stakeholders consulted since 2022 in relation with the implementation of a process plant

Type of consulting activities	Date	Stakeholders	Comments
Quebec government Initial project presentation, site selection, follow-up meetings and communications	November 2022 – mid-2023 (ongoing)	– Investissement Québec – Société du Plan Nord – Division des mines du ministère des Ressources naturelles	– Project seen as important for the Quebec Plan for the Development of Critical and Strategic Minerals – Interest in understanding all the potential project benefits, including exploring potential strategic opportunities that the project could enable, e.g.foundation of rare earth industry and downstream supply chain – Project seen as potentially meeting criteria of multiple funding programs
Local stakeholders – Sept-Îles Initial project presentation, site selection, follow-up meetings and communications	December 2022 – mid-2023 (ongoing)	– Développement Économique Sept-îles – Port de Sept-Îles – City Council of Sept-Îles – Chamber of commerce – Société de Développement Économique de Uashat Mak Mani-utenam (SDEUM)	– Project is seen as potentially providing the type of significant economic development opportunity to meet their needs, as long as environmental and social concerns are addressed
Local stakeholders – Baie-Comeau Initial project presentation, site selection, follow-up meetings and communications	December 2022 and February 2023	– Innovation et développement Manicouagan (CLD) – Corporation de gestion du port de Baie-Comeau (CGPBC) – Ville de Baie-Comeau	
Local stakeholders – Saguenay Initial project presentation, site selection, follow-up meetings and communications	November 2022 – mid-2023.	– Promotion Saguenay – Administration Portuaire du Saguenay	– Project is seen as potentially providing the type of significant economic development opportunity to meet their needs, as long as environmental and social concerns are addressed

From mid-2023, consultation activities will take place with both Indigenous and non-Indigenous people in the region of Sept-Îles, as part of the federal and provincial environmental impact assessment procedures.

10.2 Planned Information and Consultation Activities during the Conduct of the Environmental and Social Impact Study

As part of the environmental and social impact study, Torngat Metals plans to conduct new information and consultation activities with institutional stakeholders, communities, non-governmental groups or associations, and other stakeholders affected by the project.

Without limitation, Torngat Metals plans to carry out the following activities:

- Consultation with government ministries and agencies to obtain basic data for conducting studies on the physical, biological, and social environment.
- Consultation with non-Indigenous communities, such as Schefferville, Fermont, Labrador West, Goose Bay, Sept-Îles, that combines various techniques: village assemblies, interviews with target groups (territorial users, elders, youth, men, women), individual interviews with key stakeholders within communities (local administration services).
- Consultation with other key stakeholders such as environmental groups, chambers of commerce, citizens associations, outfitters and other stakeholders still to be identified to integrate their expectations and concerns into the Project.
- Establishment of consultation and grievance mechanisms allowing members of communities to express their questions and views online.

All results of these consultation activities will be recorded in the stakeholder management system developed by Torngat Metals as part of the project.

11 Engagement Activities and Plans with Indigenous Groups

11.1 Information and Consultation Activities Carried Out

11.1.1 List of consultation activities carried out for the northern components of the Project

Torngat Metals (previously Quest Rare Minerals) initiated informal meetings with Indigenous representatives from Nunavik and Labrador as early as 2008. Beginning in 2011, a series of more formal meetings was organized with key Indigenous communities, including follow-up meetings following changes in authorities. Between 2015 and 2021, due to a decrease in its corporate activities, engagement activities with stakeholders were reduced by keeping them informed of updates on the project.

Since 2022, thanks to new funding, Torngat Metals has restarted its formal consultation activities with the various government and Indigenous groups. Meetings have been held with elected representatives, leaders and officials from the Nunatsiavut Assembly and the Innu Nation of Labrador in Ottawa in February 2023. Meetings were also held February in Kuujjuaq with the Makivik Corporation, the Kativik Regional Administration, and the Kuujjuaq City Hall. A Community assembly was also held in February 2023 in Kangiqsualujjuaq. In April, May and June 2023, in-person and virtual meetings were held with representatives of the Nunavik and Nunatsiavut Inuit, the Innu Nation of Labrador, the Naskapi Nation of Kawawachikamach, and the Innu of Matimekush-Lac-John in their respective communities.

Since Spring 2023, stakeholders and partners have access to a web platform providing project maps, database and reports.

The consulted Indigenous groups are as follows:

In Quebec

- The Nunavik Inuit, including the Makivik Corporation, the Kativik Regional Government, as well as the northern communities and land corporations of Kangiqsualujjuaq and Kuujjuaq.
- The Naskapi Nation of Kawawachikamach.
- The Innu communities of Matimekush-Lac John and Uashat mak Mani-Utenam.

In Labrador

- The Nunatsiavut Inuit, including representatives of the Nunatsiavut Government legislative assembly, the Nunatsiavut Group of Companies, and the community of Nain, and various officials
- The Labrador Innu, including the Innu Nation of Labrador political representative, as well as the communities of Sheshatshiu and Natuashish, and various officials.

The consultation activities that have been carried out since 2011 have, among other things, made it possible to collect essential information for the impact study, particularly regarding the historical and contemporary use of the territories affected by the Project, as well as the socio-economic conditions of the communities. These activities have also made it possible to identify their expectations and concerns related to the Project, the overall concerns expressed by most communities being: the preservation of the water quality of the George River and its tributaries; the protection of caribou and valued species that are part of the diet of the populations; economic benefits that promote sustainable development of the communities concerned; access to relevant information related to the Project; and effective participation of communities in the development of the Project.

Caribou Working Group

More specifically, early in the engagement process with the Naskapi Nation of Kawawachikamach in spring 2023, and prior to AECOM's field surveys, Torngat Metals put in place a Caribou Working Group in collaboration with the nation. The purpose of those meetings is to review together the methodology of the different field work happening on the territory and to put in place mechanisms to avoid impacting the herd of George River caribous during those activities. Torngat Metals put in place as well as an interactive map of all accidental observation of caribous by the field workers on a shared web platform. The link to the map and a PDF version is sent to all the communities in Quebec and Labrador once to several times a week as soon as the field workers observe the presence of caribous. Those activities allowed to put in place in collaboration with different Indigenous groups some mitigation solution when observing caribous.

Table 11-1 provides a summary of the consultation activities conducted with Indigenous groups to date, as well as their main comments.

Table 11-1: Government agencies, Indigenous groups, and other stakeholders consulted since 2011 in Quebec and Labrador

Type of consulting activities	Date	Indigenous entities	Comments
Nunavik Inuit (Quebec) – Baseline studies on socio-economic aspects and traditional land use, information meetings and community engagement process, environmental assessment process	2012 – 2015	– Makivik Corporation – Nunavik Mining Exploration Fund (FEMN) – Kativik Regional Administration (ARK) – Municipal authorities of Kuujjuaq and Kangiqsualujjuaq – Landholding Corporations of Kuujjuaq and Kangiqsualujjuaq – ARK Sustainable Employment Service – Representatives from the Employment Sector of the Northern Communities of Kangiqsualujjuaq – Regional and local development service of ARK – School principals in Kuujjuaq and Kangiqsualujjuaq Representatives from Health Centres in Kuujjuaq and Kangiqsualujjuaq	– Expectations in terms of business opportunities for registered Inuit businesses – Concerns regarding the environmental protection, notably the water quality and fishes of the George river – Concerns on the protection of the Inuit diet and way of life – Expectations on potential Impact and Benefits Agreement (IBA) – Expectations on training and job opportunities
Nunavik Inuit (Quebec) – Baseline studies on socio-economic aspects and traditional land use, information meetings and community engagement process, environmental assessment process	2023 (ongoing)	– Municipal authorities of Kuujjuaq and Kangiqsualujjuaq – Landholding Corporations of Kuujjuaq and Kangiqsualujjuaq – Community meetings with elders and land users in Kangiqsualujjuaq – Nunavik Research Center	– Expectations in terms of business opportunities for registered Inuit businesses – Concerns regarding the environmental protection, notably the water quality and fishes of the George River – Concerns on the protection of the Inuit diet and way of life – Concerns regarding the radioactivity level and the potential contamination of the environment – Expectations on potential Impact and Benefits Agreement (IBA) – Expectations on training and job opportunities – Expectations regarding the Inuit participation in the decision making and the environmental monitoring of the Project – Expectations on potential Impact and Benefits Agreement (IBA)

Table 11-1: Government agencies, Indigenous groups, and other stakeholders consulted since 2011 in Quebec and Labrador (Cont'd)

Type of consulting activities	Date	Indigenous entities	Comments
Naskapi Nation of Kawawachikamach – Baseline studies on socio-economic aspects and traditional land use, information meetings and community engagement process	2011 – 2015	– Leaders of the Naskapi Nation Council of Kawawachikamach – Elders, land users and community members of Kawawachikamach (through a public meeting) – Public Works Department – Naskapi Nation Bureau – Naskapi Development Corporation – Naskapi Police Services	– Expectations in terms of job and business opportunities – Concerns regarding the environmental protection, notably the caribou – Expectations on potential Impact and Benefits Agreement (IBA)
Naskapi Nation of Kawawachikamach – Baseline studies on socio-economic aspects and traditional land use, information meetings and community engagement process	2023 (ongoing)	– Leaders of the Naskapi Nation Council of Kawawachikamach – Elders, land users and community members of Kawawachikamach (through a public meeting) –	– Expectations in terms of job and business opportunities – Concerns regarding the environmental protection, notably the caribou – Expectations on recognition of Naskapi interests in Labrador – Expectations on potential pre development agreement (PDA) and Impact and Benefits Agreement (IBA) – Expectation to realize their own environmental studies – Expectations regarding the Naskapi participation in the decision making and the environmental monitoring of the Project
Quebec Innu– Information meetings and community engagement process	2012 – 2015	– Matimekush-Lac John First Nation Council – Aventures Ashini – Friends of Mushuau-Nipi	– Expectations on recognition of Innu rights and interests in the project's area – Concerns about the mining practices in the region over the past decades
Quebec Innu – Information meetings and community engagement process	2023 (ongoing)	– Matimekush-Lac John First Nation Council	– Expectations on recognition of Innu rights and interests in the project's area – Concerns about the mining practices in the region over the past decades – Expectations to build a strong partnership in terms of equity
Nunatsiavut Inuit (Labrador) – Baseline studies on socio-economic aspects and traditional land use, information meetings and community engagement process, environmental assessment process	2011 – 2015	– Nunatsiavut government leaders and ministers – Nunatsiavut Secretariat – Nunatsiavut Department of Land and Natural Resources – Nunatsiavut Department of Education and Economic Development – Nunatsiavut Department of Health and Social Development – Nunatsiavut Department of Culture and Tourism – Nunatsiavut Affairs Department – Representatives from the Inuit community government of Nain – Community meetings with elders and members of the Inuit community of Nunatsiavut in Nain	– Realization of their own land use study in collaboration with the Project – Concerns regarding the impacts on the Ikadlivik brook valley and its resources, notably the char – Concerns regarding the impacts of the projected road on the caribou – Expectations on business opportunities for the Inuit enterprises – Expectations on potential Impact and Benefits Agreement (IBA) – The Voisey's agreement to be seen as a model

Table 11-1: Government agencies, Indigenous groups, and other stakeholders consulted since 2011 in Quebec and Labrador (Cont'd)

Type of consulting activities	Date	Indigenous entities	Comments
Nunatsiavut Inuit – Introduction of revised plans (since Quest); environmental assessment process and expectations; updated information on traditional land use; engagement process; port options in Voisey's Bay; sensitivities to char and caribou; opportunities for business, employment and public markets	2023 (ongoing)	– President, Ministers of Education and Economic Development; Language, Culture and Tourism; and Lands and Natural Resources, – Deputy Ministers and officials of Nunatsiavut Secretariat; Education and Economic Development; Language, Culture and Tourism; Lands and Natural Resources, – Nunatsiavut Group of Companies	– Expectation to update their land use study – Expectations for a consultation of the 5 Inuit communities – Concerns regarding the impacts on the Ikadlivik brook valley and its resources, notably the char – Concerns regarding the impacts of the projected road on the caribou – Expectations on business opportunities for the Inuit enterprises – Expectations on potential Impact and Benefits Agreement (IBA) – The Voisey's agreement to be seen as a model – Concerns about the level of radioactivity and the environment contamination – Interest to take charge of the proposed road maintenance
Innu Nation of Labrador – Baseline studies on socio-economic aspects and traditional land use, information meetings and community engagement process	2012 – 2015	– Leaders of the Innu Nation of Labrador – Innu Development Limited Partnership (IDLP) – Innu Mikun – Mushuau Innu Band Council of Natuashish and Sheshashiu Innu Band Council – Environment office of Innu Nation – Economic Development Advisors for the Mushuau and Sheshashiu Innu First Nations – Sheshatshiu Innu First Nation's Community Health Department – Community meetings with land users and other members of the Natuashish and Sheshashiu communities	– Expectations to be a partner in the construction and the maintenance of the proposed road – Expectations of business opportunities for Innu companies – Concerns on the potential impacts of the proposed road on caribou – Expectations on recognition of Innu interests in Quebec – Expectations on potential Impact and Benefits Agreement (IBA)
Innu Nation of Labrador – Plans for the Voisey's Bay port; road design; overlap of Indigenous land claims; business, supply and employment opportunities for Labrador Innu; expectations for business participation; consultation plans for Innu communities	2023 (ongoing)	– Grand Chief of the Innu Nation of Labrador – IBA negotiators – Environmental Management and Analysis Branch of the Environment department – Land Rights Negotiator – Key Advisors	– Expectations of business opportunities for Innu companies – Concerns on the potential impacts of the proposed road on caribou – Expectations on potential Impact and Benefits Agreement (IBA)

With regard to the High purity rare earth processing and separation plant in Sept-Îles, preliminary contacts with the Innu of Uashat mak Mani-utenam were made during site visits in 2023. An Indigenous engagement program will be developed and carried out starting in the fall of 2023.

11.2 Planned Information and Consultation Activities with Indigenous groups during the Conduct of the Environmental and Social Impact Study

As part of the environmental and social impact study, Torngat Metals plans to conduct new information and consultation activities with the Indigenous authorities and communities affected by the project.

Without limitation, Torngat Metals plans to carry out the following activities:

- Consultation activities to obtain basic data for conducting studies on the physical, biological, and social environment as well as to the preferred endland use and closure vision.
- A consultation program that combines various techniques: village assemblies, interviews with target groups (territorial users, elders, youth, men, women), individual interviews with key stakeholders within communities (local administration services).
- A program of periodic visits to Indigenous communities concerned to inform them of project updates and opportunities.
- Diffusion of a set of information tools culturally adapted, in Indigenous language, developed in collaboration with the Indigenous groups.
- Establishment and collaboration with local monitoring committees and local liaison officers (in the main communities affected (Kangiqsualujjuaq and Kawawachikamach in Quebec, and Nain and Natuashish in Labrador) on the main issues raised by the project.
- Establishment of consultation and grievance mechanisms allowing members of communities to express their questions and views online.
- Translation services will be provided at public meetings, as well as document translation to provide access to information to all.

All results of these consultation activities will be recorded in the stakeholder management system developed by Torngat Metals as part of the project.

12 Biophysical Environment Description

The description of the biophysical environment takes into account the data acquired during the 2011-2014 baseline studies, i.e. as part of the last pre-feasibility study. This data will be updated according to the most up-to-date gouvernmental protocols and best pratices. The updated data will comply with the current regulatory and legislative frameworks.

For the 2023-2024 biophysical workplans, governmental departments of Québec (Ministère de l'Environnement, de la Lutte aux changements climatiques, Faune et Parcs, MELCCFP), Federal, NG and NL have been and will be contacted in order to assemble proper information on best timing for fieldwork assessments and inventories, such as for migratory birds, caribou, Arctic char, and Indigenous land and resources uses.

At the time of writing this document (August 2023), engagement activities and data acquisition have started for wildlife (birds, water quality and water crossing fish habitat characterization along the access road in Québec), and more surveys will be conducted in 2023-2024 for other components. A gap analysis was conducted in order to comprehensively address each component and identify gaps from the baseline studies that were elaborated between 2011 and 2014. Data acquisition will continue throughout 2023 and 2024 in order to elaborate new baseline studies and align with the Feasibility Study report to be produced. The acquired data will also be incorporated into the detailed project description, and in the EIA for the Project.

12.1 Physical environment

12.1.1 Climate

The northern components of the Stange Lake Project are located in the Taiga ecozone of the Canadian Shield (ecozone 05), more specifically in the Kingurutik and Fraser Rivers ecoregion (05.3.077). Northern Quebec and Labrador are characterized by a cold subarctic climate zone with long, cold winters with heavy snowfall and short, cool summers. The average daily temperatures rise above freezing only from May to September, and during the winter months, temperatures can drop as low as -45°C. The minimum average annual temperature is -10°C, and the maximum is 0°C. Snow and ice cover freshwater bodies for six to eight months per year. Due to low evapotranspiration rates, the terrain becomes waterlogged in several areas during the summer months. The production of 1991-2020 climate normal is currently underway and will be published in the next months.

The process plant in Sept Iles is located in the Boreal Shield ecozone of the Canadian Shield (ecozone 06), more specifically in the Central Laurentian ecoregion (06.3.101). Northern Quebec is characterized by a cold subarctic climate zone with long, cold winters with heavy snowfall and short, cool summers. The minimum average annual temperature is -3.6°C, and the maximum is 5.6°C. Snow covers the lands for seven months per year.

12.1.2 Ambient air quality

All material shipped using the road will be containerised, there will be no bulk shipping, thus reducing the potential for air pollution.

No concerns were raised with regards to the port vicinity, based upon 1995-1997 Environmental Studies for TSP, dustfall, SO_2, and NO_2 - prior to the Voisey's Bay Mine Project. The *2021 Ambient Air Monitoring Report*[3] (Newfoundland Labrador) refers to air monitoring stations in Voisey's Bay. These stations were installed at three locations to monitor mining, processing, and port activities.

[3] https://www.gov.nl.ca/ecc/files/2021-Air-Quality-Annual-Report.pdf

An air quality study[4] was published by the MELCCFP in 2010 in which they reviewed Sept-Îles historical Air Quality data and conducted air sampling over a year. The study concluded that the air quality was influenced by the mining and metallurgy industries. On an annual basis, the Sept-Îles air quality was comparable to typical urban or suburban environments.

12.1.3 Ambient noise level

A background noise study was conducted by AECOM and published in December 2012, in the document *Strange Lake B-Zone – Physical Environment Baseline Surveys – Background Noise Study, 2011* (AECOM, 2012a). The maximum hourly ambient sound levels (LAeq 1h) at the monitoring site were 37.7 dBA during the day and 31.5 dBA at night. These values are below the most stringent noise criteria (45 dBA-day, 40 dBA-night) set out in the mining industry Directive 019 for the Province of Quebec. No baseline noise monitoring was undertaken in Labrador representative of locations near the planned access road between sites. Background noise in the Road's valley segment may be different compared to the plateau due to the presence of tree/wind interaction in the valley, and presence of a large water body in the plateau area.

No background noise study has been conducted for this site and the surrounding areas. It is recommended that the future noise baseline study consider sufficient noise monitoring locations to accurately capture current background noise levels for the larger expected study areas, particularly at any potential noise sensitive locations of concern based on stakeholder consultation.

No background noise study is currently available for the Sept-Îles site and the surrounding areas. The consideration of noise and vibration effects on the surrounding environment is addressed by Quebec's Directive 019 (MDDEP, 2012) and by Sept-Îles's zoning regulations n^{o}2007-103 (Ville de Sept-Îles, 2007). It is recommended that the future noise baseline study considers sufficient noise monitoring locations to accurately capture current background noise levels for the larger expected study areas, particularly at any potential noise sensitive locations of concern based on stakeholder consultation.

12.1.4 Geology

The Strange Lake rare earth deposit is located in the Churchill geological province, which is exposed in northeastern Quebec. The Southeast Churchill Province (SECP) straddles the border between Quebec and Labrador. It is bordered to the west by the Superior Province, to the east by the Nain (part of the North Atlantic Craton and the Burwell lithotectonic domain) and Makkovik provinces, and to the south by the Grenville Province. The study area is located in the central-eastern part of the Mistinibi-Raude Domain (MRNF, 2020). This domain has a generally north-south orientation and spans approximately 290 km in length and 30 to 70 km in width. It is characterized by a significant proportion of intrusive rocks. The Lake Brisson Pluton (The Strange Lake Peralkaline Complex, also known as the Strange Lake Alkaline Complex, which is associated with the deposit), stands out slightly from other intrusions due to its younger ages (1240 Ma) (MRNF, 2023; Charette *et al.*, 2019). It is important to note that the name "Lac Strange" or "Strange Lake" is often used to refer to the mineralized zones and the mining property in general. Seasonal road and existing port facility

The road will cross The Southeastern Churchill Province as well as the Nain Province before arriving at Edward's cove in the Anaktalak bay. The general bedrock geology along the road is mostly Paleoproterozoic to Mesoproterozoic. Principal rocks are metamorphic (gneisses, migmatite) and igneous (granite, granodiorite and granitoid). Numerous remnant glacial features are present at the surface.

The closest seismographs from the mine site, road and port are situated in Nain (NINL station), Schefferville (SCHQ station) and Kuujjuaq (KUQ station). Although earthquakes might occur throughout Canada, the region, both in the Quebec and Labrador province is not known for high seismic activity[5]. Since 1994, in a 300 km radius from Edward's cove, 79 seismic events occurred, the majority being in the Labrador Sea.

[4] https://www.environnement.gouv.qc.ca/air/sept-iles/rapport2009.pdf
[5] Earthquakes Canada - https://www.seismescanada.rncan.gc.ca/zones/eastcan-en.php - consulted 07/10/2023

The region of Sept-Îles is situated in the Grenville Province. The general bedrock geology is mostly Cambrian to Paleoproterozoic/Mesoproterozoic. Principal rocks are metamorphic (gneisses, migmatite) and igneous (anorthosite, gabbro, nelsonite, dunite).

Sept-Îles is located in the Lower St. Lawrence Seismic zone (LSZ), also referred as "Lower-St. Lawrence-Quebec North Shore" which is a seismically active region of eastern Canada. While the region is active, no large earthquake has been reported or recorded. On average about 60 events are recorded annually. The regions is monitored by several seismograph: Ste-Marguerite (SMQ station), Islets-Caribou (ICQ station), Manicouagan (MNQ station), Cote-Nord (CNOQ station), Sainte-Felicite (SNFQ station), Port-Meunier Anticosti (PMAQ station).

Since 1985, in a 300 km radius from Sept-Îles, more than 2000 events occurred, the majority being in the St. Lawrence River. The great majority of those events were less than magnitude 4. The most recent events that was more than magnitude 4 was on June 23, 1999. It was an earthquake of magnitude 5.1 occurring about 60 km south of Sept-Îles.

12.1.5 Surface geology, geomorphology, and permafrost

The basic conditions regarding surface geology, geomorphology, and permafrost have been assessed and described based on existing data, a field survey conducted in 2011, and the examination and interpretation of available aerial photos, including a high-resolution orthophotography (with a ground resolution of 15 to 25 cm) covering the mine area, produced in September 2012. The following paragraphs summarize the information obtained within the scope of this survey.

The Strange Lake region is characterized by a rocky plateau with a gentle slope towards the lowlands of Ungava Bay. This plateau has an average elevation of 460 m and is traversed by the George River. The regional morphology is controlled by different glacial phases, as well as the Naskaupi glacial dam lake (Dubé-Loubert *et al.*, 2016). The entire study area was covered by the Laurentide Ice Sheet during the last glaciation. The mine site is covered by a thick layer of glacial deposits consisting of basal till overlain by ablation till. The till has a grayish matrix composed of silt and sand with some clay and contains centimeter to millimeter-sized clasts (Dubé-Loubert *et al.*, 2016). This region is characterized by the presence of several typical glacial landforms oriented east-northeast/west-southwest, parallel to the glacial flow: roche moutonnée (asymmetric bedrock bumps or hills), drumlins, and crag and tail formations. Rogen moraines are also found, which appear as till ridges arranged perpendicular to the glacier flow. A thin layer of organic material generally covers the till. Surface drainage is poor on the till, especially in depressions between the drumlinoid ridges. Glaciers have also left behind fluvio-glacial deposits forming wide, visible bands in the study area. The presence of kames and kettles, as well as eskers forming long sinuous ridges in the landscape, is typical of this region. The thickness of the eskers varies between 5 and 25 m (Micon, 2019). They are generally composed of fluvio-glacial sands and gravels with some embedded cobbles. A glacial dispersal train over 40 kilometers long downstream of the deposit can also be observed (Dubé-Loubert *et al*., 2016).

The process plant in Sept-Îles will be located in an area designated for industrial usage. According to Dredge (1971), the region of Sept-Iles can be divided into two major physiographic units, the Laurentian foreland and the Champlain plain. A well-defined escarpment, about 65 metres high, separates the two zones. The upland is a prominent chain of low hills, having a mean elevation of about 150 metres. Large quantities of sandy till and out-wash were deposited by glaciers which over-rode the area. These sediments have infilled former valleys and hillsides, producing a surface of subdued relief. The lower surface is a sand and clay plain built by recent coastal processes. Although elevations range from 0 to 60 metres, the region is almost fIat; most of the relief is taken up as small scarps associated with strandlines and river terraces which mark positions of former sea levels.

12.1.5.1 Permafrost

The mine site is located in a discontinuous permafrost zone where the ground remains permanently frozen beneath the surface on at least 50% of the land area. Several landforms typically associated with the presence of permafrost are present in the study area. These include extensive frost boils, polygonal ground areas, cryogenic mounds, and thermokarst lakes. The presence of some of these thermokarst lakes suggests that permafrost degradation is occurring locally within the project area. The thermal regime of the soil is dynamic and sensitive to changes that affect soil properties, surface cover (including snow), climate, and groundwater. Recent studies have shown that the thickness of the active layer appears to be deepening due to climate change.

Along the road, the plateau region corresponds to a zone of extensive discontinuous permafrost, the Ikadlivik valley has sporadic permafrost.

Torngat Metals will complete an evaluation of the permafrost in accordance with the procedures contained in Canadian Standards Association published CSA 4011, “Infrastructure in Permafrost: A Guideline for Climate Change”. The document describes the nature of permafrost, trends in climate change, foundation systems for community infrastructure, and presents a process for ensuring climate change is incorporated into design and location decisions.

There is no permafrost in Sept Iles and as such, Sept-Îles is excluded from this evaluation.

12.1.5.2 Fluvial Geomorphology and Hydrology

Water is omnipresent in the northern Quebec landscape. The mine site is characterized by the presence of lakes, wetlands, and tributaries that drain the area over impermeable frozen substrates, dense basal till, or shallow till to bedrock. Approximately 80% of the mine site's area drains towards Lake Brisson, which waters, after flowing through Lake Napeu Kainiut, discharge into the Deat River watershed and ultimately leads to the George River (approximately 100 km downstream). Besides the Napeu Kainuit watershed at the mine site (Déat River), the Kogaluk River, the Konrad Brook, the Ikadlivik Brook, the Reid Brook and Little Reid Brook watersheds are the watersheds along the road corridor in Labrador and LIL.

The road corridor plans to cross three main water crossings (1 bridge and 2 arch culverts), associated with three main watersheds, namely from west to east: in the Kogaluk River, in the Ikadlivik Brook, and in Reid Pond. Waters are also characterized with low buffering capacity. Culverts of lesser dimensions would be installed to cross the remaining smaller intermittent and permanent streams. The dominant watercourse substrate type is coarse; with erosion-sensitive materials surrounding about one third of the water crossings.

The process plant in Sept-Iles will be located in an approved industrial site where there is minimal impacts on the surrounding environment. However, a small creek does cross the proposed area of the plant. A complete investigation of the site will be completed in the summer of 2024.

12.1.6 Hydrogeology

An assessment of groundwater conditions was conducted at the mine site in 2011 and 2012 (AECOM, 2013b). Based on observations from borehole logs and permeability tests, three hydrostratigraphic units have been identified:

- An undifferentiated till overburden, with poor aquifer potential, is present in the till and is the primary hydrogeological unit covering the Site. The groundwater elevation is typically within 1 - 2 m of the surface.
- The esker aquifer is composed of well sorted, coarse-grained sediments. The hydraulic conductivity of the esker aquifer is high. Groundwater elevations are 5 – 10 m below surface. The esker aquifer represents a potential source of potable water but should be further evaluated for quality and yield prior to use.
- A fractured bedrock aquifer is present beneath the site. The hydraulic conductivity of the bedrock is moderate to low. Groundwater elevations are typically within 1 or 2 m below the ground surface.

The vertical hydraulic gradient appears to be upward, from bedrock to the surficial deposits. The upward vertical gradient is most pronounced in the slope area of the B-Zone ore body and the esker.

Groundwater characterization in 2011 involved groundwater sampling from 14 monitoring wells while the 2012 groundwater characterization has involved the sampling of 25 monitoring wells. The pH varied between 5.3 and 7.3. Electrical conductivities are low to very low, which can be expected in water with very low to low dissolved solids content. The total alkalinity varied from <1 to 89 mg/l, which is low to very low. The total hardness was in the range of 10 to 410 mg/l. Considering the conductivity, total alkalinity and total hardness, the groundwater would be classified as soft to very soft. The results indicates that the natural groundwater is already exceeding certain recommended Quebec limits for groundwater discharge to surface water. Radionuclides and rare earth elements were detected in most samples, which tends to confirm that the B-Zone ore body influences the groundwater quality in the downgradient in terms of groundwater flow from the mineralized zone.

12.1.7 Hydrology and Water Management

From the 2011-2012 baseline (AECOM, 2012b), the hydrology and watersheds are known and are unchanged as no modification was made to drainage since then. The Québec-Labrador border is delineated following the drainage basins/ watersheds. From the outlet of Lake Brisson, water flows into the Deat River and eventually the George River, after running through a string of lakes for a total of 103 km. The George River is a large river that flows northwards up to the Ungava Bay (Arctic). At the Mine Site, the hydrological network is comprised of 19 sub watersheds, eight of which drains into Lake Brisson. These eight sub watersheds cover a total area of 18 km^2 (27% of the project area), of which 4.5 km^2 drain directly into the Lake Brisson. The other 11 sub watersheds flow either towards Labrador or Lake Napeu Kainiut, directly south of the Mine Site. Thus, approximately 80% of the Mine Site (51.3 km^2) is located in the northeastern part of the Deat River watershed (Québec) and the remaining part (12.1 km^2) drains into the Notakwanon watershed (Labrador). Taken together, these sub watersheds create a multi-basin pattern due to numerous surface depressions. Indeed, more than 90 small lakes or depressions are found in the project study area. Two types of oligotrophic lakes are common in this region: small, shallow, irregular ponds which occupy hollows eroded in the bedrock; and larger rock-basin lakes created by damming that resulted from natural accumulations (AECOM, 2012b).

The Road Corridor is located between the Strange Lake B-Zone Deposit in Québec and Anaktalak Bay on the coast of Labrador. From 2011-2012 baseline (AECOM, 2012b), the hydrology and watersheds are known and are unchanged as no modification was made to drainage since then. The main rivers flowing easterly in Labrador are the Kogaluk River, Kogluktokoluk Brook, Ikadlivik Brook, Reid Brook and Little Reid Brook. Ikadlivik Brook is a tributary of Kogluktokoluk Brook, which empties into the head of Voisey's Bay. Reid Brook's mouth empties at the same location as the Kogluktokoluk River and is normally considered as an extended tributary of the Kogluktokoluk–Ikadlivik River system. Reid Brook flows into Voisey's Bay while Little Reid Brook flows into Anaktalak Bay.

The process plant in Sept-Îles will be located in an area designated for industrial usage. A hydrological analysis will be conducted to the site in order to characterize the hydrological portrait of the study area as well as the delimitation of the watersheds and the drainage network. At the project current stage of development, the characteristics and discharge point of the plant effluent are not yet known. A mining effluent plume modeling will be conducted in the receiving waters should an effluent is discharged from the plant into the Bay of Sept-Îles, in order to assess the dilution rates accordingly to the provincial and federal environmental standards.

12.1.8 Limnology

Limnology within the region and the entire study area, e.g. in northern Quebec (mine site) and along the road corridor in Labrador and LIL is typically characterized by oligotrophic conditions, which refers to waters with low nutrient input and low biological productivity. This is the case for the two main lakes at the mine site, Lake Brisson and Lake Napeu Kainiut. Despite being fed by several small lakes, ponds, and streams, some of which are intermittent, these oligotrophic conditions have been documented through various laboratory analyses of water samples in 2011-2012, as well as *in situ* measurements of certain surface water quality parameters. Similar results occurred while sampling at the three main water crossings (WC) along the road corridor.

The process plant in Sept-Îles includes overlapping to the drainage of the Au Foin River, which is a tributary of the Baie des Sept-Îles. The Baie des Sept-Îles is recognized as a high ecological value ecosystem, where tributaries such as the Au Foin River provide freshwater with varying feeding resources and minerals. The presence of filamentous algae is reported along with the rainbow trout egg retention for the Au Foin River, of a total watershed of 562 m^2, which is a sign of eutrophication within the watershed (OBV Duplessis, 2021).

12.1.9 Surface water quality

Surface water quality was monitored in 2011 and 2012 at a total of 23 sampling stations located throughout the mine site to account for the spatial variability of different water bodies in the study area. In order to have results that are comparable to guidelines, limits of detection (RDL) from the laboratory were requested to be lower than the criteria. Parameters included metals and metalloids, rare earth elements (REE) and associated minerals, radioisotopes, nutrients and trophic status indicators, and hydrocarbons. To account for temporal trends, water quality data was acquired for four seasons, including winter, and showed relatively low concentrations of metals, radioisotopes, nutrients, and other elements across the study area.

The 2011-2012 datasets are considered historical reference baseline data, and water quality values exceeding guideline concentrations will be highlighted but will not be considered representative of exposure conditions. The results indicate some seasonal and interannual variability for key parameters such as pH. Along the road corridor, surface water quality was addressed while sampling at the three main water crossings. Aluminium (Al) and iron (Fe) were the metals most frequently exceeding provincial and federal guidelines (MDDEP, CCME, 2012). More precisely, for the Mine Site, the results indicate low alkalinity values, which when considered in addition to low conductivity, low calcium and low sulfate values all suggest slightly acid water bodies with low buffer capacity to resist to pH variations. For the ecosystem trophic status, measurements indicated a relatively low concentration of nutrients with low organic production (low total phosphorus, chlorophyll *a*, nitrates, nitrites, nitrogen, ammonia and dissolved organic carbon), high dissolved oxygen concentrations, low turbidity, and low total dissolved solids. Most trace metals within the study area had naturally low concentrations. However, trace metals that were frequently occurring at levels exceeding either provincial and/or CCME guidelines were the aluminium (Al) and iron (Fe). Other exceedances of guidelines concerned: beryllium (Be), copper (Cu), lead (Pb), and zinc (Zn). Rare earth elements (REEs) and associated minerals (Be, Nb, U, Th, Zr): all stations had concentration levels below the RDL for the various REEs, except for one measurable value of yttrium (Y) (0.0071 mg/L). In terms of associated minerals, niobium (Nb), thorium (Th), zirconium (Zr), and uranium (U) were not detected at their reported detection limits (RDLs). Only beryllium (Be) was reported at detectable concentrations in surface waters. Radioisotopes were investigated in streams and in lacustrine stations of Lake Brisson. The station closest to the deposit had a measurable value for both radioisotopes (Ra-226, Th-228) in surface waters in 2011. In 2012, Th-228 and U-234 were detected in surface waters at each station. Th-230 and Ra-226 were detected at two stations.

Along the road corridor, results are based on three sampling completed in 2012 to account for seasonality. Low concentration of nutrients (nitrates, nitrites, total Kjedahl nitrogen, total phosphorus) with low organic production as they were either slightly above detection for dissolved organic carbon or were not detected at their reported detection limits (RDL). These indicators of low nutrient inputs when considered in addition to low alkalinity, low mineral content (conductivity), low hardness reflecting low concentrations of calcium (Ca) and magnesium (Mg), high dissolved oxygen concentrations, low turbidity, and low total dissolved solids all indicate oligotrophic conditions. In terms of trace metals in surface water, none was reported in exceedance of the guidelines at any of the three main water crossings. For water crossings where large culverts were planned, turbidity was measured as it is a valuable indicator of suspended particulates in water, and this is particularly useful in the context of erosion of stream banks and evaluation of sedimentation of spawning grounds. As for the three main water crossings, the *in situ* measurements revealed low conductivity and turbidity values, a pH close to neutral (pH=7), and high dissolved oxygen concentrations. Total suspended solids (TSS) concentrations were all lower than the reported detection limit.

No data was acquired to date at water crossings in the Vale port facilities surroundings, and data from 1997 Voisey's Bay EIS is not considered as current reference.

Within the process plant area in Sept-Îles, reference water quality data was gathered in 2019 by the OBV Duplessis (2021), through 6 samplings that occurred from June to November 2019 on Au Foin River, such as the other tributaries of the Baie des Sept-Îles. Parameters analyzed were the ones considered in the *indice de qualité bactériologique et physicochimique ($IQBP_6$)*, namely: total phosphorus, fecal coliforms, suspended solids, ammoniacal nitrogen, nitrites-nitrates, and chlorophyll *a.* All parameters scored for good surface water quality in the Au Foin River (OBV Duplessis, 2021).

12.1.10 Soil quality

At the mine site, soil quality was evaluated based on the results of analyses carried out in 2011 and 2012 on 33 soil samples collected at a depth range of 0.3 to 0.5 m and distributed across the proposed mine, stockpile areas and process plant areas and excluded the road. The sampling was done in accordance with the 2011 and 2012 methodologies. The results are as follows:

- The soil quality analysis results show uniform conditions across the entire site, including concentrations of rare earth elements (REEs).
- Metal concentrations comply with the "A" criterion of the MDDELCC (Churchill-Rae).
- Low concentrations of radioisotopes Ra-226, Th-228, Th-230, Th-232, U-234, and U-238 were measured at some stations.

Total hydrocarbon concentrations, VOCs, and PAHs were all below their respective MDDELCC standards or detection thresholds for these parameters.

No physicochemical data is currently available on the process plant surroundings in Sept-Îles A soil characterization meeting the requirements of the Quebec's guidelines on the physicochemical characterization of the initial state of the soil before the implementation of an industrial project (MELCC, 2016) will be conducted at the future process plant site.

12.1.11 Sediment quality

At the mine site, the sediments were sampled in 2011 and 2012 at seven lacustrine stations in Lake Brisson and five stream stations. Arsenic, cadmium, and zinc exceeded the threshold effect level (TEL) in sediment according to Environment Canada and the MDDEP (2007) at four out of seven lacustrine stations within Lake Brisson, and in one out of five streams stations.

Along the road corridor, sediment quality analysis was performed at the three main water crossings along the road corridor. No parameter was found in excess of a threshold limit. The results obtained for metals, rare earth elements, and radioisotopes are considered to be representative of the natural and ambient levels specific to the study area based on local mineralogical conditions. Laboratory analysis results for nutrient indicators confirm the presence of oligotrophic environmental conditions. As for PAHs and PH C_{10}-C_{50}, their concentrations were below the limit of detection (LOD).

No reference sediment quality data is currently available for the Au Foin River in the surroundings of the process plant in Sept-Îles,

12.2 Biological environment

The information presented in the following sections is based on data obtained in 2011 and 2012. This baseline data will be updated as part of the impact study.

12.2.1 Vegetation and Wetlands

The mine site area is characterized by arctic vegetation dominated by wetlands. During the floristic surveys conducted in 2011 and 2012, wetlands covered 45% of the study area. Also, during these surveys, low habitat diversity was observed. Tall shrubs (dwarf birch and bog bilberry) and trees (white spruce) were restricted to the transitional slopes between the central plateau and Lac Brisson, as well as along streams and the edges of some lakes (larch). Greater plant diversity was found in riparian areas and near the shores of Lac Brisson. The most diverse environments were fens and marshes with calciphilous flora. Snowbeds were also unique microhabitats for the flora. At the mine site, a total of 88 plots were fully sampled and an additional 43 observation points were characterized for mapping purposes. A total of 115 vascular plant species were found in the mine site area of about 80 km^2 (lakes included). Twenty vegetation subclasses were defined on a structural basis for mapping purposes.

The classification is hierarchical, allowing the generalization of vegetation cover into nine overall classes. Generally, the mine study area is characterized by arctic types of vegetation, with the dominance of dwarf shrubs and sedges. About half of the mine site is covered by vegetation types dominated by sedges alone (including tufted clubrush) or with dwarf shrubs. These are for the most part wetlands. Tall shrubs (American Dwarf birch, alpine bilberry) and trees (white spruce) are restricted to the transitional slope between the central plateau and Brisson Lake and along streams and some on the periphery of lakes (tamarack). Overall, the mine site is considered to have relatively low habitat diversity.

Wetlands are extensive and belong essentially to the fen type. The development of fens is favored by the surface run-off ubiquitous in this region. The topographical position of the central streamlined moraine plateau makes it an upstream source for 19 sub-watersheds. The physical landforms of longitudinal crests and large depressions also make the central plateau act as a “reservoir”. The presence of dense basal till and of permafrost are other factors restricting soil permeability and drainage.

The vegetation survey did not identify any flora protected under Quebec’s Threatened or Vulnerable Species Act, listed on Canada’s Species at Risk list or include any federal-level COSEWIC vascular plant candidate species at the time. Only one species, starwort chickweed, was considered rare in Canada by Argus and Pryer (1990) and is likely to be designated threatened or vulnerable in Quebec in administrative regions of the Bas-Saint-Laurent and Gaspésie-Îles-de-la-Madeleine. One species of moss, is uncommon in eastern North America according to current knowledge and is likely to be designated threatened or vulnerable (Gouvernement du Québec, 2012). These two species were found about 3 km north-east of the B-Zone near a stream in the Glaciofluvial Deposit Complex.

Given that vegetation was relatively homogenous in the Brisson Lake area, no exceptional plant habitat was found. However, micro habitats can shelter particular plant species. A few sectors or habitats appeared to be more ecologically interesting or sensitive: Wetland habitats along streams, ponds and small depressions on the Naskaupi glacial lake deposits in the Glaciofluvial Deposit Complex (north-east of B-Zone); small meadow marshes along the shores of Brisson Lake or at the mouth of small stream outlets in Brisson Lake; fens of the Naskaupi Glacial Lake Lowlands in the western part of the study area; riparian Shrub Fens of the central Streamlined Moraine Plateau, and snowbeds.

For the road corridor, a total of 68 plots were sampled in 23 different areas. A total of 148 vascular plant species were found in the 400 m strip along the proposed road alignment. Seventy-one ecological types were defined on the basis of vegetation structure (or potential vegetation), height of the shrub layer, surficial material (combination of thickness, texture and drainage) and particular physical features. These were lumped into 25 vegetation subclasses and generalized into 17 overall classes. The road corridor passes through three ecological Land Regions and vegetation types vary from one to another. The first third of the road corridor (~75 km) is inside the Western Plateau Land Region, as the mine site and vegetation is very similar: 60% is described as Arctic Land communities largely dominated by Dwarf Shrublands and the other 40% is described as wetland communities, dominated by Sedge Fens, then by Shrub Fens. The Central Range Land Region, which covers the upland region from the Western Plateau to the Reid Brook Valley near Anaktalak Bay, is also dominated by the Shrubland class, representing 57% of the area, with Tall Shrubland subclasses occupying more area within this region than in the Western Plateau Region. The area occupied by fens is generally lower, covering about 13% of the area (Sedge Fen and Shrub Fen classes combined). Rocky Barrens (Bareland or Mixedland classes) occupy approximately 14% of land and Coniferous Moss Forests occupy approximately 8% of the area. The lowland valleys of Ikadlivik Brook and Reid Brook belong to the Fraser River Land Region. Nearly three-quarters of this region are comprised of forested communities dominated by Coniferous Moss Forests (63%), while Shrublands occupy about 13% cover.

Wetlands form an important part of the landscape in the first 95 km road alignment section from the mine. In terms of floristic diversity, fens rank the highest, especially in a few specific locations such as the edges of streams, along slopes and other individual fens. Given the overall low diversity of the dominant dwarf shrub tundra, these areas dramatically contribute to the overall floristic diversity of the region. Palsa fens, uncommon in that area, may represent a sensitive feature.

The road corridor survey did not identify any vascular plants listed under provincial endangered species legislation (Quebec, Newfoundland and Labrador), listed as a Species at Risk in Canada or included among the federal-level COSEWIC vascular plant candidate species. Since no observed vascular plant has official protection in Labrador, rare species have been identified through provincial ranking criteria ranging from S1 to S3, as defined by the NatureServe International Network.

Ten rare plant species were encountered in the road corridor study area, including four species (Williams' Sedge, Saint John River locoweed, tufted pearlwort, and nard sedge) with S1 ranking (five or fewer occurrences in Labrador), and six species (alpine bartsia, milky draba, alpine cudweed, elephant's head lousewort, hairy butterwort, and northern buttercup) listed as S2 (rare throughout their range). 14 uncommon (S3) species are also presented and compiled to document the presence of these species for inland Labrador.

In addition to the riparian habitats (shrub fens, shrub swamps, marshes or sedge fens) and some particular fens such as slope fens, the following habitats have the potential to contain rare species and high species diversity: the rocky shores found along upper Ikadlivik Brook, rocky summits near large rivers, and, especially, exposed rocky summits in the geological province of Nain. Within the Ikadlivik and Little Reid Brook valleys (Fraser River Land Region), no distinctive habitats were observed, however sampling plots in these areas are very few in the scope of this study.

Sept-Îles is located in the bioclimatic zone of balsam fir dominated stands with black spruce and black spruce dominated stands with moss. More precisely, the study area is characterized by a balsam fir dominated stands with white birch and mountain maple on mesic sites. Where soils are well drained, black spruce dominated stands with moss are found, while balsam fir dominated stands with white birch and white alder characterize hydric sites. The information provided by the port of Sept-Îles (dated 2023-02-03) suggest the presence of at least three swamps at the proposed process plant site. Other swamps and peatlands are also found along the Au Foin River.

12.2.2 Fish and Fish Habitat (FAFH) Assessment

Although cold waters are characterized by a poor nutrient environment, such ecosystems support many trophic levels, including fish. However, species and densities of individuals are generally lower in comparison to southern or more temperate areas. Aquatic life in the lower part of the watersheds is in general richer in abundance and diversity than in the upper headwaters, or in some of the smaller surrounding watersheds, where connectivity is interrupted and obstacles to fish passage exist.

At the mine site, the overall fish habitat encountered consisted of permanent and intermittent streams, some small lakes with connecting channels, isolated ponds that may receive surface water runoff from the surrounding landscape, and two major lakes: Lake Brisson and Lake Napeu. Aquatic vegetation was absent, and instream cover very low in abundance and distribution. No thermocline was observed in August 2012 and, therefore, temperature is not influencing oxygen availability throughout the water column. Dissolved oxygen concentrations were high (7.9 to 9.75 mg/L) for the range in water temperature of 14.7 to 15.5°C from the bottom to the surface of the lake.

Lake Brisson is the largest lake located in the study area covering 3,220.9 ha. Therefore, only the area pertaining to the development of the mining site a portion of the entire water body was surveyed during aquatic field studies conducted in 2011-2012; pertaining to the development of the mining site. Likewise, given a large number of water crossings along the road corridor (450 on different road alignment variants), aerial assessment of flow type (intermittent, permanent) was made everywhere, but sampling occurred mostly at the three main water crossings, as well as other water crossings with permanent flow and large watershed area (>4 km²; n=51). Habitat type determination was made according to DFO (McCarthy et al., draft, revised 2010).

From the 54 ground surveys using electrofishing on a 100 m reach (50 m downstream and upstream of water crossings), along the road corridor, 25 were determined to be fishless (46%). Many of them (44%, n=11) had natural obstacles to fish passage and migration within the surveyed section. Obstacles were of two types: vertical drop (cascade, waterfalls) and low flow barrier (low water level flowing over exposed boulders or bedrock).

12.2.2.1 Fish Communities

At the mine site, fishing efforts were conducted in August 2011 and August 2012, using many several fishing gears (gillnets in 2011, trapnets and fish pots in 2012, and electrofishing in the streams). Fish were captured at all but two of the fishing stations. One of these is located near the proposed low grade ore stockpile. The fish community is composed of eight species (Arctic char, brook trout, lake trout, round whitefish, longnose sucker, burbot, lake chub and mottled sculpin); typically found in cold freshwater thermal regime. Longnose sucker and lake trout were the most abundant species in lakes, while brook trout was the dominant species in stream catches. Juveniles of lake trout, lake chub and longnose sucker were also found in some streams. Both lake trout and Arctic char were found to be using the same lacustrine habitat. Most water courses with fish presence were represented by an aquatic ecosystem dominated by brook trout owing to suitable heterogeneous habitat characteristics including habitat types and substrates that provide holding, rearing and/or potential spawning habitats for the species. Salmonid young-of-the-year individuals were caught at 10 water crossings, and at each the three main water crossings. The presence of young-of-the-year indicated probable spawning at or nearby the site of observation. That being said. One lake trout was caught by angling at the proposed bridge 1 during the spawning assessment and this individual was a mature male of 416 mm and was aged 9+ years old.

Both resident and anadromous forms of brook trout were thought to be represented in the catch although this was not confirmed in the surveys. The anadromous form was considered to be mainly associated with the eastern portion of the road corridor (3rd main water crossing) and at water crossings associated with Ikadlivik Brook; where Arctic char and Atlantic salmon were also part of the aquatic fish community. Two stocks of Arctic char reside in the eastern end of the road corridor: the Nain stock and the Voisey's Bay stock. Components of Voisey's Bay stock can migrate to accessible freshwater habitat in Reid Brook, Kogluktokoluk Brook (including its tributary, Ikadlivik Brook), where a great amount of freshwater habitat is available (Vale Inco, 1997).

12.2.2.2 Salmonid spawning sites

At the mine site, salmonid spawning was assessed in 2012 with the installation of 30 egg collectors on two potential salmonid spawning areas in Lake Brisson to ensure that these sensitive habitats are not impacted by the project. Of the potential habitats surveyed, one spawning site was confirmed in October 2012 along an esker near a tributary leading to Lake Napeu Kainiut. Two sizes of eggs were collected; the smallest eggs (2.5 to 3.5 mm) being from the Arctic char females (2.5 to 4.3 mm), and largest (5 to 6 mm) from lake trout females (Scott and Crossman, 1973). This area can now be considered a confirmed spawning ground for salmonids (Arctic char, lake trout). However, no eggs were observed in the area closer to the B-Zone deposit. Fall investigations were conducted at sites with preferential characteristics for salmonid reproduction Regarding at stream habitats and surrounding small lakes, fall investigations were conducted at sites with preferential characteristics for salmonid reproduction. The stream reaches covered during this assessment ranged from 65 to 261 m long. No eggs or redds were observed in the streams during this spawning investigation. An aggregation of 25 adult brook trout was observed in proximity to spawning habitats (gravel beds), and spawning was therefore inferred in this reach. The water temperature at time of investigation was 6.77°C which is consistent with preferred brook trout spawning conditions. This site is located at the entrance to the bay proximal to the spawning ground along the esker.

Along the road corridor, 15 water courses were identified during ground surveys as having habitat characteristics suitable for salmonid reproduction. These sites were re-visited again during the spawning period, e.g. between October 1st and October 6th 2012, to assess spawning activity. Salmonid spawning grounds were confirmed, based on observations of redds and spawners, for four water courses including the third main water crossing. The spawning habitat found at proposed bridge 3 is indirectly connected to Ikadlivik Brook, through Reid Brook, which is normally considered as an extended tributary of the Kogluktokoluk Brook and Ikadlivik Brook system. A helicopter survey was conducted October 4th 2012 on Reid Brook along Ikadlivik Brook from stream crossing (main water crossing) to Reid Pond. Many potential Arctic char spawners (approximately 50) were observed at two different locations in Ikadlivik Brook within a reach of high spawning potential.

Only brook trout redds were observed at crossing #509, no char redds were apparent. However, despite the fact many char spawners were observed upstream of Reid Falls, which is considered as a passable obstacle during the spawning period, and Arctic char have been reported spawning along Reid Brook. The anadromous Arctic char of Voisey's Bay stock would exhibit a general distribution pattern along the main stem of the Reid Brook, Kogluktokoluk Brook and Ikadlivik Brook system. The freshwater environment is therefore used for spawning, and rearing, and most of the Arctic char spawners in Reid Brook (below Reid Falls) move into Ikadlivik Brook for over-wintering. The estuarine and marine environments are used for feeding during the summer months (Vale Inco, 1997).

At the proposed bridge 1 , the capture of a male extruding milt upstream of crossing indicated possible proximate spawning.

12.2.2.3 Benthic Invertebrates

Benthic macroinvertebrates communities within the study area are representative of the ecoregion, e.g. eastern Canadian Taïga Shield and George Plateau. Similar to the fish communities, the taxa richness and diversity are low compared to southern areas in temperate regions. Several factors may be responsible for the overall low benthos including substrate type and sediment quality, and oligotrophic conditions (low productivity, low plankton biomass, low nutrients). At the mine site, stream stations were less diversified (mean of 5 ± 2 taxa) than lacustrine stations (mean of 7 ± 3 taxa). The benthic invertebrate communities present in the lacustrine and stream stations sampled were composed of species relatively tolerant to nutrient enrichment and increased trace metal contamination in water. Along the road corridor, the benthic invertebrate community identified at the three main water crossings (proposed bridges) show variable composition, densities and taxonomic richness. The highest benthic density was obtained at the proposed bridge 1: 2,154 org./m², and the lowest, at the proposed bridge 2: 231 org./m². The highest taxonomic richness (n=10 taxa) was observed at the main water crossing. Two proposed bridges were dominated by *Chironomidae* larvae, whereas bridge 3 was dominated evenly by four taxa: *Chironomidae* larvae, *Ceratopogonidae* sp., *Cyprididae* sp. and *Chloroperlidae* sp, and the absence of *Sphaeriidae*. Plecoptera *Chloroperlidae* were observed only at proposed bridge 3 (Mine Site included) including benthic organisms known to be less tolerant to pollution, with the Plecoptera *Chloroperlida*e and Plecoptera *Leuctridae* being very intolerant to water pollution (Mandaville, 2002).

12.2.2.4 Biological monitoring (fish tissues)

According to Environment Canada (2012), the species selected for tissue analysis should be, if present, a recreational, subsistence and/or commercial species. On a site-specific basis, the species selected for tissue analysis should be chosen based on local consumption (excluding commercial species that may not contribute to local consumption). In terms of number of samples tissues analyses should be conducted on eight samples, if possible, from one sex (male or female) and age class (Environment Canada, 2012).

At the mine site, lake trout was designated as the preferred species for tissues analyses. Fish tissue samples (muscle or fish flesh) were analyzed in the laboratory for the following elements:

- Metals (Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Ti, Tl, U, V, Zn);
- Mercury (Hg);
- Rare earth elements (Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sm, Tb, Tm, Yb, Y) and associated minerals, including, niobium (Nb), zirconium (Zr), as well as uranium (U) and thorium (Th).

From fish surveys using one fyke net held in 2019 at the Au Foin River, two species of stickleback were reported, the threespine and the fourspine stickleback. Spawning of rainbow smelt is confirmed at the Au Foin River, along with Du Poste, Clet and Hall rivers. The presence of filamentous algae was reported has having influence on retaining/fixing eggs from the rainbow smelt. The American eel is also reported to be using the Au Foin River (threatened in Canada according to COSEPAC, 2012), and of concerns in Québec. A large number of eels was also reported along the Hall and des Rapides rivers. On the Hall River, an eel-ladder was design and installed at the Hall dam by AECOM in 2021 for OBV Duplessis in collaboration with the Conseil de la nation huronne-wendat to secure free passage upstream, and collaboration of the owner, la Société ferroviaire et portuaire de Pointe-Noire (SFPPN).

A total of 21 fish species is reported in the Baie des Sept-Îles . During the winter, the rainbow smelt is fished by recreative fishermen given the large concentration of fish. In the Baie des Sept-Îles, DFO aquatic species at risk map (DFO, 2023), no critical habitat is reported. The presence of species at risk is nevertheless reported for one marine fish species, the spotted wolffish. Other species are marine mammals.

12.2.3 Amphibians and reptiles

No amphibians or reptiles were observed or heard in and around the project study area during the various field surveys conducted in 2011, 2012, and 2013. However, the mink frog and wood frog may be present within the study area at this latitude.

The distribution range of 11 species of amphibians or reptiles overlap the process plant insertion area. None of them are species at risk federally or provincially.

12.2.4 Avian fauna

Birds surveys were carried out in 2011 and 2012. Additional surveys are to be carried out in 2023 and 2024. All the results of the surveys will be incorporated in the baseline report for the environmental assessment.

12.2.4.1 Waterfowl and seabirds

A total of 208 individuals and 77 indicated breeding pairs from 11 waterfowl species (1 species of goose, 2 species of dabbling duck and 9 species of diving duck) and one loon species were observed at the mine site during the first 2011 aerial breeding pair survey. During the second aerial survey, carried out five or six days later, a total of 173 ducks and geese were observed. This number included 73 indicated pairs. The relative abundance of the various species was the same as for the first aerial survey, with the exception of the hooded merganser, which was not seen again during the second aerial survey, and the common goldeneye, which was not seen during the first aerial survey.

During the waterfowl aerial survey in the road corridor, a total of 169 individuals and 86.5 indicated breeding pairs from 12 waterfowl species (1 species of goose, 3 species of dabbling duck, and 8 species of diving duck) and one loon species were observed.

12.2.4.2 Raptors

During the 2011 surveys, six species of raptors were observed around the mine site. During the first aerial waterfowl survey in June 2011, 18 individuals from four different species were observed. A total of three raptors were observed during the second aerial waterfowl survey. In addition, 22 individuals from four different species were seen during the caribou surveys. The rough-legged hawk was the most abundant species, with 27 individuals and eight nests, followed by the peregrine falcon, with seven individuals observed near four nests. The golden eagle, short-eared owl and bald eagle were observed on a few occasions, while the osprey was seen only once. Three of the above species were confirmed breeders: the golden eagle, the rough-legged hawk, and the peregrine falcon. The other species are possible breeders.

During the 2012 survey in the road corridor, 18 individuals belonging to five different species were observed in the four km buffer zone on either side of the road options. The peregrine falcon was the most numerous with seven individuals, followed by the golden eagle with six sightings, the merlin with two, the gyrfalcon with one sighting, and one short-eared owl. Another raptor, an eagle, was seen too briefly to allow proper identification. In addition, a total of three active nests were found in the road corridor study area, all of which were peregrine falcon nests. Twenty-seven old and unidentified raptors nests were also observed.

12.2.4.3 Passerines, Game Birds and Shorebirds

A total of 20 species were detected during the point count survey at the mine site. Most of the species detected consisted of passerines (14 species) However, five shorebird species and the willow ptarmigan were also heard or observed during the survey. In addition, a pair of lesser yellowlegs, some spotted sandpipers and a few dark-eyed juncos were heard after the 10-minute survey period.

For the road corridor, in order to compare bird communities from different vegetation cover types, each point count surveyed on the Western Plateau, Central Ranges and in the Ikadlivik Brook valley was assigned to a vegetation class type. For the Ikadlivik Brook valley point counts the original cover units defined and the stratified sampling plan were used. For the western portion of the road corridor in which point count locations were selected systematically, the underlying vegetation cover type was first assigned, but checked and reclassified to fit field data recorded during the point count surveys. In order to obtain meaningful statistics, vegetation cover types was regrouped in three classes that shared structural and plant cover characteristics.

Ecotone and Deciduous Forests

A total of 17 species were detected during the point count survey. Of these, 9 breeding species were detected using the limited radius count (LRC) method, and 8 additional species were detected beyond the 50 m of the point counts using the undetermined distance index (UDI) method. The most abundant breeding species according to the LRC method were the dark-eyed junco, the Swainson's thrush, the grey jay, and the pine siskin. In addition to being the most abundant breeding species, the dark-eyed junco was also the species with the most constancy i.e. the one heard or observed most frequently (3 of the 10 ecotone point counts). Otherwise, the pine siskin, which was one of the most abundant species in ecotone habitat, was absent in the point count carried out in heath and conifer habitats. Also, although not the most abundant breeding species within the 50 m radius circular plot, the common redpoll was by far the most numerous species detected.

Heaths

A total of 17 species were detected during the point count survey. Of these, 10 breeding species were detected using the LRC method, and 7 additional species were detected beyond the 50 m of the point counts using the UDI method. The most abundant breeding species according to the LRC method were the horned lark, the common redpoll, the American pipit, the white-crowned sparrow and the savannah sparrow. In addition to being the most abundant breeding species, the horned lark was also one of the two species (American Pipit was the other) with the most constancy. These two species were also unique to the heath habitat since no individual was observed in the ecotone and conifer point counts.

Coniferous Forests

A total of 16 species were detected in this habitat class. Of these, 15 breeding species were detected using the LRC method, and 1 additional species was detected beyond the 50 m radius of the point counts using the UDI method. The most abundant breeding species according to the LRC method were the common redpoll, the white-winged crossbill, the American robin, the yellow-rumped Warbler, and the grey Jay. In addition to being the second most abundant breeding species, the white-winged crossbill was also the species with the highest constancy. This species was also highly associated with conifer habitats since none was present within the 50 m radius circular plot (LRC) in the two other habitat types. In the spruce-fir/dwarf shrub habitat of the Voisey’s Bay region, the most numerous species were the same as in the present study, namely the common redpoll, the yellow-rumped warbler, the white-winged crossbill and the dark-eyed junco (JWEL, 1997c).

Avian communities found in terrestrial habitats in the vicinity of Sept-Îles are typical of the boreal forest ecosystems. These habitats are the breeding grounds of many groups of migratory and resident birds’ species such as woodpeckers, thrushes, warblers, sparrows, crossbills and birds of prey. Wetlands and aquatic habitats are also abundant in the landscape, and they provide staging and breeding habitats for numerous ducks, geese, loons, shorebirds and gulls species. Commonly seen species are black duck, common goldeneye, common merganser, green-winged teal, Canada goose, spotted sandpiper and herring gull.

12.2.5 Mammals

During a survey of snow tracks around the mine site in 2012, tracks of seven different animal species were observed, primarily in wooded areas. Arctic fox and red fox tracks were most frequently observed in the plots. Five species were identified during a survey of micromammals: the deer mouse, the common vole, the eastern heather vole, the Gapper's red-backed vole and the common shrew. These are common species in northern Québec and Labrador.

During summer, the most frequently observed mammals were black bear, arctic fox, red fox, arctic hare, red squirrel, and gray wolf.

<u>Caribou</u>

Historical observations of migratory caribou herds of Quebec and Labrador have undergone significant demographic changes. A first detectable population peak occurred between 1870 and 1890, based on a consensus between historical reviews and an index developed to estimate the population size of the George River Caribou Herd. This population peak was followed by 3 crashes resulting in a record low in 1956. The population then began to recover gradually and reached record high numbers again in the 90's. However, the population has been experiencing a rapid decline in recent years (Bergerud *et al.*, 2008).

The George River caribou population is the only known caribou herd using the project area. Data on this herd have been gathered by Québec and Labrador wildlife managers, as well by universities, since the early 1970s. The Quebec and Labrador governments have been monitoring the migratory tundra caribou herd's seasonal movements for at least the last 30 years by means of radio collars fitted on 30 to 50 individuals per year.

Using telemetry data available from the MRNF (formerly MERN) from 2000 to 2012, the southern limit of the traditional calving grounds of the George River herd was located at least 40 km north of B-Zone. The same data indicate that a small proportion (4.3%) of tagged caribou were located within 30 km of the project area. During the annual migration cycle, September and October are the months when the greatest number of marked caribou moved near the project area during their fall migration to reach winter habitats located to the south and east.

In the Sept-Iles area, large mammals such as moose and black bears are common and can be found in all habitats in the area particularly in young stands or early successional forests. Many furbearer species such as the beaver, the gray wolf, the red fox, the American marten, the ermine, the river otter, the muskrat, and the striped skunk also occupy the area. Red squirrels and various species of voles and other microtine rodents are also highly present and sometimes abundant in many habitats found in this region.

12.2.6 Avian and terrestrial Species at risk

The following text presents the conservation status for sensitive species observed during the 2011, 2012 and 2013 surveys:

- The Harlequin duck is listed as a species of special concern in Canada and is considered vulnerable under the legislation of Québec and Newfoundland and Labrador.
- All raptor species observed, except the osprey and the rough-legged hawk, have conservation status under provincial or federal legislation.
  - Golden eagle: no federal status but considered vulnerable in Québec;
  - Peregrine falcon: no federal status but vulnerable in Québec and in Newfoundland and Labrador;
  - Bald eagle: no federal status but considered vulnerable in Québec;
  - Short-eared owl: federally special concern, vulnerable in Newfoundland and Labrador and likely to be designated threatened or vulnerable in Québec. It should be noted that it is currently under review to change its status. It is considered threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

- Caribou are an important issue given the value of this animal to Indigenous and non-Indigenous people in Québec and Newfoundland and Labrador, and the recent decline in the George River migratory herd population (from 74,000 in 2010 to 14,200 in 2014). Regardless, this population does not have legal conservation status. COSEWIC, for one, considers it endangered and it is currently under review for addition to the SARA schedule. This migratory population is not listed as threatened or vulnerable in Québec or in Newfoundland and Labrador.
- No other wildlife or plant species with conservation status were observed during the 2011, 2012 and 2013 surveys.

According to the CDPNQ, six wildlife species at risk can be found within an eight km radius of the potential process plant location. The Barrow's Goldeneye is vulnerable, the Yellow Rail is endangered, the Short-eared Owl, the Saltmarsh Sharp-Tailed Sparrow and the Rock Vole are likely to be designated and the Bank Sparrow is a candidate.

12.2.7 Aquatic Species at risk

In the north, for the mine site, access road and port, no aquatic fish species at risk is reported. Nevertheless, salmon and arctic charr are sensitive species with high significance to communities. The marine environment in the port, and along the marine transportation does involves marine mammals, and wolffish (northern, spotted).

For the process Plant, the American eel is a threatened species according to COSEWIC (2012) for which large abundance are reported in the Au Foin River. Fish passage will have to be assessed from the Baie des Sept-Îles towards the process plant. Also, plant discharge could be directed towards the Baie des Sept-Îles, after treatment.

Although already considered the largest industrial port facility infrastructure in Québec, according DFO aquatic species at risk map, the presence of species at risk is nevertheless reported for one marine fish species, the spotted wolffish, and four marine mammals, the white shark and the luth Tortuga (DFO, 2023).

Whereas no critical habitat is reported by DFO (2023), Baie des Sept-Îles is an important seagrass habitat for many species, and according to the MELCCFP wildlife habitat mapping, the Baie des Sept-Iles is an aquatic species concentration area. The mouth of the Au Foin River is at the junction of the Aire de concentration d'oiseaux aquatiques de la Baie des Sept-Îles #4 and #5. The Réserve de territoire aux fins d'aire protégée du Marais-de-la-Baie-de-Sept-Îles is also officially mapped.

13 Socio-Economic and Human Health Description

13.1 Land Use and Traditional Ecological Knowledge

The development of the Strange Lake Mining Project could potentially lead to changes associated with land and resources use. Development, construction, operation, as well as closure and restoration of the proposed mining site, seasonal access road and handling and storage facilities in Edward’s Cove could affect the activities of different Indigenous groups such as the Nunavik Inuit, Naskapi Nation of Kawawachikamach, Quebec Innu, Nunatsiavut Inuit, and Labrador Innu. It could also have an impact on Indigenous and non-Indigenous businesses and organisations such as tourism companies, outfitters, parks and mining companies.

A study on land use and traditional ecological knowledge (TEK) was conducted between 2012 and 2013 in relation with the Quest Rare Mineral (AECOM, 2013c)[6]. The study revealed that the territories located within or bordering the project's study area were traditionally used by several Indigenous groups. It also showed that some groups still visited these territories. The described use was sporadic and of low intensity in the mining site area. Nunavik Inuit had not engaged in recent activities there. However, Inuit from Kangiqsualujjuaq, who heavily use the George River, expressed concerns about the potential effects of the proposed project on the water quality of the river. Naskapi users from Quebec and Labrador Innu users visited the mining site area for activities such as winter caribou hunting and spring waterfowl hunting. The corridor identified for road development (which is essentially the corridor identified for this project) was used in part by Nunatsiavut Inuit for activities at various times of the year. Nunatsiavut Inuit also expressed concerns about the effects of having an access road near the Ikadlivik Brook, particularly regarding the impact on Arctic char populations. To a lesser extent, Labrador Innu also engaged in hunting and fishing activities near the corridor identified for road development. The 2012-2013 study showed that Nunavik Inuit had historically used the territories traversed by the corridor identified for road development but had not engaged in activities there since the 1960s-70s. All Indigenous groups encountered at the time (Nunavik Inuit, Naskapi Nation of Kawawachikamach, Nunatsiavut Inuit, Labrador Innu) also expressed concerns about the effect of the project (essentially the mining site and the road) on caribou.

Furthermore, the study conducted in 2012-2013 revealed that both Indigenous and non-Indigenous businesses offered recreational activities near the proposed mining site. The owner of one of these businesses, an Innu from Matimekush, expressed concerns about the potential effects of the project on the water quality of the George River, where he operated activities.

In addition to the proposed mining site, the seasonal access road and the handling and storage facilities in Edward’s Cove, as well as ore processing and separation plant in Sept-Îles, Québec (industrial port zone of Sept-Îles) will be evaluated. The Innu of Uashat mak Mani-Utenam are likely to engage in land use activities in the vicinities of the Sept-Îles industrial port zone. City of Sept-Îles and the MRC of Sept-Rivières (having jurisdiction in the Sept-Îles area) will also be concerned by the project, as well as various Indigenous and non-Indigenous organisations and businesses practicing activities in the vicinities of the proposed separation plant. Since the implementation of a processing and separation plant in Sept-Îles was not part of Quest Rare Minerals' initial project, no study was conducted concerning the traditional ecological knowledge and the land use performed by Indigenous groups in the area nor the land use and occupation performed by Indigenous and non-Indigenous organisations or businesses.

A new land use study of the affected areas (the proposed mine site, seasonal access road and handling and storage facilities) will be performed with the same Indigenous groups and businesses as in 2012-13. In the case of Nunatsiavut, the land use study will be conducted by the same lead researchers under the direction of the Nunatsiavut Government. This new land use study will also include the Innu Uashat mak Mani-Utenam concerning their potential use of the proposed mine site area as well as the proposed process plant area in Sept-Îles.

[6] This study was carried out by AECOM in most of the »Indigenous communities concerned. However, in the case of Nunatsiavut, the land use study was conducted by by Chris Furgal, Agata Durkalec, Katie Winters and coll. This land use study was then provided to AECOM for consideration and the results were incorporated in AECOM study.

In order to provide an accurate description of the activities currently practised by Indigenous and non-Indigenous businesses within or nearby the land affected by the development and the operation of the proposed mining site, seasonal road and handling and storage facilities in Edward's Cove, a new desktop study will be carried out. This study will focus on current and projected activities likely to take place within and/or near the lands affected and will be made trough available sources, such as business and organisation websites or available environmental studies previously carried out in concerned areas. Following this desktop study, additional information will be gathered through telephone interviews conducted with representatives of the organisations and businesses identified in the literature. These interviews will help validate and refine the information gathered during the documentary research. They will also inform on the expectations and concerns of the various businesses and organisations in relation to the proposed project.

In order to properly document non-Indigenous land use and occupation within and nearby the Sept-Îles industrial-port area, the following components will be considered: the administrative framework, land tenure, land management and development, land use, commercial and industrial activities, recreational and tourism activities, the built environment, infrastructures, heritage elements, as well as planning and development projects. These components will be documented through two complementary activities: a literature review, and interviews with local/regional organisations and stakeholders.

The methodology presented here may be adjusted in response to requests from the various Indigenous groups concerned. It is also possible that certain Indigenous groups will themselves conduct parts of the land use and TEK study or the entire portion of the study concerning them. Specifically, for the Nunatsiavut Inuit, the land use study will be performed according to the rules issued by the Nunatsiavut Research Centre[7]. All the information gathered during the land use and TEK study will be used to assess the effects of the project and determine appropriate mitigation measures. As previously mentioned, the new land use study will be performed with the same Indigenous groups and businesses as in 2012-13 and performed by the same lead researchers under the direction of the Nunatsiavut Government.

13.2 Socio-economic Conditions, Local Capacity Analysis, and Workforce Analysis

As part of the Quest Rare Minerals project, studies were conducted with different Indigenous and non-Indigenous communities that could potentially be affected by the project, aiming to describe their socio-economic conditions, local services, and workforce capacities. Several issues were raised during that time. For Indigenous communities, these issues included education levels, health, social problems, and economic characteristics such as limited employment opportunities, high unemployment rates, and low specialization levels. All Indigenous groups encountered shared common values related to the preservation of natural habitats and traditional harvesting activities. Non-Indigenous communities affected by the Strange Lake project (namely Schefferville, Fermont, Sept-Îles) were experiencing an economic boom in the mining and/or resource sectors, leading to an increasing demand for accommodations, infrastructure, and municipal services.

Within the framework of the present project, a new study will be carried out using available sources. This will provide up-to-date socio-economic information on the various communities involved, as well as an accurate description and assessment of their local services and workforce. Telephone interviews will also be conducted with key informants in the involved communities, as well as with government organisations to document specific topics such as education, health care and health issues, social services and social issues, housing, economic development, as well as the labour force situation and the ability of local businesses to meet the needs of Torngat Metals. Once again, the methodology presented here may be adjusted in response to requests from the various Indigenous groups concerned. It is also possible that certain Indigenous groups will choose to conduct all or part of the portion of the study concerning them.

[7] According to NG Regulations regarding environmental reviews of initiatives on Labrador Inuit Lands (art.24): Registration must be consistent with Land Use Plan : *a proponent shall not register, and the minister shall not accept for registration, and initiative that is not a permitted land use or an approved discretionary use under the Land Use Plan*

13.3 Human Health, quality of life and Psychosocial Impacts

The Ministry of Health and Social Services (MSSS) of Quebec states that the health status of the population is influenced by a set of factors related to both individuals and their physical, economic, political, and sociocultural environments. These factors are also known as "determinants of health". For Indigenous peoples, including the Inuit, health is a holistic concept that encompasses not only the absence of disease but also the "physical, spiritual, mental, economic, emotional, environmental, social, and cultural well-being of individuals, families, and communities".

An assessment of risks to human health and the environment was planned in 2013 for the Quest Rare Minerals project. This conceptual model, based on the Quest Rare Minerals project, will need to be updated according to the planned activities for Torngat Metals Ltd as described in this initial project description. A comprehensive study on human health, on quality of life and psychosocial impacts will be conducted as part of the current project.

No study on quality of life and psychosocial impacts had been conducted as part of the Quest Rare Minerals project. A comprehensive study on human health, on quality of life and psychosocial impacts will be conducted as part of the current project. A baseline will be established using available data and will describe the determinants of health using indicators that identify the main characteristics of the environment in which the various components of the Torngat Metals project will be inserted. Various characteristics, and therefore determinants of health, belonging to several fields (individual characteristics, living environments, systems and infrastructure and the overall context) will be documented in the impact study as reference conditions. Subsequently, impacts on human health, quality of life and psychosocial impacts will be assessed on according to the determinants of health for which concerns will be expressed during Torngat Metals's information and consultation activities. To identify relevant issues and assess the impacts on these issues, concerns, perceptions, and potential consequences (reactions and actions) of the population regarding the project will be documented through interviews and stakeholder engagement programs and subsequently analyzed.

13.4 Archaeology

Two archaeological inventories were conducted at the proposed mining site in 2011 and 2012 as part of the Quest Rare Minerals project. A cache dating back to the Maritime Archaic period was found at an elevation of 508 meters above current sea level, potentially on the shores of the former glacial lake Naskaupi. This small pile of stones was located at the boundary of the B-Zone mineral deposit, approximately 500 meters from the shore and 63 meters above the level of Lake Brisson (site HbDb-b). It was anticipated that this structure could be affected by the final phase of the proposed mining plan for the project.

Three concentrations of anthropogenic quartz flakes and a concentration of burned bone fragments were also found on the surface within an area of 100 square meters. This site (HbDb-3) was located 7 meters above the level of Lake Brisson, approximately a little over 50 meters from the helipad used at the exploration camp, and less than 100 meters from the lake. Another site with several stone flakes was discovered near Lake Brisson, at the end of the airstrip at the exploration camp. These two sites were not dated (HbDa-1).

Further work will be necessary to ensure that the new configuration of the mining site does not affect any potential archaeological resources. Therefore, an archaeological reassessment will be carried out, which may lead to an on-site archaeological inventory. Additionally, an archaeological excavation will be required at the HbDb-b site identified in 2012-2013 within the B-Zone mineral deposit at the mining site.

Furthermore, several known archaeological sites are located near or within the corridor identified in 2011-2013 for the construction of a road, and in the area identified for the implementation of the handling and storage facilities in Edward’s Cove, including:

- HbCv-01, HbCv-06 et HbCv-07 north of the Kogaluk River;
- HcCo-01, HcCo-02, HcCo-03, HcCo-01, HcCo-05 et HbCm-02 along the Ikadlivik Brook;
- HcCm-20, HcCm-21, HcCm-22, HcCm-23, HcCm-24, HcCm-26 et HcCm-30 near Little Reid Brook;
- HcCm-6, HcCm-7, HcCm-8, HcCm-9, et HcCm-10 along Edward's Cove.

The inventories conducted along the road corridor and Edward’s Cove in 2012 did not identify any new archaeological sites (AECOM, 2014). However, a reassessment of the sites expanded the extent of two known sites, HcCm-08 and HcCm-20.

As with the mining site, additional work will be necessary to ensure that the new configuration of the projected road and associated borrow pits do not impact any potential archaeological resources. Thus, an archaeological reassessment will have to be carried out, which will possibly lead to an archaeological inventory on site.

Since the establishment of an ore processing and separation plant in Sept-Îles was not part of Quest Rare Minerals' project, no archaeological study has yet been carried out on the site planned for the implementation of this plant. According to the *Inventaire des sites archéologiques du Québec* (Gouvernement du Québec, 2023), there are no known archaeological sites on the site identified for the processing and separation plant. The closest known archaeological sites are located further south, in downtown Sept-Îles, near *Baie de Sept-Îles*, some 7.5 km away. Nevertheless, an archaeological assessment will be carried out concerning the identified site for the implementation of the plant, which may lead to an onsite archaeological inventory.

13.5 Landscape

Landscape studies were conducted in 2012-2013. The study conducted for the proposed mining site indicated that it is characterized by open, sparse, stunted vegetation covering a series of hills and depressions, providing observers with a wide field of vision over a hilly topography with little human development. This is the case in most viewpoints, especially when navigating the eastern part of Lake Brisson. The study also indicated that this landscape was infrequently used and therefore considered to have moderate intrinsic value for both Indigenous and non-Indigenous users.

Regarding the proposed road and the surroundings of Edward’s Cove, the study indicated that the landscape within the corridor identified at the time exhibited variable sensitivity to the development of new infrastructure. Thus, the westernmost portion of the corridor had low resistance, mainly due to its low capacity for absorption and its monotonous landscape, despite the open panoramic views. The central portion of the corridor could present moderate sensitivity if the road was built on the plateau (due to the moderate visual value of the landscape) or high sensitivity if it was constructed in the valley of the Ikadlivik River (due to the high visual value of the landscape and its interest among the Indigenous communities in this area). Finally, the easternmost portion of the corridor (roughly near Little Reid Brook and near Edward’s Cove) exhibited moderate sensitivity due to its high visual accessibility and the moderate visual value of the landscape.

Since the configuration of the proposed mining site and the projected seasonal road are different from those planned for the Quest Rare Minerals project, and since the use of the area may have changed since the last study, a new landscape study is planned as part of the current project. This landscape study will also include the site of the proposed ore processing and separation plant in Sept-Îles.

13.6 Areas of Interest

There are no known protected areas within or immediately near the proposed mining site, road corridor or handling and storage facilities in Edward’s Cove. The Kuururjuaq National Park, Ulittaniujalik National Park, and the Pyramides Mountains National Park Reserve, are all located more than 200 kilometers north of the proposed mining site. In Addition, the Rivière-George territorial reserve for protected area purposes is located about 30 kilometers west of the proposed mining site. With an average width of 40 kilometers, this territory stretches for approximately 350 kilometers along the George River.

Besides, several protected areas are located close to the site of the proposed processing and separation plant in Sept-Îles. The closest are in Sept-Îles Bay, less than 3 km south of the planned site. These are the *Baie des Sept-Îles* 4 and 5 waterfowl areas, and the Marais-de-la-baie-de-Sept-Îles protected area reserve. Three biological refuges are located north of the proposed plant site, at 5.05, 6.25 and 8.15 km respectively. In addition, the proposed Moisie River Aquatic Reserve and the Rivière-Moisie Protected Area Reserve are located approximately 11 km east of the proposed plant site.

14 Federal, provincial, territorial, Indigenous and municipal involvement and effects

14.1 Project Funding

Torngat Metals has received a private investment to complete the pre-feasibility study (PFS), the bankable feasibility study (BFS) and the impact assessment. The Strange Lake Project under Torngat Metals is not depending on government agency funding; federal nor provincial.

14.2 Federal Lands

No federal land is located within the territories concerned by the Strange Lake Project.

14.3 Implication of Jurisdictions in the Project's Assessment

Considering the scope of the Strange Lake Rare Earth Mining Project and its location in Québec for the mining site and its access road (north of the 55th parallel), as well as in Labrador, Labrador Inuit Settlement Area (LISA) and Labrador Inuit Land (LIL) for the majority of the access road to the existing port on the eastern coast, the project is subjected to environmental assessments and approval from several government authorities for complying to Nunatsiavut Government (NG,) the Newfoundland and Labrador Government (NL) and the Québec Government (MELCCFP/Kativik), and the Federal Government through the Impact Assessment Agency of Canada (IAAC). All regulators have divisions and/or department leading the analysis and permitting/authorization process. The main regulators are described in more detail in the following subsections.

Only one registration document / IDP is presented to all three authorities (besides Québec MELCCFP & Kativik process). Article 19 (f)[8] and Part 10 of the *Regulations regarding the review of initiatives on Labrador Inuit Lands* of the Environmental Review Regulations (CSL E-4, 31-03-2017, original enactment NGSL 2012-07) concerns specifically the Reviews[9].

Torngat Metals understands that permits will be required from all jurisdictions independently from the environmental assessment process.

14.4 Government of Canada (Federal)

In addition to the Impact Assessment Act, Torngat Metals will ensure compliance with various regulations. Therefore, they will apply for permits and authorizations necessary for the construction and operation of the project.

14.5 Nunatsiavut Government

This Registration document addresses the requirements of the Nunatsiavut Government (NG) under the *Nunatsiavut Environmental Protection Act* (CIL 31-12-2012 N-5) [10], the Labrador Inuit Land Claims Act and Labrador Inuit Land Claims Agreement, and their Regulations Regarding the Review of Initiatives on LIL, as well as according to the Environmental Assessment process in Labrador Inuit Settlement Area[11] (LISA) and outside Labrador Inuit Lands (LIL).

8 Information notice of initiatives and requests for Environment Division's advice 19. A proponent may give the Environment Division written notice of an initiative and request the Division's informal advice on whether or not the initiative: ((f): may be the subject of a project-specific harmonization agreement.

9 https://www.nunatsiavut.com/wp-content/uploads/2018/12/E-004-Environmental-Review-Regulations31-03-2017.pdf

10 https://www.nunatsiavut.com/wp-content/uploads/2021/06/CIL-31-12-2012-N-5-Nunatsiavut-Environmental-Protection-Act.pdf

11 https://www.gov.nl.ca/exec/iar/files/lilca_impplan_ch11.pdf

It is important to understand that a single document has been produced to satisfy the requirements of all three levels of government (NG, federal and NL) due to the collaborative context of this project under detailed impact assessment and the processes under section 4.14 of the Nunatsiavut Environmental Protection Act (ref. Harmonization of Environmental Assessments) [12]:

This Document is in accordance with Section 5 elements of the *Regulations Regarding Environmental Reviews of Initiatives on LIL* pertaining to the Project Notice filing (sections 25 à 40).

As stated in the Labrador Inuit Land Claims Agreement on the subject of Environmental Assessment process on Labrador Inuit Lands, an Environmental Assessment must contain a description of the existing environment (11.2.10 (d)). In addition to the application of the *Nunatsiavut Environmental Protection Act* permits and authorizations will have to be obtained.

In addition to the application of the *Nunatsiavut Environmental Protection Act* permits and authorizations will have to be obtained.

14.6 Québec Government Process

In Quebec, project components located north of the 55th parallel (mine, beneficiation plant, aerodrome and portion of road located in Quebec) are subject to a separate process from that applicable south of the 55th parallel (Sept-Îles Process Plant).

14.6.1 Mining project (North of the 55th parallel)

In terms of the environmental assessment procedure, in accordance with the terms set out in the James Bay and Northern Québec Agreement (JBNQA), Chapter II of the Environment Quality Act - *Loi sur l'environnement du Québec* (LQE) (L.R.Q, c. Q-2) provides specific provisions applicable to the northern regions of Québec. The applicable environmental assessment procedures are different in that representatives of the Indigenous communities living there are directly involved in the decision-making process.

The Strange Lake Rare Earth Mining Project (Strange Lake Project) is located north of the 55th parallel, a region for which the JBNQA created the Kativik Environmental Advisory Committee (KEAC). The KEAC oversees the application and administration of the environmental protection regimes provided for in the JBNQA. On the other hand, the preliminary assessment and review of projects are carried out by the Kativik Environmental Quality Commission (KEQC).

Appendices A and B of the *Environment Quality Act* and the JBNQA specify which development projects are compulsorily subject as well as those which are compulsorily excluded from the environmental impact assessment and review procedure of the Environmental and Social Impacts Study (ESIS) and review. Any mining project, including the expansion, transformation or modification of an existing mining operation and any access road to a locality or road infrastructure for a new project are automatically subject to this ESIS and the procedure assessment and review of the *Environment Quality Act* and the *Réglement relatif à l'évaluation et l'examen des impacts sur l'environnement de certains projets* - Regulation respecting the assessment and review of the environmental impacts of certain projects.

In the case of the Strange Lake Project, the procedure is led by the representative of the *ministère de l'Environnement et de la Lutte contre les Changements climatiques, de la Faune et des Parcs du Québec* (MELCCFP), i.e., the Industrial, Mining, Energy and Northern Projects Environmental Assessment Branch. For its part, the KEQC carries out the analysis and the evaluation.

In addition to the application of the *Environment Quality Act* permits and authorizations will have to be obtained.

[12] NG : Nunatsiavut Environmental Protection Act : https://www.nunatsiavut.com/wp-content/uploads/2021/06/CIL-31-12-2012-N-5-Nunatsiavut-Environmental-Protection-Act.pdf

14.6.2 Process Plant (Sept-Îles)

Chapter I of the Environment Quality Act defines the environmental impact assessment and review procedure that applies in the southern part of Quebec (south of the 55th parallel). Under the “Regulation respecting the environmental impact assessment and review of certain projects”, the construction of a rare earth ore process plant is subject to this environmental impact assessment and review procedure, regardless of the plant's capacity.

In addition to the application of the Environmental Quality Act, permits and authorizations will have to be obtained such as for the North of the 55th parallel.

14.7 Government of Newfoundland and Labrador

This Registration Document also complies with the provincial government of Newfoundland and Labrador (NL) under the *Environmental Protection Act* (SNL, 2002 cE-14.2) and the Environmental Assessment Regulations, 2003[13].

As dictated by the Environment Protection Act (EPA) of the province (2002 cE-14.2 s57), an Environmental impact statement (EIS) or Environmental preview report (EPR) may be needed for the road corridor. A description of the local environment that will be affected by the project would then be needed.

According to the Newfoundland and Labrador Regulations[14] anyone who plans a project having a significant impact on the nature, social and economic environment is required to establish the Environmental Assessment (EA).

In addition to the application of the *Environmental Protection Act* permits and authorizations will have to be obtained.

[13] NL : Environmental Assessment. Guide to the Process https://www.gov.nl.ca/ecc/files/GUIDE-TO-THE-PROCESS_Jan-2023.pdf
[14] GUIDE-TO-THE-PROCESS_May-2022.pdf (gov.nl.ca)

15 Potential Changes to the Environment and on Indigenous people

15.1 Description of the main issues

The main environmental and social issues specific to the northern and Sept-Îles components of the Strange Lake rare earth mining project that can be identified at this preliminary stage of project development are summarized in table 15-1 and detailed in the following paragraphs.

During the environmental impact assessment, the potential effects will not only be addressed for the study area where modifications are planned but will also be made at a larger scale, at the level of an enlarged study area, for addressing appropriately the potential effects of the different ecosystems and communities that might be affected by the Project and others through time.

Table 15-1 : Key environmental issues of the Strange Lake mining project

Development, construction	Operation	Closure, restoration	Issues	Physical environment	Biological environment	Social environment
X	X	X	Protection of human health and quality of life in communities	X	X	X
X	X	X	Protection of northern biodiversity, both flora and fauna, especially species at risk		X	X
X	X	X	Preservation of the quality and ecological functions of receiving environments, notably wetlands, bodies of water and soils, including permafrost in the north	X	X	
X	X	X	Maintenance, access and conciliation of land uses			X
X	X	X	Climate change and the balance of GHG emissions	X		
X	X	X	Social acceptability			X

15.1.1 Issue - Protection of human health and quality of life in communities

The human health and quality of life of communities residing or active in the study areas of the various project components could be affected by the implementation of the different phases of the project, in particular with regard to:

- risks associated with the potential release of contaminants (metals, radioactive elements) into air, water or soil, and their movement through the ecosystem and food chain;
- socio-economic impacts of the project;
- psychosocial effects of the project.

More specifically, a rare earth mining project raises issues of toxicity and radioactivity of the contaminants generated by the different phases of the project. These concerns have been expressed in consultations conducted in the communities closest to the project in Québec and Labrador. In the north, specific concerns relate to the consequences of mining activities on the quality of water, air, soil, or plants and eventually on the traditional diet of these populations (berries, caribou, fish). In Sept-Îles, concerns could be raised about industrial wastewater discharges and atmospheric emissions from the plant, as well as their effect on the environment and inhabited areas. Moreover, the presence of radionuclides in process residues stored on land adjacent to the plant could also raise concerns, even if these elements are naturally occurring radioisotopes. Therefore, a Human Health and Environmental Risk Assessment (HHERA) will be an integral part of the impact study that will be conducted for this project. This HHERA will identify not only the contaminants of concern but also the ecological and human receptors potentially exposed to the project activities and to identify the exposure pathways of the receptors retained for the risk assessment.

15.1.2 Issue - Protection of northern biodiversity, both flora and fauna, including species at risk and species of importance to Indigenous communities

In the north, the project's integration environment is both rich and fragile in terms of biodiversity. It includes sensitive habitats for species valued by Indigenous communities occupying or using the land, such as the caribou and the Arctic char. Species at risk are also likely to be found in the northern study area. In Sept-îles, the projected plant site is overlapping to the drainage of the Au Foin River, where the presence of American eel and a spawning ground of rainbow smelt are reported. The presence of wetlands is also suspected on this site.

The protection of biodiversity therefore concerns:

- protection of sensitive habitats of fish communities (such as salmonids in the North and rainbow smelt in Sept-Îles), benthic organisms, aquatic plants, and species at risk;
- maintaining migratory corridors for caribou, Arctic char, American eel, and migratory birds;
- protection and preservation of the territory's wildlife and flora resources valued by stakeholders, in particular by the Indigenous groups concerned (notably caribou, Arctic char, etc.).

15.1.3 Issue - Preservation of the quality and ecological functions of receiving environments, notably wetlands, bodies of water and soils, including permafrost

Due to the location of the northern components of the project in a territory characterized by numerous watercourses and the presence of permafrost, the project's integration environment has specific characteristics that must be taken into account and preserved as far as possible. In Sept-Îles, the projected plant site is overlapping patches of wetlands, and the drainage of the Au Foin River, which is a tributary of the Baie des Sept-Îles. It is also possible that the final treated effluent of the process plant be discharged to the St-Lawrence River at the Baie des Sept-îles, through a dedicated pipe and outlet. The Baie des Sept-îles is recognized as a high ecological value ecosystem, where tributaries such as the Au Foin River provide freshwaters with varying feeding resources and minerals.

Therefore, particular attention must be paid to the following characteristics of receiving environments:

- hydrodynamic conditions (water and sedimentary regime, drainage);
- wetlands and riparian environments;
- soils, including permafrost that may be affected by the excavation of a pit at the mine site and along the road corridor.

15.1.4 Issue - Maintenance and conciliation of land uses in the north

The possible disruption of land and resources use during the various phases of the project is a major issue for the project’s northern components. Indeed, the northern areas where the mine, the road and the port storage area will be inserted is used by various Indigenous communities and potentially by Indigenous and non-Indigenous businesses. Maintaining access to the territory and reconciling current and planned uses is therefore an important issue for the project.

15.1.5 Issue - Climate change and the balance of GHG emissions

The purpose of the project is to exploit resources that are essential to the transition of the economy to renewable energy. Indeed, the main rare earth elements targeted by the exploitation will improve energy performance both during the production of electricity (e.g., wind energy) and during the use of electrical energy (e.g., motors). In this sense, the project aims to contribute to the fight against climate change. Nevertheless, the balance of GHG emissions of each phase of the project, the strategies for reducing these emissions and their possible offsetting are important issues.

As a large part of the project is carried out in a northern territory particularly sensitive to climate change, the risks arising from these climate changes on the implementation of the various phases of the project also constitute a significant issue.

15.1.6 Issue - Social acceptability

In accordance with the principles of sustainable development, social acceptability is an essential condition for the realization of any project likely to impact the biophysical and human environments. In the case of the Strange Lake rare earth mining project, acceptance of the project by the Indigenous and non-Indigenous communities directly affected will be particularly important, both in northern and Sept-Îles areas.

15.1.7 Taking into account environmental and social issues in project design

- **Northern project components:**
  - **Development phase (preliminary work) and construction:** installation of temporary facilities (camp, road), site preparation, fuel storage area, use and movement of machinery, road construction and infrastructure and establishment of the mine residue stockpile and other mining materials stockpiles (stripping, excavation, grading, backfilling), water supply network, drainage of runoff water, mine water, domestic wastewater, etc.;
  - **Operational phase (30-year operation):** transportation and processing of ore, presence, and use of related infrastructure (plant, etc.), presence of workers (living environment and travel), waste management;
  - **Closure and restoration phase**: Closure of the mine site, appropriate remediation activities (progressive dismantling of project infrastructure; heavy equipment traffic, mobile and stationary equipment, materials; presence of workers (living environment and travel).
- **Sept-Îles project components:**
  - **Development phase (preliminary work) and construction:** site preparation, use and movement of machinery, rail siding / access road construction and infrastructure, establishment of the process residue stockpile (stripping, excavation, grading, backfilling), construction of plant and associated facilities, including industrial wastewater treatment plant and its discharge point, etc.;
  - **Operational phase (30-year operation):** transportation of ore concentrate form the port terminal to the plant, operation of the plant, wastewater and air emission treatment, residue management ; presence of workers;
  - **Closure and restoration phase:** Closure of the plant and of the residue stockpile, appropriate remediation activities.

The potential environmental and social issues associated with these activities will be taken into account from the earliest stages of project design (pre-feasibility, feasibly) right through to detailed design, in order to eliminate or reduce potential impacts at source as much as possible.

15.2 Description of the main anticipated impacts of the project on the receiving environment, planned mitigation or restoration measures

The main apprehended impacts of the Project on the receiving environment were considered by assessing the potential Valued Ecosystem Components (VECs) and analyzing their potential interactions with the Project. The following list presents the most relevant criteria for the selection of potential VECs:

- the recognition of the importance of a component through legislation, regulation or policy;
- the sensitivity or vulnerability of the component;
- the uniqueness or rarity of the component;
- the sustainability (durability) of the component or ecosystem;
- the value or importance assigned to the resource by stakeholders;
- the risks to health, safety or well-being of the public;
- the ecosystem characteristics, both of the northern environment (beyond the forest line and in the presence of discontinuous permafrost) and of the Sept-Îles environment.

Table 15-2 presents the key environmental components and indicators to be considered as a basis for identifying VECs. The VECs are selected while taking into consideration the above-mentioned criteria, which include the potential interactions with the project, presence within the spatial boundaries, Indigenous interests or rights, and priorities of the federal, provincial, territorial or municipal governments. During the impact assessment, the potential effect analysis will also be addressed as a whole and will include the assessment of interactions between VECs and this, in the regional study area. The existing baseline conditions will be discussed for each of the VECs using existing literature, reports, government data, and field data collected for the Project. Mitigation measures will include best management practices as well as project-specific measures that may be required as a result of the discipline-specific evaluations.

Table 15-2 : List of critical environmental components, key indicators and Project rationale for selection (Mine Site and Road Corridor)

Critical environmental components	Examples of key indicators	Rationale for choice
Physical environment		
Greenhouse gases, air quality	• Greenhouse gases – Metric Tons of CO2 eq. • Concentration of ambient air contaminants (dust – Particulate matter, metals, Volatile Organic Compounds (VOCs), radioactive elements, CO2, CO, NOx, SOx)	• Importance of complying with various provincial regulations and standards specific to the property limits • Essential to life and the maintenance of human health and well-being and the biological environment • Potential for transboundary effects, affecting Labrador
Accoustic environment (ambient noise and vibrations)	• Ambient noise level (dB), vibrations	• Importance of complying with different provincial regulations and standards specific to the property limits at the sensitive receptor location • Essential to life, the maintenance of human health and well-being, and the biological environment
Soil health	• Soil health • Terrain stability and soil erosion • Effect on permafrost freeze-thaw cycle	• Importance for maintaining soil stability • Serves as a pathway for interactions between the Project and other components of the environment
Water and sediment regime, water and sediment quality	• Surface and groundwater quantity and quality	• Importance to human life and ecosystem functions, particularly in the George River watershed for the northern components of the Project, and in the Baie des Sept-îles • Serves as a pathway for interactions between the Project and other components of the environment

Table 15-2: List of critical environmental components, key indicators and Project rationale for selection (Mine Site and Road Corridor) (Cont'd)

Critical environmental components	Examples of key indicators	Rationale for choice
Biological environment		
Vegetation and wetlands	• Abundance and diversity of terrestrial plant communities • Abundance and diversity of wetlands	• Fundamental role in maintaining terrestrial, riparian and wetland ecosystems (biodiversity, hydrological function, wildlife habitats, traditional use of resources, etc.) • Susceptibility of certain types of vegetation in the northern environment to disturbance
Aquatic fauna (benthos, fish) and habitats	• Species presence and population abundance • Habitat quality and abundance	• Subsistence significance for Indigenous communities, biological, cultural, other use (recreational) • Legal protection of habitats under provincial and federal legislation • Maintaining biodiversity • Fragility (lower resilience, reduced growth rate, lower productivity) of aquatic habitats in northern environments
Avifauna (migratory and non-migratory birds)	• Abundance and diversity of migratory and non-migratory birds • Habitat quality and abundance	• Social, cultural and economic importance (migratory bird watching and hunting) to local populations and Indigenous people • Maintaining biodiversity
Caribou	• Migratory George River herd	• Biological, cultural and subsistence significance for Indigenous peoples • Herd in precarious situation following a drastic decline in the population
Flora and fauna species at risk or in precarious situation	• Plants at risk, threatened or vulnerable • Wildlife species at risk, threatened or vulnerable	• Protection of species, their habitat and biodiversity • Legal protection of species and their habitat under the federal Species at Risk Act, Québec's Act respecting threatened or vulnerable species and Newfoundland and Labrador Endangered Species Act (e.g., harlequin duck, peregrine falcon)
Social environment		
Current and traditional use of land and resources - for Indigenous peoples and the general population	• Current and traditional use of land and resources for recreational or commercial purposes • Traditional and current use of land for subsistence, cultural or recreational purposes by Indigenous and non-Indigenous people • Protected areas	• Important and valued component on the socio-economic and cultural level • Reflects the characteristics, traditions and values shared by users from many communities, including Indigenous communities • Potential interactions with outfitters, adventure tourism businesses or protected area managers serving this region
Cultural heritage	• Historical, archaeological and heritage sites and resources	• Identification of a few sites, especially on the periphery of the proposed development • Management of these resources deemed important and at risk
Human quality of life and health	• Quality of life, well-being and health of people and communities	• Potential interactions between the Project and the population and communities, particularly Indigenous ones • Health risks arising from the potential emission of contaminants and their movement through the ecosystem, as well as psychosocial effects
Employment and economy	• Jobs • Workforce training • Local and regional economy • Business development in services, supplies and equipment	• Socio-economic impacts of the Project for local and regional communities (positive and negative)
Landscape	• Views of the mining complex, especially from Lake Brisson • View of the process plant and of the process residue stockpile, particularly from populated areas or viewpoints valued by residents and visitors	• The tundra is recognized as a landscape devoid of trees and human infrastructure, so significant visibility of the Project is anticipated • Sept-îles is recognized as a prime destination for outdoor activities.

Table 15-3 presents the sources of potential effects and potential change upon project phases for the fish and fish habitat and the migratory birds. The effects assessment on fish and fish habitat (FAFH) and migratory birds will identify the Project activities and infrastructure that may adversely affect the FAFH and migratory birds environmental valued component (EVC) and will identify mitigation measures to minimize or eliminate potential effects. The effects assessment will provide an evaluation of residual effects, considering the implementation of mitigation measures, and a significance determination will be provided.

Table 15-3 : Fish and fish habitat (FAFH) and migratory birds potential change, mitigation measures under the project phases based on the main sources of potential effects.

Critical environmental components	Sources of potential effects	Potential Changes	Mitigation
Development and construction phase			
Fish and Fish Habitat (fish, benthic invertebrates, aquatic plants) and surface water/ sediment quality	• Construction of the access road • Mine Site preparation works • Process plant site preparation works • Use and circulation of heavy machinery and fixed and mobile equipment (mine, road, port storage facilities, process plant) • Presence of temporary infrastructures and facilities • Construction of permanent infrastructures and facilities • Watercrossings along the road access • Potential temporary watercourse diversion and change to natural drainage • Presence of workers (including camp and waste, emissions and discharges)	• Alteration of ecological functions of wildlife habitats in the ecosystem (terrestrial habitats, wetlands and water bodies) via potential input of contaminants • Permanent or temporary loss of aquatic habitats • Modification of water and sediment quality (inputs to the aquatic environment) • Degradation of fish habitat • Possible modification of aquatic communities • Impediment to the free movement of fish • Detour of waterways at the mine site, and watercrossings along the access road • Erosion, risk of spills altering the aquatic environment or groundwater	• Localisation and preservation of all sensitive habitats (spawning grounds, rearing habitats) for salmonids (Arctic char, Atlantic salmon, brook trout, lake trout) • Providing safe passage for fish for altered water bodies • Examining all alternatives in the planning phase to avoid/minimise the harmful alteration, disruption or destruction of fish habitat • Preliminary and regular inspection of the machinery to ensure its good condition and operation. Carry out preventive inspections of fuel storage areas and supply emergency kit for the recovery of petroleum products and hazardous materials available in vehicles, machinery and worksite facilities • Locate parking, washing and maintenance areas for machinery at least 60 m from any watercourse. Refuelling of machinery shall be carried out under constant supervision and at a minimum distance of 30 m from a watercourse. • Install a geomembrane downstream of crossings and around work areas to intercept SM particles, use culverts of sufficient size so as not to significantly narrow the flow sections at crossing points, prevent the transport of fine particles during work by installing sediment barriers around the edges of aquatic environments. • Prohibit fording in waterways (intermittent and permanent) • Submit a Compensation Plan for fish and fish habitats if residual impacts cannot be mitigated at the planning phase

Table 15-3: Fish and fish habitat (FAFH) and migratory birds potential change, mitigation measures under the project phases based on the main sources of potential effects (Cont'd)

Critical environmental components	Sources of potential effects	Potential Changes	Mitigation
Development and construction phase			
Migratory Birds	• Construction of the access road • Mine Site preparation works • Process plant site preparation works • Use and circulation of heavy machinery and fixed and mobile equipment (mine, road, port storage facilities, process plant) • Presence of temporary infrastructures and facilities • Construction of permanent infrastructures and facilities • Presence of workers (including camp and waste, emissions and discharges) • Addition of light source	• Alteration of ecological functions of wildlife habitats in the ecosystem (terrestrial habitats, wetlands and water bodies) via potential input of contaminants) • Permanent or temporary loss of nesting and rearing habitats • Noise disturbance to breeding pairs, broods and migratory birds • Light sources may alter the orientation of birds during migration	• Fencing to limit circulation outside of working areas in bird nesting habitats • Avoid any tree and brush cutting and circulation on undisturbed soil during nesting period • Preliminary and regular inspection of the machinery to ensure its good condition and operation • Avoid leaving vehicles running unnecessarily • Light sources facing downwards • Use of green light sources
Operational Phase			
Fish and Fish Habitat (fish, benthic invertebrates, aquatic plants) and surface water/ sediment quality	• Excavation of the pit • Transportation of the ore along the road access, shipment of goods, raw materials • Treatment and concentration of the ore that will include water management and treatment, discharges (effluent) • Rare earth processing and separation potentially requiring wastewater treatment and discharge • Mine residues and waste rock management • Process plant residue management • Mining and transportation activities • Use and circulation of heavy machinery and fixed and mobile equipment (mine, road, port storage facilities, process plant) • Presence of workers (including camp and waste, emissions and discharges)	• Alteration of ecological functions of wildlife habitats in the ecosystem (terrestrial habitats, wetlands and water bodies) via potential input of contaminants • Permanent or temporary loss of aquatic habitats • Modification of water and sediment quality (inputs to the aquatic environment) • Degradation of fish habitat • Possible modification of aquatic communities • Impediment to the free movement of fish • Detour of waterways at the Mine Site, and watercrossings along the access road • Erosion, risk of spills altering the aquatic environment or groundwater	• Preliminary and regular inspection of the machinery to ensure its good condition and operation. Carry out preventive inspections of fuel storage areas and supply emergency kit for the recovery of petroleum products and hazardous materials available in vehicles, machinery and worksite facilities • Application of all mitigation measures to protect the air, water, sediment and soil quality, such as the use of dust suppressants, water treatment, and implementation of measures related to contamination hazards at the Mine Site and along the Road Corridor (transportation) • Environmental monitoring and follow-up programs¸ For expansion/stabilisation/maintenance work: see Construction phase mitigation measures to minimise the harmful alteration, disruption or destruction of fish habitat, and protect air, water, sediment and soil quality.

Table 15-3: Fish and fish habitat (FAFH) and migratory birds potential change, mitigation measures under the project phases based on the main sources of potential effects (Cont'd)

Critical environmental components	Sources of potential effects	Potential Changes	Mitigation
Operational Phase			
Migratory Birds	• Excavation of the pit • Transportation of the ore along the road access, shipment of goods, raw materials • Treatment and concentration of the ore that will include water management and treatment, discharges (effluent) • Rare earth processing and separation potentially requiring wastewater treatment and discharge • Mine residue and waste rock management • Process plant residue management • Mining and transportation activities • Use and circulation of heavy machinery and fixed and mobile equipment (Mine, Road) • Presence of workers (including camp and waste, emissions and discharges) • Addition of light source	• Alteration of ecological functions of wildlife habitats in the ecosystem (terrestrial habitats, wetlands and water bodies) via potential input of contaminants • Permanent or temporary loss of nesting habitats • Noise disturbance to breeding pairs and migratory bird • Light sources may alter the orientation of birds during migration	• Preliminary and regular inspection of the machinery to ensure its good condition and operation to reduce noise disturbance during nesting and brood rearing • Avoid leaving vehicles running unnecessarily • If new working areas are required, proceed to nest searches and avoid disturbing nesting areas before fledging if active nests found • Light sources facing downwards • Use of green light sources
Closure and Restoration Phase			
Fish and Fish Habitat (fish, benthic invertebrates, aquatic plants) and surface water/ sediment quality	• Progressive dismantling activities of the project infrastructures • Use and circulation of heavy machinery and fixed and mobile equipment ((mine, road, port storage facilities, process plant) • Presence of workers (including camp and waste, emissions and discharges)	• Erosion, risk of spills altering the aquatic environment or groundwater • Modification of water and sediment quality (inputs to the aquatic environment)	• Restoration Plan and monitoring, aiming at restablishing natural drainage (natural state of the receiving env., where feasible), e.g. apply mitigation measures to comply with regulations for proper Mine restoration according to *Guide de préparation du plan de réaménagement et de restauration des sites miniers du Québec* • Application of all mitigation measures to protect the air, water, sediment and soil quality, such as the use of dust suppressants, water treatment, and implementation of measures related to contamination hazards. For closure and restoration work: see Construction phase mitigation measures to minimise the harmful alteration, disruption or destruction of fish habitat, and protect air, water, sediment and soil quality.

Table 15-3: Fish and fish habitat (FAFH) and migratory birds potential change, mitigation measures under the project phases based on the main sources of potential effects (Cont'd)

Critical environmental components	Sources of potential effects	Potential Changes	Mitigation
Closure and Restoration Phase			
Migratory Birds	• Progressive dismantling activities of the project infrastructures • Use and circulation of heavy machinery and fixed and mobile equipment (Mine, Road) • Presence of workers (including camp and waste, emissions and discharges)	• Noise disturbance to breeding pairs and migratory bird	• Restoration Plan and monitoring

15.2.1.1 Physical environment

The impacts associated with the Development and Construction Phases and the Operation Phase on the physical environment of each project component are essentially:

- Greenhouse gases (GHGs): sources of emissions associated with fossil fuels, other sources of GHGs (e.g., explosives, refrigerants, etc.);
- Air quality: sources of atmospheric emissions (dust - particulate material, metallic dust, volatile organic compounds (VOCs), radioactive elements from the deposit, gases – $CO2$, NOx, $SO2$). At the mine site, it should be noted that considering the proximity of the site to the provincial border, the study area will cover the areas potentially impacted on the Newfoundland and Labrador side;
- Acoustic environment: noise level and vibrations: blasting, use of machinery, machinery traffic, fixed (process) and mobile equipment, blasting, air transport;
- Soil quality: soil disturbance by stripping, blasting, excavation, risk of contamination due to accidental spills, soil subsidence, effects of work on permafrost and soil subsidence (northern areas);
- Water and sediment regime: modification of surface water flow patterns, water regime, possible increase in erosion and sediment transport in watercourses, sediment transport when breaches are opened), potential sanitary and mining discharges;
- Water and sediment quality: potential detour of watercourses, erosion, risk of spills affecting the aquatic environment or groundwater, risk of increased SS during maintenance work, etc.

During the Development and Construction and the Operation phases, a series of typical mitigation measures to avoid or reduce impacts on greenhouse gases, air quality, soil quality, water and sediment regime, and water and sediment quality are presented below on a preliminary basis. The assessment of the impacts related to the issues raised and the development of mitigation measures in consultation with stakeholders, in particular the Indigenous communities directly concerned, will validate, refine and complete this preliminary list of mitigation measures.

Typical mitigation measures will be applied in response to the impacts apprehended. The assessment of the impacts related to the issues raised and the development of mitigation measures in consultation with stakeholders, in particular the Indigenous communities directly concerned, will allow the validation, clarification and completion of this preliminary list of mitigation measures.

Mitigation measures to minimize impacts - Physical Environment (preliminary)
Develop and implement management plans for liquid effluents, tailings, residual materials, air emissions and ambient noise according to the Best Available Technology (BAT) approach, while respecting legal and regulatory requirements.
Use light vehicles that have effective mufflers to reduce noise level at the source
Use air treatment equipment to reduce dust emissions from industrial process equipment (mills, crushers, conveyors, etc.) or transportation.
Promote the use of low-emission (e.g., fuel-efficient) and zero-emission machinery and vehicles, according to the latest Environment and Climate Change Canada (ECCC) standards for on- and off-road vehicles.
Promote the use of generators that minimize fuel consumption and therefore have low atmospheric emissions.
Establish a procedure for shutting down heavy vehicles when they are not needed.
Implement a preventive maintenance and inspection program for equipment to ensure its proper functioning
Apply dust suppressants according to the conditions (meteorology) and development activities that have an impact on dust generation (e.g., construction of temporary access roads)
Conduct preventive inspections of fuel storage areas and make an emergency petroleum and hazardous materials recovery kit available in machinery, vehicles and site facilities.
Evaluate the feasibility of using renewable energy (e.g., solar, wind) to decarbonize the energy supply of operations and implement the best available solutions.
Carry out and update atmospheric and acoustic modelling to confirm compliance with provincial regulations at the property boundary (air quality) and at the surrounding sensitive receptors' location (noise, vibrations, etc.).
Inspect air conditioning, ventilation and heating equipment to ensure proper operation and limit the risk of refrigerant leaks, if any.
Study the feasibility and implement the best technologies for carbon capture and sequestration, such as carbon dioxide mineralization and revegetation of tailings sites.
Develop and implement a carbon management plan to reduce GHGs and eventually achieve net-zero goals by 2050, with a focus on renewable energy sources and non-fossil fuel transportation. In particular, promote air transport by airship instead of road transport, as soon as technically and economically feasible and approved by the authorities.
Optimize and control processes to maximize water reuse, reduce freshwater inputs and minimize discharges
Locate parking, washing and maintenance areas for machinery at least 60 m from any watercourse. Refuelling of machinery shall be carried out under constant supervision and at a minimum distance of 30 m from a watercourse.
Dispose of excavated material in a manner that minimizes the dispersion of suspended matter
Ore storage areas shall be constructed on a compacted gravel base surrounded by a collection ditch

15.2.1.2 Biological environment

The impacts associated with all the Development and Construction Phases and the Operation Phase on the biological environment of each project component are essentially:

- Vegetation and wetlands: loss, fragmentation and degradation of terrestrial wildlife and plant habitats, deterioration and alteration of ecological functions of terrestrial habitats, wetlands and water bodies, potential input of contaminants into terrestrial and aquatic habitats (e.g., dust deposition on vegetation and in waterbodies);
- Aquatic fauna (benthos, fish, aquatic plants) and their habitats: permanent or temporary loss of aquatic habitats, modification of water and sediment quality (inputs to the aquatic environment), degradation of fish habitat, possible modification of aquatic communities, impediment to the free movement of fish, possible temporary diversion of watercourses at the Mine Site, and water crossings along the access road (Mine Site, Road Corridor);
- Migratory and non-migratory birds: loss of bird habitat, noise disturbance to breeding pairs, broods and migratory birds, potential nest destruction and risk of nest abandonment;

- Caribou: potential habitat loss, noise disturbance, disturbance linked to human presence and activities, dust deposits on vegetation and habitat quality, barrier effect on migration;
- Fauna and flora species in precarious situation: potential loss of habitat or degradation due to the infrastructure footprint, dust/trampling, and noise disturbance.

The following list presents, on a preliminary basis, typical mitigation measures that could be applied in response to the impacts apprehended on the biological environment, in addition to the measures applied to the physical environment. The assessment of the impacts related to the issues raised and the development of mitigation measures in consultation with the stakeholders, in particular the Indigenous communities directly concerned, will make it possible to validate, specify and complete this preliminary list of mitigation measures.

Mitigation measures to minimize impacts – Biological environment (preliminary)
Fencing to limit circulation outside of working areas in bird nesting habitats
Prohibit fording in waterways (intermittent and permanent)
Avoid movement of any vehicle or construction equipment within 20 m of a permanent watercourse or 5 m of an intermittent watercourse and, if such movement is necessary, divert water flowing in ruts to a vegetated area at least 20 m from a watercourse
Installing culverts in a manner that does not impede the flow of water (embedding the base of the culvert below the natural streambed, stabilizing with rock fill, constructing stream crossings (culverts) during the summer low flow period (mid-July to early September)
Ensure the free passage of fish at all times during the temporary diversion of a watercourse
Use clean granular material for the installation of cofferdams
Preliminary and regular inspection of the machinery to ensure its good condition and operation
Avoid leaving vehicles running unnecessarily
Install an absorbent floating boom (hydrocarbons) downstream of the work in the waterways
Modify the shoulders of the road along migration paths so that caribou can easily cross over
Adjust traffic level during spring and fall migration of caribou along the road to minimize disturbance
Prohibit all movement of equipment and people towards caribou observed within approximately 250 m of work sites or road access
Suspend noise activities (such as blasting) when a caribou is observed within 1 km, and drilling/crushing if a female with a calf is observed within 1 km. Wait 30 minutes before resuming suspended activities
Avoid any tree and brush cutting and surface alteration during the bird nesting and rearing period
Remove solids from domestic wastewater with a treatment unit

These measures allow for the reduction of sources of contamination in the air, water and soil in addition to reducing the impact of noise.

15.2.1.3 Social environment

The impacts of the Strange Lake Project on the social environment will be identified as part of the environmental assessment process. However, based on the information available, we expect that the project's Development, Construction and Operation phases are likely to have the following effects:

- Quality of life and human health: concerns and potential impacts of the Project on quality of life and health in local and regional communities (such as reduced access to traditional food, possible contamination or fear of contamination);
- Social and economic aspects: socio-economic impacts of the project on local and regional communities (such as possible tensions, job creation, labour shortage, possible issues for the workers hired by the project and their families (fly-in fly-out at the mine site and at the ore processing and separation plant), contracts for local and regional companies; housing scarcity and rising rental costs in Sept-Îles due to the arrival of outside workers at the ore processing and separation plant);

- Cultural heritage: the potential disturbance of archeological resources ;
- Land use: disruption of the current use of the land and resources by Indigenous peoples and the general population, disturbance of the components and resources of the land valued by the various stakeholders, particularly those valued by Indigenous groups (notably caribou, Arctic charr and water quality of the George Riverand Ikadlivik Brook), modification of the landscape (visual degradation).

The following list presents, on a preliminary basis, mitigation measures that could be applied in response to the impacts apprehended. The impact assessment related to the issues raised and the development of mitigation measures in consultation with the stakeholders, in particular the Indigenous communities directly concerned, will make it possible to validate, specify and complete this preliminary list.

Mitigation measures to minimize impacts - Social environment (preliminary)
Inform local and regional communities (Indigenous and non-Indigenous communities concerned by the project) of the schedule for the work planned during the two phases, as well as the potential risks for users. Throughout both phases, maintain contact with local and regional communities authorities to enable them to identify any problems concerning the use of the land by their population.
Inform the Indigenous and non-Indigenous users concerned (outfitters, adventure tourism companies, protected area managers, etc.) of the planned work schedule, as well as the potential risks to users during both phases. Maintain contact with these people throughout both phases to allow them to identify potential land use issues
Install signs indicating the presence of traffic lanes or work/operation areas in their vicinity to inform users who may be traveling or engaging in activities in the area
Fence off work areas
Maintain accessibility to areas not targeted for work throughout both phases
In the event that traffic is temporarily or permanently restricted on trails utilized by users, plan bypass or new safe travel routes in consultation with Indigenous communities, authorities or other relevant stakeholders. Inform the affected population of these bypass routes or new travel routes
Regularly inform workers of the potential presence of users on the territory concerned, particularly along the access roads used
Implement measures to limit the spread of dust
Carry out a prior and regular inspection of the machinery and equipment used to ensure that they are in good condition and functioning properly (so as not to generate excessive noise)
Limit machinery traffic to work areas
If possible, isolate the main noise sources with absorbent material
Avoid putting in place measures to facilitate wildlife harvesting activities by workers on site during throughout both phases
Take appropriate measures to avoid disturbing known archeological resources
If archaeological remains are discovered, stop the work, take steps to protect the site and inform the relevant authorities, i.e. the *Ministère de la Culture et des Communications du Québec (MCC)* in Quebec, the Provincial Archaeology Office of the Newfoundland and Labrador Department of Tourism, Culture, Arts and Recreation and the Nunatsiavut Government Archaeology and Heritage Officer.
Preferential hiring of workers from local or regional communities, especially within the Indigenous communities concerned
Favour local or regional companies that have the competence for the tasks requested in the call for tenders' procedure, before undertaking requests to companies based elsewhere in Québec, Labrador or abroad
Provide for site restoration after the development phase of the sites
Establish an environmental monitoring program to ensure that mitigation measures are met for both phases
Implement measures to limit the impact of maritime transport on the activities practised by Indigenous groups in the bays concerned

15.2.2 Closure and restoration phase

At the Mine Site, the main activities likely to have impacts on the receiving environment during this phase of the project are:

- Progressive dismantling activities of the project infrastructures
- Site restoration
- Movement of heavy machinery, mobile and fixed equipment, materials
- Presence of workers (living environment and travel)

The restoration phase aims at restoring the site to its natural state and will mainly generate positive impacts on the receiving environment. The work that will be carried out during this phase will be like that of the development and construction phases; the sources of impacts and mitigation measures will therefore be similar, with the exception that the vehicles and machinery used at this time should be mostly, if not entirely, of the zero-emission type (post-2050).

In addition, this work will aim to rehabilitate the receiving environment as well as the functions of the biophysical and social environments, i.e., air, soil, water and sediment quality, wildlife and plant habitats (plant recovery, end of disturbance), occupations and uses that prevailed before the project. However, socio-economic impacts resulting from the loss of jobs will require the implementation of relocation measures and support for the demobilized workforce.

At the process plant , the main activities likely to have impacts on the receiving environment during this phase of the project are:

- Progressive dismantling activities of the project infrastructures
- Site restoration, including for the residue storage facility
- Movement of heavy machinery, mobile and fixed equipment, materials
- Presence of workers (living environment and travel)

15.2.3 Environmental Monitoring and Follow-up programs

In parallel with the application of specific and general mitigation measures, the development of rigorous environmental surveillance and monitoring programs will make it possible to reduce the apprehended negative impacts of the project. In addition, the implementation of mitigation measures, such as the use of dust suppressants, will make it possible to limit the disturbances. Additional studies during the development and construction phases and continuously during the operational phase will make it possible to identify and apply appropriate mitigation measures to adequately protect the sensitive components of the receiving environment (physical, biological, social). Finally, the consultations already initiated and those that will follow will make it possible to adequately consider the concerns of the Indigenous communities.

15.3 Potential Changes to the Environment (federal lands, other province or land)

The Strange Lake Rare Earth Mining project is located in Québec for the Mine site, the airstrip and the process plant; all physical designated activities under the *Impact Assessment Act.* The seasonal road corridor has 18 km in Québec, and the remaining 142 km in Labrador and Labrador Inuit Land (LIL). No effluent or runoff water from the Project in Quebec will reach the Newfoundland and Labrador territory. All discharges from the Mine Site will be directed towards the receiving environment of the mining activities, e.g. Lake Brisson, within Lake Napeu Kainut watershed, then into the Déat River and the George River watershed.

Considering the proximity of the provincial boundary of Labrador with respect to Torngat Metals mining claims, it is however possible that the mining Project air emissions (mainly dust) reach Newfoundland and Labrador. According to the meteorological data, prevailing winds are from the south-west direction.

It is noteworthy that all potential changes to the environment will be addressed on a large-scale study area and will be comprehensively detailed in the impact assessment study, including the mitigations measures and the environmental monitoring and follow-up programs for each phase of the Project, accordingly, to reduce the significance of the adverse effects of the Project.

15.4 Anticipated changes and impacts on Indigenous communities - physical and cultural heritage, use of lands and resources, historical, archaeological significance)

Since the Strange Lake Mining Project has not yet been the subject of an impact assessment, its effects on Indigenous communities are not yet clearly defined. However, based on available data and experience from previous studies, certain potential impacts can be expected. The development, construction, operational, as well as closure and restoration phases might have different impacts on the social environment. Concerning the mining site, the road corridor and the storage and handling facilities, most of these impacts would be felt by the Indigenous groups: the Nunavik Inuit (mainly from the communities of Kangigsualujjuaq and Kuujjuaq), the Naskapi (the community of Kawawachikamach) the Innu of Quebec (mainly the communities of Matimekush - Lac John, but also Uashat mak Mani-Utenam), the Nunatsiavut Inuit (communities of Nain, Hopedale, Makkovik, Rigolet and Postville) and the Labrador Inn (mainly the communities of Sheshatshiu and Natuashish). Concerning the implementation of an ore processing and separation plant in Sept-Îles changes and impacts would be felt by the Innu of Uashat mak Mani-utenam.

Concerning cultural heritage, work carried out as part of the preparation and construction of the proposed mine site seasonal road, handling and storage facilities as well as the processing and separation plant could potentially destroy archaeological sites present in the affected areas. Similar effects on archaeological resources could also occur during the operation of the mining site (ore excavation) and of the seasonal road (borrow pit mining). Mitigation measures concerning archaeological resources will be applied in response to the impacts apprehended.

The different phases of the project could also cause a disruption of the current and projected use of the land and resources by Indigenous people. According to information obtained during the study conducted in 2012-2013, Indigenous land users are frequenting the area of the proposed mine site and its surroundings, as well as areas crossed by or located near the proposed seasonal road and along Edward's Cove[15]. In addition, the surroundings of the industrial port zone of Sept-Îles are likely to be used by Innu from Uashat mak Mani-utenam. It is therefore possible that the noise, dust and vibrations produced by the various works carried out as part of the preparation and construction phase, during the operation phase, and during the closure and restoration phase, could be perceived by aboriginal users, resulting in a disturbance of the peace and quietness of the site for them, as well as a potential deterioration in the practice of certain activities such as hunting.

It is also possible that the noise, dust and vibrations produced during the various phases of the project could affect the resources (animals and plants) exploited and/or valued by Indigenous users, which again could adversely affect the practice of certain traditional activities, such as hunting, fishing, trapping or gathering. It is also possible that Indigenous groups may reduce or even stop practising certain traditional activities because of fears of resource contamination (proven or not) linked to the project. It is also possible that access to certain areas could be restricted or interrupted as a result of the work carried out during the various phases of the project. This could have an impact on Indigenous users whose traffic routes and/or activity areas cross or are located within the affected areas.

Safety issues (risk of collisions/accidents during the various phase of the project) could also be raised for these same users. In addition, Indigenous land users frequenting the surroundings of the proposed mining site, seasonal road, handling and storage facilities in Edward's Cove and processing and separation plant in Sept-Îles will be able to see these new elements, which could lead to a visual disturbance of the landscape during construction and operation phases. Mitigation measures as those mentioned earlier concerning land and resource use could be applied to limit the impacts apprehended. Additional mitigation measures may also be defined at the time of the impact assessment, in conjunction with the Indigenous communities concerned, based on their expectations and concerns regarding the proposed project.

[15] A a new land use and traditional ecological knowledge study will be conducted in order to update the information gathered in 2012-13

Appropriate studies will be conducted to assess the project's effect on the cultural and historical heritage of Indigenous communities, as well as on their land use and the resources they value. To date, the following communities have been identified for these studies:

- Nunavik Inuit : Kuujjuaq and Kangiqsulujjuaq;
- Naskapi Nation of Kawawachikamach : Kawawachikamach;
- Québec Innu : Matimekush – Lac-John and Uashat mak Mani-utenam;
- Nunatsiavut Inuit : Nain, Hopedale, Makkovik, Postville and Rigolet;
- Labrador Innu: Sheshatshiu and Natuashish;

15.5 Anticipated changes and impacts on Indigenous communities – health, social or economic conditions

Potential impacts on Indigenous communities are not only limited to the traditional activities performed on the land but are also including impacts on socio-economic conditions, human health and quality of life among Indigenous communities. For instance, contracts could be awarded to Indigenous businesses as part of the various phases of the proposed project. Business partnerships could also be created between the proponent and Indigenous businesses, communities or groups. In addition, jobs (direct and indirect) could be created in the various Indigenous communities affected by the project, both in Quebec and in Labrador[16]. All of this could contribute to improving economic conditions in the communities concerned. However, the creation of new jobs and the influx of capital could also have negative socio-economic effects. One example is the worsening of the labour shortage that some communities are currently experiencing. Furthermore, some Indigenous workers hired as part of the proposed project will have to move away from home during their work periods (fly-in fly-out), including those who will be working at the mine site or the handling and storage facility and who will be housed on site in a workers' camp. This situation could lead to changes in living conditions and habits for these workers and their families. In particular, workers will have to adapt to a new living environment and the distance from their community. Families, for their part, will have to cope with the prolonged absence of workers. A better income can also exacerbate certain problems already present among workers and their families, such as drug and/or alcohol abuse, or gambling problems.

There may also be impacts on health and quality of life, particularly in terms of access to quality food. Admittedly, by having a better income, the families of workers employed on the project could benefit from greater purchasing power, making it easier for them to buy quality food. However, for many northern communities like those involved in the present project, quality food often comes from the land and from traditional activities (hunting, fishing, trapping and gathering). It is therefore possible that by taking a job related to this project, people from Indigenous communities will have less time to devote to these traditional activities, which could lead to a reduction in the consumption of food from the land for them and their family. Furthermore, it is also possible that the work carried out as part of the various phases of the project will have an impact on traditional activities, access to the land or even on the various animal and plant resources exploited by the Indigenous groups (such as movement of game due to the noise produced, change in surface water quality, potential contamination of resources). As mentioned in the previously, it is also possible that Indigenous groups may reduce or even stop practising certain traditional activities because of fears (proven or not) linked to the project. In any case, this could once again result in a reduction in access to traditional food and therefore in the consumption of quality food.

Furthermore, the arrival of large-scale projects such as the proposed project is generally perceived in different ways by members of a same community. Some will be in favour, while others will be vehemently opposed. It is therefore possible that this project could fuel existing tensions or even create new ones within the Indigenous communities concerned.

[16] Torngat Metals plans to hire nearly 400 workers during the operation phase. Since the Torngat Metals intends to promote the hiring of Indigenous workers, we can expect that a certain number of workers from communities identified in the environmental assessment will be hired.

To limit the anticipated impacts of the project on the socio-economic conditions, quality of life and health within the concerned Indigenous communities, the preliminary mitigation measures presented earlier could be applied. Additional mitigation measures may also be defined at the time of the impact assessment, in conjunction with the Indigenous communities concerned, based on their expectations and concerns regarding the proposed project.

As mentioned, appropriate studies will be conducted to assess the Strange Lake Mining project's effect on human health, quality of life and socio-economic conditions among the various Indigenous communities concerned.

The first step in baseline studies is to describe the determinants of health, where possible, using a series of indicators that allow us to compare the regional or local situation with that of Quebec or Labrador as a whole. This will enable us to identify the main characteristics of the environments in which Torngat's project components will be inserted.

Then, in a second phase, the impacts on human health, quality of life and socio-economic conditions will be assessed on the basis of the health determinants identified (in particular those for which concerns will be raised during the engagement activities held with the Indigenous communities concerned). Given the characteristics of the project and the environments in which its various components will be located, some preliminary determinants for which concerns could emerge could be: employment, income and employability of the population; modification of the living environment or territory; access to traditional food; alcohol consumption and risk behaviours; family environment; social cohesion; health and social services; housing; municipal infrastructures and services; demographic context.

Thereby, it is important to mention that the health and social impact assessment will be realized using GBA plus, so that the health and social effects on Indigenous peoples, both positive and negative, will be assessed taking into account the various population groups. Women, girls, young people, the elderly and people with different gender identities experience development projects differently. Using a GBA Plus approach will ensure that negative effects for every population group can be identified and mitigated.

In addition, it is important to note that all "human receptors" likely to be impacted by changes to the biophysical environment, social (including cultural) or economic conditions will be identified and located during the impact assessment process. The term "human receptor" refers to all inhabited or used areas likely to be impacted, such as dwellings, camps, areas used for traditional activities, recreational areas, health and social services establishments, educational establishments, etc. To this end, the project components (proposed mine site, seasonal road, handling and storage facilities in Edwards Cove as well as the or separation plant in Sept-Îles), will be precisely located.

16 Strategic climate change assessment

In order to enable consistent, predictable, efficient and transparent consideration of climate change throughout the impact assessment process, Environment and Climate Change Canada (ECCC) has developed the strategic assessment of climate change (SACC). The latter is conducted under section 95 of the Impact Assessment Act (IAA) and it applies to designated projects under the IAA, and therefore applies to this project. The SACC describes the greenhouse gas and climate change information that project proponents need to submit at each phase of a federal impact assessment and requires proponents of projects with a lifetime beyond 2050 to provide a credible plan that describes how the project will achieve net- zero emissions by 2050.

16.1 Greenhouse Gas Emissions (GHG)

The GHG emissions quantification allows the identification of carbon sources and their relative significance to give a better understanding of the most impactful mitigation strategies which may apply. The quantification of GHG emissions will consider the seven gases defined as GHGs under the United Nations Intergovernmental Panel on Climate. Each gas will be quantified using an appropriate emissions factor and are converted into tonne of CO_2 equivalent (tCO_2-eq) using global warming potentials (GWP) which is the heat absorbed by any greenhouse gas in the atmosphere, as a multiple of the heat that would be absorbed by the same mass of carbon dioxide. The scope of emissions inventory of the Project will include all direct emissions (Scope 1) associated to combustion of fossil fuels by stationery and mobility sources and any major indirect emissions (Scope 2).

The initial estimation of GHG emissions associated with the Project includes the operational phase of the mining site, the road and the plant since there's no details available at this stage for the construction and decommissioning phases. In addition, this estimation does not include the concentrate transport from Vale Port to Sept-Îles Process plant, as well as the Sept-Îles' Process plant (construction, operation, decommissioning) as data was not available at the time of the assessment. The estimation will be updated and completed as part of the impact assessment.

16.1.1 Direct GHG Emissions

Over the operation phase, mining site shows the main sources of scope 1 GHG emissions are related to the combustion gases generated by the circulation of trucks, machinery, and generators. It is assumed that the mine site and all associated infrastructure are running on diesel fueled generators. According to the maximum production scenario of the operation phase over 30 years (2029-2059), the direct emissions of mine site would be approximately 485,533 tCO_2 equivalent.

The road's sources of GHG emissions would be exclusively related to the scope 1 emissions linked with trucks on the road and handling of mineral materials which has been estimated to be around 38,010 tCO_2 equivalent over the same period of 30 years.

16.1.2 Acquired Energy GHG Emissions

Hydroelectricity will be supplied through Hydro-Quebec for the process plant, which will reduce scope 1 emissions by removing the large amount of GHGs emitted typically by generators. According to the available data, this would be the only known source of scope 2 emissions at this stage of the project. This acquired energy GHG emission has been estimated to be 1 158 tCO_2 equivalent over the operation phase. This data will be integrated in the GHG assessment as the Plant's energy balance will be assessed. Note that it is expected that the Sept-Îles Process plant will also consume hydroelectricity from Hydro-Quebec. This data will be integrated in the GHG assessment as the Plant's energy balance will be assessed.

16.1.3 Net GHG emissions

By combining the direct and indirect emissions from the available information, the estimation of the maximum net GHG emissions for the operation phase is 524,701 tCO_2-eq over the entire 30 years of operation phase (2029-2059).

The Project is planning on avoiding GHG emissions by replacing the diesel furnace at the process plant by electrical furnaces.

As per required by SACC guidelines, the federal requirements for developing and implementing a net-zero plan for 2050 will be included in the impact study. Stemming from the need to find innovative ways to reduce carbon within the infrastructure delivery process, a baseline will be established to set the goals and develop mitigation measures.

16.1.4 Resilience to climate change

As part of the strategic climate change assessment, a climate change resilience analysis will be conducted. This will include a selection of weather-related risks that may change under current and anticipated climate change. in 2021, ECCC has published a technical guide that provide instructions and details on the level of information for the climate change resilience assessment. The climate change resilience analysis will be completed in accordance with this document and also the procedures contained in Canadian Standards Association published CSA 4011, “Infrastructure in Permafrost: A Guideline for Climate Change”.

17 Waste, Emissions and Discharge

17.1 Waste

17.1.1 Solid Waste

Domestic and other non-hazardous wastes will be generated by the activities and by the workforce at the mine site and at the process plant. These solid wastes will be managed by following the principles of the Québec Residual Materials Management Policy while considering the location of the project in an isolated northern territory. Reduction at source, recycling and recovery methods will be considered before disposal. The elimination of ultimate waste residues will be carried out in a landfill meeting the specific requirements for such facility in a northern environment.

17.1.2 Hazardous Materials and Hazardous Waste

The list of the main chemicals that could be used in the beneficiation process in the north and in the process plant at Sept-Îles will be established based on the prefeasibility and feasibility studies, and will be considered in the impact assessment. The storage of all hazardous materials will be designed in accordance with applicable regulations and best practices.

Potential hazardous waste generated by the activities in the north could include waste hydrocarbons from machinery maintenance, antifreeze, various solvents, used oils and used batteries, etc. Hazardous wastes that could be produced by the project activities in the north and in the process plant at Sept-Îles will be established based on the prefeasibility and feasibility studies, and will be considered in the impact assessment. All hazardous wastes will be stored in appropriate containers for transport off-site to an approved disposal facility.

17.1.2.1 Waste and residue from mining operation and ore concentration process

Mining operations, ore concentration and ore processing and separation produces significant amounts of waste, including overburden, waste rocks, and mine/process plant residue. These wastes will be segregated, settled, and filtered when produced in a wet environment, and then stockpiled in specific storage areas adapted to their nature and meeting the requirements of all applicable regulations and guidelines.

As part of the Pre-Feasibility Study of the impact assessment, waste rocks, ore and residues from the various steps of the concentration process and process plant that will be generated from completed or ongoing pilot tests will be sampled and characterized to support the design of the various storage facilities. It is to be noted that around 30 ore samples were characterized in 2012 and 2013 following the Directive 019 on the mining industry (MDDEP, 2012). This directive is still in effect, but some sections are currently being revised and new guidelines on mine residue and ore characterization (mentioned above, MELCC, 2017 and 2020) are now in force. Samples with low, medium, and high grade of rare earth elements have been analysed (Bernier 2013). For guidance only, the results show that, following the Directive 019 criteria, those samples cannot be described as “low risk” because of the silver, arsenic, and copper content. Moreover, those elements have a leachable risk level classified as “intermediate”. Also, following the same criteria, the tested samples do not present a risk of acid generation. As for the radioactivity risk in those same samples, it has been classified as “intermediate”. Those conclusions will potentially be revised according to the company's updated mining plan and processes, following the updates of the Directive and the new characterization guides mentioned above.

Owed to the natural radioactivity in the deposit area at the mine site, the guide on the recommended radionuclide for the analysis of radioactivity in environmental matrices will be considered in all physical and biological baseline studies to be conducted, as well as in the mine and process engineering design.

17.1.2.2 Residue from rare earth processing and high purity separation plant

The rare earth processing and separation produce residues. These residues will be segregated, settled and filtered, and then stockpiled in a residue storage facility located next to the plant, adapted to their nature and meeting the requirements of all applicable regulations and guidelines.

The residues from the process plant will be permanently stored in a dry stockpile. In order to minimize the potential environmental impact, and subject to the approval of the authorities, the residues will be thickened, filtered and mixed with a cementing agent before being deposited in the residual management area. Generally, cemented backfill are inert, however, seepage and kinetic studies will be performed in order to determine the percentage cement to be used, the potential for long-term metal leaching and the potential source terms to be added in the water quality model. Additional geochemical and geotechnical studies will be conducted in order to inform the design of the mine residue stockpile area and the retention basin that will be used for sedimentation and/or retention for associated water treatment. The environmental design to ensure groundwater protection and wastewater treatment will be developed based on *in-situ* conditions and Quebec's Directive 019 (MDDEP, 2012).

A part of the natural radioactivity present in the Strange Lake deposit will remain in the concentrate processed at the Sept-iles plant and will ultimately be found in the process plant residues. Therefore, the guide on the recommended radionuclide for the analysis of radioactivity in environmental matrices will be considered in all physical and biological baseline studies to be conducted, as well as in the process engineering design.

17.2 Emissions

The Strange Lake Rare Earth Mining project can generate various air emissions by the different activities and project component (mine site & process plant, road) involved in the process. Air emissions will be assessed in detail as part of the impact assessment. Various mitigation measures will be implemented to ensure control on the atmospheric pollution.

Movements of machinery, crushing operations, electricity production, land and air transport will generate noise during both construction and operation phases. Noise emissions will be assessed in detail as part of the impact assessment, as well as determination and selection of mitigation measures. The mine site and its associated facilities, the camp and the aerodrome may generate light that can cause nuisances mainly for the wildlife. Light emissions will be assessed in detail as part of the impact assessment and mitigation measures will be identified.

GHG emissions will be assessed in detail as part of the impact assessment as per the SACC guidelines & requirements.

17.3 Water Discharges

Several ponds will receive the contact water form the various mine activity areas (pit, mining areas, ore piles, concentrate piles, mine residue stockpiling area, etc.). They will be positioned to avoid the mixing of water from different sources before the measurement points. After this measurement point, the water discharged from these retention ponds may be routed, if required, to a treatment system to ensure that any water discharged complies with the requirements of Directive 019. The possibility of reusing the water collected for the needs of the ore concentration facilities will be assessed to minimize the use of freshwater.

In the current state of process development for the ore treatment and concentration plant, it is expected that all water will be recirculated, and the process will not generate liquid discharges, except during sporadic events. A certain amount of freshwater may however be necessary (to be confirmed during the pre-feasibility and feasibility studies). Any sporadic discharge from the process will be analyzed and treated appropriately before being released into the environment. Having a recirculating circuit will help minimize the frequency and amount of water discharges into the environment. Nevertheless, the project will include at least one final mining effluent. This aspect will be detailed in the environmental impact assessment, as the current process is not finalized. The volume of water will be evaluated according to the final production rate, which will influence the amount of water required for the operations and the rate of recirculation.

The characteristics and discharge point of the treated wastewater into the environment at the process plant site and are not yet known. Different options will be evaluated and compared as part of the prefeasibility and feasibility studies and in the context of the impact assessment. Treated wastewater meeting the regulatory requirements might be discharged into the municipal sewer. The final treated effluent meeting the criteria set by the authorities might also be discharged to the St-Lawrence River (Bay of Sept-Îles) through a dedicated pipe and outlet.

18 Cumulative Effects

Cumulative effects are defined as changes affecting the environment caused by an action combined with the effect of past, present or future activities. Cumulative effects therefore result from the combined effect of the present project and those stemming from other activities (past, actual or future) taking place on the same geographical location, or territory (study area).

These cumulative effects can occur over a certain time and at a certain distance from the project. The current section evaluates how the exploitation of the Strange Lake Rare Earth Mining Project and other activities, such as the access road, can exert cumulative impacts on Valued Ecosystem Components (VECs) in the territory (study area). Cumulative impacts will therefore be presented after the residual impact assessment, taking into account mitigation measures, so that the reader can clearly distinguish them from the direct or indirect impacts of the main project.

18.1 Identification of the VECs Considered

The VECs considered for the assessment of the cumulative impacts arise from the six environmental and social issues. The most relevant criteria for the selection of potential VECs are as follows:

1. the recognition of the importance of a component through legislation, regulation or policy;
2. the sensitivity or vulnerability of the component;
3. the uniqueness or rarity of the component;
4. the sustainability (durability) of the component or ecosystem;
5. the value or importance assigned to the resource by stakeholders;
6. the risks to health, safety or well-being of the public;
7. the ecosystem characteristics, both of the northern environment (beyond the forest line and in the presence of discontinuous permafrost) and of the Sept-Îles environment.

In the case of biodiversity, the species or groups of species considered as VECs for the analysis of cumulative effects in the present study are those with an increased risk of being disturbed by the mining activities and collisions with road vehicles (ex. caribou) and those valued by Indigenous and non-Indigenous groups concerned by the project (ex. caribou, Arctic char, water quality). These VECs will be revised during the elaboration of the project. They will be bonified if necessary.

18.2 Identification and Justification of the Spatial and Temporal Limits of the Analysis

For the northern activities (mine site, seasonal access road, storage facilities in Edward’s Cove), the spatial boundaries considered for this analysis extend beyond those of the proposed mine site and the preferred corridor identified for the proposed seasonal road. The limits of the bio-physical environment will include projects likely to have had or will have an impact on valued VECs such as the George River caribou herd, as well as George River and Ikadlivik Brook water quality. Concerning social environment, the spatial limits for the purposes of the analysis will be extended to include other projects that have had or will have an impact on access to land and resources, archaeological resources, socio-economic conditions, health as well as psychosocial condition of the Aboriginal and non-Aboriginal communities affected by the project.

For the process plant in Sept-Îles, the spatial boundaries considered for this analysis also extend beyond those of the proposed plant and residue storage facility site. The limits of the bio-physical environment will include projects likely to have had or will have an impact on valued VECs such as the Au Foin River and the Baie des Sept-Îles and their biological components. The spatial limits of the social environment for the purposes of the analysis will be extended to include other projects that have had or will have an impact on valued VECs such as socio-economic conditions, health, psychosocial condition of the Aboriginal and non-Aboriginal communities affected by the project, as well as landscape. It is difficult to establish time limits at this stage. As a preliminary step, we propose to consider a period of 15 years for past activities. If necessary, this limit will be reviewed during the analysis. Concerning future activities, the anticipated operation phase of the Strange Lake project extends to 30 years from construction, and includes the closure and restoration phase up to 2072. For the purposes of this analysis, the lifecycle of the projected mine will include the timelines from construction (starting in 2027) until restoration (2072). The temporal limit on the territory that will be considered for future activities is then approximatively 45 years.

18.3 Identification of past, present and future activities potentially affecting VECs

The analysis will identify other activities or development projects (past, present or future) that may have an impact on VECs of biophysical environment, like air quality (ex: atmospheric pollution coming from industries south of the site), caribou and other terrestrial wildlife, Arctic char, waterfowl (ex: fragmentation of the territory, creation of dams). It will also consider past, present and future activities that have had, are having or are likely to have an effect on the VECs of the social environment, such as land use activities performed by the Indigenous and non Indigenous communities (ex: opening up of the territory due to road development by other mining companies), as well socio-economic and health conditions of Indigenous and non Indigenous communities (such as the accentuation of the effect on labour shortages or other socio-economic impacts associated with the implementation of other projects).

18.4 Effects of the project on VECs accrue with the effects of other activities

Concerning biophysical components cumulative effects could be:

- atmospheric pollution due to the emission of dust particles of the project and other projects;
- maritime and port activities in Anaktalak Bay and Edwards Cove in addition to that already generated by other projects;
- caribou habitat fragmentation in addition to that already generated by other projects;
- additional light sources that might interfere with bird migration.
- possible treated wastewater discharge in the Baie des Sept-Îles.

Concerning cultural heritage and the use of land and resources by Indigenous and non-Indigenous groups cumulative effects could be:

- increased pressure on archaeological resources in addition to that already generated by other projects;
- opening up of the territory due to the accumulation of road development.
- additional disturbance of land use activities performed by Indigenous and non-Indigenous groups (noise, dusts, vibration, restriction or interruption of access to certain areas or traffic routes);
- additional impacts on resources valued by Indigenous and non-Indigenous groups (such as the caribou, and Arctic char);
- additional visual disturbance of the landscape.

Concerning quality of life, socioeconomic conditions, and health conditions among local and regional communities (Indigenous and non-Indigenous), cumulative effects could be:

- accentuation of the effect on labour shortages due to the demand for employees for different large-scale projects in the same region;
- increased pressure on businesses and infrastructure (particularly accommodation infrastructure) if major projects are carried out at the same time in the same region.
- possible exacerbation of other socio-economic impacts associated with the implementation of other projects;
- possible exacerbation of tensions within communities regarding development. additional source of potential contamination of consumed resources (animal and plant);
- increased reduction in access to traditional food

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