Rose Lithium-Tantalum Mining Project

ENVIRONMENTAL ASSESSMENT REPORT

August 2021

ᐃᓂᐯᐧᐃᐃᐧᐣ ᓂᕆᑎᑭᐧᐃᐃᐧᐣ ᐁ ᓀᑕᒧᑐᑦ (ᐃᓕᓴᐧᐃᐣ ᐋᑦᒋ)
Grand Council of the Crees (Eeyou Istchee)
Grand Conseil des Cris (Eeyou Istchee)

ᐃᓕᓴᐧᐃᐣ ᑎᐯᓂᑎᓕᓄᐧᐃ
Cree Nation Government
Gouvernement de la Nation Crie

Impact Assessment Agency of Canada
Agence d'évaluation d'impact du Canada

Canada

Catalogue No: En106-242/2021E-PDF

ISBN : 978-0-660-39596-8

This document has been issued in French under the title:

Projet minier Rose Lithium-Tantale – Rapport d'évaluation environnementale

Summary

Critical Elements Lithium Corporation is proposing the construction, operation and decommissioning of an open pit lithium and tantalum mine 38 kilometres north of the village of the Cree Nation of Nemaska, in Quebec, on the traditional lands of the Cree Nation of Eastmain. The project would consist of an open pit, an industrial complex, stockpiles for the ore, waste rock, dry tailings and overburden, an industrial ore processing facility, a spodumene and tantalum plant, a water treatment plant and mine water management facilities. The project site would be accessible via the Nemiscau-Eastmain-1 road and the ore would be transported south by the proponent via the northern roads and the Billy-Diamond Highway. A fly-in-fly-out work system would be favoured and workers would be housed in the former Eastmain work camp. The mine would have an ore production capacity of 4,600 tonnes per day. The proponent expects to produce annually approximately 236,532 tonnes of spodumene concentrate, from which lithium would be extracted, and 429 tonnes of tantalum concentrate during 17 years, for a total average daily production of 649 tonnes of spodumene and tantalum concentrate.

Under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), the project is subject to an environmental assessment by the Impact Assessment Agency of Canada (the Agency) as it involves a designated activity described in paragraph 16(a) of the Schedule to the *Regulations Designating Physical Activities*:

> ***"The construction, operation, decommissioning and abandonment of a new metal mine, other than a rare earth element mine or gold mine, with an ore production capacity of 3,000 t/day or more."***

This project is also subject to an environmental impact assessment and review under Section 22 of the *James Bay and Northern Quebec Agreement*.

In order to complete the environmental assessment process, the Agency and the Cree Nation Government signed in 2019 the Agreement under the *Canadian Environmental Assessment Act, 2012* Concerning the Environmental Assessment of the Rose Lithium-Tantalum and James Bay Lithium Mine Projects, and delegated to a Joint Assessment Committee (the Committee), comprised of representatives appointed by the Cree Nation Government and the Agency, the carrying out of the activities required under CEAA 2012.

The Committee prepared this Environmental Assessment Report considering the concerns and comments of the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi and of the general public. The Committee also considered the technical opinions of Environment and Climate Change Canada, Fisheries and Oceans Canada, Health Canada, Natural Resources Canada, Transport Canada, the Cree Board of Health and Social Services of James Bay and the Ministère des Forêts, de la Faune et des Parcs du Québec. The concerns expressed relate mainly to the cumulative effects of the project on the current use of lands

and resources for traditional purposes, including an increase in the number of trucks on the roads used by land users, and the effects on water quality. Concerns were raised, among others, about cumulative effects on species at risk and the abundance of wildlife, such as moose, caribou, goose, partridge, ptarmigan and beaver, as well as about effects on air quality.

This report presents the assessment of the potential environmental effects of the project and the Committee's conclusions as to whether the project is likely to cause significant adverse environmental effects, considering the implementation of mitigation measures.

The Committee examined the effects that the project is likely to have on the following valued components:

- Those that fall under federal jurisdiction as described in subsection 5(1) of CEAA 2012, including:
  - fish and fish habitat;
  - migratory birds;
  - the current use of lands and resources for traditional purposes by Indigenous peoples, including the loss or alteration of access for Indigenous use;
  - the health of Indigenous peoples;
- Those that are directly related to or result from federal decisions enabling the project to be carried out in accordance with subsection 5(2) of CEAA 2012, including:
  - wetlands;
- Species listed on Schedule 1 of the *Species at Risk Act* and their critical habitat.

The Committee also considered the factors set out in subsection 19(1) of CEAA 2012.

This report discusses the impact of the project on the rights of the Cree Nations through a conceptual framework based on Cree values. These values are at the heart of the Cree identity and the rights established for the Crees under the *James Bay and Northern Québec Agreement* and recognized by section 35 of the *Constitution Act, 1982*. In particular, the project could affect Cree values such as health, well-being, economic prosperity, and hunting, trapping and fishing.

The environmental assessment conducted by the Committee helped identify the following key residual environmental effects:

- Effects on fish and fish habitat resulting from the development of infrastructure, the draining of two lakes and project activities that would take place near water that could result in the mortality of fish and the harmful alteration, disruption or destruction of fish habitat, water contamination and changes to the hydrological and thermal regimes;
- Loss and alteration of wetlands caused by infrastructure development or project activities;
- Effects on birds and bird habitat, particularly on five species of birds at risk (common nighthawk, Canada warbler, olive-sided flycatcher, rusty blackbird and short-eared owl), through the disturbance of their eggs and nests, as well as through habitat losses and alterations caused by infrastructure development or project activities that could result in disturbance by noise, light and human presence;

- Effects on certain mammal species at risk resulting from the destruction, alteration or disturbance of their habitat, such as woodland caribou;
- Effects on Cree Nations health resulting from air contaminant emissions, noise, as well as water contamination, affecting fish or traditional resources hunted, trapped or gathered by the Cree Nations for consumption;
- Effects on socio-economic conditions related to the traditional activities of the Cree Nations through the installation of nearby infrastructure, land use change and increased road traffic;
- Effects on the current use of lands and resources for traditional purposes by the Cree Nations, including the practice of hunting, fishing, gathering and other activities surrounding this practice;
- Effects on physical heritage due to infrastructure development;
- Low contribution of the project to provincial and national greenhouse gas emissions (transboundary environmental effects resulting from greenhouse gas emissions).

The proponent has committed to implementing mitigation measures that would avoid or minimize the adverse effects of the project. Compensation measures are also proposed to offset residual adverse effects. The Committee identified the key mitigation measures required to avoid significant adverse environmental effects by taking into account the measures proposed by the proponent, the opinion of government experts and the comments received from the Cree Nations and the public.

Key mitigation measures include:

- A compensation plan, to the satisfaction of Fisheries and Oceans Canada and in collaboration with the Cree Nations, for the mortality of fish and the losses due to the harmful alteration, disruption or destruction of fish habitat;
- A compensation plan for wetlands losses to be submitted to Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques;
- A mine effluent management program, including the recovery and in-plant treatment of mine water, to minimize the effects on water quality;
- A dust management plan, including the control of drilling emissions and the restriction of tailings blasting during high wind periods to minimize the effects of dust on health;
- Carrying out the project in such a way as to protect migratory birds and avoid injuring, killing or disturbing them;
- Complying with the Quebec Noise Instruction Standard 98-01 to minimize disturbance caused by noise;
- Intensification of transportation during the day;
- Deforestation outside of migratory bird nesting and chiropteran breeding periods;
- Use of U.S. Environmental Protection Agency Tier 4 certified machinery;
- A communication plan to inform land users during all phases of the project;
- Modification of the frequency of blasting activities and the frequency of transport truck convoys during goose and moose hunting periods;

- Prohibiting any person from engaging in any hunting, trapping or fishing activity and from possessing firearms, hunting, trapping or fishing equipment within the security perimeter, except when accessing the security perimeter for cultural purposes or to exercise Indigenous rights, provided such access and activities are safe and subject to the terms and conditions developed with the First Nations prior to construction.

The Committee also identified follow-up requirements to verify the prediction of effects on the valued components and the effectiveness of the proposed mitigation measures. The results of these follow-ups would be submitted to the Agency for review in collaboration with the federal authorities, would be shared with Cree Nation representatives and would allow the proponent to make corrections, if necessary.

The Committee concludes that the project is not likely to cause significant adverse environmental effects, considering the implementation of key mitigation measures.

In accordance with subsection 53(2) of CEAA 2012, if he authorizes the project, the Minister of Environment and Climate Change would establish the conditions in relation to the environmental effects referred to in subsections 5(1) and 5(2) of CEAA 2012, with which the proponent would be required to comply. These conditions would be established for the sole purpose of the Decision Statement issued under CEAA 2012. They would not relieve the proponent from any obligation to comply with other legislative or other legal requirements of the federal, provincial, or local governments.

The Committee also concludes that the project, in combination with past, present and reasonably foreseeable future projects, is not likely to cause significant adverse cumulative environmental effects on fish and fish habitat, wetlands, migratory and at risk birds, woodland caribou and chiropterans at risk. While it also concludes that the project is not likely to cause significant adverse cumulative environmental effects on the current use of lands and resources for traditional purposes, considering the implementation of recommended mitigation measures, the Committee recognizes that the project could cause residual cumulative effects on hunting, fishing and trapping activities practised by the Cree Nations by limiting access to the territory and the use of lands and resources for traditional purposes. Adjustments to the mitigation and follow-up measures recommended by the Committee could be made, if necessary, to minimize negative effects during the course of the project.

After gathering and considering comments from the Cree Nations, government experts and the public on the Draft Environmental Assessment Report and potential conditions, the Committee has finalized these two documents in order to submit them to the Minister for his decision under CEAA 2012 as to whether the project is likely to cause adverse and significant effects.

If the Minister determines that the project is likely to cause significant adverse environmental effects, the Minister will refer to the Governor in Council the question of whether these effects are justifiable in the circumstances. If the project is not likely to cause significant adverse effects or if such effects are justifiable in the circumstances, the Minister will set out the conditions for carrying out the project in his Decision Statement under CEAA 2012. The conditions set out by the Minister would be legally binding on the proponent.

Table of Contents

List of Tables

List of Figures

List of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
SARA	*Species at Risk Act*
the Agency	Impact Assessment Agency of Canada
the Agreement	Agreement under the *Canadian Environmental Assessment Act, 2012* Concerning the Environmental Assessment of the Rose Lithium-Tantalum and James Bay Lithium Mine Projects
the Committee	Joint Assessment Committee (Cree Nation Government and Impact Assessment Agency of Canada)
the impact statement	Environmental impact statement
the JBNQ Agreement	*James Bay and Northern Quebec Agreement*
the Minister	Minister of Environment and Climate Change
the proponent	Critical Elements Lithium Corporation

1. Introduction

1.1 Joint Environmental Assessment with the Cree Nation Government

1.1.1 Context of the James Bay and Northern Quebec Agreement

The *James Bay and Northern Quebec Agreement* (the JBNQ Agreement) is a modern treaty agreed upon in 1975 by the Cree Nation and the Governments of Quebec and Canada[1]. Section 22 (*Environment and Future Development Below the 55th Parallel*) of the JBNQ Agreement establishes an environmental and social protection regime that provides for an environmental and social impact assessment and review process to which certain developments are subject to in the territory covered by the agreement. Mining projects are automatically subject to the assessment and review process under Section 22. Principles[2] guide the assessment and review of projects in order to ensure, inter alia, the protection of the Crees, their hunting, fishing and trapping rights, as well as the wildlife and environmental resources on which they depend. Their participation in the environmental and social protection regime is also ensured. Three assessment and review committees on which the Cree Nation has increased participation have been created:

- The Evaluating Committee (COMEV) is a tripartite committee (Cree Nation Government, Government of Quebec and Government of Canada) mandated to review the preliminary information provided by the proponent of a project located in the territory governed by the JBNQ Agreement and situated south of the 55th parallel. On the basis of this information, the COMEV recommends to the regional, provincial or federal Administrator of the JBNQ Agreement (depending on the project's location [Category I land, Category II land or Category III land] and depending on the nature of the project) whether or not to subject the project to the environmental and social impact assessment and review procedure, if the project is not automatically subject to or exempted from the procedure. If the project is subject to the procedure, the scope of the impact statement to be prepared (the directive) is determined at that time;
- The Environmental and Social Impact Review Committee (COMEX) is a joint committee comprised of representatives appointed by the the Cree Nation Government and the Government of Quebec, with a mandate to review the environmental assessment of certain development projects under provincial jurisdiction (for example, mines) and to recommend to the regional or provincial Administrator whether or not to authorize the development projects and, as applicable, under what conditions;
- The Federal Review Panel (COFEX South) is the federal body mandated to review the environmental and social impacts of certain development projects under federal jurisdiction (such as ports, airports or

[1] The JBNQ Agreement is also signed by the Northern Quebec Inuit Association, Société d'énergie de la Baie James, Société de développement de la Baie James and Hydro-Québec.

[2] The principles are set out in section 22.2.4 of the JBNQ Agreement.

national defence) proposed in the territory concerned. COFEX South is a bipartite committee (Cree Nation Government and Government of Canada) which produces at the end of its review a recommendation to the federal or regional Administrator on whether or not to authorize the development project and, as applicable, under what conditions.

The Rose Lithium-Tantalum Project (the project) is a designated project subject to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). Moreover, the project is subject to a provincial environmental assessment under the JBNQ Agreement. Therefore, the project is subject to two environmental assessment processes: that of CEAA 2012, and that of the provincial assessment and review process provided for in Section 22 of the JBNQ Agreement.

In the winter of 2019, the Cree Nation Government notified the Impact Assessment Agency of Canada (the Agency; formerly the Canadian Environmental Assessment Agency) of their concerns in relation to the ongoing federal environmental assessment, signalling their desire to ensure that it complies with the requirements set out in the Quebec (Attorney General) v. Moses[3] decision and that it respects the spirit and objectives of the JBNQ Agreement. An agreement was reached in June of 2019 and described in the following section in response to this request.

1.1.2 Joint Environmental Assessment Agreement with the Cree Nation Government

On June 27, 2019, the Agency and the Cree Nation Government signed the Agreement under the *Canadian Environmental Assessment Act, 2012* concerning the environmental assessment of the Rose Lithium-Tantalum and James Bay Lithium mining projects (the Agreement)[4]. The Agreement stipulates that the Agency delegates to a Joint Assessment Committee (the Committee), composed of representatives appointed by the Cree Nation Government and the Agency, any activity required in order to complete the environmental assessment under CEAA 2012 of the project.

[3] In Quebec (Attorney General) v. Moses, 2010 SCC 17, [2010] 1 S.C.R. 557, it is stipulated that "Common sense as well as legal requirements suggest that the CEAA assessment will be structured to accommodate the special context of a project proposal in the territory covered by the [James Bay and Northern Quebec] Agreement, including the participation of the Cree."

[4] The Agreement is available at the following link: www.ceaa-acee.gc.ca/050/evaluations/document/135131?&culture=en-CA

1.1.3 Joint Assessment Committee

Role of the Committee

As stipulated in the Agreement, the Committee must carry out the environmental assessment and complete it according to the legislative requirements of CEAA 2012. The environmental assessment must be consistent with the spirit and objectives of the JBNQ Agreement, particularly with Sections 22 *(Environment and Future Development South of the 55th Parallel*) and 24 (*Hunting, Fishing and Trapping*). It must also provide for special and concerted participation by the Crees. Certain procedural aspects of the Crown consultations were also delegated to the Committee.

The Agreement also indicates that the Committee must prepare, by consensus whenever possible, the environmental assessment report, its recommendations and its conclusions. The environmental assessment of the project must account for CEAA 2012 and Section 22 of the JBNQ Agreement, including the social effects. The Committee's conclusions are submitted to Canada's Minister of Environment and Climate Change (the Minister), who will take them into account to decide whether the project is likely to result in significant adverse environmental effects under section 5 of CEAA 2012. In his decision, the Minister will have to consider the points of view of the Cree Nation Government and the Cree Nations potentially concerned by the project, and any appropriate mitigation measure.

Participation in the Committee

The Committee is composed of two representatives appointed by the Cree Nation Government and two representatives appointed by the Agency. The Committee is co-chaired by one representative appointed by the Cree Nation Government and one representative appointed by the Agency. The Agency provides the Committee with the logistical support and secretarial services necessary for the performance of the functions conferred by the Agreement.

1.2 Brief Presentation of the Project

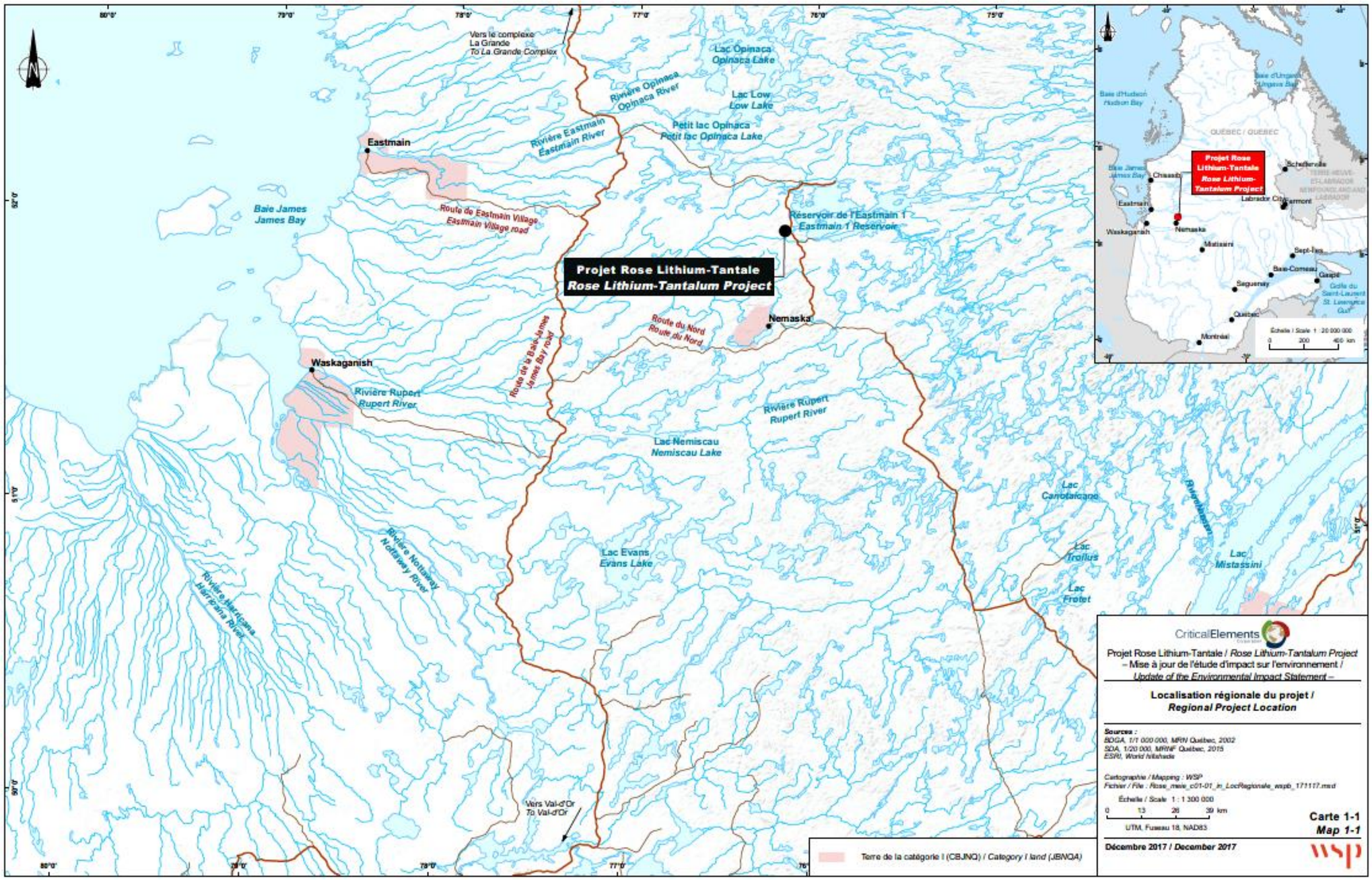
Critical Elements Lithium Corporation (the proponent) proposes the construction, operation and decommissioning of an open-pit lithium and tantalum mine located approximately 38 kilometres north of Cree village of Nemaska and within trapline RE01 of the Cree Nation of Eastmain (Category III lands within the definition of the JBNQ Agreement), in Quebec (Figure 1). As proposed, the project would have a lifecycle of 26 years, including 17 years of operation. The mine would have an ore production capacity of 4,600 tonnes per day. The proponent expects to produce approximately 236,532 tonnes of spodumene concentrate, from which lithium would be extracted, and 429 tonnes of tantalum concentrate per year, for a total average production of 649 tonnes of spodumene et tantalum concentrate per day. The ore would be crushed, processed and concentrated in an industrial complex on site. The project would include an open-pit mine, as well as ore, overburden, waste rock and tailing accumulation areas.

1.3 Purpose of the Environmental Assessment Report

This environmental assessment report provides a summary of the information and analyses the Committee took into account to determine, in accordance with CEAA 2012 and the Agreement, whether the project is likely to result in significant adverse environmental effects, in view of the proposed mitigation measures.

The Minister of Environment and Climate Change will review the report and will take into account the comments of the Crees, the public, the proponent and government experts before rendering his decision under CEAA 2012.

Figure 1: Location of the Project in Quebec, approximately 38 Kilometres North of the Cree Community of Nemaska



Source: WSP Canada Inc. (February 2019a)

1.4 Scope of the Environmental Assessment

1.4.1 Requirements of the Environmental Assessment

On August 28, 2019, the *Impact Assessment Act* (IAA) took effect and CEAA 2012 was repealed. However, in accordance with the transitional provisions of the IAA, the environmental assessment of this project continues under CEAA 2012 as if it had not been repealed.

The project is subject to CEAA 2012 because it includes physical activities described in section 16(a) of the schedule of the *Regulations Designating Physical Activities* under CEAA 2012: "The construction, operation, decommissioning and abandonment of a new metal mine, other than a rare earth element mine or gold mine, with an ore production capacity of 3,000 t/day or more."

Based on the description of the project presented by the proponent in August 2012, the Agency conducted a preliminary review of the project to decide if an environmental assessment was required under CEAA 2012. On September 6, 2012, the Agency invited the public and the Crees to submit comments on the project and its potential environmental effects. The Agency decided that an environmental assessment was required and started the environmental assessment on October 22, 2012. The mine would have an ore production capacity of 4,600 tonnes per day. The proponent expects to produce approximately 236,532 tonnes of spodumene concentrate, from which lithium would be extracted, and 429 tonnes of tantalum concentrate per year, for a total average production of 649 tonnes per day. On June 27, 2019, the Agency delegated to the Joint Assessment Committee the necessary activities to complete the environmental assessment process.

The project is also subject to a provincial environmental review under Section 22 of the JBNQ Agreement and Quebec's *Environment Quality Act.*

1.4.2 Factors Considered in the Assessment

The Agency has published Guidelines for the proponent as well as additional information regarding the preparation of an environmental impact statement. The Guidelines and the additional information describe the environmental effects and the factors to consider in the environmental assessment, and are available on the Canadian Impact Assessment Registry[5]. As required by CEAA 2012, the environmental assessment pertained to the review of the significance of the potential significant adverse environmental effects provided for in section 5. Under subsection 79(2) of the *Species at Risk Act* (SARA), the Committee must determine the adverse effects of the project on the listed species at risk (Schedule 1 of SARA) and their critical habitats. The Committee must also ensure that measures are taken to avoid, mitigate and control the adverse effects on species at risk and that appropriate surveillance and monitoring programs are implemented if the project goes ahead. The measures shall be compatible with any applicable recovery strategy and action plan.

[5] The *Environmental Impact Statement Guidelines* are available at the following link: www.ceaa-acee.gc.ca/050/evaluations/document/132451?&culture=en-CA and the additional information is available at the following link: https://iaac-aeic.gc.ca/050/evaluations/document/135638?culture=en-CA

In accordance with subsection 19(1) of CEAA 2012, the federal environmental assessment also considered the following factors:

- Environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other physical activities that have been or will be carried out;
- The significance of these environmental effects;
- Comments from the public;
- Mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
- The requirements of the follow-up program in respect of the project;
- The purpose of the project;
- Alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternatives;
- Any change to the project that may be caused by the environment.

Moreover, according to subsection 19(3) of CEAA 2012, the environmental assessment of the project may take into account community knowledge and Cree traditional knowledge.

As indicated in the Agreement, the environmental assessment also considered the guiding principles of Section 22 of the JBNQ Agreement, as stipulated in section 22.2.4:

- The protection of the hunting, fishing and trapping rights of Indigenous Peoples in the JBNQ Agreement Territory, and their other rights in Category I lands, with respect to developmental activity affecting the Territory;
- The environmental and social protection regime with respect to minimizing the impacts on Indigenous Peoples by developmental activity affecting the Territory;
- The protection of Indigenous Peoples, societies, communities, economies, with respect to developmental activity affecting the Territory;
- The protection of wildlife resources, physical and biological environment, and ecological systems in the Territory with respect to developmental activity affecting the Territory;
- The rights and guarantees of the Indigenous peoples within Category II lands established by and in accordance with section 24;
- The involvement of the Cree people in the application of [the environmental assessment regime, including the environmental assessment and review process];
- The rights and interests of non-Indigenous peoples, whatever they may be;
- The right to develop by persons acting lawfully in the Territory;
- The minimizing of adverse environmental and social impacts of development on Indigenous Peoples and on Indigenous communities by reasonable means with special reference to those measures proposed or recommended by the impact assessment and review procedure.

The environmental assessment also considered the objectives, the alternatives and the environmental and social impacts of the project.

1.4.3 Selection of the Valued Components

The valued components assessed by the Committee are presented in Table 1. The Agency has targeted its assessment of the effects of the valued components under federal jurisdiction, pursuant to section 5 of CEAA 2012, as well as the species at risk under subsection 79(2) of SARA. The Committee also considered the guiding principles, including the socio-economic factors, of Section 22 of the JBNQ Agreement.

Table 1: Valued Components Selected by the Joint Assessment Committee

Valued Component	Justification
Effects Assessed under Subsections 5(1) and 5(2) of the *Canadian Environmental Assessment Act, 2012*	
Fish and Fish Habitat	Changes in the quantity and quality of water could have effects on fish health and result in the mortality of fish (except that from fishing) and the harmful alteration, disruption or destruction of fish habitat.
Migratory Birds	Increase in noise levels and terrestrial, aquatic and wetland habitat disturbance and loss could have adverse effects on migratory birds.
Wetlands	Project components that require federal authorizations may result in loss of wetland extent and effects on wetland functions.
Transboundary Environmental Effects	The project would lead to greenhouse gas emissions contributing to the increase in atmospheric concentrations on a global scale and climate change. The effects on atmospheric greenhouse gas concentrations are assessed, because they concern provincial or international transboundary changes.
Indigenous Peoples – Health Conditions	Changes in the quantity and quality (perceived and existent) of food hunted and gathered as traditional food, drinking water and changes to the atmospheric, terrestrial, aquatic, noise and sensory environments could have effects on the health of the Indigenous Peoples.
Indigenous Peoples – Socio-economic Conditions	Changes to the environement, including the terrestrial environment, could have effects on the socio-economic conditions of the Indigenous Peoples.
Indigenous Peoples – Current Use of Lands and Resources for Traditional Purposes	Changes to the atmospheric, terrestrial, aquatic and sensory environments could have effects on the current use of lands and resources for traditional purposes by the Indigenous Peoples, including access to the lands and availability, quantity and quality of fish, plant and wildlife species.
Indigenous Peoples – Physical or Cultural Heritage and Structure, Site or Thing of Historical, Archaeological, Paleontological or Architectural Importance	Changes to the environment could have effects on the physical or cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural importance.
Effects Assessed under Subsection 29)2) of the *Species at Risk Act*	
Species at Risk	Disturbance and loss of terrestrial, wetland and aquatic environments, as well as the increase in noise and light pollution levels, could lead to effects on the following species listed in Schedule 1 of SARA: common nighthawk, rusty blackbird, short-eared owl, olive-sided flycatcher, Canada warbler, wolverine, caribou (woodland caribou, Boreal population and caribou, Eastern migratory population), little brown myotis and northern myotis.
Components Considered under the Agreement	
Socio-economic Conditions (other than those provided for in section 5 of CEAA 2012)	The project could have effects on roads users' safety, the availability of jobs and training and on the status of women.

1.4.4 Spatial and Temporal Boundaries

Spatial Boundaries

The spatial boundaries define the geographic areas in which the project's potential effects could occur. They may vary according to each valued component of the natural and human environments. Thus, the proponent defined several study areas for the purposes of assessment of the project's effects on the biophysical and human environments. The Committee used the spatial boundaries defined by the proponent for its assessment of the effects.

The study area of the natural environment covers an extent of approximately 100 square kilometres (Figure 2). It more specifically concerns the description of the biological components of the environment likely to be affected by the project. It is composed of bodies of water and watercourses, the reservoir of the Eastmain-1 hydroelectric facility, wooded sectors and wetland sectors. Wetlands account for over 30% of this area. Terrestrial vegetation, excluding wetlands, occupies 64% of the natural environment. The study area consists mainly of coniferous stands with a tree layer composed of jack pine, white birch, trembling aspen and white and black spruce. Shrub barrens and regenerating burns are also present. Fifty-eight forest fires were recorded between 1994 and 2014 within a 50-kilometre radius of the mine site. Forest fires have disturbed almost 83% of the area within five kilometres of the project.

The study area of the human environment extends over an area of 256 square kilometres (Figure 3), including all of the projected mine infrastructure (pit, plants, etc.). It includes an area of influence approximately five kilometres away on the perimeter of the project's components.

The proponent adjusted the boundaries of the study areas for certain components selected in the impact statement to adequately describe the existing conditions of the receiving environment before the project, and to assess the project's potential effects on each valued component. For example, to assess the project's impact on woodland and migratory caribou, the proponent defined the spatial boundaries considering the woodland caribou habitat development guidelines established by the Équipe de rétablissement du caribou forestier du Québec (Quebec woodland caribou recovery team). The specific study areas are presented and justified in the sections dealing with these components.

Temporal Boundaries

The temporal boundaries are established to account for all the activities of the project likely to cause adverse environmental effects. In the context of this environmental assessment, the proponent defined the temporal boundaries according to the schedule and the duration of the project's activities that may have adverse environmental effects. The Committee used the temporal boundaries defined by the proponent, namely a 26-year period encompassing the project from the start of the construction phase to the end of the monitoring phase.

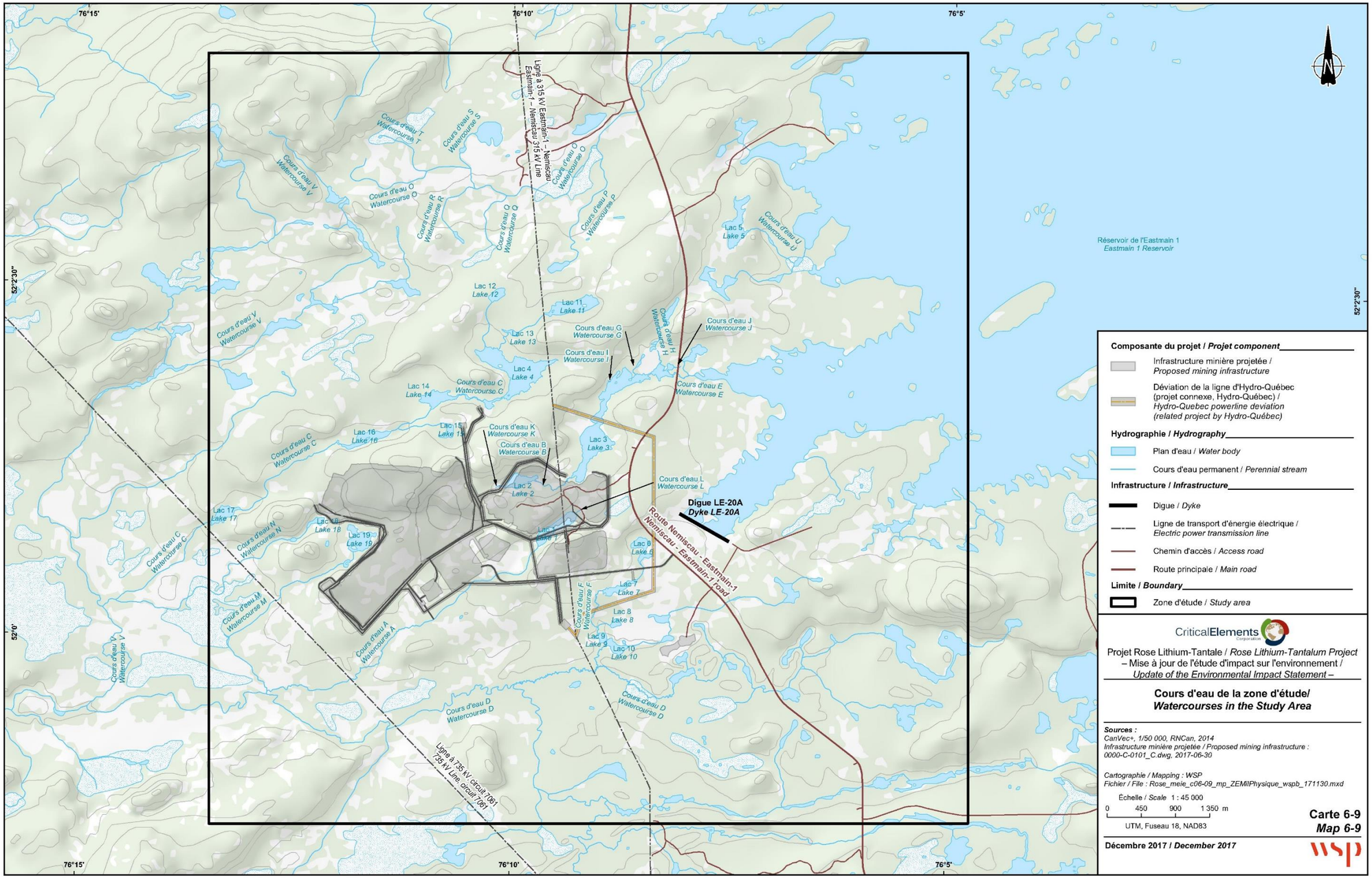
Construction: The construction phase, projected to last 18 months, including deforestation and clearing of the vegetation, necessary for preparation of the sites and construction of the mining infrastructure.

Operational: The operation phase, projected to last 17 years, corresponds to commercial production and includes mining of the pit, waste rock management, water management and ore transport.

Decommissioning: Decommissioning of the project, projected to last two years, is the phase succeeding the final end of commercial production, during which the mining infrastructure will be dismantled and the mining site reclaimed.

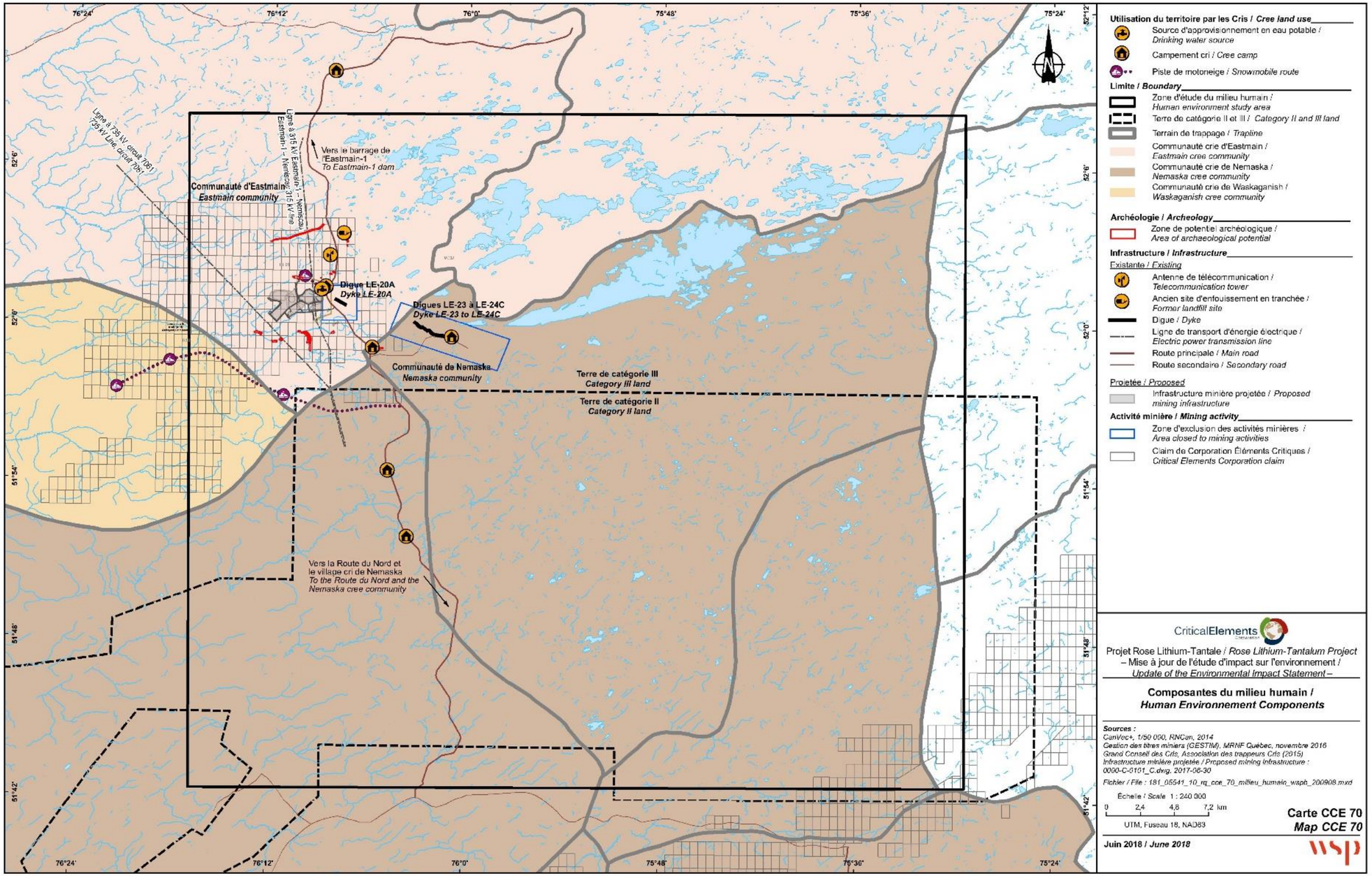
Monitoring: The site monitoring phase, starting at the end of the decommissioning phase and extending over five years, will be devoted to the continued monitoring of the integrity and physical stability of the works, the surface water and groundwater quality and other valued components, as well as to a social follow-up and agronomic monitoring to determine the success of the recovery of the vegetated sites.

Figure 2: Study Area of the Natural Environment



Source: WSP Canada Inc. (February, 2019a)

Figure 3: Study Area of the Human Environment



Source: WSP Canada Inc. (October, 2020)

1.4.5 Methodology and Approach

The Committee, in collaboration with governmental experts (federal, provincial and Cree) (see section 4.3), defined and assessed the project's adverse environmental effects based on the impact statement submitted by the proponent, the additional information the proponent provided during the environmental assessment, and the comments, concerns and knowledge received from the Crees and the public.

The Committee reviewed the effects of the potential environmental changes on the valued components selected in Table 1, and determined the residual adverse effects after accounting for the implementation of the mitigation measures and the monitoring programs proposed by the proponent. The Committee then determined the significance of the residual effects for each valued component.

To characterize the significance of the residual effects, the Committee used the same criteria as the proponent, namely intensity, scope and duration. The Committee also considered the reversibility and frequency according to the Operational Policy Statement: Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the *Canadian Environmental Assessment Act, 2012* (Canadian Environmental Assessment Agency, 2015). These criteria are defined as follows:

- The **intensity** indicates the degree of change the valued component studied would undergo. The assessment of the intensity accounts for the ecological or social context of the component. The intensity can integrate the notion of the time when the effect would occur, which may refer to a phase of the component's lifecycle (migration, breeding, feeding, etc.) or a period during which a cultural, spiritual or recreational practice would be practised by a Cree Nation or a population (for example, the hunting season);
- The **scope** corresponds to a geographic scope over which the adverse effects would occur;
- The **duration** corresponds to the period during which the adverse effects would be felt;
- The **frequency** corresponds to the rate at which the adverse effects would occur during a given period; and
- The **reversibility** corresponds to the probability that a valued component would recover from the adverse effects caused by the project.

The Committee assigned three effect levels to each criterion. For example, the "duration" criterion was scored according to a short, medium or long-term effect. The Committee also considered the federal, provincial and Cree Nation Government regulatory standards, criteria or guidelines in force to determine the significance of the residual effects.

Appendix A defines the Committee's assessment criteria for each of the valued components assessed under subsections 5(1) and 5(2) of CEAA 2012. The Committee then used a grid that combines the levels attributed to each of the criteria (intensity, scope, duration, frequency and reversibility) to determine the significance of each residual effect on each valued component (see Appendix A).

The Committee's analyses and conclusions about the significance of the environmental effects on the valued components selected and assessed according to subsection 5(1) of CEAA 2012 are presented in Chapters 5 and 6. Appendix B summarizes the Committee's assessment of the residual effects on the valued components after the mitigation measures. The Committee described the residual effects on the valued socio-economic components considered under the Agreement and the proponent's associated measures in Chapter 6.5, but the Committee did not conclude on their significance because the Minister cannot set conditions regarding these effects.

The Committee also assessed the impacts of the project on Cree values in Chapter 8.

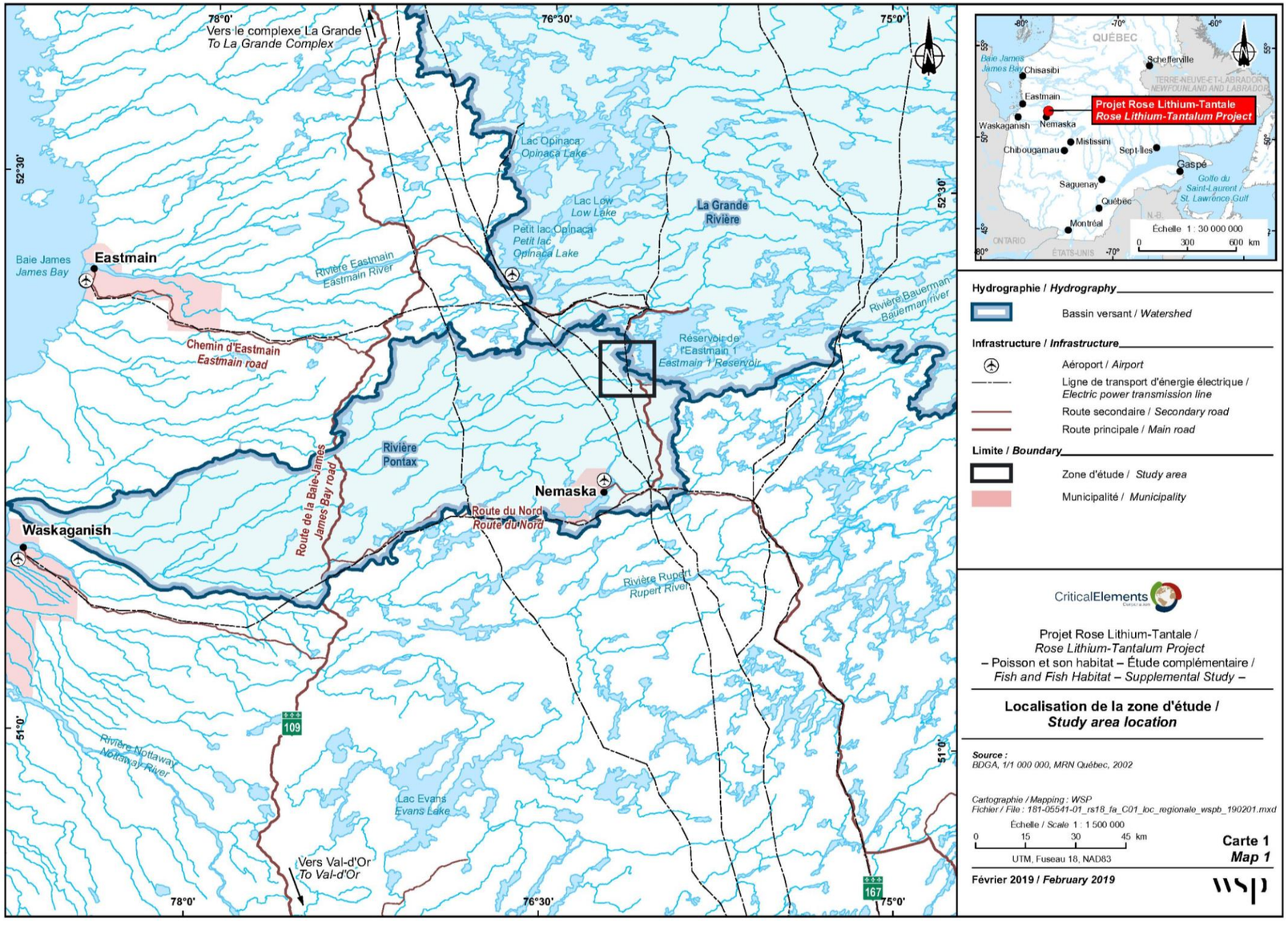
2. Project Overview

2.1 Location of the Project and Regional Context

The purpose of the project is to operate an open-pit mine in order to extract lithium and tantalum ore. It would be located in the Nord-du-Québec administrative region, in the Eeyou Istchee James Bay territory, more specifically on the traditional lands of the Cree Nation of Eastmain. The central geographic coordinates of the mining site would be as follows: 52° 0′ 59,785″ north and 76° 9′ 36,711″ west. Under the JBNQ Agreement, the project would be located on Category III lands, where the Cree have exclusive trapping rights. Certain wildlife species, particularly aquatic species, are also reserved for their exclusive use (sections 24.3.19 and 24.7.1 of the JBNQ Agreement). As illustrated in Figure 1, the mining site would be located 38 kilometres north of the village of the Cree Nation of Nemaska. It would be located approximately 240 kilometres northwest of Chibougamau and 300 kilometres northeast of Matagami. The site would be accessible by the Route du Nord and the Nemiscau-Eastmain-1 road from Chibougamau, or by the Billy-Diamond Highway, the Route du Nord and the Nemicaus-Eastmain-1 road from Matagami.

The mining project would overlap two watersheds: the Eastmain River watershed to the northeast, and the Pontax River watershed to the southwest (Figure 4). Lakes 2 and 3 drain into the reservoir of the Eastmain-1 hydroelectric facility, while the other lakes near the mining site flow to the Wachiskw River, which spills into the Pontax River.

Figure 4: Location of the Study Area of the Natural Environment and the Watersheds



Source: WSP Canada Inc. (February, 2019c)

2.2 Project Components

The project components covered by the environmental assessment are illustrated in Figure 5 and are described briefly below.

2.2.1 Pit and Industrial Complex

The project includes an open pit measuring 1,620 metres long, 900 metres wide and 200 metres deep, for a total area of approximately 93 hectares. About 240 million tonnes of ore, waste rock and overburden would be extracted from the mine during the life of the project. Production is estimated at 236,532 tons of spodumene concentrate and 429 tons of tantalum concentrate per year. Thus, there will be approximately 649 tons of spodumene and tantalum concentrates per day coming out of the plant. The project also includes a 3-hectare industrial complex, comprising crusher, grinders, a conveyor, a storage dome and a spodumene and tantalum plant.

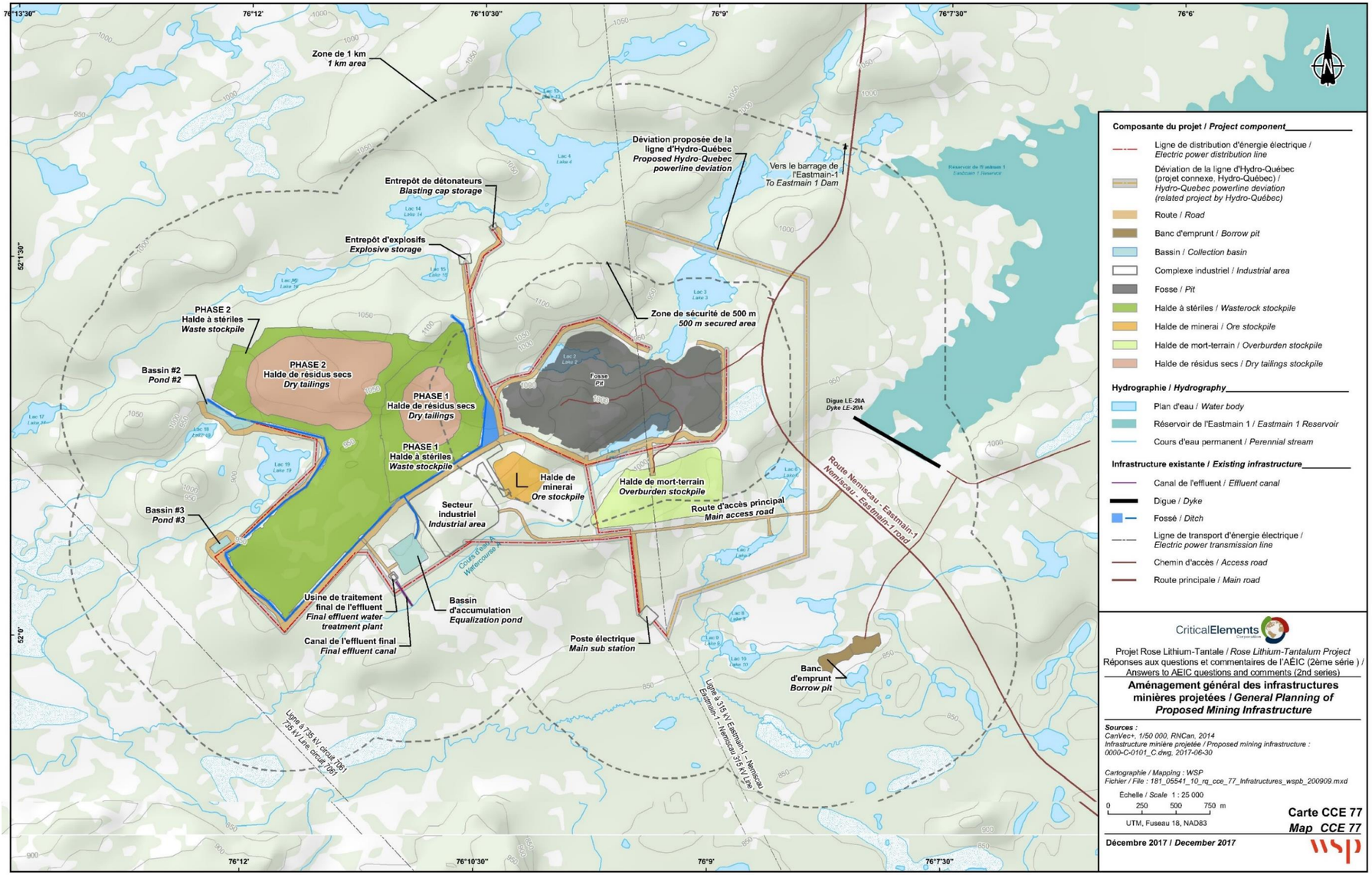
2.2.2 Accumulation Areas

The proponent plans to develop a co-disposal accumulation area for waste rock and dry tailings, an overburden accumulation area and an ore stockpile. Table 2 presents the characteristics of these three accumulation areas, namely the capacity, the height and the footprint.

Table 2: Main Characteristics of the Accumulation Areas

Accumulation Area	Capacity (in Thousands of Tonnes)	Height (in Metres)	Area of the Footprint (in Hectares)
Overburden	11.3	30	37
Waste Rock and Dry Tailings	206	80	204
Ore Stockpile	3.9	40	10

Figure 5: Main Components of the Project



Source: WSP Canada. Inc. (October, 2020)

2.2.3 Water Management

This section describes planned surface water management at the mining site, which is also illustrated in Figure 6. The project provides for the draining (dewatering) of Lakes 1 and 2, because they are located above the deposit, and thus in the eventual pit site. A submersible pump on floats would be installed temporarily for this purpose. The water would be pumped into a sedimentation pond located near each lake, and finally discharged farther downstream, into Watercourses A (Lake 1) and B (Lake 2).

During the operational phase of the mine, the pit would be kept dry by pumps installed at the bottom and by nine groundwater pumps located on its perimeter. Water accumulating at the pit bottom (mine water) would be pumped into a ditch, and then sent to an accumulation pond, as described below. Groundwater from eight wells would be discharged into the sedimentation ponds, where it would be analyzed regularly, before final discharge into Lakes 3, 4 and 6. In the event that certain contaminants would exceed the authorized limits when sampling water from one of these sedimentation ponds, a treatment plant would be added before discharge into the affected receiving environment. Pending the installation of such a treatment plant, the pumps at the periphery causing the standards to be exceeded would be shut down. Therefore, no contaminants would be discharged in the effluent. If a rise in the water level in the pit was observed, additional pumps would be added to convey this water to the storage basin and the main water treatment plant.

The ninth well, located on the southwest periphery of the pit, would provide the industrial area with spot supplies of fresh water. This fresh water would be stored in different tanks and would be used for fire protection, the concentration process, preparation of reagents or, after treatment, for domestic consumption. It should be noted that 98% of the process water would be recirculated in the spodumene and tantalum plant. A domestic wastewater treatment system is planned in the industrial area.

The proponent provides for special water management for infrastructure involving potential contamination, namely the pit, the industrial area, service roads and the waste rock, dry tailings, overburden and ore accumulation areas. The runoff water would be recovered there by peripheral ditches and directed by gravity or pumping to sedimentation ponds, and then to an accumulation pond with a capacity of 70,000 cubic metres. This water then would be routed to a treatment plant in the industrial area. If the quality of the treated water proved unsatisfactory, it would be returned automatically to the accumulation pond. The final effluent would be discharged into Watercourse A, located southwest of the mining site. Moreover, a portion of the treated water could be reused as process water in the plant.

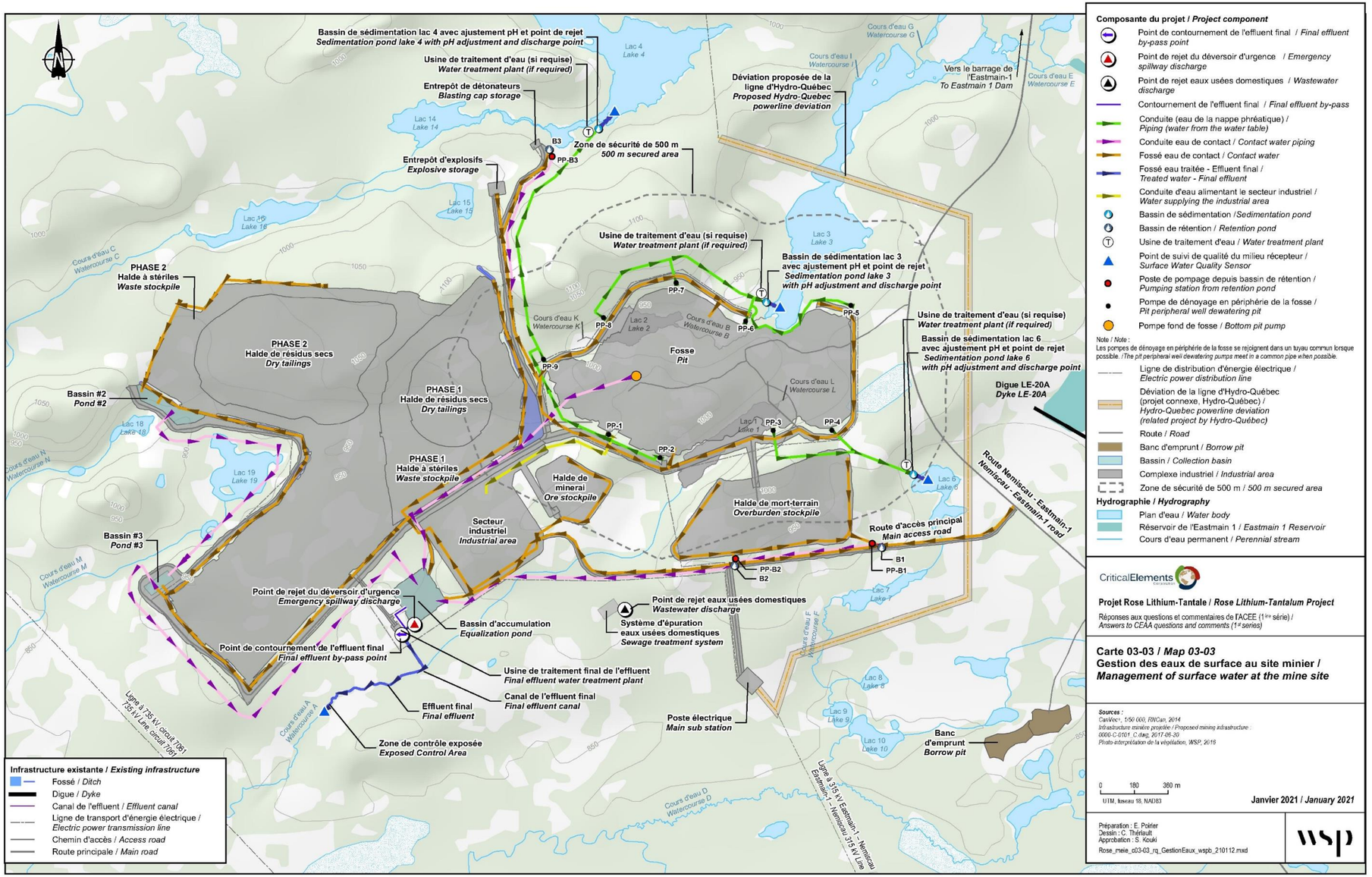
2.2.4 Roads

The main access to the mining site would be from the Nemiscau-Eastmain-1 road. A permanent access road would be 2.7 km long and would have a culvert crossing Watercourse F between Lakes 6 and 7. An existing borrow pit[6], located southwest of the mine pit, near the Nemiscau-Eastmain-1 road, would first be used for construction of this main access road. This borrow pit had been used previously for Hydro-Québec's adjacent

[6] An excavation, outside the limits of the work area, from which the material necessary for the construction is produced.

roads and infrastructure. Subsequently, the waste rock coming from preparation of the pit and containing less than 1% crystalline silica would be available for road construction. A ramp would allow access to the pit. Haulage and service roads would be developed on the site to reach the different surface infrastructure.

Figure 6: Surface Water Management at the Mining Site



Source: WSP Canada Inc. (December, 2020)

2.2.5 Electrical Infrastructure

A power transformer substation would be constructed by the proponent to meet the project's electrical needs. This substation would be connected by a short bypass line to an existing 315-kilovolt transmission line already crossing the site. However, the transmission line should be relocated over 500 metres, because it crosses the footprint of the future pit. The relocation of the transmission line and the construction of the bypass line would be carried out by Hydro-Québec, as they are not part of the project as assessed. Nevertheless, the Committee has considered them in the cumulative effects analysis.

2.2.6 Workers' Camp

The workers would be accommodated at the Eastmain camp, located 25 kilometres north of the mining site. This is a camp belonging to Hydro-Québec, in the process of being assigned to a business group from the Cree Nation of Eastmain or to the community itself. This camp is already supplied with drinking water and electricity and has a wastewater treatment system. Workers would travel to the mining site by bus.

2.2.7 Other Facilities

Other facilities are planned for the project site, particularly administration buildings, a mechanical maintenance garage, petroleum facilities and an explosives storehouse.

The administration buildings would be developed in the industrial area, near a guard station controlling access to the site. The administration buildings would be composed of 26 connected site trailers, which would be occupied, inter alia, by offices, an infirmary, a dining room, two conference rooms and sanitary facilities. Forty-eight parking spaces are also planned for employees and visitors.

The mining equipment maintenance garage would include lubrication facilities, storage spaces for tools, a water washing area, offices and a warehouse of 750 square metres. The oil necessary for equipment maintenance would be stored in the garage. The garage's used oils would be transferred manually to the mining site's used oil storage tank.

The petroleum facilities near the garage would include three double-walled tanks for storage and distribution, such as a 10,000-litre gasoline tank, a 45,000-litre diesel tank and a liquefied natural gas tank of 330 cubic metres.

The explosives storehouse would be located north of the pit, and only storage and maintenance activities would be carried out there. The explosives and the detonators would be stored at two distinct locations, with respective capacities of 20,000 and 15,000 kilograms.

2.3 Project-Related Activities

The activities necessary to carry out the project are described in Table 3, according to the phases of its lifecycle. The projected duration of the project is 26 years.

Table 3: Physical Activities of the Project and Description of the Activities by Performance Phase

Activity	Description
Site Preparation and Construction (2 Years)	
Site Preparation	• Diversion of the power transmission line by Hydro-Québec* • Installation of the infrastructure necessary for the construction work • Creation of temporary access roads • Brush clearing and stumping • Removal of overburden and stockpiling • Grading and excavation of the industrial deck
Construction Work	• Creation of the access road, service roads and ditches • Installation of surface water regulating, erosion protection devices and sediment protection • Construction of the buildings of the industrial area • Construction of the accumulation pond and the water treatment plant • Development of accumulation areas, collection ponds and ditches • Dewatering of Lakes 1 and 2 • Implementation of the fresh water supply well (PP1) • Construction of the transformer substation and the power grid
Operational (17 Years)	
Open-pit Mining	• Pit dewatering by mine water pumping • Water table drawdown by development of nine wells on the periphery of the pit • Excavation of overburden from the pit and transport to the corresponding accumulation area • Rock drilling, blasting and extraction • Transport of ore to the crusher or the ore stockpile • Transport of waste rock and dry tailings to the corresponding accumulation area • Development of Phase 2 of the waste rock and tailing accumulation area
Ore Processing	• Crushing, grinding, concentrating of the ore by magnetic separation, gravity separation and flotation • Production of spodumene concentrate (lithium) and tantalum concentrate
Water Management	• Recovery and treatment of water from the pit and the waste rock, dry tailings and ore accumulation areas, with discharge of final effluent into Watercourse A • Fresh water supply from Well PP1
Restoration and Closure (2 years)	
Dismantling of the Facilities and Support Infrastructure	• Dismantling of the buildings and support infrastructure • Removal of the infrastructure of the mine water and collection and treatment and water supply system • Closure of the water table drawdown wells
Site Reclamation	• Pit flooding and securing • Rehabilitation of the contaminated lands, if applicable • Rehabilitation and revegetation of the mining site • Management of waste and hazardous materials

* Diversion of the power transmission line by Hydro-Québec is not part of the assessment of the project.

3. Project Justification and Alternatives Considered

3.1 Purpose of the Project

The purpose of the project is the operation of an open-pit mine to extract lithium and tantalum ore. According to the proponent, this type of ore is particularly in demand in the automotive industry, more specifically for the production of batteries intended for hybrid and electric cars. It is also used in electronic devices and for renewable energy storage. The proponent projects economic benefits for the local Cree and non-Indigenous communities, particularly by the creation of quality jobs, business opportunities and purchasing of services and materials. The proponent estimates that the project would also generate tax revenues for the federal and provincial governments.

The Cree Nations of Eastmain, Waskaganish and Nemaska have expressed their concern regarding the need for and the economic viability of a new lithium mine in the James Bay Territory, while a lithium mine currently under construction is experiencing documented difficulties in the media. In order to respond to this concern, the proponent provided additional information to the Committee relating to the specific context of the mining sector, in particular with regard to variations in the lithium market. According to the proponent, the difficulties encountered in the implementation of another similar project would not necessarily be applicable to this project.

3.2 Alternatives Means to Carry Out the Project

Under CEAA 2012, the environmental assessment of a project must account for alternatives that are technically and economically feasible and their environmental effects. Therefore, the proponent determined different alternatives for the main components of the project to justify each preferred option. This chapter describes this approach for the main components of the project.

3.2.1 Mining Method

The proponent presented two mining methods: open-pit or underground extraction. Open-pit extraction was preferred by the proponent, given the depth and morphology of the deposit. Underground extraction was not considered economically feasible due to the operating costs associated with it and the considerable volume of resources to be left in place in the form of surface pillars. Open-pit mining would involve the dewatering of two lakes located in the pit footprint and would have impacts on the neighbouring bodies of water. The proponent chose the pit's location based on economic, geomechanical and operational parameters.

3.2.2 Ore Processing Method

The proponent detailed two ore processing methods allowing lithium carbonate or lithium hydroxide to be obtained. These methods are brine extraction and extraction and processing from spodumene concentrate. Brine extraction consists of pumping water rich in salar salts to the surface, from shallow lakes found mainly in South America and China. The water is evaporated in a series of ponds for several months, then pumped to a recovery facility for different treatments. Brine extraction is the most common treatment method in the world, but it does not suit the geological composition of the Rose deposit. The proponent chose extraction and processing from spodumene concentrate, the main lithium ore. First the rock would be crushed and ground to extract the spodumene, then the lithium would be concentrated by gravity separation and flotation.

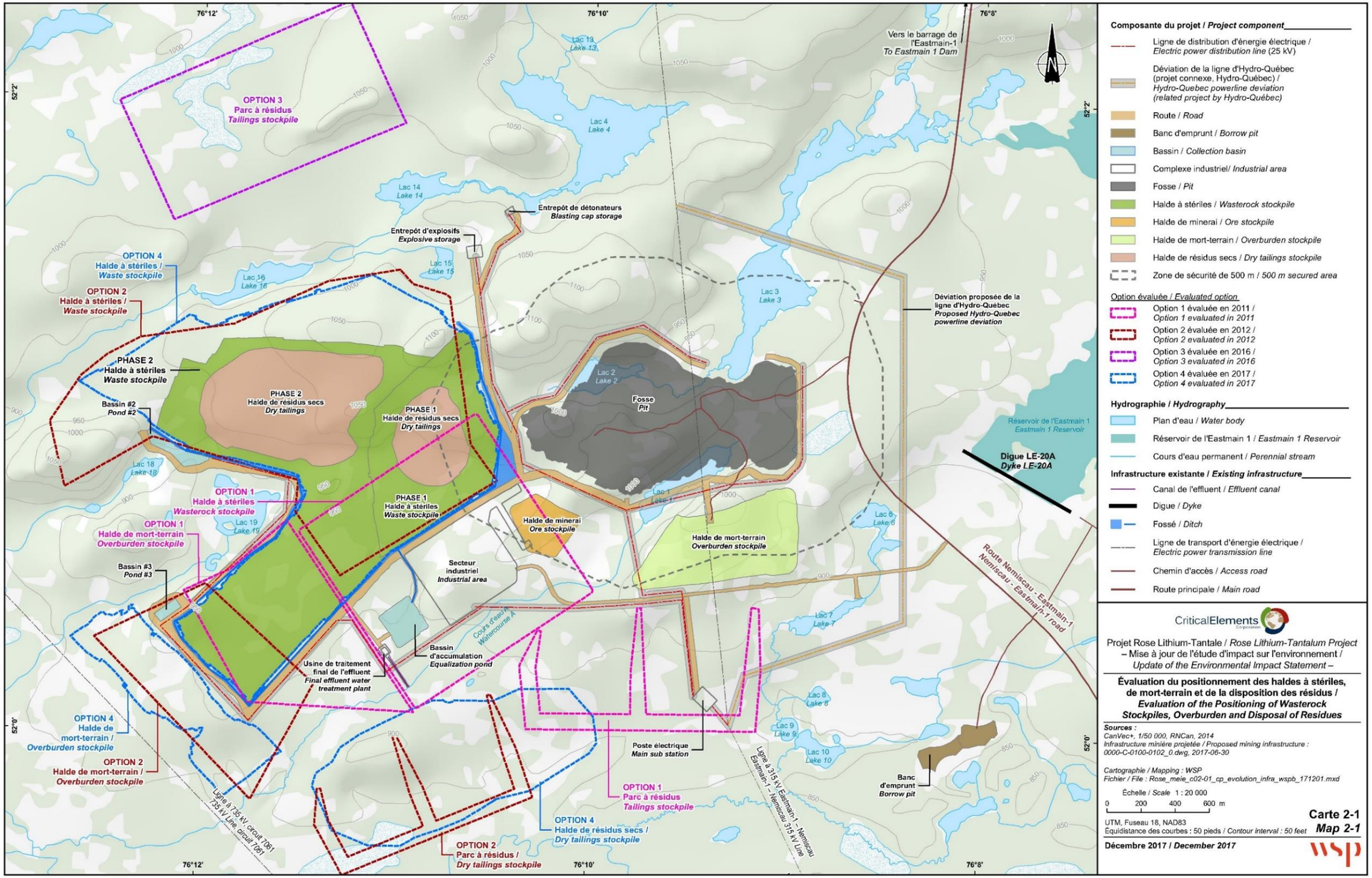
Members of the Cree Nations have expressed concerns about the safety of the ore processing process chosen by the proponent, considering that there are few lithium mines in operation in Canada. They recommended that the proponent use a conservative approach based on the precautionary principle.

3.2.3 Location and Disposal of the Waste Rock and Tailings Accumulation Area

The proponent favours the west end of the pit for installation of the waste rock and tailings accumulation area due to the large area available. The north side would present a steeper slope and little space would be available on the east side. The south or southwest side would be dedicated to the industrial complex. The choice of the waste rock and tailing site was broken down into five options (Figure 7):

a) Waste rock accumulation area southwest of the pit, tailings storage facility south of the pit and Watercourse A;
b) Waste rock accumulation area west of the pit, tailings accumulation area south-southwest of the pit, south of Watercourse A;
c) Waste rock accumulation area west of the pit, tailings accumulation area more than three kilometres northwest of the pit, north of Watercourse C;
d) Waste rock accumulation area west of the pit, tailings accumulation area southwest of the pit, south of Watercourse A; and
e) Co-disposal waste rock and dry tailings accumulation area west of the pit.

Figure 7: Positioning of wasterock, tailings, overburden and ore accumulation areas



Source: WSP Canada Inc. (February, 2019a)

The proponent excluded the first option because a waste rock accumulation area southwest of the pit would have encroached on Watercourse A and thus would have required its diversion. No encroachment was then proposed for the other options; the location of the waste rock accumulation area is projected between Watercourse A and D. A protective perimeter was added about 20 metres from the watercourses present on the site.

The proponent initially considered a conventional tailings disposal mode, in the form of pulp, in a tailings storage facility containing two holding cells on three sides (Options 1 and 2). In this disposal mode, the tailings are submerged in water to reduce the oxygen intake and thus avoid acid mine drainage. Options 1 and 2 were abandoned to prefer a dry tailings disposal mode, requiring minimum post-disposal management. The proponent indicates, in particular, that the absence of a body of water above the tailings favours the physical stability of the tailings accumulation area and prevents a water-tailings mixture outflow in the event of a dike failure. However, this arrangement can generate more dust.

The proponent did not choose Option 3, including a tailings accumulation area north of Watercourse C, given its distance from the mining complex (over three kilometres). The proponent prefers grouping the mining facilities to limit the project's environmental footprint.

Two studies completed in 2017 showed that the mining site's waste rock and tailings would not be potentially acid generating, thus confirming the relevance of a filtered tailings disposal mode to the proponent. Finally, given the above-mentioned characteristics, the proponent chose co-disposal of the waste rock and tailings in one and the same accumulation area (Option 5 instead of 4), thus reducing the project's overall footprint.

3.2.4 Disposal of the Overburden Accumulation Area

The solution preferred by the proponent for the location of the overburden accumulation area evolved over time, together with the disposal of the waste rock and tailings accumulation area, as described in section 3.2.3. Five options were considered by the proponent. The first four options placed the overburden accumulation area southwest of the pit. The proponent finally opted for a site less than 500 metres south of the pit to limit overburden transport by truck. This small-capacity fifth option was made possible by the final design of the pit, the result of a technical feasibility study in 2017.

3.2.5 Energy Sources

The proponent evaluated six energy sources in view of construction and operation of the project. This assessment was based on greenhouse gas emissions, air contaminant emissions, price per kilowatt-hour, technical and economical realism of the scenario and type of operation (continuous or intermittent). These energy sources are hydroelectricity, natural gas, biomass and solar, wind and geothermal energy. According to this analysis, hydroelectric produces few greenhouse gas emissions (6 to 17 g CO_2 eq/kWh) and is the most affordable (≤ 5.03¢/kWh). The price of natural gas is also interesting (5.2¢/kWh), but this fossil fuel's greenhouse gas emissions are much higher (422 g CO_2 eq/kWh). Biomass would be the energy that emits the most air contaminants, while natural gas would emit slightly less. Hydropower as well as solar, wind and geothermal energy would emit very few air contaminants.

The proponent considers that the scenarios including solar and geothermal energy are not technically or economically feasible. Too great an area would be necessary for the installation of a sufficient number of solar panels or underground loops to meet the project's energy needs (13.5 MW). It also notes that solar and wind energy have an intermittent operation that would not suit the mine's continuous needs. The proponent thus chose hydroelectricity as the primary energy source to supply most of the site's stationary equipment, due to its advantageous cost, its low greenhouse gas emissions and air contaminants, as well as the proximity of Hydro-Québec transmission grid.

Liquefied natural gas would be used as auxiliary energy to dry the ore concentrates and heat the buildings (ore dome, concentrate plant, crushing, garage and administrative buildings), given the costs associated with electrical equipment and the power required for heating. This energy source was preferred to propane gas for economic considerations, despite a greater initial investment.

The proponent also analyzed options for mobile equipment and selected 65- and 130-ton trucks with a U.S. Environmental Protection Agency Tier 4 certified diesel engine. It appears that hybrid trucks (diesel and batteries) are not yet available on the market and that electric trucks would not have the performance required for the project's scale. The Caterpillar 785 C truck has a conversion kit to diesel/liquefied natural gas, allowing reduction of the cost of fuel, but nonetheless would emit more greenhouse gases than the Tier 4 certified diesel engine.

3.2.6 Contaminated Water Treatment

The proponent explored five contaminated water treatment methods in the treatment plant of the industrial zone: physicochemical, membrane, electrolysis, ion exchanger and activated carbon. The proponent has chosen the physicochemical treatment. Members of the Cree Nation of Waskaganish have expressed their concern regarding the treatment system chosen by the proponent. The physicochemical treatment was preferred, given its operating and maintenance costs and its ability to deal with rapid flow changes.

The proponent has also explored three methods of treating contaminated water at the three discharge points into Lakes 3, 4 and 6: sedimentation basin and pH neutralization; physicochemical system; and sand filtration and pH neutralization. The proponent is of the opinion that the sedimentation basin with pH neutralization

would be sufficient. In the event that the limits set for metals are exceeded, the proponent plans to integrate a physicochemical system into the treatment.

3.2.7 Location of Water Discharge Points

The proponent has planned four water discharge points on the mining site: Lakes 3, 4 and 6 and Watercourse A. To reduce the quantity of water in the pit, the groundwater would be pumped using eight wells located on its periphery, and then ultimately discharged into Lakes 3, 4 and 6. The water accumulated at the pit bottom would be routed to the treatment plant and discharged into Watercourse A.

Members of the Cree Nation of Nemaska argued that the Eastmain-1 reservoir could have been chosen for mining water discharges considering that it is an environment already affected by hydroelectric development (mercury contamination) rather than to dispose of the effluents in bodies of water currently free from development. The proponent does not envision any other site for discharge of treated water (final effluent), because the mine facilities would be located near Watercourse A, including the drainage system outfall and the mine water treatment plant. Discharging the final effluent into Watercourse A would allow maintenance of a certain streamflow, despite the dewatering of Lake 1.

The proponent preferred the scenario with four discharge points rather than the scenario including only one. In this last scenario, there would be no well on the periphery of the pit. The water would accumulate exclusively at the pit bottom and then would be pumped to the treatment plant. The proponent maintains that distribution of the water to Lakes 3, 4 and 6 would mitigate the intensity of the flow and water levels variations, but would involve more severe low-water levels for Watercourse A. Without any wells on the periphery, there would be so much water infiltration in the pit that the accumulation pond and the water treatment plant would need a capacity three times greater. At the treatment plant outlet, the final effluent discharged into Watercourse A would also increase its flow significantly. According to the proponent, the environmental effects of a single discharge point on the receiving environment justify the choice of the four discharge points scenario.

Fisheries and Oceans Canada (DFO) believes that the four-point discharge scenario chosen by the proponent is an attractive approach to maintaining water quantity in these water bodies and preserving fish habitat. Unline the proponent, DFO does not consider this scenario to be a mitigation measure since the proponent has not assessed the potential effects of the single discharge pointscenario on fish and fish habitat. It is therefore difficult to conclude that the four discharge point scenario is the best option. However, DFO believes that it would be a preferred measure. Follow-ups would be required to ensure that fish habitat is maintained.

3.2.8 Location of the Access Roads

The proponent plans to build a road allowing the most direct access between the mining site and the Nemiscau-Eastmain-1 road. According to the proponent, no sensitive environment is found there, except for Watercourse F, which would be crossed by the future road. The upstream portion of Watercourse A, where the road passes, would be dewatered with the disappearance of Lake 1, but could require a temporary

crossing structure during construction. The proponent is of the opinion that any other alternative would require watercourse crossings, while providing less direct access.

3.2.9 Ore Transportation and Storage

The proponent foresees 48 trucks trips per day during construction (24 round trips) and 136 truck trips per day during operation (68 round trips), of which 22 90-tonne trucks per day (11 round trips) would carry the ore concentrate. The spodumene concentrate (approximately five millimetres in diameter) would be transported in bulk and the tantalum concentrate in one tonne bags. Two potential ore transshipment sites were considered by the proponent, an existing site in Matagami or a potential site in Chibougamau.

The trucks transporting ore concentrates to the Matagami site would take the Nemiscau-Eastmain-1 road, the Route du Nord, Billy-Diamond Highway and Route 109 to get to the transshipment site. This route covers a total distance of 427 kilometres, two thirds of which are asphalted. The proponent estimates that the transportation cost would be $25 to $30 per tonne.

To get to the future transshipment site in Chibougamau, the trucks would take the Nemiscau-Eastmain-1 road, the Route du Nord and a forest road to allow use of oversized trucks. This route, covering a total distance of 356 kilometres, would exclusively take gravel roads. The proponent assesses the transportation cost at between $23 and $26 per tonne.

The proponent chose the Matagami site, since the Chibougamau transshipment yard had not yet been built at the time of this report.

The Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi have expressed concerns about the increase in road traffic. The committee assessed the effects of increased road traffic in section 6.1 (Use of lands and resources for traditional purposes).

3.2.10 Worker Accommodations

The proponent plans to accommodate the workers at the Eastmain camp. This former Hydro-Québec camp is located 25 kilometres north of the mining site and already includes several key pieces of infrastructure. Transportation between the camp and the mining site would be by bus. The creation of a permanent camp four kilometres from the pit was another option. However, the proponent prefers the choice of the Eastmain camp, given that it does not require construction of new infrastructure and therefore involves lower costs. In addition, the proponent considers this option does not increase the project's environmental footprint. The Cree Nation of Nemaska also recommended that the proponent choose the Eastmain camp.

3.2.11 Committee's Analysis and Conclusion

The Committee considers that the proponent appropriately documented the feasible alternatives for the project for the purposes of the environmental assessment under CEAA 2012.

4. Consultation Activities and Opinions Received

The Joint Assessment Committee (the Committee) wrote this Environmental Assessment Report considering the comments of the Cree Nations, the public and government experts (federal, provincial and Cree). The local and traditional knowledge regarding the project site was also taken into account to determine its potential environmental effects. The Committee consulted the public and the Cree Nations at the key stages of the process. The consultation activities, announced on the Canadian Impact Assessment Registry, pertained to the following documents:

- Project description (September 6 to 26, 2012);
- Draft guidelines for preparation of the proponent's impact statement (October 22 to November 22, 2012); and
- Summary of the proponent's impact statement (March 6 to April 5, 2019).
- Draft version of the environmental assessment report and the potential conditions (March 17 to April 16, 2021, with an extension to June 13, 2021 for the Cree Nations).

In the fourth and last consultation period, the Committee obtained comments on the draft report and on the potential conditions that support the Minister's Decision Statement. The report contains the Committee's conclusions and recommendations. After considering the comments of the Cree Nations, the public and government experts, the Committee produced this final Environmental Assessment Report, which was submitted to the Minister of Environment and Climate Change for him to render a decision under CEAA 2012.

4.1 Crown Consultation with the Crees

4.1.1 Crown Consultation Conducted by the Agency (Pre-Agreement)

The Federal Government has the obligation to consult the Indigenous peoples and, if applicable, provide for accommodation measures when it considers making decisions that risk having impacts on established or potential Indigenous or Treaty rights established in the JBNQ Agreement, protected by section 35 of the *Constitution Act, 1982* (Indigenous and Treaty rights are discussed in Chapter 8). Consultation with Indigenous peoples is conducted comprehensively, as a key factor in good governance, policy development and informed decision-making.

For the purposes of the environmental assessment, the Agency acts as coordinator of the Crown consultations to favour a government-wide approach. The Indigenous peoples invited to participate in the consultations are those whose Indigenous or Treaty rights, established or potential, are likely to be affected prejudicially by the project.

These are the following Cree Nations:

- Cree Nation of Eastmain;
- Cree Nation of Nemaska;
- Crees of the Waskaganish First Nation; and
- Cree First Nation of Waswanipi.

The project, located within a trapline of the Cree Nation of Eastmain, near the Cree village of Nemaska, and affecting a watershed on the Waskaganish First Nation's traplines, could lead to environmental effects and impacts on the rights of the Cree Nations of Eastmain, Waskaganish, Nemaska and Waswanipi. The project could lead to environmental effects on health and socio-economic conditions, on the current use of land and resources for traditional purposes, on the natural and cultural heritage and on sites of archaeological significance for these four Cree Nations.

The Agency supports the participation of Indigenous peoples by means of the Participant Funding Program, which seeks to promote participation in the consultations regarding the impact statement and the Draft Environmental Assessment Report. The Participant Funding Program allocated a total amount of $86,224 to the Cree Nations of Eastmain, Waskaganish and Nemaska.

The Agency proposed consultation plans detailing the proposed activities to these Cree Nations during different phases of the environmental assessment and held consultation activities based on the needs expressed. The Agency used various methods to consult the Cree Nations of Eastmain, Waskaganish and Nemaska: telephone calls, emails and letters. It regularly informed the Cree Nations about the significant development of the assessment process and received their opinions.

In addition, the Agency invited the Cree Nations of Eastmain, Waskaganish and Nemaska to provide written observations on the project description, the draft guidelines regarding the proponent’s impact statement and the summary of the proponent's Impact Statement and related documents (see Table 4).

Additional consultation was conducted by the Committee and is described in the section below.

4.1.2 Crown Consultation Conducted by the Joint Assessment Committee (Post-Agreement)

After the signing of the Agreement on June 27, 2019, the Committee continued the consultation activities. From October 28, 2019, to January 15, 2020, the Committee travelled to the Cree communities of Waskaganish, Eastmain and Nemaska to meet the stakeholders and members of these communities. During these consultation periods, the Committee met the Band Councils and several members of the communities, particularly the tallymen affected by the project and members of different subgroups (women, youth, elders). Employees of the Agency and the Cree Nation Government were present at these meetings. Public meetings with the proponent present were also held in the communities of Waskaganish and Eastmain.

The Cree Nation of Waswanipi was added to the consultation at a later date as the effects of the project on this Nation became apparent in the fall of 2020, when the Committee received confirmation from the proponent regarding the ore haul route. The increase in road traffic on the Billy-Diamond Highway could result in effects on the current use of lands and resources for traditional purposes by members of the Cree Nation of Waswanipi, since many of their traplines are located along this highway. Virtual consultation and information meetings were held with the Nation's tallymen[7] in November 2020 and with the Band Council in January 2021.

On March 9, 2021, the Committee organized a virtual meeting with the Chiefs and Councils of the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi. The session focused on the Draft Environmental Assessment Report and potential conditions. Following this meeting, the Committee organized a vritual consultation session on April 14, 2021 and a hybrid consultation session (virtual and with the presence of a co-chair of the Committee in person in one of the communities), on April 15, 2021, to allow members of the Cree Nations to ask the Committee and government experts questions on these two documents. These sessions also provided an opportunity to gather the communities' reactions, comments and concerns.

The Committee produced reports of each meeting and sent them for validation to each community.

Table 4: Participation Possibilities Offered to the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi[8] by the Agency and the Committee

Consultation Phase	Dates
Consultations Conducted by the Agency	
Project Description	Electronic consultation via the Canadian Environmental Assessment Registry: • September 6 to 26, 2012
Draft Guidelines for Preparation of the Proponent's Impact Statement	Electronic consultation via the Canadian Environmental Assessment Registry: • October 22 to November 22, 2012
Consultation Conducted by the Joint Assessment Committee	
Summary of the Proponent's Impact Statement and related documents	Electronic consultation via the Canadian Environmental Assessment Registry: • March 6 to April 5, 2019 Consultation in person: • Cree Nation of Waskaganish; October 25 to 30, 2019 • Cree Nation of Eastmain; December 2 to 4, 2019 • Cree Nation of Nemaska. January 13 to 15, 2020 Consultation by teleconference: • Cree Nation of Waswanipi; November 19, 2020 and January 29, 2021
Draft Environmental Assessment Report and Potential Conditions	Virtual and in person consultations: • Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi; March 9, April 14 and April 15, 2021 Electronic consultation via the Canadian Impact Assessment Registry: • March 17 to April 18, 2021 (with extension to June 13, 2021)

[7] A "Cree tallyman" is any Cree person who is recognized by a Cree community as being responsible for overseeing harvesting activities in a Cree trapline.

[8] As mentioned in this section, the Committee's consultation activities with the Cree Nation of Waswanipi began in the fall of 2020.

The concerns raised during the consultations particularly pertained to the project's effects on the following:

- Water, air and soil quality and possible contamination of traditional food;
- Traditional hunting, fishing, trapping and gathering activities and the wildlife and plant species associated with them; and
- The socio-economic effects (road traffic, mass arrival of non-Indigenous workers and access to jobs and training).

The detailed concerns and comments raised are outlined in chapters 5 and 6 in the relevant sections dealing with the project's effects on the components of the environment and on Cree Nations.

4.1.3 Consultation and Engagement Activities Organized by the Proponent

The proponent began their consultation approach with the Cree Nations in 2011. In particular, the proponent held meetings with the Cree Nation Government and the Band Councils of the communities of Eastmain, Nemaska and Waskaganish. The proponent also met socio-economic stakeholders and Cree users of the territory and organized focus groups with members of these communities. Public presentations of information on the project were organized in the three communities.

The proponent met the tallyman of Trapline RE01 (Eastmain), where the projected site of the project is located, on several occasions over the years, to inform him regularly about the project's progress. The proponent also met the tallymen of Traplines R10 (Waskaganish), R16 and R19 (Nemaska) to obtain their concerns and their Cree knowledge related to the project.

The proponent signed an Impact and Benefits Agreement with the Cree Nation of Eastmain and the Cree Nation Government in July of 2019.

4.2 Public Consultation

4.2.1 Public Consultation Conducted by the Agency and by the Joint Assessment Committee

The Agency offered the public the possibility of participating in the environmental assessment process by submitting comments and concerns on the Draft Guidelines regarding the impact statement and the summary of the impact statement. The people and groups who expressed an interest in the project were informed of these consultation possibilities and were able to express themselves directly to the Agency or through the Canadian Impact Assessment Registry. After the signing of the Agreement on June 27, 2019, the Committee continued the public consultation activities by responding to people who submitted comments on the project.

For the fourth public consultation occasion, the Committee invited the public to make observations on the content, conclusions and recommendations appearing in the Draft Environmental Assessment Report. After reviewing the observations received from the public, the Committee completed the report and will present it to the Minister of Environment and Climate Change.

The Agency supported public participation in the environmental assessment of the project through its Participant Funding Program. A total of $10,150 was allocated to the Société pour vaincre la pollution. This organization submitted comments after the publication of the summary of the proponent's impact statement. The main concerns raised by the public during the consultations were related to the following factors:

- Air, water and soil quality;
- Other means of carrying out the project; and
- Environmental surveillance of the mine.

Notices concerning the possibilities of participation in the environmental assessment process were posted on the Canadian Impact Assessment Registry. The people who expressed an interest in the project during the previous stages and Société pour vaincre la pollution were informed directly of these participation possibilities.

4.2.2 Public Participation Activities Organized by the Proponent

The proponent began its public consultation approach in 2011. It organized meetings with the Jamésie municipal and socio-economic representatives. Public presentations of information on the project were organized in the city of Chapais. Interviews were conducted in the city of Matagami with stakeholders from the municipal administration, economic development, land development and management, and natural resources management sectors of James Bay.

4.3 Participation of the Federal Government and Other Experts

In accordance with section 20 of CEAA 2012, the federal authorities in possession of specialist or expert information or knowledge with respect to a designated project provided opinions on: the Draft Guidelines regarding the impact statement, the proponent's impact statement, and the Committee's requests for information. The federal authorities also presented comments and observations in the preparation of this report and the conditions that will support the Minister's decision.

The following federal authorities and experts gave their opinion at each stage of the environmental assessment process and by providing expertise and knowledge relevant to the project, depending on their area of jurisdiction:

- Fisheries and Oceans Canada: Fish and fish habitat, including aquatic species at risk, and the regulatory and legal provisions under the *Fisheries Act* and the *Species at Risk Act*;
- Environment and Climate Change Canada: Weather and climate conditions, air quality and greenhouse gases, surface water quality and quantity, soil and sediment quality, accidents and malfunctions, migratory birds, species at risk (other than fish and marine mammals), application of the Federal Policy on Wetland Conservation, and the regulatory and legal provisions under the *Canadian Environmental Protection Act*, the *Migratory Birds Convention Act,1994*, the *Species at Risk Act* and subsection 36(3) of the *Fisheries Act*;
- Natural Resources Canada: Hydrogeology, groundwater quality, geological characteristics, seismic movements and the regulatory and legal responsibilities under the *Explosives Act* and the *Explosives Regulations*;
- Transport Canada: Navigation protection and the regulatory and legal responsibilities under the *Canadian Navigable Waters Act*;
- Health Canada: The project's potential health risks for Indigenous peoples, induced by changes in air quality, the noise environment and water quality, particularly those that may have an effect on traditional food or on the perception that it is contaminated;
- Cree Board of Health and Social Services of James Bay (CBHSSJB): In partnership with the Ministère de la Santé et des Services sociaux du Québec, the CBHSSJB manages and organizes health and social services in the nine Cree communities of James Bay Territory;
- Cree Nation Government Environment and Remediation Department: wildlife management and conservation, land use planning and mining.

5. Expected Effects on Environment Valued Components

5.1 Fish and Fish Habitat

The project could result in residual effects on fish and fish habitat as a result of the harmful alteration, disruption or destruction of fish habitat, fish mortality and changes to water quality. However, the Committee believes that these effects are not likely to be significant given the application of the mitigation, monitoring and follow-up measures recommended in section 5.1.2, including the implementation of a compensation program. In determining the significance of the effects on fish and fish habitat, the Committee assessed, among other things, whether the effects would result in a decrease in the essential functions of fish habitat (e.g., spawning, nursery, rearing, feeding and growing areas), the survival of fish and the maintenance of fish populations.

The following subsections present the information considered by the Committee in its analysis, including the opinions and comments of the government experts (federal, provincial and Cree), Cree Nations consulted and the public.

5.1.1 Analysis of Potential Effects and Proposed Mitigation Measures

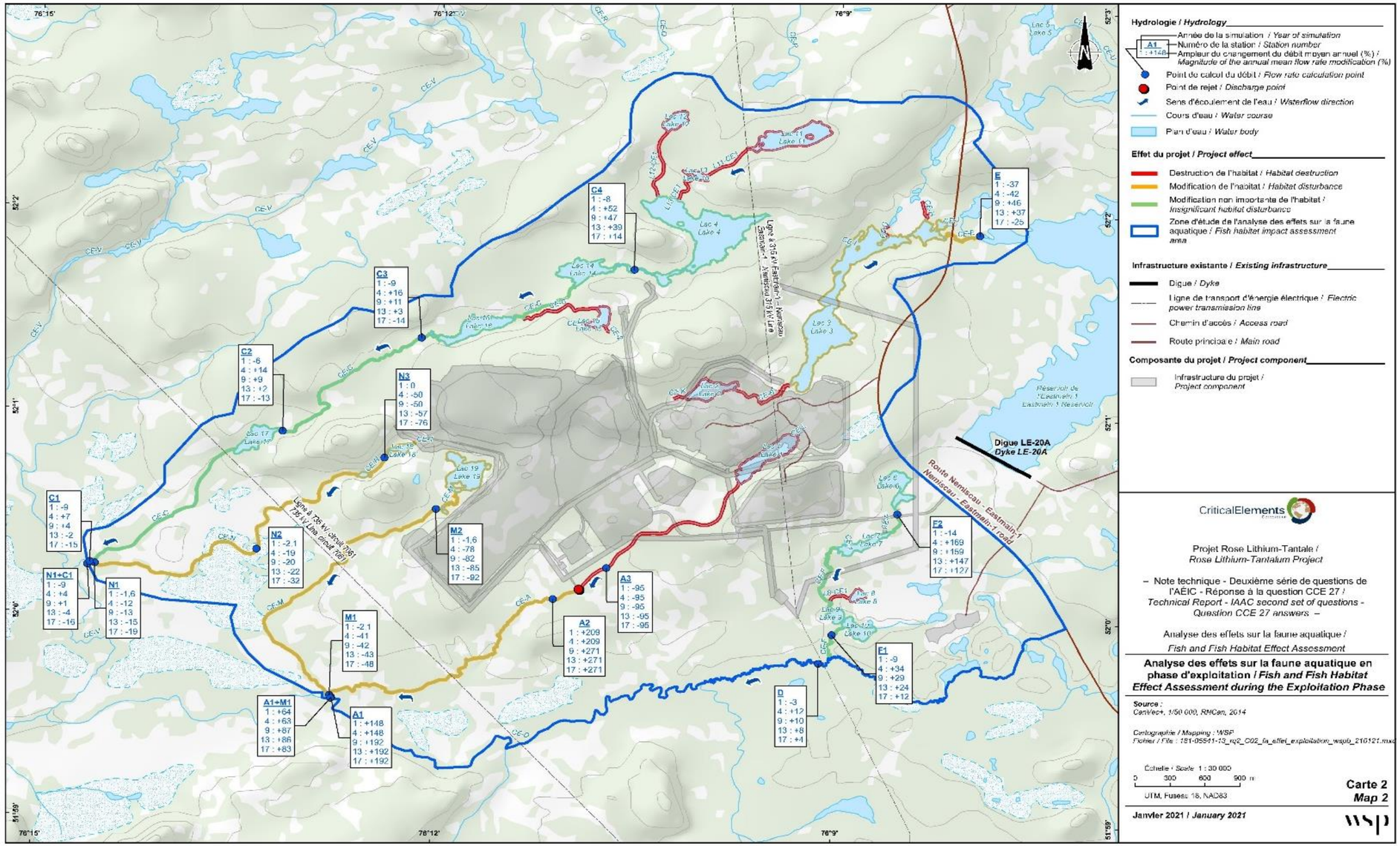
In order to assess the effects on fish and fish habitat, the proponent used a study area corresponding to the zone of influence of the project on this component. This is an area of approximately 3,000 hectares, including all of the projected infrastructure (Figure 8).

A total of fourteen species of fish were inventoried by the proponent in this study area: white sucker, northern pike, yellow perch, lake whitefish, yellow walleye, brook trout, burbot, lake chub, pearl dace, longnose dace, mottled sculpin, slimy sculpin, brook stickleback and fallfish. No special-status fish species were captured during these inventories, although the proponent recognizes that the river system in the study area could provide habitat for lake sturgeon (Southern Hudson Bay-James Bay populations unit). This species is of particular importance to the Crees and is listed on Schedule 1 of the *Species at Risk Act* with a status of special concern. No recovery strategy, action plan or management plan is applicable and no critical habitat is designated for this population. It should be noted that lake sturgeon, white sucker, burbot and lake whitefish are species reserved for the exclusive use of Indigenous people under the *Act Respecting Hunting and Fishing Rights in the James Bay and New Québec Territories of Quebec* (JBNQ Agreement, Chapter 24 Schedule 2). Fisheries and Oceans Canada (DFO) considers that lake sturgeon is likely to frequent habitats located downstream from the study area, namely the Pontax River, to which most of the watercourses at the mine site flow, and the Eastmain-1 Reservoir, to which Lakes 2 and 3 flow.

Lakes 8, 9, 10, 11, 12, 13 and 17, as well as some of their tributaries and outfalls, have not been inventoried in the field. The proponent thus based the characterization of fish populations and their habitats in these water bodies and streams solely on the similarities they share with those with which a water connection exists upstream or downstream. Additional inventories may be required during the regulatory phase in order to more accurately document fish populations and habitats, particularly in Lakes 11, 12 and 13.

The proponent believes that the main effects of the project on fish and their habitat are related to the loss of temporary and permanent habitat, the modification of the hydrological regime and the modification of the thermal regime. Other potential effects are the risk of suspended solids release into the water, the risk of spills and increased fishing pressure. The effects of increased fishing pressure are assessed in section 6.1 (Current use of land and resources for traditional purposes).

Figure 8: Proponent's Study Area for the Assessment of the Effects of the Project on Fish Habitat and Water Bodies and Watercourses Considered Destroyed or Modified by the Proponent



Source: WSP Canada Inc. (January 2021)

Deterioration, Destruction or Disruption of Habitat and Fish Mortality

The proponent anticipates that the natural flow of water around the mine site would be modified to create the pit and keep it dry. The modifications to the hydrological regime and the encroachment of mining infrastructure would be likely to deteriorate, destroy or disturb 42.3 hectares of fish habitat, including 37,9 hectares in a lake environment and 4.4 hectares in a watercourse.

Construction Phase

In order to create the pit, the proponent plans to drain Lakes 1 and 2, totalling 12.4 hectares. Lake 1 would be pumped to its natural outlet (Watercourse A), downstream of its underground portion, and Lake 2 would be pumped to Lake 3. The proponent does not anticipate any effect on fish in Watercourse A during pumping activities in Lake 1, since flow would be maintained. Once the lake is drained, the decrease in flow would be felt along the entire length of watercourse A, up to its confluence with Watercourse D. Following the draining of Lake 2, Watercourses K (tributary of Lake 2) and B (outlet of Lake 2 and tributary of Lake 3) would disappear. River E (Lake 3 outflow and tributary of Eastmain 1 reservoir) would experience a 23% decrease in its mean annual flow.

The Cree Nations consulted expressed a desire to know the fate of the fish in these lakes. In order to respond to this concern, the proponent plans to fish Lake 1 for 10 days before it is drained to take some of the fish (white sucker, pearl mule, brook trout) and offer them to the Cree Nations. Cree users of the territory would be invited to participate in the fishing. No fishing would be planned at Lake 2 because of its very low abundance of fish and the lack of interest on the part of land users.

The proponent believes that the anticipated decrease in flows in Watercourses A, M and N, which would be permanently or occasionally dewatered during the construction phase, would be gradual so that fish would find refuge downstream.

Operational Phase

During the operational phase, the water flow on the mine site would already have been significantly modified. However, the operation of the water treatment plant would change the hydrology of Watercourse A. The pumping of groundwater planned by the proponent to keep the pit dry would also have an effect on the local hydrology. The presence of the tailings accumulation area would also affect the hydrology of Lakes 18 and 19 and their outlets. Changes to the surface water flow pattern, as well as to surface and groundwater inflows, would have the effect of modifying, among other things, flow velocities, water levels, the area of habitat available for fish and the quality of these habitats.

Mine water, including all types of contact water on the site and ore concentration plant water, would be directed to the water treatment plant before being discharged in the effluent, i.e., into Watercourse A. The effluent would be fed in such a way as to replicate, to the extent possible, natural flow variations. It would, however, discharge water into Watercourse A at a different flow rate than the reference state. For example, the average annual flow in Watercourse A could increase by 200% in the first year of operation. Discharges would be intermittent and dependent on rainfall and water management at the site. The proponent plans to

discharge intermittently so that low water periods in the watercourses are minimally disrupted. The average annual flow of Watercourse A, just upstream of the water treatment plant effluent, would be reduced by 95%.

The proponent plans to keep the pit dry with nine groundwater pumping wells located on its periphery. This pumping would cause a drawdown of the water table (lowering of the groundwater level) of about four kilometers in extent. This drawdown would decrease in size as it moves away from the pit. The water from this pumping, as well as the water from the water treatment plant, would be considered mining effluents under Canada's *Metal and Diamond Mining Effluent Regulations* (MDMER). They would be discharged into Lakes 3, 4 and 6 to mitigate the effects of lowering the water table. They would continuously feed Lakes 4 and 6, beginning in year four, and Lake 3, beginning in year nine. This groundwater would maintain fish habitat in Lakes 3, 4, 6, 7, 9, 10, 14, 16 and 17 as well as in Watercourses C, E and F. DFO believes that a decrease in groundwater inputs below predictions, combined with continued discharges of the three peripheral well water effluents, could result in an increase in flows and current velocities downstream of the receiving lakes above the values anticipated by the proponent.

The proponent plans to install a stone bed along the shores of Lakes 3, 4 and 6 where pumped water would be discharged to prevent bank erosion. The proponent believes that discharging this water at three additional points beyond the water treatment plant would cause less loss of fish habitat than at a single discharge point. As discussed in Chapter 3 (Project Justification and Alternatives Considered), despite the lack of an assessment by the proponent of the potential effects of a single discharge point scenario on fish and fish habitat, DFO believes that the scenario with four discharge points is a preferred measure for maintening fish habitat.

According to the proponent, the dewatering of Lake 2 as well as the drawdown of the water table would have effects on Lake 3 and the watercourses connected to it (E, G, H, I and J) up to 22 years after the closure of the mine site, even if the proponent plans to have a discharge point at Lake 3. Alteration of water levels in other water bodies would also result in the harmful alteration, disruption or destruction of fish habitat (see Appendix F).

The proponent anticipates that average monthly flows in watercourses in the study area would not exceed the estimated 2-year recurring flood flows under current conditions. It also plans to pump between July and September (after the spring melt), when possible, outside of rainy periods and before brook trout spawning. He believes that despite the significant variations in flow anticipated during the operational phase, the morphology of the watercourses studied would result in slight variations in water levels and flow speeds. The watercourses would be characterized by the presence of large floodplains, numerous beaver dams and other hydraulic controls, as well as the presence of several lakes. All of these features would limit water level variations, despite the magnitude of anticipated changes in flow rates. ECCC notes that the detailed engineering is not completed and that flow forecasts could still change, but not significantly.

The proponent undertakes to develop, in the regulatory phase, to the satisfaction of DFO and in consultation with Cree Nations, any compensation plan required to offset losses due to the destruction or disruption of fish habitat, or fish mortality due to implementation of the project.

The proponent plans a monitoring program for the hydrology of watercourses for which a significant reduction in flow (>10%) is expected, without specifying which type of flow would be used as a basis for comparison (average monthly flows, low flows, flood flows) or the monitoring methodology. According to the proponent's effects estimate, Watercourses A, C, E, F, M and N would be monitored during the life of the project.

ECCC recommends that the proponent submit a follow-up program for water levels and flows during all phases of the project, including water levels and flows in each of the identified watersheds, in order to verify the accuracy of the environmental assessment and judge the effectiveness of the mitigation measures. ECCC recommends that the detailed monitoring program related to the surface water hydrology component be developed and submitted to the responsible authorities for review and comment so that it can be finalized prior to the start of work.

Closure Phase

During the closure phase, the proponent no longer plans to draw down the water table, as pumping of groundwater would no longer be required. The proponent believes that all water bodies and watercourses, except Lakes 1 and 2, should recover their habitat functions and surface area.

Effluent from the water treatment plant would continue to flow intermittently for a few years until water quality allows treatment to be stopped and natural water flow resumes. When this plant would no longer be in operation and natural flow would resume, Watercourse A would resume receiving more regular water inflows. These inflows would be very low compared to the flow conditions that would prevail during the last years of operation.

According to the proponent, the natural filling of the pit would take approximately 26 years after the cessation of activities. It anticipates a positive effect due to the creation of a water environment and the re-establishment of the water table in the pit sector. Once the pit is impounded and the return flow at the head of watercourse A, the proponent anticipates that fish would have access to the previously dewatered area, if there are no obstacles. The proponent does not anticipate any adverse effects after the closure phase, however, it did not present detailed information on the surface water drainage of the mine site during and after closure.

DFO has reservations about the return to a natural state due to the prolonged deterioration to which these habitats would have been subjected. The length of time the pit would be in operation and the estimated time for its filling also bring uncertainties. Although the pit would be flooded, DFO considers that it would probably not constitute adequate fish habitat in the future. Furthermore, DFO considers that indirect effects during the operational phase, referred to as “temporary alteration” of fish habitat by the proponent, are permanent effects. They would constitute a harmful alteration of fish habitat under the *Fisheries Act*, since several years would elapse between the beginning and potential end of the anticipated effects, after the pit is closed and possibly even after the pit is filled.

ECCC believes that the proponent should have presented the boundaries of the various sub-catchment areas, taking into account the configuration of the mine site at closure (presence of the accumulation areas and pit), the drainage scheme and the drainage regime, including the flows and volumes of water draining to the receiving environments (lakes and watercourses). The proponent indicated that calculations and

modelling for surface water drainage at the mine site in post-closure would be carried out once the recovery plan is finalized and approved. ECCC believes that there remains uncertainty in the assessment of the effects of the project on the hydrological regime and consequently on fish habitat after the recovery and closure of the mine. However, ECCC believes that the proponent has estimated the effects of the project for the construction and operational phases sufficiently for the purposes of the environmental assessment.

With respect to the final site recovery phase, ECCC recommends that the follow-up program be designed to confirm the effects on watercourses at least one year after the completion of the recovery activities and the predicted effects after the pit filling period. This follow-up should include updated calculations and modelling for surface water drainage at the mine site in post-closure.

During the closure and post-closure phases, if additional residual effects on fish and fish habitat were anticipated (effects that would not have been considered during the present environmental assessment or authorized during the upcoming regulatory phase), it would be the proponent's responsibility to comply with the laws and regulations in effect, prior to carrying out any work. DFO notes that only the four discharge point alternative was reviewed by the proponent. Taking into consideration the value, nature and extent of the habitats that would be affected by the works, DFO assesses that the losses of fish habitat that would occur could be offset under the *Fisheries Act*. However, DFO notes that it could be difficult to compensate for losses of this magnitude by remaining in close proximity to the mine site. The proponent undertakes to develop, in the regulatory phase, to the satisfaction of DFO and in consultation with Cree Nations, any compensation plan required to offset losses due to the deterioration, destruction or disruption of fish habitat, or fish mortality due to the implementation of the project. Compensation proposals will have to comply with DFO's *Policy for Applying Measures to Offset Adverse Effects on Fish and Fish Habitat Under the Fisheries Act*.

Modification of Water Quality

According to the proponent, the management of mine water could lead to changes in fish habitat. It could affect the quality of ground and surface water, the thermal regime and the dissolved oxygen concentration of water bodies and streams. The project could emit suspended solids into the water that could clog spawning grounds.

The Cree Nations consulted expressed concerns about water quality, the risk of contamination and potential effects on fish.

Groundwater Quality

In order to determine the initial state of groundwater quality (natural background levels), the proponent conducted two groundwater sampling campaigns in 2017 and 2019 from observation wells. The list of parameters measured included major ions, C10-C50 petroleum hydrocarbons, several metals and other inorganic compounds, as well as suspended solids. With the exception of tantalum, the proponent measured all substances that could be found in the groundwater in the study area. The proponent's analyses show that, in the majority of samples, exceedances of Quebec's surface water resurgence criteria (SWR) were noted for the following metals: silver, copper, manganese, nickel, lead and zinc. The proponent believes that the concentrations of silver and copper in groundwater could occasionally exceed the SWR criteria during

future sampling campaigns without these exceedances necessarily being attributable to the new activities of the project. ECCC recommends that tantalum be measured at observation wells prior to the commencement of construction to complete the initial status of groundwater quality in the study area.

According to the proponent, given the geological context of the sector and based on geochemical studies it has conducted, the mining materials which would be stored in the waste rock and dry tailings and in ore accumulation areas would have a low risk of leaching[9] and acid mine drainage[10]. According to the proponent, it would therefore be unlikely that metals would lead to contamination of surface and ground water beyond the applicable criteria. Nevertheless, the proponent plans to implement standard measures to collect and treat any process water or runoff that have been in contact with the mining materials. Groundwater would thereby benefit from increased protection. According to ECCC, the mitigation measures identified by the proponent to reduce the effects of the project on groundwater quality are mainly focused on the prevention of accidental spills. These measures are the same as those described in section 7.1 (Effects of Accidents and Malfunctions).

ECCC and Natural Resources Canada (NRCan) note that the overburden has not been analyzed for acid mine drainage or metal leaching potential. According to ECCC, during the proponent's geochemical characterizations, no metals were found in excess of Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC) soil criteria in the overburden samples. In this situation, Quebec Directive 019 stipulates that overburden can be classified as "no metal leaching potential" without further testing. However, the proponent has undertaken to conduct tests to determine the acidogenic potential of soils on overburden samples in the summer of 2021 in order to rule on the acidogenic nature of this material. NRCan believes that the overburden could present a risk of acid mining drainage and should be tested using acid-base titration analysis and tests adapted to soils (TDPAS).

According to the proponent, the management of hazardous and residual materials and the circulation of machinery could lead to accidental spills of hydrocarbons, solvents or other hazardous liquids into the environment. The Committee's analysis and conclusions on the effects of accidents and malfunctions are described in section 7.1 (Effects of Accidents and malfunctions).

ECCC is generally in agreement with the proponent's assessment of the effect of the changes that would be caused by the project on groundwater quality. ECCC emphasizes the importance of the mitigation measures that would be put in place to protect surface water and soils, as they would also contribute to the protection of groundwater. ECCC believes that if all mitigation measures identified by the proponent and those recommended by ECCC are implemented in a timely manner, the effects of the project on groundwater quality and the associated risks would be minimized.

The proponent plans a groundwater monitoring program consisting of 18 observation wells located upstream and downstream of the mining infrastructure. The monitoring parameters would be substantially the same as those used to establish the initial state of groundwater quality, with the exception of thallium and mercury

[9] The potential for movement of metals in the soil caused by the displacement of water. (Definition by *Termium Plus*)

[10] When mining operations disturb the chemical equilibrium of soils and deep metal sulphide deposits by suddenly placing them in oxidizing conditions. This reaction creates acidic flows called "acid mine drainage". (Definition by *Termium Plus*)

due to the large number of samples for which the concentration of these two elements were below detection limits during initial characterizations. The proponent plans to monitor tantalum, but does not plan to monitor barium and beryllium, which were also measured at the time of the initial characterization. ECCC believes that these two metals should also be included in the measured parameters so that the follow-up program covers all substances that could be found in the groundwater in the area of the mine site. The proponent plans to begin sampling the wells during the construction phase and, thereafter, sampling would be conducted twice a year during the operation, post-operation and recovery phase. The proponent plans to continue its groundwater quality monitoring program over a 5-year post-closure period. It then plans to abandon it, provided that water quality meets the requirements of Quebec's Directive 019. According to ECCC, monitoring of groundwater quality should begin as soon as work begins and be maintained throughout all phases of the project, including the construction phase. However, the frequency of the surveys could be adjusted based on the results.

The proponent also described the comparison criteria that would be used to analyze the monitoring results. The results would be compared with the SWR criteria and an alert threshold of 50% of the value of the SWR criteria would be applied. Background levels that had been assessed prior to the work would be used as comparison criteria when they exceed the SWR criteria. For parameters that do not have any criteria, the results would be compared to the values generally observed in groundwater and to the concentrations obtained under initial conditions. ECCC believes that the proposed comparison criteria are adequate. Given that there are currently no criteria for tantalum, ECCC recommends that monitoring results be compared to concentrations that would be measured at baseline conditions.

Soil Quality

The project could result in effects on soil quality, which could indirectly affect groundwater quality. According to the proponent, no previous activity is likely to have affected the quality of the soil at the project’s site. The proponent undertakes to carry out a complementary characterization of the soils in order to complete the reference condition. Taking into account future data from this characterization, ECCC believes that the proponent has described the component with the available information and in an adequate manner considering the geology and previous activities carried out on the site. However, ECCC recommends that the additional characterization include analyses of tantalum in soils in order to obtain a complete picture of the natural surface concentrations on the site.

The proponent has identified only one source of effect on soil quality, namely the risk of contamination during accidental spills of hydrocarbons, solvents or other hazardous liquids (see section 7.1 Effects of Accidents and Malfunctions). However, ECCC believes that contamination with metals and metalloids resulting from the deposition of dust from mine operations remains possible. The reworking and relocation of material, including the use of waste rock as backfill for roads and mining infrastructure, could also result in a change in soil quality due to erosion, leaching or dust emission.

According to ECCC, the risks of surface soil contamination by metals and metalloids associated with the deposition of dust from the pit, roads and tailings accumulation area remain low. According to the information provided by the proponent, the natural levels of metals and metalloids in the soil would be increased by less than 10% by the deposition of dust in the area close to the mine site exposed to prevailing winds. According

to the studies provided by the proponent. ECCC believes that the proponent has well documented the effects caused by accidental spills on soils. The effects on soil quality are therefore estimated to be low.

The proponent proposed various measures to mitigate the effects on soil quality, including maintenance of vehicles and other mobile machinery in the garage. ECCC recommends other measures, such as keeping stripping, clearing, excavation, backfilling and grading of work areas to a strict minimum in order to respect the natural topography and prevent erosion.

ECCC believes that, if all the mitigation measures selected by the proponent, as well as those recommended by ECCC and added in section 5.1.2 below, are implemented in a timely manner, the effects of the project on soil quality and associated risks would be minimized.

Surface Water Quality

During the construction phase, the proponent anticipates that the installation and presence of the construction site, site preparation, installation of infrastructures and work in an aquatic environment would increase suspended solids in the water. In order to limit their emission, the proponent plans to implement several measures, such as absorbent cloths, which would prevent sediment runoff into watercourses and bodies of water. It also plans to build basins and ditches on the site using till to retain particles, then add a geomembrane if necessary.

In order to limit suspended matter in Watercourse A when pumping from Lake 1, the proponent plans to pass the water through a sedimentation basin or sediment bag before discharge. During the dewatering of Lake 2, the proponent plans to lay a stone bed at the outlet of the pipe to prevent erosion of the shoreline of Lake 3. To prevent any disturbance to aquatic fauna by suspended matter, the proponent plans to counter the remobilization of sediment (for example, with a turbidity curtain or bags) so that water from Lake 2 does not disturb the banks or bottom of Lake 3. The proponent would dispose of the sediment from Lakes 1 and 2 in the overburden accumulation area and would immediately proceed with the revegetation.

During the operational phase, water accumulating in the pit (mine water), water from the ore concentrating process and runoff from the mine site could contain suspended solids, metals, nitrates or an acidity level (pH) in excess of applicable criteria. The proponent plans to build a plant to treat this water before discharging it to Watercourse A, which would be the main input to Watercourse A. It would be diluted little or not at all before reaching Watercourse D. Consequently, the proponent believes that a nutrient enrichment effect could be observed in the medium term in this area. In order to avoid the construction of a large polishing pond after the treatment plant, the proponent proposes to continuously measure pH and turbidity at the outlet of the treatment plant to determine if its effluent is of sufficient quality to be discharged to the receiving environment. If the turbidity or pH were not within the desired range, the effluent would be recirculated to the accumulation pond using automated valves for further treatment. According to the proponent, turbidity would be a sufficient indicator to determine if the effluent quality meets the standards for suspended solids and metals. The applicable standards for effluent quality are Quebec's Directive 019 on the mining industry and the *Metal and Diamond Mining Effluent Regulations* (MDMER). ECCC notes that if effluent recirculation were to occur, the accumulation basin could contain a volume of water corresponding to 10.4 days of operation for a 10-year flood recurrence and 2.5 days for a 100-year flood recurrence.

According to the geochemical characterizations carried out by the proponent, the waste rock, ore and mine tailings would not be likely to generate acid mine drainage (AMD). In addition, these materials do not present a potential for leaching, according to the criteria of Directive 019 of the MELCC, for the majority of the metals analyzed, including tantalum and lithium, which are the metals sought in the project. However, some rock samples were considered potentially leachable for copper. These samples are mostly amphibolite and the proponent plans to use this material for the construction of the road foundations and the mine site decks. Therefore, drainage water from these structures will be directed to the treatment plant to control potential copper releases. However, copper concentrations measured in the leachate during geochemical testing remained below the MELCC water quality criterion for resurgence to surface waters.

As previously mentioned, ECCC and NRCan note that the overburden was not tested for its potential for acid mine drainage or metal leaching. During the proponent's geochemical characterizations, no metals exhibited concentrations in excess of the applicable MELCC soil criteria in the overburden samples. In this context, Directive 019 states that the overburden may be classified as "no metal leaching potential" without further testing. However, as previsouly mentioned, the proponent has committed to conducting soil acid generating potential testing on overburden samples in the summer of 2021 to rule on the acid generating nature of this material.

During the operational phase, other effects on surface water quality could result from accidental spills of petroleum hydrocarbons and potential releases of suspended solids associated with the use, refueling, maintenance and washing of vehicles and machinery. To counter these effects, the garage wastewater from maintenance work and washing of vehicles and equipment would be directed to sand traps and an oil separator in order to reduce suspended solids and petroleum hydrocarbon content. The Committee's analysis and conclusions on effects related to accidents and malfunctions are described in Section 7.1 (Accidents and Malfunctions).

No standards or criteria exist for tantalum in Canada. Based on what it describes as conservative assumptions, the proponent has estimated maximum values for tantalum in project contact waters, using a mass balance based on tantalum concentrations in geological samples collected during studies conducted in 2017 and 2018. The proponent commits to take action if the concentration of tantalum were to increase above these estimated values at the effluents. ECCC believes that this commitment by the proponent is a key mitigation measure.

ECCC believes that the proponent's commitment to comply with more stringent critera than those in Directive 019 and the MDMER for suspended solids at the effluents is a key mitigation measure. Efficient treatment of suspended solids would help reduce several other contaminants in the effluent, including metals, notably tantalum.

The proponent believes that the groundwater captured by the pumping wells on the periphery of the pit and discharged into Lakes 3, 4 and 6 could have an adverse effect on the water quality of these receiving lakes. The groundwater would be of a different temperature and could alter the thermal regime of the receiving water bodies. Oxygen saturation would also be lower, which could lead to anoxic conditions at certain times of the year and thus compromise the survival of fish. The proponent plans to set up sedimentation basins to collect groundwater before its discharge. These basins would make it possible to temper and reoxygenate

the water before its discharge, while limiting the transport of suspended matter. The pH could also be corrected in these ponds as needed.

The quality of the water from the perimeter pumps is still unknown. ECCC hypothesizes that it would be somewhere between the natural groundwater quality of the study area and the quality of the pit water. The groundwater that would be pumped to drawdown the water table in order to lower the water level in the pit could mix with the pit water. ECCC also notes that the proponent's groundwater sampling results show, among other things, that fluoride and several metals, including silver and copper, exceed Canadian Council of Ministers of the Environment quality criteria for the protection of freshwater. In the event that certain contaminants exceed the limits authorized when sampling the water in one of these basins, the proponent plans to add one to three secondary treatment plants at points of discharge of this water. A six-month period would be required between the discovery of an exceedance and the installation of such a plant. In the meantime, the pumps in the wells on the periphery of the pit would be shut down. If a rise in the water level in the pit is detected, the water would be channeled to the storage basin and the main water treatment plant. The proponent plans a treatment process at these secondary plants that would be of the physicochemical type, similar to the process proposed for the main water treatment plant.

DFO notes that the proponent did not assess the effects of such a pump shutdown on fish habitat (e.g., at receiving Lakes 3, 4 and 6 as well as in downstream habitats). ECCC considers that there remains uncertainty as to the capacity of the accumulation basin to contain all the additional water volumes during the period of installation of one or more secondary water treatment units. ECCC recommends that the proponent revalidate its water balance with this contingency in mind to ensure that the accumulation basin and the main water treatment plant have sufficient capacity if the peripheral pumping water were to be diverted from this side for a period of at least six months. The proponent should submit the water balance results for this scenario to the Agency and the relevant authorities prior to construction.

The proponent plans to establish a baseline and monitor water quality in the effluent-receiving environment. Monitoring of water quality and fish populations in Lakes 3, 4 and 6 as well as Watercourses C and F would be carried out to document the effects of groundwater discharge. In order to validate estimates of anticipated flows in watercourses, particularly low flows, the proponent plans a monitoring program for Watercourses A, C, N, M, F and E, but does not specify, among other things, the frequency (years) of monitoring and the measurement sites. According to the proponent, a detailed monitoring protocol would be developed during the next phase of the project and submitted for approval prior to its implementation.

ECCC believes that the proponent's characterization of the receiving environment includes enough lakes and rivers to provide a good description of the initial state. With the exception of tantalum, the proponent measured all substances that could be found in surface water and sediment in the study area as a result of the project. Tantalum will need to be measured as soon as possible in order to fully assess the effects of the project once it is in operation. Given the low dissolution of tantalum, ECCC recommends that the proponent measure the total concentration of tantalum in water in addition to the dissolved concentration and incorporate this consideration into its monitoring plan. The monitoring of the state of surface water and sediment quality should continue at the sampling stations used during the 2018 and 2019 characterization campaigns, since these stations better represent the study area than those used in 2011.

ECCC considers that the proponent did not accurately estimate the level of efficiency of its water treatment main unit by saying that the information would be provided during the detailed engineering. ECCC believes that the proponent could have provided information on the efficiency of a treatment system prior to this stage, in a theoretical manner, by providing comparative data on metal removal rates, for example, and by providing summary modelling of the operation of the proposed recirculation process in order to be able to justify the absence of a polishing pond downstream of the water treatment plant. ECCC notes the proponent's commitment to provide for adjustments to optimize treatment should the parameters monitored at the main water treatment plant be exceeded.

DFO believes that there is a significant risk that the combined effect of the altered hydrologic regime and dust input (proximity to the pit) could eventually lead to a deterioration of fish habitat in Lake 3 and significantly alter fish communities in Lake 3. Thus, an additional residual effect consisting of an overall deterioration of Lake 3 could occur. A follow-up of the effects on Lake 3 would have to be implemented in order to verify this. It is possible that more sensitive species, notably lake whitefish, may disappear in favour of more tolerant species such as white sucker. In addition, the anticipated loss of grass beds in the littoral zone of Lake 3 and at the mouths of its tributaries, which offer good potential for reproduction and feeding of northern pike and yellow perch in particular, could also reduce the lake's productivity. The free passage of fish in Watercourse E, between Lake 3 and Eastmain-1 reservoir, in way of the culvert under the Nemiscau-Eastmain-1 road, could also be compromised by changes in the hydrological regime or silting of the lake. This could have an adverse effect on fish populations in the sector and would have to be verified through monitoring.

DFO also raises uncertainties regarding the potential effect of dust generated by mining activities on Lakes 18 and 19 (adjacent to the co-disposal area). This effect, combined with modifications to the hydrological regime of these lakes and their current habitat characteristics (shallow lakes), could, in the long term, cause their destruction. A monitoring of the effects on these lakes would also have to be implemented in order to verify this.

DFO believes that the magnitude, extent and duration of the residual environmental effects on fish and fish habitat could be greater than those anticipated by the proponent because of the uncertainties and shortcomings cited. However, DFO currently believes that adequate follow-ups can mitigate these uncertainties. In such a case, the additional residual effects demonstrated will have to be subject to additional fish habitat compensation.

DFO would not have to issue a permit under subsections 73(1) and 74 under the *Species at Risk Act* (SARA) since no aquatic species at risk, threatened or endangered listed in Schedule 1 of SARA has been inventoried in the water bodies and watercourses under study or is likely to be found there. No critical habitat for an aquatic species at risk is currently designated in or near the study area. DFO considers that lake sturgeon (Southern Hudson Bay-James Bay populations unit), a species of special concern under SARA, is likely to frequent habitats located downstream from the study area, namely the Pontax River, to which most of the mine site's watercourses drain, and Eastmain-1 reservoir, to which Lakes 2 and 3 drain. DFO considers that the avoidance, mitigation and fish habitat compensation measures that would be implemented by the proponent would however minimize the effects on this species of special concern.

The project would result in habitat losses, i.e., the destruction and deterioration of habitat, for several fish species, including brook trout, northern pike, yellow perch, white sucker and, potentially, lake whitefish and yellow walleye. In addition, the death of fish by means other than fishing would result in particular from the drying up of Lakes 1 and 2. Thus, to proceed with its project, the proponent would have to obtain an authorization under paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*. DFO will ensure the project's compliance with the *Fisheries Act* during the regulatory phase, following the environmental assessment and its positive conclusion, if applicable.

5.1.2 Analysis and Conclusions by the Joint Assessment Committee on Residual Effects

The Committee assessed the residual effects on fish and fish habitat using the Environmental Effects Assessment Criteria in Appendix A. The Committee concludes that the project is not likely to cause significant adverse environmental effects on fish and fish habitat if the proponent applies the key mitigation measures and the measures of the follow-up and monitoring program below. The adverse effects incurred by the dewatering of water bodies and watercourses as well as by changes to the hydrological regime would be offset, in particular, by the proponent's compensation plan. The analysis of residual effects is based on the findings below.

Habitat loss, associated fish mortality and changes to water quality are local in scope. The dewatering of water bodies and watercourses and the effect of lowering the water table would be observed at the sub-watershed level. These effects would be felt on a continuous and long-term basis, with mining activities extending over more than 26 years. Habitat loss and mortality are considered irreversible and of high intensity due to the areas destroyed or modified during the life of the project. The Committee notes that the changes to the hydrological regime would be mitigated as a result of mine recovery and pit flooding. However, there are uncertainties in assessing the effects of the project on the hydrological regime and consequently on fish habitat after recovery and closure. Monitoring and follow-up programs would help to fill current knowledge gaps and adjust mitigation and compensation measures as required.The Committee believes that compensatory activities could offset the loss of habitat, thereby reducing the level of intensity of the effect to medium. Although the effects would be intense and irreversible, the Committee considers that they would not harm the maintenance of the fish population. The intensity of the modifications to water quality is considered low given the mitigation measures proposed by the proponent, particularly the management and treatment of mine water according to current standards, the presence of sedimentation ponds and the implementation of a follow-up and water monitoring program. Based on the application of the key mitigation measures identified below and compensatory activities to be defined, the Committee believes that the level of residual effects of the project on fish and fish habitat would be moderate. The Committee therefore concludes that the residual effects are insignificant.

Identification of Key Mitigation Measures

The Committee identified the following key measures to mitigate the significant adverse environmental effects of the project on fish and fish habitat. To do so, the Committee relied on the proponent's proposals[11], the opinion of governmental experts, comments received from the Cree Nations consulted and from a non-governmental organization.

General Measures

- Implementation of a mine effluent management program to specifically comply with MDMER standards, the *Fisheries Act* and the requirements of the Government of Quebec. This program includes in particular:
  - In construction phase, temporary and permanent sedimentation ponds to minimize the discharge of suspended solids, and installation of a functional water treatment plant at the start of construction;
  - From operation to decommissioning, the transfer of water from the peripheral pumping to sedimentation ponds and its physicochemical treatment if necessary, and final discharge to Lakes 3, 4 and 6;
  - From operation to decommissioning, recovery and in-plant treatment of dewatering water from the pit, runoff water from the waste rock, dry tailings and overburden accumulation areas, industrial sector, including the ore plant, road ditches at the mine site, and the ore pile, with final effluent discharge to Watercourse A;
- Prohibiting in-water construction activities outside of the low risk periods of fish habitat work identified for the project area in DFO's Timing windows to conduct projects in or around water;
- Carrying out an additional soil characterization before the start of the works in order to complete the reference state for all inorganic and organic substances likely to be emitted or released by project activities, including tantalum, as specified in the *Guide de caractérisation physico-chimique de l'état initial des sols avant l'implantation d'un projet industriel* (Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques, 2015);
- Measurement of natural levels of tantalum in Watercourse A, groundwater, surface water and sediments prior to the start of construction;
- Waste rock management plan that stipulates how those containing sulphide minerals will be managed, to avoid placing them on the edges or above the waste rock pile where they could create local pockets of acid mine drainage;
- Use of waste rock that does not contain sulphide minerals for construction purposes;
- Overburden testing for mine drainage potential, including tests adapted to soils (TDPAS) to be conducted prior to using the overburden for construction. Demonstrate that the overburden is of low risk according to Quebec Directive 019;

[11] The proponent's commitments are outlined in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

- Maintain monthly concentrations of suspended solids below 10 milligrams per litre for all final discharge points;
- Maintain tantalum concentrations below 0.1 micrograms per litre at all final discharge points. If exceeded, provide measures to identify the source of the tantalum and the treatment, if applicable;
- Development and implementation of a compensation plan, in collaboration with Cree stakeholders and approved by DFO, that is relevant and sufficient to offset all residual effects on fish and fish habitat;
- Management of mine water discharge so as to minimize hydrological modifications (e.g., water levels and flows) to water bodies and watercourses;
- Updating of the water balance taking into account the possibility that the water from the peripheral wells would exceed the quality standards or criteria during the installation period of the secondary water treatment plants and that these would have to be redirected to the accumulation basin and the main water treatment plant for a period of at least six months. Submission of the water balance results of this scenario to the Agency and the appropriate authorities.

Project Schedule

- Carrying out work in water outside the sensitive period for the fish species present and limiting the duration of work in the aquatic environment to a minimum.

Erosion and Sediment Transport Control

- Implementation of effective erosion and sediment control measures during construction, operation and decommissioning, such as discharging water from the dewatering of Lakes 1 and 2 downstream of the lakes and installing sedimentation basins, semipermeable berms, turbidity containment curtains and a stone bed at the outlet of the pumping line at Lakes 3, 4 and 6;
- Deforestation on both sides of the high-water line is kept to a minimum and the vegetation cover is preserved as long as possible before work begins;
- Maintaining an undisturbed vegetation buffer along the edge of all water bodies and watercoursess during all phases of the project;
- Stripping, clearing, grading, excavation, backfilling and levelling of work areas limited to a minimum in order to respect the natural topography and prevent erosion;
- Implementing effective measures to limit the input of site sediments and other suspended solids to the receiving water environment and to ensure their maintenance (e.g., sediment barriers, berms, sediment traps, sedimentation ponds, temporary slope stabilization, diversion of water to vegetated areas). Ensure that effective measures are maintained during periods of flooding, heavy rainfall or frost, including limiting the input of fine particles on spawning grounds;
- Disposal of excavated material outside the high-water mark. If required, confine or stabilize these materials (e.g., impermeable sheeting, sediment barrier) to prevent the entry of sediment into the aquatic environment;
- Where work is to be carried out in water, isolate the work area to work in the dry or limit the input of sediment into the aquatic environment (e.g., cofferdams, diking and pumping, temporary diversion, turbidity curtain);

- Encourage the use of turbidity curtains to surround the work area to contain suspended sediments. Deploy the curtain in such a way as to limit the trapping of fish inside the enclosure.

Debris Management

- No discharge of waste, debris or material into the aquatic environment. Remove all accidentally introduced debris as soon as possible.

Temporary Works - General Measures

- Cumulative encroachment of temporary structures limited to one third of the width of the watercourse, measured from the width of the high-water mark, in order to restrict the increase in current velocities by restricting the flow and thus avoid hindering the free passage of fish or creating erosion problems;
- Circulation and sufficient water supply at all times to maintain fish habitat functions (feeding, rearing, spawning) downstream of the work area. Take the necessary measures to avoid impacts upstream and downstream of the work area (e.g., flooding, erosion, suspended solids);
- Design and stabilize temporary structures to withstand flooding that may occur during the construction period and to avoid erosion problems at the banks or bed;
- Protection of natural weirs upstream and downstream of the structures during construction. If the weirs are destabilized during construction, recover them to protect the watercourse from scour, while limiting interventions in the natural watercourse and ensuring the free passage of fish (e.g., embedding of stabilization materials, waterproofing and an effective low-water channel).

Temporary Works – Diversion of a Watercourse (if applicable)

- Maintenance of free passage of fish in the temporary diversion, if deemed necessary;
- In the case of a temporary diversion made of granular materials, consideration should be given to the use of materials with a spread and continuous grain size in order to seal the bed and thus ensure a sufficient depth of water above the substrate. A low-water channel (thalweg) should also be built in order to concentrate the flow during periods of low flow;
- In the case of a temporary diversion consisting of waterproof membranes, ensure that the structure is stable and watertight. In the case of a temporary diversion consisting of watertight membranes, ensure that the structure is stable and watertight. This can be done by installing the membranes from downstream to upstream, making sure that they overlap and by placing a small amount of clean granular material on the bottom of the diversion at the junction between two membranes;
- Arranging the downstream connection of the temporary diversion with the natural watercourse in a harmonious manner in order to limit the risk of developing erosion sites on the opposite bank.

Temporary Works – Embankment and Pumping of Water from Upstream to Downstream

- Install a suitable device at the inlet of the pumping hose (e.g., strainer) to prevent fish from being sucked in;
- Orientation and layout of the pumping pipe outlet to limit the risk of the development of shoreline erosion sites associated with the return of water downstream of the work area;

- Avoid fording of machinery in the watercourse. In the event that fording is justified, limit the crossing of essential machinery to a single round trip. If it is necessary to cross the watercourse several times, construction of a temporary structure to cross the watercourse;
- Encouraging the use of temporary bridges or crossing structures that minimize encroachment into fish habitat and provide for the free passage of fish, if deemed necessary;
- Use of clean granular materials for the construction of temporary diversion roads, excluding the road surface and portions of the road above the high water mark. When dismantling, remove all material that has been placed;
- While considering pumping water from peripheral wells as final discharge points as defined by the MDMER, manage discharge flows to Lakes 3, 4 and 6 in proportion to the drawdown of the water table caused by pumping;
- Operation of the water treatment plant in such a way as to reproduce the natural flow variations of Watercourse A, taking into account the storage capacity of the sedimentation basin.

Connecting Watercourses to Culvert Approaches

- Placement of the top of the riprap protecting the bed of the watercourse located upstream and downstream of the culverts below the elevations of the upstream and downstream inverts of the culvert so as not to create an obstacle to fish passage;
- Designing bank slope re-profiling to ensure bank stability.

Dynamiting

- Prohibition of the use of unconfined explosives;
- For blasting activities, adherence to *Guidelines for the use of explosives in or near Canadian fisheries waters* (Wright D.G. and G.E. Hopky, 1998) to reduce the likelihood of killing or injuring fish.

Shoreline Stabilization

- Stabilization design to limit the end effect. For example, the stabilization should gradually follow the natural profile of the existing slopes on either side of the structure.

Temporary Site Closure

- Stabilization and temporary protection of disturbed soil presenting a risk of erosion and sediment transport to the aquatic environment using methods adapted to the site, the duration of the site closure and the time of year;
- Diversion of runoff before it reaches disturbed soils (e.g., ridge ditch and dissipation ditch to vegetated areas);
- Verification of the measures in place to limit the input of sediment from the work site to the aquatic environment to demonstrate that they are working properly and that maintenance is carried out before the work site is closed.

Restoration of the Premises

- Stripping of service areas and storage areas for excavated and backfilled materials and conservation of the organic soil layer in order to put it back in place when the site is rehabilitated;
- Monitoring soil quality after the recovery phase to ensure that it is similar to the natural background levels established prior to the construction phase and adequate to allow for revegetation and future activities. Ensure that the analytical parameters used to characterize soils in the ore storage and transfer areas during the closure phase are the same as those used for natural background grades. If it is suspected that machinery may have been subject to leaks, also analyze certain organic parameters (e.g., C10-C50 petroleum hydrocarbons, PAHs and MAHs);
- In the area of the ore stockpile, in the event that certain areas have been contaminated, characterize, excavate and then treat the soil on site or in an authorized centre. Prior to recovery, characterize the ore transfer areas as well;
- Recovery of riparian areas deteriorated by the work as it progresses. Restore the bed and banks of aquatic environments affected by the work to their original state (substrate granulometry, bed profile, vegetation, etc.) following demobilization of the work site on all affected areas (temporary structures, access, etc.);
- Restoration of water circulation in the work area in a gradual manner in order to allow for the adjustment and nesting of the materials of the reconstituted bed, and thus ensure the watertightness of the bed. During this period, pump turbid water out of the work area to appropriate water management systems (pumping through vegetation, settling pond, etc.);
- Limiting riprap along the coast as much as possible and in such a way as not to exceed the high-water mark, while favouring the revegetation of the shoreline at the lowest possible elevation, using recognized plant engineering techniques favouring overhanging shrub and herbaceous strata and the use of native species. Undertake revegetation as soon as possible after completion of the work, in a favourable period and in such a way as to maximize vegetation recovery. Rehabilitate ditches damaged by machinery (drainage slope, slope shoulders, etc.);
- During the mine site decommissioning phase, recovery of the original stream bed and bank profile, including slope stabilization and surface revegetation;
- Continuation of continuous treatment at the main water treatment plant as long as there is a final effluent, and provision for adjustments to optimize treatment in the event that monitored parameters are exceeded.

Need for Follow-up and Follow-up Requirements

The Committee recommends the implementation of a follow-up program to verify the effectiveness of mitigation measures and fish and fish habitat predictions. This program would include a monitoring component of water quality standards and requirements. Adjustments to the mitigation measures could be made if necessary to minimize adverse environmental effects. The monitoring would incorporate the requirements dictated in Directive 019 on the Quebec Mining Industry and the MDMER. Follow-up and monitoring would be applied during each phase of the project, unless otherwise indicated, and would include:

- Monitoring of water levels and anticipated flows in the six watercourses impacted by the project (A, C, N, M, F and E) at three times of the year (spring, summer and autumn) using a rain gauge, a level probe and gauges (speed measurements to calculate the flow), the location of which in each watercourse would be indicated on a map;
- During the operational phase, monitoring of the integrity of watercourses (relative to erosion) undergoing a water modification and intervene if necessary;
- Monitoring of the groundwater level, including:
  - Water levels measured in the observation wells drilled by the proponent and in the pit;
  - Flow rates pumped daily using flowmeters installed at the pump outlets;
- Monitoring of groundwater quality beginning early in the construction phase, including:
  - Installation of additional treatment process to sedimentation and pH correction, if contaminants from the pit or groundwater are present in the perimeter pumped water (e.g., metals, nitrates and/or fluorides);
  - Monitoring at the secondary water treatment unit(s) downstream of the sedimentation ponds where the Lake 3, 4 and 6 outfalls are located, as required;
- Monitoring of the quality of the water pumped by the wells on the periphery of the pit, taken from the sedimentation basins, before it is mixed with the water from receiving Lakes 3, 4 and 6, from the start of the operating phase, in order to obtain a more accurate and complete picture and to analyze the results in a global manner to determine if an additional treatment system in the sedimentation basins should be installed. Monitoring should include, but not be limited to:
  - Regular monitoring of dissolved oxygen concentration, temperature, and groundwater flow from perimeter wells prior to discharge to Lakes 3, 4 and 6;
  - Sampling of effluents three times per week for suspended matter and pH, one time per week for indicator metals (As, Cu, Fe, Pb, Ni, Zn) and one time per month for acute toxicity. ECCC recommends adding lithium and tantalum which are the target metals for the operation to the monitoring program as well as fluorides and metals exceeding the Canadian Council of Ministers of the Environment's water quality guidelines, at a frequency of once a week;
- Monitoring of the water quality of the final effluent from the main treatment plant by measuring suspended solids, pH, indicator metals and acute toxicity at a frequency of three times per week to one time per month, depending on the parameter. ECCC recommends adding tantalum and lithium to the list of metals at the same frequency;
- Given the lack of critical threshold data for tantalum, close monitoring of tantalum concentrations in the receiving lakes and watercourses, including:
  - During the construction phase, measurement in Watercourse A with monthly sampling;
  - During the operational phase, monitoring according to the same frequencies as those prescribed for other metals by government requirements;
- Monitoring of the quality of surface water in the receiving environment. In doing so:

  - Implement the monitoring programme from the start of the works and maintain it during all phases of the project (construction, operation, closure and post-closure);;
  - Monitoring using sampling stations in the natural environment, i.e. in water bodies that are not part of the mine site. The sampling stations and parameters used to establish the initial status of the water bodies provide an excellent basis for continued monitoring of effects on surface waters;
  - Adding, in addition to the metals identified in the initial state of the water bodies, of tantalum and lithium, as these are the metals sought in the project and are present on the site;
- Monitoring of physicochemical parameters relevant to fish habitat, including, but not limited to, dissolved oxygen and temperature profiles, and metals identified in the initial status of the water bodies, which will make it possible to assess, if necessary, the effects of the project on Lakes 3, 4 and 6, as well as Lakes 18 and 19, during the operational phase and carry out this monitoring at appropriate times and with appropriate frequency. Include an adequate baseline in the monitoring;
- Monitoring allowing to determine the extent to which dust and sediment inputs from mining activities are likely to affect fish habitat in Lakes 3, 18 and 19, including lake depth, sediment granulometry and water turbidity, until mine closure. Include an adequate baseline condition in the monitoring;
- During the operational and decommissioning phase, monitor the physico-chemical quality of the sediments, including tantalum, upstream and downstream of Watercourse A in order to estimate the potential for bioaccumulation of this metal in aquatic organisms;
- During the operational and decommissioning phase, geochemical characterization of waste rock, tailings and ore in order to validate compliance with the initial characterization results, compare them with changes in water quality at the mine site and adapt the recovery plan as required;
- Monitoring of the tailings accumulation area during operation by visual inspection to detect acid mine drainage, if any. Develop an action plan, including mitigation measures, if acid mine drainage is present;
- Inspect the sedimentation ponds during the operational phase to verify their residual capacity and to trigger the emptying of the ponds at the appropriate time;
- Monitoring program to demonstrate the maintenance of Lake 3 fish habitats and populations, particularly lake whitefish, during the operational phase, and including an adequate reference condition in the monitoring. Particular attention should be given to the frequency and methods of sampling to limit fish mortality;
- Maintaining and doing a follow-up on the free passage of fish in Watercourse E, between Lake 3 and Eastmain-1 reservoir, at the culvert under the Nemiscau-Eastmain-1 road; and
- In the decommissioning and post-decommissioning phase, monitor the flow (flow rates and direction of flow) of water from the mine site.

5.2 Wetlands

The project could cause residual effects on wetlands resulting from the destruction of several hectares of wetlands. However, the Committee believes that these effects are not likely to be significant given the implementation of the mitigation measures, including the compensation plan and the follow-up measures recommended in section 5.2.2. To determine the significance of the effects on wetlands, the Committee assessed, among other things, whether the project is likely to result in a net loss of wetland functions.

The following subsections present the information considered by the Committee in its analysis to conclude on the significance of the project's effects on wetlands, including the opinions and comments of government experts and Cree Nations consulted.

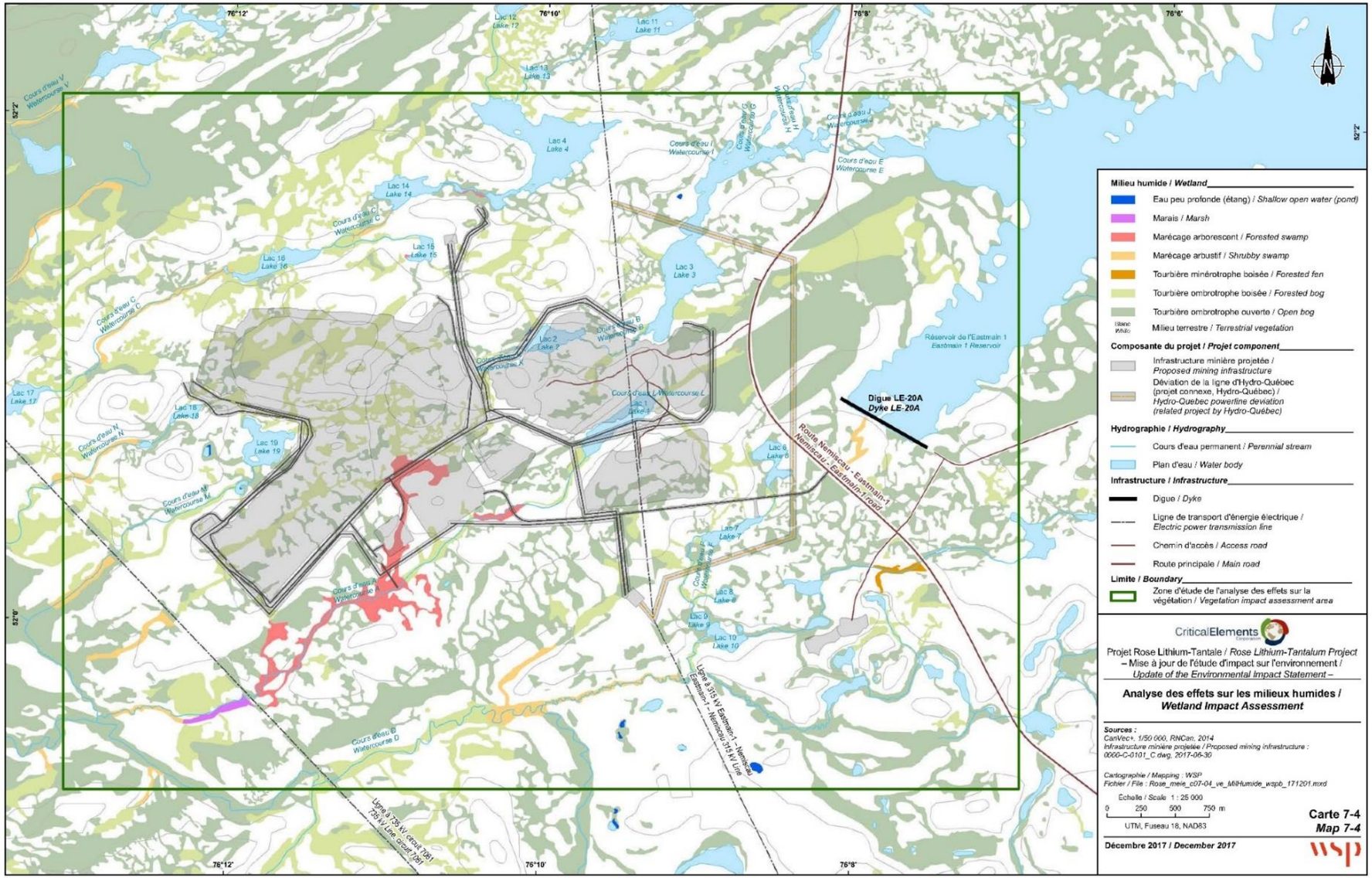
5.2.1 Analysis of Potential Effects and Proposed Mitigation Measures

A wetland is land where the water table is near or above the surface, or is saturated with water for a long enough period to create conditions such as water-modified soils and hydrophilic vegetation[12]. For wetlands located on lands where provincial jurisdiction applies, as is the case for this project, Quebec's *Loi concernant la conservation des milieux humides et hydriques* (Act for the Conservation of Wetlands and Watercourses) provides for the application of the "avoid-minimize-compensate" sequence and recommends, at all times, an approach that ensures the maintenance of functional ecosystems, rather than the restoration of fragmented and degraded environments.

The proponent inventoried eight categories of wetlands totalling 3,098.3 hectares in the study area (Figure 9): open ombrotrophic bogs, wooded ombrotrophic bogs, shrub swamps, treed swamps, marshes, ponds (shallow water and aquatic grasslands), wooded minerotrophic fens and open minerotrophic fens. All of these wetlands are common in the James Bay region. The proponent specified that no special-status plant species was detected during the vegetation inventories. Wetlands occupy 30.5% of the study area. Table 5 presents the areas of wetlands by category in the study area.

[12] With an affinity for water.

Figure 9: Location of Wetlands in the Study Area



Source: WSP Canada Inc. (February 2019a)

Table 5: Surface Area of Wetlands Directly Affected by the Project

Type of Wetland	Surface Area (in hectares)	Occupied Proportion in the Study Area (in %)
Open ombrotrophic bog	2,319.22	22.8
Wooded ombrotrophic bog	671.43	6.6
Shrub swamp	61.7	0.6
Treed swamp	32.19	0.3
Marsh	7.99	0.1
Pond (shallow water and aquatic grasslands)	2.47	<0.1
Wooded minerotrophic fen	2.11	<0.1
Open minerotrophic fen	1.19	<0.1
Total	3,098.3	30.5

Of the 51 wetlands identified, four have high ecological value, including two treed swamps, one shrub swamp and one open ombrotrophic bog. According to the proponent, these high ecological value environments totalling 31.75 hectares stand out for their good ecological integrity, their quality hydrological links and their maturity. Of the other wetlands, 43 have average ecological value and four have low ecological value.

Based on available information, Environment and Climate Change Canada (ECCC) believes that the project would be carried out in an area where wetland loss and degradation require special measures as they are considered to be moderate. ECCC therefore believes that special attention should be paid to limit any additional loss of wetlands in this region. ECCC adds that the project would not be carried out in a region where wetland loss or degradation reaches critical proportions[13].

Loss and Alteration of Wetlands

During the construction phase, the preparation of the site for the installation of the work site and mining infrastructures would result in the loss and direct disturbance of part of the wetlands identified in the study area. According to the proponent, the creation of the pit and infrastructure would cause the destruction of 139.44 hectares of wetlands, including areas of high ecological value. The environments considered lost include those in the footprint of the pit, accumulation areas for overburden, waste rock, dry tailings and ore, basins, roads, ditches and related infrastructure such as buildings. Additional wetlands within the mine site footprint would be directly disturbed by the project (34.11 hectares). The proponent determined that the project would result in a total loss of 173.55 hectares of wetlands.

[13] ECCC's advice is based on the map of specific geographic areas in Appendix 2 of the *Federal Policy on Wetland Conservation: Implementation Guide for Federal Land Managers* (ECCC, 2016).

During the operation phase, the dewatering of lakes and watercoursess, the reduction and increase of flows and the pumping of the pit and groundwater table, described in Section 5.1 (Fish and Fish Habitat), could cause changes to watercourses. These alterations could indirectly disturb 768.21 hectares of wetlands in the study area.

Figure 10 locates the wetlands within the project footprint. The two treed swamps of high ecological value would be close to Watercourse A (polygons R7 and R34). The shrub swamp and open ombrotrophic bog of high ecological value would be within the pit footprint (polygons R46 and 379). These would be entirely lost. However, the majority of the wetlands lost would be ombrotrophic bogs of low ecological value.

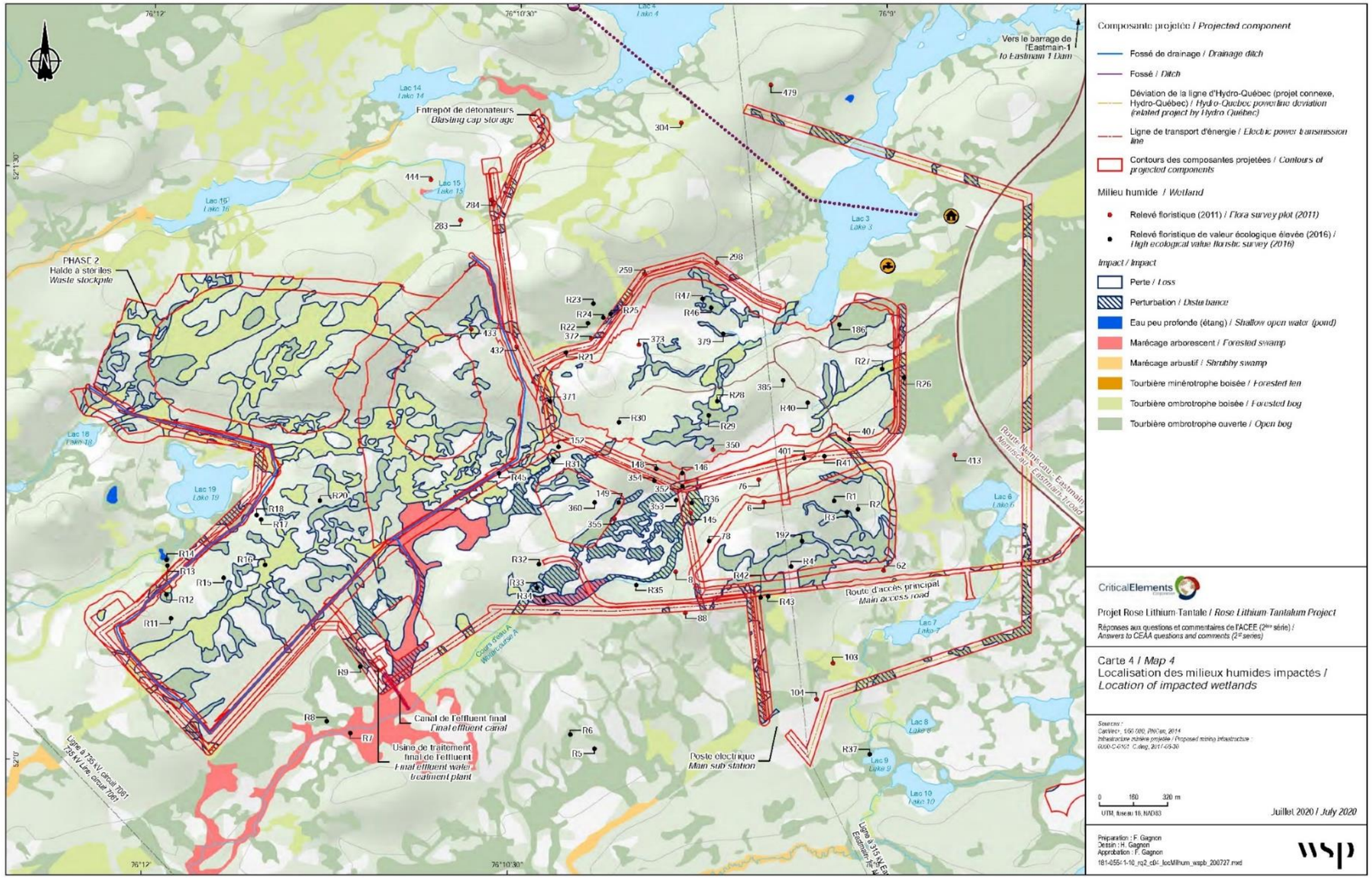
Table 6 shows the surface areas of wetlands within the project footprint that would be destroyed or disturbed. The planned watercourse alterations would have a greater impact on the marshes and swamps around the project, as these wetlands have an important connection to watercourses. Bogs and ponds, which do not have a significant connection to watercourses, would be more sensitive to the effects of pumping from the pit and the water table.

Table 6: Assessment of the Loss and Disturbance of Wetlands Affected by Mining Infrastructure

Type of Wetland	Destroyed Surface Area (in hectares)	Directly Disturbed Surface Area (in hectares)	Indirectly Disturbed Surface Area (in hectares)	Total (in hectares)
Open ombrotrophic bog	58.94	23.52	556.3	638.76
Wooded ombrotrophic bog	72.15	6.9	177.66	256.71
Shrub swamp	0.24	0	10.05	10.29
Treed swamp	8.11	3.61	20.24	31.96
Marsh	0	0	2.43	2.43
Pond (shallow water and aquatic grasslands)	0	0.08	1.53	1.61
Wooded minerotrophic fen	0	0	0	0
Open minerotrophic fen	0	0	0	0
Total	139.44	34.11	768.21	941.76

Although the proponent anticipates the return to a natural environment for certain parts of the mine site after its restoration, the destruction and disturbance of wetlands is considered permanent, even though some environments could recover after mine closure. In some cases, indirectly disturbed areas would be permanently disturbed. In the case of wetlands affected by changes in watercourses, such as marshes and swamps, the disturbance could be permanent. Conversely, the indirect effects on ombrotrophic bogs and ponds could gradually fade at the end of mine operations and at the end of the pumping of the pit and the water table in the periphery of the pit. With the end of mine operations and pumping, the water table would return to its original water levels and the indirect effects on ombrotrophic bogs and ponds would gradually diminish.

Figure 10: Wetland Losses and Changes in the Project Footprint



Source: WSP Canada Inc. (February 2019b)

The proponent chose the location of the project's components in such a way as to minimize the effects on wetlands. Although the project would result in the loss and direct disturbance of 173.55 hectares of wetlands, this would represent only 5.6% of the area of wetlands included in the study area. ECCC is satisfied with the application of the “avoid-minimize-compensate” sequence that led the proponent to choose the location of the project components in such a way as to limit the permanent loss of wetlands and their functions. ECCC considers that avoiding work in wetlands is the most effective mitigation measure.

The proponent plans to file a “wetland or watercourse compensation plan” to be approved by the Government of Quebec after the project is approved, if applicable. A preliminary version of this plan has been presented to the Committee and provides for the development of five borrow pits in the vicinity of the project. A minimum of 42.1 hectares of wetlands and a maximum of 5.8 hectares of land would be compensated. The proponent explains that, given the regional context in which the project would be implemented, only a portion of the surface areas that would be lost in the project sector could be compensated for. The proponent believes that the territory is barely developed and the presence of wetlands is prevalent. There would therefore be few options for restoring or creating new wetlands. ECCC recommends that a detailed version of the compensation plan for the loss of wetlands be developed as soon as possible, before construction begins.

The proponent anticipates that its compensation activities in the five proposed borrow pits would consist of marshes and shallow water marshes (11.6 hectares), treed swamps (14.7 hectares) and shrub swamps (15.8 hectares). The proponent took into account maximizing the marsh-swamp and shallow water areas in order to increase the water retention capacity and regulate the water levels of the environments that would be developed. The proponent also determined during inventories that shrub swamps and treed swamps were the environments with the highest ecological values in the study area. The development of these disturbed sites should enable them to ensure their ecological functions in terms of hydrology, improvement of water quality, habitat and climate. ECCC believes that the compensation plan should be implemented before the loss of wetlands occurs, as recommended by ECCC's *Operational Framework for Use of Conservation Allowances*.

The proponent is also planning a follow-up program that would make it possible to more accurately assess the effects of changes to watercourses on wetlands. According to the proponent’s estimates, the newly developed wetlands could reach a certain balance after 5 years. Those that have been disturbed within a 100-metre radius of the mine site's infrastructures could return to natural conditions within 5 to 15 years after the project's closure.

Loss of Wetlands Functions

Wetlands have several functions in the environment related to hydrology, biogeochemistry, habitats, particularly for species at risk, and socio-economic functions. The diversity of these wetlands and their functions contributes to the health of ecosystems.

The ombrotrophic bogs are the wetland type that will be most affected by the project (Table 7). Approximately 161.51 hectares of ombrotrophic bogs would be destroyed or directly affected by the project. Bogs have as their main functions the export of nutrients and carbon sequestration. The disruption of these carbon sinks results in the interruption or modification of a natural, ongoing process that removes carbon from the

atmosphere. Bogs also support biodiversity, serve as habitat for certain species at risk, and are characterized by high biological productivity.

Rather, ponds and wetlands support hydrological functions such as flow regulation, aquifer recharge, climate regulation and erosion protection. These environments also help improve water quality. Since the surface areas of ponds and wetlands affected by the project would be small, overall functions associated with hydrological processes would be less affected.

The description of the ecological functions of wetlands makes it possible to appreciate their role as a habitat for avian fauna. However, ECCC points out that the habitat function for species at risk has only briefly been dealt with by the proponent and that the socio-economic functions of wetlands have not been assessed.

Table 7: Main Functions of the Wetlands Affected by the Project

Type of Wetland	Destroyed and directly disturbed Surface Area (in hectares)	Main Functions		
		Hydrological Functions	Biogeochemical Functions	Habitat Functions
Pond	0.08	• Flow control • Aquifer recharge • Climate control	• Improvement of water quality	• Biodiversity support • Species at risk • Migratory birds habitats
Treed and shrub swamps	11.96	• Flow control • Protection against erosion • Climate control	• Improvement of water quality	• Biodiversity support • Species at risk
Ombrotrophic bog	161.51	---	• Export of nutrients • Carbon sequestration	• Biodiversity support • Species at risk • Biological productivity

The ecological functions of the wetlands that would be destroyed (139.44 hectares) by the project are considered lost. For the wetlands that would be directly disturbed by the project (34.11 hectares), some of their functions could be preserved, depending on the type of wetland, its location and the nature or intensity of the disturbance. The proponent quantified the losses of wetlands frequented by migratory birds and estimated that for open ombrotrophic bogs, a maximum of 200 breeding pairs could be affected due to habitat loss.

According to the proponent, the implementation of a compensation plan for five borrow pits located near the project could minimize the project's effects on the loss of wetland functions. The proponent anticipates that revegetation, the configuration of shallow waters (ponds) and the site-specific development of a mosaic of

habitats would create favourable conditions for the use of the sites by various wildlife species. The growth of plants that would be introduced into wet and terrestrial environments would help carbon sequestration. However, it would be difficult to recover carbon sequestration levels comparable to those of the lost environments.

According to the proponent, most of the wetlands that would be affected by the project in the study area present a low quality habitat for migratory birds. The proponent's compensation plan calls for the establishment of islands of herbaceous or shrubby vegetation to create nesting or feeding habitat conditions for several species of birds. The proponent believes that the wetlands created would be of greater ecological value than those that would be destroyed. ECCC believes that the implementation of compensatory measures would meet the objectives of the *Federal Policy on Wetland Conservation* and compensate for the loss of functions, particularly the loss of habitat for migratory birds and species at risk. However, ECCC emphasizes that, because of the uncertainties inherent in the implementation of any wetland compensation plan, the plan should include a follow-up program that will make it possible, where applicable, to identify the corrective measures that may need to be implemented.

Introduction and Propagation of Invasive Alien Species

According to the proponent, the development of the construction site and mine site as well as the transportation and circulation of machinery in the work area could promote the introduction or propagation of invasive alien species in wetlands at all stages of the project. However, the harsh climatic conditions in the study area could limit the growth potential of some of these species, which are more common in southern Quebec.

Small colonies of reed canary grass, a perennial grass plant considered an invasive alien plant, were observed by the proponent in the study area. This species was mainly observed in the wasteland present in the power line right-of-way and in a former access road bordering a bog.

In order to minimize the risks of introduction and propagation of these species, the proponent has planned measures such as ensuring that construction equipment is cleaned before arriving at the mine site so that it is free of mud, animal or plant fragments. Should the work require the relocation of soil, the proponent has planned to examine it beforehand to identify the potential presence of invasive alien species. The proponent would then manage the affected soil in order to reduce the risk of propagation. A follow-up in the areas that would be restored and revegetated is also planned 2 years after the end of the project to verify whether invasive alien species have become established.

Risk of Accidental Hydrocarbon Spills

Many of the equipment and machinery present on the site would require the use of hydrocarbons for their operation. Accidental spills into the environment could occur mainly during the refuelling of this equipment or in the event of machinery breakdown. In the event of a spill in a wetland, the product would come into contact with plants, sediments and soils. Such a spill would cause damage to the ecosystem and aquatic fauna and flora. It could lead to the loss of suitable habitats for certain wildlife species in the more or less long-term. The proponent plans work practices to avoid accidental spills, including an emergency plan detailed in section 7.1 (Effects of Accidents and Malfunctions). In the event of a spill, contaminated soil would

be managed in accordance with current regulations. According to the proponent, the environmental risks related to spills would be low and, if they did occur, they would be located at the construction site.

The proponent also plans to implement an environmental monitoring program to ensure compliance with laws, policies and regulations in force, with the proponent's commitments and obligations, with the plans and specifications, and with the various mitigation measures proposed to minimize the effects on wetlands. According to ECCC, the monitoring program should also aim to quickly identify unforeseen sources of potential effects that could occur, such as encroachments or spills resulting from accidents or malfunctions.

ECCC believes that the mitigation measures planned by the proponent, including the implementation of a compensation plan submitted for review by the competent authorities, would make it possible to minimize the project's residual environmental effects on wetlands.

5.2.2 Analysis and Conclusions of the Joint Assessment Committee on Residual Effects

The Committee assessed the residual effects related to wetlands based on the Environmental Effects Assessment Criteria in Appendix A. The Committee believes that the project is not likely to cause significant adverse environmental effects on wetlands if the following key mitigation measures (including the compensation plan) and follow-up measures are implemented. The adverse effects related to the loss of wetlands and their ecological functions would only be partially compensated for by the preliminary compensation plan submitted by the proponent at the time of the environmental assessment. However, ECCC notes the proponent's commitment to fully compensate for the loss of wetlands functions. This plan would have to be approved by the Government of Quebec and implemented by the proponent in order to meet the provincial regulatory requirements of the *Loi sur la qualité de l'environnement* (Environment Quality Act). The analysis is detailed in the following paragraphs.

The loss of wetlands is local in extent, as the expected losses would be within the footprint of the mine site and habitat disturbance would be noticeable at the periphery of the site in the study area. The effect would be felt from the outset of the project, over the long term and with a continuous frequency. From the construction phase, wetlands would be destroyed to develop the project site. The loss of wetlands is considered irreversible. Since the project would be located in an area where wetland losses or wetland functions require special measures and the project would result in a loss of wetland ecological functions, the intensity of the effects is basically considered high. As the proponent has committed to compensate for the loss of wetlands functions, ECCC considers, however, that the implementation of compensatory measures would meet the objectives of the *Federal Policy on Wetland Conservation* and compensate for the loss of wetland functions. The Committee believes that once the wetland compensation plan is improved and approved by the Government of Quebec, it could then limit the effects caused by the loss of wetlands and their functions. The intensity of the effect would thus be reduced to a "moderate" level since the project would affect the wetlands, but without causing a net loss of their ecological functions. The Committee also recommends that the proponent improve their compensation plan by including contribution and collaboration initiatives in research or compensation projects on wetlands. The Committee therefore concludes that the residual effect would be moderate and not significant.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the proposed project does not cause significant adverse environmental effects on wetlands. The Committee took into account the mitigation and compensation measures proposed by the proponent[14] and the opinions of government experts. The key mitigation measures are the following:

- Avoidance of work in wetlands, whenever possible;
- Development and implementation of a compensation plan for the loss of wetlands related to the project in collaboration with the affected Cree Nations, the Cree Nation Government and the competent authorities. In collaboration with the affected Cree Nations and the tallymen, the proponent is also encouraged to identify, contribute and collaborate in research or compensation projects on wetlands that would make it possible to compensate for the losses that would be generated by the project. The detailed compensation plan must:
  - clearly demonstrate how it will meet the objective of reducing the loss of wetland functions, specifying the functions that will be compensated and the balance of losses after compensation;
  - identify and justify the performance indicators that will allow the success of the compensation measure to be assessed and identify additional measures that could be implemented if the performance indicators are not met;
  - demonstrate that compensation will be sustainable over time;
  - be submitted to the Impact Assessment Agency of Canada and the relevant authorities as soon as possible for review and comment prior to the start of construction;
- Conduct of work on frozen ground, during periods of low water conditions or using construction equipment that exerts low pressure on the ground when the machinery must circulate in a wetland. Wooden mats or fascines could also be used if necessary;
- Maintenance of drainage conditions in wetlands adjacent to work areas;
- Prevention of the introduction of invasive alien species into the project study area by ensuring that construction equipment is cleaned prior to arrival at the mine site so that it is free of mud, animal or plant fragments;
- During the closure phase, restoration of natural drainage and stream banks within the project footprint;
- Delimitation of areas containing invasive alien species in order to ensure soil management without risk of propagation;
- Cleaning of all vehicles and machinery that have been driven through any area that contains invasive alien species.

[14] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

In addition, adherence to the key measures identified in the other chapters of this Report would minimize the effects on other environmental components affected by the project that could affect wetlands. Adjustments to the mitigation measures could be made if necessary to minimize adverse environmental effects.

Need for Follow-up and Follow-up Requirements

The Committee recommends the implementation of follow-up programs to verify the prediction of effects on wetlands and the effectiveness of proposed mitigation measures:

- Monitoring of wetlands on and near the mine site to verify the accuracy of the environmental assessment predictions, to ensure the effectiveness of mitigation measures and to more accurately assess the effects of changes to watercourses on different types of wetlands in order to document, among other things, the effects of the project on plant communities and the maintenance of ecological functions. This follow-up program must be presented as soon as possible to the Committee and the competent authorities for comments in order to examine the objectives, methodology, performance indicators and duration required to adequately assess the effectiveness of the mitigation or compensation measures that will have been implemented for the wetlands;
- Development and implementation of a wetlands monitoring program with the objective of rapidly identifying unanticipated sources of potential effects that may occur, such as encroachments or spills resulting from accidents or malfunctions;
- Follow-up of the compensation plan for the loss of wetlands related to the project during the first 5 years at minimum, following the work that will allow, where applicable, to identify corrective measures that may need to be put in place. The duration of the monitoring will have to be reviewed and adjusted according to the results obtained;
- Follow-up minimum 2 years after the end of the work in order to verify whether invasive alien species have become established in the project area and in the wetlands that will have been restored.

5.3 Migratory Birds and Birds at Risk

The project could result in residual effects on migratory birds, birds at risk and their habitat due to habitat loss, mortality risk and disturbance of birds, their nests or their eggs. However, the Committee believes that these effects are not likely to be significant given the implementation of the mitigation and follow-up measures recommended in Section 5.3.2. To determine the significance of the effects on these birds and their habitat, the Committee assesses, among other things, whether the project's effects could adversely affect one or more important phases of their life cycle, the maintenance of their populations or the maintenance, management or recovery of birds at risk.

The Committee assessed the effects on traditional resource use, including goose hunting and small game birds, in section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations).

The following subsections present the information considered by the Committee in its analysis, including the opinions and comments of government experts and Cree Nations consulted.

5.3.1 Analysis of Potential Effects and Proposed Mitigation Measures

The Committee assessed the effects of the project on migratory birds, their eggs, their nests and their habitats, as well as the bird species listed on Schedule 1 of the *Species at Risk Act* (SARA). Migratory birds are those listed in the schedule of the *Migratory Birds Convention Act, 1994*.

In order to put together a profile of the bird fauna, the proponent used the natural environment study area, which covers an area of approximately 100 square kilometres on the periphery of the future mine site (Figure 2). The project site is currently frequented by avian fauna during the spring and fall migration periods, as well as during nesting and raising of young birds. The proponent analyzed data from all available sources of information and field inventories. A total of 97 avian species, both migratory and non-migratory, are potentially present in the study area. At least 24 species of waterfowl, 27 species of aquatic birds and 61 species of land birds are likely to frequent the study area. Some waterfowl species, such as Canada geese and snow geese, are valued by the Cree Nations. The nesting of 9 avian species has been confirmed. The proponent assigns probable nesting status to 21 species and possible nesting status to 38 other species.

There are seven species at risk protected under SARA that have been inventoried in the study area or that are likely to frequent the study area. The common nighthawk and short-eared owl have notably been inventoried during the nesting season. The study area is also believed to have nesting potential for the Canada warbler, olive-sided flycatcher and rusty blackbird, which are designated as Threatened, Endangered and Special Concern species under SARA, respectively. Harlequin ducks (species of Special Concern) and peregrine falcons (species of Special Concern) are likely to frequent the study area. ECCC confirms, based on the information submitted by the proponent, that no critical habitat for birds at risk is present within the footprint of the mine site.

According to the proponent and the Cree Nations consulted, the Eastmain-1 hydroelectric development reservoir, located northeast of the future mine site, is a preferred area for certain migratory species, particularly waterfowl.

Habitat Loss and Mortality

According to the proponent, habitat loss would be the main negative effect caused by the project on birds. It would result from the implementation of mining infrastructure, which requires site preparation (soil stripping, deforestation, excavation and earthworks). The proponent anticipates an increased risk of mortality (e.g., destruction of nests) given the nature of the work to be carried out. The dewatering of lakes and changes in water levels in watercourses and other water bodies would also contribute to this habitat loss, particularly for waterfowl species.

The total footprint of the project, and hence the expected habitat loss for migratory birds, is 614 hectares. It includes terrestrial environments (427.38 hectares), treed wetlands (90.77 hectares), open wetlands (82.54 hectares), lakes (13.09 hectares), shrubby wetlands (0.24 hectares) and already modified environments (0.50 hectares). The proponent maintains, however, that a large proportion of the wetlands that would be destroyed or modified by the project are ombrotrophic bogs, which would constitute a low-quality habitat for

migratory birds, particularly because of their linear and discontinuous appearance. Table 8 provides a complete picture of habitat and breeding pair losses by type of bird inventoried (migratory and non-migratory, excluding birds at risk).

Table 8: Habitat and Breeding Pair Losses by Type of Bird, Excluding Birds at Risk

Type of Bird	Habitat Loss (in hectares)	Number of Potentially Affected Species	Breeding Pair Losses
Waterfowl	614.02	13	5.25
Aquatic birds	614.02	2	0.28
Birds of prey	614.02	6	3
Forest land birds associated with softwood lichen stands	301.90	24	854.37
Forest land birds associated with sphagnum peat moss stands	90.77	17	260.52
Forest land birds associated with mixed stands	88.08	17	229.01
Forest land birds associated with deciduous stands	21.71	14	73.59
Land birds associated with ponds	0.08	2	1
Land birds associated with open bogs	82.46	10	99
Shorebirds	82.54	4	1

According to the proponent, with the exception of the common nighthawk, the project would affect critical habitats in the study area that are currently not used by birds at risk. Table 9 details the expected habitat losses for the 5 species of birds at risk protected under SARA for which a loss of critical habitat is anticipated.

Table 9: Loss of Critical Habitat by Bird Species at Risk Protected under the *Species at Risk Act*

Bird Species at Risk	Loss of Critical Habitat (in hectares)
Common nighthawk	275.36
Short-eared owl	4.57
Olive-sided flycatcher	0.00 (habitat is not affected)
Canada warbler	110.03
Rusty blackbird	152.44

According to ECCC, the recovery documents identify habitat loss or degradation on the breeding grounds as a potential threat to the recovery or survival of 5 species of birds at risk. Loss of nesting and feeding habitat can also have potential effects on birds, particularly on breeding pairs that will have to relocate to similar habitats nearby. When these habitats become scarcer, an increase in the density of birds in the same

habitat can occur, leading to a scarcity of resources and an increase in predation. Thus, the destruction and deterioration of habitats contribute directly or indirectly to the decline of certain more vulnerable species.

The proponent has planned several measures to reduce the negative effects of the project on the habitat of migratory birds and birds at risk and thus avoid mortality risks. In particular, it plans to develop a compensation plan, as described in section 5.2 (Wetlands), to compensate for the loss of wetlands, and to raise awareness and train its employees about the presence of bird nests. It also plans to carry out deforestation during the construction phase and outside the birds' nesting period, as far as possible, paying particular attention to the presence of eggs and nests. ECCC believes that the best way to avoid adverse effects on migratory birds (such as injuring, killing or disturbing migratory birds or destroying and disturbing their nests and eggs) is to carry out the work outside the nesting period. Since the proponent has not undertaken to carry out site preparation work, particularly clearing and brushing, outside the nesting season, there is a risk of causing negative effects on migratory birds, particularly if such work is carried out during the nesting season. ECCC believes that if the proponent conducts nest monitoring, it should be non-intrusive.

Disturbances Due to Noise, Light, Dust and Risk of Collision

Mining infrastructure and activities can cause noise, light and dust that can disturb the behaviour of birds. Mortality risks would also be increased due to potential collisions related to the presence of infrastructure and traffic on the site, particularly during site preparation, construction and operation.

Noise

The proponent measured current noise levels of 40 decibels at two Cree camps located respectively 2 and 4 kilometres from the centre of the future mine site, which corresponds to levels typically measured in a natural environment. According to the proponent, the scientific literature specifies that a sound level of 40 decibels is the threshold at which negative effects are observed in birds. Above this threshold, changes can occur in reproductive success and communication between species. Birds also avoid these areas. The proponent plans to comply with provincial standards of 55 decibels during the day and 45 decibels at night, as set out in Quebec's Noise Instruction Note 98-01 and the *Lignes directrices relativement aux niveaux sonores provenant d'un chantier de construction industriel du Québec* (Guideline for Noise Levels from an Industrial Construction Site in Quebec). Given the sound power of the equipment planned to be used for the construction and operation phases (e.g., hydraulic shovels, off-road trucks, crushers, etc.), the Committee believes that the noise level in the project footprint would exceed the 40-decibel threshold, which would encourage birds to avoid the area of the future mine site.

The sector of dikes LE-22, LE-23 and LE-24C of the Eastmain-1 reservoir located near or in the proponent's study area is a migratory stopover for waterfowl and an important hunting area valued by the Crees. The noise caused by the project could cause waterfowl to move to a quieter area. During the Committee's consultations, certain members of the Cree Nations raised concerns about the noise associated with blasting and the passage of heavy trucks during goose hunting seasons. In response to these concerns, the proponent plans to reduce the frequency of blasting activities and truck traffic during hunting periods (see section 6.1 Current Use of Lands and Resources for Traditional Purposes by Cree Nations). The proponent

also commits to meeting the provincial standards set out in the *Directive 019 sur l'industrie minière* (Mining Industry Directive 019) for an open-pit mine.

In order to mitigate the disturbances associated with noise, both for one-time (blasting) and ongoing (drilling) events, the proponent intends to apply additional measures, includingvehicle circulation at reduced speed to limit noise and vibration emissions.Light and Collision Risks

Migrating birds may be attracted to night-time lighting that causes them to deviate from their migratory route. In foggy conditions, they may also collide with infrastructure such as lighting towers. According to the proponent, artificial light would be limited to a 300-metre zone around the mine. The level of light generated towards the sky would be low. In order to minimize the negative effects of light on migratory birds and birds at risk, the proponent proposes, among other things, to install bulbs that have a lower light impact and limit light emission towards the sky by directing the luminous flux towards surfaces.

Dust

Dust emitted from construction activities, extraction and storage of mine tailings and from transportation to the site could affect air quality and wildlife through deposition. Using atmospheric dispersion modelling scenarios, the proponent estimates that the expected dust concentrations would be below the standards set by the *Canadian Environmental Protection Act* and Quebec's *Clean Air Regulation (Environment Quality Act)*. The proponent concludes that the degradation of atmospheric quality by dust would be limited to the immediate environment of the site, resulting in a negligible effect on wildlife. Nevertheless, the proponent proposes numerous measures to reduce the negative impacts of dust on migratory birds and birds at risk. For example, it proposes to sprinkle water on roads around the mine site, fit its drilling equipment with dust control devices and implement an air quality and dust control monitoring program.

Spill Risks

According to the proponent, the most likely risk of a hazardous material spill is related to the supply of hydrocarbons. A spill could cause health problems in birds in direct or indirect contact with the product (injuries, body burns, hypothermia or loss of feathers' waterproofness). However, the proponent believes that birds have the ability to move quickly. They would therefore be less likely to feel the effects of such an event. The risks of spills and the proposed measures are discussed in greater detail in section 7.1 (Effects of Accidents and Malfunctions).

Risks of Contamination in Water Storage Basins

According to the proponent, birds using the water storage basins for feeding or grooming purposes (e.g., feather smoothing) could be contaminated, since their water would contain suspended solids and heavy metals that could accumulate in the birds' tissues. The proponent undertakes to install well-established scaring equipment to keep avian fauna away from the storage basins. The proponent also undertakes to set up a monitoring program for the storage basins.

In sum, ECCC believes that the mitigation measures proposed by the proponent would reduce the project's effects on migratory birds, particularly for healthy and resilient populations, provided that all the mitigation measures previously stated are implemented in a timely manner. However, residual effects would remain due to disturbance caused by noise (blasting, transportation, use of equipment, etc.), light, the loss, modification or alteration of habitat, as well as by-catches caused by collisions or otherwise.

For birds at risk, ECCC considers that the mitigation measures would reduce the project's effects on these species or their habitat, given that these are species with a wide distribution in Quebec that do not frequent the project area and that could find other potential breeding habitats at the regional level.

5.3.2 Analysis and Conclusions of the Joint Assessment Committee on Residual Effects

The Committee's analysis is based on the proponent's assessment of the effects on migratory birds and birds at risk protected under SARA and their habitats, on comments received from the Cree Nations as well as advice from government experts (federal, provincial and Cree).

After taking into account the implementation of the key mitigation measures and follow-up measures described in this section, the Committee believes that the project is not likely to cause significant adverse effects on migratory birds and birds at risk. The Committee considers that the proponent has adequately documented the effects of their project on migratory birds and birds at risk. The level of residual effects would be moderate. The Committee’s assessment of the residual effects is based on the environmental effects assessment criteria in Appendix A and the following findings.

With the 17-year mine operation phase, habitat loss, effects caused by noise, light and dust emissions, as well as the risk of collisions and contamination would be observed over the long term. Although habitat loss would be limited to the footprint of the mine site, the disturbance to birds would extend beyond the immediate project site, which is still local in extent. A partial return to the reference state could be considered from the remediation phase onwards, while these negative effects would gradually fade away. The Committee believes that these effects could be reversible in the longer term, i.e., the valued component would fully recover from the effects caused by the project.

The intensity of the negative effects of the project would be moderate. With respect to habitat loss, it could interfere with one or more important phases in the life cycle of migratory birds and birds at risk, thus reducing their abundance. The Committee notes, however, that replacement habitats exist in the natural environment’s study area. Consequently, habitat loss would not affect the maintenance of a population in the study area. The Committee emphasizes that deforestation during the construction phase would be carried out, as much as possible, outside the nesting period, which would minimize adverse effects on migratory birds . Furthermore, the Committee believes that the disturbance would not be detrimental to the maintenance of the population, as the population would be able to avoid the area. The Committee is also satisfied with the measures presented by the proponent to avoid and minimize adverse effects on migratory birds. It notes that the scaring measures should discourage birds from using the storage basins.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the project does not cause significant adverse environmental effects on migratory birds and birds at risk and their habitat. The Committee took into account the mitigation measures proposed by the proponent[15], the advice of government experts, as well as the comments received from the Cree Nations consulted. The Committee also ensured that measures consistent with any recovery strategy were taken to avoid, or mitigate, and monitor adverse effects on birds at risk should the project proceed. Adjustments to the mitigation measures could be made if necessary to minimize adverse environmental effects.The key mitigation measures are as follows:

- Carrying out the project in such a way as to protect migratory birds and to avoid injuring, killing or disturbing them, or destroying, disturbing or taking their nests or eggs. In this respect, take into account ECCC's Guidelines to Reduce Risk to Migratory Birds. In carrying out the designated project, implement measures that are consistent with the *Migratory Birds Convention Act, 1994*, the *Migratory Birds Regulations* and the *Species at Risk Act*. In doing so:
  - Deforestation should be carried out outside the nesting period, i.e., between May 30th and August 15th in order to prevent the destruction of nests. If deforestation takes place during the nesting period, do not actively search for nests unless the nests are easily located. To determine whether migratory birds are nesting in an area at a particular time, use non-intrusive monitoring methods to avoid disturbing migratory birds while nesting (such as listening stations);
  - Determination of nesting period dates based on the best available information for any year in which activities associated with the construction or operation of the project could adversely affect the nesting of migratory birds or birds at risk. It is important that measures are put in place to avoid adverse effects on birds, their nests or eggs during all phases of the project and in particular for the period from late April to early September. It should be noted that when nesting dates apply to a large area such as the Upper Rupert Plateau Ecodistrict, it is possible that locally the nesting period may begin and end earlier or later than the dates used due to microclimatic conditions specific to certain locations, or due to interannual climatic variations (e.g., early spring, cold and rainy summer);
  - If nests are found in the construction zone, establish a protection zone around the nest until nesting is complete. Protective distances must take into account the intensity, duration, frequency and proximity of the activity, but also the cumulative effect of all activities in the vicinity of the nest;
  - If it is not technically or economically feasible to carry out activities that may adversely affect nesting outside the nesting period, submit a justification to the Agency and develop and implement, in consultation with ECCC and the Monitoring Committee, additional mitigation measures to avoid adverse effects on migratory birds, including nests, eggs and their nestlings. Submit these measures to the Agency prior to their implementation;

[15] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

  - Implementation of a training and awareness program for employees on the presence of migratory bird nests and the measures to be implemented in the event that a nest is discovered;
- Limit deforestation to the designated project area;
- Compliance with the noise standards contained in Quebec's Noise Instruction Note 98-01 and taking all necessary measures to limit noise at the source;
- Prohibit the use of engine brakes within the work site area;
- Limit the speed of mining trucks on the mine site in order to limit noise, vibration and dust emissions;
- Development and implementation of a policy prohibiting the operation of engine brakes for all vehicles in the project area;
- Control of dust emissions from access and traffic routes, as well as aggregate handling in accordance with Quebec's *Clean Air Regulation (Environment Quality Act)*;
- Equip drilling equipment with dust control devices;
- Control of the duration, orientation and intensity of lighting required during each phase of the project;
- Development and implementation of an intervention plan to prevent the use of the storage basins by migratory birds. Consideration of ECCC's Beneficial Management Practices in the development of the response plan;
- Gradual rehabilitation of the project components in order to revegetate cleared areas and thus create suitable habitat for migratory birds;
- Progressive recovery of the environment at the end of the work, as the disturbed areas are no longer used. Favour the creation of favourable habitats for birds at risk species present or potentially present in the project area during recovery.

Need for Follow-up and Follow-up Requirements

In order to verify the prediction of effects on migratory birds and birds at risk protected under SARA and the effectiveness of the proposed mitigation measures, the Committee recommends that the follow-up program include the following requirements:

- Development and submission to the Agency and ECCC of a detailed general monitoring program for migratory birds and birds at risk prior to the start of construction work. In this monitoring program, take into account the construction phase. Prior to construction work, inventories may be required to establish adequate and up-to-date baseline values, since the last inventories were conducted in 2016. Take into account the knowledge of land users;
- Prior to the start of construction, implementation of a monitoring program for activities or operations that may have an effect on migratory birds and birds at risk during all phases of the project. For each activity, determine the measures to be put in place to ensure that nuisance or disturbance is reduced, particularly during the nesting period. In particular, take into account birds at risk, including the common nighthawk, which is likely to use bare areas of vegetation in the project area. Periodically update the monitoring program to take into account changes in regulations, such as a review of the status of wildlife species by the Committee on the Status of Endangered Wildlife in Canada or SARA;

- Monitoring of the composition and abundance of birds nesting on the periphery of the infrastructures during the construction, operation and closure periods in order to validate the presence and use of the area on the periphery of the project by birds at risk;
- Every five years, census of birds at risk that would be present at the periphery of the deforested area as well as in restored habitats, from the construction phase to closure, and afterwards if appropriate, indicating their density, abundance and location. All species of birds seen and heard during the inventories must be listed, with special attention paid to the following species of birds at risk: Canada warblers, olive-sided flycatchers, rusty blackbirds, common nighthawks, and short-eared owls;
- Implementation of an air quality monitoring and dust control program, as described in section 6.2 (Cree Health);
- Implementation of a basin monitoring program to prevent and minimize the negative effects of the project on migratory birds that would use all of the basins;
- Follow-up of the restored sectors with respect to all species at risk present or potentially present in the study area during the recovery and after. Determination of a monitoring period long enough to allow the habitat to become suitable for these species and thus avoid inventorying the habitat at a stage of development that is too early.

5.4 Transboundary Environmental Effects – Greenhouse Gas Emissions

The project could result in residual transboundary effects related to greenhouse gas emissions. However, the Committee believes that these effects are not likely to be significant given that the volume of greenhouse gases emitted by the project would contribute little to provincial or national emissions. The total annual emissions that would be generated by the maximum operating scenario of the mine would be in the range of 84.3 kilotonnes (84,300 tonnes) of carbon dioxide equivalent (CO_2 eq). This corresponds to approximately 0.12% of the total greenhouse gas emissions inventoried in Quebec in 2017 (Ministère de l'Environnement et de la Lutte contre les changements climatiques, 2019), and 0.012% of the total greenhouse gas emissions inventoried in Canada in 2018 (Environment and Climate Change Canada, April 2020a). The project's total emissions would be in the order of 1,519 kilotonnes of CO_2 eq.

The following subsections provide the information that the Committee considered in its analysis to conclude on the significance of transboundary environmental effects, specifically on greenhouse gas emissions, including the opinions and comments of government experts and Cree Nations consulted.

5.4.1 Analysis of potential effects and proposed mitigation measures

Greenhouse gases (GHGs) are atmospheric gases that absorb and reflect infrared radiation causing the lower layers of the atmosphere to warm. They are recognized as being one of the causes of climate change that can have various impacts on ecosystems and human health. These gases disperse at the global scale

and, for the purposes of CEAA 2012 are considered to have transboundary environmental effects. The main GHGs include carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, ozone, hydrofluorocarbons and perfluorocarbons. Greenhouse gas estimates are usually expressed in tonnes of carbon dioxide equivalent[16] (CO_2 eq) per year.

As of 2017, projects that emit more than 10 kilotonnes of CO_2 eq per year are required to report their emissions to Environment and Climate Change Canada (ECCC). At the provincial level, under the *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere,* anyone who operates an establishment that releases an amount of GHGs into the atmosphere equal to or higher than 10,000 tonnes of CO_2 eq per year is required to report emissions every year.

In 2017, total GHG emissions in Quebec amounted to 78,600 kilotonnes of CO_2 eq. For Canada as a whole, total greenhouse gas emissions in 2018 amounted to 729,000 kilotonnes of CO_2 eq (ECCC, April 2020a).

The main sources of greenhouse gas emissions identified by the proponent for the duration of the project are, in decreasing order of importance, the following:

- Diesel combustion by generators, machinery and off-road vehicles;
- Combustion of natural gas in furnaces, boilers and heating systems during the operation phase;
- Combustion of fuels for the logistical transportation of materials, consumables and personnel;
- Loss of a carbon sink during deforestation of the project area;
- Use of explosives for extraction activities;
- Indirect emissions associated with the use of electrical energy.

According to the proponent, after applying the mitigation measures proposed below, the project would emit an average of 74.1 kilotonnes of CO_2 equivalent per year, for 20.5 years. Annual emissions would peak in the operational phase at 84.3 kilotonnes per year. Table 10 shows the amounts of greenhouse gas emissions by project phase.

Table 10: Summary of the Project's Greenhouse Gas Emission Forecasts

Phase	Duration (in years)	Estimation of Greenhouse Gas Emissions	
		Annually (CO_2 eq tonnes/year)	For the duration of the phase (CO_2 eq tonnes)
Construction	1.5	34,653	51,980
Operation	17	84,283	1,432,811
Closure	2	17,082	34,163
Total	20.5	74,095	1,518,954

[16] Greenhouse gas emissions are calculated and expressed in carbon dioxide equivalent to facilitate comparison. The emission rate of each substance is multiplied by its global warming potential relative to that of carbon dioxide.

It is also important to consider that approximately 161.52 hectares of ombotrophic peatlands would be destroyed or directly affectted by the project, as mentioned in section 5.2 (Wetlands). One of the primary functions of peatlands is carbon sequestration. An impact on carbon sinks results in the interruption or modification of a natural and ongoing process that removes carbon from the atmosphere. The loss of these 161.52 hectares of ombotrophic peatland is not considered in Table 10.

The Cree Nations consulted mentioned the importance of putting in place measures to reduce greenhouse gas emissions from the project. The proponent intends to implement several measures[17] to minimize these emissions, including by using only U.S. Environmental Protection Agency Tier 4 certified machinery and mobile equipment in the operational phase, when available.

ECCC believes that the various measures proposed by the proponent are adequate and sufficient to reduce the effects of the project on GHG emissions. Among the proposed measures, some are considered more important for reducing GHGs, including: using electrical equipment wherever possible in mine operations; limiting engine idling; using the latest (Tier 4 certified) engine technology; using energy-efficient equipment, construction and design standards, procedures and operating practices; and providing eco-driving training to drivers of material hauling trucks. ECCC believes that while the above mitigation measures will reduce emissions, GHGs would be emitted during all phases of the project and would contribute to Canadian and global GHG emissions.

The Committee also recognizes the proponent's commitment to connect to the Hydro-Québec grid and to use hydropower, an energy source with low greenhouse gas emissions, as the primary source of energy to power most stationary equipment.

5.4.2 Joint Assessment Committee's Analysis and Conclusions Regarding Residual Effects

According to the Committee, significant adverse transboundary environmental effects occur when project emissions are a high contribution compared to provincial or national greenhouse gas emissions. Given the project's low contribution to provincial and national greenhouse gas emissions and the implementation of the mitigation measures described above, the Committee believes that the project is not likely to cause significant adverse environmental effects in relation to greenhouse gas emissions.

The maximum total annual emissions would occur during the operational phase of the project and would be in the order of 84.3 kilotonnes of CO_2 eq. These emissions are equivalent to approximately 0.12% of the total greenhouse gas emissions inventoried in Quebec in 2017, and approximately 0.012% of the total greenhouse gas emissions inventoried in Canada in 2018.

[17] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

By comparison, in 2018, the ten largest emitters in Canada emitted between 4,785 and 11,783 kilotonnes of CO_2 eq annually. As for the ten largest emitters in Quebec, they emitted between 763 and 1,187 kilotonnes of CO_2 eq annually (ECCC, April 2020b).

Based on this information, the Committee considers that the estimated greenhouse gas emissions from the project would be low compared to provincial and national emission levels.

ECCC notes that Canada is committed to implementing the *Pan-Canadian Framework on Clean Growth and Climate Change*, strengthening existing greenhouse gas reduction measures and introducing new ones in order to exceed Canada's 2030 emissions reduction target. Thus, any greenhouse gas emissions from the project, despite the measures that would be put in place, could result in a negative residual effect.

Identification of Key Mitigation Measures

The Committee has determined that, as key mitigation measures, the proponent would have to:

- Exclusive use of U.S. Environmental Protection Agency Tier 4 certified machinery and mobile equipment in the operational phase, when available;
- Whenever possible, use of electrical equipment during the operation phase and electric buses to transport employees during all phases of the project;
- Limitation of engine idling;
- Use of energy-efficient equipment, construction and design standards, procedures and operating procedures;
- Eco-driving training of truck drivers transporting materials.

The Committee has identified multiple key mitigation measures to reduce the effects of the project on air quality and the health of Cree Nations that would also help reduce greenhouse gas emissions (see section 6.2 Cree Health).

Considering the project's low contribution to provincial and national greenhouse gas emissions, the Committee has not identified any other key mitigation measures. However, the Committee considers that the proponent must implement all achievable mitigation measures that would reduce the project's contribution to greenhouse gas emissions.

Need for Follow-up and Follow-up Requirements

Given the project's small contribution to provincial and national greenhouse gas emissions, the Committee considers that monitoring is not needed to verify the predicted transboundary effects or the effectiveness of mitigation measures. However, the Committee notes that the proponent would be required to monitor and report greenhouse gas emissions annually to ECCC and to the Government of Quebec, as they would exceed the reporting threshold of 10 kilotonnes of CO_2 eq per year.

5.5 Species at Risk

5.5.1 Analysis of Potential Effects and Proposed Mitigation Measures

Species at risk include species that receive legal protection under Schedule 1 of Canada's *Species at Risk Act* (SARA). For the project, at least five mammalian wildlife species at risk have been observed or are likely to frequent the territory: woodland caribou, migratory caribou, little brown myotis, northern myotis, and wolverine.

In general, ECCC believes that all relevant mitigation measures proposed by the proponent below to minimize the effects of the project on the individuals and habitat of these species should be implemented in a timely manner, regardless of the significance of the effects.

Caribou

The woodland caribou (boreal population) is a species recognized as threatened under SARA and as vulnerable under Quebec's *Loi sur les espèces menacées et vulnérables* (Threatened and Vulnerable Species Act). The migratory caribou (or caribou – Eastern Migratory population) is a species designated as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). As of the date of this report, migratory caribou are not a species at risk under SARA. Nevertheless, the Committee has conducted a summary assessment of the effects on migratory caribou since they are valued by the Cree Nations.

Several members of the Cree Nations participate in caribou conservation efforts by limiting their harvesting of the species. Numerous concerns were expressed during the consultations regarding the project's effects on caribou, particularly regarding tree cutting, blasting and increased road traffic. People who expressed these concerns want Cree knowledge to be considered in the analysis. Information on caribou from traditional knowledge shared by Cree Nations members during the consultations is incorporated below.

Woodland Caribou

The future mine site would overlap the QC6 range of woodland caribou identified in the Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), boreal population, in Canada. This recovery strategy states that caribou prefer to use large areas of continuous, undisturbed land and mature forest stands. The program aims to make local populations of woodland caribou self-sufficient in each of their ranges in Canada. For a local population to have a probability of self-sufficiency (60% probability), the rate of habitat disturbance in its range must remain below 35%. The QC6 range is slightly or moderately disturbed with a habitat disturbance rate of 32% (Environment and Climate Change Canada, 2017). The local population in this range therefore has a probability of self-sufficiency and is stable (Environment Canada, 2012).

As ECCC states, the precise location of the proportion of undisturbed habitat in each range will vary over time. The availability and arrangement of habitat should be such that woodland caribou can move throughout

their range to access the required habitat when they need it. The recovery strategy aims to achieve and maintain a continuous overall range status that ensures a dynamic system of habitat availability and biophysical characteristics that woodland caribou require to function. It is this dynamic system that constitutes the state of the habitat required for the recovery of woodland caribou.

The QC6 range is very large and requires different management approaches which are the responsibility of the province. According to the Quebec's Ministère des Forêts, de la Faune et des Parcs (MFFP), the density of the species is not homogeneous across the range.

For their assessment of the effects on woodland caribou, the proponent established a study area of approximately 8,000 square kilometres, included within a 50-kilometre radius of the future mine site. The two local populations of woodland caribou are the Nottaway herd, estimated at 308 individuals in 2016 by the MFFP and deemed in decline by ECCC, and the Assinica herd, estimated at approximately 580 individuals in 2013. The project is located north of the northern limit of the range of these two populations. The MFFP believes that the project area is not heavily frequented by woodland caribou because the habitat is highly disturbed.

ECCC believes that the proponent's description of potential effects, detailed below, is adequate and consistent with the threats identified in the recovery strategy.

Habitat Alteration (Loss, Degradation or Fragmentation)

The proponent estimates that the project would cause a loss of critical habitat[18] for woodland caribou, as defined in Appendix H of the recovery strategy, of approximately 40 hectares, consisting of 33 hectares of large-scale habitat and 6.9 hectares of calving, post-calving and rutting habitat. This estimate excludes anthropogenic and natural disturbance within the footprint of the future mine site and its 500-metre buffer zone. The Committee and ECCC believe that this loss of critical habitat would have a low impact on the rate of habitat disturbance in the study area and at the scale of the QC6 range. This loss would not affect the self-sufficiency status of the local population in this range.

The proponent believes that the habitat alteration caused by the project would have no significant impact on woodland caribou. The proponent estimates that the current rate of disturbance (natural and anthropogenic) of caribou habitat is 60% in the study area and 99% within a 5-kilometre radius. The many major fire cycles that have occurred in recent decades would partly explain these high disturbance rates. The proponent believes that the eventual addition of mining infrastructures would take place in an already highly disturbed zone and in a biophysical environment that is widespread on the territory. Although the proponent recognizes that part of the burned areas has the capacity to regenerate in the medium term, they believe that the study area does not currently constitute quality caribou habitat, a fact that is recognized by the Committee, ECCC, the MFFP and certain Cree users of the territory. This would explain in part the area's low level of caribou use.

[18] Critical habitat is the habitat necessary for the survival or recovery of a listed wildlife species that is identified as such in a recovery strategy or action plan developed for the species.

According to the MFFP, the very short fire cycle on the territory does not favour colonization by woodland caribou. The active populations are currently located further south and are not accustomed to moving around much. The MFFP believes that, over a 50-80 year period, it is unlikely that the species will colonize the project area. Furthermore, with climate change, the fire cycle is likely to be more frequent and would not allow forest recovery.

According to the proponent, the project would also have no significant effect on the connectivity between caribou habitats, since the study area is already fragmented by roads and the power grid, which is also recognized by the Committee and ECCC.

Increasing Noise, Road Traffic and Collision Risks

The project would cause several disturbances to the species, particularly due to increased road traffic and noise. Approximately 166 crossings per day are planned on the Nemiscau-Eastmain-1 road and the Route du Nord, during the operational phase. According to the proponent, the caribou would avoid the roads more as traffic increases. ECCC and the MFFP corroborate the proponent's assessment, who believes that the project's effect on the species would be slight. However, the increase in road traffic could increase the risk of collisions. A Cree user of the territory testified that he has already observed several accidents involving caribou and transport trucks. He also noted that individuals from the same group of caribou tend to stay close to a caribou that has been struck by a vehicle in order to protect it, thus making them more at risk.

The proponent anticipates an increase in ambient noise of at least 25% at 1 kilometre from the centre of the mine during the operational phase. The proponent believes that caribou would deploy an avoidance strategy within a 5-kilometre radius of the mine site during the construction phase, which was also mentioned by a Cree user of the Waskaganish territory. The proponent believes that blasting would have no significant effect on woodland caribou, considering the low blasting frequency (two blasts every 5 days, except during goose and moose hunting periods when one blast every 5 days is planned) and the low probability that caribou would frequent the proximity of the site. However, as a precautionary approach, the proponent proposes the mitigation measures listed below if a caribou or an indication of its presence is observed by employees, the MFFP, tallymen or any other land user.

Increased Risk of Predation

According to the proponent, the areas deforested for the development of mining infrastructures would not offer advantageous habitat conditions for moose and would therefore not favour the presence of the main predators of woodland caribou, i.e., black bear and wolf. He also believes that the mining infrastructures would not include linear elements that would allow wolves to move at high speed and be more efficient when hunting, thereby increasing predation pressure on woodland caribou.

According to the MFFP, poor waste management could nevertheless increase the presence of predators. To minimize the risk of attracting wolves and black bears, the MFFP believes that the proponent should store its waste in containers equipped with bear-proof lids and placed in fenced sites.

Proposed Mitigation Measures

The proponent proposed several mitigation measures to minimize adverse effects on woodland caribou and to ensure consistency with the recovery strategy. These include the postponement of blasting if a caribou is observed in the project's zone of influence (500 metres around the mine's footprint); the implementation of a communication system to inform employees and subcontractors of any observation or indication of caribou presence on the mine site access roads and the Nemiscau-Eastmain-1 road; the adequate management of residual materials, including the installation of containers with anti-bear lids and fencing of the waste storage site, in order to minimize predator frequentation; and the implementation of a general monitoring programme for species at risk, including measures to raise awareness among land users. In addition to these measures, the proponent anticipates that the measures to mitigate the effects on noise in section 6.2 (Cree health) would also make it possible to mitigate the effects on caribou.

Migratory Caribou

According to the proponent, the mine site would overlap part of the historical range of migratory caribou (Leaf River and George River herds), but the presence of the Leaf River herd would be marginal in the area. Between 2010 and 2015, a dozen collared caribou from the Leaf River herd were observed during the winter season more than 25 kilometres from the future mine site. According to the MFFP, the range of the migratory caribou has declined sharply northward due to the decline in its population and a return to population peaks in the project area is unlikely over the next 3 decades due to unfavourable environmental pressures. The consultations conducted by the Committee with Cree users of the territory confirm the MFFP's findings. They noted that migratory caribou have not been frequenting the sector for about 10 years. The Committee believes that the project is unlikely to cause harmful effects on migratory caribou, given their more northern range and the low probability of a return to the region in the coming decades. The Committee and ECCC are of the opinion that the effects and key mitigation measures below for woodland caribou are applicable to migratory caribou.

Chiropterans

An acoustic inventory of chiropterans (bats) conducted by the promoter in 2018 confirmed the presence of five species within a 50-kilometre radius of the future mine site. Among these species, the northern myotis and the little brown myotis are designated as endangered under SARA. Their special status is due, among other things, to the population decline observed as a result of the white-nose syndrome. According to the Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-coloured Bat (*Perimyotis subflavus*) in Canada (ECCC, 2018), the white-nose syndrome and habitat loss are hindering the recovery of these species.

For its analysis of the effects on chiropterans, the proponent selected a study area with a radius of 50 kilometres around the future mine site. It considers that deforestation and the construction of mining infrastructures could destroy the chiropterans' diurnal habitat or reduce its quality, causing the mortality of individuals or changes in their use of different types of habitats. The proponent indicated that no chiropteran maternity or hibernacula are known within a 10-kilometre radius of the mining project. ECCC submitted that the proponent did not assess the potential for resting habitats such as maternity colonies or resting sites for

males in the forested areas of the study area. Wooded areas with snags could provide this type of summering habitat, which is of great importance for the life cycle of chiropterans.

ECCC believes that the proponent's description of potential effects, detailed below, is adequate and consistent with the threats identified in the recovery strategy.

Habitat Loss and Fragmentation

The proponent estimates that the project would result in the loss of 614 hectares of chiropteran habitat, including 427 hectares of terrestrial environments, 174 hectares of wetlands and 13 hectares of lakes. The proponent believes that the forest stands in the study area represent a medium-quality habitat for chiropterans, since the study area has already been affected by major fires. According to the proponent, the disappearance of wetlands would mean the loss of feeding sites, which would require the relocation of chiropterans to other sites. However, the proponent believes that these wetlands are mainly bogs, which are not preferred feeding sites for chiropterans. Moreover, the proponent has not detected any traces of these species in the four Cree camps located near the future mine site. The proponent believes that, despite the loss of habitat, many quality replacement habitats are available in the vicinity. ECCC indicates that habitat fragmentation is also an effect of the Project on chiropterans.

Noise, Vibrations, Light and Other Effects

Mining activities produce noise, vibrations and artificial light that can disturb chiropterans. According to the proponent, the noise could disturb the chiropterans' sleep, causing them to avoid the area and choose another resting place. Vibrations could also cause a reduction in reproductive success and lead to the abandonment of maternity wards. Artificial light could alter the movements of chiropterans, requiring greater energy expenditure and increasing the risk of predation. Bats of the *Myotis* genus sometimes use artificial light sources for feeding, as they attract insects. The proponent anticipates that the level of light generated towards the sky would be low and that no night lighting would be emitted within a radius of 300 metres of the future facilities. ECCC also notes the risk of collisions, the risk of accidental spills of contaminants at feeding sites, and the presence of contaminants in accumulation ponds.

Proposed Mitigation Measures

The mitigation measures planned by the proponent in relation to noise, light and the risk of contamination in water storage basins, amongst others, described in section 5.3 (Migratory birds and birds at risk), also apply to chiropterans. In order to minimize the effects affecting chiropterans in particular, the proponent plans, among other things, to systematically verify the presence of chiropterans before the dismantling of any building. During the construction phase, if the schedule permits, the proponent plans to conduct deforestation outside the chiropteran breeding period. If the schedule does not allow it, it plans to implement a five-phase action plan:

- Acoustic inventory of potential maternity sites;
- Establishment of a protection zone with a radius of 100 metres in case a maternity or resting site is discovered;
- Marking of the protection zone;

- Monitoring of maternity or resting sites and work carried out in the vicinity: any disturbance observed in the behaviour of chiropterans would cause construction activities in the vicinity to cease, which would be postponed until the end of the chiropterans' breeding period or until the young bats have left the site;
- Drafting of a monitoring report.

The proponent indicated that they could not commit to carrying out the deforestation work during the construction phase for logistical reasons, hence the reference to deforestation outside the chiropteran breeding period “if the schedule permits”. For this reason, ECCC considers that the project is likely to have negative effects on chiropterans, despite the monitoring proposed by the proponent.

The Committee and ECCC believe that the mining project would result in a loss of habitat for little brown myotis and northern myotis bats due to deforestation and disturbance, but note that the proponent proposes appropriate measures (e.g., the five-phase action plan) to minimize these negative effects and that replacement habitats are available. ECCC adds that the success of detecting any resting sites, whether in buildings or natural sites, would influence the effectiveness of subsequent measures to be implemented to avoid killing, injuring or disturbing individuals.

Wolverine

The wolverine is designated as a species of Special Concern under SARA. According to ECCC, the species' persistence in Quebec remains uncertain. At best, the wolverine population is composed of an extremely small number of individuals. The last verified sighting of a wolverine in Quebec dates back to 1978, although unconfirmed sightings have been reported since then. In 2006, two possible trail networks were identified a few hundred kilometres from La Sarre and Matagami. In 2006, aerial surveys conducted at low altitude did not reveal the presence of the species in Quebec. Numbers were so low that adult males and females were unlikely to meet during the mating season (ECCC, 2016). In this context, although the project is located in the species' range and the project area includes potential habitats and food sources, ECCC believes that the presence of wolverine is unlikely in the area.

For these reasons, the proponent does not anticipate any adverse effects of the project on wolverine and, consequently, has not proposed any specific mitigation measures. The proponent justifies this decision by the low probability of presence of this species, the extent of the territory it occupies, the small size of the project's zone of influence and the intensity of current human occupation. The proponent states that the project is located south of the wolverine's range. The Committee and ECCC agree with the proponent's analysis.

5.5.2 Conclusion of the Joint Assessment Committee on Residual Effects

Based on its analysis, the Committee believes that, considering the implementation of the key mitigation measures below, the project is not likely to cause adverse residual effects on woodland caribou, northern myotis, little brown myotis and wolverine. The Committee recommends that the proponent consider recovery strategies and action plans for species at risk likely to be affected by the project, in accordance with SARA,

in order to reduce or prevent the decline of these species. It also recommends that the proponent share any observations on species at risk with the appropriate authorities at an appropriate frequency.

For the Committee's conclusion and analysis of residual effects on the use of species at risk for traditional purposes, such as caribou, see section 6.1 of this report (Current Use of Lands and Resources for Traditional Purposes by the Cree Nations).

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the proposed project does not result in adverse residual effects on species at risk. It considered the mitigation measures proposed by the proponent[19], the advice of government experts, as well as the comments received from the Cree Nations consulted. The key mitigation measures are outlined below. No specific mitigation or follow-up measures are recommended for wolverine.

Woodland Caribou

- Deferring blasting if caribou are observed in the project's zone of influence (500 metres around the periphery of the mine footprint) until a validation confirms that the caribou is outside this zone;
- Developing an agreement with the competent authorities and the tallymen of the Eastmain, Nemaska and Waskaganish traplines that includes a clause providing for the notification of the mine manager if a caribou or group of caribou appears to be heading towards the mine site, or if seasonal habitat near the mine site or any other presence within a 4-kilometre radius of the mine site is observed. Monitoring would be concentrated mainly during the periods when the caribou are most vulnerable, i.e., winter and during calving and post-calving;
- Implementing a communication system to inform employees and subcontractors of any observation or indication of the presence of caribou on the access roads to the mine site and the Nemiscau-Eastmain-1 road;
- Developing a traffic management plan with the Cree Nations. The plan should include the frequency of heavy truck traffic at different times of the day and consider a reduction in the evening hours due to the higher risk of collisions;
- Implementing an action plan in the event of the presence of caribou near the mine, in collaboration with the Environmental Monitoring Committee. The action plan must include an adjustment to the transportation schedule and a temporary interruption of certain mining activities in the event of a high risk to caribou. It must also identify risks of collision during the transportation of ore to the transhipment site and measures to mitigate these risks. The action plan must rely on early detection of caribou in the vicinity of the mine. The proponent must consult the Agency, the competent authorities, including ECCC, the Cree Nation Government, the Government of Quebec and the affected Cree Nations prior to the

[19] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

implementation of this plan to ensure that it is carried out in the most optimal manner possible to protect the individuals of this species;

- Developing and presenting a training module for employees and subcontractors to make them aware of the precarious nature of the caribou and to enable them to distinguish the signs of presence;
- Installing waste containers equipped with anti-bear lids and fencing of the waste storage site;
- Revegetating the entire surface area of mining infrastructures in the closure phase, with the exception of the pit, in consultation with the tallyman or tallymen concerned for the choice of preferred species. Site recovery should be carried out gradually, as the disturbed areas are no longer used, with priority being given to creating habitats favourable to species at risk, particularly woodland caribou.

Northern Myotis and Little Brown Myotis

- Deforesting to be carried out, as far as possible, outside the chiropteran breeding period;
- If deforestation or dismantling of buildings during the construction phase must take place for technical or economic reasons during the chiropteran breeding period, implementing an action plan as detailed in section 5.5.1 above if chiropterans are present;
- If signs of the presence of chiropterans are observed and a building in use cannot be preserved, carrying out operations after the chiropteran breeding period and installation of a new shelter in a place protected from disturbance. This new shelter must be subject to annual monitoring of its use and integrity.

Need for Follow-up and Follow-up Requirements

In order to verify the accuracy of the predicted effects on species at risk and the effectiveness of the proposed mitigation measures, the Committee recommends that the follow-up program include the following requirements:

- Implementing a general monitoring program for endangered species, including measures to raise awareness among land users. The plan must be submitted to the Agency, the Cree Nation Government and the competent authorities, such as ECCC and the Government of Quebec, prior to the start of construction work. In particular, the plan must identify the activities or operations that may have an effect on species at risk and, for each of these, determine the measures to be implemented to ensure that the nuisance or disturbance is reduced. The monitoring program must be periodically updated to take into account changes in regulations, such as the review of the status of wildlife species by COSEWIC or SARA. These changes may require that additional measures be put in place to mitigate the effects of the project on species affected by changes in their status;
- Implementing a follow-up program specific to woodland caribou in order to verify the accuracy of the conclusions of the environmental assessment and to evaluate the effectiveness of the mitigation measures;

- Implementing of a follow-up program for chiropterans, during the construction and operation phase, to estimate actual habitat losses and to verify the effectiveness of mitigation measures. The follow-up program should include:
  - Acoustic monitoring as well as measurement of night-time luminosity and chiropteran activity on a bimonthly basis during the breeding period (June 1 to July 31) through sampling stations;
  - A habitat characterization for each of the sampling stations;
  - If a building must be dismantled and signs of presence were observed, monitoring of the use of the new structure that would be built and annual monitoring of its integrity.
- In the post-closure phase, annual agronomic monitoring for a minimum of 5 years in order to assess the growth and diversification of the species planted at the time of closure and to take action if adjustments are necessary. Monitoring should include inspections including visual assessment of various parameters such as plant condition, percentage of areas showing vegetative recovery and soil erosion.

6. Anticipated Effects on Indigenous Components under CEAA 2012 and the Agreement

6.1 Current Use of Lands and Resources for Traditional Purposes by Cree Nations

The project could result in residual effects on the current use of lands and resources for traditional purposes and, more specifically, on hunting, fishing and trapping activities practised by the Cree Nations, by limiting access to the territory, and the use of resources for traditional purposes. However, the Committee believes that these effects are not likely to be significant given the implementation of the mitigation measures recommended in Section 6.1.2.

The following subsections set out the information that the Committee considered in its analysis. They also include the advice of the government experts (federal, provincial and Cree) and those of the Cree Nations consulted.

6.1.1 Analysis of Potential Effects and Proposed Mitigation Measures

For the purposes of federal environmental assessment, current use of lands and resources for traditional purposes refers to any practice or activity that is part of the distinctive culture of an Indigenous Nation and that has been commonly carried out by that group over a period of time extending from the past to the present. The analysis of the effects on this use is carried out according to each particular practice or activity, such as hunting, fishing, trapping, gathering of medicinal plants or the use of sacred sites. It takes into account potential uses at all stages of the project's life cycle, from construction to closure. It also includes uses that have ceased due to external factors, if they are likely to resume once conditions are restored. The analysis includes whether the project may result in changes to resources subject to traditional use and to the conditions of Indigenous peoples' land use and practices.

The Committee assessed the residual environmental effects of the project on the current use of lands and resources for traditional purposes by the Cree Nations [20] of Eastmain, Nemaska, Waskaganish and Waswanipi.

[20] "Cree Nations" is used in this and the following chapters to refer to all the Cree Nations consulted in the environmental assessment: the Cree Nations of Eastmain, Nemaska, Wasakaganish and Waswanipi.

The main effects are as follows:

- Decreased availability of resources;
- Changes in access to the territory, by land and water, and to hunting camps (e.g., loss of access to the territory and disturbance during movements on the territory);
- Decrease in the overall quality of the experience of land users, including perceptions of contamination.

The proponent selected the human environment study area as the study area for the analysis of effects on use (Figure 3). It overlaps four traplines of three Cree Nations. The future mine site would be located on trapline RE01 of the Cree Nation of Eastmain. Water from the water treatment plant (final mining effluent) would be discharged on this same trapline, but would eventually reach trapline R10 of the Cree Nation of Waskaganish, located approximately 5 kilometres to the west. The project would be located on the periphery of traplines R16 and R19 of the Cree Nation of Nemaska. These traplines are also crossed by the Nemiscau-Eastmain-1 and Route du Nord roads that would be used by the proponent to transport the ore concentrate by heavy truck during the mining phase. The proponent's transportation activities would continue to Matagami from the Route du Nord to the Billy-Diamond Highway, which crosses seven traplines of the Cree Nation of Waswanipi (A52, A54, W01, W03, W07, W13, W53). These traplines are not included in the proponent's study area, but the Committee considers the users of these traplines could be affected by the increase in road traffic generated by the project. The Committee has assessed these effects on the Cree Nation of Waswanipi in this chapter.

In the territory covered by the project, the current use of lands and resources for traditional purposes refers mainly to hunting of big and small game, trapping of fur-bearing animals, fishing, berry and plant gathering, as well as the cultural practices associated with these uses.

No sacred or heritage sites, such as birthplaces or burial sites, were identified in the study area. However, many places remain culturally valued for traditional activities. For example, the various bodies of water on the territory and their quality are of great cultural importance to the Cree Nations consulted.

Decreased Availability of Resources

The Committee believes that the project could modify the conditions for the practice of the traditional activities listed below by reducing the availability of resources for the Cree Nations in the periphery of the project and the roads used by the proponent, within a zone of influence that could vary according to species. However, these effects would not compromise the maintenance of the various harvests, or the other current uses of lands and resources for traditional purposes by Cree Nations.

Big Game Hunting

Moose hunting is the main big game hunting activity practised in the study area. It is highly valued and practised year-round, mainly by the tallymen of the traplines in the study area. The other members of the Cree Nations mainly practise it over several weeks from September to November. It is practised on trapline RE01 and many hunting camps are located on either side of the Route Nemiscau-Eastmain-1, the Route du Nord and the Route Billy Diamond Highway (the latter road being outside the proponent's study area).

Caribou hunting is also practised in the study area to the west (trapline R10) and south of the future mine site (trapline R16) (see section 5.5 on species at risk for an analysis of the project's effects on caribou[21]). According to the proponent, Cree users of the territory occasionally hunt woodland caribou when they are spotted by chance while moose hunting. Available information indicates that the harvesting of caribou by the Cree Nations of Eastmain, Nemaska and Waskaganish would be practically nil since 2011[22]. Cree users in the Nemaska and Waskaganish territory expressed concerns to the Committee about the effects of the project on caribou. They mentioned that several of them have chosen to limit their caribou harvesting in order to contribute to the recovery of this valued species. Users stated that they have not observed migratory caribou in the study area for several years.

The proponent believes that the project would not modify the availability of moose and caribou for Cree hunting and would not alter the harvesting potential in the study area. According to the proponent, mining activities could disrupt traditional activities directly on the periphery of the site, including big-game hunting, mainly during the construction and decommissioning phases. During operations, the proponent considers that Cree users of the territory could adapt their activities in the study area by following the game that would move to the periphery of the future mine site. To facilitate this adaptation, the proponent plans to inform Cree users of the territory of the schedule of activities for each phase of the project.

The project's infrastructures (see Figure 5), covering an area of approximately 20 km^2, would result in a direct loss of habitat for big game, including an area valued for moose hunting on lot RE01. According to the Cree users of this trapline, other moose habitats would nevertheless exist on the periphery of the future mine site, particularly near the location where the relocation of the tallyman's camp on trapline RE01 is planned. The traditional knowledge of the Cree users of trapline RE01 indicates that moose and caribou would avoid the mine site and the surrounding area, but that they would probably return to the area after a few years, once the project has started.

The proponent considers that the increase in heavy truck traffic could reduce the abundance of big game available for harvesting by the Cree Nations, due to an increased risk of collision and the modification of game behaviour that would avoid roadsides for quieter areas. Members of the Cree Nation of Waswanipi mentioned that the risk of fatal collisions would be higher for big game that moves at a slower pace. With respect to caribou, since it is a species at risk, the proponent proposes to implement a mandatory reporting protocol in the event that the species is present in the study area (see section 5.5 Species at Risk for more details).

The Committee believes that the mining activities and the increase in road traffic related to the project could result in big game avoidance in the study area on the periphery of the mine site and the Nemiscau-Eastmain-1 and Route du Nord roads at all stages of the project. The project would result in the loss of an area valued for moose hunting on trapline RE01, a species valued by the Cree Nations and whose density remains low in the region, according to the proponent. However, the Committee believes that the project would have a

[21] The Committee concluded that the project is not likely to cause adverse effects on species at risk, including woodland caribou, taking into account the proposed mitigation and follow-up measures.

[22] The data used by the proponent are those of the Cree Trappers' Association. These wildlife harvest declarations are made on a voluntary basis by Cree tallymen and must be considered as possibly incomplete.

negligible impact on the moose harvesting potential in the study area once Cree users have moved their hunting sites elsewhere on trapline RE01 and if the proponent modifies mining activities during moose hunting as described below (Goose Hunting subsection).

The Committee notes that certain Cree users of the territory, mainly the tallyman of trapline RE01, would have to modify their habits to continue to practise their traditional activities in other places, particularly moose hunting. Cree users of the territory would be asked to adapt again, since several development projects have taken place in the same sector over the last few decades. Although land users can show their resilience to these changes by modifying their harvesting sites, this adaptation could negatively affect many individuals and their families. The renewal of knowledge and habits related to these new places could require a period of adaptation and could, in some cases, affect the transmission of knowledge and the sense of belonging.

The Committee is satisfied with the protocol proposed by the proponent to limit the risk of collisions between trucks and wildlife, as well as the measures planned to limit the attraction of predators. These measures could help reduce the risk of wildlife mortality. However, the project could lead caribou to avoid the vicinity of the mine site and would accentuate the avoidance already present along the roads used by the proponent, from construction to decommissioning of the project. This would further decrease the already low availability of caribou in the study area for approximately two decades. However, the residual effects of the project would have little effect on the practices and habits of Cree caribou hunters, considering that their abundance in the study area would remain very low and that many mentioned that they had chosen to limit their caribou harvest in order to contribute to the recovery of this valued species. The project would not compromise the occasional caribou hunt, which would remain possible outside of the area of direct influence of the mine and roads.

The Committee believes that it is highly likely that the Cree caribou hunting of the Cree Nations affected by the project will be more successfully practised outside the study area during the life of the project. It believes that the project could delay the return to suitable caribou habitat, mainly in areas affected by fires in the proposed mining infrastructure area. The Committee considers that other factors external to the project could influence the return of caribou to this sector, such as climate change. The project could nevertheless reduce the likelihood that the next generation of Cree users of these traplines could enjoy greater availability of the resource than that which prevailed at the time of the environmental assessment. The steady decline of caribou in the traplines of the study area could contribute to the erosion of Cree knowledge transfer on this species.

Goose Hunting

For a few weeks a year, mainly in the spring, members of the Cree Nations practise goose hunting in ponds and sometimes unexpectedly along the roadside when they are present. An area developed for goose hunting is located approximately 700 metres from the future mine site, around Hydro-Québec's LE-20A dike in the Eastmain-1 Reservoir. Hunting would potentially no longer be possible at this location due to the implementation of the proponent's security perimeter (see subsequent subsection Loss of practice sites). The annual goose hunt is highly valued culturally. It involves numerous gatherings and movements on the territory.

The Cree Nations are concerned that the blasting and heavy trucking associated with the project may cause avoidance of surrounding wildlife, reducing harvests during the goose and moose hunting seasons. Cree users of trapline RE01 indicated that geese are abundant and easy to hunt in the area, but that their migration is very short, lasting three weeks. According to Environment and Climate Change Canada (ECCC), the noise and vibrations generated by the blast are likely to frighten away the birds that would be in the vicinity of the blast, and this during all seasons, including the hunting season. However, ECCC believes that other factors would also contribute to influencing the quantity of geese in the area.

In order to respond to the concerns of the Cree Nations, the proponent undertakes to modify its blasting and heavy trucking of ore during the annual goose and moose hunting periods, for a period of at least 14 consecutive days each time. This measure would reduce the frequency of disturbance and wildlife avoidance. During these periods, the number of blasts would be reduced from two to one every five days, while the number of heavy trucks on the road would be reduced from 308 to 100 per week. The proponent also undertakes to reduce the transportation of waste rock to the mine site during these two hunting periods in order to reduce noise pollution.

The Committee considers that the proponent's commitment to significantly reduce the number of blasting operations and transportation activities during the annual goose and moose hunting periods would make it possible to reduce the frequency of sources of disturbance for wildlife and land. This would therefore reduce the intensity of the effects on these highly valued activities. It recommends the implementation of a program to monitor the effectiveness of modifications to blasting and transportation activities on maintaining goose and moose harvesting by users of traplines RE01, R16 and R19. In addition, the Committee recommends the implementation of a direct communication mechanism between the proponent and users of the territory, through the proponent's Cree liaison officer, to inform them at least 48 hours in advance of the planned blasting schedules and any changes in this regard during the annual hunting periods. This would make it possible to promote the predictability of nuisances and the adaptation of harvesting. The proposed mitigation measures should limit the project's effects on the availability of geese and moose in the sector during annual hunting periods, thereby maintaining the continuation of traditional activities in the sector.

Small Game Hunting and Trapping of Fur-bearing Animals

The Cree Nations hunt spruce grouse, ruffed grouse and willow ptarmigan at various locations in the study area, including roadsides. In field RE01, trapping mainly involves beaver[23]. It is practised by the tallyman on the lakes that would be directly affected by the project and those surrounding it. Beaver trapping is also practised by the other tallymen in the study area and is regularly carried out unexpectedly and in various roadside locations.

Members of the Cree Nations are concerned about the effects of the project on the abundance of small game, mainly partridge, ptarmigan, muskrat and beaver, on the periphery of the mine and the roads used by the proponent. According to Quebec's Ministère des Forêts, de la Faune et des Parcs (MFFP), the loss of habitat resulting from the construction and operation of the mine would result in the displacement of these species, which are generally sedentary, to more favourable habitats on the periphery. Although they could

[23] Beaver and mustelid trapping is an exclusive activity for the beneficiaries of the Convention on Category III lands.

also be affected by the increase in predators in the vicinity of the mining infrastructure due to the residual materials generated by the project, the MFFP and Cree Nation Government experts believe that the measures implemented by the proponent, including those relating to the management of its waste, should minimize the project's effects on these species. The MFFP considers that the availability of small game would be maintained in the periphery for Cree harvesting.

The Committee believes that the project would reduce the abundance of small game in the project area, but that the planned measures would ensure the maintenance of populations for Cree harvesting once users have moved their harvesting sites to the periphery of the project. The Committee is reassured by the fact that the proponent plans to monitor traditional use of the territory, which would allow the project to be adjusted if effects on the availability of the various resources used by the Crees were to be felt more than anticipated.

Fishing

The Cree Nations fish a dozen different species of fish[24] in the study area. According to the proponent, only Lakes 2 and 3 in trapline RE01 and a lake located along the Nemiscau-Eastmain-1 road in trapline R19 would have been used for fishing in the study area. The tallyman of trapline R10 indicated to the Committee that several lakes located outside the study area, but nearby, had already been used for fishing.

The project would result in the loss of fish habitat, particularly due to the dewatering of Lakes 1 and 2 to create the pit, which would diminish the available resource in the study area. The proponent plans to carry out intensive fishing in Lake 1 in order to collect fish prior to the construction work. To the extent possible and depending on the interest of Cree users of the RE01 territory, the proponent plans to offer Cree participation in these fisheries. The proponent does not plan to carry out fishing in Lakes 2 and 3, due to the very low abundance of fish in Lake 2 and the lack of Cree user interest in Lake 3 at the time of the environmental assessment. Lake 3 is one of three points provided by the proponent for the discharge of groundwater pumped through wells on the periphery of the pit to keep it dry.

The Committee notes that fishing would no longer be possible in the bodies of water that were used for this purpose in the affected sector of trapline RE01 (Lakes 2 and 3), due to the one-kilometre safety perimeter around the mining infrastructure and mine activities that would result in changes to the levels of several bodies of water and watercourses. As indicated in section 5.1 (Fish and Fish Habitat), the proponent will develop a plan under the *Fisheries Act* to compensate for the loss of fish habitat. At the time of the environmental assessment, the proponent was in discussion with Fisheries and Oceans Canada regarding the details of this compensation plan. The Committee considers that the decrease in fish availability would be irreversible in this trapline, but stresses that the intensity of this effect on fishing would still be reduced by the compensation. It recognizes that future gains from the compensation plan would only be partially perceptible in the study area and that part of the plan would, for technical reasons, have to be carried out outside trapline RE01. The Committee remains reassured that the choice of compensation activities would be made in consultation with Cree stakeholders. This should help ensure the sustainability of this valued

[24] Fishing for the following species is for the exclusive use of the Cree Nations under the Convention in Category III lands: whitefish, sturgeon, burbot and goldeye.

resource in areas that, if they are not directly accessible to these same users, will be accessible to other members of the Cree Nations in general.

The Committee takes into account the measure proposed by the proponent to guarantee one last fishing trip by users of the territory in Lake 1 before the start of construction work. It notes, however, that the use of lakes 1 and 2 would be permanently lost. Failing to avoid these lakes because of the location of the deposit, the Committee believes that the proponent has presented satisfactory mitigation measures to limit the effects on water levels and that the planned compensation plan for the loss of fish habitat should satisfy Cree users and allow them to continue their fishing activities elsewhere on the territory, after a period of adaptation in the search for new sites. However, despite the abundance of lakes in the area, the Committee notes that these bodies of water are located in a sector where fish availability has already been altered by mercury contamination of the Eastmain-1 hydroelectric development reservoir and where cumulative effects are of considerable concern (see section 7.3.7 Cumulative Environmental Effects – Current Use of Lands and Resources for Traditional Purposes by the Crees).

Pressure on Wildlife Resources due to Workers' Hunting and Fishing Activities

The proponent assesses that the presence of its workers on the territory could lead to competition for the harvesting of wildlife resources. The Cree Nations are concerned about the massive influx of non-Indigenous workers who could hunt and fish outside of their working hours. The Cree Nation Government's small game experts believe that mine workers could hunt partridge and ptarmigan in large numbers, thereby increasing the pressure on the resource. However, the Committee considers that the measures put in place by the proponent should mitigate this effect.

The proponent plans to address these concerns primarily by banning hunting weapons, trapping and fishing equipment at the mine site and at the workers' camp. It would conduct random searches upon the arrival of employees at the site and at the workers' camp. It intends to ensure compliance with this prohibition by signing clauses in its employees' contracts and including disciplinary measures in this regard. It also undertakes to create a conflict resolution protocol in the event of problems related to the reconciliation of land and resource use by mine workers, which would include the possibility of reporting theft or other problems observed by land users. It also provides for the hiring of a liaison officer fluent in the Cree language whose mandate would be to maintain constant communication between the proponent, its employees and the Cree Nations throughout the life of the project. Finally, while welcoming new employees and during awareness sessions, the proponent plans to inform its employees about the permits required to practise any hunting and fishing activity on Category III land. It also plans to inform them about species exclusive to the Crees and about existing outfitters in the James Bay territory. These measures would promote compliance with the law when employees no longer have an employment relationship with the proponent.

The Committee is satisfied with the measures proposed by the proponent to prohibit the possession of hunting, fishing and trapping equipment by employees of the mine and considers that they could have a significant deterrent effect. It believes that the proponent proposes to do what is within its control to limit the additional pressure that its employees could exert on the wildlife resources valued by the Cree Nations. It notes, however, that these measures partially respond to the fears of the Cree Nations. Employees could obtain moose hunting or fishing permits and carry out wildlife harvesting on their days off, for example. The Committee is satisfied with the proponent's commitment to set up a conflict resolution mechanism to

reconcile land use. It is confident that ongoing communication between the proponent and land users, particularly through the Mine Implementation Committee, would make it possible to initiate dialogue in a timely manner in the event of potential problems.

Plant Gathering

Plant and berry picking is also practised in the Study Area and mainly involves blueberries, raspberries, Labrador tea and alder. The project would result in the loss of berry and plant picking sites. However, the proponent plans to implement a program to harvest medicinal plants for community use prior to construction.

Changes to Land Access and Hunting Camps

The Committee believes that the project could modify the conditions for the practice of several traditional activities by restricting access to certain sectors of trapline RE01 and to certain bodies of water. Certain habits related to travelling on the road to access the camps could be modified for the Cree Nations affected by the project. The project would also change certain behaviours and habits due to the implementation of a security perimeter with a 1-kilometre radius around the mining infrastructures. However, these effects would not compromise the current use of land and resources for traditional Cree Nation purposes.

Loss of Practice Space

Several camps are listed in the study area. The project would result in the loss and relocation of a camp and water intake for the tallyman of trapline RE01, located at kilometre 42 of the Nemiscau-Eastmain-1 road. The latter plans to relocate this camp in order to avoid the effects of the project. He also mentions that he has already chosen a new location accessible by road that would allow him to maintain a similar use of the territory. The proponent proposes to help the tallyman relocate the camp to a location of his choice. It also undertakes to provide the necessary materials for this purpose. The proponent plans to provide him and his family with regular access to workers' camp services (drinking water, showers, cafeteria) to compensate for these inconveniences. The tallyman of trapline RE01 has several other camps on the trapline, including one located at kilometre 51, near the study area. No other relocation of Cree camps is planned within the study area.

The Committee believes that the footprint of the project would modify the conditions of practice on trapline RE01 by reducing the area of territory exempt from development and available for the practice of traditional activities in the sector. More specifically, the project would modify access to a portion of trapline RE01 by causing, among other things, the relocation of a camp. The Committee is satisfied with the measures that will be taken by the proponent to facilitate this relocation. Users of this land could have access to similar conditions of practice in the new location they have chosen.

For security reasons, the proponent plans to set up a security perimeter within a 1-kilometre radius around the mine infrastructures (Figure 5). Goose hunting would thus be prohibited within the perimeter, which would imply the loss of the hunting site around Hydro-Québec dike LE-20A in the Eastmain-1 Reservoir and an additional loss of territory usable for traditional purposes in trapline RE01. A portion of the Nemiscau-Eastmain-1 road would also be within the security perimeter and opportunistic hunting along this road would no longer be possible. This perimeter would not be fenced off, but would be indicated by signs. The proponent

plans to carry out awareness activities to ensure that the perimeter limits are known to users of the territory. It also plans to hold discussions with the affected Cree Nations, including the tallyman of trapline RE01, prior to the commencement of work, to discuss the practice of traditional activities and the size of this perimeter, and to adjust it following these discussions.

The tallyman of trapline RE01 values beaver trapping on this land and expressed concern about the size of the security perimeter chosen by the proponent. Several Cree users practicing on trapline RE01 are concerned about the restriction of activities and possible sanctions. The proponent undertakes that trapping, with the exception of large traps, will be permitted within the security perimeter for this tallyman and his family. The Committee considers that the security perimeter could restrict traditionnal activities on trapline RE01 by reducing the harvesting potential in these specific areas. However, this restriction is considered reasonable in order to ensure the safety of workers and users of the territory, and the Committee believes that the practice of traditional activities could be maintained outside these locations.

The proponent undertakes to take traditional food harvesting activities into account when carrying out environmental monitoring in order to interfere as little as possible with access to the territory and harvesting. The proponent plans to award certain site development contracts to the tallyman of land RE01, including intensive beaver trapping prior to construction work. The length of time required to carry out intensive beaver trapping prior to construction was a concern for the tallyman. The Committee recommends the implementation of a beaver trapping plan for the area within the security perimeter established by the proponent. This plan would include an inventory, carried out in collaboration with the tallyman of trapline RE01, to determine the zones to be favoured for intensive beaver trapping prior to construction work. The inventory would be followed by a period including at least one winter (November to March) during which intensive trapping would be carried out by the tallyman using equipment provided by the proponent. The plan would be implemented at least six months before the start of construction work.

Ability to Move Around the Territory

The proponent recognizes that the increase in road traffic would make access to the traplines more difficult, especially during the annual goose and moose hunting periods, an element that also raised the concern of several members of the Cree Nations consulted by the Committee. Some mentioned that these hunting periods, especially goose hunting, are already known for the increased traffic they generate on the road. As previously mentioned, the proponent plans to reduce the frequency of heavy truck traffic from 308 to 100 per week during these periods. The proponent estimates that this measure would allow users of the territory to pursue their traditional activities in the same place, or otherwise elsewhere on the territory.

The Committee believes that the increase in road traffic could increase the usual travel time and make access to certain hunting grounds temporarily more difficult. Family gatherings during the annual goose and moose hunting season, as well as the current harvesting practices of certain users of Cree Nation territory could be affected. The Committee acknowledges that these effects would be felt to a limited extent on the periphery of the Nemiscau-Eastmain-1 road, the Route du Nord road and the Billy-Diamond Highway, but considers that changes to access to the territory would be limited to the roads' zone of influence. It recommends monitoring the effects of the proponent's transportation activities on Cree users' access to the territory and is confident that the proponent could verify the effectiveness of the mitigation measures proposed in this framework (see Need for a follow-up program section). It is also satisfied with the mitigation measures

proposed by the proponent aimed at reducing the risk of road congestion during goose and moose hunting periods (see Goose Hunting section above). It is confident that access to the territory during the enhanced periods would be maintained. The ease of access to the hunting territories by road would return to the state that existed before the project was carried out once the project is completed.

According to the proponent, Cree camps in the study area are accessible by vehicle and the project would not affect travel on the traplines by snowmobile, ATV, snowshoes or boat. The proponent considers that the project would not result in any changes to Cree Nations navigation activities. He believes that the bodies of water that would be affected are not currently used for travel on the territory, with the exception of Lakes 2 and 3 used for fishing. According to the Cree users consulted by Transport Canada, these bodies of water of the trapline RE01, mostly only navigable occasionally, are used at the time of the environmental assessment, have been used in the past or could be used in the future. According to them, changes to watercourses by beavers (e.g. construction of beaver dams), as well as climatic conditions, can influence the navigability of watercourses or the choice of using one watercourse rather than another for travel.

Transport Canada believes that the anticipated dewatering of water bodies and other changes to surface and groundwater levels caused by the project would make future navigation in 28 different water bodies[25] and watercourses navigable by canoe or kayak impossible. According to the proponent, the loss of navigability of these water bodies would be temporary or permanent. Lakes 1 and 2 as well as Watercourses A[26], B, K and L would be replaced by the pit and would thus suffer a permanent loss of navigability. With regard to Lakes 8, 11, 12, 13, 15, 18 and 19 as well as Watercourses L8-1, L11-1, L12-1, L13-1, L15-1, L15-2, C', L18-1, N and M, the proponent estimates a temporary loss of navigability of approximately 26 years. The proponent also foresees a loss of navigability of approximately 17 years for Watercourses G, H, I, J and L7-1.The Committee believes that the anticipated future loss of navigability in these 28 plans and water bodies, mostly navigable occasionally only, would reduce the potential access to fish and beavers sheltering in them. The loss of navigability of Lake 2 would modify the conditions of practice and the habits of the tallyman RE01. However, he has access to other lakes near the new location of his camp. The Committee nevertheless notes that this loss of navigability would modify the ability of future generations to access certain zones of trapline RE01 as well as its resources. It could thus reduce the connectivity of the various areas of the trapline by altering part of the natural travel corridors for land users. The Committee considers that the proponent should rely on adaptive management, including consultation with local users of the land throughout the project, to limit residual effects on navigability, access to the territory and traditional food harvesting.

[25] 28 of the 40 watercourses located within the project study area are used by the Cree community (see Figure 8 in section 5.1 Fish and Fish Habitat).

[26] The downstream portion would be temporarily navigable for approximately 17 years (operational phase).

Access to the Territory of the Mine Site by Future Generations

The proponent anticipates that the Cree Nations could reuse the project site for traditional purposes after the mine recovery, particularly because wildlife could quickly reuse the site. According to the proponent, the pit would be naturally flooded and would have the appearance of a lake. However, the site would retain a residual post-industrial visual appearance[27] after the mine closes. Several Cree users of the territory expressed their concerns to the Committee about the recovery of the mine site. The proponent indicated that it would consult the tallyman of trapline RE01 on the development of the recovery plan in order to promote the resumption of traditional activities on the territory. The proponent also proposes to leave certain facilities on site, as much as possible, at the request of the tallyman of land RE01.

Members of the Cree Nations recommend that the accumulation areas be revegetated gradually and, if possible, with the same type of vegetation currently present. This revegetation should, in their opinion, include conifers to promote soil stability, the return of wildlife and the future use of the territory. In response to these concerns, the proponent proposes the gradual revegetation of the tailings piles starting in year 5 or when the first level of tailings piles is available. The proponent also plans to plant the tops of the tailings piles with conifers to limit the effects on the landscape.

With respect to the reuse of the territory by future generations, the Committee believes that the final site recovery scenario that would be approved by Quebec's Ministère de l'Énergie et des Ressources naturelles at a later date would influence the future reuse of the mine site. Although the decommissioning of the mine would largely restore access to the project site, it remains possible in practice that some users may not be willing to reinvest time in the reuse of these areas by changing their habits once again. The Committee considers that consultation with the tallyman RE01 in the context of developing the mine recovery plan is essential to promote the future reuse of the territory. Ongoing communication and collaboration throughout the project with the members of the Cree Nations of Eastmain, Waskaganish and Nemaska could facilitate future planning for the use of the territory by the Cree Nations, the tallymen and their families.

Decrease in the Quality of the Experience on the Territory, Including the Perception of Contamination

The Committee believes that the various nuisances such as noise, dust, mining effluents and road traffic generated by the project could change the conditions for practising certain traditional activities by diminishing the quality of the territory's experience in a few specific sectors. The perception of contamination could modify the harvesting habits and behaviours of several users of the territory. Negative residual effects on the experience of the territory could be felt by certain families whose camps are located closest to the mining site or roads. However, the members of the families consulted indicated that other sectors of the territory are of interest for harvesting and that moving the camp to a chosen sector would provide them with interesting

[27] The *Mining Act (Section 4.5.2 – Open Pit Excavation)* provides that an open pit must be secured with fences or an appropriate physical barrier (e.g., artificial ditch). Signs indicating danger must be installed and placed around the pit to ensure visibility for the safety of the users of the area.

opportunities. In this way, the Committee believes that these effects would not significantly compromise the current use of lands and resources for traditional Cree Nation purposes.

Decreased Peace and Sense of Security on the Territory

According to the proponent, the project could temporarily disrupt the peace and quiet conducive to traditional activities on the territory, mainly during the construction and decommissioning of mining infrastructure. It anticipates that users would gradually adapt to these changes during the operational phase. The proponent also considers that the increase in heavy vehicle traffic would lead to an increased risk of accidents and a decrease in the peace and quiet around the Cree camps located on the periphery of the Nemiscau-Eastmain-1 road due to noise, vibrations and dust. Many members of the Cree Nation of Nemaska fear an overall decrease in the quality of the experience on traplines R16 and R19, mainly in the moose-hunting camps located on either side of the Nemiscau-Eastmain-1 and Route du Nord roads. The proponent points out, however, that no user of the Cree Nation of Nemaska territory has expressed a desire to relocate a camp because of the project. The increase in nuisances, the less easy access to the camps, the less safe roadside parking and the possible relocation of camps due to wildlife avoidance also raise fears for the members of the Cree Nation of Waswanipi met. This concern is shared by members of the Cree Nation of Waskaganish, who anticipate similar effects for beaver trappers at the roadside. To mitigate these effects on the experience of the territory, the proponent plans, among other things, to:

- Reduce the number of blasting and heavy truck passes on the road (from two to one blasting every 5 days, from 308 to 100 trucks per week) during goose and moose hunting periods;
- Concentrate blasting activities between 10 a.m. and 4 p.m., to limit the disturbance to users of the territory and increase the predictability of nuisances;
- Space out the convoys and distribute them throughout the day to avoid traffic congestion;
- Equip heavy trucks with speed controllers and radios to facilitate communication with other road users;
- Make its employees aware of road safety rules every three months and include disciplinary sanctions in the event of non-compliance with the highway code;
- Make its employees aware of hunting and trapping activities on traplines so that they can respect these practices and slow down in the presence of users of the territory;
- If necessary, take measures with the competent authorities to ensure the safety of users of the Nemiscau-Eastmain-1 road;
- Add, in conjunction with the competent authorities, road signs to remind drivers of the speed limit at an appropriate frequency;
- Undertake discussions with the Nemaska tallymen affected by the project's road transportation regarding signage in the camps and access roads;
- Monitor the effects of the increase in heavy traffic on the Nemiscau-Eastmain-1 road on the quality of the experience at the camps and present the results to the Implementation Committee;
- Meet, a few times during the project's operation period, with Waswanipi tallymen whose current use of land and resources for traditional purposes could be affected by the increase in road traffic in order to identify and address their concerns;

- Set up a system for receiving and resolving noise-related complaints to confirm that the noise environment does not cause any effect on the users of the territory (see section 6.2 Cree Health).

The proponent believes that these measures, combined with an adaptation period, would be sufficient to mitigate the effects of the project on the quality of the experience of land users.

The Committee believes that the disturbance caused by mining activities would noticeably reduce the peace and quiet on part of trapline RE01 of the Cree Nation of Eastmain and could lead to similar effects, of lesser intensity, for traplines R16 and R19 of the Cree Nation of Nemaska, during all phases of the project. The project could also affect the quality of the territory experience of users of the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi who access their camps by the roads that would be used by the proponent. These transportation-related disturbances would be felt mainly within a zone of influence of a few kilometres around the roads. The project could diminish the sense of tranquility on the territory, alter the possibility of recharging one's batteries in the forest and reduce the ability to peacefully access practice areas. The Committee considers that the intensity of these nuisances would vary from one family to another, since Cree camps located near the roads could be exposed to more nuisances than others located in the periphery.

The Committee believes that a reduction in the frequency of blasting and heavy truck transport activities during goose and moose hunting periods would make it possible to maintain relative peace and quiet in the sector, during the key periods when the members of the Cree Nations gather in large numbers on the territory. The Committee considers that the proponent proposes to implement a number of measures to limit the effects of its transportation activities on the day-to-day use of the territory. It is also satisfied with the mitigation measures proposed by the proponent to make heavy truck drivers aware of the traditional activities of the Cree Nations. This measure could help maintain greater courtesy on the road towards Cree users who park along the roadside to carry out their activities. The Committee recognizes that although satisfactory, these measures only partially address the concerns of the Cree Nations more broadly related to road maintenance and policing, issues that go beyond the scope of the federal environmental assessment. The Committee recommends, however, that the monitoring of the quality of the territory's experience, including tallymen of Nemaska tarplines R16 and R19, be included as part of a follow-up program by the proponent. Follow-up through interviews with users of traplines RE01, R16 and R19 would make it possible to initiate a dialogue on the quality of the experience on the territory. The Committee believes that despite all these measures, the project would have residual effects on the quality of the experience of certain Cree users of the territory whose camps are located closest to the mine and the roads in question.

Perception of Contamination of Territory and Resources

The proponent acknowledges that the activities of the mine could give rise to concerns about the possible contamination of the environment, game, fish and flora that constitute the traditional food of the Cree Nations. The Cree Nations have expressed concern in this regard, mainly about beaver, moose and fish. The Cree Nations territory users consulted said they had already observed changes in the appearance of fish, which they attribute to the historical contamination of certain watercourses and water bodies in the sector. Doubts remain on their part as to the ability of development project proponents to control the quality of the water resulting from their processes. They anticipate that many land users would avoid an expanded area on the periphery of the mine for several decades for fear of contamination. Some users of the Waskaganish territory

fear that water from the final mining effluent will contaminate the lakes east of trapline R10. In particular, they fear the project's effects on the quality of beaver meat and fur.

The proponent agrees that the project could alter the water quality of various watercourses and fish-bearing water bodies. To address the Cree Nations' concerns, the proponent plans measures to prevent the dispersion of contaminants into the environment. To limit the perception of contamination and increase the credibility of the results of the environmental follow-up studies, the proponent undertakes, insofar as possible, to employ members of the family of the tallyman of trapline RE01 for the various environmental follow-ups. The proponent also plans to inform Cree users of the territory and members of the Cree communities of the results of the environmental follow-ups. It undertakes to submit the studies of these follow-ups to the environmental services of the councils of the Cree Nations of Eastmain, Waskaganish and Nemaska. The proponent undertakes to implement several follow-up measures and programs to limit the project's effects on the health of the Cree Nations. These elements are assessed more specifically in Section 6.2 (Cree Health).

The Committee considers that the proponent is proposing several relevant measures to increase the confidence of land users in the control of contaminant discharges into the environment and to reduce the avoidance of the territory due to the perception of environmental contamination. The latter could be felt with a slightly higher level of intensity by the users of traplines RE01 of the Cree Nation of Eastmain and R10 of the Cree Nation of Waskaganish, due to the waters of the final mining effluent that would begin their journey over five kilometres in trapline RE01 to complete their dispersion in the extreme east of trapline R10. The Committee recommends the hiring of an independent environmental monitor as well as the effective dissemination, and as soon as possible, of the results of the environmental follow-ups to the Cree public, in addition to encouraging the active participation of the tallyman RE01 directly affected by the project. The Committee considers the water quality management measures proposed by the proponent (assessed in section 5.1 Fish and Fish Habitat) to be adequate and believes that they should make it possible to maintain the quality of the water produced by the mine's processes. The mitigation and follow-up measures proposed by the proponent with respect to human health would make it possible to limit the risks of contamination (see section 6.2 Cree Health).

The Committee notes, however, that the project would be part of a regional context marked by a history of water contamination in the area by other proponents. Avoidance of the project site and its surroundings for fear of contamination could continue after the mine is decommissioned, despite the measures put in place by the proponent to increase user confidence. The perception of contamination could generate anxiety and cause the avoidance of certain sectors for several generations, which could reduce the current level of satisfaction with stays on the territory in the direct periphery of the project. Users could change their harvesting habits for fear of a change in practice conditions, which could reduce harvests and occasionally harm the food security or drinking water supply of certain families.

The Committee believes that it is uncertain whether land users would actively re-use the territory of the mining site once it has been recovered, particularly since the site would only regain a natural appearance suitable for traditional activities after several decades. Many of these users might avoid the vicinity of the reclaimed mine site for fear of contamination, but the intensity and frequency of the perception of contamination would be lower once the mine is recovered.

6.1.2 Analysis and Conclusions by the Joint Assessment Committee on Residual Effects

At the end of its analysis and based on the evaluation criteria presented in Appendix A, the Committee concludes that, taking into account the mitigation measures proposed by the proponent[28] and the additional measures proposed by the Committee, the level of residual environmental effects on the current use of land and resources for traditional purposes would be moderate. These effects would be insignificant as defined by CEAA 2012 for the following reasons:

- The extent of the effects would be local, as the effects would extend beyond the project site but would be within the human environment study area. The project would result in the avoidance of wildlife on its periphery which would extend beyond the mine site, but not the study area. The Committee considers that the effects of transportation activities on current land use would be felt to a limited extent along the periphery of the roads. The availability of resources and the quality of the territory's experience would not be compromised beyond the roads' zone of influence.
- The duration of the effects would be long because of the project's lifespan (26 years).
- The frequency would be continuous considering that the effects would be perceived consistently during all phases of the project, despite a notable decrease in the frequency of blasting and road transport activities during goose and moose hunting periods.
- The effects of the project would be partially reversible. Certain effects would be considered irreversible, notably the loss of Lakes 1 and 2 and of the currently navigable Watercourses A (in part), B, K and L which is home to fish, as well as the loss of a camp and the Cree knowledge related to it. The decrease in the availability of the resource with regard to fish would be irreversible in the study area, but the intensity of this effect on fishing would be reduced by the compensation. Wildlife, with the exception of fish, could return to its current level of abundance once the mine is recovered and transportation activities are completed. The effects of the project on access to the territory would be partially reversible once the mine is decommissioned and the security perimeter dismantled, since only a small portion of the territory would remain inaccessible to the Crees, namely the flooded pit secured with a physical barrier. The navigability of most water bodies, including Lakes 8, 11, 12, 13, 15, 18 and 19, would be reversible, even if the effects would be felt over a long period. The effects of the project on the reduction of peace and quiet on the territory and the feeling of safety on the road would be reversible. The effects of the perception of resource contamination on the experience of the territory are considered partially reversible.
- The intensity of the effects would be moderate. The decrease in the availability of resources, the modifications to access to the territory, the decrease in the quality of the experience and the perception of contamination would modify the conditions of practice as well as several habits and behaviours among

[28] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

certain families of users of the territory, without, however, compromising the current use of the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi.

Identification of Key Mitigation Measures

The Committee considered the mitigation measures proposed by the proponent, the advice of government experts (federal, provincial and Cree) and the comments of the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi to determine the following key mitigation measures that would be required to ensure that the project does not cause significant adverse environmental effects on the current use of lands and resources for traditional purposes by the Cree Nations:

- Collaboration with the tallyman of trapline RE01 in the relocation of the camp located near the project site to another location of the latter's choice. Supply of materials for the construction of this new camp;
- Implementation of a communication plan, in consultation with the Mine Implementation Committee, to inform Cree users of traplines RE01, R16, R19, R10, A52, A54, W01, W03, W07, W13 and W53 of the schedule of construction, operation, maintenance and closure activities;
- Changes in the frequency of blasting operations and the frequency of truck convoys transporting ore concentrate during the annual spring goose and fall moose hunting seasons. Authorization of a maximum of one blasting per five days and 100 heavy truck passages per week during these two annual hunting periods, over a period of fourteen consecutive days each time. Identification of favourable times for these modifications to the proponent's activities in consultation with the Cree Nation of Eastmain;
- Carrying out blasting activities in the open pit between 10 a.m. and 4 p.m.. Establishment of a direct communication mechanism between the proponent and the Cree users of traplines RE01, R16, R19 and R10 regarding the dissemination of changes to blasting schedules during the operational phase;
- Inclusion of a clause in the employment contracts of employees, including subcontractors, concerning the prohibition of all hunting, trapping and fishing activities on the mine site and within the mining lease. Prohibition for employees to have in their possession firearms, hunting, trapping or fishing equipment. Imposition of disciplinary measures on employees in the event of failure to comply with this prohibition in the employment contracts, unless such activities are specifically organized by the proponent in appropriate locations, such as outfitting operations;
- Development of a plan to recover fish prior to the dewatering of Lake 1 and allow Cree Nations to participate in this plan;
- Development and implementation, in consultation with the Mine Implementation Committee, of a conflict resolution protocol in the event of problems related to the reconciliation of land and resource uses between mine workers and Cree users of the territory;
- Prohibiting any person from engaging in any hunting, trapping or fishing activity and from possessing any firearms, hunting, trapping or fishing equipment within the security perimeter, unless that person is accessing the security perimeter for cultural purposes or to exercise aboriginal rights, provided that such access and the exercise of such activities are safe and subject to the terms and conditions developed with the Cree Nations prior to construction;

- Implementation, in consultation with the tallyman RE01, of a beaver trapping plan covering the area within the safety perimeter established by the proponent. Completion of an inventory, in collaboration with the tallyman of trapline RE01, to determine the zones to be favoured for intensive beaver trapping prior to construction work. Reservation of a period including at least one winter (November to March) during which intensive trapping would take place, prior to construction work, and providing the tallyman with the necessary equipment for beaver trapping activities;
- Offering consultation and information meetings with the tallymen of the Cree Nation of Waswanipi during the operational phase of the project, in order to discuss the effects of the project on the Nation's current use. The frequency and conduct of these consultation meetings will be defined with the Cree Nation of Waswanipi;
- Communication of the results of the environmental monitoring carried out by the proponent to the Cree users of traplines RE01, R16, R19 and R10, after consultation with the Mine Monitoring Committee regarding the appropriate frequency and manner of informing them;
- Offer of work or observation contracts, as much as possible, to the family members of the tallyman of trapline RE01 to carry out the environmental follow-up activities;
- Submission of the environmental follow-up studies produced by the proponent to the environmental services of the band councils of the Cree Nations of Eastmain, Nemaska and Waskaganish as soon as they are published, throughout the life of the project;
- Offer to consult with the tallyman RE01 regarding the mine recovery plan prior to its submission for authorization to the Quebec's Ministère de l'Énergie et des Ressources naturelles. Offer to the members of the Cree Nation of Eastmain and to the tallymen R10 of Waskaganish as well as R16 and R19 of Nemaska to present the final mine recovery plan, before and after its approval by the Quebec's Ministère de l'Énergie et des Ressources naturelles, to inform them of the selected scenario and the residual modifications to the territory;
- Gradual revegetation of the tailings piles as soon as possible, consulting tallyman RE01 for the choice of plant species;
- Prior to the start of the construction phase and in collaboration with Cree Nations, develop a plan for managing heavy trucking activities during all phases of the project. This plan should be presented to the Committee and the Cree Nations and shall include the following measures:
    - Distribution of heavy truck passages over the whole day and week;
    - Limiting the number of truck passages in the evening and at night;
    - Regular awareness-raising among workers and drivers of the need to comply with road safety rules, under penalty of expulsion;
    - Regular sensitization of drivers to the traditional activities carried out by Cree land users and to the courtesy required for the safety of land users who park along the roads to carry out their harvesting;
    - Installation of radio communication systems in transport trucks.
- Implementation of a system for receiving and resolving noise-related complaints, in order to confirm that the noise environment does not cause an effect on users of the territory.

Need for Follow-up and Follow-up Requirements

The Committee recommends the implementation of a follow-up program to verify the effectiveness of certain mitigation measures and the predictions regarding the continued current use of lands and resources for traditional purposes by users of traplines RE01, R16 and R19. This follow-up would mainly be based on meetings with the tallymen of these traplines and their families.

A baseline survey should be carried out before construction work begins. This would document the following elements with the users of traplines RE01, R16 and R19:

- Assessment of the state of resources with regard to goose, moose and lake sturgeon and the Cree knowledge related to these species;
- Access to camps and traplines via the Nemiscau-Eastmain-1 and Route du Nord roads during the annual hunting season;
- The quality of the experience at the hunting camps during the annual hunting season.

Thereafter, the Committee recommends annual monitoring during the construction phase and during the first six years of operation of the mine. The results of this follow-up would be presented annually to the Environment Committee of the Pihkuutaau Agreement as well as to the Agency. If the mitigation measures prove effective after the first six years of operation, the proponent could, in consultation with the Environment Committee of the Pihkuutaau Agreement and the Agency, re-evaluate how often this follow-up would be necessary over the remaining life of the project. In the event that the measures are not deemed effective by the parties, monitoring would continue until the end of the mine's operation. Adjustments to the mitigation measures could be made if necessary to minimize adverse effects on the current use of land and resources for traditional purposes.

The proponent should monitor the effectiveness of measures to reduce the frequency of blasting and heavy trucking activities on the maintenance of goose and moose harvests by users of traplines RE01, R16 and R19 by documenting the following elements:

- Assessment of the state of these resources and the effects on goose, moose and lake sturgeon harvests;
- Cree knowledge related to changes in the behaviour of these species, if applicable;
- The effects of increased heavy traffic on the Nemiscau-Eastmain-1 and Route du Nord roads on access to traplines and on the quality of the experience at camps and hunting sites, both during and outside the annual goose and moose hunting seasons;
- The perceived effectiveness of the mitigation measures implemented.

The Committee also recommends monitoring the effectiveness of the progressive reclamation of areas disturbed by the project. In particular, the proponent should monitor the stability of the soils and the growth and diversification of the plant species used for revegetation.

Finally, the Committee recommends that the proponent retain the services of an independent third-party environmental monitor to oversee the implementation of the follow-up programs presented in this Environmental Assessment Report. This monitor would report its findings to the proponent, the Agency and the Cree Nation Government.

6.2 Cree Health

The project could result in residual effects on Cree health related to changes in the environment. However, the Committee believes that these effects are not likely to be significant given the implementation of the mitigation and follow-up measures recommended in section 6.2.2. To determine the significance of the effects on human health, the Committee assesses whether any residual effects of the project on air, water, soil or traditional food quality persist despite the proponent's proposed contaminant management and mitigation measures (including contaminants for which there is no threshold for health effects). The Committee also assesses whether health effects could result from exposure to contaminant levels that exceed applicable health protection standards and criteria or high nuisance levels.

The following subsections present the information considered by the Committee in its analysis to conclude on the significance of the project's effects on Cree health, including the opinions and comments of federal government experts, the Cree Board of Health and Social Services of James Bay, the Cree Nations consulted and the public.

6.2.1 Analysis of Potential Effects and Proposed Mitigation Measures

Under CEAA 2012, the effects of the project on the health of the Cree are the result of changes to the environment that would pose risks to their health. The project could result in effects on Cree health through changes to air, water and soil quality and through the presence of contaminants in traditional food sources obtained through hunting, trapping, fishing and berry picking. The sources of effects on Cree health and possible sources of contamination are particles such as gaseous contaminant, dust, heavy metals in dust or water and hazardous materials accidentally spilled into the environment. Possible routes of exposure are inhalation, ingestion and direct contact. Nuisance caused by noise could also affect Cree health.

The proponent used its human environment study area to assess the effects of the project on Cree health (Figure 3). The study area straddles four traplines associated with users in the traditional territory of the Cree Nations of Eastmain (trapline RE01), Nemaska (traplines R16 and R19) and Waskaganish (trapline R10). Each trapline is associated with a Cree family and other users who practise traditional food harvesting activities under the management of the tallyman. Hunting, fishing, trapping, berry picking and the harvesting of medicinal plants are the main activities practised on the traplines. They take place throughout the year according to specific practices and schedules.

A Cree work camp, located at kilometre 42 of the Nemiscau-Eastmain-1 road, is 0.5 kilometres from the future mine site. This camp would be moved by the proponent further into the territory, outside the study area. A water source is also present on the future mine site, but the proponent plans to close access to it at the start of the project. A second camp is located 4.5 kilometres south of the project, at kilometre 37 of the Nemiscau-Eastmain-1 road.

The problem of contamination of traditional foods has been affecting the Cree Nations since the arrival of major projects on the territory of Eeyou Istchee James Bay. Mercury contamination of fish has particularly

marked perceptions, especially in the wake of the development of hydroelectric projects. It has had an impact on fishing practices and has aroused the mistrust of the territory's users. The Cree Nations attribute great importance to the risks to their health.

Air Quality

The proponent believes that the current air quality at the proposed site is very good, with little industrial activity in the vicinity of the project. It also notes that the risk of forest fires in the area of the study site is considered significant. This risk and the potential effect of forest fires were considered in the assessment of the effects of the project on air quality.

The project could degrade air quality by emitting contaminants into the atmosphere. These contaminants include dust, potentially including metals and metalloids, and gaseous compounds from combustion (exhaust gases). Inhalation of contaminants into the atmosphere could result in risks to Cree health, particularly for users of the traditional territory who have camps near the mine site and the roads used by the proponent.

According to the proponent, the project could affect air quality by emitting dust during road transportation and other mining activities or infrastructure, such as the operation of the ore processing plant, drilling, blasting, loading and unloading of mining materials and mining material storage sites. The transportation of mining materials on the unpaved roads of the future mine site would be the main source of dust. Dust could have a negative effect on air quality near the site and along the North and Nemiscau-Eastmain-1 roads. These activities could emit particulate matter (total particles, fine particles $PM_{2.5}$ and PM_{10}), crystalline silica, metals and metalloids (antimony, silver, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, manganese, mercury, nickel, lead, selenium, thallium, titanium, vanadium and zinc) into the atmosphere.

During the construction phase, the proponent's particulate matter[29] modelling predicts compliance with the standards for total particulate matter (TPM) and fine particulate matter ($PM_{2.5}$) set out in Quebec's *Clean Air Regulation* and the *Canadian Ambient Air Quality Standards*, both on the periphery of the site and at the Cree camp located 4.5 kilometres away. During the operational phase, total particulate matter measurements of 120% of the standard could be detected within 500 metres of the mining infrastructures. No exceedance of fine particles is expected near the mine site and no exceedance of total and fine particles is expected at the Cree camp located 4.5 kilometres from the project. It should be noted that there are no Canadian criteria regulating PM_{10}. However, the proponent has evaluated that PM_{10} concentrations could reach 126% of the limit value established by the World Health Organization during the operational phase, whereas they would be below this value during the construction phase. This limit value would be respected at the Cree camp during the construction and operational phases. With respect to metals and metalloids, the proponent's modelling predicts compliance with Quebec's *Clean Air Regulation* and *Atmospheric Quality Standards and Criteria* during the operational phase.

[29] Long-term exposure to particles increases the risk of developing cardiovascular and respiratory diseases and lung cancer. (Health Canada, 2021a and World Health Organization, 2018)

Environment and Climate Change Canada (ECCC) argues that the proponent conducted their particulate matter and dust deposition modelling assuming that their mitigation measures would reduce emissions by 75%, including regular watering of roads at the mine site. According to ECCC, this rate is very optimistic and, in practice, the proponent would not be able to maintain it at all times. The modelled concentrations of particulate matter, including crystalline silica, as well as their deposition outside the mine site on sensitive receptors (Cree camp located 4.5 kilometres from the mine site, Lakes 18 and 19) could therefore be underestimated. It is therefore possible that the standards in effect at the time the project is carried out could be exceeded. Health Canada also points out that $PM_{2.5}$ and PM_{10} are no-threshold substances, i.e., it has not been possible to date to establish a threshold below which no adverse effects on health would occur. Concentrations of $PM_{2.5}$ and PM_{10} should therefore be kept as low as possible.

Although there are no specific standards in Quebec, ECCC believes that it is important to estimate dust deposition, particularly at sensitive receptors near the mine site, namely the Cree camp and nearby water bodies, including Lakes 18 and 19 (see Figure 5). In particular, dust could be deposited on water bodies located near the mine site. The proponent estimated that during the construction phase, a maximum monthly deposition of 0.05 grams per square metre (g/m^2) would occur in the Cree camp located 4.5 kilometres from the mine site. A maximum monthly deposition of 0.89 g/m^2 is modelled at Lake 6, east of the mine site. During the operational phase, wind erosion of the tailings pile could result in the transport of dust over long distances. A maximum monthly deposition of 0.26 g/m^2 would occur at the Cree camp. For the lakes around the site, the maximum monthly deposition would be 4.57 g/m^2. Comparing the results with the former deposition standard of 7.5 g/m^2 per month under Quebec's former *Air Quality Regulation* (repealed), there would be no exceedance at sensitive receptors. However, ECCC notes that the proponent's dust deposition modelling did not take into account the contribution of particulate matter already present in the air. The results obtained could therefore be underestimated. Consequently, ECCC recommends that the proponent conduct a follow-up on water and sediment quality in Lakes 18 and 19 (see section 5.1 Fish and Fish Habitat).

Crystalline silica[30], which is present in materials composed of quartz, such as certain types of rock, can be released when the rock is exploded or crushed or when vehicles drive over surfaces containing this compound. For road construction at the mine site, the proponent plans to reuse waste rock as aggregate, which has been estimated to contain approximately 21% silica. In order to minimize crystalline silica emissions on the roads, the proponent plans to use amphibolite as aggregate, a material containing little silica (0.55%) and forming part of the waste rock. Nevertheless, the proponent anticipates that Quebec's *Atmospheric Quality Standards and Criteria*[31] for Crystalline Silica around the project will be exceeded. During the operational phase, concentrations could reach up to 766% of the criteria over a 1-hour period during a waste rock blast, i.e., once every 5 days, and up to 314% of the criteria over a 1-year period, 300 metres around the mine site. On days without blasting or with ore blasting, 4 days out of 5, the modelled concentrations around the mine site would represent 663% of the criterion over a 1-hour period. At the Cree

[30] Crystalline silica dust can induce respiratory deficiencies, emphysema, asthma, lung cancer and irreversible pulmonary fibrosis called silicosis. Silicosis is a disease that causes progressive respiratory problems ranging from shortness of breath on exertion to very severe respiratory impairment. In particular, it can occur after 15 to 20 years of low to moderate exposure. Complications of silicosis can be fatal. (Commission des normes, de l'équité, de la santé et de la sécurité du travail, 2020)

[31] Available here: https://www.environnement.gouv.qc.ca/air/criteres/index-en.htm

camp located 4.5 kilometres away, modelling indicates that the criteria could be exceeded over a 1-hour period (117%) during a waste rock blast. The annual criterion would still be met (77%). On days without waste rock blasting, the concentrations modelled at this camp would be around 29% of the criterion over a 1-hour period. In order to minimize the risks, the proponent suggests blasting waste rock when the winds are not blowing towards the camp. Despite the anticipated exceedances, the proponent has not analyzed their potential health effects. To partially compensate for this shortcoming, Health Canada recommends that a follow-up of crystalline silica concentrations in the Cree camp be implemented. It considers that measures to mitigate these emissions as much as possible would be very important.

The proponent anticipates an increase in daily road traffic on the Route du Nord and Nemiscau-Eastmain-1 roads, both unpaved, due to mine supply and ore transport. The project would generate on these roads up to 24 truck return trips per day during the construction phase and 68 during the operational phase. The increase in heavy vehicle traffic on the Route du Nord would be almost 50% during the construction phase and almost 140% during the operational phase. The current average daily flow on the Nemiscau-Eastmain-1 road is unknown. This traffic would increase the suspension of particulate matter by 45% on the Route du Nord and Nemiscau-Eastmain-1 roads towards Matagami, and 62% on the Billy-Diamond Highway. For the portion of the Route du Nord towards Chibougamau, the increase would be very small. The proponent has not conducted a detailed analysis of the effects of the increase in particulate matter on the health of land users near these roads. Given the concerns of certain users, Health Canada believes that this analysis would have been relevant. The proponent plans to set up a complaint reception and resolution system that would include traffic-related complaints and air quality. The resolution of complaints by adding additional mitigation measures could make it possible to reduce the impact of the additional traffic on these roads.

According to the proponent, the machinery used at the mine site could emit gaseous contaminants such as carbon monoxide, nitrogen dioxide[32] and sulphur dioxide. The exclusive use of machinery and mobile equipment with Tier 4[33] certification in the operational phase (when available) would contribute to a significant reduction in these emissions. During the construction phase, the proponent does not anticipate any exceedances at the mine site for carbon monoxide (up to 4% of the standards of Quebec's *Clean Air Regulation* [CAR]), nitrogen dioxide (up to 87% of the CAR standards and 97% of the hourly standard of the *Canadian Ambient Air Quality Standards* [CAQS]) and sulphur dioxide (up to 5% of the CAR standards and 19% of the CAQS). The standards for carbon monoxide and sulphur dioxide would also be met at the Cree camp located 4.5 kilometres from the site. During the operational phase, concentrations for these compounds would remain below the standards at the mine site and at the Cree camp. Only the concentration of nitrogen dioxide at the Cree camp, for the operational phase, would exceed the hourly CAQS (102%).

Health Canada specifies that nitrogen dioxide is a non-threshold substance. Its concentration should therefore be kept as low as possible. ECCC believes that only generic nitrogen dioxide concentrations recommended by Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques for projects in remote areas should be used to estimate concentrations in the baseline environment for this project. Since the use of equipment on the project site could represent a significant contribution of nitrogen

[32] Nitrogen dioxide can reduce lung function and worsen asthma symptoms. Prolonged exposure to low levels of nitrogen dioxide can increase the risk of respiratory symptoms such as coughing and wheezing. (Health Canada, 2021b)

[33] U.S. Environmental Protection Agency Certification

dioxide, ECCC recommends that the proponent add this contaminant to the follow-up for the operational phase if it is unable to use Tier 4 certified equipment.

Members of the Cree Nations of Eastmain, Waskaganish and Nemaska have raised concerns about air contamination, particularly due to dust raised by increased traffic on unpaved roads.

In addition to the mitigation measures already mentioned, the proponent plans to implement a dust management plan to minimize emissions caused by the project. This plan would include a detailed air quality monitoring program. In particular, it plans to install an atmospheric measurement station on the project site. The Cree Board of Health and Social Services of James Bay believes that this plan is necessary to limit the effects on air quality and that the proponent's mitigation measures related to air quality would make it possible to minimize the effects on Cree health. The proponent also plans to develop a communication plan to respond to the concerns of the Cree Nations and to obtain their traditional knowledge on perceived changes in the territory.

Water Quality

Water quality is a key determinant of Cree health. Although to a small extent, some land users fish in the vicinity of the future mine site. Most of the water flowing from the mine site, including that from the final mining effluent, would eventually join the waters of the Pontax River. The other, smaller portion would flow towards the Eastmain-1 Reservoir. The territories encompassing the Pontax River and the Eastmain-1 Reservoir are places used by the Crees to practise their traditional fishing and hunting activities, among others.

During the consultations conducted by the Committee, members of the Cree Nations of Eastmain, Waskaganish and Nemaska raised concerns about water quality. Some explained that they did not have confidence in the ability of the proponents active in the region to control the quality of the water resulting from their processes. They also asked if the water released into the environment would be of good enough quality for consumption.

As described in Section 5.1 (Fish and Fish Habitat), the project could have an effect on water quality due to mine water management. The proponent undertakes to comply with the criteria established by Quebec's mining industry Directive 019 and Canada's *Metal and Diamond Mining Effluent Regulations*. In order to meet these criteria, the proponent plans, among other things, to send the mining water to a treatment plant before it is discharged into Watercourse A (figure 5). As noted in Section 5.1, the Committee believes that with the key mitigation and follow-up measures, the project is not likely to cause significant adverse effects on water quality. The proponent would also close the water source located at Lake 3 at the start of the project.

According to Health Canada, little is known about the toxicity and mobility of tantalum. However, from a human health perspective, tantalum would not be a concern according to the proponent's summary review of the scientific literature. Health Canada suggests that the proponent put in place an action plan to protect human health in a preventive manner to ensure the safety of the final mine effluent on the receiving environment. It is also suggested that the proponent collaborate in academic or institutional research initiatives aimed at improving knowledge on tantalum and human health. The Cree Board of Health and Social Services of James Bay believes monitoring tantalum at the point of discharge of the final mining effluent would make it possible to validate the non-toxicity of tantalum.

Soil Quality

According to the proponent, road transportation, heavy machinery traffic, the use of supply sites and the temporary storage or handling of residual and hazardous materials represent potential sources of accidental spills that could contaminate the soil. Soil contamination could lead to contamination of surface and ground water. Direct contact with an irritant may also pose a risk to human health. However, measures to prevent accidents and malfunctions (section 7.1), including the establishment of a spill contingency plan, would mitigate these risks.

Sound Environment Quality

The study area used by the proponent to assess the effects on the noise environment is the footprint of the mine site and approximately 500 metres around it. Since this zone is not very busy, its current noise level corresponds to that measured in the natural environment, which is less than 40 decibels. However, it is possible to hear users of the Nemiscau-Eastmain-1 road, passing 500 metres east of the future mine site. The increase in road traffic, the construction of the mine site's infrastructures and the use of explosives would cause an increase in ambient noise. At the Committee's request, the proponent also assessed the effects of transport-related noise outside the study area. According to Health Canada, noise can have harmful effects on health, particularly by disturbing sleep or causing significant long-term discomfort.

According to the proponent, during the construction phase, truck traffic on off-site roads, such as the Nemiscau-Eastmain-1 road, would result in an average noise level of 40 decibels at 55 metres from the road and 45 decibels at 37 metres. During the operational phase, the average noise level would reach 40 decibels at 85 metres from the road and 45 decibels at 55 metres. The maximum recommended noise levels outdoors to avoid health effects are 55 decibels to avoid impairing speech comprehension and 40 decibels to avoid disturbing sleep. The proponent has determined that the minimum distance that would be necessary to maintain between land users and the road to avoid an effect on speech and sleep disruption is 68 metres in the operational phase. Currently, the camp closest to the road is located 80 metres from the road. No campsites are therefore located within this critical health zone. According to the proponent, the noise levels emitted by traffic on the Nemiscau-Eastmain-1 road would not be sufficiently high and constant to consider an effect on the health of people with camps along this road. Health Canada believes that if noise levels along this road were similar to those modelled, effects on speech disturbance should not occur at 18 metres and over from the road (during construction phase) and 25 metres and over (during operational phase). Health Canada suggests that to protect sleep, new campsites should be set up beyond 68 metres from the road.

Members of the Cree Nation of Nemaska mentioned a concern about the effects of noise and vibrations caused by increased traffic on the health of users of the hunting camps on the periphery of the Nemiscau-Eastmain-1 road. Tallymen from the Cree Nation of Waswanipi also underlined the issue of the loss of tranquility at the camps along the roads. Users of camps near the road may experience inconveniences when trucks pass by.

The proponent anticipates that during the construction phase, most of the equipment would operate between 11 hours and 24 hours a day. The drills would be in operation for approximately seven hours a day. During the operational and maintenance phase, the noise associated with the activities of the trucks and mining equipment would be heard day and night, while the drills and the crushing plant would only operate during the day, and the equipment for the co-deposit hall would be in operation 18 hours a day. During operational phase, the proponent plans to carry out two blasts every five days, one for waste rock and one for ore. During the closure phase, noise emissions would be significantly reduced. Health Canada believes that the inconvenience related to noise could be mitigated by proactively communicating the blasting schedule to land users.

According to the proponent, an increase in noise levels during construction and operational activities would be noticeable in the study area. However, the level would remain below the permitted limits of the *Guidelines for Noise Levels from an Industrial Construction Site* and the criteria of Quebec's *Noise Instruction Standard 98-01*. In addition, the noise level would comply with the indicator used by Health Canada on the percentage of people who are strongly bothered by noise[34]. The proponent would also comply with the noise limit imposed by Quebec's Directive 019 for blasting. Further, it is expected that the site supervisor would ensure that noisy equipment is properly maintained and that the machinery's mufflers and catalysts are in good condition. In addition, the proponent plans to set up a system for receiving and resolving noise-related complaints, in order to confirm that the noise environment does not have an impact on users of the territory. Health Canada believes that fewer complaints are reported when accurate information is provided and that it does not underestimate noise.

Health Canada notes that the proponent's assessment is based in part on the assumption of low land use, which would not be a conservative approach. It is more than desirable that the Crees reclaim their territory despite the industrial projects and that they continue, and even increase, their consumption of traditional food. Health Canada believes that if the noise levels measured during the mining phase are found to be similar to the levels modelled, the emissions should not cause any adverse effects on Cree health. It would like to specify that compliance with the standards and criteria used by the proponent for its assessment does not necessarily guarantee the absence of health effects. In this very low-noise environment, an increase in the noise level of about ten decibels, although respecting the standards and criteria, could affect the users of the territory. Noise impacts thus depend greatly on the interference of noise with the activities that individuals try to do in relation to their expectations of peace and quiet during these activities (Health Canada, 2017).

Traditional Food Quality

In the Human Environment study area, land users who hunt, fish, trap or gather consume the product of their harvest, particularly goose and moose, and to a lesser extent beaver, partridge, hare, fish and berries. Lake 2, which would be drained to create the pit, and Lake 3, which could be affected by a change in the hydrological regime, have been used for fishing in the past, but are no longer used today. Some medicinal

[34] Information concerning this criterion is available here: http://publications.gc.ca/collections/collection_2015/sc-hc/H128-1-10-599-eng.pdf

plants are harvested in the study area including Labrador tea, blueberry and alder. With the arrival of the project, the users of trapline RE01 plan to relocate their activities, particularly for goose hunting.

According to the proponent, the dust emitted by the sources listed above could be deposited on soils, surface water and vegetation. The latter could thus be contaminated, leading to the contamination of the associated traditional food. Metals in the pit dewatering water and in the final mining effluent could end up in lakes and watercourses downstream from the mine site. Water infiltrating into the accumulation areas of the various mining materials and in undrained areas could also seep into groundwater and resurface further into surface waters, such as lakes.

For the Cree Nations, it is important to continue to consume traditional food not only for food purposes, but also for cultural purposes and for the transfer of Indigenous knowledge. The Cree perceive a risk to their health with respect to the potential contamination of lakes, waterways, soils and associated resources (fish, large wildlife, small wildlife such as beavers, plants or other natural resources) used for traditional purposes. The same is true for the deposition of mine-related dust on plants consumed. Some members of the communities consulted believe that mining projects may have an effect on the quality and taste of beaver meat. In addition, some also indicated that stress and anxiety among land users would persist, despite the proponent's measures to mitigate the effects on resources. Indeed, they do not trust the information made available by the proponents. Members of the Cree Nation of Nemaska also expressed concern about the potential effects of mining projects on the health of pregnant women, including an increase in miscarriages.

In order to estimate the health risks for consumers of traditional foods, the proponent carried out a risk assessment of the contamination of traditional food. The proponent based this assessment on conservative assumptions so as not to underestimate possible risks. The proponent believes that dust emissions and the possible transfer of contaminants in groundwater to surface water by resurgence would not have an effect on the plants and animals consumed. This assessment is based on the mitigation measures planned by the proponent to minimize the effects on the environment, including air, water and soil quality. Health Canada believes that the potential impacts on Cree health resulting from chemical modifications to traditional food have been adequately considered with the exception of contaminants with a high bioaccumulation potential, namely arsenic, cadmium, mercury and lead. Since the proponent based its analysis on modelling, uncertainty remains regarding the project's actual effects on traditional food. Moreover, according to the proponent's summary literature review, tantalum is not a concern from a human health standpoint. Health Canada believes that a reasonable effort was made by the proponent to assess the effects on traditional foods.

According to the proponent, compliance with environmental standards is the first measure to protect the receiving environments (physical and biophysical), although it does not guarantee the protection of human health. The design of equipment and processes would take into account all environmental standards in force. Measures would be put in place to limit the spread of contaminants in the environment as much as possible, thus limiting the exposure of land users to potential contamination of traditional food. These measures would include the establishment of a 1-kilometre security perimeter around the project's infrastructures, within which all activities, including hunting, fishing and trapping, would be prohibited for the majority of the land users. This perimeter would make it possible to limit the harvesting of resources near the site, which are more likely to be contaminated. The tallyman of RE01 and his family could still have access to certain

resources in this area under certain conditions (see chapter 6). Health Canada recommends that the proponent validate the concentrations of contaminants in the air, water and soil predicted and used as inputs in its assessment of the risk of contamination of traditional foods. The Committee recommends that these validations be taken into account when setting up the security perimeter and be communicated to the tallyman of trapline RE01. However, it raises the fact that uncertainty would persist regarding metals with a high bioaccumulation potential (arsenic, cadmium, mercury and lead).

Health Canada believes that if the mitigation and follow-up measures are efficiently implemented by the proponent, the possible chemical modification of the traditional food related to the project should not have a significant effect on Cree health. The Cree Board of Health and Social Services of James Bay believes that the concentrations of arsenic, cadmium, mercury and lead in the soil meet criterion A of Quebec's Intervention Guide - Soil Protection and Contaminated Sites Rehabilitation. This criterion makes it possible to protect sensitive receptors, and additional effort regarding these contaminants in the form of traditional food monitoring would not be justified. These contaminants would be monitored in the water quality monitoring program recommended in Section 5.1 (Fish and Fish Habitat).

According to the proponent, the project is located relatively far from Cree Nation villages and the use of the territory and consumption of traditional food from the study area is currently occasional. The proponent believes that this situation precludes the risk of chronic contamination[35] through substances consumed on a daily or weekly basis. Despite this conclusion, the Cree Nations indicated that they would avoid the removal of resources in the vicinity of the mine site. They indicated that they would judge the actual effect on health once the project was underway, since the assessment of the risk of contamination of the proponent's traditional diet is based on assumptions and modelling. Moreover, despite the planned follow-ups and the sharing with the Crees of the results of the proponent's assessment, the Committee believes that the Crees may retain their perception of contamination of the resource, which would limit harvesting near the project.

Health Canada points out that the intake of many nutrients is enhanced when even small amounts of traditional food are consumed by Indigenous people. Traditional food is also important from a social and cultural perspective (Institut national de la santé publique du Québec, 2015). As food insecurity is high in First Nations communities (Chan et al., 2016), particularly in areas where the price of food found in shops is high, access to traditional food should be valued and protected. Health Canada recommends that a communication plan for the proponent's environmental follow-up results be put in place. The objective of this communication plan would be to respond to the concerns of the Cree Nations with respect to traditional food in order to minimize the avoidance of the resource. In order to promote the consumption of traditional food by Cree workers, Health Canada recommends that the proponent offer them flexible holiday schedules for the practice of traditional food harvesting activities, facilitate access to traditional food in the workplace (for example, by leaving a place in the freezer for traditional food) and make workers aware of the importance of traditional food for the Cree Nations.

[35] Chronic means long-term or extended. The term "chronic" can be applied to a health effect. Chronic exposure is long-term exposure: months or years. A health effect is said to be chronic when it occurs long after exposure, that is, after several months or years. (Definition by Termium Plus)

6.2.2 Analysis and Conclusions by the Joint Assessment Committee on Residual Effects

The Committee assessed the project's residual effects on Cree health in accordance with the environmental impact assessment criteria in Appendix A. The Committee believes that the project is not likely to cause significant adverse environmental effects on Cree health if the key mitigation measures and follow-up measures below are applied. The adverse effects caused by the project would be offset by actions resulting from the follow-up plans for environmental and human health components. The analysis is detailed in the following paragraphs.

Taking into account the application of the key mitigation measures indicated below, the Committee believes that the level of residual effects of the project on Cree health would be moderate.

It is expected that the management and mitigation measures would minimize the residual effects of the project on the quality of water, soil, noise environment and traditional food (including contaminants for which there is no threshold) to levels below the applicable standards and criteria for the protection of physical health. Despite the planned measures, contaminant levels slightly above the applicable standards and criteria for crystalline silica (Quebec's *Atmospheric Quality Standards and Criteria*) could still be measured during the operational phase at the Cree camp located 4.5 kilometres from the mine site. In fact, the hourly criterion could be exceeded on tailings blasting days (117%), a scenario that would occur one day in five. On days without waste rock blasting, i.e., four days out of five, the hourly criterion would be met (29%). The annual criterion would be met at all times during the operational phase (77%). With respect to nitrogen dioxide, the hourly standard (*Canadian Ambient Air Quality Standards*) at the Cree camp would be met during the construction phase (97%) and would be very slightly exceeded during the operational phase (102%). Since it is expected that contaminant levels close to the applicable standards and criteria could be measured in the air despite the planned management and mitigation measures, the intensity of the effect would be moderate. The follow-ups planned by the proponent are essential to validate these predictions and the effectiveness of the planned measures.

The health effects of the predicted exceedances would be local in scope as they would be limited to the study area. They would be felt over the long term over the life of the project, i.e., over 26 years. Health effects would be intermittent for crystalline silica (1 day in 5) and continuous for other contaminants, such as nitrogen dioxide. Health effects caused by the degradation of environmental components are considered irreversible even if the source of the effect may be reversible. The planned post-closure monitoring of air, water and country food quality would not allow for the reversibility of a health effect, such as asthma and increased risk of cancer.

Identifying Key Mitigation Measures

The Committee identified the main mitigation measures required to ensure that the project does not cause significant adverse environmental effects on Cree health. It took into account the mitigation measures proposed by the proponent[36], the opinions of government experts (federal, provincial and Cree), as well as the comments received from the Cree Nations consulted. The key mitigation measures are as follows:

- Implementation of a dust management plan, including control of emissions from drilling, monitoring of nitrogen dioxide emissions during blasting and a management programme of adaptive mitigation measures. This program would provide a framework for implementing additional mitigation measures and would specify when these measures would be implemented based on the results collected. The dust management plan will need to be maintained, and updated as required, throughout all phases of the project, including construction, operation and closure. This plan should be developed prior to the start of the construction phase and should be revised based on the results of air quality monitoring;
- In the event that sub-optimal detonation conditions are observed or predicted and that would be conducive to higher nitrogen dioxide generation, implementation of one or more of the following measures: use of double detonators, use of electronic detonators, formulation of explosives adapted to the conditions and the blasting site, adapted firing procedure and use of an adapted type of explosive such as water-repellent explosives;
- Restriction of waste rock blasting and handling of granular materials, as well as temporary covering of accumulation areas during periods of high winds or when prevailing winds can carry dust to sensitive areas, such as the camp located 4.5 kilometres from the site;
- Covering of trucks transporting spodumene concentrate in bulk;
- Humification of blasting areas to prevent the dispersion of dry, fine materials deposited on the surface by drilling activities;
- Disposal of wood waste and debris by shredding, unless it is not technically or economically feasible;
- Exclusive use of Tier 4 certified mobile machinery and equipment in the operational phase (when available), which will help to reduce nitrogen dioxide emissions;
- Transportation of employees by electric vehicle during all phases of the project and prioritization of electrical equipement during operation;
- Use of non-friable, non-clayey materials with good road abrasion resistance and low crystalline silica content (less than 1%) for road construction and maintenance;
- Use of amphibolite as an aggregate on roads, a waste rock lithology which contains little crystalline silica;
- Installation of dust collection systems at the crushing circuit, drying circuit and loading silos. This includes daily monitoring (visual inspection) and regular cleaning, maintenance as recommended by the manufacturer, removal of dust collected by these devices to prevent its dispersion, keeping emissions

[36] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

from the crushing line dust collectors below 20 milligrams per normal cubic metre and sampling of sources to validate compliance with emission thresholds;

- Gradual revegetation of the accumulation areas as soon as possible to minimise particulate matter emissions generated by wind erosion;
- Limiting the speed of transport trucks at the mine site during contruction phase and posting signs indicating this limit in appropriate locations to limit noise, vibration and dust emissions;
- Enclosure of conveyors located outside the plant in sealed structures;
- Regularly spraying roads and work site areas with water and using dust suppressants, as required, on surfaces where traffic is likely to cause dust to rise despite regular spraying, and implementing a road spray management program to monitor the effectiveness of the planned control measures;
- Construction of two semi-permeable ditches on each side of the main access road to collect runoff water from the road and channel it by gravity to sedimentation basins;
- In the event that tantalum is released at concentrations above background levels in the final mine effluent, implementation of an action plan to ensure the safety of tantalum in the final mine effluent on the receiving environment and to protect health;
- Installation of a white noise back-up alarm for all equipment residing at work sites, excluding equipment in transit, such as 10-wheeled craft trucks, or equipment used for short periods of time;
- Shutdown of all unused electrical or mechanical equipment, including trucks waiting to load for more than five minutes;
- Prohibiting the use of the engine brake inside the workcamp area and raising awareness among truckers to limit the use of the engine brake outside the mine site, in areas where Cree camps are located and in areas of more intensive use of the territory for hunting and fishing;
- Compliance with the noise limits imposed by Directive 019 on the mining industry and the noise standards contained in Quebec's Instruction Note 98-01 on noise;
- During the construction phase, implementation of the Guidelines for Noise Levels from an Industrial Construction Site of the Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques;
- During the operational phase, machinery and truck traffic is limited to the right-of-way of access roads and work areas;
- Proactive communication of the blasting schedule to users of the territory;
- Validation of the assumptions and concentrations of chemical contaminants in air, water and soil predicted and used as inputs in the proponent's traditional food contamination risk assessment to ensure the effectiveness of the mitigation measures in place and to confirm the absence of risk. In the event that contaminant concentrations measured in the field were higher than the concentrations predicted as inputs to the risk assessment for contamination of traditional food or higher than criterion A of Quebec's Intervention Guide - Soil Protection and Contaminated Sites Rehabilitation, the proponent must inform the Cree Board of Health and Social Services of James Bay and assess the need to monitor these contaminants in traditional food. Where applicable, the proponent will have to determine, in collaboration with the Cree Nations, which traditional foods should be monitored. The Follow-up Committee

responsible for interpreting the results obtained will have to be formed or accompanied by a professional in human health risk assessment. The Cree Board of Health and Social Services of James Bay could offer support in this regard and will have to be consulted;

- Development of a communication plan, in collaboration with Cree Nations, the Cree Board of Health and Social Services of James Bay and the Cree Nation Government, in order to take into consideration the concerns of the community and the changes perceived in the territory through Cree knowledge. This plan will have to :
  - Inform land users of the schedule of construction, operational and closure activities, of incidents, if any, and, more generally, of the issues and risks associated with the operation of the mine site;
  - Address community concerns about traditional food in order to minimize avoidance of the resource;
  - Provide for the communication of the results of environmental monitoring, especially with the tallyman of trapline RE01;
  - Include a complaint management system for the entire life of the project, particularly related to noise associated with road transport on and off the project site, including a follow-up on these complaints and how they were resolved. The number and handling of complaints received should be information shared with the users of the territory;
  - Allow certain mitigation measures to be modified or additional mitigation measures to be implemented, in collaboration with the relevant Committee(s), land users and the Cree Board of Health and Social Services of James Bay;
  - Be maintained throughout the life of the mine, including the closure phase.

Implementation of the key measures mentioned in the other chapters of this report, particularly those related to water quality presented in section 5.1 (Fish and Fish Habitat), would make it possible to minimize the effects on the other environmental components affected by the project and that could have an impact on Cree health.

Need for Follow-up and Follow-up Requirements

The proponent plans follow-up programs for discharge water and surface and groundwater, discussed in Section 5.1 (Fish and Fish Habitat). In order to verify the accuracy of the predicted effects on Cree health and the effectiveness of the proposed mitigation measures, the Committee recommends that other follow-up programs be implemented and cover the following elements:

- Air quality monitoring, including the monitoring of particulate matter (total particulate matter [TPM] and fine particulate matter [$PM_{2.5}$ and PM_{10}]), metals and crystalline silica, during the construction and operational phases. The monitoring should:
  - Begin before the construction phase so that temporal variability can be assessed;
  - Allow an adequate air quality picture to be drawn for sensitive receptors;
  - Allow the proponent's conclusions regarding impacts on air quality during the construction and operational phases to be verified;
  - Allow the actual effectiveness of mitigation measures to be measured;

- Include the *Canadian Ambient Air Quality Standards* and any other relevant standards or criteria based on health effects;
- Allow for measurements to be taken at an on-site atmospheric and meteorological measuring station;
- In the event that exceedances of air quality criteria are anticipated or measured, allow for the implementation of adaptive mitigation measures provided for in the dust management plan, notify land users promptly and implement communication and risk management strategies adapted to them;
- If necessary, allow certain mitigation measures to be modified and implement additional mitigation measures to ensure health protection, in close collaboration with the Environment Committee, land users and the Cree Board of Health and Social Services of James Bay;
- Aim to share the results with land users, including the tallyman of trapline RE01;

- Monitor the noise level caused by the project during the construction and operational phases. This monitoring plan must be developed and submitted to the Agence before the construction phase begins;
- Monitoring of potential sources of contamination during the construction and operational phases in order to identify unanticipated sources;
- Monitoring of fine particles in the event of forest fires. This program, if implemented when the mine site is exposed to a smoke plume, should help mitigate the effects of this increase in contaminants;
- Monitoring the quality of the final mine effluent. Monitoring must make it possible to identify thresholds above which modified or additional mitigation measures would be required.

In order to foster the confidence of land users in the results that would be obtained, the proponent must allow them to participate in the environmental follow-ups.

6.3 Physical and Cultural Heritage

Physical and cultural heritage is one of the valued components under subparagraph 5(1)(c)(ii) of CEAA 2012 in relation to Indigenous peoples. For the purposes of this report, physical and cultural heritage also includes structures, sites or things of historical, archaeological, paleontological or architectural significance, which are also valued components under CEAA 2012. A land or resource (e.g., an artifact, object or place) that is considered heritage is distinguished from other elements by the value that is attributed to it (Agency, March 2015a).

For the purposes of project environmental assessment, the effects of the project on physical and cultural heritage result from a change to the environment (e.g., land disturbance and transformation of natural landscapes through soil compaction or clearing). The analysis of the project's effects on heritage will focus only on archaeological heritage, as no other natural or cultural heritage features have been identified within the proponent's study area.

The Committee believes that the project is not likely to cause significant residual adverse environmental effects on archaeological heritage, taking into account the application of the key mitigation measures recommended below. The following subsections provide the information which the Committee considered in

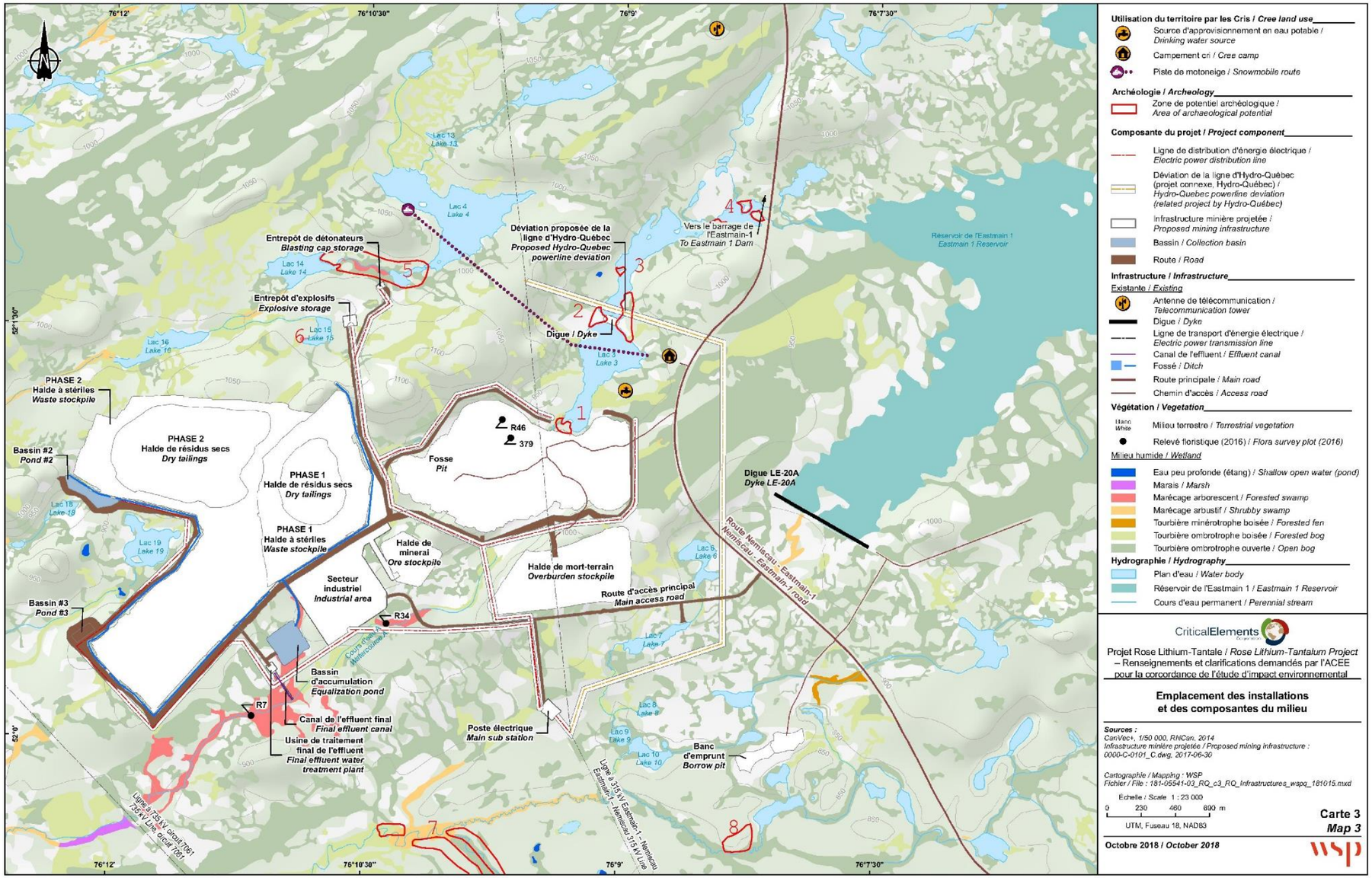
its analysis to conclude on the significance of the project's effects on archaeological heritage, including the comments of the Cree Nations consulted and the Social and Cultural Development Department of the Cree Nation Government.

6.3.1 Analysis of Potential Effects and Proposed Mitigation Measures

The proponent's study area used to assess the project's effects on physical and cultural heritage is mostly within the territory of the Cree Nation of Eastmain, at the junction of the Eastmain and Pontax River watersheds. According to the proponent, the former occupation of the study area's territory would be explained by its hydrographic and topographical characteristics. The northern part of the territory, made up of a series of hills and watercourses, presented conditions that were unfavourable to human occupation. The southern part, made up of flat surfaces and wetlands, would have been favourable for the installation of camps and the use of local resources through traditional activities. From prehistoric times to the present day, Indigenous peoples have lived in the study area, which encompasses more or less significant parts of the current traplines of the Cree Nations of Eastmain, Nemaska and Waskaganish.

The proponent's archaeological potential study is based in part on the archaeological study carried out as part of the Eastmain 1-A powerhouse and Hydro-Québec's Rupert River diversion project. Considering that this study used the same study area and that the current trapper of the RE01 trapline (Eastmain) as well as several members of the Cree Nations of Eastmain, Waskaganish and Nemaska were consulted during its development, the proponent did not deem it necessary to carry out new consultations with elders in order to validate the areas of archaeological potential. In all, the proponent has identified 21 areas of archaeological potential likely to contain vestiges of human presence from prehistoric times to the 20th century (Figure 11). According to the proponent, the only environmental effect of the project on archaeological heritage could occur during the construction phase. The tilling of the ground, necessary for the construction of the mining infrastructures, could lead to the discovery of various archaeological remains and could damage certain artifacts currently buried on the project site.

Figure 11: Location of Areas of Archaeological Potential



Source: WSP Canada Inc. (February, 2021)

In order to reduce the project's environmental effects on archaeological heritage, the proponent undertakes to produce a comprehensive survey in the areas of archaeological potential directly affected by the proposed developments[37], prior to the start of construction. The proponent plans to inform the tallyman of the RE01 trapline and his family during the survey and intends to invite them to take part in the archaeological digs, if necessary.

Should archaeological remains be discovered, the proponent undertakes to protect the site by suspending the work and immediately notifying the person in charge of the work, the tallyman, the Cree Nation Government and the Ministère de la Culture et des Communications du Québec, until the authorizations required by Quebec's *Cultural Heritage Act* are obtained. The proponent also undertakes to pay particular attention to any objects of interest that will be discovered. These will be cleaned and inventoried by a qualified consultant, and will then be the subject of a scientific publication and a Cree Nation museum exhibit. Finally, the proponent mentions that it will avoid any disturbance of the sites or artifacts discovered.

Members of the Cree Nation of Eastmain recommended that the proponent and the Nation organize a ceremony at the future mine site to honour and recognize Mother Nature and its various components that would be negatively affected by the project, prior to the start of construction. The proponent has undertaken to organize such a ceremony in collaboration with the Cree Nation of Eastmain if the latter so wishes.

The proponent mentioned that no heritage sites related to culture[38], such as birthplaces or burial sites, have been identified in the project study area. However, the Cree Nations attach great importance to the integrity of the various watercourses on the territory, which they consider an integral part of their physical and cultural heritage. This element is addressed in sections 5.1 (Fish and Fish Habitat) and 8.3 (Potential Repercussions of the Project on Cree Values) of this report.

6.3.2 Joint Assessment Committee's Analysis and Conclusions Regarding Residual Effects

The Committee assessed the residual effects related to the archaeological heritage using the environmental effects rating criteria in Appendix A. The Committee believes, taking into account the application of the key mitigation measures identified below, that the project would not cause significant adverse residual environmental effects on archaeological heritage and that the level of residual effects of the project on heritage would be low.

The Committee believes that the intensity of the effects of the project would be low. The proponent received a list of important cultural sites from the current tallyman of the RE01 trapline (Eastmain) and took them into account during project planning in order to avoid disturbing these sites to the extent possible. The proponent undertook to produce archaeological surveys before the start of construction work with the participation of the tallyman of the RE01 trapline. Should remains be discovered during the work, the mitigation measures implemented by the proponent would comply with the provincial regulations in force and the proponent would

[37] The areas of archaeological potential affected by the project developments are Zones 1 to 6 (see Figure 11).

[38] The assessment of the effects of the project on places that are culturally valued for the current use of the lands and resources for traditional purposes is presented specifically in section 6.1.

be required to notify several Cree stakeholders who might have an interest in the discovery. Consequently, the effects of the project would not compromise the integrity of the archaeological heritage. The project would result in a long-term modification of the archaeological heritage in the event that new remains are discovered. The scope of this modification would be local, as it would be limited to the project's study area. If no artifacts are discovered, the effects of the project on this component would be reversible. The effects would be continuous because the tillage associated with the pit development would likely expose archaeological remains throughout the life of the project.

The Pihkuutaau Agreement (redacted)[39] also specifies the specific steps to be taken by the proponent in relation to archaeological, cultural and burial sites:

- Immediate notification to the Implementation Committee established under the Pihkuutaau Agreement if an archaeological site or burial site is discovered in the area described in the Pihkuutaau Agreement;
- If a burial site is discovered, notification, if possible, to the family of the deceased and relocation of the site if necessary;
- If the mitigation measures in this environmental assessment report are insufficient, collaboration between the Implementation Committee and the family of the tallyman of the RE01 trapline to determine the measures to be taken for the protection or relocation of a site;
- If a cultural site is discovered in the area described in the Pihkuutaau Agreement, consultation by the Implementation Committee with the tallyman of the RE01 trapline's family to determine what measures to take;
- Reporting any artifacts discovered in the area described in the Pihkuutaau Agreement to the Implementation Committee and compliance with applicable laws to avoid disturbance of these artifacts and to follow the notification procedure of the Cree stakeholders.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the project would not cause significant adverse environmental effects on archaeological heritage. It took into account the mitigation measures proposed by the proponent[40] as well as the comments received from the Cree Nations consulted. The key mitigation measures are as follows:

- Prior to the start of construction work, production of a comprehensive survey in areas with archaeological potential and submission of the survey report to the Agency and the Cree Nation Government;
- Prior to the start of construction work, hiring of a qualified person to provide training to workers on the identification of archaeological or cultural remains;

[39] The Pihkuutaau Agreement is the impact and benefits agreement signed between the proponent and the Cree Nation of Eastmain, the Grand Council of the Crees and the Cree Nation Government.

[40] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

- Immediate cessation of work at the discovery site;
- Delimitation of an area of at least 30 metres around the site where work is prohibited. The work prohibition does not apply to actions necessary to protect the integrity of the discovery;
- Notification, in a timely manner, to the tallyman of the RE01 trapline, as well as to any other stakeholder identified for this purpose by the Cree Nation Government, of the undertaking of any work of an archaeological nature;
- Notification to the following stakeholders as soon as possible following a discovery:
  - The tallyman of the RE01;
  - The Cree Nation Government;
  - The band councils of the Cree Nations of Eastmain, Waskaganish and Nemaska;
  - Aanischaaukamikw Cree Cultural Institute; and
  - The Ministère de la Culture et des Communications du Québec.
- Offers to the tallyman of the RE01 trapline, as well as any other stakeholder identified for this purpose by the Cree Nation Government, to supervise work of an archaeological nature such as surveys or excavations;
- Assessment of the discovery site by a qualified person according to the requirements of Quebec's *Cultural Heritage Act*;
- Compliance with all legislative or legal requirements applying to the discovery of archaeological remains;
- Compliance, after consultation with the Cree Nations and the competent authorities, with all legislative or legal obligations relating to the discovery, recording, transfer and safeguarding of structures, sites or things of historical, archaeological, paleontological or architectural significance;
- Development of a glossary of Cree place names that identifies, in Cree language, the geographic locations within the project area, in consultation with the Cree Nations and the Department of Social and Cultural Development of the Cree Nation Government.

Adjustments to the mitigation measures could be made, if necessary, in order to minimize adverse environmental effects.

Need for Follow-up and Follow-up Requirements

The Committee considers that a follow-up program is not required. The proponent will still have to ensure that the measures mentioned above are implemented.

6.4 Effects on Socio-economic Conditions

The effects on the socio-economic conditions of the Cree Nations are assessed based on the changes to the environment caused by the project. The project could result in residual effects on socio-economic conditions due to the installation of mining infrastructure, land use change and increased road traffic. However, the Committee believes that these effects are not likely to be significant with the implementation

of the key mitigation measures recommended in section 6.4.2. To determine the significance of the effects on socio-economic conditions[41], the Committee assessed whether the residual effects would result in changes to commercial or income-generating activities (e.g., hunting and trapping) for the Cree Nations.

The following subsections present the information considered by the Committee in its analysis to conclude on the significance of the project's effects on socio-economic conditions, including the comments of the Cree Nations consulted.

6.4.1 Analysis of Potential Effects and Proposed Mitigation Measures

According to the proponent, no commercial activities are carried out by the Cree Nations in the human environment study area (Figure 3, Chapter 1). However, the proponent has not been able to accurately document whether members of the Cree Nations derive income from traditional activities carried out in the area of the future mine, such as the sale of furs or handicrafts. The proponent was also unable, for reasons of confidentiality, to confirm whether users of the territory of traplines RE01 (Eastmain) and R16 (Nemaska) are beneficiaries of the Cree Hunters and Trappers Income Security Program[42]. However, the proponent confirmed that three members of the Cree Nation of Nemaska using trapline R19 are beneficiaries of the program. However, it was not possible, for confidentiality reasons, to determine the location of their activities and whether their revenues would be affected due to the environmental effects of the project. The available data are thus incomplete and do not allow for a detailed analysis of the project's effects on economic activities resulting from resource exploitation.

Members of the Cree Nations told the Committee about the importance of the traditional economy related to resource use in Cree culture. Concerns were raised particularly about the negative effects of the project on the success of the hunts that could affect revenues as well as the use of the territory by future genereations. They indicated that it is a different system of natural resource extraction than the mining industry, but one that remains culturally valued today.

The proponent assesses that the socio-economic effects of the project on users of the territory deriving income from traditional activities would be the same as those identified for the current use of the lands and resources for traditional purposes. As explained in detail in Chapter 6.1 (Current Use of Lands and

[41] Under CEAA 2012, the socio-economic effects of the project that are not directly related to a change in the environment, such as contracts, training, jobs, the status of women or road safety, are not analyzed by the Committee, since these effects are under provincial jurisdiction. However, section 6.5 of the report provides a brief portrait of some of these socio-economic issues by presenting the concerns heard by the Committee and the measures proposed by the proponent without concluding on the level of effect apprehended, in accordance with the Agreement with the Cree Nation Government.

[42] This program, established by the JBNQ Agreement in 1976, aims to encourage the Crees to practise their traditional hunting, fishing or trapping activities on the territory by guaranteeing a daily income to participants. According to the Cree Hunters and Trappers Income Security Board, the Program benefits are calculated based on the number of days spent on the territory by adults in the family. The Program requires the head of the family to spend a minimum of 120 days annually on the territory to practise traditional resource harvesting activities, or any other type of ancillary activities, in order to remain registered in the Program.

Resources for Traditional Purposes by Cree Nations), the proponent believes that the project could result in the following effects:

- Temporary disruption of traditional activities, mainly during the construction and decommissioning of the mine, and gradual adaptation of land users during operation;
- Loss and relocation of a camp on trapline RE01;
- Increased pressure on wildlife resources caused by harvesting by mine workers;
- Change in harvesting habits or sites due to a perception of contamination related to the presence of the mine.;
- Modification of the means of access to the territory, in particular by the loss of navigability of certain bodies of water used occasionally.

Based on its conclusion on the effects of the project on current use, the Committee believes that the project could have an impact on the ability of certain users of the territory of the Cree Nations of Eastmain, Waskaganish or Nemaska to derive income from traditional activities. The Committee notes that:

- The project could reduce the availability of wildlife resources for users whose camps or practice sites would be located in the direct periphery of the future mine site and the roads used by the proponent outside the mine site. The avoidance of wildlife generated by the project could interfere with harvesting.
- The project could restrict access to certain bodies of water and a few sectors of trapline RE01 due to the security perimeter of a 1-kilometre radius around the mine site. Certain navigable bodies of water in this trapline would no longer be navigable.

The proponent considers that the key mitigation measures proposed by the Committee to reduce effects on the current use of lands and resources for traditional purposes (see section 6.1) would maintain the ability of land users to earn income from traditional activities. The proponent also believes that certain measures included in the Impact and Benefits Agreement (Pihkuutaau Agreement), as well as the awarding of contracts to certain land users, could mitigate the potential socio-economic effects of the project on the users most affected by the project.

The Committee believes that the following mitigation measures proposed by the proponent could help maintain the ability of users to generate revenues from traditional activities:

- Implementation of a communication plan between land users and the proponent to notify them in a timely manner of the mine's operating schedule and blasting schedules;
- Modification of the frequency of blasting and heavy truck traffic during the annual goose and moose hunts;
- Implementation of a follow-up program based on interviews with users of traplines RE01, R16 and R19 regarding the effectiveness of the proponent's mitigation measures during annual goose and moose hunts;
- Prohibiting any person from engaging in any hunting, trapping or fishing activity and from possessing any firearms, hunting, trapping or fishing equipment within the security perimeter, unless that person is accessing the security perimeter for cultural purposes or to exercise Indigenous rights, provided that

such access and the exercise of such activities are safe and subject to the terms and conditions developed with the Cree Nations prior to construction;;

- Implementation of various measures to limit road congestion and nuisances related to transportation activities;
- Participation of land users in the proponent's environmental monitoring and dissemination of the results.

6.4.2 Analysis and Conclusions by the Joint Assessment Committee on Residual Effects

The Committee believes that the confidentiality of information on traditional activity revenues in the Study Area does not allow for specific conclusions to be drawn about potential income declines as a result of the project. However, based on its analysis of the effects on the current use of lands and resources for traditional purposes (Section 6.1), the Committee similarly considers that traditional income-generating activities would be modified, but could be maintained. The Committee believes that the project could have beneficial effects on the economic situation of certain families who would benefit from employment and contract opportunities.

The Committee evaluates that the residual environmental adverse effects on the socio-economic conditions of the Cree Nations would be moderate and not significant (see Appendix A) following the implementation of the mitigation measures proposed by the proponent and the follow-up program defined by the Committee in section 6.1. The Committee bases its conclusion on the use of the following criteria:

- The extent of the effects would be local, as they would extend beyond the project site but would be within the human environment study area. The avoidance of wildlife that would result from the project on its periphery would extend beyond the project site while remaining within the study area. The Committee considers that the effects of transportation activities on current land use would be felt to a limited extent on the periphery of the roads. The availability of resources would not be compromised beyond the area of influence of the mine and the roads.
- The duration of the effects would be long due to the life span of the project (26 years).
- The frequency of effects would be continuous considering that they would be perceived consistently during the three phases of the project, despite a significant decrease in the frequency of blasting and road transportation activities during goose and moose hunting periods.
- The effects would be partially reversible. Some effects would be permanent, notably the loss of several lakes and watercourses that are home to fish, as well as the loss of a camp on site RE01 and the Cree knowledge related to it. Wildlife could return to its current level of abundance once the mine is recovered and transportation activities are completed. The effects of the project on access to the territory would be partially reversible once the mine is decommissioned and the security perimeter dismantled, as only a small portion of the territory would remain inaccessible to the Crees, namely the flooded pit secured with a physical barrier.
- The level of intensity of the effects would be moderate. The project would lead to changes in the practice of income-generating activities, but the practice of these activities would not be compromised.

Identification of Key Mitigation Measures

The Committee considers that the key mitigation measures recommended in Section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations) would avoid significant residual effects on users who derive income from traditional activities. The Committee does not recommend any additional measures regarding the effects of the project on the socio-economic conditions of the Cree Nations.

Need for Follow-up and Follow-up Requirements

The Committee considers that the follow-up program recommended in section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations) would verify the effectiveness of mitigation measures and the predictions of continued current use inherent in the practice of traditional activities for which revenues are derived. No other specific follow-up program is recommended for this valued component.

6.5 Assessment of Other Socio-economic Effects under the Agreement

Under the CEAA 2012, the Agency has a mandate to assess the project's socio-economic effects related to changes to the environment (Section 6.4) on Indigenous peoples. It is also required to set conditions that the proponent must meet in this regard. However, the Agreement concluded between the Agency and the Cree Nation Government in June 2019 specifies that the Committee must take into account the project's social effects in order to respect the spirit and principles of the JBNQ Agreement. Thus, in this section, the Committee presents the effects of the project in terms of three socio-economic aspects not related to changes to the environment which it deemed of interest for this report:

- Road user safety;
- Employment and training; and
- Status of women.

Since the project was assessed under CEAA 2012, only socio-economic effects related to changes to the environment can be considered in the Minister's decision. Since the effects of the project in terms of these three socio-economic aspects were not considered in the Minister's decision or in the conditions related to the project, the Committee sets out in this section the key information gathered about these aspects during the environmental assessment process without issuing a conclusion on the significance of the effects.

The main elements of the proponent's analysis, the proponent's proposed mitigation measures and the views of the Cree Nations consulted are set out below for information purposes. The mitigation measures presented in this chapter are not within the conditions issued under CEAA 2012.

6.5.1 Potential Effects and Proposed Mitigation Measures

Road User Safety

The road network in the proponent's study area for assessing the project's effects on the human environment (see Figure 3) consists mainly of the Nemiscau-Eastmain-1 road along which the project would be located. This road connects the Route du Nord to the Billy-Diamond Highway, and also runs along the Muskeg-Eastmain-1 and Sarcelle roads. The Sûreté du Québec is responsible for user safety on the main roads of the study area road network. The Société de Développement de la Baie-James is the organization responsible for road management and signage in this area.

According to the proponent, the average daily traffic flow on the Route du Nord in 2014[43] was 110 vehicles, and this rate could double as a result of the project. The current daily traffic flow on the Nemiscau-Eastmain-1 road is unknown. According to the Committee, it is likely to be lower than that of the Route du Nord.

The proponent estimates that employee transportation, for up to a maximum of 300 workers during the construction phase and approximately 280 during the operational phase, would be the main factor that would generate an increase in road traffic in the study area. After arriving at Nemiscau Airport, employees would be transported by bus to the work camp located about 25 kilometres north of the site, on the site of a former Hydro-Québec camp (former Eastmain camp). Employees would be transported daily by bus from the work camp to the mine site.

Procurement for the mine and shipping of the ore concentrate would be done by heavy trucks. These trips would also increase traffic on the road. According to the proponent, the biggest increase in traffic would occur during the operational phase. Approximately 580 vehicles (trucks, buses and cars) could access the mine site each week. This would amount to traffic equivalent to about 1,160 additional trips per week on the Nemiscau-Eastmain-1 road and the Route du Nord, for an average of 166 trips per day (round trips).

The proponent estimates that the main effect of the project on road user safety would be an increase in the accident risk. Users of the Nemiscau-Eastmain-1 road, the main access road used to reach the mine site, could be inconvenienced by this additional traffic. The Nemiscau-Eastmain-1 road is frequently used by members of the Cree Nations for roadside hunting and trapping and for travelling around the territory. In fact, it is the only road access to several traplines in this sector.

The Cree Nations consulted expressed concern about the increase in road traffic. Members of the Cree Nation of Nemaska expressed concern about the safety of children around their camps if truck drivers fail to obey the speed limits. Five camps are located near the Nemiscau-Eastmain-1 road. Some members expressed concern that the increase in traffic might have an effect on the safety of users of the territory during the annual moose and goose hunting season. In addition, members of the Cree Nation of

[43] Although more than five years have passed since the last daily traffic flow data were submitted, the Committee considers this estimate to be still valid since no new major industrial projects have been developed in this area.

Waskaganish have raised concerns about the safety of beaver trappers parking along the roads. Concerns were also raised about increased vehicle maintenance costs due to dust and rocks thrown by trucks.

To address these concerns and mitigate the project's effects on road user safety, the proponent proposes to implement specific mitigation measures during all phases of the project, including the following:

- Raising awareness among workers and subcontractors with responsibility for transportation of the need to comply with the road safety rules and, if necessary, implementing measures with the appropriate authorities to ensure the safety of local road users;
- Equipping its heavy trucks with speed controllers and radios to facilitate communication between drivers and other road users;
- Where possible, distributing the volume of heavy traffic over the entire day and week so as to avoid intensive periods of this type of traffic;
- Compliance with speed limits by workers and transporters (suppliers), subject to penalties, including expulsion from the area;
- Follow-up with the appropriate authorities regarding the installation of additional road signs at an appropriate frequency to remind people of the speed limits;
- Follow-up with the Cree Nation of Nemaska regarding signage for certain camps;
- Raising driver awareness of traditional Cree roadside activities, especially beaver trapping.

The proponent also considered the effects of the project on road user safety as part of its assessment of the effects on community well-being and human health. In this assessment, the proponent proposes a monitoring program for community well-being and human health. One of the objectives of this program is to monitor the effects of the increase in heavy traffic on the Nemiscau-Eastmain-1 road. It would be based mainly on meetings with the tallymen for traplines RE1 (Eastmain) and R19 (Nemaska). The purpose of the monitoring would be to collect data on the following:

- Traffic volume and conditions on the Nemiscau-Eastmain-1 road;
- Users' perceived safety on the Nemiscau-Eastmain-1 road;
- Increase in heavy traffic on the Nemiscau-Eastmain-1 road and its effects on the quality of the camp experience and access to the territory.

The proponent is committed to monitoring these elements seven times during the project, from the construction phase to the end of the mine's operational phase. The proponent is also committed to submitting the conclusions of this monitoring to the Implementation Committee set up under the Pihkuutaau Agreement and to making adjustments to the mitigation measures, if necessary.

Following implementation of the measures and the monitoring program for mitigating the effects on community well-being and human health of the Cree Nations, including the specific measures above related to road user safety, the proponent believes that the project would have a low and insignificant residual effect on these components.

Employment and Training

The unemployment rate of the Cree Nations is generally higher than that reported in most regions of Quebec. According to two employment needs assessment studies conducted for the Cree Nations of Eastmain and Nemaska, the unemployment rate for the Cree Nation of Eastmain is around 8.8%, while it is about 9% for the Cree Nation of Nemaska (WSP Canada Inc., February 2019a).[44]

According to the proponent, the project would allow these Nations to benefit from well-paid quality jobs. The project would require 300 workers during the construction phase and 280 workers during the operational phase. As the mine is expected to operate over a 21-year period, the proponent anticipates that the project would also result in the creation of many indirect jobs.

The proponent believes that several Cree Nations have a workforce with experience in the construction industry, along with skills acquired in major Hydro-Québec projects. They would promote the hiring of Cree workers in order to develop this local expertise. They believe that the experience acquired by Cree workers in this project would be transferable and would enable them to improve their future employability.

Before the project begins, the proponent is proposing the following measures to generate interest among Cree Nations' young people to take up employment in the mining sector:

- Distribution of informative videos about the project;
- Sharing of a list matching the jobs offered with the associated training;
- Planning of a visit to the mine;
- Organization of information and job preparation workshops;
- Collaboration with Apatisiiwin Skills Development and the James Bay training centres to ensure that the training provided is consistent with the reality of young Crees.

Access to training and the hiring criteria are one of the Cree Nations' main concerns regarding the project's socio-economic effects. Several members of the Cree Nation of Eastmain are concerned about the lack of information related to the training available and their timely geographic access. To address these concerns, the proponent informed the Committee that it had already begun discussions with the James Bay Training Centre and Apatisiiwin Skills Development about offering regular or customized training in the areas of occupational health and safety and ore mining and processing. This training would be implemented once the proponent has obtained all the authorizations required to begin construction of the project. The proponent is also offering social work training, at the request of the Cree Nation of Eastmain, in order to create jobs in the community.

The proponent also undertakes, in cooperation with local organizations, to set up a communications plan for disseminating information on human resource needs, thus enabling the Cree Nations to prepare for the project. The Pihkuutaau Agreement provides for close collaboration with the Cree Nation of Eastmain and the Grand Council of the Crees/Cree Nation Government regarding training, employment and business

[44] These unemployment rates were taken from Statistics Canada 2016 Census data.

opportunities. Some members of the Cree Nation of Nemaska expressed concern about the physical health examinations required by the mining proponents to obtain employment, which could be a barrier to hiring, since most Cree Nations do not have a permanent physician.

Members of the Cree Nation of Nemaska are concerned about the long-term retention of Cree employees. The Nations consulted believe that the work schedules represent a particular challenge for employee retention since they would not allow participation in annual hunting periods, nor frequent returns to the community. To overcome this problem, the proponent explained that work schedules would be drawn up before the hunting season begins and that leaves of absence would be authorized for Cree employees.

Lastly, concerns were raised about the language of work at the future mine site. In response to this concern, the proponent confirmed that the work environment would be bilingual (English/French) and that there would always be a Cree liaison officer fluent in English, French and Cree at the mine site to promote the retention of Cree workers.

In addition, the proponent would implement other mitigation measures to maximize the project's benefits for members of the Cree Nations, including the following:

- Insertion of clauses promoting the hiring of Cree workers and the Cree economy in the Pihkuutaau Agreement;
- Support for organizations involved in the development of training programs tailored to the needs of the mine and members and businesses of the Cree Nation of Eastmain;
- Severance pay at the closing of the project;
- Employee Assistance Program to support transition during closure (Workforce Outplacement Committee).

Once the mitigation measures are in place, the proponent believes that the residual effect of the project would be positive during both the construction and operational phases. A monitoring program would be set up at the end of the project to mitigate the negative effects related to the termination of jobs. The purpose of this program would be to document the economic benefits and assess the effectiveness of the measures used and the satisfaction of Cree workers, in particular through a survey of these workers.

Status of Women

The proponent met with Cree women from the Cree Nation of Eastmain as part of the environmental impact statement to document their expectations and concerns regarding the project. According to the proponent, the overall labour force participation rate for women[45] of the Cree Nations is close to 61.9%. It anticipates that the project could facilitate access to employment for Cree women, both at the mine site and in the village of Eastmain.

[45] The overall labour force participation rate for women is the ratio of the number of women employed or seeking employment to the total female working-age population.

A representative of the Cree women of the Cree Nation of Eastmain consulted by the Committee emphasized the importance of encouraging young Cree women to take jobs in the mining industry. To address this concern, the proponent would work with organizations such as “Chapeau les filles”, Women in Mining and the Cree Women of Eeyou Istchee Association to promote employment opportunities for women in traditionally male fields. The same representative also said that the care of children and seniors, which continues to be mostly the responsibility of Cree women, was a problem preventing women’s access to jobs at the mine, particularly because of the work schedules anticipated by the proponent. However, the proponent believes that the work schedules and mine location would not allow for the establishment of a daycare service at the mine site. Lastly, the representative also pointed out that the loneliness that Cree employees at the mine might feel could also be an obstacle to their retention.

The proponent also acknowledges that the project could raise fears among Cree women, because it would result in the presence of a larger male population near the Cree Nations. This could affect women’s feelings of safety, including fear of sexual harassment. To address these concerns, the proponent promises to provide a healthy work environment where sexual harassment would not be tolerated by implementing the following measures:

- Inclusion of clauses in employees' employment contracts prohibiting all forms of harassment;
- Provision of mandatory harassment awareness training for all employees;
- Rigorous follow-up of cases of harassment, where applicable.

In addition, the representative of the women of the Cree Nation of Eastmain raised concerns about pay equity. The proponent is committed to ensuring pay equity and equal access to jobs for women. The proponent also plans to provide the Cree Nation of Eastmain with support to set up special support programs for women.

Lastly, the proponent plans to maintain ongoing communication with Cree women throughout the project in order to address their concerns and adjust mitigation measures in the event that they do not adequately meet women's needs. In particular, this would be done through the monitoring program for community well-being and human health, which would be based on, among other things, interviews conducted with women’s groups of the Cree Nations of Eastmain and Nemaska and the Cree Women of Eeyou Istchee Association. These interviews would take place at least seven times over the course of the project.

The proponent incorporated the project's effects on the status of women into its assessment of the effects on community well-being and human health of the Cree Nations. Following implementation of the mitigation measures for effects on community well-being and human health of the Cree Nations and of the monitoring program, including the above-mentioned specific measures related to the status of women, the proponent believes that the project would have a low and insignificant residual effect on these components.

7. Other Effects Considered

7.1 Effects of Accidents and Malfunctions

Accidents and malfunctions are likely to occur during all phases of the project, for example a release of contaminated water due to a failure of the water tratment system, a spill of hazardous material, a fire, or a collapse of tailings and waste rock due to slope instability. Such accidents could result in adverse effects on the surrounding environment. However, the Committee believes that these effects are unlikely to be significant given the application of the recommended key mitigation measures (section 7.1.2). To determine the probability that an accident or malfunction will occur as well as in determining the significance of the effects related to accidents and malfunctions, the Committee considered the protection and intervention measures as well as the emergency response protocols proposed by the proponent.

The following subsections provide the information that the Committee considered in its analysis to conclude on the significance of the effects of accidents and malfunctions, including the advice and comments of government experts and the Cree Nations consulted.

7.1.1 Analysis of Potential Effects and Proposed Mitigation Measures

The environmental assessment takes into consideration the environmental effects of the project, including those caused by accidents or malfunctions that may occur. Environmental factors may also damage the project's infrastructure and increase the probability of an accident or malfunction. These factors are discussed in section 7.2.

For the purposes of environmental assessment, an accident is described as a sudden and unexpected event involving project mechanisms or activities that results in damage to valued components. A malfunction, on the other hand, is defined as the failure of an equipment or a system to function as intended, resulting in damage to valued components. Accidents and malfunctions are likely to occur at all phases of the project.

The proponent considered more than a dozen scenarios in which project-related accidents and malfunctions could occur (Table 11). The proponent assessed the level of risk for each of these scenarios based on their probability of occurrence and the severity of their consequences. Their assessment included the identification of likely adverse environmental effects on the valued components that could be affected by an accident or malfunction: fish and their habitat, migratory birds, special status species and their habitat, wetlands, Cree health, and the Cree's current use of lands and resources for traditional purposes. In their analysis, the proponent considered the sensitive elements of the environment in the vicinity of the future mine site, i.e., water bodies and watercourses, the community of Nemaska to the south, the Nemiscau-Eastmain-1 road, a few secondary roads, the hydroelectric and telecommunication network, the four traplines, and hunting and fishing activities.

Environment and Climate Change Canada (ECCC) believes that the proponent has adequately identified the sensitive components of the environment that could be affected by potential accidents and malfunctions.

Health Canada believes that, in general, the proponent has adequately identified the sensitive components of the human environment. According to Health Canada, the proponent should, however, better define land use in order to identify all users (workers, Indigenous communities, villages and individuals likely to travel near the project area for activities) that could be affected by an accident or a malfunction.

Table 11: Accident and Malfunction Scenarios Assessed by the Proponent

Structure or Activity	Accident or Malfunction Scenario
Extraction Pit	• Flood • Falling rocks along the walls
Ore Processing Plant	• Fire • Exposure to ionizing radiation • Dust emission • Wedging point
Storage and Use of Petroleum Products	• Spills of fuel, oil or grease • Fire and/or explosion
Use of Natural Gas	• Natural gas leak
Storage and Use of Chemicals	• Spill
Storage and Handling of Explosives	• Explosion on the surface • Theft of explosives
Use of Electrical Transformers	• Dielectric oil spill • Fire/explosion involving a transformer
Mine Water Treatment Plant	• Accidental release of deleterious substances in the final effluent (Watercourse A)
Tailings and Waste Rock Storage Areas	• Slope instability • Accident involving an ore truck

The proponent proposes prevention and response measures for each scenario, including an emergency measures plan to be implemented during accidents and malfunctions. Given the remoteness of the mine site, the proponent undertakes to deploy the necessary resources to respond diligently in the event of a major accident. The proponent intends to develop mutual assistance agreements with companies in the sector and the public services of the Cree Nation of Nemaska to pool response resources, in addition to inviting Nemaska respondents to participate in emergency simulation exercises.

Health Canada believes that the commitments submitted by the proponent for the implementation of the emergency measures plan are important. Health Canada points out that the proponent proposes good consultation practices with the emergency services of the Cree Nation of Nemaska, namely to consult the community's first responders regarding the emergency measures plan, to evaluate the possibility of their participation and to invite them to emergency simulation exercises. However, Health Canada recommends

that this plan be sufficiently detailed prior to the start of the project and stresses the importance of the availability and speed of intervention of external partners in emergency situations.

The Committee has grouped the proponent's scenarios which are most likely to have an impact on the surrounding environment into four categories described below, given their potential impact on the valued components and their higher level of risk.

Water Treatment System Deficiency

Malfunction of the main water treatment plant system or secondary treatment plants (the latter would be installed if necessary at the three groundwater discharge points) could result in the discharge of harmful substances to the mining effluents, which could contaminate Watercourse A, Lakes 3, 4 and 6 and their downstream waters. Most of this water flows into the Pontax River watershed and to a lesser extent into the Eastmain-1 reservoir (Lake 3 only).. Such a discharge could be caused by design or operational error, human error or mechanical failure.

A failure of the main water treatment plant causing an alteration of water quality in the final mining effluent could have repercussions on valued components, including the health of the Crees and the Cree's use of lands and resources for traditional purposes. This alteration could, among other things, affect fish and fish habitat, notably through increased mortality of individuals and a negative impact on abundance, diversity, reproduction, growth rate and feeding. Feeding, staging and nesting areas for migratory birds could also be affected.

The proponent has proposed the three following measures to prevent such a scenario:

- Verification of water treatment efficiency through periodic testing;
- Continuous pH and turbidity monitoring;
- Monitoring of storage capacity in accumulation and settling tanks.

The purpose of these measures is to detect a deficiency in the water treatment system and, if necessary, intervene before any discharge into the environment, including Watercourse A. If continuous testing prior to discharge from the main treatment plant indicates that the water does not meet the established standards, the water would be recirculated to the ponds rather than being discharged. Any necessary repairs or adjustments could then be made before the water is discharged into Watercourse A. Depending on the proponent and the amount of rainfall, the proponent would have up to 10 days, depending on the weather conditions, to complete the repair before the storage basins could continue to store the recirculated water in the plant. The proponent could also be required to shut down their mining operations, which would give them greater latitude to make repairs, up to more than 40 days.

Some members of the Cree Nation of Waskaganish raised concerns about the proponent's technical capacity to respond to an accident or malfunction at the main water treatment plant within two hours, given the distances to be covered and the resources available in the James Bay Territory. The proponent confirmed that the two-hour delay is associated with the time required for on-site employees to identify the problem and activate the recirculation mechanism in the water treatment plant.

Hazardous Material Spills

A spill of hazardous materials can occur during the life of a mine. It may include a spill of ore concentrate, petroleum products or chemicals used in the treatment of ore or mine wastewater. The potential causes of a spill are various, such as an accident during road transportation, equipment failure, a leak in a valve, pipe or connection, the overflow of a tank or human error.

According to the proponent, the effect of a spill of ore concentrate would be localized at the spill location and the concentrate would not spread. For another type of product, if the spill is significant and cannot be contained quickly, there will be runoff and/or infiltration into the ground. Depending on the size of the spill, a loss or change in vegetation cover may be observed in the terrestrial environment. Animals in contact with the product could suffer numerous health problems, including death. A hazardous material spill could potentially reach a wetland, body of water or watercourse and could also contaminate soils. The impact of a spill would depend, among other things, on the substance spilled, the volume spilled, and the location of the spill.

Reaching a body of water or a watercourse with a harmful substance could entail risks to the health of the Crees or at least lead to their avoidance of the contaminated territory. The proponent indicates that negative impacts could be observed on fish and their habitat as well as on feeding, resting and nesting areas for migratory birds. In addition, fish ingesting the toxic substance could transmit it to their predators, causing bioaccumulation in the food chain.

Fisheries and Oceans Canada recognizes that a spill of deleterious substances (e.g., hydrocarbons or chemicals), a non-compliance of effluent water quality or a long-term change in the quantities of water discharged into the water body would be likely to have negative effects on fish and fish habitat. Fisheries and Oceans Canada pointed out the presence of two species of fish reserved for the exclusive use of the Cree, namely the lake whitefish in Lake 3, recipient of one of the effluents, and lake sturgeon, outside the study area, but in the river system downstream of the effluents.

Numerous measures are proposed by the proponent to prevent and mitigate the risks associated with hazardous material spills. Among other things, the proponent plans to design tanks, storage areas, transfer points and equipment in accordance with the requirements and to develop an emergency response plan including an intervention procedure in the event of a spill of hazardous materials.:

Fires and Explosions

Fire and explosion risks are associated with many of the activities planned at the eventual mine site. In particular, a fire could occur at the ore plant, in an electrical transformer or during the storage, transportation or distribution of petroleum products. An explosion could also occur following a fire in the explosives warehouse or an accident involving a transport vehicle. The probability of a fire or explosion occurring is deemed very low by the proponent (i.e., it would only occur in exceptional circumstances).

If a fire were to spread beyond the mine site, it would cause mortality of the surrounding vegetation. A loss or alteration of vegetation cover would be observed, resulting in the loss of wildlife habitat. Wildlife would respond to a fire by quickly evacuating the area and then avoiding it due to the change in vegetation cover.

A fire could result in mortality of young and less mobile individuals who would be less able to flee the area. Bird nests could also be destroyed. In addition, the fire could affect water quality in nearby watercourses by adding particulate matter and other contaminants. In the case of an explosion without fire, immediate vegetation could be destroyed by heat. The blast and projection effect could affect vegetation and cause injury or death to wildlife within the impact radius of the explosion.

The proponent is committed to implementing several measures to prevent and mitigate the risk of fire and explosion. Among other things, it provides for the establishment of an intervention brigade trained in fire prevention and fire fighting and the maintenance of an up-to-date emergency measures plan that includes a fire and explosion response procedure. It finally provides to securely store emulsions and detonators in separate buildings.

The measures described above to prevent and mitigate the risk of harzardous substance spills are also applicable to this section.

Slope Instability

According to ECCC, the proponent provided general information on the environmental effects of potential accidents and malfunctions. More detail could have been provided on the adverse effects of certain scenarios on sensitive environmental components, particularly with respect to the scenario of tailings and waste rock slope instability and its potential effects on environmental components. This aspect would benefit from being developed for the preparation of the site's emergency measures plan. However, the environmental effects caused by accidents and malfunctions were, on the whole, adequately described for the purposes of the environmental assessment.

Health Canada emphasizes the importance of harmonizing emergency procedures to facilitate implementation and employee training. It would be desirable to clarify which entities should be contacted in the event of a spill depending on the nature of the substance spilled. The proponent must inform competent authorities, namely ECCC and Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques, regardless of the nature of the spill. This would simplify knowledge transfer and employee training.

ECCC considers the mitigation measures provided by the proponent to be adequate. For each type of potential accident, the proponent presented the prevention and mitigation measures to reduce the risk of accidents and malfunctions and to minimize their effects on the environment. ECCC believes that the protective measures, response protocols and preliminary emergency response plans proposed by the proponent are sufficient and adequate as they address the types of emergencies that could reasonably be expected to occur, including on-site consequences, related prevention, alerting and preparedness issues, and remedial and recovery measures. However, the draft emergency measures plan submitted by the proponent provides only an outline of the information that will need to be included in the emergency measures plan. ECCC notes that this preliminary plan will be completed before the project goes into production, when the project definition will be more detailed. ECCC made some recommendations and highlighted the importance of certain actions regarding the emergency measures plan (final version).

7.1.2 Joint Assessment Committee's Analysis and Conclusions Regarding Residual Effects

The Committee considers that the proponent has taken into account the environmental effects that could result from accidents or malfunctions, that they have documented these effects, and that they have an adequate preliminary contingency plan in place. The proponent has also adequately identified the risks inherent to the project and would implement preventive measures that include appropriate infrastructure design, inspection and maintenance.

Based on the implementation of the mitigation and follow-up measures identified below, the Committee believes that the project is not likely to cause significant adverse environmental effects as a result of accidents or malfunctions. Although significant adverse effects could occur under certain scenarios, the likelihood for major accidents is low. The Committee takes note of the proponent's intention to comply with federal and provincial laws and regulations.

The Committee also took into account the advice and impact analysis provided by ECCC, Health Canada and Fisheries and Oceans Canada. These departments provided some recommendations that have been incorporated into the relevant sections.

Identification of Key Mitigation Measures

The Committee considered the mitigation measures proposed by the proponent[46] and the advice of government experts and Cree Nations consulted to identify the key mitigation measures required to ensure that the project does not cause significant adverse environmental effects in the event of accidents or malfunctions. The key mitigation measures are the following:

- Implementation of all reasonable measures to prevent accidents and malfunctions that could cause adverse environmental effects and mitigate any adverse environmental effects that could occur;
- Development of an emergency response plan prior to the construction phase, in consultation with the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi and the relevant authorities. The plan must cover all emergency scenarios identified in the Impact Statement. It must identify precisely which entities should be contacted according to the emergency scenario or indicate the option of contacting ECCC and Quebec's Ministère de l'Environnement et de la Lutte contre les Changements climatiques (MELCC), as recommended by Health Canada;
- Development of an emergency measures plan. In doing so:
  - Place the plan in an easily accessible place and in view of all employees. Include in the plan a map of the sensitive elements that could be affected by an accident or malfunction. Keep the emergency plan and the environmental sensitivity map up to date;

[46] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

  - Detail the measures to be taken to respond to emergencies for each of the main accident risks considered, including measures to protect the environment. Describe, in particular, what is planned in the event of a spill of hazardous products to protect the sensitive elements of the environment, including surface water, groundwater and wetlands, fish, migratory birds or any other sensitive species concerned;
  - Determine the equipment needed to respond to such emergencies and locate it to ensure its availability;
  - Provide staff training in the maintenance and use of response equipment;
  - Provide a detailed spill notification procedure and an emergency communication plan for external parties;
- Maintaining of an updated emergency measures plan;
- In the event of an accident or malfunction, implementation of the contingency plan, which includes the implementation of appropriate measures to minimize adverse environmental effects;
- Identification, prior to the project and in collaboration with the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi, of the mechanisms for disseminating information in the event of an accident or malfunction having an effect on the environment, including the elements that these Cree Nations wish to be shared with them;
- Communication to the Agency, the Cree Nation Government, the Cree Nations concerned as well as the local stakeholders of any accident or malfunction having an effect on the environment;
- Provision of one or more emergency kits for the recovery of petroleum products and hazardous materials that are complete, permanent and easily accessible at all times on the job site. This kit must include a sufficient supply of absorbent materials and related equipment (shovels, gloves, leak plugs, etc.) to deal with any situation, as well as clearly identified leakproof receptacles intended to receive petroleum residues and other hazardous residual materials. Secondary emergency kits may be required at certain locations on the job site. Each piece of construction equipment must also contain a sufficient quantity of sorbents to be able to intervene quickly. The list of spill response equipment and devices must be approved by the supervisor;
- Design of petroleum product transfer areas outside the pit, away from traffic, on designated surfaces that will be constructed with physical barriers such as riprap or a catchment ditch. Development and implementation of a petroleum product transfer procedure;
- Immediate reporting on any accidental spills to the person in charge of the project's emergency plan, which will have been developed and approved prior to the work. The affected area must be immediately identified and cleaned up without delay. Contaminated soil must be removed and disposed of in an authorized site and characterized according to the terms of the MELCC's Soil Protection and Rehabilitation of Contaminated Sites Policy. In the event of a spill of hydrocarbons or any other harmful substance, ECCC’s alert network (1-866-283-2333) or MELCC’s alert network (1-866-694-5454) should be notified without delay.

Need for Follow-up and Follow-up Requirements

The Committee considers that a follow-up program is not required. If the project goes forward, the proponent will still have to ensure the implementation of the measures mentioned above.

7.2 Environmental Effects on the Project

The Committee considers that the proponent has taken into account the environmental factors that could affect the project in the design of the infrastructure and in the day-to-day operations of the project. The Committee believes that the environment is not likely to cause significant adverse environmental effects on the project.

The following subsections provide the information which the Committee considered in its analysis, including the opinions and comments of government experts and Cree Nations consulted.

7.2.1 Analysis of Potential Effects and Proposed Mitigation Measures

The analysis takes into consideration potential changes to the project due to the environment which may result in adverse environmental effects (e.g., earthquakes and extreme weather conditions, either related to climate change or not). The environment may damage the project's infrastructure and affect the likelihood of an accident or malfunction occurring (section 7.1).

The proponent assessed several environmental factors that could affect the project, including extreme weather conditions, forest fires, floods, terrain instability and earthquakes. The proponent indicated that the detailed engineering design of the project would take into account the risks associated with climate change.

Extreme Weather Conditions

Extreme weather conditions can occur in the form of heavy precipitation (rain, snow), high winds, and hail or ice storms. They can cause overloads and jeopardize the integrity of buildings or equipment. Such conditions could be observed more frequently in view of global warming. During the Committee's consultations with the Cree Nations of Eastmain and Waskaganish, members expressed concern about the proponent's consideration of the effects of climate change in the project design (infrastructure, final mining effluent, or during the restoration phase).

The proponent considered the climate projections of the Consortium on Regional Climatology and Adaptation to Climate Change (OURANOS, 2015) in developing the project. In the region including the proponent's study area, the projections for the year 2050 are the following:

- Increase in average annual temperatures of 2.3°C to 8°C depending on the scenario considered;
- Increase in extreme minimum temperatures, resulting in a shorter frost season;

- Increase in the amount and frequency of annual precipitation;
- Decrease in the duration of snow cover from 160 to 180 days (1950 to 2010) to 115 to 135 days;
- Increase in average river flows by 20 to 40%.

In order to address the above concern, the proponent plans to design the infrastructure in compliance with applicable laws, regulations and codes. The proponent recognizes that extreme weather conditions could have a negative impact on certain project components, but considers it unlikely that this effect could adversely affect mining operations. In winter, snow and ice would be removed as required to prevent overloading. The proponent would also ensure the presence of a self-contained power generation system at the workers' camp and alternative electrical equipment at the mine site. An emergency measures plan including an evacuation procedure for mine personnel would also be put in place.

Forest Fires

The risk of forest fires is considered high in the area of the study site. Since 1994, fires have occurred almost every year within 50 kilometres of the site. Fires were recorded within 4 to 6 kilometres of the site in 1995, 1996 and 2005. Therefore, it is plausible that a forest fire could occur during the life of the mine. A forest fire could, if left uncontrolled, cause damage (e.g., fuel tank explosion) or destroy mine site facilities.

Several measures have been developed by the proponent to prevent any fire and to act promptly if one were to occur: clearing of the site, restriction on open fires and collaboration with the Société de protection des forêts contre le feu (SOPFEU). The project is located in the Northern Protection Zone, where forest fire fighting is carried out by SOPFEU on a targeted basis, under agreements or in support of civil security. The measures relating to fires and explosions, listed in section 7.1.1, also apply to this section.

Flooding and Terrain Instability

Flooding is caused by heavy rainfall and can compromise the safety of mine site structures and roads. The proponent notes that the project is located at the head of two watersheds. The proponent notes that the hydrography and relief at the mine site make it a very flood-prone area. The surrounding wetlands have a high retention capacity for rainwater, which would reduce the risk of flooding. According to the proponent, the area of the mine site is not identified as an area potentially exposed to landslides, which are often favoured by flooding. Consequently, the proponent has not provided for any specific mitigation measures in the event of flooding or land instability.

Earthquakes

Eastern Canada is located in a stable continental region of the North American Plate and has relatively low seismic activity. Large regional-scale faults are present north and south of the mine site. In 35 years, a single 2.4 magnitude earthquake occurred 80 kilometres northeast of the mine site. The proponent has undertaken to ensure that the structural facilities meet the seismic standards of Quebec’s Construction Code and the National Building Code of Canada.

7.2.2 Joint Assessment Committee's Analysis and Conclusions Regarding Residual Effects

The Committee considers that the proponent has taken into account environmental factors that could affect the project in the design of the infrastructure, has documented potential accidents and malfunctions related to these effects, and has provided an adequate emergency response plan. Information related to accidents and malfunctions is provided in section 7.1. The Committee notes that climate change could, in the coming decades, exacerbate extreme weather events. The Committee believes that the environment is unlikely to cause significant adverse environmental effects on the project.

Identification of Key Mitigation Measures

The Committee considered the proponent's proposals[47] as well as the opinion of government experts and the Cree Nations consulted to conclude that the implementation of an emergency measures plan, set out in the previous section, is a key mitigation measure to ensure that the project does not cause any significant adverse environmental effects.

Need for follow-up and follow-up requirements

The Committee considers that no follow-up program is required. If the project moves forward, the proponent will still have to ensure the implementation of the identified mitigation and prevention measures mentioned above.

7.3 Cumulative Environmental Effects

Cumulative environmental effects are defined as the effects of a project that are likely to occur when a residual effect acts in combination with the effects of other projects or activities that will be or have been carried out. The assessment of cumulative effects was guided by the Agency's Operational Policy Statement on the subject (Agency, March 2015b). The Committee focused its analysis of cumulative effects on the following components:

- Fish and fish habitat;
- Migratory birds and birds at risk;
- Wetlands;
- Woodland caribou;
- Chiropterans at risk;
- The current use of lands and resources for traditional purposes by the Crees.

[47] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

Based on its analysis, the Committee concludes that the project, in combination with past, present and reasonably foreseeable future projects, is not likely to cause significant cumulative effects on any of the above components.

7.3.1 Methodology and Scope

The proponent carried out the cumulative effects assessment in the following four steps:

- Determining the scope of the assessment, including identifying regional concerns, selecting valued components, and establishing spatial and temporal boundaries;
- Identifying, describing and selecting past, present or future projects, actions or events that may interact with at least one of the valued components;
- Determining cumulative effects for each selected valued component;
- Determining mitigation and follow-up measures.

The proponent determined the spatial boundaries of the analysis of cumulative effects on the selected valued components (Figure 12). For the valued component “current use of lands and resources for traditional purposes by the Crees”, the proponent established a spatial boundary encompassing the Cree Nations of Nemaska, Eastmain and Waskaganish, as well as the traplines of these nations. The Committee also included the Cree Nation of Waswanipi in its analysis. For the other valued components, the proponent considered a radius of 50 kilometres around the project, covering an area of 7,850 square kilometres.

The temporal limits of the analysis were also determined for each of the selected valued components. For the valued component “current use of lands and resources for traditional purposes by the Crees”, the temporal limit begins in 1975, the year the JBNQ Agreement was signed. For the valued component “fish and fish habitat”, the temporal limit begins in 2002, the year in which data was collected for the Eastmain-1-A powerhouse and Rupert River diversion project. For the “migratory birds and birds at risk” component, the temporal limit begins in 1970, when the first inventories of the breeding bird route were conducted in Quebec. For the “wetlands” component, the temporal limit begins in 1970, i.e., before the effects of the actions or projects considered in the analysis occur. Finally, the temporal limit for the “species at risk” component begins in 1975 for caribou, based on the first exhaustive caribou inventories, and in 2003 for chiropterans, the date of the first bat inventory conducted by the Réseau québécois d'inventaires acoustiques de chauves-souris in the Northern Quebec region. The future temporal limit was set at 2045, the year corresponding to the mine closure and the rehabilitation of the estimated sites.

Several past (from 1970 onward), present and reasonably foreseeable works and events have been selected by the proponent for the analysis of cumulative effects:

- The construction and operation of the Eastmain 1 and Eastmain 1-A-Sarcelle-Rupert hydroelectric complexes;
- Nemiscau and Opinaca airports;
- The Billy-Diamond Highway, Route du Nord, Nemiscau-Eastmain-1, Muskeg-Eastmain-1 roads and secondary roads;

- The Nemaska-Eastmain, Nemaska-La Grande-2 and Nemaska-Waskaganish power transmission lines;
- Relocation of a 315-kilovolt line and construction of a substation (related to the Rose Lithium-Tantale Mining Project);
- Mining exploration activities;
- The Éléonore mine and the extension of the access road to the mine[48];
- The Whabouchi Mining Project (under development);
- The James Bay Lithium Mine Project, currently under environmental assessment by the Committee;
- La Grande Alliance, which is planning a comprehensive plan to extend the transportation network on the James Bay territory.

The proponent also foresees a spodumene-to-lithium processing plant as a future project that could be built in the study area in a later phase. The proponent indicates that the most recent economic and financial analysis of the project does not support its implementation and that it appears preferable to sell the concentrate produced by the Rose project on the international market rather than process it further near the mine. In the longer term, this situation could change, but it is not anticipated at the time of the environmental assessment, according to the proponent. If the proponent plans to make changes to the project that could result in adverse environmental effects, it must inform the Agency and the Cree Nation Government. The proponent must then describe the modifications to the project, the anticipated adverse environmental effects and the proposed mitigation measures, as well as the follow-up requirements to be implemented. The proponent met with several stakeholders and groups of people in the Cree Nations. They expressed concerns related to the rapid and intensive development, mining and otherwise, that is taking place in the Cree territory. The cumulative effects of these projects transforming the territory have an impact on the Cree way of life and identity. Stakeholders shared a sense of loss and powerlessness in the face of this development model that is too rapid and without a long-term vision. Some were concerned that it seems impossible to predict all the effects before a project is carried out, as well as the cumulative effects of the various projects.

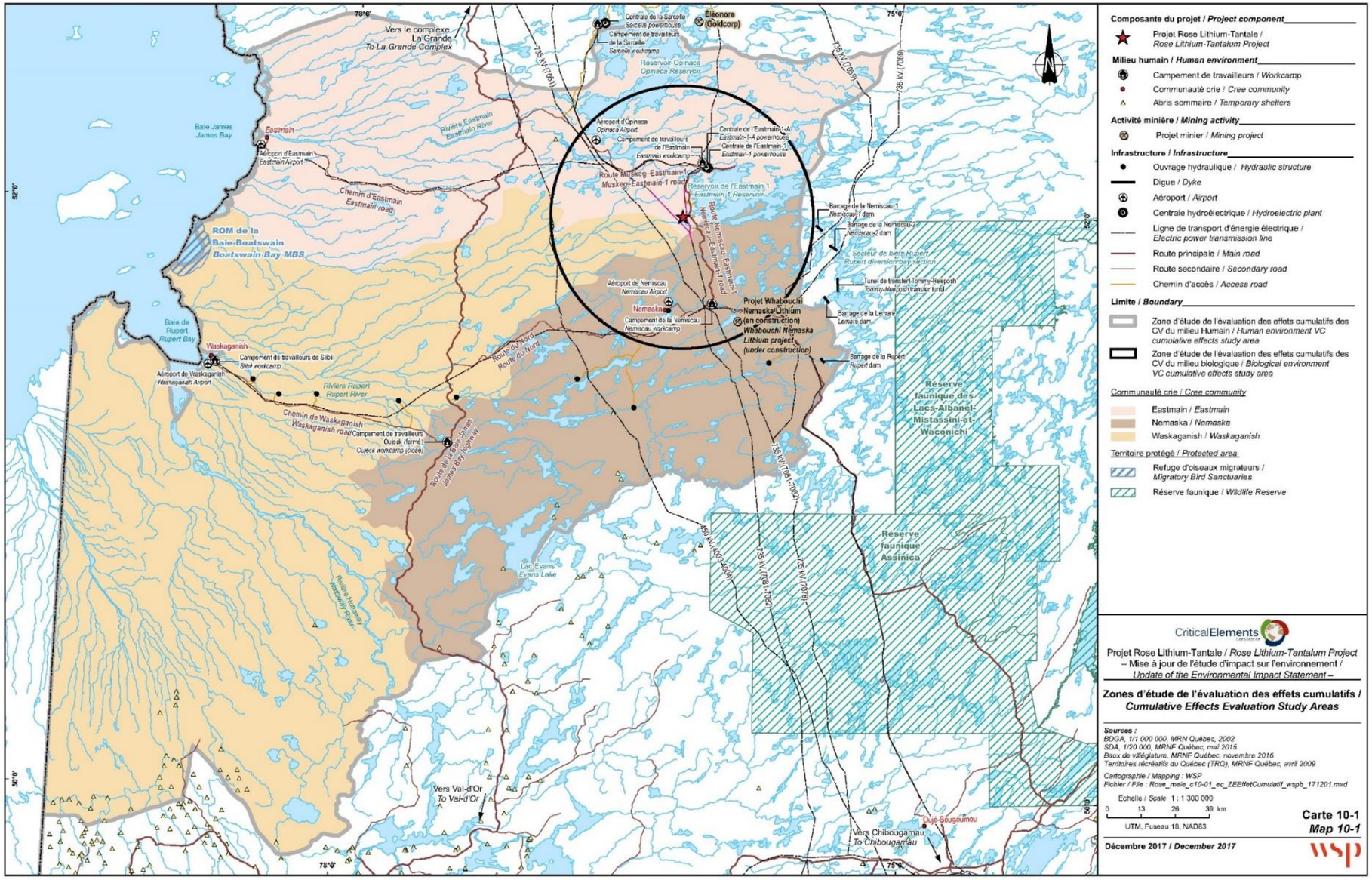
In selecting the valued components, the Committee based its selection on the potential significance of cumulative environmental effects and the likelihood of their occurrence, the degree of concern expressed by the Cree Nations consulted, the public and government experts, as well as the state or condition of the valued component. The Committee excluded the other valued components from its analysis given the absence or low intensity of residual anticipated effects on these components and the fact that these effects are unlikely to cumulate with the effects of other past, present or reasonably foreseeable projects in the environment where the project would be developed.

In sections 5.1 (Fish and fish habitat), 5.2 (Migratory birds and birds at risk), 5.3 (Species at risk, including woodland caribou and chiropterans), 5.4 (Wetlands) and 6.1 (Current Use of Lands and Resources for Traditional Purposes by the Cree Nations) of the report, the Committee concludes that the project's

[48] The Éléonore Mine and the extension that accesses it, as well as the James Bay Lithium Mining Project, are outside the study area for all valued components except for the current use of lands and resources for traditional purposes by the Crees.

contribution to residual non-cumulative effects is not significant, taking into account the implementation of mitigation measures, follow-up programs and compensation programs (if applicable). However, the residual effects could become significant when combined with those of other past, present and reasonably foreseeable projects or activities in time and space.

Figure 12: Study Areas for the Assessment of Cumulative Effects of Biophysical and Human Components



Source: WSP Canada Inc., February 2019a

7.3.2 Fish and Fish Habitat

Assessment of Cumulative Environmental Effects by the Proponent and Proposed Mitigation and Monitoring Measures

The proponent analyzed the cumulative effects of the project on fish and fish habitat due to the applicable regulations and the concerns raised by the Crees regarding the importance of the resource in their feeding habits.

The main projects in the study area whose effects would cumulate or could cumulate with the effects of the Rose Lithium-Tantale Mining Project (Rose Project) are the construction and operation of the Eastmain 1 hydroelectric complex, which resulted in the loss and alteration of fish habitats. The Muskeg-Eastmain-1, Route du Nord and Nemiscau-Eastmain-1 roads have modified fish habitat and altered water quality in addition to opening up the territory and increasing fishing pressure. The power transmission lines modified fish habitat and the relocation of a 315-kilovolt line as part of the Rose Project would also modify it. The Whabouchi Mining Project, located 40 kilometres southeast of the Rose Project, would result in habitat loss and alteration and could alter local water quality. Finally, the mining exploration activities that take place on the territory could alter water quality.

The main anticipated effects of the Rose Project on fish and fish habitat are the direct loss of habitat caused by the construction of the mining infrastructure as well as indirect habitat losses as changes to the hydrological regime are anticipated. In total, a potential loss of 42.3 hectares of fish habitat, either through destruction or deterioration, is anticipated. The project could also lead to changes in water quality due to the possible introduction of contaminants such as hydrocarbons, heavy metals and suspended solids into the environment.

Aside from the mitigation measures and follow-ups presented in section 5.1.2 (Fish and Fish Habitat), the proponent does not propose any other specific measures to reduce cumulative effects.

According to the proponent, the effects of the project would be limited to the watersheds affected by mine activities and it is unlikely that the cumulative effect on fish and fish habitat would be accentuated by the project. Therefore, the cumulative effect would be insignificant.

Analysis and Conclusion by the Joint Assessment Committee

The Committee's analysis is based on the proponent's assessment of cumulative effects on fish and fish habitat, as well as on the advice of Fisheries and Oceans Canada. The Cree Nations have expressed concerns to the Committee about the cumulative effect of the project on water quality as well as on fish and fish habitat.

Fisheries and Oceans Canada points out that the project's effects on fish and fish habitat could add to those previously generated in the territory by the operation of the Eastmain-1 reservoir. Indeed, Lakes 2 and 3 have a direct water connection with this reservoir. However, as mentioned by the proponent, the spatial scale

on which fish and their habitat have been affected by the Eastmain-1-A-Sarcelle-Rupert and Eastmain-1 complexes means that the addition of the effects of the Rose Project would probably not be significant.

The Whabouchi Mining Project is also located near the Rose Project. However, Fisheries and Oceans Canada notes that the infrastructure and final effluent from this project are located in the Nemiscau River and Rupert River watershed, south of the Pontax River watershed in which the Rose Project would be located.

The Committee supports Fisheries and Oceans Canada's opinion that the implementation of all key mitigation measures, of a monitoring and follow-up program, as well as of compensation measures pursuant to the *Fisheries Act* (section 5.1 Fish and Fish Habitat) will help avoid, mitigate and compensate for the project's effects on fish and fish habitat. The Committee believes that the project would not have a significant cumulative effects on fish and fish habitat.

7.3.3 Migratory Birds and Birds at Risk

Assessment of Cumulative Environmental Effects by the Proponent and Proposed Mitigation and Monitoring Measures

The Rose Project area is located within the northern boundary of Bird Conservation Region 8, the boreal coniferous forest. For the purposes of its cumulative effects analysis, the proponent considered priority[49] and stewardship[50] migratory bird species, as well as the five species at risk present or potentially present in the project's area of influence.

The proponent conducted an assessment of the cumulative effects on the nesting of pairs of migratory birds and birds at risk nesting near the project and on the loss and alteration of their habitats. The selected birds at risk are the common nighthawk, the short-eared owl, the olive-sided flycatcher, the rusty blackbird and the Canada warbler.

The main projects whose effects would or could cumulate with the effects of the Rose Project are the construction and operation of the Eastmain 1 hydroelectric complex, the Nemiscau and Opinaca airports and the Muskeg-Eastmain-1, Route du Nord and Nemiscau-Eastmain-1 roads, which have caused the loss and alteration of habitats, increased disturbance and increased air pollutant emissions and noise. The power transmission lines have modified and caused habitat loss, as well as increasing the disturbance perceived by migratory birds and birds at risk, particularly breeding birds present in the area. The relocation of a 315-kilovolt line as part of the Rose Project would have similar effects. Although mining-related projects have the potential to have the greatest impact on bird populations in the area, only one such project is located in the study area. The Whabouchi Mining Project, located 40 kilometres from the Rose Project, would result in habitat loss and alteration and would cause disturbance. Finally, mining exploration activities taking place

[49] Priority species are those that are vulnerable in terms of population size, distribution, population trend, abundance and threats.

[50] Stewardship species are those for which a high proportion of their range or continental population is included in a given region.

on the territory would have similar effects. However, the presence of reservoirs such as that of the Eastmain 1 hydroelectric complex may be beneficial to the presence of certain bird species such as waterfowl.

The migratory species likely to be most affected by the Rose Project are those with the greatest abundance in the project's area of influence: white-throated sparrow, ruby-crowned kinglet, yellow-bellied flycatcher, greenish warbler, butter warbler and alder flycatcher. According to the proponent, the priority species are among those that would be least affected by the project.

According to the proponent, the project would have few cumulative effects on the populations of migratory and birds at risk in the study area. The project could increase the disturbance of pairs nesting near the project site and could result in habitat loss and alteration. However, equivalent and unsaturated habitats are present around the project site and would allow species to find new sites suitable for nesting. The proponent concludes that the project would not cause significant cumulative effects on migratory birds and birds at risk, and no additional mitigation measures or environmental follow-up is required.

Analysis and Conclusion by the Joint Assessment Committee

The Committee's analysis is based on the proponent's assessment of cumulative effects on migratory and birds at risk, as well as on the advice of ECCC.

According to ECCC, the analysis of cumulative effects on migratory and birds at risk is summary and it is therefore difficult to determine their significance. Because of the uncertainties regarding the causes of the decline of birds at risk, any additional loss or alteration of habitat would be likely to further contribute to the decline. Rose Project activities, as well as past, present and future projects, actions and events identified by the proponent could have cumulative effects on the nesting habitat of species at risk in relation to habitat alteration and loss. The project could also have effects on the nesting activities of these species due to the disturbance caused by the presence of infrastructure and mining activities. Even if habitats are present in abundance in the vicinity of the project, the accumulation, over time, of residual effects could reduce the availability of quality habitats for species, thereby increasing intraspecific and interspecific competition.

Nevertheless, due to the abundance of habitat at the regional scale, ECCC believes that the Rose Project is not expected to contribute significantly to the cumulative effects associated with the loss or degradation of breeding or migration habitat for migratory birds and bird species at risk.

The proponent did not propose any additional mitigation measures to those planned to mitigate the effects of the project on migratory birds and birds at risk (section 5.3) to reduce cumulative effects on birds at risk and their habitats. ECCC believes that the implementation of any additional measures during the project that would reduce, mitigate or compensate for habitat losses of species at risk and species with declining populations would be beneficial.

Taking into account the implementation of mitigation and follow-up measures (section 5.3.2) and considering that the losses would be limited and that the species can move to other equivalent habitats, the Committee believes that the project is not likely to cause significant cumulative effects on migratory birds and birds at risk.

7.3.4 Wetlands

Assessment of Cumulative Environmental Effects by the Proponent and Proposed Mitigation and Monitoring Measures

The proponent assessed the cumulative effects on the loss of wetlands and the loss of their function. As indicated in section 5.2 Wetlands, the project would result in the loss of 173.55 hectares of wetlands, some of which are of high ecological value. Habitat for birds at risk and some species at risk would be lost. Nutrient export and carbon sequestration functions would also be lost for the wetlands destroyed. Wetlands in the future footprint of the pit are in close proximity to areas where the common nighthawk, a bird at risk species, has been inventoried.

The main projects whose effects would or could cumulate with the effects of the Rose Project are the construction and operation of the Eastmain 1 hydroelectric complex, which resulted in the loss and alteration of wetlands. The Muskeg-Eastmain-1, Route du Nord and Nemiscau-Eastmain-1 roads, power transmission lines and mining exploration activities have modified wetlands in the study area. The relocation of a 315-kilovolt line as part of the Rose Project could result in changes as well. Finally, the Whabouchi Mining Project would result in the loss of 7.4 hectares of wetlands. All of these projects have also had or would have an impact on the habitat functions of the affected wetlands.

According to the proponent, although major projects often result in the loss of wetlands, compensation programs make it possible to partially compensate for this loss. It also believes that there are no links between the wetlands lost or modified by these various projects. Moreover, given the abundance of these environments in the study area, the cumulative effects on this component would be reduced.

Among the mitigation measures that would be implemented during the construction phase, the compensation plan for the loss of wetlands (section 5.2 Wetlands) is the one that would most likely reduce the loss of habitat function, particularly for migratory birds and species at risk. Follow-ups are also proposed for wetlands that would be disturbed, in order to document, among other things, the project's impacts on plant communities and the maintenance of ecological functions. The proponent anticipates an insignificant cumulative effect on the wetlands and their functions, and no additional measures or follow-ups are proposed.

Analysis and Conclusion by the Joint Assessment Committee

The Committee's analysis is based on the proponent's assessment of cumulative effects on wetlands, as well as on the advice of ECCC.

The project would result in the destruction of wetlands with different ecological functions. The residual effect on these environments was qualified as moderate by the Committee (section 5.2 Wetlands). The other reasonably foreseeable projects described would add further pressure on wetlands. The Committee believes that there is a potential for cumulative effects on wetlands, particularly in relation to mining activities.

ECCC believes that the proponent did not base their analysis on a baseline condition or a consideration of past, present and future events. It is therefore difficult for ECCC to comment on the significance of potential cumulative effects.

Although Quebec's Regulation Respecting Compensation for Adverse Effects on Wetlands and Bodies of Water does not apply in Cree territory, the Committee believes that proponents are strongly encouraged to implement the "avoid-minimize-compensate" mitigation sequence. The implementation of this sequence would enable them to avoid a net loss of ecological functions during project implementation, particularly because of the financial contributions and compensation projects that may be requested from proponents in the event of losses.

The Committee supports ECCC's view that particular attention should be paid to wetlands. Indeed, according to the Implementation Guide for Federal Land Managers, the project is located in an area where wetland losses are deemed to be moderate.

The Committee believes that the effects of this project and of past and future projects have been and would be partially compensated for by compensation programs. The Committee emphasizes that the implementation of compensation projects for projects taking place in Cree territory is essential to counterbalance significant cumulative effects on wetlands. Monitoring by the proponent of the compensation project it proposes would make it possible to validate its effectiveness and measure its importance in minimizing cumulative effects on wetlands and their functions. Thus, given the compensation measures for the loss of wetlands and the implementation of mitigation and follow-up measures (section 5.2), the Committee believes that the project is not likely to cause significant cumulative effects on wetlands and their functions.

7.3.5 Woodland Caribou

Assessment of Cumulative Environmental Effects by the Proponent and Proposed Mitigation and Monitoring Measures

The proponent conducted an assessment of the project's contribution to cumulative effects on caribou habitat loss and disturbance as well as its disruption. It took into account potential interactions between the Rose Project and other projects in the study area, namely: the construction and operation of the Eastmain-1 complex, the Nemiscau and Opinaca airports, the Muskeg-Eastmain-1, Route du Nord and Nemiscau-Eastmain-1 roads, power transmission lines, mining exploration activities and the Whabouchi Mining Project. These activities have caused or could cause the loss, alteration and fragmentation of habitats as well as an increase in the disturbance of the species in the cumulative effects analysis area. According to the proponent, caribou tend to avoid anthropogenic structures such as logging, roads, buildings and natural disturbances. Habitat loss, overhunting and increased predation by grey wolves and black bears are considered to be the main causes of the species' decline observed over the past 150 years.

For a local population to have a probability of self-sufficiency (60% probability), the rate of habitat disturbance in its range must remain below 35% (ECCC, 2017). The proponent estimates that past events have resulted in a rate of disturbance to woodland caribou habitat of approximately 60% within the 50-kilometre zone around the mine project. Fires would have disturbed 55% of this area over the past 40 years. According to the proponent, the rate of disturbance of caribou habitat within the project footprint is currently 100%. Within a 5-kilometre radius around the mine, this disturbance rate would already be 99% (Table 12).

Table 12: Disturbance Rate (in %) of Woodland Caribou Habitat Within 5 to 50 Kilometres of the Centre of the Mine

Type of Disturbance	Disturbance Rate (in %)						
Distance from the Centre of the Mine (in kilometres)	0-5	5-10	10-20	20-30	30-40	40-50	Total (0-50)
Exclusively Anthropic	17	14	9	6	2	2	4
Exclusively Natural	31	31	35	37	42	53	44
Natural and Anthropic	52	29	12	11	11	9	11
Total Disturbances	99	74	57	53	55	64	60

The woodland caribou would thus not frequent the area of the projected infrastructures, which is greatly disturbed and enclaved by linear anthropogenic structures. These anthropogenic structures would therefore already prevent connectivity with contiguous habitats. The proponent estimates that the project would have an impact on approximately 42 hectares of undisturbed habitats (0.01% of the study area) within the mine's area of influence exclusively. According to the proponent, the total disturbance rate in the study area would therefore remain at 60% despite the project's implementation.

The proponent considers that completion of the project would not result in any significant increase in the rate of disturbance of woodland caribou habitat in the study area. Furthermore, given the current low level of use of the study area by woodland caribou, the probability of a cumulative effect is very low. The proponent concludes that the project would not result in significant cumulative effects on caribou since it would not cause any additional degradation of habitat conditions and would not affect individuals that may frequent the territory.

Analysis and Conclusion by the Joint Assessment Committee

The Committee's analysis is based on the proponent's assessment of cumulative effects on woodland caribou, as well as on the advice of government experts (provincial [from Quebec's Ministère de la Faune, des Forêts et des Parcs (MFFP)], federal and Cree).

The Committee supports ECCC's opinion, which states that hydroelectricity production, linear structures (roads and power transmission lines) and forest fires have contributed in the majority to the cumulative effects in the study area, which is included in the QC-6 range[51].

[51] A range is the geographical area where a group of individuals exposed to similar factors influencing their demography live and which is used to meet the needs of their life cycle. The QC-6 range is established in the recovery strategy (ECCC, 2020) and encompasses the James Bay and North Shore territory over an area of approximately 622,000 square kilometres.

In the absence of a range plan, ECCC points out that it is difficult to accurately assess the long-term effects in the QC-6 range and to keep the percentage of disturbed habitat below 35%. However, according to the information provided by the proponent, and according to the Report on the Progress of the Recovery Strategy Implementation for the Woodland Caribou, Boreal Population (ECCC, 2017), the population and distribution objectives defined in the woodland caribou recovery strategy for the QC-6 range do not appear to be compromised in the short or medium term.

According to the MFFP, the return of the species to the project area over the next three decades is unlikely. Environmental pressures would be unfavourable to reaching a population as large as before the development of the region. In a future of 50-80 years, it is unlikely that the species will colonize the project area. The fire cycle is likely to intensify in the coming years due to climate change, which would not allow forest cover to recover.

According to the proponent's analysis, in the cumulative effects study area, the project would contribute to a 0.01% loss of undisturbed habitat with the biophysical characteristics required for woodland caribou to meet their life cycle needs. For the entire QC-6 range, ECCC considers that the Rose Project's contribution to the rate of disturbance would be negligible and that the project would be unlikely to compromise the objective of maintaining the percentage of disturbed habitat in this range below 35%. According to the Cree Nation Government, the QC-6 range used is very large and requires adapted management approaches due to the different densities of caribou populations. It considers that habitat losses are limited and reversible if the proponent contributes to their recovery.

The Committee believes that the project's contribution to cumulative effects on woodland caribou would be low, since the project's residual effect in terms of encroachment is limited to its immediate area and involves small areas of habitat. Moreover, the species is already avoiding the project area and the increase in road traffic will accentuate this trend. The Committee concludes that the project is not likely to contribute significantly to the cumulative effects on woodland caribou and deems that no additional mitigation or follow-up measures are required.

7.3.6 Chiropterans at Risk

Assessment of Cumulative Environmental Effects by the Proponent and Proposed Mitigation and Monitoring Measures

The proponent assessed the project's contribution to the cumulative effects on habitat loss and disturbance of two chiropteran species at risk: the little brown myotis and the northern myotis. It also assessed the project's contribution to cumulative effects on disturbance, the creation of potential movement corridors, and significant mortality caused by white-nose syndrome in hibernating bat populations. Mining exploration activities, the Whabouchi Mining Project, the Eastmain-1 hydroelectric project, the Nemiscau and Opinaca airports, roads and power transmission lines have resulted or could result, over time, in habitat losses for these species. Forest fires have also contributed to habitat fragmentation. However, the most significant threat to chiropteran populations remains the white-nose syndrome, which appeared in 2010 in Quebec. This syndrome has a major effect on the little brown myotis, northern myotis and tri-coloured bat.

According to the proponent, the habitat losses related to the project would concern average quality habitats for chiropterans and would not compromise the integrity of local populations. Moreover, considering that there are sufficient replacement habitats of similar quality in the region, the effect of this loss would not be significant.

The project's contribution to cumulative effects would be negligible and the effects would mainly consist of an increase in disturbance in the vicinity of the project and occasional losses and alterations to the habitat of these species. No consequences are expected on the population objectives of the Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-coloured Bat. Given the reclamation activities planned at the end of the project and the mitigation measures presented in section 5.5 Species at Risk, the project would not result in significant cumulative effects on chiropterans.

Analysis and Conclusion by the Joint Assessment Committee

The Committee's analysis is based on the proponent's assessment of cumulative effects on chiropterans at risk, as well as on the advice of ECCC.

The Committee supports ECCC's opinion, which recognizes that the loss of habitat caused by forest fires and the human activities identified by the proponent in the study area contribute mainly to the cumulative effects on chiropterans at risk, whose populations are already very fragile due to the white snout syndrome. The Committee and ECCC believe that the Rose Project's contribution to cumulative effects is low.

This is mainly because the residual effect in terms of habitat loss and alteration is limited to the project area and that many replacement habitats are available beyond the future mine site, at the regional level, to support local populations.

Thus, the Committee concludes that the project is not likely to cause significant adverse cumulative effects on chiropterans at risk and deems that no additional mitigation or follow-up measures are required.

7.3.7 Current Use of Lands and Resources for Traditional Purposes by the Crees

Assessment of Cumulative Environmental Effects by the Proponent and Proposed Mitigation and Monitoring Measures

The spatial scope selected by the proponent for the assessment of the project's cumulative effects on the current use of lands and resources by the Cree Nations encompasses part of the territories of the Cree Nations of Eastmain, Waskaganish and Nemaska (see Figure 12 above). The temporal scope of the proponent’s assessment begins with the signing of the JBNQ Agreement in 1975, at which time several development projects gradually took place in the area. It ends in 2045, at which time the environmental conditions that prevailed prior to the project could be considered as possibly restored or in the process of being restored.

According to the proponent, the hydroelectric developments in the study area have caused a considerable loss of fishing, trapping and hunting sites, thus pushing the Cree Nations to adapt and seek new areas for their traditional activities. Some of these developments also caused, over time, an increase in the mercury content in fish flesh due to the pollution created by the impoundment of reservoirs further north. This forced the Crees to change their fish consumption habits and harvesting locations, particularly in the study area, for fear of effects on human health.

Airports and roads have contributed to the opening up of the territory and the alteration of habitats for wildlife. Hydroelectric power lines, which also raise health concerns, have had similar effects, in addition to modifying the habits of Cree users of the territory. Relocation of the 315-kV line and the construction of a substation by Hydro-Québec would have similar effects. The proponent believes that since the construction of each of the above-mentioned major structures has required or will require the temporary participation of many workers who are not beneficiaries of the JBNQ Agreement, each of them may have accentuated or could accentuate wildlife harvesting pressure in the future, thereby reducing the resources available to the Crees in certain places and at certain times.

The proponent also considered the effects of three other mining projects located in the study area. The Éléonore, Whabouchi and James Bay mining projects modify or would modify the use of the territory and resources, and have or would generate deforestation in addition to opening up the territory. The Whabouchi lithium mine, which was under temporary construction stoppage at the time of this report, is located about 20 kilometres from the village of the Cree Nation of Nemaska. The construction of this mine would disrupt hunting, trapping, gathering and firewood collection activities. It would modify access to the territory and the tranquility of a Cree community camp in Nemaska. More specifically, it would affect users of Nemaska's R20 trapline. This trapline borders traplines R16 and R19 (Nemaska), which, along with trapline RE01 (Eastmain), are most likely to feel the effects of the Rose Project (see Figure 3 in chapter 1 for the human environment study area). According to the most recent information available, the daily numbers of trucks during the Whabouchi project operation phase would be around six round trips in total. For the moment, the mine is not in operation, but there could be few trucks of maintenance on the road daily.

According to the proponent, the main anticipated effects of the Rose Lithium-Tantale Mining Project on the current use of lands and resources for traditional purposes are the loss of practice sites, the relocation of a Cree camp and the temporary disruption of traditional activities on the periphery. The mine recovery plan should allow for the return of Cree Nations current use once the mine is decommissioned.

The proponent recognizes that the project would partially affect land users who have already had to adapt to the creation of the Eastmain-1 reservoir in 2006, its alteration (Eastmain-1-A powerhouse) starting in 2009 and the construction of the Whabouchi Mining Project. The proponent considers that the Rose Project in itself would have little residual effect on the current use of the Cree Nations of Eastmain and Nemaska. It recognizes, however, that families using a limited portion of traplines RE01 and R19 and holding camps along the Nemiscau-Eastmain-1 road could experience cumulative effects due to the various nuisances of development projects in the sector and the loss of wildlife habitats. The proponent considers that only a few individuals could feel these effects. It recognizes, however, that this situation could be modified by Cree demographics, which are clearly on the rise. It is therefore possible that there could be more and more individuals on the territory over time.

Users of trapline RE01 of the Cree Nation of Eastmain indicated that they had a generally negative impression of the project since it would constitute an additional impact on the territory after Hydro-Québec's development projects. Several members of the Cree Nation of Nemaska expressed concern about the cumulative effects of the project in the event that all of the proposed mining projects proceed (Whabouchi when the mine is in operation, Rose and James Bay). Some deplore the cumulative effect of nuisances in an area where several natural resource development projects are already reducing the amount of space available for traditional activities. Several Cree users of the territory mentioned that all these projects would take place in an ecosystem that is already disturbed. Other users seemed to perceive that the study area is already quite heavily exploited and that the critical threshold for maintaining current Cree use on certain traplines could already be exceeded by the current level of development. Finally, the massive influx of workers who could hunt and fish during the construction of each of the projects also raises concerns about the future availability of wildlife resources.

However, the proponent believes that the mitigation measures put in place by these various projects have made it possible to mitigate their impact on the resources exploited by the Crees while facilitating access to new areas of practice. The promoter undertakes to involve the Cree users of Eastmain trapline RE01 and Nemaska traplines R16 and R19 in its monitoring of the current use of lands and resources. It is also open to collaborate with other proponents active in the region and the government entities concerned in order to implement mitigation measures to address cumulative effects in the area, should complaints be made in this regard. Similarly, the proponent undertakes to prohibit hunting and fishing activities and the possession of equipment inherent to these activities by including clauses in the employment contracts of its employees. The proponent plans to use an existing camp to house its employees, which would reduce the project's footprint and limit disruption to the peace of mind of land users. It considers that the territory would remain vast and that land users could, after a period of adaptation, relocate their activities in order to avoid potential cumulative nuisances. The proponent therefore deems that the cumulative effect of the present project on the current use of the Cree Nations is not significant. Consequently, the proponent considers that there is no need to propose any mitigation measures other than those set out in Section 6.1 (Use of Lands and Resources for Traditional Purposes by Cree Nations), nor any specific follow-up.

Analysis and Conclusion by the Joint Assessment Committee

The Committee believes that the spatial and temporal boundaries chosen by the proponent are adequate. However, the Committee decided to focus its analysis on the cumulative context specific to the spatial boundaries of traplines RE01, R16 and R19, since the concerns of the Cree Nation members consulted regarding cumulative effects were mainly related to these traplines. The cumulative context specific to transportation activities also includes traplines A52, A54, W01, W03, W07, W13, W53 of the Cree Nation of Waswanipi. The Committee does not foresee any cumulative effects on trapline R10 of the Cree Nation of Waskaganish as a result of the Rose Project. The eastern end of this land is still free of development and has not been frequently used in the last decade, due to its great distance from the Nation's village. The Committee considers that the proponent has identified relevant past, present and future projects and their respective and cumulative effects on the current use of the land by the Crees.

The Committee believes that the project could result in residual cumulative effects on the use of lands and resources, particularly with respect to fishing and the quality of the territory's experience. After considering the effects of the project and its interactions with past, existing and reasonably foreseeable projects or activities, it deems that these effects are not likely to be significant. The Committee reached this conclusion based on the proponent's assessment, the observations of the Cree Nations consulted and the opinions of government experts.

Cumulative Decrease in the Availability of Fish for Fishing

The project would take place in an area (traplines RE01 and R19) where fish availability has already been altered by mercury contamination of the Eastmain-1 hydroelectric development reservoir (see Figure 3 - Human Environment Study Area). The Committee is aware that fishing is a highly valued activity that is widely practised by the Crees, especially in the summer. The Committee notes that several of the members consulted stressed the importance of the integrity of the watercourses for the maintenance of the ecosystem and Cree culture.

The project would result in a permanent loss of navigability of two lakes and one river and a temporary loss of navigability (approximately 30 years) of two other navigable fish-bearing lakes. A loss of 42 hectares of fish habitat is also anticipated as a result of the development and operation of the pit as well as the presence of mining infrastructure (see section 5.1 Fish and Fish Habitat). As explained in more detail in section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations), the Committee concludes that the decrease in fish availability would be irreversible in the RE01 trapline, but points out that the intensity of this effect on the fishery would be reduced by the compensation provided for under the *Fisheries Act*. The Committee notes that the potential gains from the only activity planned and known in the proponent's compensation plan at the time of the environmental assessment would probably only be partially perceptible in these traplines. For technical reasons, part of the compensation plan would be carried out outside the human environment and cumulative effects study areas. However, the Committee remains confident that the selection of the other compensation projects required according to Fisheries and Oceans Canada would be made in consultation with the relevant Cree stakeholders for this purpose. This consultation should contribute to the sustainability of this valued resource in sectors which, if they are not directly accessible to the same users of lands RE01, R16, R19, would be accessible to other members of these Nations in general.

The Committee notes that water bodies are abundant in these traplines. The tallyman of trapline RE01 has confirmed to the Committee that he has access to similar resources in the location chosen for the relocation of his camp. The Committee believes that Cree users have access to several other quality fishing sites free of contamination in traplines RE01 and R19. The Committee believes that the project could have cumulative effects on the availability of fish for fishing in traplines RE01 of the Cree Nation of Eastmain and R19 of the Cree Nation of Nemaska. These effects on Cree Nation fisheries would be mitigated due to the planned compensation activities and would not be significant considering the ubiquitous presence of water bodies in these traplines.

Cumulative Decrease in the Quality of the Experience on the Territory Due to the Increase in Nuisances and the Perception of Contamination

The Committee notes that the effects of the project could be felt in three traplines (RE01, R16 and R19) that have already undergone significant changes in recent decades with respect to the quality of the territory's experience. It recognizes that the ability to enjoy quality stays in nature, without being regularly disturbed, is inherent to the satisfactory practice of traditional activities that are an integral part of Cree culture.

According to the Committee, the quality of the experience on traplines RE01, R16 and R19 has already been altered if the following elements are taken into account[52] :

- Trapline RE01 is characterized by the presence of several roads, an airport, the Eastmain-1 reservoir, a temporary workers' camp that will soon become permanent, and three power lines, one of which should be partially relocated if the project goes ahead;
- Land R19 is bordered by the Eastmain-1 reservoir and crossed by the Nemiscau-Eastmain-1 road, which becomes the Route du Nord at its western border and is located near the Whabouchi Mining Project;
- Land R16 is characterized by the presence of the Cree village of Nemaska and its airport, a hydroelectric substation, four traditional activity exclusion zones (one for the airport and three for the hydroelectric substation for security purposes), three power lines and several roads in addition to being located near the Whabouchi Mining Project.

The Committee recognizes that each development project in the sector has reduced the proportion of natural areas free of development in these traplines. Each of them has possibly forced users of the territory to adapt by modifying their practice to find new places that are quieter or conducive to traditional activities. Some users of these traplines may have witnessed this from 1975 to the present day.

The Committee believes that the project itself would contribute to diminishing the quality of the current experience of traplines RE01, R16 and R19 because of the sensory disturbances related to the construction, operation and decommissioning of the mine and the increase in road traffic that it would generate[53]. As explained in detail in section 6.1, the Committee concludes that the users of traplines RE01, R16 and R19 could feel the combined residual effects of the project's mining and transportation nuisances. The users of the traplines of the Cree Nation of Waswanipi are located at a significant distance from the project and would not feel the nuisances of mining activities. However, these traplines are crossed by the Billy-Diamond Highway, the last road the proponent would take to Matagami. These land users could also feel the effects of the increase in heavy vehicle traffic from the Rose Project (24 round trips per day during construction, 68 round trips per day during operation). In the event that the future James Bay Mine Project (5.5 round trips per day under construction, 53 round trips per day in operation) follows exactly the same construction and operation schedule as the Rose Project, these users could feel the cumulative effects of the increase in road traffic from the two mining projects (29.5 round trips per day under construction, 121 round trips per day in

[52] This information was obtained from the proponent and is identified on maps that remain confidential. The Committee does not have similar information for lot R10 of the Cree Nation of Waskaganish.

[53] The increase in heavy vehicle traffic on the Route du Nord would be around 50 per cent during the construction phase and around 140 per cent in the operational phase.

operation in total), in addition to the Whabouchi mining project (six round trips in operational phase). Cumulative effects on the experience of the territory could thus also be felt by these users of the Cree Nation of Waswanipi. The Committee considers, however, that this is the worst case scenario and that it remains unlikely that the two projects will follow exactly the same schedule.

The nuisances generated by the project could diminish the feeling of tranquility on the territory, alter the possibility of resting in the forest or at camps and reduce the ability to access the practice areas in a peaceful and safe manner. However, the Committee is reassured by the implementation of several mitigation measures aimed at reducing the negative effects of the project's transportation and blasting activities (see section 6.1). It recommends a cumulative effects follow-up program to assess the effectiveness of the proposed mitigation measures on the access and experience of these users. It emphasizes that the significant reduction in the frequency of blasting and transport convoys during the annual goose and moose hunting periods should make it possible to maintain a certain degree of tranquility and safe access at times when land users are present in greater numbers on these traplines.

The project could also itself generate a decrease in the quality of the experience due to the fear of contamination. It would be part of a particular regional context marked by a history of water contamination in the area by other proponents. As explained in section 6.1, avoidance of the project site and its surroundings for fear of contamination could continue after the mine is decommissioned, despite the measures put in place by the proponent to increase user confidence.

The Committee concludes that the perception of contamination could be felt with a slightly higher level of intensity by the users of traplines RE01 of the Cree Nation of Eastmain and R10 of the Cree Nation of Waskaganish, due to the waters of the final mining effluent that would begin their journey over 5 kilometres in trapline RE01 to complete their dispersion in the extreme east of trapline R10. As explained in section 6.2 on Cree health, the Committee does not foresee any significant effects on human health and recommends several key mitigation measures to limit the risks and ensure adequate monitoring, particularly of water quality.

The Committee recognizes that it is difficult to measure the precise area of sectors that could be avoided by users due to the perception of contamination associated with the project. However, it believes that these effects on current use must be considered cumulative and likely. It acknowledges that these traplines remain vast and that several portions of the territory remain visibly free of industrial or anthropogenic disturbances that could, in particular, give rise to fears of contamination or sensory disturbances. It notes, however, that the wildlife species present as well as the accessibility of the sectors vary, notably because of the costs and travel times, which are not always reasonable.

The level of resilience of users to cumulative disruption is also difficult to predict. Some may maintain their activities in the same areas with less satisfaction, others may move to find areas that they consider to be more quiet or safe, while others may stop their activities in these traplines. The Committee also notes that Cree demographics are clearly on the rise, and that this could increase pressure on these development free zones in the future.

The context in which these new nuisances would occur could increase the intensity of the cumulative effects of the project on the quality of the experience of the territory of the Cree Nation of Nemaska. The resilience of these users of the territory could be called upon again in this regard with a new lithium mine project near the Nation. On the basis of the observations heard during consultations with members of the Cree Nation of Nemaska, the Committee believes that the project could contribute to the erosion of the sense of cultural belonging among certain individuals of this Nation.

The Committee believes that the project could have cumulative effects on the quality of the experience of traplines RE01 of the Cree Nation of Eastmain, R16 and R19 of the Cree Nation of Nemaska and on the users of traplines A52, A54, W01, W03, W07, W13 and W53 of the Cree Nation of Waswanipi. These effects on the experience of the Cree Nation territory would not be significant due to the planned mitigation and follow-up measures. However, the Committee emphasizes that the study of any other major industrial project having effects on the traplines (RE01, R16 and R19) in the near future should be carefully evaluated and document what would be a critical threshold allowing the maintenance of the current use of lands and resources for traditional purposes by the Crees.

The Committee does not recommend any additional mitigation measures beyond those set out in sections 6.1 and 6.2. The follow-up program presented in chapter 6.1 concerning the quality of experience in the area due to the increase in nuisance and the perception of contamination on traplines RE01, R16 and R19 would also address the cumulative effects.

8. Collaborative Evaluation of the Impacts of the Project on Crees Values

The Agency's new policy for assessing potential impacts on the rights of Indigenous peoples[54] indicates that Indigenous Nations may identify a set of values and priority issues associated with their well-being, cultural expression and preferred means of exercising their Aboriginal and treaty rights. For the purposes of this environmental assessment, the Committee agreed to focus its impact analysis on Cree Nation rights through a conceptual framework based on Cree values. These values are at the heart of the Cree identity and the rights established for the Crees under the James Bay and Northern Quebec Agreement (the JBNQ Agreement) and recognized by section 35 of the *Constitution Act, 1982*.

8.1 Established Rights in the Project Area

The project is located on the Eeyou Istchee territory, which means the People's Land, and corresponds to the east of James Bay and the south-east of Hudson Bay. The Eeyou traditional territory comprises eleven Nations, home to over 18,000 people and over three hundred "traplines" or traditional family hunting and trapping grounds.

The JBNQ Agreement was signed in 1975 by the Grand Council of the Crees, the Northern Quebec Inuit Association, the Government of Canada, the Government of Quebec, Hydro-Quebec, the James Bay Energy Corporation and the James Bay Development Corporation. It was Canada's first modern land claim agreement. Section 24 of the JBNQ Agreement establishes a Hunting, Fishing and Trapping Regime subject to the principle of conservation and outfitting regime specific to the Territory, which provides certain rights to signatory Cree Nations including gathering and harvesting wildlife. The Cree people have the exclusive use of certain wildlife species, as well as the exclusive right to establish and operate commercial fisheries for certain fish species, as set out in Section 24, Annex 2 of the JBNQ Agreement. This list is included in annex G of the present report. Section 22 of the JBNQ Agreement sets out the environmental and social protection regime for Cree people, societies and communities with respect to developmental activity on the territory. It also protects the hunting, fishing and trapping rights and guarantees established in Section 24. These activities are still at the bedrock of the Cree identity and essential for meeting their physical, psychological, spiritual and economic needs, and cultural values.

[54] *Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples* is available at the following link: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/assessment-potential-impacts-rights-indigenous-peoples.html

The project is located on Category III land. These lands fall under the jurisdiction of the Government of Quebec, which retains mining rights, but the James Bay Crees have exclusive trapping rights of fur-bearing animals, as well as exclusive hunting rights for certain species of animals. Fishing and hunting of other species are permitted for both Cree and non-Cree land users on Category III lands. The environmental effects of the project would not be felt exclusively on the mine site, but in the larger area around the project as well. These could include Category I lands, whose use is reserved exclusively for Cree beneficiaries of the JBNQ Agreement, and Category II lands, which are owned by the Province of Quebec but on which Crees have exclusive hunting, trapping and fishing rights (see section 4.1 Crown Consultation with the Crees). The protection of the environment, the Cree rights, the Cree people, their economies and the wildlife resources upon which they depend are at the foundation of the JBNQ Agreement environmental and social protection regime.

The New Relationship Agreement “Paix des Braves”, signed in 2002 between the Quebec Government and the Crees, was a peaceful political and economic agreement which helped address issues related to the implementation of the JBNQ Agreement. This 50-year agreement marked the beginning of a new era in Quebec-Cree relations by guaranteeing Cree participation in forestry, mining and hydroelectric development in James Bay, and a portion of the revenue derived from that development. This was followed by the Canada-Cree New Relationship Agreement signed in 2008 to improve the implementation of the JBNQ Agreement and which led to the *Agreement on the Cree Nation Governance* in 2017. Many other agreements have been signed since the JBNQ Agreement, which is a demonstration that the relationships between the Cree and the federal and provincial governments, the Cree self-governance and the rights of the Cree people are still evolving.

8.2 Analysis Methodology

The analysis of the Cree values is guided by the principles found in the JBNQ Agreement article 22.2.4, and are the following:

a) The protection of the hunting, fishing and trapping rights of Native people in the Territory, and their other rights in Category I lands, with respect to developmental activity affecting the Territory;

b) The environmental and social protection regime with respect to minimizing the impacts on Native people by developmental activity affecting the Territory;

c) The protection of Native people, societies, communities, economies, with respect to developmental activity affecting the Territory;

d) The protection of wildlife resources, physical and biotic environment, and ecological systems in the Territory with respect to developmental activity affecting the Territory;

e) The rights and guarantees of the Native people within Category II established by and in accordance with Section 24 until such land is developed;

f) The involvement of the Cree people in the application of this regime;

g) The rights and interests of non-Native people, whatever they may be;

h) The right to develop by persons acting lawfully in the Territory;

i) The minimizing of negative environmental and social impacts of development on Native people and on Native communities by reasonable means with special reference to those measures proposed or recommended by the impact assessment and review procedure. All development projects in Eeyou Istchee must be respectful of historic, social and economic contexts and territorial organization.

The draft value list was established by the Committee. The list and the definition of each value were finalized with the cooperation and input of representatives of each of the Cree communities consulted.

This approach recognizes that impacts to values do not only happen because of biophysical effects but also because of social, economic, heritage, and health-based effects, as well as direct impacts to values from the project. For each value, the assessment considers project effects that could cause a change to the practice of a right (for example project-induced changes to habitat of a hunted species), impacts to the exercising of a right (for example project-induced changes on access to preferred hunting or fishing sites), and project-induced effects to other traditional or cultural uses of the land such as destruction or degradation of cultural sites, or noise and visual disturbances. The perception of impacts to rights is also considered as part of this analysis, as perception may interfere with the exercise of rights. The outcome of this assessment has allowed for the assessment of the sufficiency of mitigation and compensation measures to mitigate impacts on Cree values.

The Cree Nations of Eastmain, Nemaska and Waskaganish shared their concerns with the Committee through in-person and virtual consultations, in fall/winter 2019-2020 and in winter 2020. Certain members of the Cree Nation of Waswanipi were also consulted in fall 2020, specifically related to the effects of traffic on their land use. The perspectives reported in this chapter represent what was shared with the Committee during these consultation sessions. The Committee also consulted with these four Cree Nations on the draft Environmental Assessment Report in the spring of 2021. Concerns frequently raised during these consultations have been added to this chapter.

8.3 Potential Repercussions of the Project on Cree Values

The Committee accounted for any impacts to Cree values raised by the proponent (Critical Elements Lithium Corporation) or the Cree Nations affected by the project in carrying out its analysis. The analysis was updated to reflect any new information as it came to light through the environmental assessment process, in order to assess the nature and scope of the impact the project would have on Cree values. The following section outlines the Committee's assessment of the impact the project will have on Cree values, should it be allowed to proceed. In each section, the value is described, the key comments heard during the Committee's consultations, as well as mitigation measures, are presented, and the analysis of the Committee are detailed. Mitigation measures that respond to each value and to some of the concerns of the Cree Nations are detailed. It should be noted that additional mitigation measures to meet the values may be found in other chapters of this report. The *key mitigation measures* presented for each value are those recommended to the Minister by the Committee and which would be considered by establishing conditions that form part of the decision

statement that he will publish pursuant to CEAA 2012. These key mitigation measures are deemed essential to avoid significant adverse environmental effects on valued components under federal jurisdiction. *Other accommodation and mitigation measures* are those that have been proposed by the proponent[55] or respond directly to Cree concerns but are not in federal jurisdiction and which may not be considered as conditions within the meaning of the Minister's decision statement. The comprehensive list of key mitigation measures is provided in Appendix C.

A significant factor in many of the mitigation measures is the implementation of these measures by the Environment and Implementation committees established by the Pihkuutaau Agreement (redacted). The Environment Committee would be composed of proponent representatives, the Cree Nations of Eastmain and Nemaska and the Grand Council of the Crees (Eeyou Istchee)/Cree Nation Government. The Environment Committee would, among other activities, assist in the implementation of the proponent's environmental management system, review environmental policies, and participate in environmental monitoring activities. The Environment Committee would also cooperate in the development of the Emergency Response Plan, the rehabilitation and restoration plan, and facilitate the exchange of Cree knowledge with the cooperation of various Cree parties.

The Implementation Committee would be composed of proponent representatives, the Cree Nation of Eastmain, and the Grand Council of the Crees (Eeyou Istchee)/Cree Nation Government. A representative from the Cree Nation of Nemaska would also be invited to join as an observer. The Implementation Committee would, among other activities, oversee the implementation of the Pihkuutaau Agreement (redacted), serve as the principal forum for communications between the parties, provide reports on the implementation of this Agreement and carry out other functions vested by this Agreement.

8.3.1 Health (air, water, and quality of traditional food)

Description of the Cree value

This value refers to Crees' access to quality air, water and traditional food whose contaminant levels do not exceed established thresholds. The perception that Cree communities may have that the air, water or traditional food is contaminated must also be taken into consideration in the health impact assessment.

Perspectives of the Cree Nations

Cree Nation of Eastmain

In general, members of the Cree Nation of Eastmain who participated in the federal consultation stated that they were preoccupied by the effects of mining operations on health. They are concerned about the damage mining projects could cause to the surrounding environment, including soil, waterbodies, fish and fish habitat,

[55] The proponent's commitments can be found in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

and other species harvested as traditional food. One land user stated that the project would have cumulative health impacts with the Hydro-Quebec projects already in place on the territory. They were uncertain about the proponent's capacity to control water quality, since they previously had a negative experience in this respect with Hydro-Quebec projects. Some believe that future generations would give up using the mine site to practise traditional activities, for fear of health impacts.

Cree Nation of Nemaska

The members of the Cree Nation of Nemaska who participated in the federal consultation stated that they were concerned about the health effects caused by increased road traffic and blasting, particularly with respect to noise, vibrations, and air quality (dust). In general, members stated that dust would affect current and future land use and the health of the population. They stated that open pit mines have negative effects on air and water quality and emit greenhouse gases. They recommend regular monitoring of the mining effluent.

Some community members stated that land users practising traditional activities on traplines R-16 and R-19 would experience increased health risks due to the project. Some participants also stated that they were preoccupied about the effects of the project on pregnancies. They have noticed a higher rate of miscarriages potentially due to air contamination since another development project has been in operation on the territory.

Community members were also concerned about the effects of the project on surface and groundwater, both during regular operations and in the event of an accident or malfunction possibly leading to a spill. They stated that the waterbodies and watercourses that flow west and into the Pontax river watershed are already contaminated with mercury and other contaminants by development projects in the area. There is a concern that potential effects on water resources would in turn cause contamination of fish and other harvested species.

Many community members stated that once contamination to one element of the environment occurs, it propagates throughout the fauna and flora, and the effects will often last long after the mine has ceased operating. Whether or not traditional foods are actually contaminated, the fear of contamination brought about by the project can be a significant source of anxiety. The species that were of particular concern included muskrat, beaver, moose, fish and harvested berry types.

Cree Nation of Waskaganish

The members of the Cree Nation of Waskaganish who participated in the federal consultation stated that they were concerned about the impacts to water quality and wildlife brought about by the project and the implications for the health of land users. They stated that the potential effects to the watershed were not clearly defined, particularly, the long-term management of the sedimentation ponds and monitoring of contamination levels. They stated that they want to remain informed about environmental monitoring results and any accident or malfunction, and one land user indicated that they were skeptical of the proponent's ability to contain a major spill due to the remote location of the project.

Some land users expressed a concern that the entire portion of the R10 trapline nearest to the project would be contaminated and that their children would not be able to go hunt and fish in this area. The final mine effluent would begin its five kilometre journey in trapline RE01 and end its dispersal in the far east of trapline

R10, and therefore water quality during and after the mine life was a central concern. They were also concerned about the effects on all the lakes (such as dust) that are valued by land users in the southwest portion of the R10 trapline and the fish and beaver that live there.

Committee consultations on the Draft Environmental Assessment Report

During the Committee's consultations on the draft report, members of the three Cree Nations raised several concerns about the residual health effects of the project. Several stakeholders had concerns about water quality and potability, as well as the potential contamination of harvested species (including fish and beaver) due to their consumption of final mine effluent water.

Regarding air quality, members of the three Cree Nations also had concerns about the dust generated by the transportation activities and their repercussions on the health of land users practicing their activities near the roads. A member of the Cree Nation of Eastmain also questioned the measures taken by the proponent to reduce greenhouse gases.

In general, several participants in the consultations indicated that they were concerned about the project's effects on the quality of traditional food and water. They were also concerned about how the ore would interact when it came into contact with various elements of the environment (such as air and water).

Key Accommodation and Mitigation Measures

- Use of dust suppressants on unpaved roads where traffic is likely to cause dust uplift and implementation of a road watering management program to monitor the effectiveness of these control measures. Revegetation of waste rock, organic matter and unconsolidated waste rock piles. Throughout the various phases of the project, progressive recovery, particularly of the outer slopes of these piles, should be encouraged where possible in order to minimize particulate matter emissions generated by wind erosion. In addition, the covering of conveyors located outside and the temporary covering of the accumulation areas with straw or granular materials, depending on the terrain and meteorological conditions, should be considered in order to limit wind erosion;
- Submission of the environmental follow-up studies produced by the proponent to the environmental services of the band councils of the Cree Nations of Eastmain, Nemaska and Waskaganish as soon as they are published, throughout the life of the project. Ensure Cree participation in environmental monitoring. Environmental monitoring should include food-gathering activities;
- Services of an independent third party to monitor the implementation of the measures of the monitoring programs;
- Development of an emergency response plan prior to the construction phase, in consultation with the Cree Nations of Eastmain, Nemaska and Waskaganish and the appropriate authorities. The plan must cover all emergency scenarios identified in the impact study;
- Identify, prior to the project and in collaboration with the Cree Nations of Eastmain, Nemaska and Waskaganish, the mechanisms for disseminating information in the event of an accident or malfunction having an effect on the environment, including the elements that these Cree Nations wish to be shared with them;

- Inform the Agency, the Cree Nation Government, the Cree Nations concerned as well as the local stakeholders of any accident or malfunction having an effect on the environment;
- Implement a mine effluent management program to meet the standards of the *Metal and Diamond Mining Effluent Regulations* and the *Fisheries Act* as well as the requirements of the Government of Quebec. This program includes in particular:
  - From mining to decommissioning, pumping of groundwater through wells on the periphery of the pit, transfer to a sedimentation basin, treatment if necessary, then final discharge into Lakes 3, 4 and 6.
- Water quality monitoring of effluent from the main treatment plant and exposed water bodies and watercourses.

Other Accommodation and Mitigation Measures

- Within one year of the Minister's approval of the project, if applicable, the proponent is to provide a follow-up of measures they have taken to ensure that the pressure on the Cree Nation of Nemaska's services will be minimal (including any agreements that have been signed with stakeholders in the health services sector).

Analysis of the Joint Assessment Committee

Many common threads were observed with respect to the health concerns of the Cree Nations. Air quality would be affected by the project, despite mitigation measures. In particular, the Cree Nations were concerned about dust, both from the road and from the mining activities itself, and the effects on the surrounding environment. The proponent has indicated that because the ore is not acid generating and non-leachable, the dust generated by the project would not contaminate the environment. They have also proposed several mitigation measures aimed at controlling the dust from the road and mining activities, which can be found in section 6.2 (Cree Health). However, dust can reduce the quality of the experience of land users and more importantly, their perception of safety while out on the land, as this dust is highly noticeable.

With respect to containing potential major malfunctions of the the main water treatment plant, the proponent plans to continuously collect data from the effluent, and as soon as a value exceeds the limit set out by Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques, an alert would sound, and the water would be recirculated. In the case of a spill from a truck into the environment, the truck driver would use a spill kit and the environmental team, present onsite, would be informed immediately. All employees would be in possession of radios and capable of responding to these types of emergencies in under two hours.

Water quality was an important concern of all Cree Nations consulted. The cumulative effects of this project in conjunction with the effects of the Hydro-Quebec projects already present on the territory were raised several times. Mitigating this effect is not exclusively in the control of the proponent, but ensuring proper functioning of the main water treatment plant and communication with the Cree Nations will be key for acceptability. There is a water source (Lake 3) located on the RE01 trapline very close to the mine site that could be contaminated by dust and mining activities. The proponent is planning to install a water sampling station in Lake 3 to monitor these effects.

The presence of power lines, unpaved roads, airports and the Whabouchi mining project are already causing a variety of health concerns. The actual or perceived reduction in traditional food resources considered healthy may lead to increased reliance on non-traditional imported foods in Nations with already high diabetes incidence rates. The project could contribute to these cumulative health effects.

Land users from all Cree Nations consulted indicated that they would probably modify their land use patterns despite mitigation measures put in place, for fear of health risks. Perceived health risks could cause avoidance and changes to land use patterns, particularly on the trapline directly situated on the mine site. However, there are abundant harvesting areas on this trapline and the impact on land use caused by the fear of a health risk should be adequately managed. Strong communication mechanisms should be put in place to help manage this effect and improve the confidence of the Cree Nations.

The proponent produced an ecotoxicology study to detail the effects on traditional foods and found that overall, there would be a low risk to ingesting traditional foods. Based on the experts consulted, the Committee do not consider additional baseline and monitoring studies necessary at this stage. However, in the event that contaminant concentrations measured in the field were higher than the concentrations predicted and higher than criterion A of Quebec's Intervention Guide - Soil Protection and Contaminated Sites Rehabilitation, the proponent must inform the Cree Board of Health and Social Services of James Bay and assess the need to monitor these contaminants in traditional food.

8.3.2 Well-Being of the Cree Nations

Description of the Cree Value

This value refers to the social cohesion and quality of life that exists within a Cree community and on the land. It also refers to the socio-economic conditions of the different subgroups of a community and the interrelationship between these subgroups. The connection with culture, identity, the land and the possibility of transmitting Cree knowledge to future generations is also part of this. It also refers to the possibility to live in a safe space free of external disturbances that could affect cultural integrity and mental health (notably noise, vibrations and socioeconomic negative impacts).

Perspectives of the Cree Nations

Cree Nation of Eastmain

Female participants from the Cree Nation of Eastmain expressed concerns about employment at the mine and the potential for sexual harassment. They suggested sexual harassment workshops, delivered by Cree women if possible, to help educate mine workers, as well as a strict sexual harassment policy. It was also suggested that the proponent put in place women's groups to help combat feelings of isolation of Cree female workers in a male-dominated industry while on the mine site. Some participants mentioned that single mothers could potentially face discrimination from other community members if they choose to work at the mine and leave their children for a few weeks at a time. They also noted that salaries should be equal for men and women.

Community members of the Cree Nation of Eastmain underlined the importance of promoting the economy of the Nation while respecting the way of life of its members and ensuring that people can continue to live off the land. Some land users of trapline RE01 indicated that they would continue to transmit traditional knowledge to the younger generation at their new camp.

Cree Nation of Nemaska

Members of the Cree Nation of Nemaska were generally concerned about the proximity of the project to the community. Some members stated that they are often consulted on projects, both by proponents and by regulators, but they feel that the information they share is largely ignored. They also stated that they were concerned that the proponent would not maintain a good relationship with them once the consultation process will be over, or after the project was completed but they are still experiencing environmental effects.

They have already seen a decrease in the practice of traditional activities and were concerned about the cumulative effects of multiple projects on the territory happening at the same time but in an uncoordinated fashion. They are concerned about the long-term effects to the Cree Nation of Nemaska. They stated that an oversight committee is required to ensure that the promises made by the proponent are kept.

Several participants also raised concerns about the large number of workers from the South that would arrive on the territory. The importance of establishing a good relationship between the community and the workers was underlined. A participant suggested that the proponent put a cultural integration program in place to foster a good relationship with the mine workers. A concern was raised about the workers needing to respect the goods belonging to the members of the Cree Nation of Nemaska and about the potential for goods and equipment to be stolen from their camps or vandalized. Some participants were skeptical about the effectiveness of awareness sessions for employees. Participants also mentioned that they were concerned about the pressure on the health services of the Nation if workers from the mine used them for routine or emergency care. Another concern was raised about potential barriers that could exist to prevent women from being hired at the mine.

Cree Nation of Waskaganish

Members of the Cree Nation of Waskaganish were concerned about the effects on the Nation if the mine were to go out of business and abandoned. They were also concerned about the arrival of workers from the South (approximately 300 during construction and 200 during operations) and the lack of courtesy that could be experienced by members of the Cree Nation of Waskaganish. Some participants suggested that the proponent hold intercultural exchanges between the tallymen and the employees.

Committee consultations on the Draft Environmental Assessment Report

During the consultations on the draft report, several questions were raised regarding the relationship between Cree and non-Cree workers at the mine, as well as the multicultural integration program. A member of the Cree Nation of Nemaska argued that alcohol should be prohibited on the project site.

Key Accommodation and Mitigation Measures

- Development and implementation, in consultation with the Mine Implementation Committee, of a conflict resolution protocol in the event of problems related to the reconciliation of land and resource uses between mine workers and Cree users of the territory;
- Follow-up program to verify the effectiveness of certain mitigation measures and the predictions regarding the maintenance of the current use of land and resources for traditional purposes by the users of traplines RE01, R16 and R19. This follow-up would mainly be based on meetings with the tallymen of these traplines and their families.

Other Accommodation and Mitigation Measures

- Hold mandatory sexual harassment workshops delivered by Cree women;
- Include a clause in employee contracts concerning all forms of harassment;
- Develop a harassment policy, including a protocol for following up effectively on all harassment cases reported to the human resources;
- Establish a women's group for female Cree mine workers;
- Put in place multicultural integration programs, notably on Cree language and culture. These programs should also include information about the role of the tallyman and how to respect the trapline;
- Hire a Cree community liaison officer.

Analysis of the Joint Assessment Committee

Common concerns to all three Cree Nations included interactions with non-Cree workers from the South and worries about what the effects on the Nations would be, should the mine be abandoned. The *Mining Act of Quebec* provides financial guarantees in the case of an abandoned mining project, which mitigates the concerns of the community related to the abandonment of the mine site. The proponent stated they would put in place a conflict resolution policy between Cree Nations members and mine workers, which would include addressing cases of theft.

In response to concerns from members of the Cree Nations that they had not been adequately consulted, the proponent carried out more consultations in 2020, specifically with the affected tallymen. The environment and implementation committees would ensure follow-up on the Cree Nations' concerns if the project proceeds.

Members of the Cree Nations are also concerned aboutfeeling isolated and disconnected from their culture and community. In response to concerns about feelings of isolation and the relationship between Cree and non-Cree workers, the proponent has proposed to put in place multicultural integration programs. They would also put in place a multifunctional area to allow Cree employees to participate in various activities.

With regard to women's issues, the proponent indicated that it would not be safe to have children in daycare at the mine site, but the proponent should work to find solutions for mothers who would like to work at the mine with the 2 weeks on 2 weeks off schedule. The proponent has said that salaries would be equal between male and female workers.

The Committee notes that the work environment at the mine site, which is generally more male, could increase the risk of harassment for Cree women employed by the proponent. The proponent plans several measures related to the prevention of harassment on the mine site. The Committee believes that the proponent has adequately documented the management and prevention of sexual harassment.

The success of these mitigation measures hinges on the follow-up and communication between the proponent and the three Cree Nations. Many of the impacts would cease once the mine is no longer in operation. However, some lasting impacts could occur if social issues are brought about by the mine. Positive impacts to well-being could occur if the mine reduces unemployment rates and thus improves the quality of life of members of the three Cree Nations.

8.3.3 Economic Prosperity

Description of the Cree value

This value refers to a favourable economic situation, abundant wealth and development opportunities that have positive effects on the community as a whole and on the quality of life of its members in the longer term. Various elements can be considered in this value, including the creation of quality jobs (notably for Cree women), access to training, obtaining contracts for local businesses, investment in infrastructure or any other activity that promotes the empowerment or the capacity building of the community.

Perspectives of the Cree Nations

Cree Nation of Eastmain

Members of the Cree Nation of Eastmain were concerned about the socioeconomic impacts of the increased presence of non-Cree workers from the South. They stated that it was important that those who live off their land can continue to do so. They underlined the importance of the proponent keeping the Cree Nation of Eastmain informed about opportunities with the mine and investing in the Nation in the long-term.

Many participants also stated that they were interested in the jobs that would be created by the project. Some people mentioned that there was an increased graduation rate in the community, and increased interest in employment with such projects. One participant said that the jobs offered by the project could change the lives of a lot of people. They stated that they did not have much information on how they could prepare, and wondered whether there were any training programs in place. A suggestion to include Apatisiiwin skills development in the training program was made. Some community members see an opportunity for the proponent to encourage young women to choose non-traditional jobs in the mining sector through workshops. Some community members were concerned about the working language at the mine. They would like to ensure that there is no language barrier on the mine site.

Cree Nation of Nemaska

Members of the Cree Nation of Nemaska would like to ensure that their community would benefit economically from the project. They stated that they have seen, with regard to other projects on their territory, that the money does not necessarily go to the community. They are also concerned about the long-term impacts on the community regarding project-generated employment, beyond the relatively short-term benefits.

Many community members expressed that they would like to have the opportunity to benefit from the jobs and training offered by the project. Some stated that the jobs created would be the main positive impact of the project. They were concerned about the training and qualifications required, especially during the construction period. The distance of the community from the Waswanipi training centre was a concern, especially for young people. Some participants were worried that the proponent would not employ Cree workers throughout the life of the mine, after an initial effort to hire Crees at the beginning of the project.

Cree Nation of Waskaganish

Members of the Cree Nation of Waskaganish said that they are interested in the job, contract, and training opportunities that the proponent would provide. Certain participants stated that they often hear proponents highlight job creation during consultations, but they also should consider the effects of the project on the traditional economy of the Crees.

Committee Consultations on the Draft Environmental Assessment Report

A member of the Cree Nation of Nemaska asked if a certain percentage of the contracts and jobs generated by the mine would be reserved for Cree Nation members.

Other Accommodation and Mitigation Measures

- Adapt the work schedule of Cree workers to account for certain traditional activities;
- Hire a Cree job counselor;
- Work with the organizations “Chapeau les filles”, Women in Mining, and the Cree Women of Eeyou Istchee organization to promote jobs to women in a traditionally male-dominated industry;
- Ensure that an integration agent who knows English, French and Cree is always available;
- Provide training programs in the Nations, such as for social workers and daycare services;
- Provide support to organizations concerned with the development of training programs adapted to the needs of the mine and the members and companies of the community of Eastmain;
- Develop a communication plan to inform different local stakeholders of the human resource needs of the project (information and job preparation workshops, etc.).

Analysis of the Joint Assessment Committee

The most significant concern related to economic prosperity was that the Cree Nations would experience effects from the project without receiving a proportional number of economic benefits. Concerns about unemployment rates, especially among youth, were raised both during the Committee consultations and in the proponent's consultation report, and the project could help to alleviate these concerns.

A recurring concern was the availability of training and sustained job opportunities throughout the life of the mine. Mining jobs and training should also be accessible to women and adaptable to Cree traditional harvest schedules. There was a certain level of skepticism from some of the Cree participants in the consultations, as they have experience with natural resource extraction projects promising jobs but not upholding these promises a few years into the project.

Positive impacts would include increased employment and contracts for members of the Cree Nations. Such impacts would help to alleviate high unemployment numbers in the communities. The signing of the Pihkuutaau Agreement (redacted) is also a positive economic impact.

The mitigation measures proposed by the proponent would help to address some of the concerns and potential impacts of the projects on economic prosperity. The jobs created from the project and the Pihkuutaau Agreement (redacted) should also bring positive economic impacts to the community. The Pihkuutaau Agreement (redacted) also sets out a measure for the proponent to lend support to the training programs put in place by the Cree parties.

8.3.4 Cree Hunting, Trapping and Fishing

Description of the Cree value

This value refers to the quality of the experience on the land and the availability and access to resources in sufficient quality and quantity for Cree personal and community use. This value also refers to the Cree land users' capacity to rely on the land for food security and to adapt to the changes the project would cause to the environment. The land users' resilience must be assessed by taking into account the effects of past projects on the territory. This value is considered from two angles: 1) Cree family subsistence hunting, trapping and fishing, and 2) the seasonal goose and moose hunting, summer and ice fishing of the members of the Cree Nations.

Perspectives of the Cree Nations

Cree Nation of Eastmain

Members of the Cree Nation of Eastmain stated that the project would have effects on wildlife and cause changes to the behaviour of large mammals. Some participants in the Committee's consultation also stated that the project was likely to affect beaver and muskrat, including their population numbers, range, and the quality of their fur. A land user stated that the project would push moose and caribou to avoid the area for its

duration, although they were likely to return in the future. Additional habitat is available for moose near the site where the RE01 camp would be relocated.

Some land users indicated that they were concerned about the ability of the tallymen to continue to monitor the resources of the traplines, particularly fish and large game, because of the influx of workers on the territory. However, another land user believed the project would not have a significant effect on the way they use their territory for hunting and trapping. They plan to bring the youth in the family to the new camp on trapline RE01 to teach them about land use and traditional activities.

One land user was concerned about how the area around the project would no longer be accessible for beaver trapping. The proponent offered to the tallymen to trap all the beavers around the mine prior to construction, and the tallyman raised a concerned about the amount of time that will be allocated for him to trap out the area.

A land user stated that they would no longer fish in the lakes around the mine due to health risks, as they doubt the proponent's ability to effectively manage the water quality. They stated that they already had issues with regards to fish and fish habitat because of the hydro projects in the region, and the mine would worsen these issues.

Cree Nation of Nemaska

Members from the Cree Nation of Nemaska stated that they were concerned about impacts to hunting, fishing and trapping on traplines R16 and R19. They also stated that the road traffic would affect the abundance of game, including partridge, hare, and ptarmigan. A land user indicated that they hunt near the Nemiscau-Eastmain-1 road as well as in the zone around the project, and that increased traffic and hunting restrictions around the mine site would affect their activities. More generally, the land user was concerned that the mine's activities would lead to a decrease in abundance of the species they hunt regularly, and how this in turn would affect the activities of future generations.

With regards to changes to abundance and behaviour caused by mining activities more generally, the species of concern included bear, moose caribou, muskrat, beaver, goose, lynx, ptarmigan, partridge, and fish. They have already noticed a decrease in abundance and behaviour of moose and hare following other natural resource extraction projects and noted that caribou are rarely or never seen on their territory anymore.

The members of the Nation have stated that they were concerned about the effects of the project on moose break and goose break activities, in particular due to blasting and increased traffic. Concerns regarding impacts to fishing include the massive arrival on the territory of workers from the South who would fish in the waterbodies around the mine, and the pressure this would put on fish resources. They were also concerned about their ability to continue to fish in the same way that they currently do following the construction of the mine.

Cree Nation of Waskaganish

Land users from the Cree Nation of Waskaganish were concerned about the effects of the project on fishing, hunting and trapping practices on the R10 trapline. Some land users said that they would tell their children not to practise these activities on the portion of the trapline near the project. They also stated that the arrival

of workers from the South could lead to moose being hunted on Cree traplines without the tallymen being informed. This could both put pressure on resources and cause a security risk for land users. Some community members were more generally concerned about how the project would change the way the land is used and affect their rights under section 24 of the JBNQ Agreement. They stated that the noise from the project could cause changes to the migratory patterns of geese.

With regards to beaver, some participants stated that they were concerned about the effects of the project on beaver trapping and beaver meat quality. Increased road traffic could cause land users to avoid trapping along the roads, which is typically done to avoid flooding, due to safety concerns. Concerns related to fishing included the effects of changes to flow rates on fish spawning grounds. One land user also stated that the vibrations related to the project may have effects on the fish in the waterbodies of the R10 trapline. Finally, some participants were concerned about the effects of the mining effluent on fish and fish habitat.

Committee Consultations on the Draft Environmental Assessment Report

During consultations on the draft report, several Cree Nation members raised concerns about the application of measures related to the hunting and fishing practiced by non-Cree workers. It was suggested by a member of the Cree Nation of Eastmain that the proponent hold annual meetings with land users to hear their comments on how the project affects their harvesting practices. One participant also reiterated the importance of beaver to the land users who practice trapping around the project site.

Several participants expressed concern about the one-kilometre exclusion zone for traditional activities around the project site. One participant asked what the consequences would be if a Cree land user hunted or trapped in this zone. Another participant recalled the hunting, trapping and fishing rights granted to the Crees under Section 24 of the JBNQA.

With regard to fishing, one participant in the consultations reaffirmed the importance of fish, and asked that the proponent involve Cree Nation members in the development of the compensation plan for the fish habitat. A concern was shared by a member of the Cree Nation of Waskaganish about cumulative effects on fish and fish habitat, especially considering other mine projects in the area.

Proposed Accommodation and Mitigation Measures

- Inclusion of a clause in the employment contracts of employees, including subcontractors, concerning the prohibition of hunting, trapping and fishing activities on the mine site, in the workers' camp or on the outskirts of the sector. Prohibition for employees to have in their possession firearms, hunting, trapping or fishing equipment. Imposition of disciplinary measures on employees in the event of failure to comply with this prohibition in their employment contracts, unless such activities are specifically organized by the proponent in appropriate locations, such as Cree outfitters;
- Implementation, in consultation with tallyman RE01, of a beaver management plan covering the area within the security perimeter established by the proponent. Completion of an inventory, in collaboration with the tallyman of trapline RE01, to identify the zones to be favoured for intensive beaver trapping prior to construction work. Reservation of a period including at least one winter (November to March) during

which intensive trapping would take place, prior to construction work. The Committee also recommends that the proponent make all the necessary equipment for intensive trapping available to the tallyman;

- Development of an action plan in the event of the presence of caribou near the mine, including, if necessary, an adjustment of the transportation schedule and a temporary interruption of certain mining activities in the event of a high risk to caribou;
- Develop and implement a compensation plan, at the satisfaction of Fisheries and Oceans Canada and in collaboration with Cree Nations, to offset the loss of habitat and fish mortality associated with the project;
- Change the frequency of blasting activities and the frequency of truck convoys transporting ore concentrate during the annual goose, spring and moose hunting seasons in the fall. Authorization of a maximum of one blasting and 100 heavy truck passes per week during these two annual hunting periods, over a period of fourteen consecutive days each time. Identification of favourable times for these modifications to the proponent's activities in consultation with the Cree Nation of Eastmain;
- Offer consultation and information meetings with the tallymen of the Cree Nation of Waswanipi periodically during the operation phase of the project;
- The proponent should monitor the effectiveness of reductions in the frequency of blasting and heavy trucking activities on maintaining the goose and moose harvests of the users of traplines RE01, R16 and R19, by documenting goose and moose harvests and the assessment of the state of these resources.

Other Accommodation and Mitigation Measures

- Put in place multicultural integration programs, notably on Cree language and culture. These programs should also include information about the role of the tallyman and how to respect the trapline.

Analysis of the Joint Assessment Committee

Effects to the hunting and trapping practices of Cree land users are likely to occur in the project mining area. These would include changes to the behaviour and abundance of species valued by land users, and disruptions to moose and goose break activities caused by road traffic and blasting. The increased road traffic could disrupt activities along the roads, both with regards to safety and wildlife abundance near roads. The arrival of a large number of workers on the territory could put pressure on wildlife resources. However, this should be limited by the hunting and trapping prohibition for employees and their work schedules.

All three Cree Nations have indicated that the project is likely to change or limit their fishing activities to varying degrees. Although waterbodies used for fishing are abundant, and those directly affected by the project are not frequently used by the land users, the fear of contamination may disrupt fishing practices throughout the study area.

The project would cause some effects to the hunting and trapping practices of Eastmain community members. However, the land users of RE01 believe that the mitigation measures, including moving the camp, would help mitigate the effects of the project on harvesting practices.

Land users indicated that it is unlikely that they would continue to fish in the waterbodies affected by the project, despite mitigation measures. The proponent would give the Cree Nation of Eastmain the fish harvested from one of the two lakes that would be drained, but this is not equivalent to a sustained resource. The waterbodies in the area are already perceived to be contaminated by the Reservoir of the Eastmain-1 hydroelectric development, so the project would contribute to land users' additional risk aversion with respect to fishing. This could result in impacts not only for this generation, but also for future generations if there is a loss of accessibility and transmission of traditional knowledge.

In addition to the issues mentioned above, the Cree Nation of Nemaska is facing multiple industrialization projects on its territory. The addition of another major resource extraction project very closeby could further contribute to the decreased sense of well-being on the land and interruptions to the transmission of traditional knowledge, if community members are no longer able to practise hunting, trapping and fishing activities in the same way in the project area and the watercourses affected. There were also concerns about caribou. Due to forest fires and a higher rate of industrialization, caribou are rare in the area around the project.

Members of the Cree Nation of Waskaganish were particularly concerned about the effects to fish resources that would occur because of the project. Changes to flow rates caused by the project were raised. This could cause changes to the way land users access fish resources. According to Transport Canada, 28 water bodies and watercourses would experience modifications to their flow rate, which would bring about changes to fish habitat. Concern about mine workers putting pressure on resources would be mitigated by the ban on hunting and fishing for mine employees.

Lake 3 was indicated as a fishing area for land users, and the combination of changes to water levels and fear of contamination are likely to lead land users of the RE01 to avoid this fishing area. Furthermore, although effects on fish would be expected, including mortality, and that fish habitats would be destroyed, the proponent would be required to compensate the habitat lost. The proponent proposed several mitigation measures that would alleviate the risk to land users and their practices. The Committee supports the advice of expert ministries that the mitigation measures are satisfactory to limit the effects to fish and fish habitat.

Although some community members raised concerns about effects of the project on small game, according to the experts from the Cree Nation Government and Quebec’s Ministère de la Forêt, de la faune et des parcs, the project should not cause major disturbances to small game harvesting practices.

8.3.5 Plants and Berry Picking

Description of the Cree value

This value refers to the quality of the experience on the territory and access to resources in sufficient quantity and quality by members of Cree Nations during their medicinal plants and berry picking activities.

Perspectives of the Cree Nations

Cree Nation of Eastmain

Members from the Cree Nation of Eastmain stated that they were concerned about the potential contamination of traditional food caused by the project, including plants and berries. They emphasized the importance of ensuring that those who live off their land can continue to do so.

Cree Nation of Nemaska

Several participants from the Cree Nation of Nemaska stated that they were concerned about the impacts to those harvesting along the road, and particularly about the rocks and dust thrown by the trucks. They also mentioned that community members harvest berries along the road. They stated that they were concerned about being able to continue berry picking activities and about the contamination of these. They were concerned about how the project would contribute to the cumulative effects of industrialization on berry picking.

Cree Nation of Waskaganish

Members from the Cree Nation of Waskaganish stated that they would like to be informed of all environmental monitoring so that they remain aware of any changes that occur in the environment (including plants and berry picking). They also stated that revegetation should be done using species (coniferous species) that were already present before the mine was in operation. A land user who practises picking on the R10 trapline stated that they were concerned about the portion of the land near to the mine being contaminated, and that they and their children would no longer be able to harvest there.

Key Accommodation and Mitigation Measures

- Validation of the assumptions and concentrations of chemical contaminants in air, water and soil predicted and used as inputs in the proponent's traditional food contamination risk assessment to ensure the effectiveness of the mitigation measures in place and to confirm the absence of risk. In the event that contaminant concentrations measured in the field were higher than the concentrations predicted as inputs and higher than criterion A of Quebec's Intervention Guide - Soil Protection and Contaminated Sites Rehabilitation, the proponent must inform the Cree Board of Health and Social Services of James Bay and assess the need to monitor these contaminants in traditional food. Where applicable, the proponent will have to determine, in collaboration with the Cree Nations, which traditional foods should be monitored. The Follow-up Committee responsible for interpreting the results obtained will have to be formed or accompanied by a professional in human health risk assessment. The Cree Board of Health and Social Services of James Bay could offer support in this regard and will have to be consulted;
- Offer to consult with the tallyman RE01 on the mine recovery plan before submitting it for authorization to the Quebec Ministry of Energy and Natural Resources. Offered to the members of the Cree Nation of Eastmain as well as the R10 tallymen of Waskaganish, as well as R16 and R19 of Nemaska to present the final mine recovery plan following its approval by the Quebec Department of Energy and Natural Resources to inform them of the scenario selected and the residual modifications to the territory;

- Gradual revegetation of the waste rock piles as soon as possible, using a diversity of plant species present prior to construction, particularly conifers.

Analysis of the Joint Assessment Committee

Effects to plants and berry picking intersect both with road safety and health concerns, as well as concerns about the continuity of land use. Although this value was not one of the top concerns for Cree Nations consulted, it should be considered in the larger context of the related values. The mitigation measures would help to avoid impacts of the project on plants and berry picking. The concerns of the three Nations were similar. All three were preoccupied about alterations to their land use and potential contamination of plant resources. The project would alter the way land users practise traditional activities. Increased traffic would make it more dangerous to harvest along the roads, and dust would lead to avoidance of certain areas for harvesting. This could lead to changes in the way future generations harvest as well, especially if certain areas are abandoned as harvest sites. However, despite some unavoidable residual effects, the proponent has several mitigation measures aimed at limiting these impacts.

8.3.6 Cultural and Physical Heritage

Description of the Cree value

This value refers to the access to culturally important places, landscapes, objects or archeological sites that are profoundly related to the relationship that a Cree community has to the spirituality, traditions, customs or history.

Perspectives of the Cree Nations

Cree Nation of Eastmain

A member of the Cree Nation of Eastmain stated that the proponent and the Cree should hold a ceremony before the start of construction activities to show respect for Mother Earth. They expressed that it is part of the ancestral ways, rites of passage of the Cree and the connection to the spirit world. They also stated that they would like to share their expertise and traditional ecological knowledge with the proponent.

Cree Nation of Nemaska

Participants from the Cree Nation of Nemaska stated that they were preoccupied by potential impacts on archaeological sites that may be disturbed during the development of the project. They also stated that they were concerned about the visual impact of the accumulation areas (overburden, waste rock and dry tailings accumulation areas and ore stockpile) at the end of the project's life, and the permanent alteration to the landscape.

Cree Nation of Waskaganish

Participants from the Cree Nation of Waskaganish stated that they wanted to ensure that traditional knowledge was considered in environmental monitoring and in particular during the evaluation of the effects on caribou.

Key Accommodation and Mitigation Measures

- Prior to the start of work, carry out an exhaustive inventory in areas with archaeological potential and submit the inventory report to the Agency;
- Prior to the start of construction work, hire a qualified person to provide training to workers on the identification of archaeological or cultural remains;
- Immediately stop work at the site of the discovery;
- Delimit an area of at least 30 metres around the discovery in which work is prohibited. The work ban does not apply to actions necessary to protect the integrity of the discovery;
- Notify, in a timely manner, the trapping tallyman of trapline RE01, as well as any other intervener identified for this purpose by the Cree Nation Government, of the undertaking of any work of an archaeological nature;
- Inform the following stakeholders as soon as possible following a discovery:
  - The tallyman of the RE01 plot;
  - The Cree Nation Government;
  - The band councils of the Cree Nations of Eastmain, Waskaganish and Nemaska;
  - The Aanischaaukamikw Cree Cultural Institute;
  - The Quebec's Ministère de la Culture et des Communications.
- Offer to the trapper of trapline RE01, as well as any other intervener identified for this purpose by the Cree Nation Government, to supervise work of an archaeological nature such as inventories or digs;
- Have the site of the discovery evaluated by a qualified person according to the requirements of the Quebec *Cultural Heritage Act*;
- Comply with all legislative or legal requirements that apply to archaeological discoveries;
- Comply, after consultation with the Cree Nations and the competent authorities, with all legislative or legal obligations relating to the discovery, recording, transfer and safeguarding of structures, sites or things of historical, archaeological, paleontological or architectural significance.

Analysis of the Joint Assessment Committee

The Cree Nations expressed concerns about whether the land, important cultural sites, and their traditional knowledge would be protected. Participants were concerned about archaeological sites and they suggested carrying out cultural activities before disturbing the site.

The proponent has proposed several mitigation measures related to archaeological sites and the visual aspect of the project, such as detailing how the revegetation would be carried out, which would help to respond to concerns about permanent alteration to the landscape. They also commissioned a study on the archaeological potential of the study area. The report recommended a comprehensive study of the sites with archaeological potential that would be impacted by mining infrastructures. Proper communication with the Cree Nations and other relevant stakeholders, as detailed in the mitigation measures, would help to avoid these effects. The proponent has also agreed to have Cree participation in environmental monitoring. This would help respond to concerns about traditional knowledge being taken into account as well as protected.

8.3.7 Waterbodies, Wetlands and Vegetation

Description of the Cree value

This value refers to the ecological value and services provided by the water bodies, wetlands and vegetation to maintain habitats of quality for species of interest, especially fish, beaver, geese, partridge, bears, caribou, muskrat and moose. It also refers to the acknowledgment of the diverse uses of water bodies and wetland components for cultural purposes (i.e., navigable waterways, places to store food during winter, etc.).

Perspectives of the Cree Nations

Cree Nation of Eastmain

Members of the Cree Nation of Eastmain stated that there was a lack of information about how potential waterbody contamination could affect the surrounding environment and habitats. They stated that the project was likely to affect fish and fish habitat, which could trigger a chain reaction in the food web that would affect other species. A land user stated that all the waterways around the project should be considered navigable waterways.

Cree Nation of Nemaska

Members of the Cree Nation of Nemaska stated that the project would cause contamination to aquatic habitats on their traditional territory, and were concerned about the effects of the project on fish. Some participants questioned why the final effluent water from the main water treatment plant would be directed towards the Pontax river watershed, instead of flowing into the reservoir of the Eastmain-1 hydroelectric development. Participants also expressed concerns that draining two lakes would cause disruptions to the water levels throughout the watershed. Community members also stated that in recent decades, they had seen a decrease in caribou, moose, beaver and muskrat presence and habitat, and they were concerned that the decrease in available habitat for these species would further impact the presence of these animals. With regards to wetland compensation, some community members expressed doubts that moose would utilize newly created habitat.

Finally, community members expressed concerns that the cumulative effects of past, current and future industrialization on the territory would impact habitats and vegetation and their ability to harvest fish, moose, beaver and berries. These cumulative impacts could affect the transmission of Cree knowledge as well as the sharing of skills and traditional foods and goods if there are significant changes to the Cree land use.

Cree Nation of Waskaganish

Given the proximity of the final effluent to Cree Nation of Waskaganish traditional territory, water was a central concern for members of this Nation. Some participants requested more information on the consequences of a spill and the impact to the Rupert and Pontax watersheds and to aquatic habitats. They stated that the proponent may not have correctly considered climate change when predicting the effects of the project on the watershed. A land user stated that the project may increase turbidity in the lakes of the R10 trapline, which may in turn affect spawning areas. They also questioned the effects of changes to turbidity on ice quality. They were concerned that the ice may no longer be suitable for snowmobiling. Pre-construction and post-construction ice studies were suggested to identify the effects of the project on ice quality, under various weather conditions.

A land user stated that they were concerned about the effects of the project on fish and aquatic fauna in the southwest portion of the R10 trapline and their ability to continue to harvest these species if their habitat is contaminated. Finally, a land user stated that revegetation should be done with coniferous species and species of plants that were present before the construction of the mine, and not just willows.

Key Accommodation and Mitigation Measures

- Monitoring to more accurately assess the effects of changes to watercourses on the various types of wetlands in order to document, in particular, the effects of the project on plant communities and the maintenance of ecological functions;
- Development and implementation of a compensation plan, in collaboration with Environment and Climate Change Canada, to offset the loss of wetlands associated with the project;
- Monitoring of water levels and flows in water bodies and watercourses undergoing a hydrological change of more than 10 percent;
- Monitoring water quality of effluent from the treatment plant and exposed water bodies and watercourses;
- Develop and implement a compensation plan, in collaboration with Fisheries and Oceans Canada, to offset the loss of habitat and fish mortality associated with the project;
- Use of scaring methods to keep birds away from the pond;
- Implementation of a pond monitoring program to prevent and minimize the negative effects of the project on migratory birds that would use the entire pond;
- Revegetation of the entire surface area of mining infrastructure in the closure phase, with the exception of the pit, with consultation with the tallyman or tallymen concerned for the selection of preferred species.

Analysis of the Joint Assessment Committee

Habitat loss would be the primary impact on vegetation and wetlands caused by the project. Approximately 427.38 ha of terrestrial vegetation, 42.3 ha of fish habitat and 173.55 ha of wetlands would be destroyed. The proponent's conclusion that impacts to wetlands would be low is partly based on the wetland compensation program that would be put in place. However, currently, the proponent plans on compensating only 42.1 ha of wetlands.

The proponent has chosen the option of directing the final mining effluent to the Pontax watershed instead of the Eastmain-1 reservoir because if they do not send the effluent into Watercourse A that leads to the Pontax river watershed, the watercourse would dry up, and this would cause impacts to water levels. Considering the final mining effluent would comply with Directive 019 and Metal Mining and Diamond Mining Effluent Regulations (MMER), this is an acceptable option according to the Committee, particularly because the Cree Nations expressed concerns about water levels. The proponent would install a spillway at the end of the life of the mine which would allow water from the pit to flow into Watercourse A, thus reducing the impact to this watercourse in the interim (before the pit fills naturally, which is estimated to take 24 years). However, this could increase risk in the event of a spill, and close monitoring of the contaminant levels in the effluent would be required. The monitoring of hydrological conditions, including flow rates and water levels, would be carried out in all phases of the project. The proponent would also build a plant and a recirculation pond to deal with the mining waters. The water used in mining operations would be treated and continuously tested prior to being rejected into the environment. If it does not meet the standards set out in Directive 019 and the MMER, it would be returned to the recirculation pond and not sent into the final mining effluent (Watercourse A). These measures would help to address concerns related to water levels for navigation and habitat for aquatic fauna species. The results of the studies done by the proponent would be communicated to the communities throughout the life of the mine, mainly through the Environment Committee, which would be responsible for communicating the results of the studies to the tallymen and Band Councils.

Some land users expressed concerns about changes to turbidity and flow of the waterbodies affected by the project. It should be noted that no impacts to turbidity are anticipated in waterbodies on Waskaganish territory, whose members raised concerns about ice quality. According to Transport Canada, the project would cause 28 currently considered navigable waterbodies by the Cree, many of them on an occasional basis, to no longer be navigable during the life of the project[56]. All the navigable waterways around the mine should be considered used, based on information provided by a land user of the Cree Nation of Eastmain.

The Cree Nation of Eastmain may experience impacts to their ability to harvest beaver around the mine site and fish certain species due to a reduction in distribution and population numbers caused by wetland and aquatic habitat destruction of Lakes 2 and 3. The two lakes being drained (Lakes 1 and 2) are located on trapline RE01 of the Cree Nation of Eastmain. Lake 2 is used for fishing, and Lake 3, which would be affected

[56] According to the proponent, Lakes 1 and 2 as well as Watercourse B would be part of the pit once the mine is restored. The pit would be potentially navigable after a few years and completely filled and navigable after 22 years. With respect to lakes 8, 11, 12, 13, 15, 18 and 19, the proponent estimates that current navigation conditions would be restored within approximately 5 years following the closure of the mine.

by the project, is used for collecting water. The draining of Lake 2, and the proximity of the project to Lake 3, could affect how land users interact with the watershed, although the proponent indicated that there should not be a significant impact given the low abundance of fish in Lake 2. This impact would be limited by the abundance of other fishing areas on the trapline. The proponent also indicated that there used to be beaver trapping in Lake 2, but this is no longer the case. To offset the loss of fish harvesting capacity caused by the draining of Lakes 1 and 2, the proponent would fish out Lake 1 for a maximum period of 10 days and offer the fish to the Cree Nation of Eastmain. Lake 2 would not be fished out due to the relatively low abundance measured during the proponent's inventories. It should also be noted that the proponent would put in place a ban on harvesting activities in a one-kilometre radius of the mine, and Lakes 1, 2 and 3 all fall within this boundary.

The land users of the Cree Nation of Nemaska were concerned about beaver, muskrat and moose habitat destruction. The proponent mentioned that none of these species should be significantly impacted, either because they are already scarce or because the accommodation and mitigation measures would help to avoid significant impacts. The level of success of these measures would depend on the level of collaboration between the proponent and the community.

No wetlands are scheduled to be destroyed directly on the territory of the Cree Nation of Waskaganish. However, given several factors (climate change, cumulative effects, and potential contamination), the behaviour, population numbers, range and distribution of species may be affected if their habitat is disturbed elsewhere, causing reduced abundance on Waskaganish territory. Significant impacts are not anticipated.

Due to the nature of the project and the location of the deposit, some destruction of wetlands and alterations to the watershed would be unavoidable. Land users would therefore experience the effects of habitat loss and alterations to aquatic habitats to some degree. The Committee considers that the mitigation measures put forward by the proponent would help minimize these effects.

The proponent accounted for potential caribou habitat disturbances during the planning phase, and modified the project design accordingly, such as shortening the life of the project to only mine in areas that were significantly disturbed, limiting the footprint of the project site, and planning to recreate quality caribou habitat during restoration.

Beavers present in the project area would be trapped out prior to construction. Because of this, they state that any changes to water quality, water levels or flow rates would not affect beavers. The proponent has indicated that they would allocate the beaver trapping contract to the tallyman of trapline RE01. It is expected that the proponent would continue dealing with the control of beaver to protect infrastructures routinely, and the involvement of the tallymen should be included in this planning.

8.3.8 Road Safety

Description of the Cree value

This value refers to the possibility of travelling on roads free of road traffic. Access from the road to the various hunting camps is also taken into account. It also includes the road users feeling of safety and the risk of road accidents and potential spills that could occur in the environment.

Perspectives of the Cree Nations

Cree Nation of Eastmain

Some community members of the Cree Nation of Eastmain were generally concerned about the impacts of a larger volume of traffic. Five potential projects are proposed in the area, causing concerns about the cumulative impacts to road safety.

From a wildlife safety perspective, one land user indicated that they did not have any particular concerns about increased traffic since there are only a few periods where the Nemiscau-Eastmain-1 road and the Route du Nord have noticeable amounts of traffic, such as during moose break. They recommended that trucks travel exclusively during the day to avoid collisions.

Cree Nation of Nemaska

Many participants from the Cree Nation of Nemaska were concerned about the impacts of noise and vibrations from road traffic on traditional activities. They stated that the Nemiscau-Eastmain-1 road is not designed for this volume of truck traffic. There are five camps and nine families on either side of the Nemiscau-Eastmain-1 road who could potentially be impacted by an increased traffic. The security of children around these camps was a concern, if mine workers and contractors do not respect speed limits. Some members were concerned that the increased traffic would affect hunters and trappers during moose and goose hunting periods. They stated that dust and rocks from mining trucks are thrown against other vehicles which can cause a safety issue. Multiple community members stated that the best solution to these issues would be to pave the Nemiscau-Eastmain-1 road. They also suggested that the proponent reduce or stop truck traffic during the busiest hunting periods (moose break and goose break).

With regards to impacts on wildlife safety, some land users stated that the increased traffic would likely generate impacts to fauna such as ptarmigan, partridge, and caribou.

Cree Nation of Waskaganish

Land users from the Cree Nation of Waskaganish stated that trappers will regularly trap beaver along the roads to avoid flooding caused by the beaver dams. Increased traffic could impact roadside beaver trapping, both with respect to the safety of the trappers and the presence of beavers.

Cree Nation of Waswanipi

Land users from the Cree Nation of Waswanipi stated that signs near their camps would be helpful because in certain areas, some camps are hidden behind trees. They indicated that some trappers are permanently at their camps or present for most of the year. Most camps are located near the highway, for logistical reasons. In spring and fall, especially around moose and goose break, they often have families with children, and this could lead to a dangerous situation with the increased truck traffic on the Billy-Diamond Highway. A participant to the Committee consultations suggested that trucks should go 80 km/h or less during moose and goose breaks. Land users were also concerned about damage to their cars, since they often have no choice but to park on the shoulder of the Billy-Diamond Highway, and the trucks could potentially damage

their cars. Another participant mentioned that their primary concern related to wildlife was for large animals, and that small animals were usually able to get out of the way relatively quickly.

Committee consultations on the Draft Environmental Assessment Report

Members of the four Cree Nations raised concerns about the safety of land users in relation to the increased traffic generated by the project. Several questions were asked about the frequency of passages, tonnage, transport schedules, and the size of the trucks. Several participants were also concerned about the project's contribution to the cumulative effects of road transport.

Key Accommodation and Mitigation Measures

- Distribution of heavy truck passages over the whole day and week;
- Limitation of the number of truck passages in the evening and at night;
- Authorization of a maximum of 100 heavy truck passages per week during these two annual hunting periods, over a period of 14 consecutive days each time;
- The proponent should monitor the effectiveness of reductions in the frequency of blasting and heavy truck transport activities on maintaining the goose and moose harvests of users of traplines RE01, R16 and R19;
- Offers consultation and information meetings with the tallymen of the Cree Nation of Waswanipi periodically during the operation phase of the project;
- Limits vehicle speed to 25 kilometres per hour at the mine site during the construction phase to reduce noise, dust and vibration emissions;
- Regular sensitization of workers and drivers to the need to respect road safety rules, under penalty of expulsion;
- Setting up a system for receiving and resolving noise-related complaints, in order to confirm that the acoustic environment does not cause any effect on users of the territory.

Analysis of the Joint Assessment Committee

Road safety would be an issue throughout the life of the mine that could directly impact the experience and well-being of land users, despite the mitigation measures put in place. Impacts to wildlife safety include avoidance of the roads due to increased traffic and direct mortality from collisions. Increased traffic would also cause an issue for those who hunt opportunistically, trap and harvest berries along the roads. These impacts would in turn generate impacts to the traditional harvesting rights of Cree communities, immediately and into the future. In response to the suggestion that trucks circulate only during the day, the proponent agreed to increase traffic during the day and decrease traffic at night.

The proponent proposed mitigation measures, but some impacts would remain. The volume of transportation is necessary to operations. The proponent has limited control over road safety. It is not in their power to pave the Nemiscau-Eastmain-1 road, for example, as these roads are controlled by the Société de développement de la Baie James (SDBJ). Nevertheless, good communication mechanisms to report land users' concerns

should alleviate this effect. The proponent would be in contact with land users via the Implementation and Environment Committees on topics pertaining to road safety.

Following the Committee's consultations on the Draft Environmental Assessment Report, the Committee made several changes to the report and key mitigation measures to address the concerns expressed.

The Cree Nation and Quebec Governments signed an agreement (La Grande Alliance) which, among other things, is a plan to extend the transport network, including rail, road, port, and airport. The extension of the rail network should contribute to reducing effects caused by road traffic, as the proponent could eventually ship their ore by rail instead of trucks to Matagami. However, the rail extension project is unlikely to be completed by the time operations would have commenced for the project, therefore the impact La Grande Alliance will have on reducing concerns related to road traffic is uncertain in the short and medium term.

Conclusions of the Joint Assessment Committee

The Committee considered the concerns and input of the Cree Nations regarding the impacts of the project on Cree rights, including the proponent's proposed accommodation and mitigation measures. The Committee considers that only the beneficiaries of the rights can judge the degree of detrimental impact of the project on the rights. The Committee focused its assessment on Cree values to ensure that the specific rights and needs of those directly or indirectly affected are taken into account and that mitigation or compensation measures are sufficient to minimize the negative impacts and maximize the positive impacts of the project on each of the Cree values and rights.

The Committee concludes that the accommodation and mitigation measure put in place by the proponent and the additional ones recommended by the Committee are satisfactory to cope with the impacts on Cree values.

8.4 Issues to be Addressed during the Regulatory Approval Stage

Certain issues raised during the consultations that may have an impact on Cree values and rights will only be addressed in the case that the Minister approves the project, during the regulatory approval stage.

The regulatory approvals phase, during which federal authorizations or permits are considered, would take place once the environmental assessment has been completed. Should the project be authorized under CEAA 2012, Fisheries and Oceans Canada would continue to consult with the Cree Nation of Eastmain and the Cree Nation Government in the pursuit of regulatory processes under the *Fisheries Act*, particularly with respect to the fish habitat compensation plan.

In addition, Transport Canada confirmed that the 28 navigable waterbodies potentially affected by the project are subject to the *Canada Navigable Waters Act* (CNWA). The proponent will be required to apply for exemptions under section 24 of the CNWA in order to carry out works that would significantly lower water levels to the point where navigation on these waterways will be impracticable. The proponent will also be

required to apply for authorization to construct works below, above or across the waterways. Transport Canada would continue to consult with the Cree Nation of Eastmain in the pursuit of these regulatory processes under the CNWA.

The Committee forwarded the Cree Nation comments it received during the environmental assessment to Fisheries and Oceans Canada and Transport Canada so that these departments could review them before making their decisions under the legislation they apply. Where applicable, the decisions of Fisheries and Oceans Canada and Transport Canada would take into account the results of the Committee consultations with the Cree Nations as well as the record of consultations resulting from the environmental assessment.

9. Conclusions and Joint Assessment Committee Recommendations

In preparing this Report, the Committee took into account the proponent's environmental impact statement, the proponent's responses to the Committee's information requests, the advice of government experts (federal, provincial and Cree) and the comments made by Cree Nations and the public.

The environmental effects of the project and their significance as well as the potential for cumulative environmental effects have been determined using assessment methods and analytical tools that reflect currently accepted practices in the field of environmental assessment.

The Committee concludes that, taking into account the implementation of mitigation measures, the project is not likely to cause significant adverse environmental effects as defined in the *Canadian Environmental Assessment Act, 2012*.

The Committee has identified key mitigation measures and the requirements of a follow-up program that will be presented to the Minister of Environment and Climate Change during the decision-making process relative to the significance of potential adverse environmental effects of the project. Should the Minister determine that the project is likely to cause significant adverse effects, the Minister will refer the matter to the Governor in Council as to whether the effects are justified in the circumstances. If the Governor in Council decides that these effects are justified in the circumstances, the Minister will outline the conditions for carrying out the project in his Decision Statement under the *Canadian Environmental Assessment Act, 2012*. Conditions issued by the Minister would be legally binding on the proponent.

The Committee expects for all of the proponent's commitments[57] to be implemented in order for the project to be carried out in a careful and precautionary manner.

[57] The proponent's commitments are outlined in document number 35, entitled "List of the proponent's current and specific mitigation measures". This document is available on the Canadian Impact Assessment Registry website under reference number 80005.

References

Canadian Environmental Assessment Agency (the Agency), March 2015a. Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing. Available online at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing.html

Canadian Environmental Assessment Agency (the Agency), March 2015b. Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012. Available online at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-under-canadian-environmental-assessment-act-2012.html

Canadian Environmental Assessment Agency (the Agency), November 2015. Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under CEAA 2012. Available online at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/determining-whether-designated-project-is-likely-cause-significant-adverse-environmental-effects-under-ceaa-2012.html

Chan L., Batal B., Receveur O., Sadik T. Schwartz H., Ing A., Fediuk K., Tikhonov C. and Lindhorst K., 2016. *Étude sur l'alimentation, la nutrition et l'environnement chez les Premières Nations : Résultats de Québec 2016*. Ottawa : University of Ottawa. Available online at: http://www.fnfnes.ca/docs/QC_French_Aug6.pdf, visited on January 22, 2020.

Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST), 2020. Silice cristalline : danger de l'exposition aux poussières de silice. Available online at: www.csst.qc.ca/prevention/tolerance-zero/Pages/silice-cristalline.aspx

Environment Canada, 1996. *The Federal Policy on Wetland Conservation: Implementation Guide for Federal Land Managers*. 33 pages.

Environment Canada, 2012. Woodland Caribou, Boreal population (*Rangifer tarandus caribou*): recovery strategy. Recovery Strategy Series under the Species at Risk Act, Environment Canada, Ottawa. xii + 152 p.

Environment Canada. 2016. Recovery Strategy for the Wolverine (Gulo gulo), Eastern population, in Canada. Recovery Strategy Series under the Species at Risk Act, Environment Canada, Ottawa. viii + 27 p. Available online at: www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_wolverine_eastern_population_e_final.pdf

Environment and Climate Change Canada (ECCC), 2017. Woodland caribou (*Rangifer tarandus caribou*): recovery strategy progress report 2012 to 2017. Recovery Strategy Series under the Species at Risk Act, Environment and Climate Change Canada, Ottawa. ix + 108 p.

Environment and Climate Change Canada (ECCC), 2018. Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (Perimyotis

subflavus) in Canada. Available online at: https://faune-especes.canada.ca/registre-especes-peril/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-eng.pdf

Environment and Climate Change Canada, 2020. Woodland Caribou, Boreal population (Rangifer tarandus caribou): amended recovery strategy. Recovery Strategy Series under the Species at Risk Act, Environment and Climate Change Canada, Ottawa. xiv + 155 pp.

Environment and Climate Change Canada (ECCC), April 2020a. Canadian Environmental Sustainability Indicators: Greenhouse Gas Emissions. Available online at: https://www.canada.ca/content/dam/eccc/documents/pdf/cesindicators/ghg-emissions/2020/greenhouse-gas-emissions-en.pdf

Environment and Climate Change Canada (ECCC), April 2020b. Greenhouse Gas Reporting Program (GHGRP) – Facility Greenhouse Gas (GHG) Data. Dataset PDGES-GHGRP-GHGEmissionsGES-2004-Present.xlsx. Available online at: https://open.canada.ca/data/en/dataset/a8ba14b7-7f23-462a-bdbb-83b0ef629823

Environment and Climate Change Canada (ECCC), July 2020. Strategic Assessment of Climate Change Revised. Available online at: https://www.canada.ca/en/services/environment/conservation/assessments/strategic-assessments/climate-change.html

Government of Canada, 2020. Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples. Available online at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-assessment-potential-impacts-rights-indigenous-peoples.html

Institut national de la santé publique du Québec, 2015. *L'alimentation des Premières Nations et des Inuits au Québec*. [Online] https://www.inspq.qc.ca/publications/2054, visited on January 22, 2021

Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP), 2008. *Guide d'élaboration d'un plan de conservation des milieux humides*. 68 pages.

Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDELCC), 2015. *Guide de caractérisation physicochimique de l'état initial des sols avant l'implantation d'un projet industriel*. 26 pages.

Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC), 2015. *Lignes directrices relativement aux niveaux sonores provenant d'un chantier de construction industriel*. Available online at: www.environnement.gouv.qc.ca/publications/note-instructions/98-01/lignes-directrices-construction.pdf

MELCC, 1998. *Note d'instructions : Traitement des plaintes sur le bruit et exigences aux entreprises qui le génèrent*. Available online at: www.environnement.gouv.qc.ca/publications/note-instructions/98-01.htm

World Health Organization, 2018. Ambient (outdoor) air pollution. Available online at: https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health

OURANOS, 2015. *Vers l'adaptation. Synthèse des connaissances sur les changements climatiques au Québec.* Partie 1 : Évolution climatique au Québec. Édition 2015. Montréal, Québec : Ouranos, 114 pages.

Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC), 2019. *Inventaire québécois des émissions de gaz à effet de serre en 2017 et leur évolution depuis 1990*. Direction générale de la réglementation carbone et des données d'émission, 44 pages. Available online at: www.environnement.gouv.qc.ca/changements/ges/2017/inventaire1990-2017.pdf

Health Canada, 2017. Guidance for evaluating human health impacts in environmental assessment: noise. Available online at: http://publications.gc.ca/site/fra/9.832514/publication.html

Health Canada, 2021a. Health effects of air pollution. Available online at: https://www.canada.ca/en/health-canada/services/air-quality/health-effects-indoor-air-pollution.html

Health Canada, 2021b. Nitrogen dioxyde. Available online at: https://www.canada.ca/en/health-canada/services/air-quality/indoor-air-contaminants/nitrogen-dioxide.html

Wright D.G. and G. E. Hopky, 1998. Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. Canadian Technical Report of Fisheries and Aquatic Sciences 2107. Available online at: http://publications.gc.ca/collections/Collection/Fs97-6-2107E.pdf

WSP Canada Inc., February 2019a. Rose Lithium-Tantalum Mining Project, Update of the Environmental Impact Statement, Report (final version), Volume 1 to 3.

WSP Canada Inc., February 2019b. Rose Lithium-Tantalum Mining Project, *Réponses aux questions et commentaires du MDDELCC (Partie 1).* Available online at: https://comexqc.ca/wp-content/uploads/Projet-minier-Rose_Reponses-QC1-et-QC2-Partie-1.pdf

WSP Canada Inc., February 2019c. Rose Lithium-Tantalum Mining Project, *Renseignements demandés par l'ACÉE pour la concordance de l'étude d'impact environnemental, Version finale*.

WSP Canada Inc., December 2019. *Rose Lithium-Tantalum Mining Project – Answers to the Questions and Comments Received from the CEAA.* Report produced for Critical Elements Lithium Corporation. 222 pages + appendices.

WSP Canada Inc., October 2020. *Rose Lithium-Tantalum Mining Project – Answers to the Second Information Request from IAAC.* Report produced for Critical Elements Lithium Corporation. 162 pages + appendices.

WSP Canada Inc., December 2020. *Rose Lithium-Tantalum Mining Project – Answers to the Non-compliance of the Second Information Request from IAAC*. Report produced for Critical Elements Lithium Corporation. 45 pages + appendices.

WSP Canada Inc., January 2021. Map updated. Personal communication.

Appendices

Appendix A: Residual Environmental Effects Rating Criteria

The Committee has developed the following assessment criteria for the analysis of the significance of residual environmental effects for the Rose Lithium-Tantalum Mining Project (the project) environmental assessment. It also provides below a general definition of each criterion, a definition of extent, duration, frequency and reversibility levels (Table 13), a definition of intensity levels for each valued component (Table 14), and grids for determining the significance of residual environmental effects (Tables 15, 16 and 17).

General Definitions of Criteria Used to Assess Residual Environmental Effects on Each Valued Component

Intensity: Indicates the level of disturbance (change) that the studied valued component (VC) would experience. The intensity assessment takes into account the component's ecological or social context. The intensity can incorporate the concept of the time when the effect would occur, which can refer to a phase of the component's life cycle (migration, mating, feeding, etc.) or a period during which a cultural, spiritual or recreational practice by a Cree Nation or a population (e.g., hunting season) would occur.

Extent: Geographical extent of the adverse effects.

Duration: Period of time during which the adverse effects would occur.

Frequency: Pace at which the adverse effects would occur in a given period.

Reversibility: Likelihood of a VC recovering from the adverse effects caused by the Project.

Significance: The significance of the adverse effects is determined by the combination of levels assigned to each criterion (intensity, extent, duration, frequency and reversibility) for each VC. A grid for determining the significance of residual environmental effects on VCs is used for this purpose and is provided below, in Tables 15, 16 and 17.

Table 13: Level Definitions for Extent, Duration, Frequency and Reversibility Criteria[58]

Assessment Criterion	Level Definition
Extent	**Site-specific:** Effects would be limited to the Project site. **Local:** Effects would extend beyond the Project site, but would be located in the local study area. In the case of effects on the current use of lands and resources for traditional purposes by Cree Nations, the local study area includes the area of direct influence located on either side of the roads used for the transport activities of the project. **Regional:** Effects would extend beyond the local study area.
Duration	**Short term or temporary**: Effects would occur over a period of less than 1 or 2 years. **Medium term**: Effects would occur over a period of 1 or 2 to 5 years. **Long term**: Effects would occur over a period of more than 5 years.
Frequency	**Once**: Would occur once in any phase of the Project. **Intermittent**: Would occur occasionally or intermittently during one or more phases of the Project. **Continuous**: Would occur continually during one or more phases of the Project.
Reversibility	**Reversible**: The VC would recover completely from the Project's effects (e.g., return to the baseline or another target). **Partially reversible**: The VC would partly recover from the Project's effects. **Irreversible**: The VC would not recover from the Project's effects.

[58] These levels apply to all valued components.

Table 14: Intensity Criterion Level Definitions for Each Valued Component

Level	Intensity Criterion Level Definition for Each Valued Component
	Wetlands
LOW	In the case of wetlands in "*areas where wetland losses or functional values require that special measures be applied"*[59] or in an area where wetlands have been designated as having ecological or socioeconomic importance[60]: • The effects **would not limit or reduce** the ecological or socioeconomic functions of wetlands. In the case of wetlands outside of such areas: • The effects **would affect** the wetlands and alterations or loss of ecological or socioeconomic functions would be expected in wetlands of **lesser ecological value**[61].
MEDIUM	In the case of wetlands in "*areas where wetland losses or functional values require that special measures be applied"* or in an area where wetlands have been designated as having ecological or socioeconomic importance: • The effects **would affect** wetlands, **BUT** without causing any **net loss** of wetland ecological or socioeconomic functions. In the case of wetlands outside of such areas: • The effects **would affect** wetlands and alterations or loss of ecological and socioeconomic functions would be expected in wetlands **of moderate ecological value**[12].
HIGH	In the case of wetlands in "*areas where wetland losses or functional values require that special measures be applied"* or in an area where wetlands have been designated as having ecological or socioeconomic importance: • The effects would cause a **net loss** of wetland ecological or socioeconomic functions. In the case of wetlands outside of such areas: • The effects would affect wetlands and alterations or loss of ecological or socioeconomic functions would be expected in wetlands **of high ecological value.**
	Fish and Fish Habitat
LOW	The effects **would cause little to no disruption** to one or more sensitive phases in the life cycle of fish.
MEDIUM	The effects **would disrupt** one or more sensitive phases of the life cycle of fish, **BUT without harming the sustainability** of the fish population.
HIGH	The effects **would disrupt** the sustainability of the fish population.
	Migratory Birds
LOW	The effects **would cause little to no disruption** to one or more sensitive phases in the life cycle of birds.
MEDIUM	The effects **would disrupt** one or more sensitive phases of the life cycle of birds, **BUT without harming the sustainability** of the bird population.
HIGH	The effects **would disrupt** the sustainability of the bird population.
	Cree Health
LOW	The potential effects on physical health would be related to exposure to contaminant levels that are **well below the applicable standards and criteria** for the protection of physical health; OR Contaminant management and mitigation measures **would minimize residual effects** on the acoustic environment, the air, water, soil and food quality, or the quality of life (including contaminants for which there are no thresholds) at **contaminant levels below the applicable standards and criteria** for the protection of physical health; AND Potential effects on physical health would be related to exposure to **low levels of nuisance** (noise, vibrations, dust). The effects could be felt by a few individuals.
MEDIUM	Contaminant management and mitigation measures **would minimize residual effects** on the acoustic environment, the air, water, soil and food quality, or the quality of life (including contaminants for which there are no thresholds) at **contaminant levels below or near applicable standards and criteria** for the protection of physical health; OR Potential physical health effects are related to exposure to **moderate levels of nuisance** (noise, vibration, dust). The effects could be felt by certain sensitive receptors.

[59] Taken from: Environment Canada, 1996. Federal Policy on Wetland Conservation Implementation Guide for Federal Land Managers. 23 pages and appendices.

[60] Taken from: Environment Canada, 1991. Federal Policy on Wetland Conservation. 15 pages.

[61] Ecological value: This value must be determined through an analysis of such criteria as surface area, connectivity (natural environments, bodies of water), the diversity of natural communities found there, and disruptions affecting these environments. It tends to illustrate the fragmentation of habitats and ecosystems. Reference: MDDEP (2008), Guide d'élaboration d'un plan de conservation des milieux humides.

Level	Intensity Criterion Level Definition for Each Valued Component
HIGH	Potential physical health effects would be related to exposure to contaminant levels that would be **above applicable standards and criteria** for the protection of physical health OR to **high levels of nuisance** (noise, vibration, dust). The effects could be felt by **several sensitive receptors or a significant portion of the affected population**; AND **Residual effects would persist** on the acoustic environment, the air, water, soil and food quality, or the quality of life, despite contaminant management and mitigation measures (including for contaminants for which there are no thresholds).
Socioeconomic Conditions	
LOW	The effects would cause **few changes** to the practise of any commercial or income-generating activity. The sector is not regularly frequented for the practice of these activities.
MEDIUM	The effects would lead to changes to the practise of any commercial or income-generating activity, **BUT** carrying out activities **would not be compromised** in the most commonly used areas.
HIGH	The effects would lead to **noticeable** changes to the practise of any commercial or income-generating activity in regularly used areas, such that the activity **would be compromised or no longer possible**.
Physical and Cultural Heritage	
LOW	The effects **would slightly alter** the characteristics of the unique nature of an element of the physical or cultural heritage **or** of a structure, site or thing of historical, archeological, paleontological or architectural significance; OR Access to or use of an element of the physical or cultural heritage **or** of a structure, site or thing of significance **would not be altered** for users.
MEDIUM	The effects **would alter** some characteristics of the unique nature of an element of the physical or cultural heritage **or** of a structure, site or thing of historical, archeological, paleontological or architectural significance, **BUT would not compromise its integrity**; OR Access to or use of an element of the physical or cultural heritage **or** of a structure, site or thing of significance **would be altered BUT would not be compromised** for users.
HIGH	The effects **would lead to the loss** of characteristics of the unique nature of an element of the physical or cultural heritage **or** of a structure, site or thing of historical, archeological, paleontological or architectural significance, such that **its integrity would be compromised**; OR The effect **would prevent** users from accessing or using an element of the physical or cultural heritage **or** a structure, site or thing of historical, archeological, paleontological or architectural significance.
Current Use[62] of Lands and Resources for Traditional Purposes[63] by Cree Nations	
LOW	The effects would alter the conditions[64] of traditional practices in a manner **resulting in few changes to current use**; OR The effects would involve **few changes to behaviour, allowing current use of the practice to continue**, in accordance with preferred ways **or** valued locations.
MEDIUM	The effects would alter the conditions of traditional practices **without compromising current use**; OR Some behaviours **would be modified**, but current use **would not be compromised**.
HIGH	The effects would alter the conditions of traditional practices in a manner **resulting in changes that would compromise current use**; OR Current Indigenous use **would no longer be possible** in accordance with preferred ways **or would be compromised** in the only suitable, available or most valued locations.

[62] In the context of an environmental assessment, “current use” refers to the manner in which land and resource use may be affected in the course of the life cycle of a proposed project. “Current use” includes active use by Indigenous peoples at the time of the environmental assessment and uses that are likely to occur in a reasonably foreseeable future provided that they have continuity with traditional practices, traditions or customs. Furthermore, uses that may have ceased due to external factors and should also be considered if they can reasonably be expected to resume once conditions change.

[63] “Traditional purposes” typically relate to activities that are integral to a community’s way of life and culture and have continuity with historic practices, customs and traditions of the community.

[64] A “practice” is a way of doing something that is common, habitual or expected, generally related to activities that are integral to a community’s way of life and culture and offer continuity with historic practices.

“Conditions of practice” are baseline conditions for the practice of activities. Examples of these are quantity or quality of available resources and access to the area.

Table 15: Grid for Determining the Significance of Residual Environmental Effects (High Intensity)

Extent	Duration	Frequency	Reversibility/Irreversibility	Level of Effect	Significance	Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of Effect	Significance	Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of Effect	Significance
Regional	Long term	Continuous	Irreversible	High	Significant	Local	Long term	Continuous	Irreversible	High	Significant	Site-specific	Long term	Continuous	Irreversible	High	Significant
			Partially reversible	High	Significant				Partially	High	Significant				Partially	High	Significant
			Reversible	High	Significant				Reversible	High	Significant				Reversible	High	Significant
		Intermittent	Irreversible	High	Significant			Intermittent	Irreversible	High	Significant			Intermittent	Irreversible	High	Significant
			Partially	High	Significant				Partially	High	Significant				Partially	High	Significant
			Reversible	High	Significant				Reversible	High	Significant				Reversible	High	Significant
		Once	Irreversible	High	Significant			Once	Irreversible	High	Significant			Once	Irreversible	High	Significant
			Partially	High	Significant				Partially	High	Significant				Partially	High	Significant
			Reversible	High	Significant				Reversible	High	Significant				Reversible	High	Significant
	Medium term	Continuous	Irreversible	High	Significant		Medium term	Continuous	Irreversible	High	Significant		Medium term	Continuous	Irreversible	High	Significant
			Partially	High	Significant				Partially	High	Significant				Partially	High	Significant
			Reversible	High	Significant				Reversible	High	Significant				Reversible	High	Significant
		Intermittent	Irreversible	High	Significant			Intermittent	Irreversible	High	Significant			Intermittent	Irreversible	High	Significant
			Partially	High	Significant				Partially	High	Significant				Partially	High	Significant
			Reversible	High	Significant				Reversible	High	Significant				Reversible	Moderate	Not Significant
		Once	Irreversible	High	Significant			Once	Irreversible	High	Significant			Once	Irreversible	High	Significant
			Partially	High	Significant				Partially	High	Significant				Partially	Moderate	Not Significant
			Reversible	High	Significant				Reversible	Moderate	Not Significant				Reversible	Moderate	Not Significant
	Short term or temporary	Continuous	Irreversible	High	Significant		Short term or temporary	Continuous	Irreversible	High	Significant		Short term or temporary	Continuous	Irreversible	High	Significant
			Partially	High	Significant				Partially	High	Significant				Partially	High	Significant
			Reversible	High	Significant				Reversible	High	Significant				Reversible	Moderate	Not Significant
		Intermittent	Irreversible	High	Significant			Intermittent	Irreversible	High	Significant			Intermittent	Irreversible	High	Significant
			Partially	High	Significant				Partially	High	Significant				Partially	Moderate	Not Significant
			Reversible	High	Significant				Reversible	Moderate	Not Significant				Reversible	Moderate	Not Significant
		Once	Irreversible	High	Significant			Once	Irreversible	High	Significant			Once	Irreversible	Moderate	Not Significant
			Partially	High	Significant				Partially	Moderate	Not Significant				Partially	Moderate	Not Significant
			Reversible	High	Significant				Reversible	Moderate	Not Significant				Reversible	Moderate	Not Significant

*Only residual environmental effects with a “High” effect level demonstrate a significant effect within the meaning of the *Canadian Environmental Assessment Act, 2012*.

Table 16: Grid for Determining the Significance of Residual Environmental Effects (Medium Intensity)

Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of Effect	Significance
Regional	Long term	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	High	Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
	Medium term	Continuous	Irreversible	High	Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
	Short term or temporary	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
Local	Long term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
	Medium term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
	Short term or temporary	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Low	Not Significant
Site-specific	Long term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
	Medium term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Low	Not Significant
	Short term or temporary	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant

*Only residual environmental effects with a “High” effect level demonstrate a significant effect within the meaning of the *Canadian Environmental Assessment Act, 2012*.

Table 17: Grid for Determining the Significance of Residual Environmental Effects (Low Intensity)

Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of Effect	Significance
Regional	Long term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Moderate	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Moderate	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
	Medium term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
	Short term or temporary	Continuous	Irreversible	Moderate	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
Local	Long term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Moderate	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Moderate	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
	Medium term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
	Short term or temporary	Continuous	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
Site-specific	Long term	Continuous	Irreversible	Moderate	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
	Medium term	Continuous	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
	Short term or temporary	Continuous	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Intermittent	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant
		Once	Irreversible	Low	Not Significant
			Partially	Low	Not Significant
			Reversible	Low	Not Significant

*Only residual environmental effects with a “High” effect level demonstrate a significant effect within the meaning of the *Canadian Environmental Assessment Act, 2012*.

Appendix B: Assessment of Residual Adverse Environmental Effects – Executive Summary

Table 18: Summary of the assessment of residual adverse environmental effects

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Fish and Fish Habitat		
Habitat destruction and deterioration: • Pumped dewatering of Lakes 1 and 2, with a total surface area of 12.4 hectares, in order to allow the exploitation of the deposit. • Modification of the hydrological regime (flow pattern, flows and water levels) resulting in the loss of 42.3 hectares of aquatic habitat, i.e., 37.9 hectares in a lake environment and 4.4 hectares in a river environment. Modification of water quality: • Modification of the thermal regime and increase in contaminant input to the receiving water bodies caused by the release of groundwater captured by the wells at the periphery of the pit.	Intensity: Moderate – Effects could affect one or more important phases of the fish life cycle without affecting the maintenance of populations. The proponent undertakes to develop, in the regulatory phase and to the satisfaction of Fisheries and Oceans Canada and in consultation with Cree Nations, any compensation plan related to the harmful alteration, disruption or destruction of fish habitat, and fish mortality associated with the project. Scope: Local – The effects would extend beyond the project site, but would only be felt within the study area. Duration: Long-term Frequency: Continuous Reversibility: Irreversible habitat loss and mortality due to the duration of effects throughout the project, other residual effects partially reversible.	Non-significant. The residual effects of the project would be moderate given the proposed mitigation measures, compensation plan and water monitoring and follow-up program.
Migratory Birds and Birds at Risk		
• With respect to bird species listed under Canada's *Species at Risk Act*, the following species could frequent the study area and thus experience potential residual effects: common nighthawk, short-eared owl, olive-sided flycatcher, Canada warbler and rusty blackbird. Habitat destruction and modification: • Loss of habitat of 614 hectares caused by land preparation and hydrological changes to water bodies and watercourses. This loss would correspond to the total footprint of the project and would include terrestrial environments (427 hectares), wetlands (174 hectares), lakes (13 hectares) and already modified environments (0.50 hectares). Collisions: • Risk of collision due to the presence of infrastructure and road traffic during site preparation, construction and operation. Disruptions: • Risk of disturbance caused by noise and dust from construction work and activities in the operational phase. • Changes in reproductive success and intraspecies communication due to noise.	Intensity: Moderate – Effects could affect one or more important phases of the birds' life cycle without affecting population maintenance. Extent: Local – Disturbance would be felt beyond the footprint of the project. Duration: Long-term Frequency: Continuous Reversibility: Irreversible drying out of lakes, other residual effects partially reversible.	Non-significant. The residual effects of the project would be moderate given the proposed mitigation measures.

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Contamination: • Risk of contamination through the use of water accumulation basins for feeding or grooming purposes.		
Species at Risk		
Caribou: • Loss of critical habitat of about 40 hectares, comprising 33 hectares of large-scale habitat and 6.9 hectares of farrowing, post-fledging and rutting habitat. • Risk of disturbance caused by noise (e.g., blasting, road traffic). • Risk of collision associated with increased road traffic. • Increased risk of predation due to the presence of residual materials attracting predators. Little brown myotis, northern myotis: • Loss of habitat caused by deforestation and the construction of mining infrastructure. This loss of 614 hectares would correspond to the total footprint of the project and would include terrestrial environments (427 hectares), wetlands (174 hectares) and lakes (13 hectares). • Risk of disturbance caused by noise and vibrations. Noise could disturb the chiropterans' sleep, causing them to avoid the area and choose another resting place. Vibrations could lead to reduced reproductive success and lead to the abandonment of maternity wards. Wolverine: • No residual effects are expected on wolverine given the low probability of presence of this species, the extent of the territory it occupies, the small size of the project's zone of influence and the intensity of current human occupation.	The assessment of effects on species at risk is carried out here under subsection 79(2) of the *Species at Risk Act*. Therefore, unlike the other items in the table, the Committee does not conclude on the significance of residual effects under CEAA 2012.	The project is not likely to cause adverse residual effects on woodland caribou, northern myotis, little brown myotis and wolverine given the proposed mitigation measures and monitoring programs.
Wetlands		
• Loss of 173.55 hectares of wetlands during the construction phase, of which 69.3 hectares are of high ecological value, i.e., two tree swamps, a shrub swamp and an open ombrotrophic peat bog. • Indirect disturbance of 768.2 hectares of wetlands in the operational phase, associated with the expected hydrological changes in several water bodies. • Loss of ecological functions due to the loss and disturbance of wetlands, including but not limited to: flow regulation, aquifer recharge, climate regulation, erosion protection, filtration and habitat for certain species at risk. • Risk of introduction and spread of an invasive exotic plant, reed canary grass.	Intensity: Medium – The project would result in the destruction of wetlands with multiple ecological functions. The proponent has planned compensation measures to avoid a net loss of wetland functions. Scope: Local Duration: Long-term Frequency: Continuous Reversibility: Irreversible	Non-significant. The project's residual effects would be moderate given the mitigation measures, the compensation plan and the follow-up program relating to the effects of the hydrological modifications on the proposed wetlands.
Cross-border Environmental Effects – Greenhouse Gas (GHG) Emissions		
• Maximum annual emissions of 34.7 kilotonnes of CO2 equivalent during the construction phase. • Annual emissions of 84.3 kilotonnes of CO2 equivalent during the operational phase. • GHG sources would come from the combustion of diesel fuel by generators, machinery and off-road vehicles; the combustion of natural gas in furnaces, boilers and heating systems during the operational phase; the combustion of fuels for the logistical transportation of materials, consumables and personnel; the loss of a carbon sink during deforestation of the project area; the use of explosives for extraction activities; and indirect emissions associated with the use of electrical energy.	Low contributions of the project's direct and indirect emissions to provincial or national emissions.	Non-significant. Greenhouse gas emissions would not contribute significantly to provincial or national emissions.

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Indigenous Peoples – Common Uses of Lands and Resources for Traditional Purposes		
Availability of resources: • Disruption of hunting activities in the human environment study area, including the loss of valued areas for moose hunting (Eastmain trapline RE01) and goose hunting (dike LE-20A of the Eastmain-1 Reservoir). • Avoidance of the sector by wildlife due, in particular, to blasting and heavy truck transport. • Relocation of small game and fur-bearing animal harvesting sites. • Decrease in fish availability due to the drying up of lakes and hydrological changes to water bodies and watercourses. • Competition for wildlife harvesting by non-indigenous workers. • Loss of berry and plant picking sites due to the footprint of the project. Access to the territory and hunting fields: • Restricted and more difficult access to certain sectors of trapline RE01 and to certain bodies of water. • Loss and relocation of a camp and a water intake for the tallyman of trapline RE01. • Loss of territory usable for traditional purposes (fishing, trapping, hunting) due to the establishment of a security perimeter for the majority of the territory's users. • Loss of navigability in at least 28 water bodies and water plans permanently or temporarily. Quality of experience on the territory: • Disturbance of the peace and quiet conducive to traditional activities caused by the construction of mining infrastructures and resource exploitation (noise, vibrations, dust). • Increased risk of accidents due to the increase in heavy vehicle traffic. • Concerns about contamination of the environment, game, fish and flora that could result in avoidance by the Cree Nations.	Intensity: Medium – Several behaviours would be modified, but the common use by the Cree Nations would not be compromised. Scope: Local – The effects would extend beyond the project site, being located in the human environment study area. Duration: Long-term Frequency: Continuous Reversibility: Partially reversible	Non-significant. The residual effects of the project would be moderate, taking into account the mitigation measures and follow-up programs put in place to verify the effectiveness of certain mitigation measures and the predictions of continued current use of lands and resources for traditional purposes.
Cree Nations Health		
Air quality: • During the operational phase, potential exceedances of the criteria of the *Clean Air Regulation* of the Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques for total particle concentrations at the project site. • In the operational phase, potential exceedance of the World Health Organization's limit value for PM_{10} concentrations at the project site. • During the operational phase, potential exceedance of *Quebec's Atmospheric Quality Standards and Criteria* for crystalline silica 1) within 300 metres of the mine site and 2) at the Cree camp located 4.5 kilometres away, over a 1-hour period, on blasting days. • Potential dust inhalation associated with increased road traffic at the mine site. Water quality: • Low risk of exposure to contaminated water due to mine water treatment and proposed verification measures.	Intensity: Moderate – It is expected that levels of contaminants close to the applicable health protection standards and criteria may be measured in the air despite the planned management and mitigation measures. Scope: Local Duration: Long-term Frequency: Intermittent in the case of crystalline silica and continuous for other contaminants Reversibility: Irreversible	Non-significant. The effects of the project would be moderate given the proposed mitigation measures and follow-up programs (e.g., air, water and traditional food quality).

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Quality of acoustic environment: • Potential disturbance caused by noise, felt by users of the camps near the Nemiscau-Eastmain-1 road, when trucks pass by. However, it is expected that noise levels would meet applicable standards. Quality of traditional food: • Stress perceived by the Cree Nations, associated with the perception of contamination of traditional food by the project. • Low risk of contamination of traditional food.		
Physical and Cultural Heritage		
Archaeological heritage: • During the construction phase, the tillage required for the construction of the mining infrastructures could lead to the discovery of various archaeological remains and could damage certain artifacts currently buried on the project site.	Intensity: Low – The mining project would not compromise the integrity of the archaeological heritage. The proponent undertakes to conduct a comprehensive survey in areas of archaeological potential directly affected by the proposed project prior to the commencement of construction. Scope: Punctual Duration: Long-term Frequency: Continuous Reversibility: Reversible if no artifacts are found.	Non-significant. The residual effects of the project would be low, taking into account the proposed mitigation measures.
Socio-economic Conditions		
Economic activities: • Potential decrease in income from traditional activities resulting from the project's impacts on current uses of land and resources for traditional purposes. However, little information is currently available on this subject.	Intensity: Medium – The project could decrease the capacity of some users to make satisfactory and long stays in the territory, and thus modify their ability to earn income from traditional activities. However, outside the direct periphery of the future mining site and off-site roads, the ability to earn income from traditional activities would not be compromised. Scope: Local Duration: Long-term Frequency: Continuous Reversibility: Partially reversible	Non-significant. The effects of the project would be moderate given the proposed mitigation measures and follow-up programs (e.g., air, water and traditional food quality).

Appendix C: Key Mitigation and Monitoring Measures Identified by the Committee

The Committee identified the main mitigation and monitoring measures required to ensure that the proposed project does not cause significant adverse environmental effects on the valued components considered in the federal environmental assessment of the project. It took into account the mitigation measures proposed by the proponent, the advice of government experts, as well as the comments received from the Cree Nations and the public. These mitigation and monitoring measures were used in the development of the document on potential conditions for the environmental assessment.

Table 19: Key mitigation measures and monitoring requirements for each valued component

Valued Component	Key Mitigation Measures and Monitoring Requirements
Cross-border Environmental Effects	**Key Mitigation Measures** • Exclusive use of U.S. Environmental Protection Agency Tier 4 certified machinery and mobile equipment, in the operational phase, when available; • Whenever possible, use of electrical equipment during the operation phase and electric buses to transport employees during all phases of the project; • Limitation of engine idling; • Use of energy-efficient equipment, construction and design standards, procedures and operating procedures; • Eco-driving training of truck drivers transporting materials. **Monitoring Requirements** • Monitoring and annual reporting of greenhouse gas emissions to Environment and Climate Change Canada (ECCC) and the Government of Quebec if they exceed the reporting threshold of 10 kilotonnes of CO2 eq. per year.

Wetlands	**Key Mitigation Measures**
	• Avoidance of work in wet areas, whenever possible;
	• Development and implementation of a compensation plan for the loss of wetlands related to the project in collaboration with the affected Cree Nations, the Cree Nation Government and the competent authorities. In collaboration with the affected Cree Nations and the tallymen, the proponent is also encouraged to identify, contribute and collaborate in research or compensation projects on wetlands that would make it possible to compensate for the losses that would be generated by the project. The detailed compensation plan must :
	  ◦ Clearly demonstrate how it will meet the objective of reducing the loss of wetland functions, specifying the functions that will be compensated and the balance of losses after compensation;
	  ◦ Identify and justify the performance indicators that will allow the success of the compensation measure to be assessed and identify additional measures that could be implemented if the performance indicators are not met;
	  ◦ Demonstrate that compensation will be sustainable over time;
	  ◦ Be submitted to the Impact Assessment Agency of Canada and the relevant authorities as soon as possible for review and comment prior to the start of construction.
	• Conduct of work on frozen ground, during periods of low water conditions or using construction equipment that exerts low pressure on the ground when the machinery must circulate in a wetland. Wooden mats or fascines could also be used if necessary;
	• Maintainance of drainage conditions in wetlands adjacent to work areas;
	• Prevention of the introduction of invasive alien species into the project study area by ensuring that construction equipment is cleaned prior to arrival at the mine site so that it is free of mud, animal or plant fragments;
	• During the closure phase, restoration of natural drainage and stream banks within the project footprint;
	• Delimitation of areas containing invasive alien species in order to ensure soil management without risk of propagation;
	• Cleaning of all vehicles and machinery that have been driven through any area that contains invasive alien species.

Valued Component	Key Mitigation Measures and Monitoring Requirements
	Monitoring Requirements • Monitoring of wetlands on and near the mine site to verify the accuracy of the environmental assessment predictions, to ensure the effectiveness of mitigation measures and to more accurately assess the effects of changes to watercourses on different types of wetlands in order to document, among other things, the effects of the project on plant communities and the maintenance of ecological functions. This follow-up program must be presented as soon as possible to the Committee and the competent authorities for comments in order to examine the objectives, methodology, performance indicators and duration required to adequately assess the effectiveness of the mitigation or compensation measures that will have been implemented for the wetlands; • Development and implementation of a wetlands monitoring program with the objective of rapidly identifying unanticipated sources of potential effects that may occur, such as encroachment or spills resulting from accidents or malfunctions; • Follow-up of the compensation plan for the loss of wetlands related to the project during the first 5 years at minimum, following the work that will allow, where applicable, to identify corrective measures that may need to be put in place. The duration of the monitoring will have to be reviewed and adjusted according to the results obtained; • Follow-up minimum 2 years after the end of the work in order to verify whether invasive alien species have become established in the project area and in the wetlands that will have been restored.

Fish and Fish Habitat	**Key Mitigation Measures**
	General Measures
	• Implementation of a mine effluent management program to specifically comply with MDMER standards, the *Fisheries Act* and the requirements of the Government of Quebec. This program includes in particular :
	  ○ In construction phase, temporary and permanent sedimentation ponds to minimize the discharge of suspended solids, and installation of a functional water treatment plant at the start of construction;
	  ○ From operation to decommissioning, the transfer of water from the peripheral pumping to sedimentation ponds and its physicochemical treatment if necessary, and final discharge to Lakes 3, 4 and 6;
	  ○ From operation to decommissioning, recovery and in-plant treatment of dewatering water from the pit, runoff water from the waste rock, dry tailings and overburden accumulation areas, industrial sector, including the ore plant, road ditches at the mine site, and ore pile, with final effluent discharge to Watercourse A;
	• Prohibition of in-water construction activities outside of the low risk periods of fish habitat work identified for the project area in DFO's Timing windows to conduct projects in or around water;
	• Carrying out an additional soil characterization before the start of the works in order to complete the reference state for all inorganic and organic substances likely to be emitted or released by project activities, including tantalum, as specified in the *Guide de caractérisation physico-chimique de l'état initial des sols avant l'implantation d'un projet industriel* (Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques, 2015);
	• Measurement of natural levels of tantalum in Watercourse A, groundwater, surface water and sediments prior to the start of construction;
	• Waste rock management plan that stipulates how those containing sulphide minerals will be managed, to avoid placing them on the edges or above the waste rock pile where they could create local pockets of acid mine drainage;
	• Use of waste rock that does not contain sulphide minerals for construction purposes;
	• Overburden testing for mine drainage potential, including tests adapted to soils (TDPAS) to be conducted prior to using the overburden for construction. Demonstrate that the overburden is of low risk according to Quebec Directive 019;
	• Maintain monthly concentrations of suspended solids below 10 milligrams per litre for all final discharge points;
	• Maintain tantalum concentrations below 0.1 micrograms per litre at all final discharge points. If exceeded, provide measures to identify the source of the tantalum and the treatment, if applicable;
	• Development and implementation of a compensation plan, in collaboration with Cree stakeholders and approved by DFO, that is relevant and sufficient to offset all residual effects on fish and fish habitat;
	• Management of mine water discharge so as to minimize hydrological modifications (e.g., water levels and flows) to water bodies and watercourses;
	• Updating of the water balance taking into account the possibility that the water from the peripheral wells would exceed the quality standards or criteria during the installation period of the secondary water treatment plants and that these would have to be redirected to the accumulation basin and the main water treatment plant for a period of at least six months. Submission of the water balance results of this scenario to the Agency and the appropriate authorities.
	
	Project Schedule
	• Carrying out work in water outside the sensitive period for the fish species present and limiting the duration of work in the aquatic environment to a minimum.

Valued Component	Key Mitigation Measures and Monitoring Requirements
	Erosion and Sediment Transport Control • Implementation of effective erosion and sediment control measures during construction, operation and decommissioning, such as discharging water from the dewatering of Lakes 1 and 2 downstream of the lakes and installing sedimentation basins, semipermeable berms, turbidity containment curtains and a stone bed at the outlet of the pumping line at Lakes 3, 4 and 6; • Deforestation on both sides of the high-water line is kept to a minimum and the vegetation cover is preserved as long as possible before work begins; • Maintaining an undisturbed vegetation buffer along the edge of all water bodies and watercourses during all phases of the project; • Stripping, clearing, grading, excavation, backfilling and levelling of work areas limited to a minimum in order to respect the natural topography and prevent erosion; • Implementing effective measures to limit the input of site sediments and other suspended solids to the receiving water environment and to ensure their maintenance (e.g., sediment barriers, berms, sediment traps, sedimentation ponds, temporary slope stabilization, diversion of water to vegetated areas). Ensure that effective measures are maintained during periods of flooding, heavy rainfall or frost, including limiting the input of fine particles on spawning grounds; • Disposal of excavated material outside the high-water mark. If required, confine or stabilize these materials (e.g., impermeable sheeting, sediment barrier) to prevent the entry of sediment into the aquatic environment; • Where work is to be carried out in water, isolate the work area to work in the dry or limit the input of sediment into the aquatic environment (e.g., cofferdams, diking and pumping, temporary diversion, turbidity curtain); • Encourage the use of turbidity curtains to surround the work area to contain suspended sediments. Deploy the curtain in such a way as to limit the trapping of fish inside the enclosure. *Debris Management* • No discharge of waste, debris or material into the aquatic environment. Remove all accidentally introduced debris as soon as possible. *Temporary Works – General Measures* • Cumulative encroachment of temporary structures limited to one third of the width of the watercourse, measured from the width of the high-water mark, in order to restrict the increase in current velocities by restricting the flow and thus avoid hindering the free passage of fish or creating erosion problems; • Circulation and sufficient water supply at all times to maintain fish habitat functions (feeding, rearing, spawning) downstream of the work area. Take the necessary measures to avoid impacts upstream and downstream of the work area (e.g., flooding, erosion, suspended solids); • Design and stabilize temporary structures to withstand flooding that may occur during the construction period and to avoid erosion problems at the banks or bed; • Protection of natural weirs upstream and downstream of the structures during construction. If the weirs are destabilized during construction, recover them to protect the watercourse from scour, while limiting interventions in the natural watercourse and ensuring the free passage of fish (e.g., embedding of stabilization materials, waterproofing and an effective low-water channel). *Temporary Works – Diversion of a Watercourse* • Maintenance of free passage of fish in the temporary diversion, if deemed necessary; • In the case of a temporary diversion made of granular materials, consideration should be given to the use of materials with a spread and continuous grain size in order to seal the bed and thus ensure a sufficient depth of water above the substrate. A low-water channel (thalweg) should also be built in order to concentrate the flow during periods of low flow; • In the case of a temporary diversion consisting of waterproof membranes, ensure that the structure is stable and watertight. This can be done by installing the membranes from downstream to upstream, making sure that they overlap and by placing a small amount of clean granular material on the bottom of the diversion at the junction between two membranes; • Arranging the downstream connection of the temporary diversion with the natural watercourse in a harmonious manner in order to limit the risk of developing erosion sites on the opposite bank. *Temporary Works – Embankment and Pumping of Water from Upstream to Downstream* • Installation of a suitable device at the inlet of the pumping hose (e.g., strainer) to prevent fish from being sucked in; • Orientation and layout of the pumping pipe outlet to limit the risk of the development of shoreline erosion sites associated with the return of water downstream of the work area; • Avoid fording of machinery in the watercourse. In the event that fording is justified, limit the crossing of essential machinery to a single round trip. If it is necessary to cross the watercourse several times, construction of a temporary structure to cross the watercourse; • Encouraging the use of temporary bridges or crossing structures that minimize encroachment into fish habitat and provide for the free passage of fish, if deemed necessary;

Valued Component	Key Mitigation Measures and Monitoring Requirements
	• Use of clean granular materials for the construction of temporary diversion roads, excluding the road surface and portions of the road above the high water mark. When dismantling, remove all material that has been placed; • While considering the pumping water from peripheral wells as final discharge points as defined by the MDMER, management of discharge flows to Lakes 3, 4 and 6 in proportion to the drawdown of the water table caused by the pumping; • Operation of the water treatment plant in such a way as to reproduce the natural flow variations of Watercourse A, taking into account the storage capacity of the sedimentation basin. *Connecting Watercourses to Culvert Approaches* • Placement of the top of the riprap protecting the bed of the watercourse located upstream and downstream of the culverts below the elevations of the upstream and downstream inverts of the culvert so as not to create an obstacle to fish passage; • Designing bank slope re-profiling to ensure bank stability. *Dynamiting* • Prohibition of the use of unconfined explosives; • For blasting activities, adherence to *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters* (Wright D.G. and G.E. Hopky, 1998) to reduce the likelihood of killing or injuring fish. *Shoreline Stabilization* • Stabilization design to limit the end effect. For example, the stabilization should gradually follow the natural profile of the existing slopes on either side of the structure. *Temporary Site Closure* • Stabilization and temporary protection of disturbed soil presenting a risk of erosion and sediment transport to the aquatic environment using methods adapted to the site, the duration of the site closure and the time of year; • Diversion of runoff before it reaches disturbed soils (e.g., ridge ditch and dissipation ditch to vegetated areas); • Verification of the measures in place to limit the input of sediment from the work site to the aquatic environment to demonstrate that they are working properly and that maintenance is carried out before the work site is closed. *Restoration of the Premises* • Stripping of service areas and storage areas for excavated and backfilled materials and conservation of the organic soil layer in order to put it back in place when the site is rehabilitated; • Monitoring soil quality after the recovery phase to ensure that it is similar to the natural background levels established prior to the construction phase and adequate to allow for revegetation and future activities. Ensure that the analytical parameters used to characterize soils in the ore storage and transfer areas during the closure phase are the same as those used for natural background grades. If it is suspected that machinery may have been subject to leaks, also analyze certain organic parameters (e.g., C10-C50 petroleum hydrocarbons, PAHs and MAHs); • In the area of the ore stockpile, in the event that certain areas have been contaminated, characterization, excavation and then treatment of the soil on site or in an authorized centre. Prior to recovery, characterize the ore transfer areas as well; • Recovery of riparian areas deteriorated by the work as it progresses. Restore the bed and banks of aquatic environments affected by the work to their original state (substrate granulometry, bed profile, vegetation, etc.) following demobilization of the work site on all affected areas (temporary structures, access, etc.); • Restoration of water circulation in the work area in a gradual manner in order to allow for the adjustment and nesting of the materials of the reconstituted bed, and thus ensure the watertightness of the bed. During this period, pump turbid water out of the work area to appropriate water management systems (pumping through vegetation, settling pond, etc.); • Limiting riprap along the coast as much as possible and in such a way as not to exceed the high-water mark, while favouring the revegetation of the shoreline at the lowest possible elevation, using recognized plant engineering techniques favouring overhanging shrub and herbaceous strata and the use of native species. Undertake revegetation as soon as possible after completion of the work, in a favourable period and in such a way as to maximize vegetation recovery. Rehabilitate ditches damaged by machinery (drainage slope, slope shoulders, etc.); • During the decommissioning phase of the mining site, recovery of the original stream bed and bank profile, including slope stabilization and surface revegetation;

Valued Component	Key Mitigation Measures and Monitoring Requirements
	• Continuation of continuous treatment at the main water treatment plant as long as there is final effluent, and provision for adjustments to optimize treatment if monitored parameters are exceeded. **Monitoring Requirements** Implementation of a follow-up program to verify the effectiveness of mitigation measures and fish and fish habitat predictions. This program would include a monitoring component for water quality standards and requirements. Adjustments to the mitigation measures could be made if necessary to minimize adverse environmental effects. The monitoring would incorporate the requirements dictated in Directive 019 on the Quebec Mining Industry and the MDMER. Follow-up and monitoring would be applied during each phase of the project, unless otherwise indicated, and would include: • Monitoring of water levels and anticipated flows in the six watercourses impacted by the project (A, C, N, M, F and E) at three times of the year (spring, summer and autumn) using a rain gauge, a level probe and gauges (speed measurements to calculate the flow), the location of which in each watercourse would be indicated on a map; • During the operational phase, monitoring of the integrity of watercourses (relative to erosion) undergoing a water modification and intervene if necessary; • Monitoring of the groundwater level, including: ○ Water levels measured in the observation wells drilled by the proponent and in the pit; ○ Flow rates pumped daily using flowmeters installed at the pump outlets; • Monitoring of the groundwater quality beginning early in the construction phase, including: ○ Installation of an additional treatment process to sedimentation and pH correction, if contaminants from the pit or groundwater are present in the perimeter pumped water (e.g., metals, nitrates and/or fluorides); ○ Monitoring at the secondary water treatment unit(s) downstream of the sedimentation ponds where the Lake 3, 4 and 6 outfalls are located, as required; • Monitoring of the quality of the water pumped by the wells on the periphery of the pit, taken from the sedimentation basins, before it is mixed with the water from receiving Lakes 3, 4 and 6, from the start of the operating phase, in order to obtain a more accurate and complete picture and to analyze the results in a global manner to determine if an additional treatment system in the sedimentation basins should be installed. Monitoring should include, but not be limited to: ○ Regular monitoring of dissolved oxygen concentration, temperature, and groundwater flow from perimeter wells prior to discharge to Lakes 3, 4 and 6; ○ Sampling of effluents three times per week for suspended matter and pH, one time per week for indicator metals (As, Cu, Fe, Pb, Ni, Zn) and one time per month for acute toxicity. ECCC recommends adding lithium and tantalum which are the target metals for the operation to the monitoring program, as well as fluorides and metals exceeding the Canadian Council of Ministers of the Environment's water quality guidelines at a frequency of once a week; • Monitoring of the water quality of the final effluent from the main treatment plant by measuring suspended solids, pH, indicator metals and acute toxicity at a frequency of three times per week to one time per month, depending on the parameter. ECCC recommends adding tantalum and lithium to the list of metals at the same frequency; • Given the lack of critical threshold data for tantalum, close monitoring of tantalum concentrations in the receiving lakes and watercourses, including: ○ During the construction phase, measurement in Watercourse A with monthly sampling; ○ During the operational phase, monitoring according to the same frequencies as those prescribed for other metals by government requirements; • Monitoring of the quality of surface water in the receiving environment. In so doing: ○ Implement the monitoring program from the start of the works and maintain it during all phases of the project (construction, operation, closure and post-closure) ○ Monitoring using sampling stations in the natural environment, i.e., in water bodies that are not part of the mine site. The sampling stations and parameters used to establish the initial status of the water bodies provide an excellent basis for continued monitoring of effects on surface waters; ○ Adding, in addition to the metals identified in the initial state of the water bodies, of tantalum and lithium, as these are the metals sought in the project and are present on the site; • Monitoring of physicochemical parameters relevant to fish habitat, including, but not limited to, dissolved oxygen and temperature profiles, and metals identified in the initial status of the water bodies, which will make it possible to assess, if necessary, the effects of the project on Lakes 3, 4, and 6, as well as Lakes 18 and 19, during the operational phase and carry out this monitoring at appropriate times and with appropriate frequency. Include an adequate baseline in the monitoring. • Monitoring allowing to determine the extent to which dust and sediment inputs from mining activities are likely to affect fish habitat in Lakes 3, 18 and 19, including lake depth, sediment granulometry and water turbidity, until mine closure. Include an adequate baseline condition in the monitoring; • During the operational and decommissioning phase, monitor the physico-chemical quality of the sediments, including tantalum, upstream and downstream of Watercourse A, in order to estimate the potential for bioaccumulation of this metal in aquatic organisms;

Valued Component	Key Mitigation Measures and Monitoring Requirements
	• During the operational and decommissioning phase, geochemical characterization of waste rock, tailings and ore in order to validate compliance with the initial characterization results, compare them with changes in water quality at the mine site and adapt the recovery plan as required; • Monitoring of the tailings accumulation area during operation by visual inspection to detect acid mine drainage, if any. Develop an action plan, including mitigation measures, if acid mine drainage is present; • Inspection of the sedimentation ponds during the operational phase to verify their residual capacity and to trigger the emptying of the ponds at the appropriate time; • Monitoring program to demonstrate the maintenance of Lake 3 fish habitats and populations, particularly lake whitefish, during the operating phase, and including an adequate reference condition in the monitoring. Particular attention should be given to the frequency and methods of sampling to limit fish mortality; • Maintaining and doing a follow-up on the free passage of fish in Watercourse E, between Lake 3 and Eastmain-1 reservoir, at the culvert under the Nemiscau-Eastmain-1 road; • In the decommissioning and post-decommissioning phase, monitor the flow (flow rates and direction of flow) of water from the mine site.
Birds and Bird Habitat	**Key Mitigation Measures** • Carrying out the project in such a way as to protect migratory birds and avoid injuring, killing or disturbing them, or destroying, disturbing or taking their nests or eggs. In this respect, take into account the ECCC's Guidelines to Reduce Risk to Migratory Birds. In carrying out the designated project, implement measures that are consistent with the *Migratory Birds Convention Act, 1994*, the *Migratory Birds Regulations* and the *Species at Risk Act*. In doing so: ○ Deforestation should be carried out outside the nesting period, i.e., between May 30th and August 15th in order to prevent the destruction of nests. If deforestation takes place during the nesting period, do not actively search for nests unless the nests are easily located. To determine whether migratory birds are nesting in an area at a particular time, use non-intrusive monitoring methods to avoid disturbing migratory birds while nesting (such as listening stations); ○ Determination of nesting period dates based on the best available information for any year in which activities associated with the construction or operation of the project could adversely affect the nesting of migratory birds or birds at risk. It is important that measures are put in place to avoid adverse effects on birds, their nests or eggs during all phases of the project and in particular for the period from late April to early September. It should be noted that when nesting dates apply to a large area such as the Upper Rupert Plateau Ecodistrict, it is possible that locally the nesting period may begin and end earlier or later than the dates used due to microclimatic conditions specific to certain locations, or due to interannual climatic variations (e.g., early spring, cold and rainy summer); ○ If nests are found in the construction zone, establish a protection zone around the nest until nesting is complete. Protective distances must take into account the intensity, duration, frequency and proximity of the activity, but also the cumulative effect of all activities in the vicinity of the nest; ○ If it is not technically or economically feasible to carry out activities that may adversely affect nesting outside the nesting period, submit a justification to the Agency and develop and implement, in consultation with ECCC and the Monitoring Committee, additional mitigation measures to avoid adverse effects on migratory birds, including nests, eggs and their nestlings. Submit these measures to the Agency prior to their implementation; ○ Implementation of a training and awareness program for employees on the presence of migratory bird nests and the measures to be implemented in the event that a nest is discovered; • Limit deforestation to the designated project area; • Compliance with the noise standards contained in Quebec's Noise Instruction Note 98-01 and taking all necessary measures to limit noise at the source; • Prohibit the use of engine brakes within the work site area; • Limit the speed of mining trucks on the mine site in order to limit noise, vibration and dust emissions; • Development and implementation of a policy prohibiting the operation of engine brakes for all vehicles in the project area; • Control of dust emissions from access and traffic routes, as well as aggregate handling in accordance with Quebec's *Clean Air Regulations (Environment Quality Act)*; • Equip drilling equipment with dust control devices; • Control of the duration, orientation and intensity of lighting required during each phase of the project; • Development and implementation of an intervention plan to prevent the use of the storage basins by migratory birds. Consideration of ECCC's Beneficial Management Practices in the development of the response plan; • Gradual rehabilitation of the project components in order to revegetate cleared areas and thus create a suitable habitat for migratory birds; • Progressive recovery of the environment at the end of the work, as the disturbed areas are no longer used. Favour the creation of favourable habitats for birds at risk species present or potentially present in the project area during recovery.

Valued Component	Key Mitigation Measures and Monitoring Requirements
	Monitoring Requirements • Development and submission to the Agency and ECCC of a detailed general monitoring program for migratory birds and birds at risk prior to the start of construction work. In this monitoring program, take into account the construction phase. Prior to construction work, inventories may be required to establish adequate and up-to-date baseline values, since the last inventories were conducted in 2016. Take into account the knowledge of land users. • Prior to the start of construction, implementation of a monitoring program for activities or operations that may have an effect on migratory birds and birds at risk during all phases of the project. For each activity, determine the measures to be put in place to ensure that nuisances or disturbance are reduced, particularly during the nesting period. In particular, take into account birds at risk, including the common nighthawk, which is likely to use bare areas of vegetation in the project area. Periodically update the monitoring program to take into account changes in regulations, such as a review of the status of wildlife species by the Committee on the Status of Endangered Wildlife in Canada or SARA; • Monitoring the composition and abundance of birds nesting on the periphery of the infrastructures during the construction, operation and closure periods in order to validate the presence and use of the area on the periphery of the project by birds at risk; • Every five years, census of birds at risk that would be present at the periphery of the deforested area as well as in restored habitats, from the construction phase to closure, and afterwards if appropriate, indicating their density, abundance and location. All species of birds seen and heard during the inventories must be listed, with special attention paid to the following species of birds at risk: Canada warblers, olive-sided flycatchers, rusty blackbirds, common nighthawks and short-eared owls. • Implementation of an air quality monitoring and dust control program, as described in section 6.2 (Cree Health); • Implementation of a bassin monitoring program to prevent and minimize the negative effects of the project on migratory birds that would use all of the bassins; • Follow-up of the restored sectors with respect to all species at risk present or potentially present in the study area during the recovery and after. Determination of a monitoring period long enough to allow the habitat to become suitable for these species and thus avoid inventorying the habitat at a stage of development that is too early.
Species at Risk	**Key Mitigation Measures** *Woodland Caribou* • Deferring blasting if caribou are observed in the project's zone of influence (500 metres around the periphery of the mine footprint) until a validation confirms that the caribou is outside this zone; • Developing an agreement with the competent authorities and the tallymen of the Eastmain, Nemaska and Waskaganish traplines that includes a clause providing for the notification of the mine manager if a caribou or group of caribou appears to be heading towards the mine site, or if seasonal habitat near the mine site or any other presence within a 4-kilometre radius of the mine site is observed. Monitoring would be concentrated mainly during the periods when caribou are most vulnerable, i.e., winter and during calving and post-calving; • Implementinga communication system to inform employees and subcontractors of any observation or indication of the presence of caribou on the access roads to the mine site and the Nemiscau-Eastmain-1 road; • Developing a traffic management plan with the Cree Nations. The plan should include the frequency of heavy truck traffic at different times of the day and consider a reduction in the evening hours due to the higher risk of collisions; • Implementing an action plan in the event of the presence of caribou near the mine, in collaboration with the Environmental Monitoring Committee. The action plan must include an adjustment to the transportation schedule and a temporary interruption of certain mining activities in the event of a high risk for caribou. It must also identify risks of collision during the transportation of ore to the transhipment site and measures to mitigate these risks. The action plan must rely on early detection of caribou in the vicinity of the mine. The proponent must consult the Agency, the competent authorities, including ECCC, the Cree Nation Government, the Government of Quebec and the affected Cree Nations prior to the implementation of this plan to ensure that it is carried out in the most optimal manner possible to protect the individuals of this species; • Developing and presenting a training module for employees and subcontractors to make them aware of the precarious nature of the caribou and to enable them to distinguish the signs of presence; • Installing waste containers equipped with anti-bear lids and fencing of the waste storage site; • Revegetating the entire surface area of mining infrastructures in the closure phase, with the exception of the pit, in consultation with the tallyman or tallymen concerned for the choice of preferred species. Site recovery should be carried out gradually, as the disturbed areas are no longer used, with priority being given to creating habitats favourable to species at risk, particularly woodland caribou. *Northern Myotis and Little Brown Myotis* • Deforesting to be carried out, as far as possible, outside the chiropteran breeding period; • If deforestation or dismantling of buildings during the construction phase must take place for technical or economic reasons during the chiropteran breeding period, implementation of an action plan as detailed in section 5.5.1 above if chiropterans are present;

Valued Component	Key Mitigation Measures and Monitoring Requirements
	• If signs of the presence of chiropterans are observed and a building in use cannot be preserved, carrying out operations after the chiropteran breeding period and installation of a new shelter in a place protected from disturbance. This new shelter must be subject to annual monitoring of its use and integrity. **Monitoring Requirements** • Implementing a general monitoring program for endangered species, including measures to raise awareness among land users. The plan must be submitted to the Agency, the Cree Nation Government and the competent authorities, such as ECCC and the Government of Quebec, prior to the start of construction work. In particular, the plan must identify the activities or operations that may have an effect on species at risk and, for each of these, determine the measures to be implemented to ensure that the nuisance or disturbance is reduced. The monitoring program must be periodically updated to take into account changes in regulations, such as the review of the status of wildlife species by COSEWIC or SARA. These changes may require that additional measures be put in place to mitigate the effects of the project on species affected by changes in their status; • Implementing a follow-up program specific to woodland caribou in order to verify the accuracy of the conclusions of the environmental assessment and to evaluate the effectiveness of the mitigation measures; • Implementing a follow-up program for chiropterans, during the construction and operation phase, to estimate actual habitat losses and verify the effectiveness of mitigation measures. The follow-up program should include: ◦ Acoustic monitoring as well as measurement of night-time luminosity and chiropteran activity on a bimonthly basis during the breeding period (June 1 to July 31) through sampling stations; ◦ A habitat characterization for each of the sampling stations; ◦ If a building must be dismantled and signs of presence were observed, monitoring of the use of the new structure that would be built and annual monitoring of its integrity; • In the post-closure phase, annual agronomic monitoring for a minimum of 5 years in order to assess the growth and diversification of the species planted at the time of closure and to take action if adjustments are necessary. Monitoring should include inspections including visual assessment of various parameters such as plant condition, percentage of areas showing vegetative recovery and soil erosion.
Cree Health	**Key Mitigation Measures** • Implementation of a dust management plan, including control of emissions from drilling, monitoring of nitrogen dioxide emissions during blasting and a management program of adaptive mitigation measures. This program would provide a framework for implementing additional mitigation measures and would specify when these measures would be implemented based on the results collected. The dust management plan will need to be maintained, and updated as required, throughout all phases of the project, including construction, operation and closure. This plan should be developed prior to the start of the construction phase and should be revised based on the results of air quality monitoring; • In the event that sub-optimal detonation conditions are observed or predicted and that would be conducive to higher nitrogen dioxide generation, implementation of one or more of the following measures: use of double detonators, use of electronic detonators, formulation of explosives adapted to the conditions and the blasting site, adapted firing procedure and use of an adapted type of explosive such as water-repellent explosives; • Restriction of waste rock blasting and handling of granular materials, as well as temporary covering of the accumulation areas during periods of high winds or when prevailing winds can carry dust to sensitive areas, such as the camp located 4.5 kilometres from the site; • Covering of trucks transporting spodumene concentrate in bulk; • Humification of blasting areas to prevent the dispersion of dry, fine materials deposited on the surface by drilling activities; • Disposal of wood waste and debris by shredding, unless it is not technically or economically feasible; • Exclusive use of Tier 4 certified mobile machinery and equipment in the operational phase (when available), which will help reduce nitrogen dioxide emissions; • Transportation of employees by electric vehicle during all phases of the project and prioritization of electrical equipement during operation; • Use of non-friable, non-clayey materials with good road abrasion resistance and a low crystalline silica content (less than 1%) for road construction and maintenance; • Use of amphibolite as an aggregate on roads, a waste rock lithology which contains little crystalline silica; • Installation of dust collection systems at the crushing circuit, drying circuit and loading silos. This includes daily monitoring (visual inspection) and regular cleaning, maintenance as recommended by the manufacturer, removal of dust collected by these devices to prevent its dispersion, keeping emissions from the crushing line dust collectors below 20 milligrams per normal cubic metre and sampling of sources to validate compliance with emission thresholds; • Gradual revegetation of the accumulation areas as soon as possible to minimize particulate matter emissions from wind erosion; • Limiting the speed of transport trucks at the mine site during construction phase and posting signs indicating this limit in appropriate places to limit noise, vibration and dust emissions; • Enclosure of conveyors located outside the plant in sealed structures;

Valued Component	Key Mitigation Measures and Monitoring Requirements

	• Regularly spraying roads and work site areas with water and using dust suppressants, as required, on surfaces where traffic is likely to cause dust to rise despite regular spraying, and implementing a road spray management program to monitor the effectiveness of the planned control measures;
	• Construction of two semi-permeable ditches on each side of the main access road to collect runoff water from the road and channel it by gravity to sedimentation basins;
	• In the event that tantalum is released at concentrations above background levels in the final mine effluent, implementation of an action plan to ensure the safety of tantalum in the final mine effluent on the receiving environment and to protect health;
	• Installation of a white noise back-up alarm for all equipment residing at work sites, excluding equipment in transit, such as 10-wheeled craft trucks, or equipment used for short periods of time;
	• Shutdown of all unused electrical or mechanical equipment, including trucks waiting to load for more than five minutes;
	• Prohibiting the use of the engine brake inside the workcamp area and raising awareness among truckers to limit the use of the engine brake outside the mine site, in areas where Cree camps are located and in areas of more intensive use of the territory for hunting and fishing;
	• Compliance with the noise limits imposed by Directive 019 on the mining industry and the noise standards contained in Quebec's Instruction Note 98-01 on noise;
	• During the construction phase, implementation of the Guidelines for Noise Levels from an Industrial Construction Site of the Quebec's Ministère de l'Environnement et de la Lutte contre les changements climatiques;
	• During the operational phase, machinery and truck traffic is limited to the right-of-way of access roads and work areas;
	• Proactive communication of the blasting schedule to users of the territory;
	• Validation of assumptions and concentrations of chemical contaminants in air, water and soil predicted and used as inputs in the proponent's traditional food contamination risk assessment to ensure the effectiveness of mitigation measures in place and to confirm the absence of risk. In the event that contaminant concentrations measured in the field were higher than the concentrations predicted as inputs to the risk assessment for contamination of traditional food orhigher than criterion A of the Quebec's Intervention Guide – Soil Protection and Contaminated Sites Rehabilitation, the proponent must inform the Cree Board of Health and Social Services of James Bay and assess the need to monitor these contaminants in traditional food. Where applicable, the proponent will have to determine, in collaboration with the Cree Nations, which traditional foods should be monitored. The Follow-up Committee responsible for interpreting the results obtained will have to be formed or accompanied by a professional in human health risk assessment. The Cree Board of Health and Social Services of James Bay could offer support in this regard and will have to be consulted.
	• Development of a communication plan, in collaboration with Cree Nations, the Cree Board of Health and Social Services of James Bay and the Cree Nation Government, in order to take into consideration the concerns of the community and the changes perceived in the territory through Cree knowledge. This plan will have to:
	  ◦ Inform land users of the schedule of construction, operational and closure activities, of incidents, if any, and, more generally, of the issues and risks associated with the operation of the mine site;
	  ◦ Address community concerns about tradtional food in order to minimize avoidance of the resource;
	  ◦ Provide for the communication of the results of environmental monitoring, especially with the tallyman of trapline RE01;
	  ◦ Include a complaint management system for the entire life of the project, particularly related to noise associated with road transport on and off the project site, including a follow-up on these complaints and how they were resolved. The number and handling of complaints received should be information shared with the users of the territory;
	  ◦ Allow certain mitigation measures to be modified or additional mitigation measures to be implemented, in collaboration with the relevant Committee(s), land users and the Cree Board of Health and Social Services of James Bay;
	  ◦ Be maintained throughout the life of the mine, including the closure phase.
	
	Monitoring Requirements
	• Air quality monitoring, including the monitoring of particulate matter (total particulate matter [TPM] and fine particulate matter [$PM_{2.5}$ and PM_{10}]), metals and crystalline silica, during the construction and operational phases. The monitoring should:
	  ◦ Begin before the construction phase so that temporal variability can be assessed;
	  ◦ Allow an adequate air quality picture to be drawn for sensitive receptors;
	  ◦ Allow the proponent's conclusions regarding impacts on air quality during the construction and operation phases to be verified;
	  ◦ Allow the actual effectiveness of mitigation measures to be measured;
	  ◦ Include the *Canadian Ambient Air Quality Standards* and any other relevant standards or criteria based on health effects;

Valued Component	Key Mitigation Measures and Monitoring Requirements
	◦ Allow for measurements to be taken at an on-site atmospheric and meteorological measuring station; ◦ In the event that exceedances of air quality criteria are anticipated or measured, allow for the implementation of the adaptive mitigation measures provided for in the dust management plan, notify land users promptly and implement communication and risk management strategies adapted to them; ◦ If necessary, allow certain mitigation measures to be modified and implement additional mitigation measures to ensure health protection, in close collaboration with the Environment Committee, land users and the Cree Board of Health and Social Services of James Bay; ◦ Aim to share the results with land users, including the tallyman of trapline RE01; • Monitor the noise level caused by the project during the construction and operational phases. This monitoring plan must be developed and submitted to the Agency before the construction phase begins; • Monitoring of potential sources of contamination during the construction and operational phases in order to identify unanticipated sources; • Monitoring of fine particles in the event of forest fires. This program, if implemented when the mine site is exposed to a smoke plume, should help mitigate the effects of this increase in contaminants; • Monitoring the quality of the final mine effluent. Monitoring must make it possible to identify thresholds above which modified or additional mitigation measures would be required; In order to foster the confidence of land users in the results that would be obtained, the proponent must allow them to participate in the environmental follow-ups.
Socio-economic Conditions	**Key Mitigation Measures** • The key mitigation measures recommended under Current Use of Lands and Resources for Traditional Purposes would avoid significant residual effects on users who derive income from traditional activities. No additional measures are recommended regarding the effects of the project on the socio-economic conditions of the Cree Nations. **Monitoring Requirements** • The monitoring program recommended under Current Use of Lands and Resources for Traditional Purposes would verify the effectiveness of the mitigation measures and the predictions of continued current use that are inherent in the practice of traditional activities for which revenues are derived. No other specific monitoring program is recommended for this valued component.
Current Use of Lands and Resources for Traditional Purposes by the Cree Nations	**Key Mitigation Measures** • Collaboration with the tallyman of trapline RE01 in the relocation of the camp located near the project site to another location of the latter's choice. Supply of materials for the construction of this new camp. • Implementation of a communication plan, in consultation with the Mine Implementation Committee, to inform Cree users of traplines RE01, R16, R19, R10, A52, A54, W01, W03, W07, W13 and W53 of the schedule of construction, operation, maintenance and closure activities. • Changes in the frequency of blasting operations and the frequency of truck convoys transporting ore concentrate during the annual spring goose and fall moose hunting seasons. Authorization of a maximum of one blasting per five days and 100 heavy truck passes per week during these two annual hunting periods, over a period of fourteen consecutive days each time. Identification of favourable times for these modifications to the proponent's activities in consultation with the Cree Nation of Eastmain. • Carrying out blasting activities in the open pit between 10 a.m. and 4 p.m. Establishment of a direct communication mechanism between the proponent and the Cree users of traplines RE01, R16, R19 and R10 regarding the dissemination of changes to blasting schedules during the operational phase; • Inclusion of a clause in the employment contracts of employees, including subcontractors, concerning the prohibition of all hunting, trapping and fishing activities on the mine site and within the mining lease. Prohibition for employees to have in their possession firearms, hunting, trapping or fishing equipment. Imposition of disciplinary measures on employees in the event of failure to comply with this prohibition in the employment contracts, unless such activities are specifically organized by the proponent in appropriate locations, such as outfitting operations; • Development of a plan to recover fish prior to the dewatering of Lake 1 and allow Cree Nations to participate in this plan; • Development and implementation, in consultation with the Mine Implementation Committee, of a conflict resolution protocol in the event of problems related to the reconciliation of land and resource uses between mine workers and Cree users of the territory; • Prohibiting any person from engaging in any hunting, trapping or fishing activity and from possessing any firearms, hunting, trapping or fishing equipment within the security perimeter, unless that person is accessing the security perimeter for cultural purposes or to exercise aboriginal rights, provided such access and the exercise of such activities are safe and subject to the terms and conditions developed with the Cree Nations prior to construction;

Valued Component	Key Mitigation Measures and Monitoring Requirements

	• Implementation, in consultation with the tallyman RE01, of a beaver trapping plan covering the area within the safety perimeter established by the proponent. Completion of an inventory, in collaboration with the tallyman of trapline RE01, to determine the zones to be favoured for intensive beaver trapping prior to construction work. Reservation of a period including at least one winter (November to March) during which intensive trapping would take place, prior to construction work, and provision of the tallyman with the necessary equipment for beaver trapping activities;
	• Offering consultation and information meetings with the tallymen of the Cree Nation of Waswanipi during the operational phase of the project, in order to discuss the effects of the project on the Nation's current use. The frequency and conduct of these consultation meetings will be defined with the Cree Nation of Waswanipi;
	• Communication of the results of the environmental monitoring carried out by the proponent to the Cree users of traplines RE01, R16, R19 and R10, after consultation with the Mine Monitoring Committee regarding the appropriate frequency and manner of informing them;
	• Offer of work or observation contracts, as much as possible, to the family members of the tallyman of trapline RE01 to carry out the environmental follow-up activities;
	• Submission of the environmental follow-up studies produced by the proponent to the environmental services of the band councils of the Cree Nations of Eastmain, Nemaska and Waskaganish as soon as they are published, throughout the life of the project;
	• Offer to consult with the tallyman of trapline RE01 regarding the mine recovery plan prior to its submission for authorization to the Quebec's Ministère de l'Énergie et des Ressources naturelles. Offer to the members of the Cree Nation of Eastmain and to the tallymen R10 of Waskaganish as well as R16 and R19 of Nemaska to present the final mine recovery plan, before and after its approval by the Quebec's Ministère de l'Énergie et des Ressources naturelles, to inform them of the selected scenario and the residual modifications to the territory.
	• Gradual revegetation of the tailings piles as soon as possible, consulting tallyman RE01 for the choice of plant species.
	• Prior to the start of the construction phase and in collaboration with Cree Nations, develop a plan for managing heavy trucking activities during all phases of the project. This plan should be presented to the Committee and the Cree Nations and shall include the following measures:
	  ○ Distribution of heavy truck passages over the whole day and week;
	  ○ Limiting the number of truck passages in the evening and at night;
	  ○ Regular awareness-raising among workers and drivers of the need to comply with road safety rules, under penalty of expulsion;
	  ○ Regular sensitization of drivers to the traditional activities carried out by Cree land users and to the courtesy required for the safety of land users who park along the roads to carry out their harvesting;
	  ○ Installation of radio communication systems in transport trucks;
	• Implementation of a system for receiving and resolving noise-related complaints, in order to confirm that the noise environment does not cause an effect on users of the territory. .
	
	Monitoring Requirements
	• Implementation of a follow-up program to verify the effectiveness of certain mitigation measures and the predictions regarding the continued current use of lands and resources for traditional purposes by users of traplines RE01, R16 and R19. This follow-up would mainly be based on meetings with the tallymen of these traplines and their families. A baseline survey should be carried out before construction work begins. This would document the following elements with the users of traplines RE01, R16 and R19:
	  ○ Assessment of the state of resources regarding goose, moose and lake sturgeon and the Cree knowledge related to these species;
	  ○ Access to camps and traplines via the Nemiscau-Eastmain-1 and Route du Nord roads during annual hunting season;
	  ○ The quality of the experience at the hunting camps during the annual hunting season.
	• Annual monitoring during the construction phase and during the first six years of operation of the mine. The results of this follow-up would be presented annually to the Environment Committee of the Pihkuutaau Agreement as well as to the Agency. If the mitigation measures prove effective after the first six years of operation, the proponent could, in consultation with the Environment Committee of the Pihkuutaau Agreement and the Agency, re-evaluate how often this follow-up would be necessary over the remaining life of the project. In the event that the measures are not deemed effective by the parties, monitoring would continue until the end of the mine's operation. Adjustments to the mitigation measures could be made if necessary to minimize adverse effects on the current use of land and resources for traditional purposes.
	• Monitoring the effectiveness of measures to reduce the frequency of blasting and heavy trucking activities on the maintenance of goose and moose harvests by users of traplines RE01, R16 and R19, by documenting the following elements:
	  ○ Assessment of the state of these resources and the effects on goose, moose and lake sturgeon harvests;
	  ○ Cree knowledge related to changes in the behaviour of these species, if applicable;

Valued Component	Key Mitigation Measures and Monitoring Requirements
	○ The effects of increased heavy traffic on the Nemiscau-Eastmain-1 and Route du Nord roads on access to traplines and on the quality of the experience at camps and hunting sites, both during and outside the annual goose and moose hunting seasons; ○ The perceived effectiveness of the mitigation measures implemented. • Monitoring the effectiveness of the progressive reclamation of areas disturbed by the project, in particular by monitoring the stability of the soils and the growth and diversification of the plant species used for revegetation; • Retention of the services of an independent third-party environmental monitor to oversee the implementation of the follow-up programs presented in this Environmental Assessment Report. This monitor would report its findings to the proponent, the Agency and the Cree Nation Government.
Physical and Cultural Heritage	**Key Mitigation Measures** • Prior to the start of construction work, production of a comprehensive survey in areas with archaeological potential and submission of the survey report to the Agency and the Cree Nation Government; • Prior to the start of construction work, hiring a qualified person to provide training to workers on the identification of archaeological or cultural remains; • Immediate cessation of work at the site of the discovery; • Delimitation of an area of at least 30 metres around the site where work is prohibited. The work prohibition does not apply to actions necessary to protect the integrity of the discovery; • Notification, in a timely manner, to the tallyman of trapline RE01, as well as to any other stakeholder identified for this purpose by the Cree Nation Government, of the undertaking of any work of an archaeological nature; • Notification to the following stakeholders as soon as possible following a discovery: ○ The tallyman of trapline RE01; ○ The Cree Nation Government; ○ The band councils of the Cree Nations of Eastmain, Waskaganish and Nemaska; ○ Aanischaaukamikw Cree Cultural Institute; and ○ The Ministère de la Culture et des Communications du Québec. • Offers to the tallyman of the RE01 trapline, as well as any other stakeholder identified for this purpose by the Cree Nation Government, to supervise work of an archaeological nature such as surveys or excavations; • Assessment of the discovery site by a qualified person according to the requirements of Quebec's *Cultural Heritage Act*; • Compliance with all legislative or legal requirements applying to the discovery of archaeological remains; • Compliance, after consultation with the Cree Nations and the competent authorities, with all legislative or legal obligations relating to the discovery, recording, transfer and safeguarding of structures, sites or things of historical, archaeological, paleontological or architectural significance; • Development of a glossary of Cree place names that identifies, in Cree language, the geographic locations within the project area, in consultation with the Cree Nations and the Department of Social and Cultural Development of the Cree Nation Government. **Monitoring Requirements** • No monitoring program is required.
Effects of Accidents or Malfunctions	**Key Mitigation Measures** • Implement all reasonable measures to prevent accidents and malfunctions that could cause adverse environmental effects and mitigate any adverse environmental effects that could occur; • Development of an emergency response plan prior to the construction phase, in consultation with the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi and the relevant authorities. The plan must cover all emergency scenarios identified in the Impact Statement. It must identify precisely which entities should be contacted according to the emergency scenario or indicate the option of contacting ECCC and MELCC, as recommended by Health Canada; • Develop an emergency measures plan. In doing so: ○ Place the plan in an easily accessible place and in view of all employees. Include in the plan a map of the sensitive elements that could be affected by an accident or malfunction. Keep the emergency plan and the environmental sensitivity map up to date;

Valued Component	Key Mitigation Measures and Monitoring Requirements
	○ Detail the measures to be taken to respond to emergencies for each of the main accident risks considered, including measures to protect the environment. Describe, in particular, what is planned in the event of a spill of hazardous products to protect the sensitive elements of the environment, including surface water, groundwater and wetlands, fish, migratory birds or any other sensitive species concerned; ○ Determine the equipment needed to respond to such emergencies and locate it to ensure its availability; ○ Provide staff training in the maintenance and use of response equipment; ○ Provide a detailed spill notification procedure and an emergency communication plan for external parties; • Maintain an up-to-date emergency measures plan ; • In the event of an accident or malfunction, implement the contengency plan, which includes the implementation of appropriate measures to minimize adverse environmental effects; • Identify, prior to the project and in collaboration with the Cree Nations of Eastmain, Nemaska, Waskaganish and Waswanipi, the mechanisms for disseminating information in the event of an accident or malfunction having an effect on the environment, including the elements that these Cree Nations wish to be shared with them; • Communicate to the Agency, the Cree Nation Government, the Cree Nations concerned as well as the local stakeholders any accident or malfunction having an effect on the environment; • Provide one or more emergency kits for the recovery of petroleum products and hazardous materials that are complete, permanent and easily accessible at all times on the job site. The kit must include a sufficient supply of absorbent materials and related equipment (shovels, gloves, leak plugs, etc.) to deal with any situation, as well as clearly identified leakproof receptacles intended to receive petroleum residues and other hazardous residual materials. Secondary emergency kits may be required at certain locations on the job site. Each piece of construction equipment must also contain a sufficient quantity of sorbents to be able to intervene quickly. The list of spill response equipment and devices must be approved by the supervisor; • Design of petroleum product transfer areas outside the pit, away from traffic, on designated surfaces that will be constructed with physical barriers such as riprap or a catchment ditch. Develop and implement a petroleum product transfer procedure; • Immediate report of any accidental spills to the person in charge of the project's emergency plan, which will have been developed and approved prior to the work. The affected area must be immediately identified and cleaned up without delay. Contaminated soil must be removed and disposed of in an authorized site and characterized according to the terms of MELCC's Soil Protection and Rehabilitation of Contaminated Sites Policy. In the event of a spill of hydrocarbons or any other harmful substance, the ECCC's alert network (1-866-283-2333) and MELCC's alert network (1-866-694-5454) should be notified without delay. **Monitoring Requirements** • No monitoring program is required.
Effects of the Environment on the Project	**Key Mitigation Measures** • No additional mitigation measures are required. **Monitoring Requirements** • No monitoring program is required.
Cumulative Environmental Effects	**Key Mitigation Measures** • No additional mitigation measures are required. **Monitoring Requirements** • No monitoring program is required.

Appendix D: Summary of Cree Nations Consultations

This appendix includes a summary of the comments received from the Cree Nations in the context of the environmental assessment, as well as the answers provided by Critical Elements Lithium Corporation (the proponent) and the Committee. The concerns presented were synthesized by the Committee from issues raised during the various exchanges and meetings with the Cree Nations.

The comments are presented in the order of the chapters in this Environmental Assessment Report. The information presented in Chapters 5 and 6 of the Environmental Assessment Report takes precedence over the information summarized in this appendix and provides more detail on the expected effects and mitigation and follow-up measures recommended by the Committee.

Table 20: Summary of concerns raised during the Cree Nation consultations

Theme	Summary of the Comment or Concern	Summary of the Proponent's Answer	Committee's Response
Fish and Fish Habitat	The Cree Nations are concerned about the effects of the project on water quality and fish.	According to the proponent, the effects of the project on fish and fish habitat include, among others, loss of habitat, including the loss of two fish-bearing lakes that would be dewatered to create the pit, changes in hydrological and thermal regimes, and the release of suspended solids into the water. To address these concerns, the proponent plans several measures, including a 10-day fishery on one of these two lakes (Lake 1) prior to its dewatering to collect some of the fish and offer them to the Cree Nations. The proponent also plans to monitor water quality, taking into account the relevant provincial and federal parameters and criteria for fish habitat. If the project is authorized and proceeds, the proponent would also be required to take measures at the regulatory level to compensate for any losses resulting from the harmful alteration, disruption or destruction of fish habitat or fish kills caused by the project. These measures would have to be to the satisfaction of Fisheries and Oceans Canada and be developed in consultation with the Cree communities.	Environment and Climate Change Canada and Fisheries and Oceans Canada emphasized the importance of the follow-ups to be carried out in Watercourse A and in Lakes 3, 4, 6, 18 and 19. These follow-ups would make it possible to verify the project's effects on water quality and fish. The Committee is satisfied with the measures proposed by the proponent, particularly the compensatory plan that would be developed in consultation with the Cree Nations and Fisheries and Oceans Canada. The Committee considers that the measures put in place by the proponent, as well as compliance with federal and provincial requirements regarding the quality of water from mining effluents, should mitigate the effects of the project on water quality and on fish and fish habitat. The Committee welcomes the proponent's commitment to a more stringent effluent suspension limit than those of the federal and provincial governments.
Transboundary environmental effects - greenhouse gas emissions	The Cree Nations mentioned the importance of putting in place measures to reduce the greenhouse gas emissions that would be produced by the project.	The proponent plans several measures to reduce greenhouse gas emissions. Some of these measures are considered to be the most important in reducing these emissions, namely: the use of electric equipment whenever possible, limiting engine idling, the use of machinery with the latest engines, the use of energy-efficient equipment, construction and layout standards, procedures and operating methods, and eco-driving training for the drivers of the trucks that transport the materials.	Environment and Climate Change Canada believes that the measures proposed by the proponent are adequate and sufficient to minimize the effects of the project on greenhouse gas emissions. The Committee identified several key mitigation measures to reduce the effects of the project on air quality and the health of the Cree Nations that would also contribute to reducing these emissions, including a dust management plan and the shutdown of all unused electrical or mechanical equipment, including trucks waiting to load for more than five minutes. The project would also be connected to Hydro-Québec's hydroelectricity network, a renewable energy source.
Use of Land and Resources for Traditional Purposes	The Cree Nations are concerned about the massive arrival of non-Indigenous which would create pressure on the resources available for fishing and hunting, especially moose.	According to the proponent, the presence of its workers on the territory could lead to competition for the harvesting of wildlife resources. To address this concern, the proponent provides for several measures, including a ban on hunting weapons, trapping and fishing gear on the mine site and at the workers' camp. It intends to ensure compliance with this ban by signing clauses in its employees' contracts and including disciplinary measures in this regard. It also provides for a conflict resolution protocol in case of problems related to the reconciliation of land and resource uses.	The Committee is satisfied with the measures proposed by the proponent, including the ban on possession of hunting, fishing and trapping gear by mine employees, and considers that they could have a significant deterrent effect. It notes, however, that the measures partially respond to the concerns of the Cree Nations. Employees could obtain moose hunting or fishing licences and carry out wildlife harvesting on their days off, for example (thus beyond the control of the proponent). The Committee considers that the measures planned by the proponent should alleviate the pressure on the resources available for hunting and fishing.

Theme	Summary of the Comment or Concern	Summary of the Proponent's Answer	Committee's Response
Use of Land and Resources for Traditional Purposes (continued)	The Cree Nations are concerned about the effects of project activities, such as blasting and the transportation of ore concentrate by heavy truck, on the abundance and avoidance of small and large wildlife (more specifically: moose, caribou, goose, partridge, ptarmigan, muskrat and beaver) in the periphery of the project and the roads used by the proponent to transport the ore concentrate.	According to the proponent, mining activities could disrupt traditional activities directly on the periphery of the site. The proponent is of the opinion that the project would not modify the availability of moose and caribou for Cree hunting and would not alter the harvesting potential in the study area. The traditional knowledge of the Cree users of land of trapline RE01 indicates that moose and caribou would avoid the mine site and the surrounding area, but would likely return to the area after a few years once the project started. In order to address the concerns of the Cree Nations, the proponent undertakes to reduce its blasting and heavy trucking of ore during the annual goose and moose hunting periods, for a period of at least 14 consecutive days each time. This measure would reduce the frequency of disturbance and wildlife avoidance. The proponent also undertakes to reduce the transportation of tailings on the mine site during these two hunting periods in order to reduce noise nuisance.	The Committee considers that the proponent's commitment to significantly reduce the number of blasting and transportation activities during the annual goose and moose hunting periods would reduce the frequency of sources of disturbance for wildlife and land users. It recommends the implementation of a program to monitor the effectiveness of changes in blasting and transportation activities on maintaining the goose and moose harvest of users of traplines RE01, R16 and R19. In addition, the Committee recommends the implementation of a direct communication mechanism between the proponent and the users of the territory, through the proponent's Cree liaison officer, to inform them at least 48 hours in advance of the planned blasting schedules and of any changes in this regard during the annual hunting periods. According to Quebec's Ministère des Forêts, de la Faune et des Parcs (MFFP), the measures planned should help reduce the project's effects on caribou. According to MFFP and Cree Nation Government experts, the availability of small game would be maintained in the periphery for Cree harvesting.
	The Cree Nations are concerned about the effects of the project (mainly from blasting and transportation of the concentrate by heavy truck) on harvesting success and access to hunting territories due to traffic, during goose and moose hunting periods.	The proponent recognizes that the increase in road traffic would make access to the traplines more difficult, especially during the annual goose and moose hunting periods. The proponent plans to reduce the passing of heavy trucks frequency during these periods. The proponent assesses that this measure would allow users of the territory to pursue their traditional activities in the same place, or otherwise elsewhere on the territory.	Certain habits related to travelling on the road to access the camps could be modified for the Cree Nations affected by the project. The Committee recommends monitoring the effects of the proponent's transportation activities on Cree users' access to the territory. The project would also modify certain behaviours and habits due to the implementation of a one-kilometre radius security perimeter around the mining infrastructures. This security perimeter could restrict fishing, trapping and hunting activities by reducing the harvesting potential at these specific locations. The Committee is of the opinion that the practice of traditional activities could be maintained outside these areas. The Committee is satisfied with the mitigation measures proposed by the proponent and is confident that access to the territory during the valued periods would be maintained. The Committee is satisfied with the proponent's commitment to discuss, prior to construction and with the First Nations, including the tallyman of trapline RE01, the modalities for traditional activities within the safety perimeter and the size of the safety perimeter.
	The Cree Nations are concerned about the effects of increased road traffic on the experience at the hunting camps located on the periphery of the Route du Nord and the Nemiscau-Eastmain-1 road (noise, dust, vibrations, nuisances, access, roadside parking, wildlife avoidance and possible relocation of camps due to avoidance).	According to the proponent, the project could temporarily disrupt the peace and quiet conducive to traditional activities around the Cree camps located on the periphery of the Nemiscau - Eastmain-1 road due to noise, vibrations and dust. However, these effects would only be felt within 68 metres of the roads. Currently, no Cree camp is located within 80 metres of the roads near the mine site. To minimize the possible effects, the proponent plans, among other things, to reduce the number of blasting operations and the passing of heavy trucks on the road during goose and moose hunting periods. The proponent believes that the measures it has planned, combined with an adaptation period, would be sufficient to mitigate the effects of the project on the quality of the experience of land users.	The Committee is of the opinion that negative residual effects on the territory experience could be felt by some families whose camps are located closest to the mine site or to roads. The Committee is of the opinion that a reduction in the frequency of blasting and heavy truck transport activities during goose and moose hunting periods would help maintain relative peace of mind in the sector. The Committee believes that despite the proponent's measures, the project would have residual effects on the quality of experience of certain Cree users in the territory whose camps are located closest to the mine and the targeted roads. The Committee recommends the creation of a follow-up program to assess the quality of the experience of traplines RE01, R16 and R19 as well as the effectiveness of mitigation measures.
	The Cree Nations would like to have information on beaver trapping on the periphery of the mine site before the start of the work.	The proponent plans to award certain site development contracts to the tallyman of land RE01, including intensive beaver trapping prior to construction.	The Committee recommends the implementation of a beaver trapping plan for the area within the security perimeter established by the proponent. The plan should be implemented at least six months prior to the start of construction. The Committee notes the commitment of the proponent to allow the tallyman of trapline RE01 to trap within the safety perimeter during the project.

Theme	Summary of the Comment or Concern	Summary of the Proponent's Answer	Committee's Response
Use of Land and Resources for Traditional Purposes (continued)	The Cree Nations are concerned about the cumulative effects of the project on the current use of their traditional lands, where there have already been several natural resource development projects that diminish the number of locations and lead to a general negative perception of the project's effects on an already disturbed ecosystem (holistic).	According to the proponent, the projects that took place in the study area caused a considerable loss of fishing, trapping and hunting sites, thus pushing the Cree Nations to adapt and seek new areas for their traditional activities. The proponent recognizes that the project would partially affect users of the territory who have already had to adapt to the creation of the Eastmain-1 reservoir in 2006, its modification (Eastmain-1-A power plant) starting in 2009, and the construction of the Whabouchi mining project. However, the proponent is of the opinion that the mitigation measures implemented by these various projects have mitigated their impact on the resources exploited by the Crees while facilitating access to new areas of practice. The proponent is also open to collaborate with the other proponents active in the region and the government entities concerned in order to implement mitigation measures to address cumulative effects in the sector, should complaints be made in this regard.	The Committee is of the opinion that the project could result in residual cumulative effects on the use of the territory and resources, particularly with respect to fishing and the quality of the experience of the territory. After considering the effects of the project and its interactions with past, existing and reasonably foreseeable projects or activities, the Committee considers that these effects are not likely to be significant within the meaning of CEAA 2012, given that the geographic extent of the effect was considered to be localized on either side of the roads used for the project's transportation activities. However, the Committee emphasizes that the study of any other major industrial project with effects on traplines (RE01, R16 and R19) in the near future should be carefully evaluated. In addition, a follow-up program regarding the contribution of the Rose Lithium-Tantalum Mining Project to cumulative effects on quality of experience due to increased nuisance and perceived contamination would be conducted.
Cree Health	The Cree Nations share their concern about air contamination.	The proponent indicates that the project could degrade air quality by emitting contaminants into the atmosphere. To mitigate these effects, the proponent plans, among other things, to implement a dust management plan and an air quality monitoring program. The proponent also plans to develop a communication plan in order to respond to the concerns of the Cree Nations and to obtain their traditional knowledge on the changes perceived in the territory.	The federal government experts and the Cree Board of Health and Social Services of James Bay are of the opinion that the dust management plan is necessary to limit the effects on air quality and that the proponent's mitigation measures related to air quality would minimize the effects on Cree health. The Committee is of the opinion that the project is not likely to cause significant adverse environmental effects within the meaning of CEAA 2012 on Cree health if the key mitigation measures and follow-up measures are implemented.
	The Cree Nations are concerned about water and soil contamination. They wonder whether the water at the end of the treatment process will be of good enough quality to be consumed.	The proponent agrees that the project could alter the water quality of various fish bearing watercourses and water bodies. The proponent plans measures to prevent the dispersion of contaminants in water, including monitoring and tracking water quality from the final mine effluent and in other water bodies and watercourses near the mine site. According to the proponent, there could be a risk of accidental spills that could contaminate soils. However, the measures planned to prevent accidents and malfunctions, including the implementation of a spill contingency plan, would mitigate these risks.	The Committee considers the water quality management measures proposed by the proponent to be adequate and is of the opinion that these measures should allow the maintenance of the quality of the water produced by the mine processes. The Committee considers that the proponent has considered the environmental effects that could result from accidents or malfunctions, that it has documented these effects and that it has an adequate emergency response plan.
	The Cree Nations are concerned about the effects of the project on water quality (mining effluents) which could lead to indirect contamination of wildlife resources consumed for food, mainly beaver, moose and fish. The Cree Nations request clarification on the effects of the mining development on the quality of beaver meat and fur.	According to the proponent, the project could emit contaminants that could affect the quality of traditional food. The proponent plans to limit as much as possible the spread of contaminants in the environment (air, water, soil) in order to minimize the exposure of land users to potential contamination of traditional food. In order to estimate the health risks to consumers of traditional food, the proponent has conducted a risk assessment of the contamination of traditional food. The proponent is of the opinion that the project emissions would not have any effect on the plants and animals consumed by the Crees.	Health Canada is of the opinion that a reasonable effort has been made by the proponent to assess the effects on traditional food. Health Canada is of the opinion that if the mitigation and follow-up measures are implemented by the proponent and as effective as planned in the environmental impact assessment, the possible slight chemical modification of traditional food should not have a significant effect on the health of the Crees. The Committee recommends that the proponent's follow-up validate the hypotheses, as well as the concentrations of chemical contaminants in the air, water and soil predicted and used as inputs in its assessment of the risk of contamination of traditional food in order to ensure the effectiveness of the mitigation measures in place and to confirm the absence of risk. The Committee is of the opinion that the measures and follow-ups planned to limit the effects on air, water and soil quality would make it possible to limit the effects on the resources consumed by land users. The project is not likely to cause significant adverse environmental effects as defined in the CEAA 2012 on the health of the Crees if the mitigation and follow-up measures are applied.

Theme	Summary of the Comment or Concern	Summary of the Proponent's Answer	Committee's Response
Cree Health (continued)	The Cree Nations underline their lack of trust in the ability of the proponents to control water quality in relation to the projects carried out by Hydro-Québec.	The proponent agrees that the project could alter the water quality of various fish bearing watercourses and water bodies. To address the concerns of the Cree Nations, the proponent plans measures to prevent the dispersion of contaminants in the water, including the monitoring of the water quality of the final mining effluent. The proponent also plans to develop and implement a communication plan that would make it possible to inform users of the territory of the risks, if applicable, in the event of an incident. The proponent would inform the Cree Nations concerned and local stakeholders of any accident or malfunction having an effect on the environment.	The Committee notes that the project would be part of a regional context marked by a history of water contamination in the area by other proponents. The Committee considers the water quality management measures proposed by the proponent to be adequate and is of the opinion that these measures should ensure that the quality of water coming from the mine site meets regulatory requirements before being released into the environment. Avoidance of the project site and its surroundings by land users for fear of contamination could continue after the mine is decommissioned, despite the measures put in place by the proponent. The Committee recommends that the results of the environmental follow-up be made available to the Cree public.
	The Cree Nations point out the stress and anxiety of the users of the territory related to the possible contamination of resources, even if the resources are not contaminated.	The proponent recognizes that the activities of the mine could raise concerns about the possible contamination of the environment, game, fish and flora that constitute the traditional food of the Cree Nations. In order to limit the perception of contamination and to increase the credibility of the results of the environmental follow-up studies, the proponent undertakes, insofar as possible, to employ members of the family of the tallyman of trapline RE01 for the various environmental follow-ups. The proponent undertakes to implement several follow-up measures and programs in order to limit the project's effects on the health of the Cree Nations. The proponent also plans to inform Cree users of the territory and members of the Cree communities of the results of the environmental follow-ups.	The Committee considers that the proponent proposes several relevant measures to increase the confidence of land users in the control of contaminant discharges into the environment and to reduce the avoidance of the territory due to the perception of environmental contamination. The Committee recommends that the results of the environmental follow-ups be disseminated to the affected Cree communities, in addition to encouraging the active participation of the tallyman of trapline RE01 directly affected by the project.
Physical and cultural heritage	The Cree Nation of Eastmain would like to organize a ceremony to honour the various elements of Mother Nature prior to construction work.	The proponent undertakes to organize a recognition ceremony for Mother Nature in collaboration with the Eastmain community if the latter so wishes.	The Committee is of the opinion that the commitment made by the proponent would meet the need expressed by the Cree Nation of Eastmain.

Appendix E: Species reserved for exclusive use of the Crees, the Inuit and the Naskapis

Fur-bearing animals:

All mustelids (i.e. mink, ermine, weasels, marten, fisher, otter, skunk and wolverine)

Beaver

Lynx

Foxes

Polar bear

Muskrat

Porcupine

Woodchuck

Black bear (in the Cree traplines north of the 50th parallel)

Wolves (north of the 55th parallel)

Fresh water seals

Fish :

Whitefishes (non-anadromous)

Sturgeon

Suckers

Burbot

Hiodons (Mooneye and Goldeye)

Source: *James Bay and Northern Quebec Agreement* Section 24, Annex 2

Appendix F: Description of Fish Habitat Losses Predicted by the Proponent

Table 21: Description of Fish Habitat Losses (Lakes) Predicted by the Proponent

Lake	Total Surface Area (ha)	Destroyed Surface Area (ha)	Deteriorated Surface Area (ha)	Habitat Loss (ha)	Nature of the Effect[65]	Inventoried Species[66]	Potential Species[67]
1	7.69	7.69	0	7.69	• Complete dewatering to set up the pit which leads to destruction and mortality.	White sucker (*Catostomus commersonii)*, Pearl dace (M*argariscus margarita*), Lake chub (*Couesius plumbeus*), Brook trout (*Salvelinus fontinalis*)	Burbot (*Lota lota*), Slimy sculpin (*Cottus cognatus*), Mottled sculpin (*Cottus bairdii*)
2	4.73	4.73	0	4.73	• Complete dewatering to set up the pit which leads to destruction and mortality.	Northern Pike (*Esox lucius*), White Sucker (*Catostomus commersonii*)	Yellow perch (*Perca flavescens*)
3	33.38	0.4322	0	0.4322	• Decrease in water level and loss of habitat functions. • Gradual partial dewatering due to dewatering of Lake 2 and of the drawdown of the water table leading to the destruction of part of the littoral zone of the lake.	White Sucker (*Catostomus commersonii*), Lake Whitefish (*Coregonus clupeaformis*), Northern Pike (*Esox lucius*), Yellow Perch (*Perca flavescens*), Mottled Sculpin (*Cottus bairdii*), Walleye (*Sander vitreus*)	Burbot (*Lota lota*), Lake chub (*Couesius plombeus*)
4	26.03	0	0	0	N/A	Northern pike (*Esox lucius*), White sucker (*Catostomus commersonii*) and Yellow perch (*Perca flavescens***)**	Lake chub (*Couesius plumbeus*), Pearl dace (*Margariscus margarita*), Brook trout (*Salvelinus fontinalis*), Brook stickleback (*Culaea inconstans*)
6	4.0	0	0	0	N/A	Northern pike (*Esox lucius)*	Brook trout (*Salvelinus fontinalis*), Mottled sculpin (*Cottus bairdii*)
7	3.1	0	0	0	N/A	Northern pike (*Esox lucius)*	Brook trout (*Salvelinus fontinalis*), Mottled sculpin (*Cottus bairdii*)
8	1.07	1.07	0	1.07	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Inventory not available	Brook trout (*Salvelinus fontinalis*), Northern pike (*Esox lucius*), Mottled sculpin (*Cottus bairdii*)
9	1.37	0	0	0	N/A	Inventory not available	Brook trout (*Salvelinus fontinalis*), Northern pike (*Esox lucius*), Mottled sculpin (*Cottus bairdii*)
10	3.05	0	0	0	N/A	Inventory not available	Brook trout (*Salvelinus fontinalis*), Northern pike (*Esox lucius*), Mottled sculpin (*Cottus bairdii*)
11	9.4363	9.4363	0	9.4363	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Inventory not available	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), White sucker (*Catostomus commersonii*)

[65] Definition of “no effect”: Effect of the lowering of the water table limited by the groundwater inflow from the peripheral wells. There are flow increases even for the watercoursess in green in Figure 8 (Chapter 5.1). Even if there is no loss, there is an effect.
[66] Captured during inventories by the proponent.
[67] Species that can be found in the watercourse or water body through water connectivity with another environment where the species is present.

Lake	Total Surface Area (ha)	Destroyed Surface Area (ha)	Deteriorated Surface Area (ha)	Habitat Loss (ha)	Nature of the Effect[65]	Inventoried Species[66]	Potential Species[67]
12	2.4754	2.4754	0	2.4754	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Inventory not available	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), White sucker (*Catostomus commersonii*)
13	0.839	0.839	0	0.839	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Inventory not available	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), White sucker (*Catostomus commersonii*)
14	6.2	0	0	0	N/A	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*)	Lake chub (*Couesius plumbeus*), White Sucker (*Catostomus commersonii*), Pearl dace (*Margariscus margarita*), Brook trout (*Salvelinus fontinalis*), Brook stickleback (*Culaea inconstans*)
15	2.1	2.1	0	2.1	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Brook trout (*Salvelinus fontinalis*), Pearl dace (*Margariscus margarita*), Fallfish (*Semotilus corporalis*)	
16	6.2	0	0	0	N/A	Lake chub (*Couesius plumbeus*), White Sucker (*Catostomus commersonii*), Pearl dace (*Margariscus margari*ta) Brook stickleback (*Culaea inconstans*), Brook trout (*Salvelinus fontinalis*)	Northern pike (*Esox lucius)* Yellow perch (*Perca flavescens*)
17	4.62	0	0	0	N/A	Inventory not available	Northern pike (*Esox lucius*), Yellow perch *(Perca flavescens*), Lake chub (*Couesius plumbeus*), White sucker (*Catostomus commersonii*), Pearl dace (*Margariscus margarita*) Brook stickleback (*Culaea inconstans*), Brook trout (*Salvelinus fontinalis*)
18	1.2	0	1.2	1.2	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to both the presence of the co-disposal accumulation area and the lowering of the water table which leads to deterioration.	Brook stickleback (*Culaea inconstans*), Brook trout (*Salvelinus fontinalis*)	
19	7.9	0	7.9	7.9	• Decrease in water level and loss of habitat functions • Gradual dewatering due to both the presence of the co-disposal accumulation area and the lowering of the water table which leads to deterioration.	White Sucker (*Catostomus commersonii*), Pearl dace (*Margariscus margarita*), Brook trout (*Salvelinus fontinalis*)	Brook stickleback (*Culaea inconstans*)

Table 22: Description of Fish Habitat Losses (Watercourse) Predicted by the Proponent

Watercourse	Total Surface Area (ha)	Destroyed Surface Area (ha)	Deteriorated Surface Area (ha)	Habitat Loss (ha)	Nature of the Effect	Inventoried Species	Potential Species
A	0.7125	0.7125	0	0.7125	• Increase in the water level and flow downstream of the effluent. • Dewatering upstream of effluent due to dewatering of Lake 1, leading to destruction and mortality.	Brook trout (*Salvelinus fontinalis*),Mottled sculpin (*Cottus bairdii*), Slimy sculpin (*Cottus cognatus*), Burbot (*Lota lota)*	White Sucker (*Catostomus commersonii*)
B	0.0693	0.0693	0	0.0693	• Dewatering due to the dewatering of Lake 2 and the setting up of the pit, leading to destruction and mortality.	White Sucker (*Catostomus commersonii*)	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*)
C	3.6224	0	0	0	N/A	Brook trout (*Salvelinus fontinalis*),Mottled sculpin (*Cottus bairdii*), Lake chub (*Couesius plumbeus*), Brook stickleback (*Culaea inconstans***)**	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), Pearl dace (*Margariscus margarita*)
C’	0.0407	0.0407	0	0.0407	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to lowering of the water table leading to destruction and mortality.	Inventory not available	Brook trout (*Salvelinus fontinalis*), Pearl dace (*Margariscus margarita*), Fallfish (*Semotilus corporalis*)
D	0.5864	0	0	0	N/A	Brook trout (*Salvelinus fontinalis*), Longnose dace (*Rhinichthys cataractae*), Burbot (*Lota lota*), Pearl dace (*Margariscus marguarita*)	
E	0.1952	0.0253	0	0.0253	• Decrease in water level and flow and loss of habitat functions. • Partial gradual dewatering due to dewatering of Lake 2 and drawdown of the water table leading to deterioration.	Mottled sculpin (*Cottus bairdii***),** Longnose dace (*Rhinichthys cataractae*), White Sucker (*Catostomus commersonii*), Lake chub (*Couesius plumbeus*), Burbot (*Lota lota*)	
F	0.1951	0	0	0	N/A	Brook trout (*Salvelinus fontinalis*), Mottled sculpin (*Cottus bairdii*)	
G	0.0241	0.0241	0	0.0241	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to dewatering of Lake 2 and drawdown of the water table, leading to destruction and mortality.	Inventory not available	White Sucker (*Catostomus commersonii)*, Lake whitefish (*Coregonus clupeaformis*), Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), Mottled sculpin (*Cottus bairdii*), (*Cottus bairdii*), Walleye (*Sander vitreus*)
H	0.0113	0.0113	0	0.0113	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to drying of Lake 2 and drawdown of the water table, leading to destruction and mortality.	Inventory not available	White Sucker (*Catostomus commersonii*), Lake whitefish (*Coregonus clupeaformis*), Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), Mottled sculpin (*Cottus bairdii),* Walleye (*Sander vitreus*)

Watercourse	Total Surface Area (ha)	Destroyed Surface Area (ha)	Deteriorated Surface Area (ha)	Habitat Loss (ha)	Nature of the Effect	Inventoried Species	Potential Species
I	0.0011	0	0.0011	0.0011	• Decreased water levels and loss of habitat functions. • Partial gradual dewatering due to dewatering of Lake 2 and drawdown of the water table, leading to deterioration.	Inventory not available	White Sucker (*Catostomus commersonii*), Lake whitefish (*Coregonus clupeaformis*), Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), Mottled sculpin (*Cottus bairdii),* Walleye (*Sander vitreus*)
J	0.0051	0	0.0051	0.0051	• Decreased water levels and loss of habitat functions. • Partial gradual dewatering due to dewatering of Lake 2 and drawdown of the water table, leading to deterioration.	Inventory not available	White Sucker (*Catostomus commersonii*), Lake whitefish (*Coregonus clupeaformis*), Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), Mottled sculpin (*Cottus bairdii),* Walleye (*Sander vitreus*)
K	0.009	0.009	0	0.009	• Dewatering due to the dewatering of Lake 2 and the setting up of the pit, leading to destruction and mortality.	Inventory not availabe	Northern pike (*Esox lucius*), White sucker (*Catostomus commersonii*), Yellow perch (*Perca flavescens*)
M	1.4925	0	1.4925	1.4925	• Decrease in water level and flow and loss of habitat functions. • Gradual dewatering due to the presence of the co-disposal accumulation area and of the drawdown of the water table that leads to deterioration.	Brook stickleback (*Culaea inconstans*), Pearl dace (*Margariscus margarita*)	White sucker (*Catostomus commersonii*), Brook trout (*Salvelinus fontinalis*)
N	1.7163	0	1.7163	1.7163	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the presence of the co-disposal accumulation area and of the drawdown of the water table that leads to deterioration.	Brook trout (*Salvelinus fontinalis*)	Brook stickleback (*Culaea inconstans*)
L8-CE1	0.0360	0.0360	0	0.0360	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to lowering of the water table leading to destruction and mortality.	Inventory not available	Brook trout (*Salvelinus fontinalis*), Northern pike (*Esox lucius*), Mottled sculpin (*Cottus bairdii*)
L15-CE1	0.0012	0.0012	0	0.0012	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to lowering of the water table leading to destruction and mortality.	Inventory not available	Brook trout (*Salvelinus fontinalis*), Pearl dace (*Margariscus margarita*), Fallfish (*Semotilus corporalis*)
L15-CE2	0.01265	0.01265	0	0.01265	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to lowering of the water table leading to destruction and mortality.	Inventory not available	Brook trout (*Salvelinus fontinalis*), Pearl dace (*Margariscus margarita*), Fallfish (*Semotilus corporalis*)

Watercourse	Total Surface Area (ha)	Destroyed Surface Area (ha)	Deteriorated Surface Area (ha)	Habitat Loss (ha)	Nature of the Effect	Inventoried Species	Potential Species
L18-CE1	0.00147	0	0.00147	0.00147	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the presence of the co-disposal accumulation area and the drawdown of the water table leading to deterioration.	Inventory not available	Brook trout (*Salvelinus fontinalis*), Brook stickleback (*Culaea inconstans*)
L19-CE1	0.009	0	0.009	0.009	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the presence of the co-disposal accumulation area and the drawdown of the water table leading to deterioration.	Inventory not available	White sucker (*Catostomus commersonii*), Pearl dace (*Margariscus margarita*), Brook trout (*Salvelinus fontinalis*)
L7-CE1	0.00314	0	0	0	N/A	Inventory not available	Northern pike (*Esox lucius*), Brook trout (*Salvelinus fontinalis*), Mottled sculpin (*Cottus bairdii*)
L11-CE1	0.0872	0.0872	0	0.0872	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Inventory not available	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), White sucker (*Catostomus commersonii*)
L12-CE1	0.1332	0.1332	0	0.1332	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Inventory not available	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), White sucker (*Catostomus commersonii*)
L13-CE1	0.0634	0.0634	0	0.0634	• Decrease in water level and loss of habitat functions. • Gradual dewatering due to the lowering of the water table leading to destruction and mortality.	Inventory not available	Northern pike (*Esox lucius*), Yellow perch (*Perca flavescens*), White sucker (*Catostomus commersonii*)