REVIEW COMMITTEE
(COMEX)

Whabouchi Project
Development and Operation of a Spodumene Deposit
Nemaska Lithium Inc.

Environmental and Social Impact Assessment Report

July 2015

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

Chapter II of the *Environment Quality Act* (CQLR, chapter Q-2) contains special environmental assessment provisions applicable to the James Bay and Nunavik region. These provisions are consistent with those in the James Bay and Northern Québec Agreement (JBNQA). Section 22 of the JBNQA and Chapter II of the *Environment Quality Act* (EQA) set out the general terms of the environmental and social impact assessment and review procedure for the region located south of the 55th parallel.

The Environmental and Social Impact Review Committee (COMEX) is a bipartite body charged with reviewing development projects in the territory of James Bay located south of the 55th parallel. It has five members appointed by the Québec government and the Crees of Québec. After receiving the impact assessment statement for a given project, COMEX conducts an assessment and review with assistance from experts at the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC), the Québec government and the Cree Nation Government. COMEX may also hold public consultations in communities liable to experience positive and negative impacts of the project under review. On the basis of its review, COMEX makes recommendations to the responsible Administrator under the JBNQA. Within the meaning of the JBNQA, the Administrator is the person who makes the final decision regarding the assessment and review of a proposed development. For projects that fall under provincial jurisdiction, the Administrator is the Deputy Minister of Sustainable Development, the Environment and the Fight Against Climate Change. For projects located on Category I lands, it is the Regional Administrator.

Under Schedule 1 of Section 22 of the JBNQA and Schedule A of the EQA, all mining developments, including the additions to, alterations or modifications of existing mining developments, are automatically subject to the environmental and social impact assessment and review procedure. Before proceeding with a mining project, the proponent must obtain various authorizations in addition to the certificate of authorization issued under section 164 of the EQA.

For example, the same as under the procedure for southern Québec, proponents must obtain one or more certificates of authorization issued pursuant to Chapter I of the EQA. Mining projects are also subject to several regulations, including the *Regulation respecting pits and quarries* (CQLR, chapter Q-2, r. 7), the *Clean Air Regulation* (CQLR, chapter Q-2, r. 4.1) and the *Regulation respecting industrial depollution attestations* (CQLR, c. Q-2, r. 5). The latter governs the issuance of depollution attestations. For example, the proponent of a mining project contemplated by the *Regulation respecting industrial depollution attestations* must apply to the MDDELCC for a depollution attestation within 30 days after the start of the mining operation. The attestation stipulates the environmental conditions and requirements the proponent must meet in carrying out its activities. The goal is to minimize the risk of discharges being conveyed from one environment to another, such as from the atmosphere into water, by making sure the entire process is coherent. The fact that depollution attestations are renewable every five years makes it possible to tighten the environmental requirements in pace with new knowledge, available technologies and economics and specific needs to protect receiving environments. Depollution attestations are an important tool in any continuous improvement process.

Mining projects are also governed by the *Mining Act* (CQLR, chapter M-13.1), which was amended in 2013. Under section 232.2 of the Act, the project proponent must submit a rehabilitation and restoration plan before mining activities begin. In addition, regulatory amendments made since August 2013 broadened the scope of the financial guarantee that must accompany a rehabilitation plan to cover 100% of the anticipated cost of rehabilitation. In addition, the schedule of payment of the financial guarantee for mine and exploration sites has been substantially reduced. As of 2014, the restoration obligation is stipulated on the certificate of registration of the claim.

Several proponents of mining projects south of the 55th parallel have signed impact and benefit agreements (IBA) with Cree communities and the Cree Nation Government. Moreover, the Agreement Concerning a New Relationship Between le Gouvernement du Québec and the Crees of Québec, the so-called *Paix des Braves*, encourages "agreements between promoters and the Crees concerning remedial works, employment and contracts in respect to any future mining activities in the Territory, including exploration." Similarly, one of the cornerstones of the Cree Nation Mining Policy is "mining and sustainable practices," that is, "the Crees believe that mining activities shall be done in a manner that is compatible with Sustainable Development, and appropriate existing governance tools such as social and economic agreements, and environmental assessment and remediation processes should accompany all forms and all phases of mining activities."

In addition to the legislative framework governing mining projects, more and more proponents are adhering to programs that promote responsible practices. One such program is the Mining Association of Canada's Towards Sustainable Mining (TSM) initiative. The TSM is a set of tools and indicators to drive performance and ensure that key mining risks are managed responsibly. Mining companies that participate in the TSM measure and report their performance against 23 indicators annually. The indicators are associated with six protocols: Tailings Management, Aboriginal and Community Outreach, Biodiversity Conservation and Management, Energy and GHG Emissions Management, Safety and Health, and Crisis Management. Every three years, a trained Verification Service Provider who is independent of the company being verified reviews the company's self-assessment to ensure the results are accurate. The performance results for participating companies are made public in annual TSM progress reports. This process provides local communities with information on how mining operations are faring. Note that participation in the TSM initiative is mandatory for all MAC members for their Canadian operations. COMEX recognizes the value of this initiative, but wishes to make it clear that neither it nor the Québec government provide any TSM oversight.

1. THE WHABOUCHI PROJECT

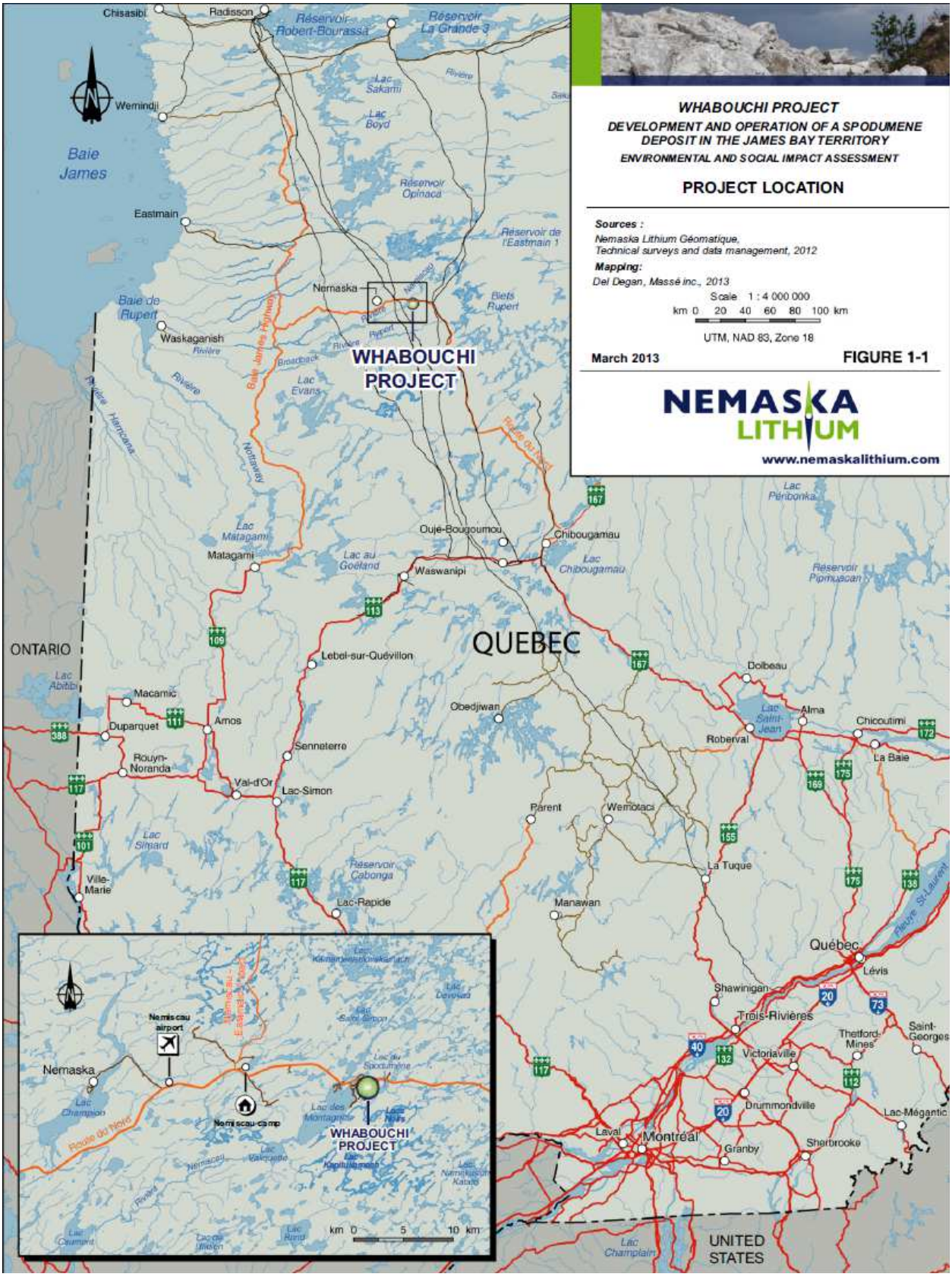
Nemaska Lithium Inc. (hereinafter "Nemaska Lithium") plans to build and operate a combined open-pit and underground mine to extract spodumene and concentrate the ore on-site. Founded in 2008, Nemaska Lithium is an exploration and development company that is active essentially in the James Bay territory. The Whabouchi Property is wholly owned by Nemaska Lithium. The Cree community of Nemaska, Sichuan Tianqi Lithium Industries Inc., a subsidiary of Chengdu Tianqi Industry Group Co. Ltd., and major Québec mining exploration funds hold shares in the company.

Spodumene is one of the chief lithium ores, along with petalite, lepidolite and amblygonite. The Whabouchi ore is a spodumene-bearing pegmatite composed primarily of spodumene, quartz, feldspath and mica, with local presence of garnet, beryl, apatite and petalite.

Lithium is used to make lithium batteries, various types of glass, ceramics, lubricants, rubber and enamels and in primary aluminum production. It is also used in the chemical industry, pharmaceuticals and some alloys. According to the Ministère de l'Énergie et des Ressources naturelles (MERN) website,[1] global production of lithium batteries has increased by over 20% a year in recent years.

The Whabouchi project is located 30 km east of the Cree community of Nemaska and 300 km north-northwest of the municipality of Chibougamau. It lies within the municipal territory of the Eeyou Istchee James Bay Regional Government and is accessible via the Route du Nord. The Whabouchi Property is composed of a single block of 33 contiguous claims covering a total area of 1726 ha. The deposit lies between Lac du Spodumène and Lac des Montagnes. The project is located entirely on Category III land, on Trapline R-20. On November 7, 2014, Nemaska Lithium, the Grand Council of the Crees (Eeyou Istchee), the Cree Nation Government and the Cree Nation of Nemaska signed the Resource Development Partnership Agreement (hereinafter the "Chinuchi Agreement" or "Agreement").

[1] MINISTÈRE DE L'ÉNERGIE ET DES RESSOURCES NATURELLES. 2010-2013. *Perspectives du marché des minéraux de lithium*. Website: www.mern.gouv.qc.ca/mines/industrie/mineraux/mineraux-perspectives-lithium.jsp (French only)



MAP 1: PROJECT LOCATION

As a new mining development, the Whabouchi project is automatically subject to the environmental and social impact assessment and review procedure under Section 22 of the JBNQA and Chapter II of the EQA. This report presents COMEX's analysis of the project, a description of the project, its purpose, the unique features of the study area and the key social and environmental issues related to the project. The information contained in the report draws from the documents submitted by the project proponent as well as those submitted during the public consultations held in Nemaska on March 30 and 31, 2015, and in Chibougamau on April 1, 2015. COMEX's analysis is based on the information gathered. The aim is to establish, in light of its purpose, whether the project is environmentally and socially acceptable and should be carried out and, if necessary, determine the conditions of authorization.

The following table presents the chronology of the main steps completed in the environmental and social impact assessment and review procedure.

TABLE 1: CHRONOLOGY OF THE MAIN STEPS IN THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND REVIEW PROCEDURE

Step	Date sent to COMEX
Receipt of preliminary information	September 8, 2011
Transmission of the Environmental Impact Statement Guidelines	December 19, 2011
Receipt of the French version of the Environmental and Social Impact Assessment (ESIA)	April 4, 2013
Receipt of Addendum 1 – characterization of waste rock and archaeological surveys	May 27, 2013
Receipt of Addendum 2 – study of chemical composition of effluent	July 5, 2013
Receipt of the English version of the ESIA	July 8, 2013
Receipt of Addendum 3 – Water balance and effluent modelling	August 27, 2013
Receipt of Addendum 4 – Three additional figures	August 27, 2013
Transmission of questions and comments to the project proponent	October 16, 2013
Receipt of proponent's responses to COMEX's questions and comments	May 23, 2014
Receipt of Addendum 5 – Noise impact study	July 8, 2014
Receipt of Addendum 7 – Fish losses/Water and sediment quality/groundwater	December 19, 2014
Receipt of Addendum 8 – Air quality modelling	January 8, 2015
Receipt of Addendum 9 – Effluent quality summary and predictions	January 8, 2015
Receipt of Addendum 10 – Walleye	January 8, 2015
Receipt of Addendum 11 – Mine effluent modelling	January 8, 2015

Receipt of Addendum 12 – English summary	February 5, 2015
Receipt of Addendum 13 – Addenda	March 9, 2015
Public consultation in Nemaska	March 30 and 31, 2015
Public consultation in Chibougamau	April 1, 2015
Receipt of Addendum 14 – Transportation route and transfer site	May 7, 2015

Appendix 1 contains a list of the documents submitted by the proponent and prepared by COMEX in the context of the environmental and social impact assessment and review procedure. All of the documents are available on the COMEX website (www.comexqc.ca/en) under the "Projects" tab ("Whabouchi project").

1.1 Purpose of the Project

The Whabouchi project is justified owing to the growing demand for lithium to make lithium-ion batteries used to manufacture and run electric vehicles and electronic devices, such as tablets, laptop computers, smart phones, etc. According to the proponent, these products are driving the global demand for lithium and a few exploration and development projects are already under way in Québec (Rose, Authier, James Bay and Moblan West).

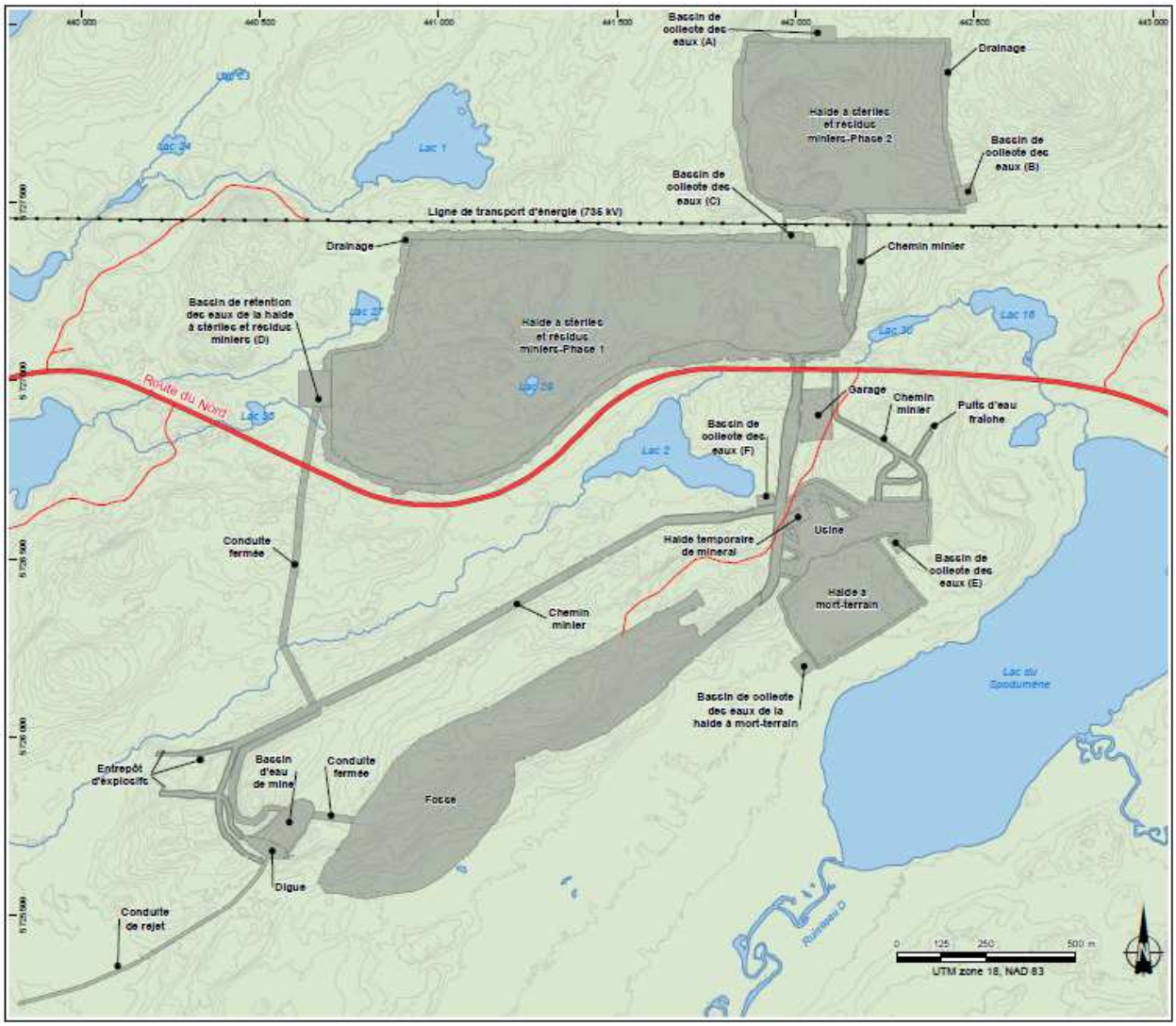
Nemaska Lithium plans to develop and mine the Whabouchi spodumene deposit and concentrate the spodumene on site. The concentrate will be transported to a lithium hydroxide and lithium carbonate processing plant to be built in Salaberry-de-Valleyfield.

Nemaska Lithium, which has conducted extensive exploration in the project area, says that Whabouchi is the richest spodumene lithium deposit in North America and the second-richest deposit in the world.

1.2 General Description of the Project and its Components

The Whabouchi project consists in mining a spodumene deposit with a total of 20 million tonnes (Mt) of measured and indicated mineral reserves at 1.53% lithium oxide (Li_2O). The anticipated lifespan of the mine is 28 years, including the two-year construction phase. When mining operations begin, there will be 125 workers on site.

Infrastructures include an open pit followed by development of an underground mine, a concentrator, a single waste rock and filtered-tailings pile allowing for co-disposal, and service buildings (maintenance garage, spare parts warehouse, engineering and operations management office, administrative office). Five sedimentation ponds will be set up in the main low points around the two waste rock and tailings cells (one per phase), as well as around the garage area, the plant and the temporary ore stockpile. The underground mining phase will take place from years 21 to 26 using the existing infrastructure (Map 2).



MAP 2: SITE PLAN OF MINING INFRASTRUCTURES

Construction will include the following activities:

- Brush and tree clearing and soil stripping
- Construction of ditches and water collection ponds
- Drilling of an artesian well for pumping 123.2 m^3/d
- Haulage and management of unconsolidated deposits
- Construction of the various buildings
- Hazardous and residual materials management
- Petroleum product management
- Preparation of access to the ore deposit

Operation will include the following activities:

- Management of hazardous and residual materials
- Petroleum product management
- Water management

- Drilling
- Blasting
- Transportation of ore to the crusher or the waste rock and tailings pile
- Milling
- Transportation of ore to Chibougamau
- Gradual restoration of the waste rock and tailings pile

The closure phase will consist of the following activities:

- Dismantling and demolishing permanent infrastructures
- Seeding the waste rock and tailings pile
- Backfilling the ditches
- Reclaiming the sedimentation ponds and roads
- Flooding and securing the open pit
- Building a spillway to control the open pit waters

The proponent estimates the capital investment required for the project at $159.2 million. Construction is slated to begin in spring 2016, following Goose Break. The operation phase would begin at the end of 2017.

1.2.1 Ore extraction and processing

The project involves extracting spodumene from a pit that will reach a length of 1300 m, a width of 300 m and a depth of 190 m. The maximum extraction rate will be 15 200 tonnes of ore and tailings per day. Ore will be extracted by conventional open-pit mining with drilling and blasting sequences followed by haulage of the ore to a crusher located at the surface, in the vicinity of the mine. Ore extraction will be conducted 24 hours/day, 350 days/year (15-day suspension of activities in spring for Goose Break).

The processing plant, located on the mine site, will process up to 3475 tonnes of ore per day. Operations are expected to last 26 years, with open pit mining in the first 20 years (from preproduction to Year 20) followed by underground mining for the last six years (years 21 to 26). The daily ore processing rate will peak in Year 6, during the open-pit mining phase, when it will be around 2945 t/d. However, the maximum ore processing rate will be reached during underground mining operations, in Year 22, at just over 3400 t/d.

The annual production target during mine operation is 216 500 t of concentrate, or just over 595 t/d. During the underground mining operations, the concentrate production rate could reach nearly 660 t/d. Mining operations will generate 43.4 Mt of tailings and 2.4 Mt of overburden. A total of 79.02 Mt of material, including ore, overburden and tailings, will be moved.

A temporary ore stockpile with a capacity of around 20 450 t will be set up near the concentrator. Crushed ore will be stored in a 1810-t silo located halfway between the crushers and the concentrator. The temporary ore pile and crushed ore silo will supply the equivalent of seven days of processing, that is, enough material to operate the concentrator during the first week of Goose Break. Annual preventive maintenance of the concentrator will be performed in the second week of the shutdown.

The ore will be temporarily stored on a pad and then ground and crushed using three crushers. The crushers will be linked to the concentrator by a covered conveyor. The concentrator will produce approximately 1 240 000 tonnes of ore per year.

Crushed ore will be stored in a bin and then directed to a two-stage dense media separation (DMS) process, then to the flotation circuit. The concentration process will require various chemical products, which will be stored in the concentrator building.

Ore, tailings and waste rock will be hauled by 46-tonne trucks from the pit to the concentrator or waste rock and tailings pile. The trucks will make 250 trips per day.

Six 100-tonne trucks will transport the spodumene concentrate daily from the mine site to Chibougamau along the Route du Nord and then via forest road R-1008 to the transfer site.

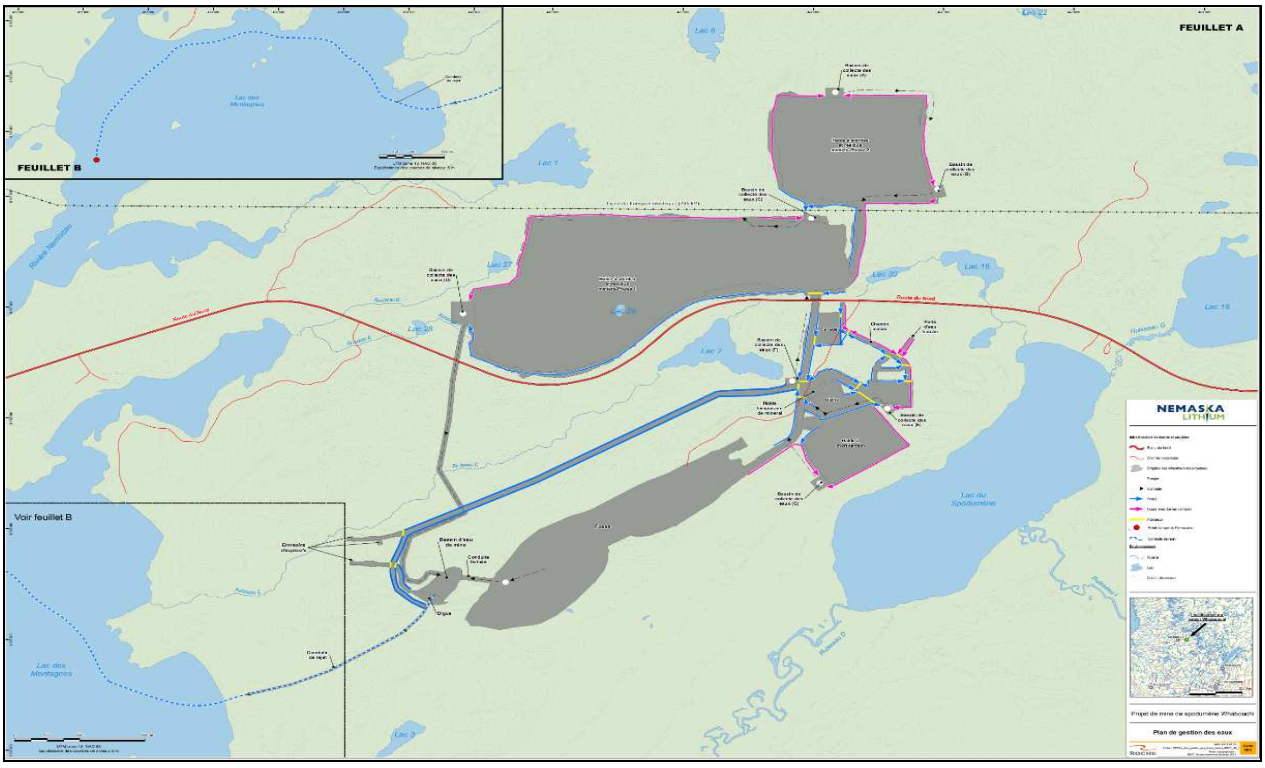
1.2.2 Waste rock and tailings pile and overburden pile

The concentration of spodumene will generate fine- and coarse-grain tailings. The fine tailings will be filtered before being mixed with the coarse tailings and hauled to the waste rock and tailings pile. The moisture content of tailings should be 9%.

The waste rock and tailings pile will consist of two cells developed in two different phases: 58.11 ha in Phase 1 and 25.75 ha in Phase 2. The pile will reach a height of 60.0 in Phase 1 and 40.0 m in Phase 2. Phase 2 will begin after Year 13 of operation.

1.2.3 Mine water

As previously mentioned, five sedimentation ponds will be set up in the main low points around the two waste rock and tailings cells (one per phase), as well as around the garage area, the plant and the temporary ore stockpile. Runoff from these areas will be collected in ditches built around the periphery of the facilities. This runoff will ultimately be directed toward a final retention basin located southwest of the waste rock and tailings pile. A pipeline will move water from the outflow of this retention basin to the mine water basin located southwest of the open pit. This basin will also collect mine water (groundwater seepage and precipitation over the pit footprint). The final effluent from the mine water basin will be treated and then discharged into Lac des Montagnes via a surface pipeline. To minimize the visual impact of the pipeline, it will be buried as of about 100 m from the shoreline.



MAP 3: SITE PLAN OF DITCHES, BERMS AND PONDS

To ensure worker and land-user safety as well as lasting infrastructure in a context of climate change, Nemaska Lithium was required to design the sedimentation ponds for a 1:1000-year flood event.

The following table presents calculated volumes for basins at a 1:1000-year flood event (empty):

TABLE 2: CALCULATED AND ACTUAL VOLUMES OF SEDIMENTATION PONDS FOR A 1:1000 YEAR FLOOD EVENT

	Calculated volume	Length	Width	Height	Actual volume
Pond A	4080	50	30	2	4104
Pond B	3444	45	30	2	3744
Pond C	3927	70	20	2	4024
Pond D	17850	95	50	3	18651
Pond E	2706	30	25	2	2304
Pond F	5208	50	40	2	5224
Pond G	4059	40	40	2	4304

The ponds are thus designed to hold and manage water for a 1:1000-year flood event. A design plan for the mine water basin was submitted following a siting change. The design capacity of the basin allows for settling clay particles 0.001 mm in size.

The pit will be dewatered as it gets deeper. Basins will be excavated at the bottom of the pit to collect groundwater and runoff. A diesel pump will be installed at the lowest point of the pit and connected to a pipe to carry the water to the surface and into the sedimentation pond.

1.2.4 Drinking water and domestic wastewater

The service buildings and maintenance garage will draw their drinking water supply from the same well that supplies the concentrator. The demand for freshwater is estimated at 6 m^3/h, including the needs of the concentrator. When the concentrator begins operation, the demand for freshwater will temporarily reach 20 m^3/h for a period of approximately one week (assuming 16 m^3/h will be provided by the well until the 2500-m^3 basin is completely filled). Drinking water will be available after treatment. The treatment process will be a basic system that will eliminate suspended matter and incorporate a UV system. Drinking water will be concentrated in a strategic location in the plant and warnings will be posted in locations where the water is not potable. Water used to control dust at the primary crusher will be provided by the well, but will not be treated to become potable. Water to fight fires will be drawn from the main concentrator storage tank.

Domestic wastewater (sewage) will be generated by the sanitary facilities in the administrative and technical service buildings, the garage and the concentrator. The wastewater will flow into septic tanks and then to a disposal field. The sewage treatment system will use ground infiltration and no effluent will be released in the surface water network. The septic tanks will be emptied regularly and the sludge will be disposed of in an authorized site.

1.2.5 Other infrastructures on the mine site

Service buildings for the Whabouchi project include an administrative office, an engineering and operations management office, and a guardhouse. These buildings will be located along the mine access road, near the Route du Nord.

The maintenance garage and spare parts warehouse will be located near the administrative and technical services buildings and the employee parking area. The garage will be used to perform maintenance on mine equipment, heavy machinery and light vehicles. The parts warehouse adjoining the garage will be designed to maximize storage space for parts and tools.

The fuel depot, with a capacity of 100 000 L, will be located near the garage and consist of two double-walled, 50 000-L tanks installed on concrete slabs. The diesel-fuel distribution network will consist of two refuelling points for heavy machinery and one for light vehicles. The storage tanks and refuelling points will be equipped with a pumping system and lighting.

1.2.6 Borrow pits

Approximately 200 000 m^3 of borrow material will be required to build the various infrastructures, in particular the retention dikes. This material will be extracted from existing borrow pits near the mine site. Nemaska Lithium does not plan to operate new borrow pits.

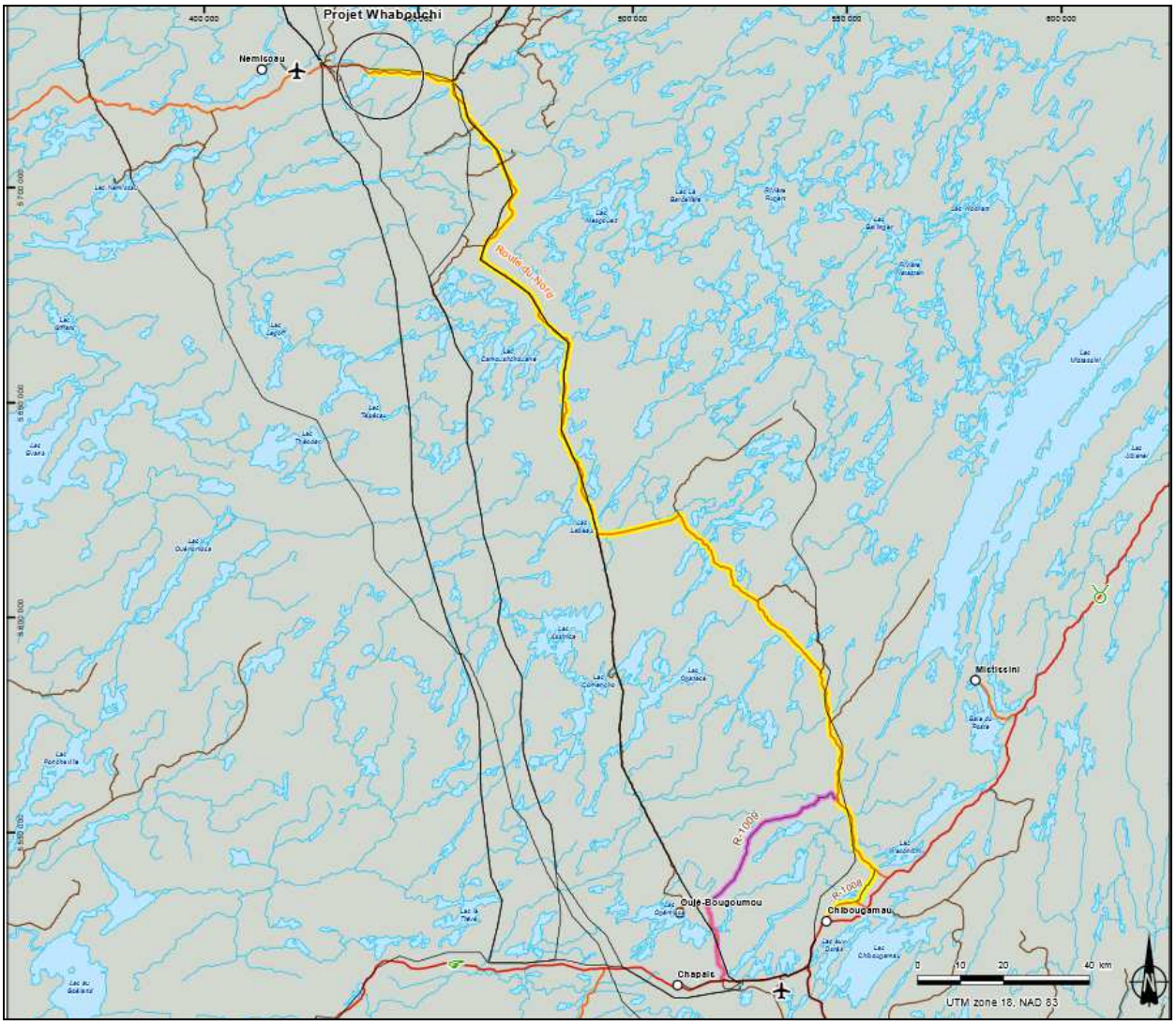
1.3 Support Infrastructure

1.3.1 Housing for workers

The work camp will be located at the truck stop currently operated by the Cree Construction and Development Company (CCDC), 12 km from the mine site and accessible by the Route du Nord. The camp will house workers over the entire life of the project, from construction to closure. If the project goes ahead, the existing CCDC work camp will have to be expanded to accommodate the Nemaska Lithium employees. CCDC will be responsible for the camp expansion work as well as for the operation of the camp and its services. Nemaska Lithium will pay CCDC a per diem for each employee for services rendered. Initially, the camp will house the workers hired for the construction of the Whabouchi project infrastructures. A total of 215 rooms will be required during the construction period. During the operation of the mine, 125 rooms will suffice to house employees.

1.3.2 Access roads and transshipment routes

The spodumene concentrate will be transported to Chibougamau along the Route du Nord. Six 100-tonne trucks will make daily trips, hauling a total of nearly 213 000 tonnes of concentrate per year. The trucks will take forest road R-1008 to get to the transfer site, where the concentrate will be stored and then loaded onto closed railcars at the new multipurpose transfer facility in Chibougamau. Développement Chibougamau conducted a prefeasibility study specifically for the construction of a multipurpose transfer facility in Chibougamau. Développement Chibougamau would be responsible for making sure the required infrastructures are available when needed and for obtaining any authorizations required.



MAP 4: ACCESS ROADS AND TRANSSHIPMENT ROUTES

1.3.3 Power supply

Power will be supplied to the project infrastructures by a 25-kV power line running from Hydro-Québec's Albanel substation. The power line, roughly 20 km long, will be built and operated by Hydro-Québec. The mining equipment operating in the pit would be powered by diesel engines, primarily for safety reasons.

1.3.4 Waste management

Nemaska Lithium will apply the 4R principles of the Québec Residual Materials Management Policy, namely source reduction, reuse, recycling and reclamation. End waste from the mining facilities and workers will be disposed of in the trench landfill operated by the community of Nemaska.

1.4 Chinuchi Agreement

On November 7, 2014, Nemaska Lithium, the Grand Council of the Crees (Eeyou Istchee), the Cree Nation Government and the Cree Nation of Nemaska signed the Resource Development Partnership Agreement, referred to as the "Chinuchi Agreement." A summary of the Agreement was sent to COMEX.

2. PUBLIC CONSULTATION

COMEX held public consultations to hear the views, opinions and concerns of the communities affected by the Whabouchi project. This section reports on the consultations and presents the essence of the comments made. The comments are examined in the following sections.

A news release was issued on February 16, 2015 announcing the holding of two public hearings in late March 2015. Notices were also published in the regional print media, including the *The Nation* and *La Sentinelle*. All project-related documents were posted on the COMEX website 30 days prior to the public hearings and the public was invited to submit written comments by May 1, 2105.

COMEX deemed that public hearings were necessary owing to the project's significant social and environmental impacts and issues. During the public hearings, the proponent outlined the project and its anticipated positive and/or negative effects on the environment and the social milieu, following which COMEX members and participants in the hearings got a chance to ask questions. Participants were invited to submit their comments to COMEX at a later time.

COMEX held two consultation sessions: one in Nemaska and one in Chibougamau. Some participants made written and oral submissions at the consultations. The principal concerns expressed are presented in this section.

Sound recordings of the public hearings, as well as the written submissions made during the public consultation period are available on the COMEX website.

2.1 Public Hearing in Nemaska

COMEX held its first hearing on March 30, 2015, at the sports centre in the Cree community of Nemaska. Over a hundred members of the community attended the hearing, which lasted from 2:00 p.m. to 10:30 p.m. Given the high turnout, and at the request of certain stakeholders, the session continued on March 31, from 9:00 a.m. to 1:30 p.m. The date of March 30 was chosen so as not to interfere with the band council elections in mid-March. The community of Nemaska has a population of around 800.

Of the 100 participants at the public hearing in Nemaska, over 30 took the floor to express their concerns regarding the Whabouchi mining project. Thomas Jolly, Chief of the Nemaska Band Council, James Wapachee, Tallyman of Trapline R-20, and numerous community members were present. Oral submissions were also made by representatives of the female focus group, the work group mandated by the Band Council to prepare the members for the public hearings on the Whabouchi project, and representatives of the Weh-Sees Indohoun Corporation.

2.2 Public Hearing in Chibougamau

A public hearing was held in Chibougamau on April 1, 2015, starting at 7:00 p.m. Roughly 25 people attended the hearing, which was held at the golf club. The city of Chibougamau has a population of approximately 7600.

There were around two dozen questions and comments from the public and COMEX members. Submissions from Chibougamau Mayor Manon Cyr, Chibougamau's chamber of commerce and Développement Chibougamau stressed the project's significant economic benefits for the local and regional communities.

2.3 Submissions During the Public Consultations

The following individuals and bodies submitted written comments to COMEX during the public consultation period on the Whabouchi Mining Project, which ran until May 1, 2015:

- Cree Nation of Nemaska (also submitted a report on the project's impacts on the aquatic environment prepared by the INRS)
- Female focus group (Cree women from Nemaska)
- Youth focus group (young Crees from Nemaska)
- Whabouchi Work Group (2 documents)
- Chambre de commerce de Chibougamau
- James Wapachee
- Harry Wapachee
- Abel Wapachee
- Weh-Sees Indohoun Corporation
- Matthew Wapachee (submitted a petition supporting the project signed by over 100 people)
- Ville de Chibougamau
- Développement Chibougamau
- Cree Board of Health and Social Services of James Bay
- Edith Matoush
- Bella Jolly
- Freddy Jolly
- Kenny Jolly Sr.
- Lindy Moar

2.4 Summary of Concerns Expressed During the Public Consultations

2.4.1 Economic benefits

Numerous participants at the public hearings in Nemaska and Chibougamau, as well as various groups and individuals who submitted written comments, talked about the environmental and social impacts as well as the potential economic benefits of the Plan Nord and the Whabouchi mining project. Some believe that the project could create a significant number of jobs, leading to the hiring of young Crees and Jamesians. The mining industry represents a powerful economic engine for Eeyou Istchee. Some participants also said that the project could lead to contracts for goods and services, in which case they feel that preference should be given to local companies in order to encourage business start-ups and thereby contribute to the region's economic growth. However, several participants felt that members of the Cree community should have access to jobs created during the construction and operation phases of the project. Cree workers should

also have access to the appropriate vocational and/or technical training needed to match labour needs and mobility. As stated by Harry Wapachee:

> I feel I will not be hired because I am not educated. I grew up on our trapline and my education comes from there. This is where my concern lies with me when I look at myself. Is employment guaranteed for me? (*sic*)

Many participants said that workers from other regions should not get all the jobs. Where jobs cannot be filled by the labour supply in northern communities, the proponent was asked to implement measures to help workers and their families settle in the communities, especially Chibougamau. Labour needs should be planned right away and the appropriate training offered. There were also concerns about the future of jobs after the mine closes.

Others, such as representatives of Développement Chibougamau, said they would endorse the project only if Nemaska Lithium uses a "multipurpose rail transfer facility in Chibougamau" that could be built within the city limits, rather than building its own transfer facility for its exclusive use. The proponent was told it could count on the Ville de Chibougamau, which intends to continue working with the company to ensure maximum spinoffs for the city and thereby foster employment and encourage new families to settle in Chibougamau.

Several participants endorsed the Chinuchi Agreement, whereas others complained about not being part of it or even being informed about the negotiations leading up to its signing. Some went so far as to question the Band Council's authority to lead the negotiations. The text of the Chinuchi Agreement remains confidential. Some members of the community of Nemaska are very keen to know the details of the commitments made by the parties, particularly as regards the distribution of benefits in the community. On the other hand, Matthew Wapachee submitted a petition signed by over 100 people in favour of both the Agreement and the project.

2.4.2 Working conditions

Many participants were concerned about working conditions in terms of Aboriginal and non-Aboriginal people sharing living space, especially relations between men and women. Several participants felt that a poor understanding of the respective cultures and/or languages might lead to discriminatory, racist or just plain abusive behaviour. Harassment, physical abuse and alcohol and substance abuse were three issues raised by the female focus group:

> Our Group is also very concerned about alcohol be (*sic*) an issue with the mine workers. The proponent should enforce a zero tolerance policy for drugs and alcohol. The proponent should require screening tests or at least require them to be sober for a reasonable amount of time (at least 72 hours) before working on the mine. This would avoid hiring people with alcohol problems.

Furthermore, stakeholders mentioned that work schedules must not have a negative effect on families (e.g. avoid 14/14, or "fly-in/fly-out" schedules and long periods away from family); instead, they should help families flourish and achieve fulfilment.

2.4.3 Land use and traditional pursuits

Concerns relating to land use were tied to blasting noise during the spring goose hunt and the location of the discharge pipe in Lac des Montagnes, which participants thought might hinder traditional hunting, fishing and trapping activities. People want to be able to continue hunting on

the trapline the mine sits on, with no restrictions, and to be informed of the blasting schedule. In addition, some stakeholders want the Weh-Sees Indohoun Corporation to remain in place, or a similar body created, in order to control hunting and fishing on the territory.

2.4.4 Water quality

Many participants in the COMEX public consultations hoped that all water from the mine site would be reused and treated before being released into the environment. They were concerned about the risk of alterations in sedimentation, flow rates, discharges, flooding and contamination of Lac des Montagnes and Lac du Spodumène, as well as nearby watercourses, in particular as a result of erosion and tailings management. Some people feared that contaminated tailings would flow down Rupert River and end up affecting the community of Waskaganish. In the words of Abel Wapachee:

> I am concerned that if the water of Mountain Lake is polluted by the project, the pollution will flow down to Rupert River …. I am concerned that the quality of the water of the Rupert River will be affected and will impact the fish habitat of that area. Certain land users of our Trapline practice traditional activities on the Rupert River. If the water of the Rupert River is affected, I am afraid that it will have an impact on the quality and taste of the water the land users drink, as well as the fish and the animals they eat.

Others, such as Matthew Tanoush, called on the proponent to study the issue at greater length and submit a detailed action plan on water treatment, especially effluent, in the event that the applicable standards are not met. There were numerous concerns about the project's impact on wildlife and fish, spawning sites, and wetlands. All of the participants, however, stressed the importance of regular monitoring and follow-up of water quality and fish populations, even after the mine has closed.

2.4.5 Land-user health and air quality

The issue of the mine's proximity to the community of Nemaska, the Bible Camp and Cree camps was raised repeatedly during the consultations. Many Crees from Nemaska use Lac des Montagnes year-round. The lake is a traditional gathering place for them. Stakeholders are concerned about the effects of the project on the health of land users and wildlife habitats. Contamination was of particular concern because many children, who are especially vulnerable due to their young age, swim in the lake. People fear that if the water becomes polluted, it will cause cancer. They also fear that the noise generated by mining activities will have a negative impact on the area. Also, dust emissions could affect air quality and cause health problems, such as respiratory ailments or skin irritations. Participants wanted details on the planned mitigation measures.

2.4.6 Safety and emergency plan

Numerous concerns were expressed with regard to safety, particularly the safety of workers, users of the Route du Nord and forest roads, as well as users of Cree camps located close to the road. In the written comments she submitted to COMEX, Bella Jolly stated the following:

> I am concerned of the safety of land users that spend most of their time at their camps which happens to be close to the Route du Nord. (*sic*)

Certain curbs and slopes on the Route du Nord could, in fact, be dangerous. Questions were also raised regarding the bearing capacity of bridges and structures, signs, and monitoring and maintenance of the Route du Nord. In winter, road conditions and visibility can be difficult due to ice and snow and, in summer, due to road dust from vehicles. Several participants were also concerned about the increase in truck and motor vehicle traffic on the Route du Nord. As expressed by Bella Jolly:

> This project will increase the traffic on the Route du Nord … and will increase the chances of accidents occurring ….

The speed of response by first responders and emergency services was also of concern given the geographical remoteness and limited access to the Route du Nord. Little seems to be known about Nemaska Lithium's emergency plan. The Cree Board of Health and Social Services of James Bay and the female focus group called on the mining company to explain the plan in detail during a public hearing. Increased pressure on Nemaska's health system because of the project as well as interaction with the health clinic were major issues for several participants. Making sure the site, especially the pit, is safe post-closure was of vital importance to the participants.

2.4.7 Cumulative and psychosocial impacts

Some land users, such as Clara Wapachee, raised concerns about the cumulative effects of development projects carried out in the territory, such as the construction and commissioning of the Eastmain-1-A and Sarcelle generating stations and diversion of the Rupert River. According to them, that Hydro-Québec project has already affected the Nemaska River and the Whabouchi project would exacerbate the impacts on the receiving environment. The participants said they were concerned about pollution, water contamination, flow modifications, the ability to continue practising traditional activities and protection of aquatic fauna, among other things.

Concerns were also expressed about the visual impact of the mine from Lac des Montagnes and the Route du Nord. As the mine site is located close to the Cree community of Nemaska, some community members asked for more-natural-shaped piles and gentler slopes. Others would like tailings to be reused to upgrade roads and expand the community, as proposed by Kenny Jolly Sr.:

> If the mine does go through, the blasted or wasted rock can be recycled and used by our community. We need to repair and improve our roads. This includes the Route du Nord as well. Our community sits on an island or a peninsula where we're surrounded by marsh land. We will need the rock to further improve the community or when the need comes to expand into the marsh land. This is where we could use the rock.

Other stakeholders, including the Youth Group, want the site to be restored to its original state when the mine is shut down, by filling in the pit and replanting all affected areas.

The psychosocial impacts of the Whabouchi project were also discussed during the public consultations. Stakeholders maintain that the mine will not only affect the physical environment, but will lead to social changes in the community as well. Moreover, Elders made the following remark to show how young people are torn:

> The Elders understand how difficult it is for the youth and how they can be torn between the desire to protect the land and the need for job openings: some youth speak of the land, others speak of jobs. My grandchildren have finished school but have no work.

They claim that people will be affected emotionally as well. Some Crees would like to see greater consideration given to their traditional knowledge in environmental studies. In fact, they wondered what kind of follow-up there would be once the public consultations are over.

3. SOCIAL AND ENVIRONMENTAL ASSESSMENT

COMEX reviewed Nemaska Lithium's Whabouchi project on the basis of documents submitted during the environmental assessment process and the public hearings held in Nemaska and Chibougamau. This section discusses the key economic, social and environmental issues identified by COMEX and proposes conditions (in bold) for the project's implementation. Economic and social issues essentially boil down to integration of the project with the landscape and human environments and chiefly concern jobs, training, road safety, land-user health and protection of land uses, including hunting, fishing and trapping. The priority environmental issues are water quality, particularly in Lac des Montagnes, which is the surface water receptor for mine effluent, air quality, wildlife management and on-site management of waste rock and tailings.

3.1 Chinuchi Agreement

As previously mentioned, the Chinuchi Agreement was signed between Nemaska Lithium, the Grand Council of the Crees (Eeyou Istchee), the Cree Nation Government and the Cree Nation of Nemaska on November 7, 2014. Although the Agreement is confidential, COMEX was able to read a summary. It seems to cover a number of themes, including job creation, workforce training, employment conditions and maximization of economic spinoffs. It also addresses environmental, social and cultural considerations. The parties ultimately agreed to establish a committee to oversee implementation of the Chinuchi Agreement.

It is COMEX's understanding that the Agreement addresses many of the concerns raised during the public hearings; however, COMEX cannot give an opinion on the purpose of the Agreement given that it is confidential. That is why COMEX thinks that future agreements of this kind should be public record. Moreover, it urges the legislator to revisit the matter. In fact, COMEX notes that a number of similar agreements are public record and that the signatory parties do not appear to have suffered any prejudice.

However, COMEX also understands that the Chinuchi Agreement provides for the establishment of an environment committee by Nemaska Lithium. Nemaska Lithium agreed to draw up an environmental and social monitoring program, in cooperation with the Crees of Nemaska, as part of the committee's work. As well, community members and, especially, the tallyman of Trapline R-20, will be involved in environmental as well as social monitoring and follow-up.

Condition: One year after the project's authorization, the proponent must submit an updated environmental and social monitoring program to the Administrator for approval. The updated program must include the monitoring activities referred to in Directive 019, those the proponent undertook to carry out and the monitoring required as a condition of authorization. The environmental and social monitoring program must explain the Nemaska Crees' involvement as well as that of the Environment Committee established pursuant to the Chinuchi Agreement. The proponent must specify the extent of Cree

involvement in monitoring activities, especially those dealing with Lac des Montagnes. The monitoring program must also include post-operation and post-remediation monitoring.

Condition: The proponent must submit all environmental and social monitoring reports to the Administrator for information purposes.

Based on the concerns expressed during the public hearings, COMEX thinks the proponent needs to step up its communication efforts to ensure the flow of information between Nemaska Lithium and the community of Nemaska. Several times, community members were critical of the project's real impact on employment and on hunting, fishing and trapping sites. The community is also worried about what will become of Cree camps and the Bible Camp if the impacts are greater than anticipated. In this regard, COMEX wishes to make it clear that environmental and social monitoring reports must be written in plain language so everyone can understand. The proponent must engage in meaningful dialogue with the community in order to share the results of environmental and social impact studies and identify solutions to any problems that may arise before, during and after the project. The proponent must constantly seek to adopt best practices in order to minimize impacts generated by its project.

Condition: The proponent must craft a communication strategy to keep the Aboriginal and non-Aboriginal communities affected by the project regularly informed of activities on the mine site, environmental and social monitoring results, operational problems and business and employment opportunities. The proponent must submit its communication strategy to the Administrator, for approval, one year after the project's authorization.

3.2 Review of Project Alternatives

During the public hearings, concerns were raised about the location of the waste rock and tailings pile. Of particular concern was the risk of dike failure or collapse and the visual impact of the piles. To ensure a full understanding of the planned infrastructures, below is COMEX's environmental assessment of the proposed waste rock and tailings management.

3.2.1 Characterization of tailings

According to COMEX's analysis based on the results of TCLP (Toxicity Characteristic Leaching Procedure) tests, the metal most likely to leach is copper, both from tailings and mineralized bodies of the deposit. Wet cell tests were conducted and showed that copper and beryllium exceed the usage criteria defined in the Soil Protection and Contaminated Sites Rehabilitation Policy during initial rinsing, after which concentrations remain below the usage criteria. Metal concentrations in both tailings and ore are below Criteria B of the Soil Protection and Contaminated Sites Rehabilitation Policy, except for copper, which is between Criteria B and C. These data corroborate the results of the wet cell and TCLP tests.

Within the strict meaning of Directive 019, mine tailings are considered leachable. Given the scope and life of the future mining operation, COMEX thinks that kinetic testing with better simulation of real tailings storage conditions is needed, the same as was done for other projects that underwent environment assessment. This would enable a more accurate assessment of contaminants that might be emitted into the environment and the required degree of imperviousness of the tailings pond, thereby determining the best mine water treatment method

for meeting the requirements of Directive 019 and the environmental discharge objectives (EDOs) determined by MDDELCC (Appendix 3). The proponent undertook to conduct such testing and send the results to the Administrator. The testing will consist in installing a test cell in the field to simulate the anticipated disposal conditions of the future waste rock and tailings pile.

3.2.2 Selected site for tailings accumulation areas

The site of the tailings pond was optimized during the review process. The entire site will now lie north of the Route du Nord, which will avoid having to relocate the road as well as minimize nuisances associated with tailings transportation and handling, which previously occurred close to a Cree camp.

However, since the proponent has very little hydrogeological and geotechnical information about this area (only two observation wells), it is currently difficult to make a definitive pronouncement on the project impact on groundwater and whether the geotechnical stability criteria under Directive 019 will be met. Consequently, COMEX required the proponent to conduct additional hydrogeological and geotechnical surveys and submit a groundwater impact assessment and a geotechnical stability study in accordance with subsections 2.3.1 and 2.9.3.2 of Directive 019 to demonstrate that this aspect of the project poses no specific risk. The proponent undertook to conduct these additional studies and submit the results at the same time as its application for a certificate of authorization under section 22 of the EQA.

3.2.3 Tailings management

Nemaska Lithium has chosen to manage tailings using filtration and co-disposal with waste rock in a single accumulation area.

This management method has several advantages, including:

- no accumulation of water in the tailings site;
- very little water in tailings (75% to 90% dryness);
- no tailings pipeline;
- no impoundment dikes for holding process water;
- smaller footprint of the tailings site;
- possibility of gradual restoration of the tailings site.

This management method entails considerably fewer environmental risks than managing tailings in slurry form, as the risks related to process water and dike failure are virtually eliminated. Considering the above, it is COMEX's opinion that the proponent will be using the best tailings management technology available.

Taking into consideration the requirements of Directive 019, the *Mining Act* and its regulations regarding tailings pile stability, it is difficult to say whether the visual appearance of the pile can be modified. It is up to the proponent to contact the competent authorities to make sure the tailings and waste rock containment method is safe for both the environment and land users. COMEX suggests that the proponent make the construction requirements for the tailings and waste rock pile available to Nemaska members for consultation.

3.2.4 Mine water treatment

A report entitled *Results of the Water Balance and Water Quality Models for the Whabouchi Lithium Mine* was submitted to COMEX in July 2013. Another report, *Prédiction de la qualité de l'effluent minier*, was submitted in December 2014. Both reports predict that the Directive 019 effluent criteria are likely to be met at the final effluent discharge point in Lac des Montagnes. According to the latter study, copper is the only parameter expected to exceed the MDDELCC's acute toxicity criteria, but not exceed the Directive 019 criteria. Note that two effluent discharge points were initially planned: Lac des Montagnes and Stream C. However, the proponent was able to eliminate the discharge point in Stream C through project optimization.

Explosive residue may cause toxicity of drainage water from the open pit, a relatively common problem with mines in the Abitibi and Nord-du-Québec regions. Nemaska Lithium assessed the risk and proposed an explosives management strategy that uses emulsion explosives, which contain less nitrogen than the standard ammonium nitrate-fertilizer (ANFO) explosives proposed in the ESIA. These measures are good, but alternative water treatment methods should be proposed if, during the operation phase, the proponent sees that the preventive measures do not succeed in eliminating potential toxicity.

Initially, the only treatment of mine wastewater planned by the proponent was attenuation of suspended matter using sedimentation ponds. Finding this insufficient, COMEX requested that all mine water flow through a treatment system before being discharged into Lac des Montagnes. In the technical update, Nemaska Lithium proposes to install a treatment system that can be brought online rapidly. To COMEX's satisfaction, the proponent undertook to bring the treatment plant online following a trial period as soon as the Whabouchi mine starts operating.

The wastewater treatment system must be operational year-round, from the start of mining operations to the end of the last operating period. The proponent must provide details on the features and treatment levels of the proposed wastewater treatment system before mining operations begin. Data on the anticipated monthly variability (minimum, maximum, mean) of the final effluent discharge rate in Lac des Montagnes, for all mining periods, must be sufficiently detailed to be able to assess the need to revise EDOs.

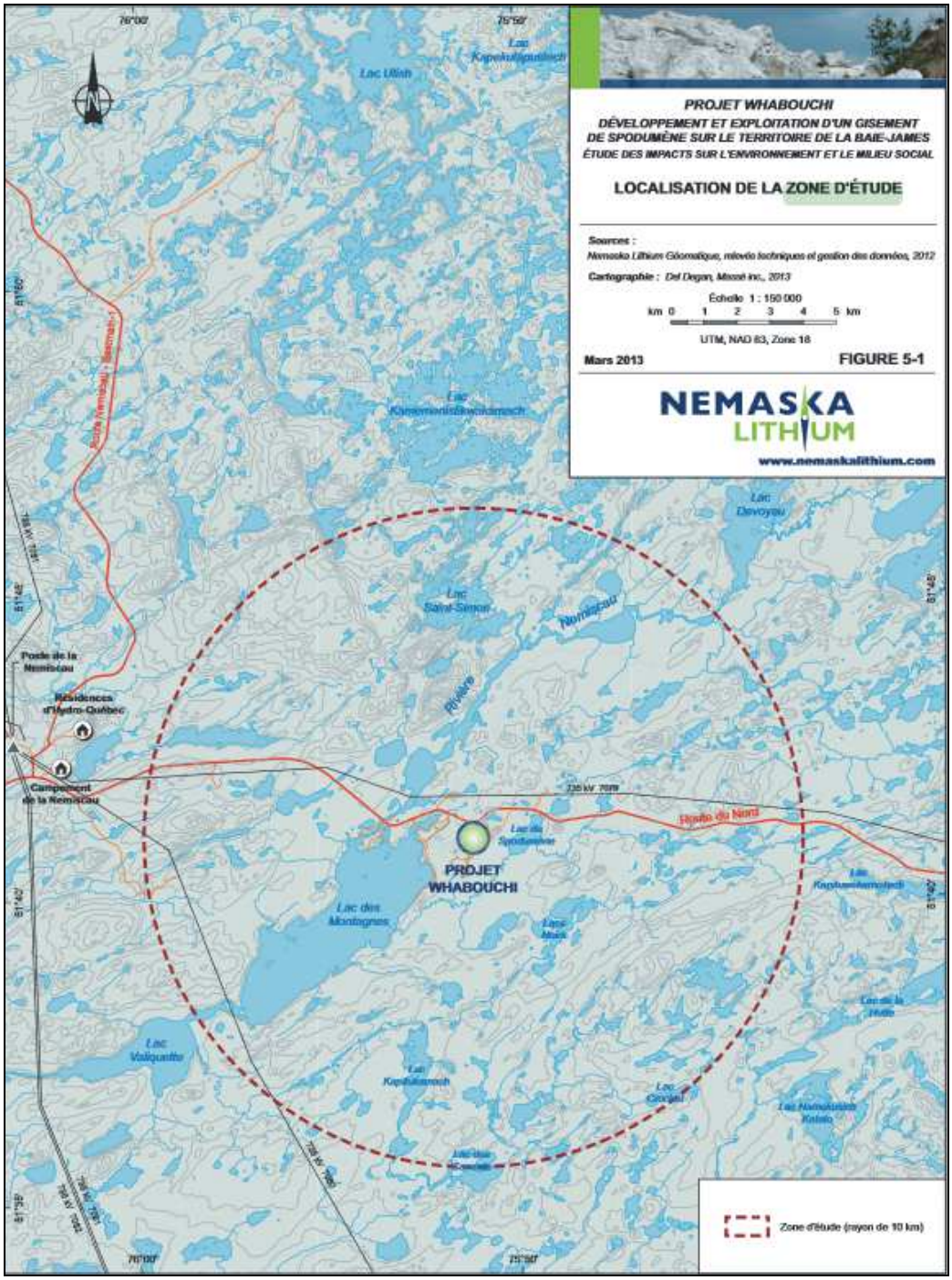
Condition: At the end of mine wastewater treatment testing, the proponent must submit the selected mine effluent treatment method to the Administrator for approval. It must be demonstrated that this method will ensure optimum treatment.

In addition, monitoring must be conducted in Lac des Montagnes to document temporal variability in surface water quality. The phosphorus analysis method must be sensitive enough to detect changes in lake conditions.

Condition: The proponent's environmental monitoring program must track surface water quality in Lac des Montagnes. Parameters to be measured include total phosphorus at trace levels (method MA. 303-P 5.2 of CEAEQ), chlorophyll a and clearness of water (with a Secchi disk). Monitoring stations must be established such that the final effluent plume on Lac des Montagnes can be determined. Triplicate, or at the very least duplicate, water samples must be collected from the lake once a month during the ice melt. If the weather does not allow for the collection of three samples, the proponent must adjust the sampling frequency so as to meet this objective.

3.3 Identification and Analysis of Social and Environmental Issues

Figure X shows the study area selected by the proponent for the purposes of describing the setting of the Whabouchi mining project and assessing its impacts. The future mine will be located in the centre of the study area, which is approximately 314 km^2 in size. The study area was delimited so as to encompass all physical, biological and human components liable to be affected by the project.



MAP 5: PROJECT STUDY AREA

After reviewing the ESIA and holding public consultations, COMEX more closely examined the social issues of training, employment, working conditions, economic spinoffs, noise levels and road safety. The environmental issues given closer examination are water quality, fish and fish habitat, hunting, fishing and trapping, air quality, noise and mine closure and site restoration.

3.3.1 Training and employment

The community of Nemaska lies on the western shore of Champion Lake. It is over 390 km away from Matagami and 340 km from Chibougamau. Nemaska is an important Cree administrative centre for the Eeyou Istchee region, with offices of the Grand Council of the Crees (Eeyou Istchee) as well as the Cree Nation Government (CNG).

The community of Nemaska, with a population of 772, accounts for approximately 4.24% of the total Cree population. Nemaska follows the same demographic trend as other communities in Eeyou Istchee in that it has experienced rapid population growth over the last 30 years. The main demographic feature of the Nemaska Cree community is its youth.

According to Statistics Canada, in 2005 the median family income in Nemaska was $52 352 before taxes. The cost of living is generally higher in Cree communities, notably due to the high cost of consumer goods, transportation and energy. In 2008, the tertiary sector (health, social and education services, municipal and other government services) was the predominant economic sector, representing 85.4% of employment in the community. Nearly a third (31%) of all jobs are in public administration. As in the case of the primary sector, construction is a marginal economic activity in Nemaska, accounting for only 4.9% of jobs in the community. The primary sector (hydroelectricity, forestry, hunting and fishing) represents just 6.6% of jobs. In 2008, the unemployment rate in Nemaska was around 16.4%.

The graduation rate in the community of Nemaska is similar to the Cree average, at 11.2% vocational diplomas and 11.2% college diplomas. The university graduation rate (9%) is similar to the Cree average.

Although every Aboriginal community receives federal funding for labour development through the Local First Nations Commission (LFNC), Aboriginal communities and their members turn to Emploi-Québec for support in their workforce training and development initiatives.

Aboriginal people have access to all Emploi-Québec services and measures. However, in the context of major projects, Emploi-Québec may also administer measures targeted specifically at Aboriginal people. Since priorities for action are decided at the local and regional levels, Emploi-Québec reviews requests for services by Aboriginal people based on the same criteria as for all other requests its receives, namely, their intrinsic value, the terms and conditions of the active employment measures and the financial resources of the local employment centres (CLE).

Emploi-Québec’s basic universal services are available to all Aboriginal people. Services for individuals and businesses include:

- intake and referral services;
- labour market information;
- information on measures and services for individuals;
- information on services for businesses;

- initial meeting for assessment and employment assistance (individuals);
- multiservice room (job banks, reference material and video library);
- online placement service for consulting job offers and submitting job applications.[2]

The Jamesian (non-Aboriginal) population is concentrated in Chibougamau, which has 7600 inhabitants. Mirroring the rest of the municipality of James Bay, Chibougamau's population shrank by 19.7% between 1996 and 2006. The completion of major Hydro-Québec construction projects and the closure of several mines led to an out-migration to other regions.

Recent mining activity and hydroelectric developments have helped lower the region's unemployment rate from 7.5% in 2010 to 6.5% in August 2011 (ISQ, 2011). This is lower than the unemployment rate for Québec as a whole, which was 7.6% en 2011. Chibougamau benefited from this economic improvement, among other ways through a tangible increase in its assessment roll. Given the expected mining boom in the region, the strategic plans of the various educational bodies in the region clearly aim to meet future labour needs. Also, with a looming shortage of skilled labour in the mining sector, local players have taken initiatives to attract young people from across Québec to come and study and eventually settle in the region to work.

Chibougamau has a slightly higher percentage of people (28.9%) without a secondary school diploma than in Québec as a whole (25.0%). However, 22.6% of the population has a vocational diploma, compared with 15.3% for Québec as a whole. This higher rate is probably related to the vocational training centre (Centre de formation professionnelle de la Jamésie) located in Chibougamau. Since opening, the centre has offered various programs of study in such sectors as mining, forestry, construction, mechanics, welding, health care and administration. However, mining is one of its niches of excellence and, in the last few years, the centre has signed agreements with mining companies in the region to deliver the Ore Extraction program in their facilities. The centre also offers the Diamond Drilling and Drilling and Blasting programs, as well as various other programs of study related to the mining industry (automated systems electromechanics, construction equipment mechanics, carpentry and joinery, industrial construction and maintenance mechanics, etc.).

The Institut de la statistique du Québec (ISQ) predicts a continued long-term decline in the Jamesian population. According to the ISQ (2009), the population will shrink by 21.0% between 2011 and 2031, from 14 186 to 11 203. Chibougamau has an aging population.

According to the 2006 Census, the median household income in Chibougamau ($58 587) is higher than in Québec as a whole ($46 419).

One of the key socioeconomic indicators likely to have a positive impact on quality of life is the number of local (Cree workers) and regional (Cree and Jamesian workers) jobs liable to be created by the Whabouchi project. The proponent initially predicted approximately 250 jobs

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[2] DIRECTION GÉNÉRALE DES OPÉRATIONS DU RÉSEAU EMPLOI-QUÉBEC, 2002, *Les orientations d'Emploi-Québec à l'égard des services autochtones*, online (French only) http://www.emploiquebec.gouv.qc.ca/guide_mesures_services/02_Generalites/02_10_Orientations_EQ_egard_services_autochtones/Orientations_EQ_autochtones.pdf

during the construction phase and 140 jobs during the operation phase. The updated ESIA anticipates an average monthly hiring rate of 245 workers during the construction phase, which will last around 19 months. During the operation phase, 185 workers could be needed over the 26-year life of the mine. The number of jobs created by the project will have a direct positive impact on future workers and their families, who will benefit from quality, well-paid jobs, some of which will require specific qualifications. There is no question that these jobs will generate the socioeconomic conditions needed to improve or maintain the quality of life and well-being of individuals, particularly local and regional inhabitants (self-worth and self-esteem, purchasing power, knowledge and skills development, etc.).

The same as for many other development projects in Québec requiring dozens of workers, the proponent intends to give hiring priority to people who live in the host region. However, as stated by several participants during the public consultations in Nemaska, Crees will likely have a hard time getting a job, especially skilled jobs, in any of the project phases due, in particular, to their lack of schooling or qualifications. This is not the case in Chibougamau. In fact, the proponent undertook to work with local authorities and organizations in the area of workforce training to ensure hiring practices that benefit Crees from Nemaska. Moreover, the Chinuchi Agreement provides for collaboration between all parties—Nemaska Lithium, Cree Nation of Nemaska, Grand Council of the Crees (Eeyou Istchee) and the Cree Nation Government—in training and hiring Cree workers. The proponent's willingness and commitment to work closely with the Cree community of Nemaska in matters of training and job readiness are very positive and should help create jobs for Crees. Furthermore, in COMEX's view, access to education and training is clearly difficult for Cree communities and it is a difficulty commonly experienced throughout Northern Québec. The proponent should immediately identify jobs within reach of Crees based on their level of education and list the training offered in the Jamésie region (training centres, related costs, available grants, etc.). With construction scheduled to begin in spring 2016, the proponent needs to be familiar with the labour pool and get potential workers job-ready based on occupational and specialized needs.

Condition: Six months after the project's authorization, the proponent must submit the list of job opportunities and minimum qualifications required (education/training, diplomas/degrees, driver's licence, etc.) to the Administrator and the community of Nemaska for information purposes.

Condition: One year after the project's authorization, the proponent must submit an updated timetable for project implementation to the Administrator, for information purposes, and report on the steps taken to identify workforce training needs and hiring forecasts.

During the public consultations, participants said they were concerned about the possible impacts of the mine's closure and resulting loss of jobs. COMEX notes that Nemaska Lithium plans to establish an employee assistance program when the time comes.

3.3.2 Working conditions

Despite the planned measures for giving hiring priority to local and regional workers, a relatively large cohort of workers will most likely come from outside the host region. The influx of these workers could cause social problems and disrupt the community's social fabric. A number of

social problems, such as crime or high-risk sexual behaviour, are sometimes associated with alcohol or substance abuse. The proponent plans to implement the following mitigation measures in this regard, which COMEX finds satisfactory:

- Develop a drug and alcohol prevention program in collaboration with the Cree Board of Health and Social Services of James Bay and the Nemaska community wellness centre.
- Adopt zero-tolerance disciplinary measures regarding drug and alcohol use by mine workers.
- Produce and distribute the mine's newsletter in the community of Nemaska.

Also, according to participants, work schedules could have a negative impact on families instead of encouraging them to settle in the Eeyou Istchee James Bay region. Indeed, given the number of future job openings for both men and women, two or more members of the same family could end up working at the mine. Healthy family relationships must therefore be nurtured to help ensure the well-being of mine workers and their families. While COMEX understands that human resource and schedule management is a major, time-consuming task, the site's proximity to the community of Nemaska and a transportation system linking the village and the mine site could facilitate time management for Cree workers from Nemaska.

Several participants raised these concerns during the public consultations and, in COMEX's opinion, the planned social monitoring activities will address the public's concerns. However, COMEX wants to be kept abreast of developments in some of the measures regarding training, shutdown of the mine during Goose Break, zero tolerance for drug and alcohol use, and harmonious co-existence of Aboriginal and non-Aboriginal workers.

Condition: The proponent's environmental and social monitoring program must include follow-up of its commitments to shut down the mine during Goose Break, implement measures to prevent drug and alcohol use on the mine site and prevent discrimination. In addition, the monitoring program must track training programs for the Crees. Monitoring must enable an assessment of the effectiveness and success rate of the measures implemented, as well as allow for measures to be adjusted where necessary based on monitoring results.

3.3.3 Economic spinoffs

Development and operation of the mine site will generate significant economic spinoffs for local and regional businesses. Many services that are essential for each phase will have to be provided by regional businesses. The project also affords opportunities for business start-ups and growth of existing businesses in the region. Potential demand will be for services related to blasting, work camp construction and maintenance, site preparation, construction of certain infrastructures, materials transportation, waste rock and tailings pile reclamation as well as the dismantling of infrastructures following closure of the mine.

Participants at the public consultations in Chibougamau called for the creation of a monitoring committee, as provided for under section 101.1.3 of the *Mining Act*, not yet in force, to ensure maximization of the project's economic spinoffs.

Nemaska Lithium pledged to establish an environment committee and an implementation and monitoring committee for the Chinuchi Agreement. It is COMEX's understanding that the Environment Committee's mandate will also cover social issues. COMEX proposes that its mandate also include ensuring maximization of economic spinoffs.

Condition: Three months before construction begins, the proponent must submit the mandate and composition of the Environment Committee and the Implementation Committee established pursuant to the Chinuchi Agreement to the Administrator for information purposes. It must also explain the proposed communication strategy for informing residents of Nemaska and Chibougamau about the committees' work.

3.3.4 Water quality

Water management is a key issue in the Whabouchi project. For the community of Nemaska, water is the fount of important memories and history and, above all, it is essential for life. Water, home to the fish that are a staple of the Cree diet, must remain clean and free of contaminants in order to protect the food chain. In its review, COMEX focused on hydrology and hydraulics, the final effluent discharge point, surface water quality, sediment at the final effluent discharge point and groundwater quality.

The hydrography of the study area is characterized by an abundance of lakes, rivers, streams and wetlands. The mine site lies within the Rupert River watershed, which covers a surface area of 43 400 km^2 and flows from east to west in direction of Rupert Bay. Upstream of the mine site, the sub-basin of the Nemiscau River, a tributary of the Rupert River, covers a surface area of approximately 2000 km^2. The confluence of the Nemiscau and Rupert rivers is located about 70 km downstream of the mine site. More specifically, the mine site is located on the eastern shore of Lac des Montagnes, a lacustrine widening of the Nemiscau River. This 1375-ha lake is the largest water body in the vicinity of the mine site. Lac du Spodumène, southeast of the site, is the second largest body of water, with a surface area of 61 ha.

The drainage network in the immediate vicinity of the mine site consists of five streams, identified as streams A, B, C, D and E. These are shallowly incised streams with generally slow natural flow. The streams flow into either the Nemiscau River or Lac des Montagnes.

Hydrology and hydraulics

According to the proponent, runoff and drainage management on the mine site, as well as drawdown of the water table during dewatering of the pit will result in changes to water levels in certain rivers and lakes. The Lakes 2, 27 and 28 as well as streams C and F are likely to be slightly affected, in terms of both outflow and water level. These changes in water levels and, consequently, flow rates in streams and rivers, could affect fish and fish habitat.

The proponent conducted more characterization studies in summer 2014 to further document the anticipated impacts. The findings confirmed that the project will have only a minor impact on water levels and flow rates in lakes, rivers and streams. However, a number of uncertainties remain with regard to future variations in the water level in Lac du Spodumène, as such variations were not assessed. Given that Lac du Spodumène provides fish habitat and that it feeds Stream D, which is close to a major wetland and whose mouth is a confirmed walleye spawning

ground, COMEX thinks that the water level in the lake must be monitored to define the baseline conditions and assess the project's impact on Lac du Spodumène and Stream D.

Condition: The proponent's environmental and social monitoring program must include monitoring the water level in Lac du Spodumène. The proponent must define adequate baseline conditions for that purpose.

Location of the final effluent discharge point

Baseline surface water conditions in the receiving environment are defined in the document entitled *Qualité des eaux de surface et des sédiments*. Three sampling campaigns were conducted to establish temporal variability of surface water quality: the spring high-water period, the summer low-water period and the fall high-water period. The results provided by the proponent are acceptable to COMEX and were used by MDDELCC as the upstream concentrations in determining environmental discharge objectives (EDOs).

COMEX would first like to point out that Nemaska Lithium plans to install a pipe with a total length of approximately 4.5 km to carry final effluent to the discharge point in Lac des Montagnes. The pipe will be buried over a distance of around 3.5 km. A 150-m-long diffuser will be installed on the right side of the mouth of the Nemaska River and wastewater will exit from 30 ports at an approximate discharge rate of 1.6 m/s.

The dilution capacity at the final effluent discharge point in Lac des Montagnes is high. However, given that lakes are particularly vulnerable to contaminants and that their hydrodynamic properties tend to promote sedimentation, the EDOs for the Whabouchi mining project were defined at 1:10 dilution, the maximum dilution factor for discharges of all contaminants, except phosphorus, into lakes. The defined EDOs will therefore protect the chemical integrity of the receiving waters, even under the most critical conditions.

According to the modelling study, discharging mine effluent into the lake without diffusion would also result in good dilution. Considering the physical footprint of a diffuser on the lake environment (additional pipe length of 150 m), it would be worthwhile verifying if there would be a genuine environmental benefit to installing a diffuser.

COMEX noted during the public hearings in Nemaska that the tallyman of Trapline R-20, James Wapachee, did not seem to be aware of the location of the final effluent discharge point and wanted to discuss the location with Nemaska Lithium. The proponent told us later on that the location of the final effluent discharge point might be changed. COMEX would like to remind Nemaska Lithium that any location of the final effluent discharge point other than the one already authorized must be approved by the Administrator and that a change of this type could mean that the EDOs for the project may have to be recalculated.

Condition: Three years after the start of operations generating mine effluent, the proponent must submit a monitoring report to the Administrator. Monitoring must be conducted in accordance with the *Guide d'information sur l'utilisation des objectifs environnementaux de rejet relatifs aux rejets industriels dans le milieu aquatique* (or later versions). The report must say whether the environmental discharge objectives have been met and discuss the treatment performance for phosphorus. If environmental discharge

objectives have not been met, the proponent must propose economically and technologically feasible means of meeting or at least getting closer to them.

Surface water quality

Generally speaking, the lakes and rivers in the study area are acidic and sensitive to acidification. Although they generally do not have high contaminant levels, in several cases copper, aluminum and lead concentrations exceeded the criteria. The median naturally occurring concentration of phosphorus (oligo-mesotroph) in Lac des Montagnes is 0.009 mg/L. This means that the lake is sensitive to phosphorus and even a slight increase in phosphorus levels could clearly lead to eutrophication. In addition, the mineralogical composition of the deposit includes the local presence of apatite, which could result in phosphorus loads to the receiving environment. Consequently, COMEX recommends imposing a standard to limit phosphorus loads to Lac des Montagnes from the final mine effluent.

Condition: To protect the waters in Lac des Montagnes, the proponent must ensure that the average monthly concentration of total phosphorus in final effluent does not exceed 0.3 mg/L, and that the maximum concentration of total phosphorus never exceeds 0.6 mg/L. Total phosphorus in the final effluent, at a phosphorus detection limit of lower than or equal to 0.05 mg/L, must be monitored on a weekly basis.

Lac des Montagnes is also sensitive to contamination by metals owing to its physicochemical characteristics, namely low hardness (median of 6.0 mg/L $CaCO_3$), low alkalinity (median of 4.0 mg/L $CaCO_3$) and thermal stratification of the water column at certain times of the year.

In light of the data shown in Appendix 13.1, and in reply to Question QC15 regarding the geochemical characteristics of ore and tailings, a number of additional metals and metalloids will be monitored every three months in relation to the Whabouchi project, in addition to the effluent parameters required under Québec and federal regulations. These parameters will be measured on a quarterly basis using the same samples to be taken every three months in accordance with the *Metal Mining Effluent Regulations* (MMER) and EDO monitoring requirements. The additional parameters to be monitored are beryllium (Be), lithium (Li), cesium (Cs) and rubidium (Rb). These same parameters have also been included in the groundwater quality monitoring originally planned under Directive 019.

Again owing to the geochemical characteristics of ore and tailings, it was deemed advisable to include some additional measurements for certain parameters already included in the annual monitoring under Directive 019. The parameters include chromium (Cr), potassium (K), sodium (Na), magnesium (Mg), manganese (Mn) and petroleum hydrocarbons (C_{10}-C_{50}). Three additional measurements will be included in the monitoring program in order to obtain quarterly data for each parameter. The parameters will be measured using the same samples to be taken every three months in accordance with the MMER and EDO monitoring requirements.

Sediment at the final effluent discharge point

The purpose of conducting sediment characterization studies before construction and operation of the mine is to assess the medium- and long-term impacts of mining activities on the receiving environment, since contaminants in water can settle and build up in sediment over time. Sediment can thus become an exposure pathway for fish, as well as for other animals and

humans. That is why the initial sediment characterization must be conducted in zones that will be exposed to final effluent to enable a comparison of background contaminant levels (year 0) against levels observed a few years after operation begins and to assess the impact. An initial characterization study must also be conducted in one or more control areas not affected by mining activities (control stations) for comparison purposes.

In July 2014, sediment samples were taken at seven sampling stations on six different bodies of water for the purposes of physicochemical characterization. As COMEX understands it, one sediment sample was taken at each station, except for Station 2, where two samples were taken. The samples were analyzed for all parameters, in particular total organic carbon (TOC), metals, rare earth metals, radium-226 and particle size.

In COMEX's opinion, because of the location of sampling stations and the fact that there were only a few on each body of water, the characterization contained in the December 2014 report does not paint a clear enough picture of baseline sediment quality in zones that will be exposed to final effluent. The initial characterization should cover at least two or three stations in zones exposed to tailings and at least one control station in the same bodies of water, in a zone not affected by mining activities and having the same characteristics (sediment type, particle size, physicochemical properties) as exposed zones.

COMEX therefore asked the proponent to conduct another sediment characterization before construction of the mine begins. The proponent agreed to the request. Nemaska Lithium must submit its sampling protocol to the experts at MDDELCC for validation and subsequently submit the characterization results for information purposes.

Condition: One year after the project's authorization, the proponent must submit, to the Administrator, the initial sediment characterization in the project study area as well as a sediment impact assessment.

Groundwater

In the project area, groundwater occurs in the voids between grains of silt, sand and gravel in unconsolidated deposits as well as in the fractures and interstices of the bedrock. Due to the thinness of the unconsolidated deposits (with local exceptions), the aquifer within these deposits is considered very localized and discontinuous, whereas the aquifer formed by fissures in the bedrock is considered regional.

Groundwater recharge primarily occurs through infiltration of precipitation on hillcrests, while drawdown occurs in surface water that drains the valleys and flows into the Nemiscau River, Lac des Montagnes and Lac du Spodumène. The groundwater flow velocity is controlled by the geological structures and fine-grained unconsolidated deposits (regional and local faults, geologic contacts and, locally, permeable unconsolidated deposits). Groundwater quality is characterized by a pH ranging from slightly acidic to alkaline and a low to moderate total dissolved solids content. Naturally occurring concentrations of copper, zinc and mercury exceed the usage criteria for seepage into surface water and/or the warning threshold for surface water.

A suitable method was used to determine natural background levels in groundwater. Natural exceedances of copper were found. In reviewing the project, COMEX wanted to make sure that

the project would not have a negative impact on groundwater quality. The Committee thinks that a hydrochemical signature of groundwater must be achieved. The hydrochemical signature of a water table that feeds a river or a river that flows into the water table in a floodplain is derived from the different geological environments they encounter. COMEX is not requiring the proponent to conduct a new groundwater characterization, but rather to monitor groundwater for the following parameters: major ions (all), total dissolved solids and oxidation-reduction potential.

Condition: The proponent's environmental and social monitoring program must include groundwater monitoring for major ions, total dissolved solids and oxidation-reduction potential.

In addition, the proponent undertook to monitor lowering of the water table caused by the presence of the pit. As part of this specific groundwater monitoring component, the proponent also pledged to monitor water levels in the peatland south of Lac du Spodumène, which provides important habitat for several animal and plant species. The aim of the monitoring is to preserve the biological functions performed by the peatland and be able to response swiftly if an impact is identified.

3.3.5 Fish and fish habitat

Most of the lakes in the survey area are small and no more than 5 m deep. Lac des Montagnes and Lac du Spodumène are the largest lakes and have a maximum depth of over 10 m. In general, the lakes are characterized by a low erosion rate and gently sloping shores (0% to 25% grade). The substrate composition of lake bottoms is generally a mixture of sand and organic matter with occasional boulders and cobble. However, the substrate in Lac du Spodumène is dominated by boulder, cobble and pebble. Potential spawning grounds were identified in Lac des Montagnes and Lake 1. Walleye spawning grounds were confirmed in the northeastern part of Lac des Montagnes and in Stream D at a site identified by the tallyman of Trapline R-20.

The mining project is located close to territory that is important to the Cree way of life. Crees from Nemaska have been hunting, fishing, trapping and gathering berries in the territory for hundreds of years. The territory's abundant lakes and rivers are used for traditional net fishing and angling, particularly in summer and fall, although many families still set their nets under the ice in winter. The main fish species harvested are lake cisco, walleye, sucker, pike, sturgeon, lake whitefish, lake trout and brook trout. More specifically, two net-fishing sites were identified in the northern part of Lac des Montagnes. There are several beaches on the lake, one of which is located at the mouth of Stream C and another, downstream from Stream C. Even though discharges into the lake do not contain contaminants liable to be directly harmful to fish consumption or swimming, the type of contaminants released in the effluent could have an impact on the health of aquatic organisms if concentrations and loads are not sufficiently controlled. Nemaska Lithium undertook to meet the minimum requirements of Directive 019 (mining industry) and will strive to meet the EDOs determined for the Whabouchi mining project.

COMEX disagrees with the proponent's habitat loss predictions and planned mitigation measures. The total surface area of lost fish habitat for which compensation measures are required must include all shoreline affected by mining activities in this sector. All fish habitat,

regardless of the fish species present or the anticipated surface area of a lake, river or stream liable to be affected, must be taken into consideration. According to COMEX estimates, the minimum habitat loss is 11 200 m.

Currently, the proposed compensation program does not meet the wildlife habitat conservation guidelines. At 900 m^2, the total area of proposed enhancements, even taking into consideration only the losses estimated by the proponent, is clearly insufficient. As well, a number of enhancements are not acceptable. For example, Stream A, which is downstream from a beaver dam, is not an ideal location for compensatory enhancements, as they risk not being successful. In fact, the instability of the erected structure and the probability of beaver using the compensatory enhancements and thereby impeding fish movement should be taken into consideration. In identifying enhancement sites, it is important that the compensatory enhancement monitoring program be developed and studied at the same time as the compensation program in order to ensure that wildlife enhancements will be used and be productive.

Based on its experience with other mining projects, COMEX has reservations about the sustainability of Lake 2 and its emissary, Stream C. This lake and stream will see significant reductions in inflows and, consequently, in depth and flow rates as well. In addition, the lake and stream are located in the heart of the mine site and, in all likelihood, will be more affected by dust emissions and possible contaminant spills. That is why COMEX believes that the planned mitigation measures for this sector are not very promising. Impact mitigation, compensation and monitoring efforts should target sites farther away from the project. The proposed monitoring and mitigation measures, as presented by the proponent, would be wasted efforts.

Similarly, the analysis conducted confirmed the presence of a walleye spawning site in Lac des Montagnes, at the mouth of Stream D. The proponent's monitoring program should include monitoring of the integrity of this natural spawning ground (speed, depth, substrate), as a change in flow rates in Stream D could cause a change in walleye spawning conditions.

Condition: The proponent's environmental and social monitoring program must include monitoring of the integrity of the natural walleye spawning ground in Lac des Montagnes, at the mouth of Stream D. Monitoring must enable validation of continuous walleye spawning and recruitment conditions. Remedial measures must be implemented where necessary if monitoring reveals changes in spawning or egg incubation conditions.

Considering the above facts, the proponent must develop a new fish compensation plan. COMEX encourages the proponent to consult experts at the Ministère des Forêts, de la Faune et des Parcs during the plan's development. The new compensation plan must also take land users' concerns into account and incorporate compensation projects that will be beneficial for fishing in the long term.

Condition: Six months after the project's authorization, the proponent must submit an updated fish habitat compensation plan to the Administrator for approval. The plan must take into account all fish habitat losses and be developed in consultation with experts at the Ministère des Forêts, de la Faune et des Parcs. The compensation plan must also take into account the needs and concerns of Cree land users.

3.3.6 Hunting, fishing and trapping

Species such as black bear, caribou and moose are highly valued by the different land users. Although definitely present in the study area, no black bears were sighted during the aerial survey.

The proponent rates caribou as “high value” given that the boreal population of woodland caribou is designated a protected species. However, according to Nemaska Lithium, there were no caribou sightings in the study area during the wildlife surveys conducted for the Whabouchi project. The woodland caribou, potentially present in the study area, is probably scarce. In Northern Quebec, the woodland caribou has manifested an aversion to road networks over distances of up to 10 km. The presence of the Route du Nord could therefore limit this species' use of the area. In addition, the woodland caribou generally avoids burned areas, which are abundant in the study area.

A few years ago, the former Ministère de l’Énergie et des Ressources naturelles (now the Ministère des Forêts, de la Faune et des Parcs) introduced a woodland caribou recovery plan to identify appropriate solutions to ensure the species’ recovery in Québec. Past and current talks between the Crees and the Québec government with a view to adopting the necessary measures to protect the woodland caribou and, especially, its habitat, testify to the species’ importance.

Five moose wintering grounds were identified during the aerial survey conducted by Nemaska Lithium. Seven moose (four males, two females and a calf) were sighted in the grounds. Another female was sighted travelling, but could not be associated with a specific wintering ground. During another survey, moose tracks were observed near Lake 2. The different wintering grounds have similar characteristics.

Surveys reported evidence or direct sightings of nine species of small mammal: red squirrel, snowshoe hare, river otter, American marten, American porcupine, red fox, American mink, ermine/weasel (impossible to differentiate tracks) and American beaver. The American marten accounts for over 50% of the total small mammal sightings.

As regards avian fauna, the proponent says that at least 24 species of waterfowl (including common loon), 27 other aquatic bird species, 19 species of raptors and 61 species of terrestrial birds may frequent the study area. Only one special-status species, the common nighthawk, was heard during fieldwork. Note that Lac des Montagnes is an important wildfowl hunting site for the residents of Nemaska and there are several seasonal or permanent camps near the shores.

The Whabouchi mining project will have impacts on land use, in particular hunting, fishing and trapping. The planned mitigation measures include a prohibition on fishing within the limits of the mining lease and leases for industrial uses. COMEX wishes to remind the proponent that Nemaska Lithium will be responsible for contacting the Municipality to inquire about prohibitions on shooting and storing firearms on the mine site (mining lease and location tickets). Despite this measure, COMEX notes that the proponent is maintaining a buffer strip around Lac des Montagnes so that the Crees can continue hunting snow geese. In addition, the proponent

will draw on the Weh-Sees Indohoun Corporation's management practices to determine hunting and fishing conditions within and around the mine property.

During the public hearings, people who hunt on Trapline R-20 clearly manifested a need and desire to continue hunting on the trapline, even if they work at the mine. As well, it was suggested that the Weh-Sees Indohoun Corporation or similar body control hunting and fishing in the territory and monitor extra pressure on the territory from fishing by mine workers.

COMEX would remind the proponent that, during the public hearings in Nemaska, it said it would support the establishment or maintenance of a similar body to the Weh-Sees Indohoun Corporation to oversee hunting and fishing activities, but that it would not be able to support an initiative of that size on its own.

According to the Corporation's website,[3] the Weh-Sees Indohoun (WSI) Special Hunting and Fishing Zone was established in [October] 2003 to implement specific management measures for sport fishing and hunting activities during the construction phase of the Eastmain-1 and Eastmain-1-A–Sarcelle–Rupert hydroelectric projects.

Previously, the WSI zone was managed by the Weh-Sees Indohoun Corporation and funded by Hydro-Québec. In 2015, management of the special zone for the 2015-2016 hunting and fishing season was transferred to the Weh-Sees Indohoun Sub-Committee created by the Hunting, Fishing and Trapping Coordinating Committee (HFTCC). The WSI Sub-Committee is composed of representatives from the Cree Nation Government, the Cree communities over which the special zone extends (Nemaska, Waskaganish, Wemindji, Eastmain, Mistissini), the Cree Trappers' Association, the Ministère des Forêts, de la Faune et des Parcs and the HFTCC.

The WSI Sub-Committee will continue to monitor the WSI special zone and its wildlife resources with the objectives of:

- monitoring and managing access to wildlife resources in the WSI special zone;
- promoting the conservation of wildlife and ecosystems;
- preserving the wildlife heritage for the benefit of future generations.

The need to renew the WSI Sub-Committee's mandate for the coming years will be reassessed at the end of the current hunting and fishing season.

Condition: One year after the project's authorization, the proponent must submit to the Administrator, for information purposes, a report on the steps taken to prohibit hunting, fishing and the shooting of firearms on the territory covered by its mining lease and location tickets. The report must discuss the action taken, the safety zone, and the proponent's contribution to the implementation of existing monitoring activities or continuation of oversight, as the case may be, such as that carried out in the Weh-Sees Indohoun Special Fishing and Hunting Zone. The report must also discuss talks initiated with the Eeyou Istchee James Bay Regional Government and other bodies concerned.

[3] www.weh-sees-indohoun.ca/en/

3.3.7 Air quality

A number of concerns were raised during the public consultations about dust emissions and related nuisances generated by the project. COMEX is continuing to review this aspect, but it is not a key issue in the project. Still, COMEX expects to receive the proponent's mining road sprinkling plan and its dust control plan to mitigate the project's impacts on air quality. Even though no contamination from dust-borne metals is anticipated, particle emission sources must be better documented. Furthermore, the proponent did not provide atmospheric modelling results demonstrating the effectiveness of the proposed mitigation measures.

Condition: Eight months after the project's authorization, the proponent must submit to the Administrator, for approval, the results of further atmospheric modelling demonstrating the effectiveness of each of the mitigation measures referred to in the Environmental and Social Impact Assessment.

Condition: The proponent must include a sprinkling plan in the comprehensive environmental and social monitoring program it has to submit to the Administrator for approval. The sprinkling plan must include, for each road segment, the number of trips per day, the length of the segment, the sprinkled surface area, the unmitigated TSP emission rate, sprinkling intensity, sprinkling intervals, the amount of water sprayed, how effective the spraying is in controlling dust, and the mitigated TSP emission rate.

Condition: The proponent must include air quality monitoring in the comprehensive environmental and social monitoring program it has to submit to the Administrator for approval. The planned sampling and analysis methods must be explained.

3.3.8 Noise levels

The users of Trapline R-20 will be directly affected by the project, the total footprint of which is in the southwestern portion of the trapline. Trapline R2-0 is located on Category II and III lands, some 25 km away from the community of Nemaska. It has an elbow shape, with the western half delimited in part by Lac des Montagnes and the Nemiscau River. The Route du Nord provides direct access to Lac des Montagnes, to the southwest of the trapline. The main permanent Cree camps are located in this area. James Wapachee has held Trapline R-20 since 2000. He uses the trapline on a regular basis with his spouse and their extended family. The users' harvesting activities are concentrated near Des Montagnes, Devoyau and Teilhard lakes and on the Nemiscau River.

There are many seasonal or temporary camps scattered throughout Trapline R-20, mainly on the shores of lakes and the Nemiscau River. A camp on the northwestern shore of Lac des Montagnes includes several cabins, many of which belong to Matthew Wapachee and his family. This camp is constantly being expanded.

The Bible Camp is a site dedicated to community activities located on Trapline R-20. Andrew Coonishish and his wife own the facility and are in charge of organizing summer activities for the children and families of Nemaska. The site can accommodate up to 35 people and, during the summer holidays, day camps are organized for the children during four consecutive weeks. After the day camps have ended, retreats are organized for adults from Nemaska and neighbouring Cree communities. Visitors to the Bible Camp take part in a range of activities on the lake,

including angling, swimming and games. Users say they drink water from the lake. A planned expansion of the Bible Camp would increase the number of all-season cabins. The expansion would include the construction of traditional installations found in Cree cultural camps for the purpose of diversifying services available to the community.

Currently, the ambient noise level is attributable mainly to typical nature sounds, such as wind and wildlife, to vehicle traffic on the Route du Nord and to aircraft (the Nemiscau airport is 19 km west of the project site). The ambient noise level recorded at the project site is 43.5 dB(A) by day (7am to 7pm) and 36.4 dB(A) by night (7pm to 7am).

In updating the project, the proponent decided to move the tailings pile to another site north of the Route du Nord and east of its initial location. This will reduce noise nuisances considerably compared to the initial project. The future mine site will be far enough away from the main villages and communities that the impact sources during the construction, operation and closure phases of the project are not likely to have a significant negative social impact. The noise impact of operations at the closest points is now below 41.6 dB(A). COMEX does not foresee any noise problems with the changes made by Nemaska Lithium. The proponent undertook to implement mitigation measures as well as monitor the noise environment annually during the first five years of mining operations.

Two types of noise were identified in the noise modelling study: stationary noise sources and air suppression associated with blasting. Simulations indicated that noise levels during operation of the mine comply with the provincial standards. Note that noise levels during mine closure were not assessed, as they are thought to be lower than in the other operation phases (preproduction, Phase 1 and Phase 2).

COMEX asked about the zoning defined in Instruction Memo 98-01, which the proponent used in assessing project impacts (Question 109 in *Réponses aux questions et commentaires du Comex - April 2014*). The proponent indicated in its response that, due to the absence of municipal zoning, it identified sensitive receptors (Cree camps) in the project area, such as the presence of dwellings in an industrial zone. The Category III zoning established under Instruction Memo 98-01 was used to determine the maximum noise levels for stationary sources, which are 55 dB(A) LAeq, 1h during the day, and 50 dB(A) LAeq, 1h at night. In the updated ESIA, all of the noise levels determined for the different phases of Whabouchi mine operations are below the maximum levels.

COMEX agrees with the use of Category III, rather than Category I, zoning because, given that there is no municipal zoning, the zoning category is determined by actual land uses. Land use is characterized but frequent comings and goings for hunting and fishing activities. Current usage could fall within the “recreation park” category (zone III in Table 5 of Directive 019). The maximum noise level for a dwelling in zone III is 50 dB(A) at night and 55 dB(A) during the day. These levels should not be exceeded at the site of sensitive receptors.

COMEX wants to stress the fact that during Phase I production operations, two Cree camps will be exposed to noise levels that are slightly higher than the applicable nighttime levels (40 dB(A)) for Category I zoning. Based on modelling assuming a worst-case scenario, this level will be slightly exceeded.

With a view to best management practices, mitigation measures were proposed in several documents, including *Environmental and Social Impact Assessment (March 2013), Réponses aux questions et commentaires du Comex (April 2014)* and *Environmental and Social Impact Assessment (Update) (June 2014).* In COMEX's view, it is imperative that all of these measures, including implementation of an acoustic monitoring program during the construction and operation phases and creation of an environment committee to handle complaints about noise, be in place before the project begins. Moreover, the proponent agreed to put all of these measures in place.

During the public hearings, the proponent indicated that if land users notice noise or dust nuisances and want their camps moved, Nemaska Lithium will study their requests and, if necessary, move the camps to another site. COMEX finds this an acceptable solution and wants to be informed of noise impacts experienced by land users to ensure, in particular, that the proponent's assessment of noise and air quality impacts reflect the reality of the community of Nemaska. To that end, the proponent must accommodate land users genuinely affected by determining the conditions for relocating camps. It must also report all complaints received from land users in relation to nuisances and relocation requests.

Condition: One year after the project's authorization, the proponent must submit the conditions for relocating camps following construction of the mine to the Administrator for information purposes. Every five years, the proponent must submit the log of complaints about mining operations and relocation requests to the Administrator, including an analysis of the complaints and the action taken to address them. The proponent must also provide the information communicated to land users regarding blasting schedules.

3.3.9 Safety on the Route du Nord and forest roads

Many members of the community of Nemaska take the Route du Nord to get to urban centres or fall hunting grounds. Several families from Nemaska and Mistissini also have a permanent or seasonal camp along the road. A total of 13 such camps were reported; they are of varying size and some include several cabins and traditional structures.

A significant increase in truck traffic on Route du Nord is anticipated during the operation phase, due in particular to ore transportation. On average, six trucks a day will haul ore concentrate from the mine site to the transfer site.[4] The increase in traffic on this road will increase the risk of accidents, not to mention the normal nuisances caused by road traffic: noise, dust, odours, vibration, etc. The increase in these nuisances could not only affect the quality of life of some of the families living along the Route du Nord, but have psychosocial impacts as well, such as irritability, stress, fatigue or changes in lifestyle.

[4] According to the proponent, concentrate transportation will result in an estimated 9% increase in heavy vehicle traffic on the Route du Nord between km 26 and km 108 (up from 28% to 37% heavy vehicles per day), and a 13% increase between km 108 and Nemaska (up from 25% to 38% heavy vehicles per day). Consequently, the AADT would rise from 110 to 124 vehicles a day between km 26 and km 108 (11%) and from 70 to 84 vehicles a day between km 108 and Nemaska (17%). (Response to QC9).

To attenuate these impacts and minimize the risk of accidents, the proponent undertook to implement various mitigation measures, including imposing speed limits on trucks (30 km/h on the project site and 70 km/h on secondary roads), holding an information session on road safety for truck drivers responsible for hauling ore concentrate, and installing special signs at the entrance to the mine site. The proponent will also keep a log of complaints and set up a complaints hotline for reporting any problems on Route du Nord related to ore transportation. While these are relevant and warranted, COMEX is nevertheless making the following recommendation.

Recommendation: In addition to keeping a log of complaints and setting up a hotline, the proponent should see that trucks hauling concentrate from the mine are specially marked so that they can be easily identified by the population and road users.

According to Nemaska residents, road conditions and visibility can be difficult in winter due to ice and snow and, in summer, due to road dust from vehicles. A large number of trucks will travel along the Route du Nord and several people are concerned about the impact of the increased road traffic. Several people also worry about the speed of response by first responders and emergency services given the remoteness and limited access to the Route du Nord.

In COMEX's opinion, this issue is adequately addressed in the emergency measures plan described in the proponent's impact assessment. The plan covers accidents involving trucks carrying hazardous material as well as trucks transporting ore.

During the hearings, the proponent said that the decision to use 100-tonne trucks would reduce risks on the Route du Nord, that in addition to bearing the mine's logo, the trucks would scrupulously obey the imposed speed limits. Since the Route du Nord is a "public road," the accident response procedures are the same as for the road network as a whole. However, the proponent's emergency measures plan provides for discussions with the different road stakeholders to ensure an adequate response time in the event of an accident. For example, each truck will be equipped with a satellite phone, GPS and first-aid kit.

Recommendation: The proponent should make a summary of emergency response strategies and a list of contact persons available to the residents of Nemaska and Chibougamau.

Condition: The proponent must install signs on the Route du Nord or use other means to warn truck drivers carrying spodumene concentrate that a Cree camp is located nearby.

3.3.10 Mine closure and site restoration

As previously mentioned, the proponent is required under the *Mining Act* (s. 232.2) to submit a rehabilitation and restoration plan before mining activities begin. Under section 232.4 of the Act, the proponent is also required to furnish a guarantee covering the total anticipated cost of the mine site restoration work.

However, COMEX wants to be informed of any temporary closure of the Whabouchi Mine for longer than three (3) months. It also wants to receive a copy of the five-year restoration plans submitted to the Ministère de l'Énergie et des Ressources Naturelles. COMEX will give its opinion on the final restoration plan for the mining project.

Condition: The proponent must submit the five-year restoration plans required under the *Mining Act* (R.S.Q., chapter M-13.1) or, failing such a plan, the work it considers necessary, to the Administrator for information and comments.

Condition: In the event of a temporary mine closure, the proponent must uphold its commitment to continue all monitoring programs until the resumption of activities, if activities resume within 12 months. If the mine remains closed for longer than 12 months, the proponent must inform the Administrator about the planned action to continue environmental monitoring and begin restoration work, as the case may be.

Condition: Except in unforeseen circumstances, if the proponent temporarily halts its mining activities for longer than one (1) month, it must notify the Administrator, the community of Nemaska, the Ville de Chibougamau and the Eeyou Istchee James Bay Regional Government at least one month in advance.

Condition: One year prior to the cessation of mining operations, the proponent must submit to the Administrator, for approval, the details of the dismantling of all project-related infrastructures and the planned rehabilitation work under the site restoration plan. The restoration plan must be prepared in consultation with the community of Nemaska and contain, in particular, physical rehabilitation of the site, renaturalization, cleanup, safety measures and possible mine effluent control measures. In addition to forest restoration objectives, the proponent must consider wildlife habitat enhancements and Cree land use and occupancy. The plan should include continued monitoring of the receiving environment following the cessation of mining operations.

The operator must continue regular monitoring of final effluent as required under section 2.1.1.2 of Directive 019 until authorization to proceed to post-closure monitoring has been requested. After mining activities have ceased permanently, but before the entire mine site has been restored, the operator must implement an updated mine wastewater and groundwater monitoring program. The program must be approved by the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques and comply with sections 2.10.1 and 2.10.2 of Directive 019. In addition, if mine effluent is still being released into the environment, the operator must continue to treat the effluent and meet the minimum discharge requirements.

The monitoring program must allow for continued monitoring of compliance and qualitative and quantitative indicators of effluent released into the environment during the transitional period between mine closure and full site restoration. The program must allow for the adjustment of appropriate restoration methods and techniques.

If mine effluent is still being released into the environment after the mine site has been restored, the discharge requirements must continue to be met. In this case, the operator must implement a mine wastewater and groundwater monitoring program following completion of all mine site restoration work.

Monitoring of each mine effluent as well as groundwater can be stopped under certain conditions. In order for MDDELCC to approve termination of post-restoration monitoring, specific conditions must be met in the last five consecutive years of post-restoration monitoring.

3.4 Other Considerations

3.4.1 Cumulative impacts

Several participants in the public hearings voiced concerns about the cumulative impacts of development projects in the territory, such the Eastmain-1-A and Sarcelle generating stations and Rupert diversion project. For example, they are worried about water pollution, contamination and flow rates, the ability to continue practising traditional activities, and the protection of aquatic fauna, among other things.

COMEX is satisfied with the cumulative effects assessment presented in Chapter 9 of the ESIA and the proponent's responses to questions 170, 171 and 172 regarding cumulative effects on fish and fish habitat, noise and hunting, fishing and trapping. Furthermore, the proponent undertakes to conduct monitoring, implement adequate mitigation measures and offset any impacts.

Recommendation: COMEX encourages Nemaska Lithium to talk with Hydro-Québec about the environmental monitoring and follow-up of the Eastmain-1-A/Sarcelle/Rupert project in order to consider the potential effects of the generating stations in its own monitoring programs. The proponent should also take this information into account in its exchanges with the residents of Nemaska.

Condition: The proponent must incorporate the monitoring of cumulative effects proposed in its Environmental and Social Impact Assessment into the comprehensive environmental and social monitoring program it has to submit to the Administrator for approval.

3.4.2 Emergency measures plan

Nemaska Lithium undertakes to make workplace health and safety a central issue during construction, operation and closure of the mine. It will also ensure that the teams from companies performing engineering, administration and construction management work for the project uphold the same commitments. No performance goal will justify compromising the physical or mental integrity of individuals, and even less tolerating risks that could result in injury or health problems.

Concretely, Nemaska Lithium undertakes to ensure and maintain a healthy and safe work environment for all employees as well as all other individuals working on the project (e.g. contractors, subcontractors) in accordance with the applicable laws and regulations. The work environment includes the actual mine site as well as the roads travelled to carry concentrate to the multipurpose rail transfer facility in Chibougamau.

During the public hearings in Nemaska, several concerns were raised in relation to safety on the Route du Nord and forest roads, as well the safety of people who use Cree camps located close to the road. According to the locals, certain curbs and slopes on the Route du Nord could, in fact, be dangerous. They also wondered about the capacity of the bridges and structures built for the project to support heavy vehicles, in addition to signs, monitoring and maintenance of the Route du Nord.

It is COMEX's understanding that Nemaska Lithium is still in talks with the Ministère des Transports du Québec about reducing the risk of accidents on the Route du Nord. Options being considered, but not confirmed, include paving the road and transporting concentrate in road convoys.

Recommendation: COMEX recommends that, as soon as the information is available, Nemaska Lithium inform the residents of Nemaska and Chibougamau about planned measures related to the transportation of spodumene concentrate.

COMEX is satisfied with the public safety and emergency measures plan for the Whabouchi mining project. Moreover, the proponent has set up two committees that will be involved at all levels of the project. In addition, the emergency measures plan is adequate and the procedures it contains cover the events most likely to compromise the operation and workings of the mine. COMEX would like to be informed of the final emergency measures plan and thinks that certain institutions should be informed as well.

Condition: Six months before mine operation begins, the proponent must submit the final emergency measures plan to the Administrator for information purposes. The plan must cover all possible situations involving spills, fires, explosions and the release of toxic substances, as well as clearly and fully define all response measures in case of an accident, particularly in terms of communication with the government authorities concerned (Urgence-Environnement, Ministère de la Sécurité publique, Ministère des Transports du Québec, SOPFEU, etc.), potential closure of the Route du Nord and forest fires.

Condition: The proponent must submit a copy of the final emergency measures plan and all subsequent updates to the community of Nemaska, the Ville de Chibougamau, the Ministère de la Santé et des Services sociaux, the Cree Board of Health and Social Services and the Direction régionale de la sécurité civile et de la sécurité incendie of the Ministère de la Sécurité Publique for the Outaouais, Abitibi-Témiscamingue and Nord-du-Québec administrative regions.

3.4.3 Bats

According to the surveys conducted by the proponent, the Northern long-eared bat, the little brown bat and the Eastern red bat may be present in the area around Lac du Spodumène. Ultrasound analysis confirmed the presence of *Myotis* spp. and *Lasiurus* spp., which the proponent thinks is probably the little brown bat and/or the Northern long-eared bat, the hoary bat and/or the Eastern red bat.

According to the Centre de données sur le patrimoine naturel du Québec (CDPNQ), a recording of the hoary bat, a species likely to be listed under the *Act respecting threatened or vulnerable species*, was made in 2001 at a station located in a jack pine-black spruce stand around 2 km northeast of the mine site. No other special-status mammal species has been sighted in the study area, according to the CDPNQ.

A nursery colony of around 300 little brown bats was identified in the survey area. The MFFP has been tracking the colony for several years, because the species has been affected by the white-nose syndrome. The proponent must monitor this nursery colony for two reasons: one, it is located on the northern limit of the species' habitat and, two, the species is threatened by the

white-nose syndrome. Monitoring must be conducted in accordance with the sampling protocols and survey methods determined by the Québec government.

Condition: The proponent must draw up the annual monitoring program for the Lac du Spodumène little brown bat nursery colony in consultation with experts at the Ministère des Forêts, de la Faune et des Parcs. This monitoring program must be incorporated into the comprehensive environmental and social monitoring program for the Whabouchi project that has to be submitted to the Administrator for approval.

3.4.4 Wetlands

The Whabouchi project is located at the northern limit of the spruce-moss forest domain in the continuous boreal forest sub-zone. The forest cover is dominated by black spruce, occasionally associated with different companion species such as balsam fir. White birch, trembling aspen and balsam poplar are also found in the spruce-moss forest domain. Undergrowths are characterized by the presence of mosses and species of the Ericaceae family. Herbaceous species are generally scarce.

Recent burns cover the largest surface area, at 62.4% of the study area. They are found everywhere in the study area, except the southwestern part. Open and dense conifer stands dominate the forested landscape and represent 10.4% of the study area. Deciduous stands are present in a few areas. The largest of these stands occurs in the northwestern part of the study area, near Lac Saint-Simon. Islands of deciduous forest, located mostly in the northern part of the study area, total 3.1% of the study area. They are predominantly open stands. No special-status or invasive species were found in the study area.

Peatlands cover 7.4% of the study area, and water bodies, 15.1%. A vast portion of the project area consists of ombrotrophic bog. A vast peatland extends between Lac du Spodumène and Lac des Montagnes, southeast of the survey area, and a few pockets occur in the rest of the area. Fen is closely associated with flow lines within the vast shrubby bog. It is poor fen, thus weakly minerotrophic, open and dominated by Cyperaceae such as few-seeded sedge, starved sedge and white beak-rush. Bogs, fens and shrubby riparian swamps account for the majority of wetlands in the survey area, covering nearly a quarter (24.6%) of the surface area. These are common environments and cover a significant land area in the region of Nemiscau.

Only 1.5% of the study area has been disturbed by human activity, primarily road construction, gravel pits and mining exploration activities.

COMEX is satisfied with the proposed measures and the commitments made by the proponent to mitigate impacts on wetlands. The loss of 7.4 ha of wetland as a result of the project is inevitable. In fact, Nemaska Lithium optimized the configuration of project components in order to avoid wetlands. The siting of mining infrastructure was modified to take into account the concerns raised by both the Cree community of Nemaska and the MDDELCC.

Concerns include the loss of 2.7 ha of shrubby ombrotrophic bog as a result of the overburden pile. The plan submitted by Nemaska Lithium reduced the total wetland losses caused by the project from 9.4 ha to 7.4 ha, a reduction of over 20%. The main reductions were achieved by

moving the site of the overburden pile and the Route du Nord. Initially, these infrastructures alone would have caused a loss of 3.69 ha, but the project update lowered this figure.

If groundwater lowering is observed in the Lac du Spodumène peatland, Nemaska Lithium undertakes to conduct a supplementary hydrogeological study of this wetland, including field surveys to establish a complete water balance for the site (surface water and groundwater inflow, sources, outfalls, aquifer mixing zone, etc.). The study results will help determine suitable measures to be implemented where necessary. Where no prevention or mitigation measure is possible, the proponent must calculate the anticipated losses and plan compensation measures in accordance with the *Act respecting compensation measures for the carrying out of projects affecting wetlands or bodies of water*. Nemaska Lithium also undertakes to comply with all of the laws in force, including the *Act respecting compensation measures for the carrying out of projects affecting wetlands or bodies of water*.

Condition: If a negative impact from construction and operation of the project is detected during monitoring of the Lac du Spodumène peatland, the proponent must submit additional compensation measures specifically for this wetland to the Administrator for approval.

Still with regard to the Lac du Spodumène peatland and adjacent shrub swamp, Nemaska Lithium proposes to monitor their hydrological, ecological and habitat functions to determine the real impact of the pit located upstream and, if necessary, propose suitable compensation measures. Monitoring would include:

- the rate of flow at the outlet of the swamp downstream from Lac du Spodumène;
- annual analysis of changes in the surface cover of water pools on the peatland, particularly minerotrophic sections;
- weekly monitoring of water-table depth on the peatland using multi-level (2 levels) piezometers and data loggers;
- annual plant and wildlife surveys (small mammals, reptiles and amphibians, and avifauna) for the duration of pit excavation and until the lowest level has been reached.

This monitoring program will be incorporated into the environmental and social management system for the mine starting in the construction phase. Logs will be kept and used to prepare annual monitoring reports on the hydrological and ecological conditions of the peatland.

Condition: The comprehensive environmental and social monitoring program the proponent is required to submit to the Administrator for approval must include monitoring of the hydrological, ecological and habitat functions of the Lac du Spodumène peatland and adjacent shrub swamp.

COMEX endorses the proposed measures and monitoring for wetlands. The proponent's commitments are clear and, despite the loss of 7.38 ha of wetland, Nemaska Lithium takes the required compensation measures seriously. COMEX notes that the Crees as well as the government authorities concerned will be involved in the planning of compensation measures; however, the final wetland compensation plan must be prepared with a certain degree of supervision.

Condition: One year after the project's authorization, the proponent must submit a wetland compensation plan to the Administrator for approval.

3.4.5 Invasive exotic species

COMEX is satisfied that the proponent has adequately addressed concerns to prevent the introduction and spread of invasive exotic species (IES) in the context of the Whabouchi mining project. Nemaska Lithium has made numerous commitments, including to clean excavation equipment before arriving on work sites and then again if the equipment is used in areas affected by IES, revegetate exposed ground as soon as possible and include monitoring and control of IES in its environmental and social monitoring program. The proposed mitigation and monitoring measures are relevant.

Although no concerns regarding IES were expressed during the public hearings, COMEX still thinks that some oversight of the proponent's activities in respect of this matter will ensure the necessary minimal monitoring.

Condition: If any invasive exotic species are positively identified during its monthly detailed inspections in summer to verify the integrity and stability of mine structures, the proponent must send a copy of the report to the Administrator for information purposes.

3.4.6 Residual materials

COMEX finds all aspects of the proponent's waste management plan acceptable.

The ESIA states that Nemaska Lithium will promote every possible effort to minimize the volume of waste that must be eliminated or disposed of by applying the 4R principles advocated in the Québec Residual Materials Management Policy, namely source reduction, reuse, recycling and reclamation. However, the company did not discuss the possibility of composting organic matter; instead, the latter will be sent to an authorized trench landfill site.

Condition: The proponent must determine the feasibility of using small, closed thermophilic composting equipment. The compost produced can be used for the gradual restoration work. The results of the feasibility study must be submitted to the Administrator for information purposes six months after the project's authorization.

The ESIA discusses the three waste management options considered by the proponent. In its responses to questions and comments, the proponent states that it decided to go with the second option, which is to haul residual materials generated by the mine to the trench landfill operated by the community of Nemaska. Talks are under way with the community. The trench landfill in question is not required to receive residual material from Nemaska Lithium; the company must get Nemaska's approval. Even if Nemaska Lithium explains that it cannot proceed any further in its talks with the community of Nemaska until all of the environmental authorizations required to carry out the project have been obtained, the community's position must be known before the project begins. Otherwise, the proponent must obtain prior authorization from the Administrator.

During the hearings, the proponent confirmed that Nemaska's trench landfill will have to be enlarged to receive residual materials from the Whabouchi project.

The rationale for disposing of residual materials in the Nemaska trench landfill is that by using an existing facility, Nemaska Lithium reduces the project's footprint, maximises the use of existing equipment and, in a way, stimulates the local economy. In addition, the fact that this landfill is located just 10 km away from the mine site makes it a better option than transporting residual materials to an engineered landfill in Chibougamau, which is around 300 km away.

In short, the proponent lists the types of residual materials that will be generated in each phase of the project and proposes a management method. It reiterates the possible disposal options for ultimate waste. However, it does not say in any of the documents the amount of each residential material that will be generated. Furthermore, although the disposal option selected is the trench landfill operated by the community of Nemaska, a clear decision has not been made.

Even though it was not a concern voiced during the public hearings on the project, COMEX considers that conditions relating to residual materials management must be imposed in order to protect both the environment and human health. In addition, monitoring reports must be submitted for information purposes.

Condition: Three months before construction begins, the proponent must submit to the Administrator, for information purposes, a document stating the amount of each type of residual material that will be generated on site during each phase of the project. The document must confirm the final disposal site selected, its capacity to receive residual materials generated by the Whabouchi project, and the needs of the community of Nemaska.

CONCLUSION

In conclusion, the purpose of Nemaska Lithium's Whabouchi mining project is to build and operate a mine for the production of spodumene concentrate, one of the chief lithium ores. The project is located 30 km east of the Cree community of Nemaska and 300 km north-northwest of the municipality of Chibougamau and is subject to the environmental and social impact assessment and review procedure under Section 22 of the JBNQA and Chapter II of the EQA.

This report presents COMEX's analysis of the project, a description of the project, its purpose, the unique features of the study area and the key social and environmental issues related to the project. The information contained in the report draws from the documents submitted by the project proponent and the public consultations held in Nemaska and Chibougamau in spring 2015.

The aim of COMEX's analysis was to establish, in light of its purpose, whether the project is environmentally and socially acceptable and should be carried out and, if necessary, determine the conditions of authorization set forth in the following section.

Using the documents submitted during the review process and public hearings, COMEX examined the main environmental and social issues raised by the Whabouchi project. Social issues centred around the project's integration with the landscape and human environment and chiefly concerned jobs, training and economic spinoffs, the safety of the Route du Nord and forest roads, blasting noise, land-user health and protection of land uses, including hunting,

fishing and trapping. Environmental issues primarily concerned water quality, especially in Lac des Montagnes, which is the surface water receptor for mine effluent, air quality, wildlife management and on-site management of waste rock and tailings.

In COMEX's view, the impacts of the Whabouchi project were adequately assessed, impacts are sufficiently mitigated, or at least will be with the authorization conditions, and residual impacts will be offset in accordance with the specified requirements.

The proponent also intends to conduct environmental and social monitoring, including the integrity and physical stability of structures, ambient air quality, groundwater quality and levels, quality of final mine effluent and surface water, vibrations, vegetation and effectiveness of reclamation work, and fish and benthic invertebrate communities. All monitoring required under Directive 019 will be carried out during the construction, operation and closure phases as well as post-closure. The proponent will also monitor land and resource use, employment and economic spinoffs, and the community's well-being.

During its review of the project, COMEX imposed several requirements on the proponent, including specific piezometric monitoring of the peatland south of Lac du Spodumène and monitoring of a bat nursery, the walleye spawning grounds in Lac des Montagnes and the cumulative noise impacts on the Bible Camp. The proponent agreed to conduct all of the requested monitoring and will submit a new environmental and social monitoring program incorporating all of the components required further to environmental assessment of the project. Its responses to the questions raised during the environmental assessment procedure must be taken into account in the new program, along with the concerns about the project's impacts expressed during the public hearings held in Nemaska and Chibougamau.

Considering the proponent's commitments and the conditions of authorization stipulated in this report, COMEX finds the Whabouchi project to develop and operate a spodumene deposit environmentally and socially acceptable.

In closing, COMEX would like to stress that this report and the subsequent authorizations to carry out the project do not mark the end of the oversight process. Relations between Nemaska Lithium, the community of Nemaska and the city of Chibougamau will evolve over the course of the project. COMEX cannot foresee every possible situation. A certain amount of latitude is necessary. However, COMEX will continue to oversee any changes and will keep a careful watch on each phase of the project. Moreover, during its 330th meeting, held on June 18, 2015, the COMEX members agreed that it would be good to meet with the Nemaska residents who are involved in the project to, in particular, get a better appreciation of the monitoring reports the proponent is required to submit.

RECOMMENDATION AND CONDITIONS

After studying the documents submitted by the proponent and taking into consideration the public consultations held, in accordance with Section 22 of the James Bay and Northern Québec Agreement and Chapter II of the *Environment Quality Act*:

The Review Committee recommends that Nemaska Lithium Inc.'s project to develop and operate a spodumene deposit, the Whabouchi Project, be authorized based on the recommendations made in this report and on certain conditions.

This recommendation pertains to the project as presented in the document *Whabouchi Project: Development and Operation of a Spodumene Deposit in the James Bay Territory. Environmental and Social Impact Assessment* and related documents. Any change or addition to the authorized project must be submitted to the Review Committee for its recommendation.

The present recommendation is conditional upon fulfilment of the commitments made by the proponent (Appendix I) and the conditions listed in this report. It is valid insofar as the main construction work on the mining project has begun within five (5) years following the date of authorization of the project by the Provincial Administrator.

Condition 1 : This recommendation is valid insofar as the main construction work on the mining project has begun within five (5) years following the date of authorization of the project by the Provincial Administrator. If the proponent has not begun the construction work by the end of the five-year deadline, it will have to submit an update of its project and the construction and operation schedule to the Administrator for approval.

Condition 2 : One year after the project's authorization, the proponent must submit an updated environmental and social monitoring program to the Administrator for approval. The updated program must include the monitoring activities referred to in Directive 019, those the proponent undertook to carry out and the monitoring required as a condition of authorization. The environmental and social monitoring program must explain the Nemaska Crees' involvement as well as that of the Environment Committee established pursuant to the Chinuchi Agreement. The proponent must specify the extent of Cree involvement in monitoring activities, especially those dealing with Lac des Montagnes. The monitoring program must also include post-operation and post-remediation monitoring.

Condition 3 : The proponent must submit all environmental and social monitoring reports to the Administrator for information purposes.

Condition 4 : The proponent must craft a communication strategy to keep the Aboriginal and non-Aboriginal communities affected by the project regularly informed of activities on the mine site, environmental and social monitoring results, operational problems and business and employment opportunities. The proponent must submit its communication strategy to the Administrator, for approval, one year after the project's authorization.

Condition 5 : At the end of mine wastewater treatment testing, the proponent must submit the selected mine effluent treatment method to the Administrator for approval. It must be demonstrated that this method will ensure optimum treatment.

Condition 6 : The proponent's environmental monitoring program must track surface water quality in Lac des Montagnes. Parameters to be measured include total phosphorus at trace levels (method MA. 303-P 5.2 of CEAEQ), chlorophyll a and clearness of water (with a Secchi disk). Monitoring stations must be established such that the final effluent plume on Lac des Montagnes can be determined. Triplicate, or at the very least duplicate, water samples must be collected from the lake once a month during the ice melt. If the weather does not allow for the collection of three samples, the proponent must adjust the sampling frequency so as to meet this objective.

Condition 7 : Six months after the project's authorization, the proponent must submit the list of job opportunities and minimum qualifications required (education/training, diplomas/degrees, driver's licence, etc.) to the Administrator and the community of Nemaska for information purposes.

Condition 8 : One year after the project's authorization, the proponent must submit an updated timetable for project implementation to the Administrator, for information purposes, and report on the steps taken to identify workforce training needs and hiring forecasts.

Condition 9 : The proponent's environmental and social monitoring program must include follow-up of its commitments to shut down the mine during Goose Break, implement measures to prevent drug and alcohol use on the mine site and prevent discrimination. In addition, the monitoring program must track training programs for the Crees. Monitoring must enable an assessment of the effectiveness and success rate of the measures implemented, as well as allow for measures to be adjusted where necessary based on monitoring results.

Condition 10 : Three months before construction begins, the proponent must submit the mandate and composition of the Environment Committee and the Implementation Committee established pursuant to the Chinuchi Agreement to the Administrator for information purposes. It must also explain the proposed communication strategy for informing residents of Nemaska and Chibougamau about the committees' work.

Condition 11 : The proponent's environmental and social monitoring program must include monitoring the water level in Lac du Spodumène. The proponent must define adequate baseline conditions for that purpose.

Condition 12 : Three years after the start of operations generating mine effluent, the proponent must submit a monitoring report to the Administrator. Monitoring must be conducted in accordance with the *Guide d'information sur l'utilisation des objectifs environnementaux de rejet relatifs aux rejets industriels dans le milieu aquatique* (or later versions). The report must say whether the environmental discharge objectives have been met and discuss the treatment performance for phosphorus. If environmental discharge objectives have not been met, the proponent must propose.

Condition 13 : To protect the waters in Lac des Montagnes, the proponent must ensure that the average monthly concentration of total phosphorus in final effluent does not exceed 0.3 mg/L, and that the maximum concentration of total phosphorus never exceeds 0.6 mg/L. Total phosphorus in the final effluent, at a phosphorus detection limit of lower than or equal to 0.05 mg/L, must be monitored on a weekly basis.

Condition 14 : One year after the project's authorization, the proponent must submit, to the Administrator, the initial sediment characterization in the project study area as well as a sediment impact assessment.

Condition 15 : The proponent's environmental and social monitoring program must include groundwater monitoring for major ions, total dissolved solids and oxidation-reduction potential.

Condition 16 : The proponent's environmental and social monitoring program must include monitoring of the integrity of the natural walleye spawning ground in Lac des Montagnes, at the mouth of Stream D. Monitoring must enable validation of continuous walleye spawning and recruitment conditions. Remedial measures must be implemented where necessary if monitoring reveals changes in spawning or egg incubation conditions.

Condition 17 : Six months after the project's authorization, the proponent must submit an updated fish habitat compensation plan to the Administrator for approval. The plan must take into account all fish habitat losses and be developed in consultation with experts at the Ministère des Forêts, de la Faune et des Parcs. The compensation plan must also take into account the needs and concerns of Cree land users.

Condition 18 : One year after the project's authorization, the proponent must submit to the Administrator, for information purposes, a report on the steps taken to prohibit hunting, fishing and the shooting of firearms on the territory covered by its mining lease and location tickets. The report must discuss the action taken, the safety zone, and the proponent's contribution to the implementation of existing monitoring activities or continuation of oversight, as the case may be, such as that carried out in the Weh-Sees Indohoun Special Fishing and Hunting Zone. The report must also discuss talks initiated with the Eeyou Istchee James Bay Regional Government and other bodies concerned.

Condition 19 : Eight months after the project's authorization, the proponent must submit to the Administrator, for approval, the results of further atmospheric modelling demonstrating the effectiveness of each of the mitigation measures referred to in the Environmental and Social Impact Assessment.

Condition 20 : The proponent must include a sprinkling plan in the comprehensive environmental and social monitoring program it has to submit to the Administrator for approval. The sprinkling plan must include, for each road segment, the number of trips per day, the length of the segment, the sprinkled surface area, the unmitigated TSP emission rate, sprinkling intensity, sprinkling intervals, the amount of water sprayed, how effective the spraying is in controlling dust, and the mitigated TSP emission rate.

Condition 21 : The proponent must include air quality monitoring in the comprehensive environmental and social monitoring program it has to submit to the Administrator for approval. The planned sampling and analysis methods must be explained.

Condition 22 : One year after the project's authorization, the proponent must submit the conditions for relocating camps following construction of the mine to the Administrator for information purposes. Every five years, the proponent must submit the log of complaints about mining operations and relocation requests to the Administrator, including an analysis of the complaints and the action taken to address them. The proponent must also provide the information communicated to land users regarding blasting schedules.

Condition 23 : The proponent must install signs on the Route du Nord or use other means to warn truck drivers carrying spodumene concentrate that a Cree camp is located nearby.

Condition 24 : The proponent must submit the five-year restoration plans required under the *Mining Act* (R.S.Q., chapter M-13.1) or, failing such a plan, the work it considers necessary, to the Administrator for information and comments.

Condition 25 : In the event of a temporary mine closure, the proponent must uphold its commitment to continue all monitoring programs until the resumption of activities, if activities resume within 12 months. If the mine remains closed for longer than 12 months, the proponent must inform the Administrator about the planned action to continue environmental monitoring and begin restoration work, as the case may be.

Condition 26 : Except in unforeseen circumstances, if the proponent temporarily halts its mining activities for longer than one (1) month, it must notify the Administrator, the community of Nemaska, the Ville de Chibougamau and the Eeyou Istchee James Bay Regional Government at least one month in advance.

Condition 27 : One year prior to the cessation of mining operations, the proponent must submit to the Administrator, for approval, the details of the dismantling of all project-related infrastructures and the planned rehabilitation work under the site restoration plan. The restoration plan must be prepared in consultation with the community of Nemaska and contain, in particular, physical rehabilitation of the site, renaturalization, cleanup, safety measures and possible mine effluent control measures. In addition to forest restoration objectives, the proponent must consider wildlife habitat enhancements and Cree land use and occupancy. The plan should include continued monitoring of the receiving environment following the cessation of mining operations.

Condition 28 : The proponent must incorporate the monitoring of cumulative effects proposed in its Environmental and Social Impact Assessment into the comprehensive environmental and social monitoring program it has to submit to the Administrator for approval.

Condition 29 : Six months before mine operation begins, the proponent must submit the final emergency measures plan to the Administrator for information purposes. The plan must cover all possible situations involving spills, fires, explosions and the release of toxic substances, as well as clearly and fully define all response measures in case of an accident, particularly in terms of communication with the government authorities concerned (Urgence-Environnement, Ministère de la Sécurité publique, Ministère des Transports du Québec, SOPFEU, etc.), potential closure of the Route du Nord and forest fires.

Condition 30 : The proponent must submit a copy of the final emergency measures plan and all subsequent updates to the community of Nemaska, the Ville de Chibougamau, the Ministère de la Santé et des Services sociaux, the Cree Board of Health and Social Services and the Direction régionale de la sécurité civile et de la sécurité incendie of the Ministère de la Sécurité Publique for the Outaouais, Abitibi-Témiscamingue and Nord-du-Québec administrative regions.

Condition 31 : The proponent must draw up the annual monitoring program for the Lac du Spodumène little brown bat nursery colony in consultation with experts at the Ministère des Forêts, de la Faune et des Parcs. This monitoring program must be incorporated into the comprehensive environmental and social monitoring program for the Whabouchi project that has to be submitted to the Administrator for approval.

Condition 32 : If a negative impact from construction and operation of the project is detected during monitoring of the Lac du Spodumène peatland, the proponent must submit additional compensation measures specifically for this wetland to the Administrator for approval.

Condition 33 : The comprehensive environmental and social monitoring program the proponent is required to submit to the Administrator for approval must include monitoring of the hydrological, ecological and habitat functions of the Lac du Spodumène peatland and adjacent shrub swamp.

Condition 34 : One year after the project's authorization, the proponent must submit a wetland loss compensation plan to the Administrator for approval.

Condition 35 : If any invasive exotic species are positively identified during its monthly detailed inspections in summer to verify the integrity and stability of mine structures, the proponent must send a copy of the report to the Administrator for information purposes.

Condition 36 : The proponent must determine the feasibility of using small, closed thermophilic composting equipment. The compost produced can be used for the gradual restoration work. The results of the feasibility study must be submitted to the Administrator for information purposes six months after the project's authorization.

Condition 37 : Three months before construction begins, the proponent must submit to the Administrator, for information purposes, a document stating the amount of each type of residual material that will be generated on site during each phase of the project. The document must confirm the final disposal site selected, its capacity to receive residual materials generated by the Whabouchi project, and the needs of the community of Nemaska.

APPENDICES

APPENDIX 1: DOCUMENTS SUBMITTED AND PRODUCED IN THE CONTEXT OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Documents submitted by the proponent

- NEMASKA LITHIUM INC. *Projet Whabouchi – Avis de projet – Version finale*, July 2011.
- NEMASKA LITHIUM INC. *Étude du potentiel archéologique – Nemaska Exploration, Projet Whabouchi*, by Archeo 08, December 2011.
- NEMASKA LITHIUM INC. *Étude hydrologique – Projet Whabouchi – Nemaska Lithium – rapport final*, by WESA inc., April 2012.
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- NEMASKA LITHIUM INC. *Projet Whabouchi – Étude des impacts sur l'environnement et le milieu social – Bilan et compensation des dommages sérieux aux poissons – Rapport d'activités*, by Roche ltée, Groupe-conseil, December 2014.

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- NEMASKA LITHIUM INC. *Projet Whabouchi – Étude des impacts sur l'environnement et le milieu social – Résumé (Mise à jour)*, by Roche ltée, Groupe-conseil, December 2014.

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- NEMASKA LITHIUM INC. *Projet de mine de spodumène Whabouchi – Modélisation de l'effluent minier*, by WSP Canada Inc., December 2014.

- NEMASKA LITHIUM INC. *Environmental and Social Impact Assessment – Whabouchi Project – Summary (Update)*, by Roche ltée, January 2015.

- Letter from Simon Thibault, of Roche ltée, Groupe-conseil, to Christyne Tremblay, Provincial Administrator of the James Bay and Northern Québec Agreement and Deputy Minister of Sustainable Development, the Environment and the Fight Against Climate Change, dated February 27, 2015, concerning an addendum – Whabouchi Project, Environmental and Social Impact Assessment.

- Letter from Simon Thibault, of Roche ltée, Groupe-conseil, to Christyne Tremblay, Provincial Administrator of the James Bay and Northern Québec Agreement and Deputy Minister of Sustainable Development, the Environment and the Fight Against Climate Change, dated April 29, 2015, concerning additional information on options for hauling

spodumene concentrate between the mine and the selected transfer site – Whabouchi Project, Environmental and Social Impact Assessment.

- Letter from Simon Thibault, of Roche ltée, Groupe-conseil, to Christyne Tremblay, Provincial Administrator of the James Bay and Northern Québec Agreement and Deputy Minister of Sustainable Development, the Environment and the Fight Against Climate Change, dated June 1, 2015, concerning additional information on the assessment of the contribution of TSP sources to receptors exceeding the applicable standards – Whabouchi Project, Environmental and Social Impact Assessment.

- Email from Simon Thibault, of Roche ltée, Groupe-conseil, to Alexandra Roio, Project Manager at the Direction de l'évaluation environnementale des projets nordiques et miniers, Ministère du Développement durable, de l'Environnement et de la Lutte aux changements climatiques, dated March 11, 2015, concerning additional information on atmospheric modelling.

Documents produced further to COMEX's recommendations

- MDDELCC *Directive pour le projet minier Whabouchi*, par Direction de l'évaluation environnementale, January 2012.

- MDDELCC *Questions et commentaires pour le projet de Whabouchi de développement et exploitation d'un gisement de spodumène sur le territoire de la Municipalité de la Baie-James par Nemaska Lithium inc.*, Direction de l'évaluation environnementale des projets nordiques et miniers, October 2013.

APPENDIX 2: SUMMARY TABLE OF NEMASKA LITHIUM'S COMMITMENTS IN RESPECT OF THE WHABOUCHI SPODUMENE MINE PROJECT

Composantes environnementales et sociales ou paramètres	Engagements de Nemaska Lithium	Référence dans l'ÉIES	Référence dans le document de réponses au COMEX (pages)
Infrastructures minières			
Intégrité et stabilité physiques des ouvrages	▪ Réaliser des inspections (inspections sommaires quotidiennes, inspections techniques détaillées mensuelles, inspections détaillées annuelles et inspections spécifiques au besoin) afin de s'assurer qu'il n'y a pas d'anomalies. ▪ Rédiger des rapports d'inspection annuelle. ▪ Effectuer un programme d'auscultation des ouvrages sur une période minimale de 2 ans après la fin des travaux de restauration.	Section 11.2.1	
Impacts de l'entreposage et du transbordement du concentré	▪ Fournir une mise à jour des impacts du projet spécifique au site retenu, de l'entreposage et du transbordement du concentré, et fournir les mesures d'atténuation et de gestion environnementale et sociale applicables.		3-17
Risques technologiques et plan de mesures d'urgence	▪ Élaborer une politique de santé et de sécurité. ▪ Développer un programme d'hygiène industrielle. ▪ Élaborer un programme de prévention des risques pour les travailleurs. ▪ Mettre en place un plan de mesures d'urgence. ▪ Nommer un gestionnaire dédié aux risques au sein de l'équipe de services du projet. ▪ Mettre en place des indicateurs de performance rétroactifs et prospectifs pour la phase de construction. ▪ Établir un comité de santé et sécurité et nommer un représentant à la prévention. ▪ Une tierce partie effectuera une vérification annuelle du plan des mesures d'urgence.	Chapitre 10	
	▪ Nemaska Lithium s'engage à effectuer une révision de son plan de mesures d'urgence une fois les autorisations obtenues du provincial et du fédéral pour son projet Whabouchi.		10-227
	▪ Quant à l'entreposage et le transport du minerai et du concentré, rien n'indique que ces activités puissent nécessiter une procédure d'urgence particulière, mais Nemaska Lithium s'engage à en analyser la pertinence et, au besoin, à rédiger une procédure appropriée.		10-229
Milieu physique			
Qualité de l'air ambiant	▪ Réaliser un programme de suivi de la qualité de l'air autour des installations minières afin de valider, entre autres, les résultats de la modélisation. Au besoin, les correctifs nécessaires seront apportés. ▪ Préparer un rapport sommaire à la fin de chaque campagne de mesure de la qualité de l'air. ▪ Préparer un rapport complet présentant le bilan de l'ensemble des mesures effectuées au cours de l'année ainsi que les correctifs apportés.	Section 11.2.2	
	▪ Effectuer un suivi de la qualité de l'air et proposer au besoin des mesures spécifiques advenant une problématique quelconque.	Section 9.5.1	
Climat sonore	▪ En ce qui a trait à la gestion des plaintes, Nemaska Lithium, en collaboration avec les membres du Comité Environnement, s'est engagé à instaurer un mécanisme, développer des moyens de communication et mettre en place une structure d'accueil pour solliciter de même que recevoir les doléances et les plaintes des membres de la communauté.		6-103
	▪ Nemaska Lithium s'engage à effectuer un sondage sur les questions concernant le bien-être communautaire périodiquement ainsi qu'à réaliser un suivi des usages du Bible Camp.		9-221
Vibrations	▪ Mettre en place un système d'auto-surveillance des vibrations au sol et des pressions d'air à proximité des camps permanents pendant les périodes de construction et d'exploitation. ▪ Conserver dans un registre les données de suivi des opérations minières (par exemple les vitesses de vibrations et les fréquences de vibrations au sol) pendant une période d'au moins 2 ans.	Section 11.2.2.4	
Eaux souterraines	▪ Effectuer un suivi conforme aux exigences de la Directive 019 sur l'industrie minière. ▪ Effectuer un suivi de la qualité et du niveau des eaux souterraines pendant toutes les phases du projet. ▪ Installer un total de 21 puits autour des installations suivantes: fosse, halde à stériles et résidus miniers, bassins de sédimentation et entrepôt de carburant. ▪ Effectuer 2 fois par an (printemps et été) le suivi des eaux souterraines durant la phase d'exploitation. ▪ Effectuer 2 fois par an (printemps et été) le suivi de la piézométrie. ▪ Transmettre au MDDELCC un rapport annuel du suivi des eaux souterraines et de la piézométrie sous forme électronique présentant notamment les résultats analytiques des échantillons.	Section 11.2.2.2	

Composantes environnementales et sociales ou paramètres	Engagements de Nemaska Lithium	Référence dans l'ÉIES	Référence dans le document de réponses au COMEX (pages)
Eaux de surface et qualité de l'effluent final	• Effectuer un suivi conforme aux exigences de la Directive 019 sur l'industrie minière. • Effectuer un suivi hebdomadaire régulier de l'effluent final jusqu'à l'arrêt définitif des activités minières. • Effectuer un suivi annuel (juillet ou août) de l'effluent final au site de rejet. • Pendant la phase d'exploitation, transmettre au MDDELCC un rapport mensuel sous forme électronique présentant notamment les résultats des analyses de l'effluent. • Pendant la phase d'exploitation, transmettre au MDDELCC un rapport annuel sous forme électronique présentant notamment le résumé des activités courantes de l'année, incluant les problèmes majeurs survenus et susceptibles d'avoir des répercussions sur l'environnement et les mesures prises pour y remédier. • Pendant la phase de fermeture, effectuer un suivi post-exploitation (durée de 2 ans) et un suivi post-restauration (durée de 5 ans minimum). • Pendant la phase de fermeture, transmettre au MDDELCC un rapport annuel sous forme électronique présentant notamment une interprétation des résultats de l'effluent final. • Pendant la phase de fermeture, prélever hebdomadairement des échantillons à l'effluent final, tel que spécifié par le REMM. • Pendant la phase de construction, effectuer la caractérisation de chaque effluent 4 fois par an, tel que spécifié par le REMM. • Effectuer un suivi de la qualité de l'eau 4 fois par an au cours de l'été et de l'automne. Nemaska Lithium débutera ce suivi dès le début des travaux de construction et le poursuivra jusqu'à la fin des travaux de restauration. • Effectuer un suivi des installations septiques où seront acheminées les eaux usées domestiques du site minier. • Effectuer une fois par mois un suivi de détermination de la létalité aiguë en prélevant des échantillons instantanés au point de rejet final de l'effluent. • Effectuer des essais de toxicité sublétale sur une espèce de poisson, d'invertébré, de plante et d'algue. Ces essais seront effectués 2 fois par an, pendant 3 ans et par la suite, 1 fois par an.	Section 11.2.2.3	
	• Respecter l'ensemble des critères applicables à l'effluent final et tendre à atteindre les objectifs environnementaux de rejet (OER) des effluents miniers qui seront déterminés par le MDDELCC spécifiquement pour le projet.		4-73
Traitement des eaux	• Nemaska Lithium s'engage a installé une unité de traitement des eaux au bassin d'eau de mine de manière préventive afin que celle-ci puisse, au besoin, rapidement être mise en fonction.		Étude de prédiction de la qualité de l'effluent p-32
Milieu biologique			
Caribou forestier	• Informer le MFFP relativement aux observations de caribous effectués à proximité du site minier. • Transmettre au MFFP toutes autres informations jugées pertinentes (aire de mise bas, incendie de forêt, etc.).	Section 9.5.3	
Végétation	• Effectuer un programme de suivi de la végétation et des activités de revégétalisation, incluant la réalisation annuelle d'inventaires printaniers sur une période de 3 ans. • Produire un rapport de suivi de la végétation une fois les travaux de revégétalisation des sites perturbés complétés, soit à la fin de la phase de construction ainsi qu'à la suite de la fermeture de la mine. Les rapports de suivi seront présentés au Comité Environnement élaboré en vertu de l'Entente Chinuchi.	Section 11.2.3.1	
Milieux humides	• Respecter l'ensemble des lois en vigueur, ce qui inclut la *Loi concernant des mesures de compensation pour la réalisation de projets affectant un milieu humide ou hydrique*.		7-129
Sédiments, benthos et poissons	• Des études de suivi biologique (qualité des sédiments, communauté d'invertébrés benthiques et poissons) seront effectuées afin de déterminer les effets sur les organismes benthiques et les poissons. Les plans des études de suivi biologique seront soumis au MDDELCC et à Environnement Canada pour approbation avant la réalisation des travaux. • Préparer des rapports d'interprétation des suivis biologiques présentant notamment l'information sur les échantillons prélevés et les stations d'échantillonnage. Ces rapports seront présentés à l'agent d'autorisation et remis au Comité Environnement.	Section 11.2.3.2	
	• Advenant le cas où certains métaux (Be, Li, Cs, Rb) non initialement inclus au programme de suivi biologique étaient observés lors des suivis à l'effluent final et dans les eaux souterraines, Nemaska Lithium s'engage à modifier les paramètres de son programme de suivi biologique afin d'inclure ces éléments, par exemple, dans le suivi de la teneur en métaux de la chair des poissons du lac des Montagnes.		11-239
	• Nemaska Lithium s'engage à réaliser un suivi des sédiments à la même fréquence que celle déterminée par Environnement Canada pour l'étude de la communauté d'invertébrés benthiques dans son Guide technique pour l'étude de suivi des effets sur l'environnement (ESEE) des mines de métaux (2012).		11-242
Faune aviaire	• Toutes les activités perturbatrices dans l'aire de nidification seront arrêtées jusqu'à ce que la nidification soit terminée, c.-à-d. jusqu'à ce que les oisillons aient quitté les environs du nid de façon permanente, ce qui peut durer quelques jours voire plus d'une semaine dépendamment de l'espèce et du stade de développement.		7-194
	• Tout nid trouvé sera protégé à l'aide d'une zone tampon basée sur une distance de protection appropriée à l'espèce jusqu'à ce que les oisillons aient quitté les environs du nid de façon permanente.		7-194
	• Documenter la mise en œuvre des mesures de protection suite à la découverte d'un nid ainsi que l'efficacité de celles-ci, c'est-à-dire à savoir si le nid est abandonné ou non. Le suivi de l'efficacité des mesures de protection nécessitera la visite du nid qui devra être faite en minimisant le dérangement sur ce dernier.		7-194

Composantes environnementales et sociales ou paramètres	Engagements de Nemaska Lithium	Référence dans l'ÉIES	Référence dans le document de réponses au COMEX (pages)
Milieu humain			
Consultation et participation des parties prenantes	• Continuer à approfondir sa relation avec la communauté de Nemaska, en maintenant une collaboration durant les différentes phases du projet minier.		3-9
Milieu humain	• Nemaska Lithium s'est engagé à ce que les membres de la communauté crie de Nemaska, et plus particulièrement le maître de trappage du terrain R20, soient impliqués dans le suivi environnemental et social du projet Whabouchi.		Résumé EIES (mise à jour) p-44
	• Nemaska Lithium s'est engagé à élaborer le programme de suivi environnemental et social en collaboration avec les parties cries dans le cadre des travaux du Comité Environnement.		11-243
	• Préparer des rapports annuels relativement au suivi du milieu humain et les rendre disponibles au Comité Environnement. • Impliquer le Comité Environnement dans le suivi du milieu humain puisqu'il a été établi comme plateforme d'échange et de la collaboration entre Nemaska Lithium et les membres de la communauté crie de Nemaska. • Maintenir en fonction un agent de liaison cri pour toute la durée du projet.	Section 11.2.4	
Emplois et retombées économiques	• Dans le cadre de la mise en œuvre de l'Entente Chinuchi, Nemaska Lithium et les parties cries s'engagent effectivement à travailler en collaboration avec les instances et les organismes locaux et régionaux, notamment cris et jamésiens, qui œuvrent déjà dans le domaine de la formation de la main-d'œuvre.		8-202
	• Nemaska Lithium s'est engagé à maximiser l'implication des travailleurs locaux (Cris) et régionaux (Cris et Jamésiens) pour les travaux de construction de la mine, dans la mesure où il existe une main-d'œuvre qualifiée.		8-203
	• Dans le cadre de l'Entente Chinuchi, Nemaska Lithium s'engage à définir précisément et faire connaître ses besoins aux parties cries dans un délai raisonnable, de manière à leur permettre de se préparer à temps.		8-203
	• Dans le cadre de l'Entente Chinuchi, Nemaska Lithium s'engage à élaborer puis à mettre en œuvre diverses mesures visant la sensibilisation interculturelle des employés non-cris à la culture crie.		8-207
	• Nemaska Lithium s'engage à embaucher des employés bilingues (français et anglais) et à faire des efforts raisonnables pour s'assurer que les superviseurs, contremaîtres et le personnel de gestion soient en mesure de s'exprimer clairement (oral et écrit) tant en français qu'en anglais.		8-207
	• Mettre en place un programme de suivi des emplois et des retombées économiques afin de valider, entre autres, les prévisions effectuées dans l'ÉIES. Ce programme couvrira toutes les phases du projet, de la construction à la fermeture. • Mettre en place des moyens afin de bonifier le programme de suivi, par exemple effectuer des entrevues auprès d'intervenants provenant d'organisme à vocation communautaire et commerciale.	Section 11.2.4.2	
	• Tel que prévu dans l'Entente Chinuchi, mettre en place un comité de suivi (formé de représentants de la communauté de Nemaska, du CRA et de Nemaska Lithium) une fois la construction de la mine débutée.	Section 9.5.5	
Bien-être communautaire	• Effectuer un sondage sur les questions concernant le bien-être communautaire périodiquement. • Alors que la mine sera en opération, tenir un registre des informations recueillies et produire un rapport périodique incluant un compte rendu des protocoles de collecte d'information, des rencontres effectuées et des solutions envisagées.		8-200
Utilisation du territoire et des ressources	• Rencontrer fréquemment les utilisateurs du terrain de trappage R20, notamment le maître de trappage James Wapachee et sa famille. • Effectuer un suivi des usages du Bible Camp. • Mettre à contribution le Comité Environnement afin de documenter notamment les impacts du projet sur l'utilisation du territoire et des ressources.	Section 11.2.4.1	
	• Mises en œuvre de mesures appropriées afin d'assurer la sécurité du site, tant pour les utilisateurs du territoire que pour la faune autour de la fosse ou de la halde à stériles et résidus miniers, et tant durant les opérations minières qu'à la fin de celles-ci.		8-197
	• Nemaska Lithium, en collaboration avec les membres du Comité Environnement qui sera créé en vertu de l'Entente Chinuchi, s'est engagé à instaurer un mécanisme, à développer des moyens de communication et à mettre en place une structure d'accueil pour solliciter de même que recevoir les doléances et les plaintes des membres de la communauté.		8-199
	• Nemaska Lithium s'est engagé à poursuivre les discussions avec ceux qui opèrent et fréquentent le Bible Camp et à considérer, dans le cas où le suivi du climat sonore identifiait des problèmes liés aux activités minières, le déménagement du camp.		8-201
	• En vertu de l'Entente Chinuchi, Nemaska Lithium et les parties cries s'engagent à collaborer à l'identification des indicateurs environnementaux et sociaux pertinents.		11-244

Source : Lettre de M. Simon Thibault, de Roche ltée, Groupe-conseil., à Mme Christyne Tremblay, Administrateur provincial de la Convention de la Baie James et du Nord québécois et sous-ministre du Développement durable, de l'Environnement et de la Lutte aux changements climatiques, datée du 27 février 2015, concernant un addendum – Projet Whabouchi, Étude des impacts sur l'environnement et le milieu social, 1er annexe.

APPENDIX 3: ENVIRONMENTAL DISCHARGE OBJECTIVES FOR THE WHABOUCHI MINING PROJECT

OBJECTIFS ENVIRONNEMENTAUX DE REJET

POUR LE PROJET MINIER WHABOUCHI

2015-02-09

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1. Introduction

Les objectifs environnementaux de rejet (OER), applicables à l'effluent final du projet minier Whabouchi situé sur le territoire de la Baie-James, dans la région administrative du Nord-du-Québec, vous sont transmis avec la description des différents éléments retenus pour leur calcul.

La détermination des OER a pour but le maintien et la récupération de la qualité du milieu aquatique. Des objectifs de rejet qualitatifs et quantitatifs pour les contaminants chimiques et pour la toxicité globale de l'effluent sont définis pour atteindre ce but. Les critères de qualité de l'eau de surface sur lesquels sont établis ces objectifs sont présentés en détails dans le document *Critères de qualité de l'eau de surface* (MDDEFP, 2013).

Les objectifs qualitatifs sont reliés principalement à la protection de l'aspect esthétique des plans d'eau. Les objectifs quantitatifs sont spécifiques aux différents contaminants présents dans l'effluent. De façon générale, ils définissent les concentrations et charges maximales de ces contaminants qui peuvent être rejetées dans le milieu aquatique tout en respectant les critères de qualité de l'eau de surface à la limite d'une zone de mélange restreinte.

La toxicité globale de l'effluent est, pour sa part, vérifiée à l'aide d'essais de toxicité aiguë et chronique. Le suivi de l'ensemble de ces objectifs est nécessaire pour s'assurer de l'absence d'effet toxique potentiel sur la vie aquatique, lié à la présence simultanée de multiples métaux et autres contaminants.

2. Contexte d'utilisation des OER

Les OER ne tiennent pas compte des contraintes analytiques, économiques et technologiques. Ils permettent d'évaluer l'acceptabilité environnementale des activités d'une entreprise ou d'un projet. Ces activités peuvent ainsi être jugées préoccupantes pour l'environnement sur la base du nombre de paramètres qui dépassent les OER, de la fréquence des dépassements ou de leur amplitude.

Dans tous les cas, l'utilisation des OER se fait en complémentarité avec une approche technologique. Lorsque les OER sont peu contraignants par rapport à la technologie couramment disponible, les normes doivent correspondre, au minimum, à la performance de cette technologie.

Des OER qui sont contraignants peuvent servir à identifier les substances les plus problématiques, à rechercher des produits de remplacement, à utiliser des technologies de traitement plus avancées, à favoriser un meilleur contrôle à la source et la mise en place de technologies propres visant la réduction du débit et des charges polluantes. Ils peuvent également conduire à la relocalisation du point de rejet pour protéger certains milieux récepteurs plus sensibles ou justifier le refus d'un projet ou d'une activité proposée.

Les OER peuvent également servir à établir des exigences supplémentaires de rejet ou de suivi. Ils ne doivent cependant pas être transférés directement comme normes dans un certificat d'autorisation sans analyse préalable des technologies de traitement existantes. En effet, les normes inscrites dans un certificat d'autorisation doivent être atteignables avec une technologie dont la performance est connue.

Les explications concernant la méthode de calcul des OER sont présentées dans le document *Calcul et interprétation des objectifs environnementaux de rejet pour les contaminants du milieu aquatique, 2e édition* (MDDEP, 2007). Toute l'information liée à l'utilisation des OER est réunie dans les *Lignes directrices pour l'utilisation des objectifs environnementaux de rejet relatifs aux rejets industriels dans le milieu aquatique* (MDDEP, 2008).

3. Description sommaire de l'entreprise

Le projet minier Whabouchi vise l'exploitation et l'extraction d'un gisement de pegmatite à spodumène situé sur le territoire de la Baie-James, dans la région administrative du Nord-du-Québec. La propriété minière Whabouchi est située à quelque 30 km à l'est de la communauté crie de Nemaska et à 300 km au nord-ouest de la municipalité de Chibougamau. Le spodumène est un minéral qui contient l'oxyde de lithium (Li_2O), sous forme de silicates ($LiAl(Si_2O_6)$), utilisé dans la fabrication de batteries et dans les marchés des véhicules électriques et de l'électronique. Le gisement de Whabouchi est l'un des plus importants dépôts de lithium en importance au monde. La minéralogie du gisement se compose principalement de spodumène, de quartz, de feldspath et de micas. Le gisement comprend également un autre minéral de lithium, la pétalite, et une faible occurrence de béryllium et de rubidium. Les ressources mesurées et indiquées s'élèvent à 19 639 000 tonnes, à une teneur de 1,49% de Li_2O (Nemaska Lithium, 2014a).

La durée totale du projet est de 26 ans. L'extraction du minerai s'effectuera à partir d'une fosse à ciel ouvert au cours des 21 premières années et à partir d'une fosse souterraine pour les ans 21 à 26. Le taux d'alimentation moyen prévu de l'usine est de 2 775 tonnes de minerai de spodumène par jour. Le concentré de spodumène du projet Whabouchi, un silicate d'aluminium (LiAl(Si2O6)), contiendra en moyenne 6,0 % Li_2O.

Les infrastructures présentes sur le site minier Whabouchi comprendront, entre autres, la fosse, le concasseur, le concentrateur, la halde à stériles et à résidus miniers filtrés (2 phases), l'aire d'accumulation temporaire du minerai, la halde des dépôts meubles, les six bassins de collecte des eaux, le bassin de rétention des eaux de la halde à stériles et à résidus miniers, le bassin d'eau de mine et l'entrepôt de concentré. À la fin des opérations, la fosse couvrira une superficie de 27,75 ha (Nemaska Lithium, 2014a; Nemaska Lithium, 2014b).

Gestion des eaux usées minières

Les eaux de procédé seront entièrement recyclées et recirculées. Les eaux de ruissellement de l'aire de bâtiments administratifs, du garage, du concentrateur, les eaux de ruissellement et d'exfiltration de la halde à stériles et à résidus miniers ainsi que les eaux de ruissellement et d'exfiltration de la halde de minerai temporaire seront, via un réseau de fossés périphériques, acheminées dans 5 bassins de collecte, puis ultimement, acheminées vers un bassin de rétention situé au sud-ouest de la halde. Depuis une conduite, ces eaux seront dirigées vers le bassin des eaux d'exhaure situé au sud-ouest de la fosse. Ce dernier recueillera les eaux de dénoyage et de ruissellement de la fosse (Nemaska Lithium, 2014b). L'ensemble de ces eaux sont considérées comme étant potentiellement contaminées ou contaminées par les infrastructures et les opérations du site minier.

L'exutoire de ce bassin constituera l'effluent final dont le point de rejet anticipé sera situé dans le lac des Montagnes, à proximité de l'embouchure de la rivière Nemiscau (Nemaska Lithium, 2014b). Le lac des Montagnes est un élargissement lacustre de la rivière Nemiscau (bassin versant niveau 2) qui s'écoule vers celle-ci puis dans la rivière Rupert (bassin versant niveau 1).

Le débit de l'effluent final anticipé est estimé sur une base annuelle et est fonction de l'évolution de la halde à stériles et à résidus miniers et de la fosse. Ce débit sera de l'ordre de 2 390 m^3/jour (an 1) à 5 151 m^3/jour (an 25) (ou 27,7 L/s à 59,6 L/s) en période d'exploitation de la fosse à ciel ouvert. En exploitation souterraine, le débit estimé pour l'an 26 est de 5 329 m^3/jour (ou 61,7 L/s). Le rejet de ces eaux minières aura lieu à l'année (Nemaska Lithium, 2014b).

4. Objectifs qualitatifs

Les eaux rejetées dans le milieu aquatique ne devraient contenir aucune substance en quantité telle qu'elle puisse causer des problèmes d'ordre esthétique. Cette exigence s'applique, entre autres, aux débris flottants, aux huiles et graisses, à la mousse et aux substances qui confèrent à l'eau un goût ou une odeur désagréable de même qu'une couleur et une turbidité pouvant nuire à quelques usages du cours d'eau.

L'effluent ne devrait pas contenir de matières décantables en quantité telle qu'elles puissent causer l'envasement des frayères, le colmatage des branchies des poissons, l'accumulation de polluants sur le lit du cours d'eau ou une détérioration esthétique du milieu récepteur.

Enfin, l'effluent devrait être exempt de toute substance en concentration telle qu'elle pourrait entraîner une production excessive de plantes aquatiques, de champignons ou de bactéries et qu'elle pourrait nuire, être toxique ou produire un effet physiologique néfaste ou une modification de comportement à toute forme de vie aquatique, semi-aquatique et terrestre. L'effluent doit aussi être exempt de substances en concentration telle qu'elles augmentent les risques pour la santé humaine (MDDEFP, 2013).

5. Objectifs quantitatifs

Le calcul des OER est généralement basé sur un bilan de charge appliqué sur une portion du cours d'eau allouée pour la dilution de l'effluent. Ce bilan est établi de façon à ce que la charge de contaminants présente en amont du rejet, à laquelle est ajoutée la charge de l'effluent, respecte la charge maximale admissible à la limite de la zone de mélange. Cette charge maximale est déterminée à partir des critères de qualité de l'eau en vue d'assurer la protection ou la récupération des usages du milieu.

5.1 Sélection des contaminants

Les paramètres faisant l'objet d'une norme et d'un suivi en vertu de la *Directive 019 sur l'industrie minière* ont été automatiquement retenus, à l'exception des cyanures totaux puisqu'il n'y a pas de traitement de minerai aurifère sur le site.

Les paramètres susceptibles d'être présents dans les eaux usées minières en concentrations significatives ont été retenus sur la base des informations relatives à la composition élémentaire des solides (minerai, stériles et résidus miniers), à la prédiction du comportement géochimique des rejets miniers et de leur potentiel de génération d'acide et de drainage contaminé ((*Toxicity Characteristic Leaching Procedure* (TCLP), *Synthetic Precipitation Leaching Procedure* (SPLP) et essais de lixiviation cinétique en cellule humide) et aux produits chimiques utilisés pour l'extraction des matériaux rocheux et le procédé de concentration du minerai.

L'azote ammoniacal, les nitrates et les nitrites ont été retenus en raison de l'utilisation d'explosifs à base de composés nitrés. Le phosphore a également été retenu en regard de la sensibilité du milieu récepteur (lac oligo-mésotrophe) et de la minéralisation du gisement.

Les éléments nécessaires à l'interprétation d'une toxicité mesurée, le cas échéant, ont également été ajoutés. Ces derniers sont la dureté, les solides dissous totaux, la conductivité et l'alcalinité.

Toute modification de la nature des produits utilisés dans le cadre du projet, de même que toute nouvelle information sur ceux-ci, pourrait conduire à une mise à jour des OER.

5.2 Éléments de calcul des objectifs environnementaux de rejet

Les OER ont été calculés en considérant les éléments qui suivent :

- *Les usages du milieu récepteur*

Comptant près de 17 000 personnes, les Cris forment la deuxième nation autochtone la plus populeuse du Québec. Ils sont répartis en neuf communautés qui sont situées sur les rives de la baie James ou de la baie d'Hudson ainsi qu'à l'intérieur des terres. Le village de Nemaska fait partie de ce dernier groupe et comptait 712 habitants lors du recensement de 2011. Il s'agit du village situé le plus près du projet d'exploitation de la mine Whabouchi.

Le territoire occupe une place importante dans la vie des Cris qui l'exploitent depuis des centaines d'années, que ce soit pour la pêche, la chasse, la trappe ou la cueillette de petits fruits. La pêche traditionnelle au filet et à la ligne est pratiquée dans la multitude de plans et cours d'eau qui alimentent le territoire, particulièrement en été et en automne, bien que de nombreuses familles continuent de poser leurs filets sous la glace en hiver. Les principales espèces pêchées sont le cisco de lac, le doré, le meunier, le brochet, l'esturgeon, le grand corégone, le touladi et l'omble de fontaine. Le canot est encore très utilisé pour se rendre d'un site de pêche à un autre.

De façon plus spécifique, deux sites de pêche au filet ont été identifiés dans le lac des Montagnes dans sa portion nord. Ce lac est aussi un lieu de chasse à la sauvagine et plusieurs campements saisonniers ou permanents sont érigés à proximité de ses rives. Plusieurs plages ont été identifiées sur les berges du lac des Montagnes. Une de celles-ci est située à l'embouchure du ruisseau C et une autre est située en aval du ruisseau C.

- *Les critères de qualité de l'eau pour la protection et la récupération des usages du milieu*

Les critères de qualité considérés pour le calcul des OER sont les critères de vie aquatique chronique (CVAC) et les critères de prévention de la contamination des organismes aquatiques (CPC(O)). Ces critères assurent respectivement : la protection de la vie aquatique, la prévention de la contamination des organismes aquatiques pouvant nuire à la consommation humaine et la protection de la faune terrestre piscivore. Ces critères proviennent de la publication *Critères de qualité de l'eau de surface* (MDDEFP, 2013).

Les métaux, les composés azotés (azote ammoniacal, nitrites et nitrates), les solides dissous et les matières en suspensions (MES) constituent des contaminants caractéristiques des activités minières. La biodisponibilité, et, par conséquent, la toxicité de certains métaux sont influencées par les caractéristiques locales particulières du milieu récepteur : le pH, la dureté et le carbone organique dissous. Les critères génériques de qualité de l'eau de surface prennent en considération ces éléments que de façon partielle. Ces critères demeurent cependant sécuritaires pour la plupart des situations. Ils permettent de faire une première évaluation sommaire de l'impact potentiel du rejet à venir.

Le promoteur peut, s'il le désire, procéder à la détermination de critères de qualité propres au site. Ces critères permettent de préciser le risque associé au rejet d'un contaminant lorsqu'un exploitant considère que des conditions particulières du milieu le nécessitent (MDDEFP, 2013). Ces procédures sont principalement utilisées pour déterminer des critères particuliers pour certains métaux, bien qu'elles peuvent servir pour d'autres paramètres. Elles sont décrites dans U.S. EPA (1994 et 2001) et CCME (2003).

Les critères de qualité du phosphore peuvent être utilisés pour évaluer la détérioration d'un lac. Ils ne peuvent toutefois pas servir à évaluer les charges de phosphore qui peuvent y être rejetées. En conséquence, aucun OER ne peut être calculé pour ce paramètre. Le rejet de ce contaminant devra être minimisé et faire l'objet d'une norme et d'un suivi.

- *Les données représentatives de la qualité des eaux du milieu récepteur*

La toxicité de certains contaminants pour la vie aquatique varie avec les caractéristiques physico-chimiques du milieu récepteur, tels le pH, la dureté, la température, les matières en suspension et la concentration en chlorures. La dureté du cours d'eau récepteur est à la base des critères de qualité de certains métaux, le pH et la température permettent d'évaluer le critère de l'azote ammoniacal et les chlorures celui du critère en nitrites. Pour ces contaminants, le critère de qualité de l'eau varie alors en fonction d'une ou de plusieurs caractéristiques de l'eau.

La teneur d'un contaminant dans le cours d'eau doit être considérée afin d'évaluer la quantité qui peut être ajoutée sans porter atteinte aux usages de l'eau. Des valeurs médianes représentatives du plan d'eau sont retenues à titre de concentration amont du milieu récepteur pour le calcul des OER (MDDEP, 2007). Les données retenues proviennent de la caractérisation de l'eau de surface effectuée par le promoteur dans le lac des Montagnes en juin, juillet et octobre 2014 (Nemaska Lithium, 2014c). La médiane des concentrations mesurées aux stations ST-7S et ST-11S du lac des Montagnes a été utilisée pour déterminer les caractéristiques physico-chimiques à la base du calcul de certains critères.

Précisément, les critères de qualité de certains métaux ont été calculés avec une dureté de 10 mg/L, valeur plancher utilisée pour le calcul des critères de métaux puisque la médiane des valeurs de dureté rapportées aux stations ST-7S et ST-11S est de l'ordre de 6 mg/L $CaCO_3$. Un pH médian de 6,64 et une température estivale de 15°C et hivernale de 5°C ont été utilisés pour le calcul des critères d'azote ammoniacal. Une concentration médiane en chlorures de 0,25 mg/L a servi pour le calcul du critère des nitrites. Pour les MES, la concentration médiane retenue est de 1,3 mg/L.

Pour les métaux traces, l'azote ammoniacal, les fluorures, les nitrites et les nitrates, les valeurs médianes mesurées à ces stations ont été retenues à titre de concentration amont du milieu récepteur pour le calcul des OER. Le tableau présentant les OER identifie, pour chaque contaminant, l'origine des valeurs amont retenues (MDDEP, 2007).

- *Le débit d'effluent*

Le rejet de l'effluent final dans le lac des Montagnes est effectué à l'année. Ce débit annuel maximal sera de l'ordre de 2 390 m^3/jour à 5 151 m^3/jour (ou 27,7 L/s à 59,6 L/s) en période d'exploitation de la fosse à ciel ouvert. En exploitation souterraine, le débit estimé pour l'an 26 est de 5 329 m^3/jour (ou 61,7 L/s). Le débit retenu pour l'établissement des OER correspond au débit maximal prévu, soit 5 329 m^3/jour (ou 61,7 L/s). Aucune information sur la variabilité mensuelle du débit n'a été transmise par le promoteur.

- *Le débit des cours d'eau alloué pour la dilution de l'effluent*

La méthode de calcul des OER intègre plusieurs éléments, dont notamment le débit ou le volume d'eau considéré pour la dilution de l'effluent à l'aval immédiat du point de rejet en conditions critiques (MDDEP, 2007).

Les lacs constituent des milieux particulièrement sensibles aux apports de contaminants et leur hydrodynamique favorise généralement la sédimentation et conduit à un mélange lent de l'effluent dans le milieu. La dilution des rejets en lac est déterminée à partir d'une

modélisation hydrodynamique. La détermination des conditions critiques du mélange doit tenir compte du niveau d'eau, de la vitesse et de la direction des courants et des vents, des variations saisonnières de température ainsi que de la présence d'une stratification. La présence d'une thermocline à certaines périodes de l'année est un élément important à considérer, car elle est peut-être limitante pour le mélange d'un rejet.

Dans ce cas-ci, les OER ont été établi selon une dilution 1 dans 10 (dilution maximale allouée pour les rejets en lacs pour tous les contaminants, à l'exception du phosphore). Les OER permettent ainsi d'assurer la protection de l'intégrité chimique du milieu récepteur, et ce, même durant les conditions les plus critiques du milieu.

5.3 Présentation des objectifs environnementaux de rejet

Les OER applicables au rejet de l'effluent final sont présentés au tableau 1. Les OER sont exprimés en termes de concentration et de charge maximales allouées à l'effluent dans le but d'assurer la protection du milieu récepteur. L'OER protégeant l'usage le plus sensible est retenu pour chaque contaminant dans le but d'assurer la protection de tous les usages du milieu récepteur.

5.4 Comparaison des rejets avec les objectifs environnementaux de rejet

La comparaison directe entre les OER et la concentration attendue ou mesurée à l'effluent (moyenne à long terme ou MLT) ne permet pas toujours de vérifier correctement le respect des OER puisqu'elle ne prend pas en considération la variabilité de l'effluent et le mode d'action des contaminants dans le milieu. Pour tenir compte de ces éléments, le MDDELCC utilise une simplification de la méthode américaine qui s'appuie sur certaines des lois statistiques. Selon celle-ci, la concentration attendue ou mesurée à l'effluent[5] est comparée à la moitié de l'OER indiqué au tableau 1, pour les contaminants pour lesquels un OER a été calculé à partir des critères de vie aquatique chronique (CVAC). Lorsque l'OER est calculé à partir des critères de prévention de la contamination des organismes (CPC(O), de même que pour la toxicité aiguë, la MLT est comparée directement à l'OER. Des informations sur la comparaison de la qualité des rejets avec les OER peuvent être obtenues dans les *Lignes directrices pour l'utilisation des objectifs environnementaux de rejet relatifs aux rejets industriels dans le milieu aquatique* (MDDEP, 2008).

Par ailleurs, il est nécessaire d'utiliser des méthodes analytiques ayant un seuil de détection plus petit ou égal à l'objectif de rejet. Dans le cas où l'OER d'un contaminant est inférieur au seuil de détection, l'absence de détection, à la limite précisée au bas du tableau, sera interprétée comme le respect de l'OER.

Les résultats de suivi doivent être exprimés en concentration totale pour tous les contaminants, à l'exception des métaux pour lesquels ils doivent être exprimés en métal extractible total. La forme extractible totale d'un métal est celle contenue dans un échantillon

[5] Selon la méthode américaine, la comparaison avec l'OER est effectuée avec la moyenne d'un minimum de 10 données représentatives de la période du rejet.

non filtré. Elle correspond à la somme du métal dissous et du métal lié aux particules, sans digestion du réseau silicaté (CEAEQ, 2007).

5.5 Toxicité globale de l'effluent

Le contrôle de la toxicité des eaux usées à l'aide d'essais de toxicité permet d'intégrer les effets cumulatifs de la présence simultanée de plusieurs contaminants, de même que l'influence des substances toxiques non mesurées.

L'effluent final de la mine Whabouchi ne doit pas dépasser une unité toxique pour les essais de toxicité aiguë (1 UTa) et 10 unités toxiques pour les essais de toxicité chronique (10 UTc). Les essais de toxicité recommandés pour vérifier la toxicité de l'effluent sont présentés à l'annexe 1. Ces essais devraient être réalisés 4 fois par année.

Tableau 1 : Projet minier Whabouchi
Objectifs environnementaux de rejet (OER) pour l'effluent final

9 février 2015

Contaminants	Usages	Critères mg/L		Concentrations amont mg/L		Concentrations allouées à l'effluent[(1)] mg/L		Charges allouées à l'effluent kg/d	Périodes d'application
Conventionnels									
Matières en suspension	CVAC	s.o.	(2)	1,3	(2)	51,3	(3)*	273,4	Année
Phosphore total (mg/L-P)	CVAC	s.o.		s.o.		Suivi	(4)	s.o.	Année
Métaux									
Aluminium	CVAC	0,087	(5)	0,036	(6)	0,55	*	2,9	Année
Antimoine	CVAC	0,24		1,00E-05	(6)	2,4	*	13	Année
Argent	CVAC	0,0001	(7)	2,50E-06	(6)	0,00098	*	0,0052	Année
Arsenic	CPC(O)	0,021		0,00022	(6)	0,21		1,1	Année
Baryum	CVAC	0,02	(7)	0,0036	(6)	0,17	*	0,92	Année
Béryllium	CVAC	1,62E-06	(7)	5,00E-06	(6)	1,62E-06	(8)(9)*	8,38E-06	Année
Cadmium	CVAC	3,19E-05	(7)	3,80E-06	(6)	0,00028	*	0,0015	Année
Chrome total	CVAC	0,011	(10)	0,00017	(6)	0,11	*	0,58	Année
Cobalt	CVAC	0,10		2,10E-05	(6)	1,00	*	5,4	Année
Cuivre	CVAC	0,00079	(7)	0,00029	(6)	0,0053	*	0,028	Année
Fer	CVAC	1,3	(11)	0,046	(6)	13	*	67	Année
Lithium	CVAC	0,44		0,00025	(6)	4,38	*	22,57	Année
Manganèse	CVAC	0,15	(7)	0,0047	(6)	1,5	*	8,0	Année
Nickel	CVAC	0,0045	(7)	0,00024	(6)	0,043	*	0,23	Année
Plomb	CVAC	8,07E-05	(7)	5,70E-05	(6)	0,00029	(9)*	0,0016	Année
Sélénium	CVAC	0,005		2,00E-05	(6)	0,050	*	0,27	Année
Uranium	CVAC	0,014		6,40E-05	(6)	0,14	*	0,75	Année
Zinc	CVAC	0,01	(7)	0,00065	(6)	0,098	*	0,53	Année
Autres paramètres									
Azote ammoniacal (estival) (mg/l-N)	CVAC	1,2	(12)	0,010	(13)	19,3	*	102,9	1er juin-30 nov
Azote ammoniacal (hivernal) (mg/l-N)	CVAC	1,9	(12)	0,010	(13)	17,6	*	93,8	1er déc-31 mai
Fluorures	CVAC	0,20		0,010	(13)	1,9		10	Année
Hydrocarbures pétroliers (C10-C50)	CVAC	0,01		0			(9)(15)*	0,54	Année
Nitrates	CVAC	2,9	(16)	0,020	(13)	29	*	154	Année
Nitrites (mg/l-N)	CVAC	0,02	(14)	0,010	(13)	0,11	*	0,59	Année
pH	CVAC	s.o.		s.o.		6,0 à 9,5	(17)		Année
Essais de toxicité									
Toxicité aiguë	VAFe	s.o.		s.o.		1 UTa	(18)	s.o.	Année
Toxicité chronique	CVAC	s.o.		s.o.		10 UTc	(19)*	s.o.	Année
Paramètres intégrateurs									
Alcalinité	s.o.	s.o.		s.o.		Suivi	(20)	s.o.	Année
Conductivité	s.o.	s.o.		s.o.		Suivi	(20)	s.o.	Année
Dureté	s.o.	s.o.		s.o.		Suivi	(20)	s.o.	Année
Solides dissous totaux	s.o.	s.o.		s.o.		Suivi	(20)	s.o.	Année

CARE : Critère d'activités récréatives
CPC(O) : Critère de prévention de la contamination des organismes aquatiques
VAFe: Valeur aiguë finale à l'effluent
CVAC : Critère de vie aquatique chronique
s.o.: Sans objet

* Les concentrations allouées à l'effluent marquées d'un astérisque doivent être divisées par 2 avant d'être comparées à la concentration attendue à l'effluent ou à la moyenne des données (voir section 5.4).

(1) Pour les différents contaminants, cette concentration doit correspondre à la forme totale à l'exception des métaux pour lesquels la concentration doit correspondre à la forme extractible totale.

(2) Le critère des matières en suspension (MES) correspond à une augmentation de 5 mg/l par rapport à la concentration naturelle. Celle-ci a été évaluée à 1,3 mg/l à partir de la médiane des concentrations mesurées lors de la caractérisation de l'eau de surface effectuée dans le lac des Montagnes en juin, juillet et octobre 2014 (Nemaska Lithium, 2014c) aux stations ST-7S et ST-11Sdans l'eau de surface du lac des Montagnes (Nemaska Lithium, 2014c).

(3) Comme l'objectif environnemental de rejet est plus élevé que la concentration moyenne acceptable de la Directive 019 sur l'industrie minière, cette dernière s'applique.

(4) Les critères de qualité du phosphore peuvent être utilisés pour évaluer la détérioration d'un lac. Ils ne doivent toutefois pas servir à évaluer les charges de phosphore qui peuvent y être rejetées. En conséquence, aucun OER ne peut être calculé pour ce paramètre. Le rejet de contaminant devra être minimisé et faire l'objet d'une norme et d'un suivi. La limite de détection de la méthode devra être plus petite ou égale à 0,05 mg/L P tot.

Tableau 1 : Projet minier Whabouchi
Objectifs environnementaux de rejet (OER) pour l'effluent final - *Suite*

9 février 2015

(5) Le critère de qualité de l'aluminium a été défini pour des eaux de faible dureté (< 10 mg/L) et de pH aux environs de 6,5. Comme l'aluminium représente un paramètre caractéristique de l'activité, un OER a été établi pour ce paramètre.

(6) Concentration médiane en métaux traces mesurée lors de la caractérisation de l'eau de surface effectuée dans le lac des Montagnes en juin, juillet et octobre 2014 (Nemaska Lithium, 2014c) aux stations ST-7S et ST-11S. Pour l'aluminium et le fer, un facteur de correction a été utilisé sur les données d'eau de surface pour réduire la fraction du métal associée aux particules fines.

(7) Critère calculé pour un milieu récepteur dont la dureté médiane est de 10 mg/L $CaCO_3$, valeur plancher qui est utilisée pour le calcul des crtières de qualité de la majorité des métaux. Le milieu récepteur présente une dureté médiane de 5,58 mg/L $CaCO_3$ selon les données de la caractérisation de l'eau de surface effecutée dans le lac des Montagnes en juin, juillet et octobre 2014 (Nemaska Lithium, 2014c) aux stations ST-7S et ST-11S.

(8) Selon l'état actuel des connaissances, on estime que la concentration de ce contaminant dans le milieu récepteur est supérieure au critère de qualité de l'eau. Dans un tel cas, l'objectif de rejet devient le critère de qualité de l'eau de surface.

(9) Il est nécessaire d'utiliser pour le suivi de tous les contaminants, des méthodes analytiques ayant une limite de détection plus petite ou égale à l'OER. Les paramètres suivants ont une limite de détection plus élevée que l'OER : béryllium 2E-04 mg/L; hydrocarbures pétroliers C_{10}-C_{50} 0,1 mg/L. Pour ces paramètres, l'absence de détection, à la limite demandée, sera interprété comme le respect de l'OER.

(10) Pour le chrome, bien qu'il existe un critère de qualité de l'eau pour des formes spécifiques de ce contaminant, l'OER est établi pour la forme totale. Une analyse des différentes formes permettrait de préciser le risque lorsque la concentration mesurée à l'effluent est supérieure à l'OER.

(11) Le critère de qualité du fer pourrait ne pas être protecteur pour l'éphémère (Ephemerella subvaria) si cette espèce est aussi sensible que certaines données de toxicité l'indiquent.

(12) Les critères de protection de la vie aquatique de l'azote ammoniacal sont déterminés pour une température de 15°C en été et de 5°C en hiver et pour une valeur médiane de pH de 6,64.

(13) Concentration médiane provenant de la caractérisation de l'eau de surface effectuée dans le lac des Montagnes en juin, juillet et octobre 2014 (Nemaska Lithium, 2014c) aux stations ST-7S et ST-11S.

(14) Le critère des nitrites est calculé pour un milieu récepteur dont la concentration médiane en chlorures est de 0,25 mg/L, selon les données provenant de la caractérisation de l'eau de surface effectuée dans le lac des Montagnes en juin, juillet et octobre 2014 (Nemaska Lithium, 2014c) aux stations ST-7S et ST-11S.

(15) En ce qui concerne les hydrocarbures pétroliers, leur diversité permet seulement de spécifier une gamme de toxicité, c'est pourquoi on retient une valeur guide d'intervention plutôt qu'un OER. En considérant le taux de dilution (1 dans 10), la valeur guide de 0,01 mg/L se traduit en une concentration allouée à l'effluent de 0,1 mg/L. Cette teneur sert à orienter la mise en place des meilleures pratiques d'entretien et d'opération ou de meilleures technologies d'assainissement.

(16) Le critère des nitrates a été révisé par le CCME. La Recommandation canadienne pour la qualité des eaux (RCQE) est de 3 mg/L pour des expositions de longue durée. Cette valeur sera adoptée en 2015.

(17) Cette exigence de pH, requise dans la directive sur les mines et la majorité des règlements existants sur les rejets industriels, satisfait l'objectif de protection du milieu aquatique.

(18) L'unité toxique aiguë (UTa) correspond à 100/CL_{50} (%v/v) (CL_{50} : concentration létale pour 50 % des organismes testés). Les essais de toxicité demandés sont spécifiés à l'annexe 1.

(19) L'unité toxique chronique (UTc) correspond à 100/CSEO (CSEO : concentration sans effet observable) ou 100/CI_{25} (CI_{25}: concentration inhibitrice pour 25% des organismes testés). Les essais de toxicité sont spécifiés à l'annexe 1.

(20) Le suivi de ce paramètre devrait être effectué 4 fois par année et réalisé au même moment que les essais de toxicité aiguë et chronique.

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Appendix A: ESSAIS DE TOXICITÉ SÉLECTIONNÉS POUR LA VÉRIFICATION DU RESPECT DES CRITÈRES DE TOXICITÉ GLOBALE À L'EFFLUENT MINIER POUR LE PROJET MINIER WHABOUCHI

Les essais de toxicité à utiliser sont les suivants :

Essais de toxicité aiguë

- détermination de la toxicité létale chez les microcrustacés (*Daphnia magna)*.
  Centre d'expertise en analyse environnementale du Québec (CEAEQ), 2007 (révisé 2011). Détermination de la toxicité létale CL_{50} 48h *Daphnia magna*. MA 500 – D.mag. 1.1. Ministère du Développement durable, de l'Environnement et des Parcs du Québec.

- détermination de la létalité aiguë chez la truite arc-en-ciel *(Oncorhynchus mykiss)*
  Environnement Canada, 2000. Méthode d'essai biologique : méthode de référence pour la détermination de la létalité aiguë d'effluents chez la truite arc-en-ciel. Environnement Canada, Conservation et Protection, Ottawa. SPE 1/RM/13 deuxième édition.

Essais de toxicité chronique

- Détermination de la toxicité – Inhibition de la croissance chez l'algue (*Pseudokirchneriella subcapitata*)

  Centre d'expertise en analyse environnementale du Québec (CEAEQ), 2005. Détermination de la toxicité – Inhibition de la croissance chez l'algue *Pseudokirchneriella subcapitata*, MA 500 – P. sub. 1.0, Québec, Ministère du Développement durable, de l'Environnement et des Parcs du Québec.

- Détermination de la toxicité – Inhibition de la croissance chez le cladocère (*Ceriodaphnia dubia*)

  Environnement Canada, 2007. Méthode d'essai biologique : essai de reproduction et de survie du cladocère *Ceriodaphnia dubia*, Environnement Canada, Conservation et Protection, Ottawa. SPE 1/RM/21 deuxième édition.