

North American Lithium Spodumene Mine Project

Comprehensive Study Report

February 2018

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Rapport d'étude approfondie - Projet de mine de spodumène North American Lithium

Executive Summary

North American Lithium Inc. (the proponent) is proposing a mine Project that involves the production of lithium carbonate from a spodumene deposit until 2030. The Project is located in the southeastern part of the regional county municipality of Abitibi, in the municipality of La Corne. The Project includes the infrastructure required to develop an open-pit mine, including a 3,800 tonnes per day ore processing plant, a refinery for the extraction of lithium carbonate from spodumene, and the impoundment and storage areas required throughout the mine development phase.

Under the *Canadian Environmental Assessment Act* (S.C. 1992, c. 37) (the former Act), a federal environmental assessment is required since Fisheries and Oceans Canada will likely need to issue an authorization as part of the Project, in accordance with the *Fisheries Act*, to allow for activities that results in serious harm to fish. The Project is subject to a comprehensive study environmental assessment because it involves an activity described in item 16(a) of the *Comprehensive Study List Regulations*. The *Canadian Environmental Assessment Act (2012)* (CEAA 2012) came into force on July 6, 2012, replacing the former Act. Under the transition provisions of CEAA 2012, the comprehensive study for the Project was completed under the former Act.

The Canadian Environmental Assessment Agency (the Agency) prepared the comprehensive study in collaboration with the Federal Environmental Assessment Committee (the federal committee), composed of representatives of Fisheries and Oceans Canada, Natural Resources Canada, Environment and Climate Change Canada, and Health Canada.

In the comprehensive study report, the Agency presents the effects of the Project on the following valued ecosystem components: atmospheric environment, water quality, fish and fish habitat, birds and bird habitat, and current use of lands and resources for traditional purposes.

The Agency assessed the significance of the effects of the Project on the basis of information provided by the proponent in its environmental impact statement and supplementary documents, opinions provided by federal experts and those provided by the public and First Nations.

First Nations and the public expressed concerns regarding water management at the mine site and the Project's impact on water quality. They also raised concerns about the Project's impact on fish and its habitat, air quality, noise and the risk of accidents and malfunctions.

The proponent committed to implement the mitigation measures deemed necessary by the federal committee, which should make it possible to reduce the Project's potential effects on the environment. These measures include a dust management plan, work restrictions during sensitive periods for wildlife, a mine wastewater collection and treatment system, and compensation measures for losses related to fish habitat. The proponent also committed to implement a follow-up program for several of the valued components, as well as an emergency response plan in the event of accidents or malfunctions.

A follow-up program is required to verify the accuracy of the environmental assessment and to determine the effectiveness of the proposed mitigation measures. Fisheries and Oceans Canada, as the responsible authority for the Project, will be responsible for ensuring the development and implementation of the federal follow-up program.

Taking into account the implementation of the proposed mitigation measures and follow-up program, the Agency concludes that the Project is not likely to cause significant adverse environmental effects.

The Minister of the Environment will consider this report and the comments received from the public and First Nations before issuing an environmental assessment decision statement. The Minister will then refer the Project to Fisheries and Oceans Canada, the responsible authority, for an appropriate course of action in accordance with section 37 of the former Act.

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List of Abbreviations and Acronyms

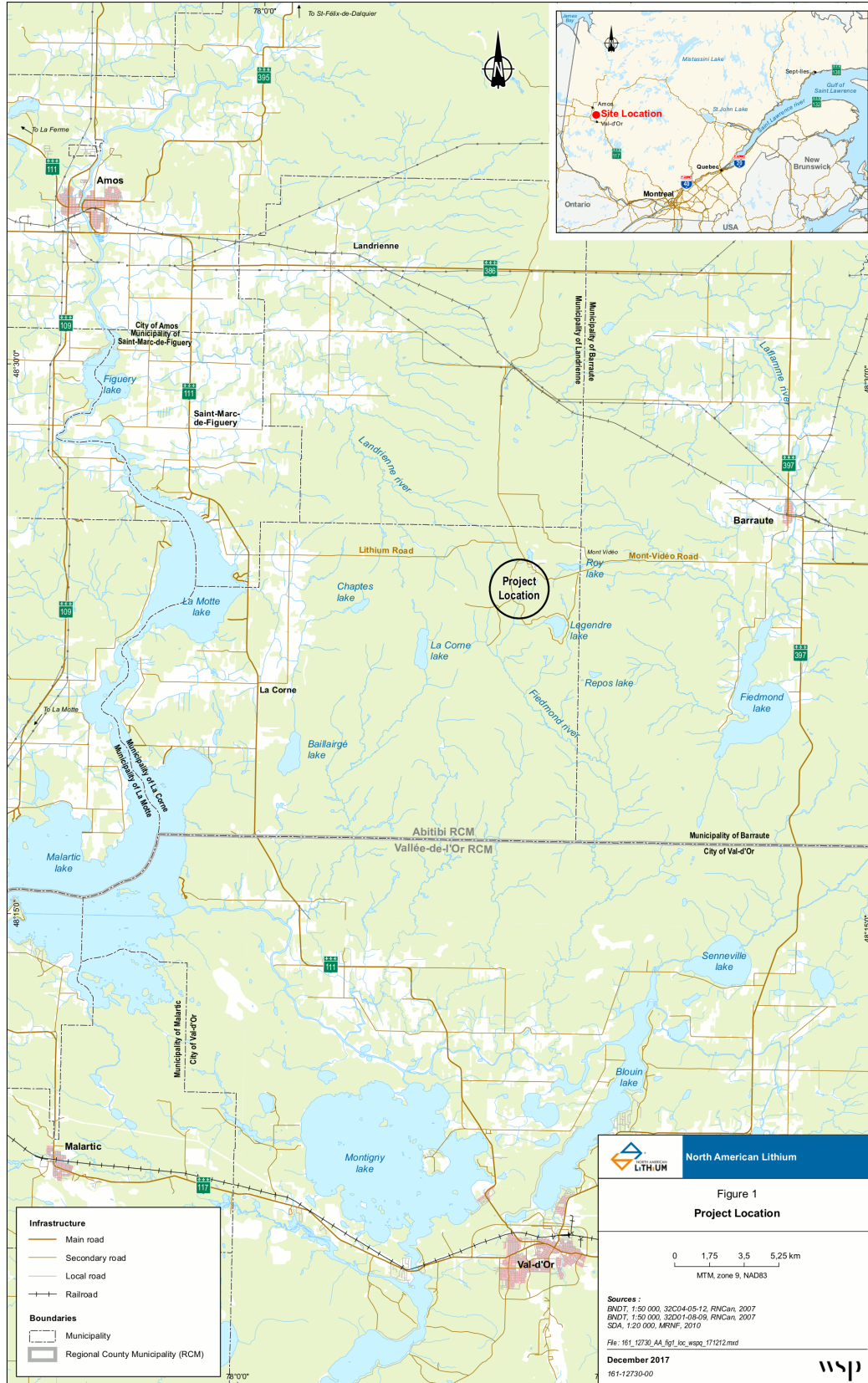
Abbreviation/Acronym	Definition
Federal review team	Federal Environmental Assessment Committee
Agency	Canadian Environmental Assessment Agency
EIS	Environmental Impact Statement
CEAA 2012	<i>Canadian Environmental Assessment Act, 2012</i>
the Act	<i>Canadian Environmental Assessment Act, 2010</i>
Proponent	North American Lithium Inc.
The Project	North American Lithium Spodumene Mine Project
t/d	Tons per day

1 Introduction

The North American Lithium Spodumene Mine Project (the Project) involves the development of a spodumene deposit until 2030. The Project is located in the in the municipality of La Corne in the southeastern part of the regional county municipality of Abitibi (figure 1). The Project includes the infrastructure required to develop an open-pit mine, including a 3,800 tonnes per day ore processing plant, a refinery for the extraction of lithium carbonate from spodumene, and the impoundment and storage areas required throughout the mine development phase.

This Project was initially called the Quebec Lithium Spodumene Mine Project and the proponent was Canada Lithium. In June 2016, Jien International, a Chinese investment company, acquired the mine and all of its assets. The company that manages the mine site (the proponent) is now called North American Lithium Inc.

Figure 1 Project location



Source: Genivar 2011

1.1 Purpose of the Comprehensive Study Report

The purpose of this comprehensive study report is to provide a summary of the information and analyses that enabled the Canadian Environmental Assessment Agency (the Agency) to determine, in accordance with the *Canadian Environmental Assessment Act* (the Act), whether the Project is likely to cause significant adverse environmental effects after taking into account the proposed mitigation measures. The Agency's conclusions are based on the environmental impact statement and additional information provided by the proponent, on an assessment of the environmental effects of the Project, and on a review of the comments received from the public and First Nations. The Agency prepared this comprehensive study report in collaboration with the Federal Environmental Assessment Committee (the federal review team) composed of representatives of Fisheries and Oceans Canada, Environment and Climate Change Canada, Natural Resources Canada, and Health Canada, which provided advice in their respective areas of expertise.

The Minister of Environment and Climate Change (the Minister) will consider this report, as well as the comments received from the public and First Nations on the report, in order to issue an environmental assessment Decision Statement regarding the significance of the adverse environmental effects of the Project. The Minister may request additional information or require that public and First Nations concerns be addressed further before issuing the Decision Statement. The Minister will refer the Project to Fisheries and Oceans Canada following the environmental assessment decision to allow the department to take the appropriate course of action in accordance with section 37 of the Act.

1.2 Scope of the Environmental Assessment

The scope of the federal environmental assessment establishes the framework and boundaries of the analysis conducted by the Agency, taking into account regulatory and legislative requirements. It defines the scope of the Project to be assessed, the factors to be considered, the selected valued components, the spatial and temporal boundaries, and the approach to the effects analysis.

1.2.1 *Environmental assessment requirements*

The proponent submitted a project description to the Agency on May 28, 2012. The Project was deemed subject to a federal environmental assessment under the *Canadian Environmental Assessment Act* (S.C. 1992, c. 37) (former Act), which was repealed and replaced by the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) on July 6, 2012. The Project is subject to a comprehensive study type environmental assessment because it involves an activity described in item 16(a) of the *Comprehensive Study List Regulations*, namely the “*construction, decommissioning or abandonment of a metal mine, other than a gold mine, with an ore production capacity of 3 000 t/d or more.*” Under the transitional provisions of CEAA 2012, any comprehensive study of a Project commenced under the former Act before the day on which CEAA 2012 came into force must be continued and completed as if the former Act had not been repealed.

The former Act applies to federal authorities that contemplate certain actions or decisions that would enable a project to proceed in whole or in part. A federal environmental assessment is required because Fisheries and Oceans Canada will have to issue a *Fisheries Act* authorization in relation to the Project in accordance with paragraph 35(2)(b) of the *Fisheries Act* which allows the carrying on of any work,

undertaking or activity that results in serious harm to fish¹ that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery without contravening subsection 35(1) of the *Fisheries Act*. The authorization is set out in the *Law List Regulations*. Because a comprehensive study type environmental assessment is required, the Agency is the responsible authority for the purposes of the environmental assessment until the comprehensive study report is provided to the Minister.

The Project is not subject to the provincial environmental impact assessment and review process set out in section IV.1 of the Quebec *Environment Quality Act*. However, a number of certificates of authorization and permits were issued by provincial authorities under section 22 of that act. The authorizations relate to the foundation footings of general buildings, the ore processing plant, the tailings storage facilities, the open pit and the waste rock pile area.

1.2.2 *Factors considered in the environmental assessment*

The following factors were considered by the Agency as part of the comprehensive study pursuant to subsections 16(1) and 16(2) of the former Act:

- the purpose of the project;
- alternative means of carrying out the project that are technically and economically feasible and their environmental effects;
- the environmental effects of the project, including those 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 projects or activities that have been or will be carried out;
- the capacity of renewable resources that are likely to be significantly affected by the project to meet present and future needs;
- the significance of the 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; and
- the need for, and the requirements of, any follow-up program in respect of the project.

In accordance with paragraph 16(1)(e)² of the former Act, the Agency required that the proponent describe the need for the Project and alternatives to the Project.

Environmental effects, as defined by the former Act, mean any changes that the carrying out of the Project may cause in the environment, including any change it may cause to a listed wildlife species, its

¹ For the purposes of *Fisheries Act*, serious harm to fish is defined as the death of fish or any permanent alteration to, or destruction of, fish habitat.

² 16(1)(e): “any other matter relevant to the screening, comprehensive study, mediation or assessment by a review panel, such as the need for the project and alternatives to the project, that the responsible authority or, except in the case of a screening, the Minister after consulting with the responsible authority, may require to be considered.”

critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*, any effects of those changes on health and socioeconomic conditions, on the current use of lands and resources for traditional purposes by First Nations, or on a structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or any changes to the Project that may be caused by the environment.

This definition also includes indirect economic and social changes that are caused by biophysical modifications of the environment. The former Act does not include the direct economic and social effects of a Project. For example, the Agency could examine the economic effects of a decline in commercial fishery performance associated with fish habitat loss, but it will not examine the economic effects associated with construction of the mine.

1.2.3 Selection of Valued components

The proponent’s assessment of the potential environmental and social impacts focused on 17 aspects of the natural and human environments that have particular legal, social or scientific value or significance and that may be affected by the Project.

The Agency grouped the aspects of the environment around the five valued components that were examined in the comprehensive study. These valued components and the rationale for their selection are described in Table 1.

Table 1 Valued components selected by the Agency

Valued component	Rationale
Atmospheric environment: air quality, greenhouse gases and sound environment.	Air quality in Quebec is protected under the province’s <i>Clean Air Regulation</i> . The Project is located in a recreation/tourism area (Roy Lake campground, Mont-Vidéo) and resort area (Legendre Lake). Dust and noise generated during the Project’s operations phase can affect residents and users of the area. Greenhouse gas emissions contribute to climate change, resulting in impacts on human health and the environment. Nitrogen oxide and sulphur oxide emissions also contribute to acid rain, which also has environmental impacts. These emissions are a concern at the provincial, national and world levels.
Water quality: groundwater and surface water.	Changes to water quality affect the capacity of the aquatic environment to support life. Water quality is important to human health and wellbeing and to wildlife (terrestrial and aquatic). Water quality is subject to the province’s <i>Directive 019 on the mining industry</i> and to federal regulatory requirements under the <i>Metal Mining Effluent Regulations</i> . Lortie, Legendre and Roy lakes are located near the mine infrastructure within the local study area. All three lakes constitute fish habitat as defined by the <i>Fisheries Act</i> and are used for fishing and other recreational activities. The groundwater resources of the Abitibi-Témiscamingue region, particularly the groundwater contained in granular aquifers found in eskers and moraines in the area, are very important to the region. The granular aquifers are resources and natural filters and some provide very high quality water. Groundwater is the source of drinking water for approximately 75% of the region’s population. The Project is located near the Harricana moraine, the protection of which is an important issue for regional stakeholders.

Valued component	Rationale
Fish and fish habitat.	<p>Fish and fish habitat support local fisheries (including traditional fisheries) and ecological diversity. They are protected under the <i>Fisheries Act</i>.</p> <p>The proponent’s surveys revealed the presence of brook trout, walleye, lake whitefish and Northern pike in the local study area. These species are fished locally and regionally.</p>
Birds and bird habitat: land birds, water birds (including waterfowl) and their habitat, including forest, wetlands, open areas and waterbodies.	<p>The protection of birds is regulated by the <i>Migratory Birds Convention Act, 1994</i>.</p> <p>Some bird species are protected under the <i>Species at Risk Act</i>.</p>
Current use of lands and resources for traditional purposes, structures and things that are of archaeological, heritage and historical significance.	<p>The Project could have an impact on traditional users of the territory and on the resources they harvest.</p> <p>The disturbance of terrestrial areas and wetlands could have effects on sites and things of archaeological, heritage and historical significance.</p>

1.2.4 Spatial and temporal boundaries

Spatial boundaries

Spatial boundaries identify the geographic areas within which the potential effects of the Project are expected to occur. The proponent has therefore defined a regional study area and a local study area for the purpose of the assessing the Project’s impacts on the biophysical and human environments. The Agency used the spatial boundaries defined by the proponent, taking into consideration the advice of experts who took part in the environmental assessment. Figure 2 presents the regional and local study areas of the comprehensive study.

The regional study area lies within the boundaries of the municipalities of Landrienne, Barraute and La Corne and covers a total area 1,117 square kilometers (111,700 hectares). It situates the Project within its socioeconomic context and makes it possible to build a picture of nearby communities and components of the human environment that are likely to be affected by the Project.

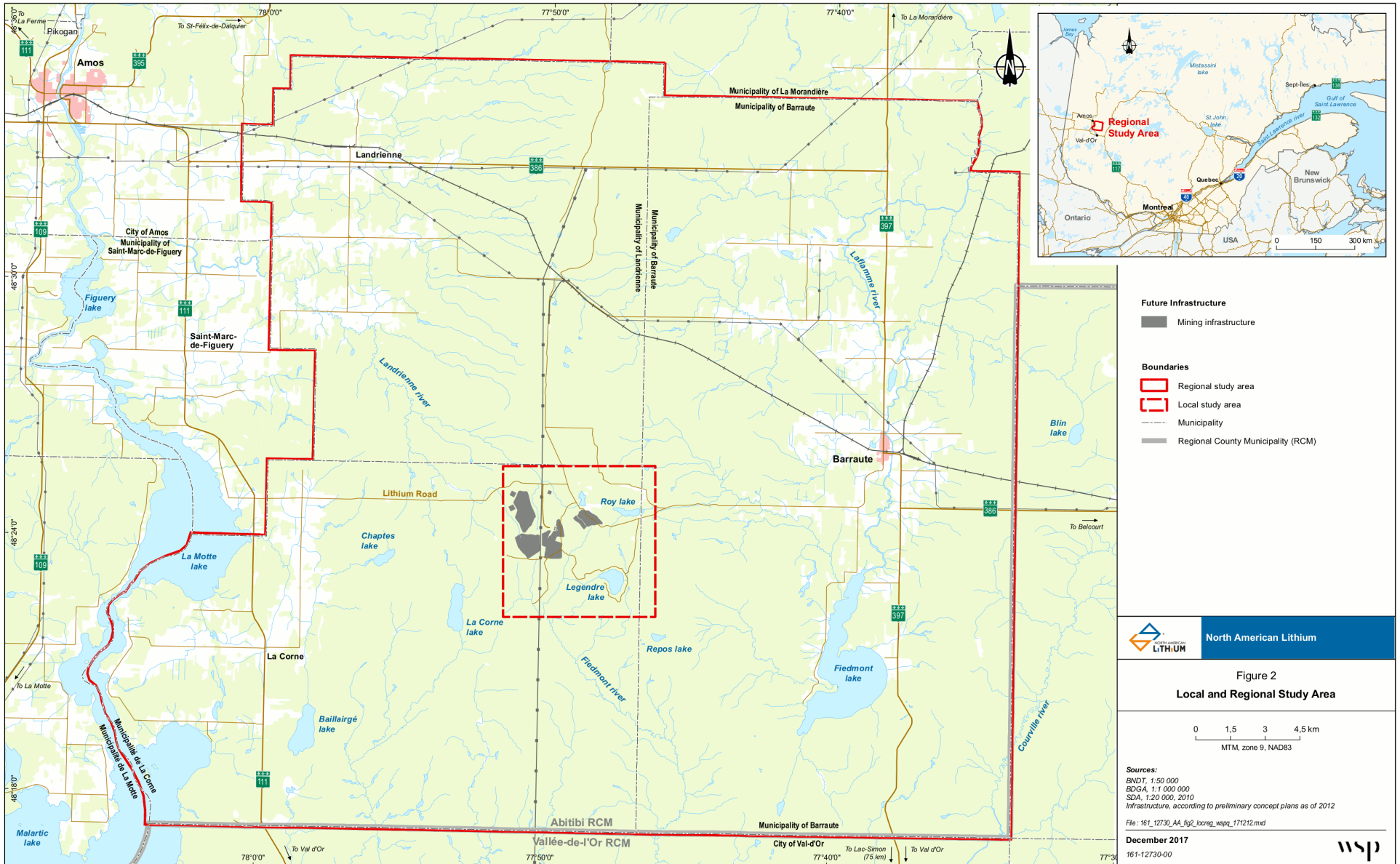
The local study area, defined on a finer geographic scale, was established in order to identify and analyze the potential effects of the Project on the components of the physical and biological environments. It covers approximately 4,300 hectares. In addition to the spodumene extraction and processing sites and related infrastructure, this area encompasses the site of Corporation Mont-Vidéo as well as Lortie, Roy and Legendre lakes.

Temporal boundaries

Temporal boundaries are established in order to define the timing and duration of all project activities likely to cause adverse effects on the environment. For this environmental assessment, the temporal boundaries considered include all phases of the Project. The construction phase, initiated in 2011 and still under way, includes tree and vegetation clearing for site preparation and the construction of mine infrastructure. The operations phase, which has resumed in 2017 and will continue over a period of

roughly 13 years, comprises the commercial production activities, including development of the open pit, wasterock management, mine water management and ore transport. Lastly, the mine closure phase is planned to take place over a period of two years and will include restoration work.

Figure 2 Local and Regional Study Areas



Source: Genivar 2013

1.2.5 *Method and approach*

The Agency reviewed the environmental impact statement and additional information provided by the proponent, the comments received from the public and First Nations and the advice from expert federal departments.

The Agency examined the effects of potential changes in the environment on the selected valued components in Table 1 and determined the significance of any residual adverse effects following the implementation of mitigation measures. The mitigation measures proposed by the proponent are described in Appendix A. The Agency then determined the significance of the residual effects for each valued component.

To characterize the significance of the residual effects, the Agency used the following three criteria proposed by the proponent:

- **Magnitude:** indicates the degree of disturbance of the component; it takes into account the ecological and social context of the component, including its sensitivity and resilience to change;
- **Extent:** is the size of the area affected or the proportion of individuals affected;
- **Duration:** is the period of time over which the effect will be felt by the valued component; duration integrates the criteria of reversibility and frequency.

Where possible, the Agency also considered applicable federal and provincial regulatory standards, criteria and guidelines to determine the significance of the effects. Appendix B summarizes the provincial and federal regulatory frameworks that apply to each valued component.

Appendix C presents further details on the residual effects assessment criteria. By combining the level of effect for each rating criterion (magnitude, extent and duration, presented in Appendix D) used to determine the severity of the effects, an overall assessment of the significance of the residual effects can be made on the basis of three levels: high, moderate and low. “High” effects are considered significant effects, whereas “moderate” or “low” effects are considered not significant.

Appendix E summarizes the residual effects assessment for the selected valued components. The Agency’s analysis and conclusions on the significance of environmental effects on the selected valued components are presented in Chapter 6.

Note that Appendices B, C, D and E were derived by the Agency using all the information collected in the environmental assessment process, namely from the proponent, the Federal Environmental Assessment Committee, First Nations and the public

2 Project Overview

2.1 Project Scope

For the purposes of the environmental assessment, the scope of the Project includes the physical works and activities associated with the construction of the mine facilities and associated facilities, ore extraction, the operation and maintenance of infrastructure, mine closure and decommissioning and final site restoration.

Canada Lithium began construction of the mine in 2011 and some production activities in 2012. At the time, the company anticipated reaching full production capacity in 2014. The former proponent had anticipated that it would not be required to obtain an authorization from Fisheries and Oceans Canada for the construction of structures that would cause fish habitat destruction until the third or fourth year of mine operations. In February 2014, RB Energy acquired the mine site assets but, due to financial difficulties, had to stop production in October 2014. Jien International acquired the company in June 2016 and resumed mine activities in the winter of 2017. At this time, certain works and activities have been completed or are currently under way and are included in the scope of the Project assessed. However, the proponent cannot carry on any work, undertaking or activity that would cause serious harm to fish until the federal environmental assessment is completed and the necessary authorizations have been obtained from the Department of Fisheries and Oceans.

In addition, the built works and mine operation activities currently under way are also subject to regulatory oversight by Environment and Climate Change Canada pursuant to the *Metal Mining Effluent Regulations* in order to ensure the protection of waters frequented by fish. It should also be noted that none of the works that have been built or planned encroach directly on any streams or waterbodies in the Project areas.

2.2 Project Components

Table 2 presents the various Project components presented by the proponent, as well as their status as of the summer of 2017. The footprint of all Project components is estimated at 569 hectares, approximately 42% of which comprises facilities that have already been built or are under construction. Figure 3 provides the general layout of the main planned facilities on the Project site.

Table 2 Project Components

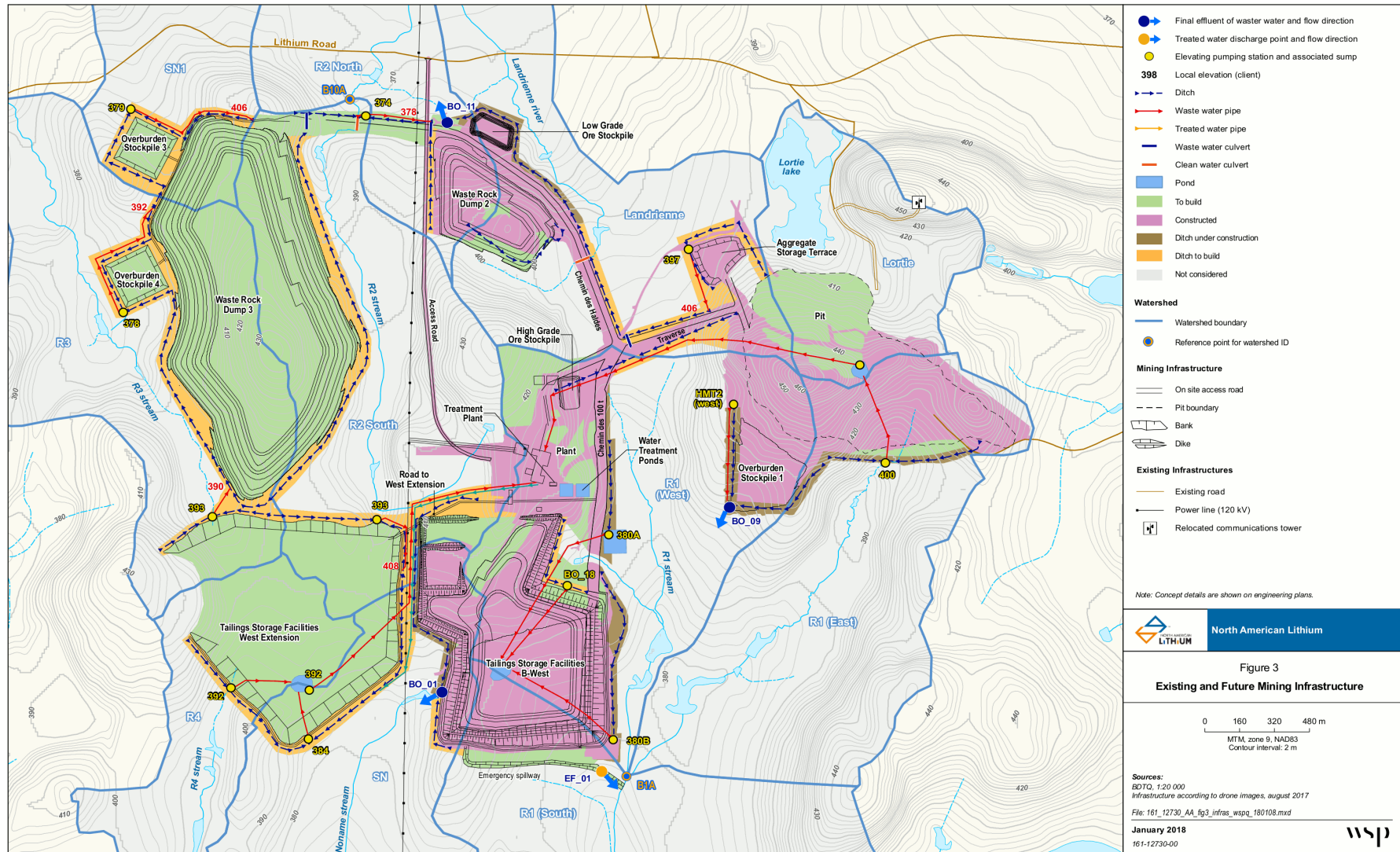
Components	Description and status as of the summer of 2017
Open-pit mine with access ramp and associated infrastructure	<ul style="list-style-type: none">• Pit operations have begun in the southern area of the pit, within the R1 creek watershed. Stripping, ore extraction and the transportation of waste rock have been carried out over approximately 50% of the total area of the pit.• The operation of the section of the pit located in the Lortie Lake watershed and the construction of associated infrastructure will begin at a later date.
Ore processing plant	<ul style="list-style-type: none">• The plant, which consists of crushers, a concentrators and conveyors, has been built.• The plant has a capacity of 3,800 tonnes of ore per day.

Components	Description and status as of the summer of 2017
Hydrometallurgical refinery	<ul style="list-style-type: none"> The section of the plant that will house the refinery has been built, but the refinery will not be built until 2018-2019. The hydrometallurgical process will be used to produce lithium carbonate from spodumene. Maximum annual lithium carbonate production is anticipated at 20,000 tonnes.
Overburden areas	<p>Overburden stockpile 1</p> <ul style="list-style-type: none"> This overburden stockpile, located on the periphery of the pit, is now constructed. Perimeter ditches have been built around the stockpile to collect surface runoff. <p>Overburden stockpiles 3 and 4 (there is no stockpile No. 2)</p> <ul style="list-style-type: none"> These stockpiles will be located on the periphery of waste rock pile 3 and are not constructed at this time.
Low-grade ore stockpile	<ul style="list-style-type: none"> The low-grade ore stockpile has been built. (In the initial proposal presented by the proponent in its environmental impact statement, the overburden stockpile was to have been located in this sector).
High-grade ore stockpile	<ul style="list-style-type: none"> The high-grade ore stockpile has been built.
Tailings storage facility	<p>Two tailings storage facilities:</p> <ul style="list-style-type: none"> Tailings storage facility B-West: Construction is almost completed. Tailings storage facility West Extension (initially identified as “facility B-West-West”): The construction of this tailings pond is planned for 2021.
Waste rock piles	<p>Waste rock pile 2:</p> <ul style="list-style-type: none"> The platform for this stockpile is almost completed. (In the initial proposal presented by the proponent in the environmental impact statement, the low-grade ore stockpile was to have been located in this sector). <p>Waste rock pile 3:</p> <ul style="list-style-type: none"> The start-up of construction of this stockpile planned for the spring of 2018. <p>Co-disposal of waste rock in tailings storage facility B-West (corresponds to Waste rock pile 1):</p> <ul style="list-style-type: none"> Waste rock will be disposed of in the tailings storage facility B-West once operation of the facility is completed.
Aggregate storage terrace	<ul style="list-style-type: none"> The aggregate storage terrace has been built. It was not part of the initial proposal, but it is needed for the storage of the various types of aggregate materials. It should be noted that there is a diesel fuel storage area on this platform.
Drainage ditches	<ul style="list-style-type: none"> Approximately 5 kilometres of drainage ditches—of a planned total of about 23 kilometres—have been built. These ditches collect drainage waters on the perimeter of the various storage areas (tailings storage facility, stockpiles, etc.).
Pumping stations	<ul style="list-style-type: none"> 5 of a planned total of approximately 14 pumping stations have been built. These pumping stations, which differ in size, will direct water to the interior of the infrastructure (ditch, tailings storage facilities) or to an outlet or into a pond where it will be treated before being discharged into the receiving environment.

Components	Description and status as of the summer of 2017
Ponds	<p>The majority of ponds are constructed and these are used for different purposes:</p> <ul style="list-style-type: none"> • Elevation ponds (identified on Figure 3 by 380A, 380B, BO_18, HTM2 and 400): water catchment pond equipped with a pumping station to elevate the water to the next transfer point (red arrows on Figure 3). • Pond containing effluent (BO_01, BO_09 et BO_11) : Water catchment pond before being discharged into the receiving environment • Process water pond (in the B-West tailings storage facility): This pond allows for storage of water that is recirculated to the processing plant and is used to supply it. • Two water treatment ponds (in proximity to the processing plant): Ponds to be constructed. Will be used to treat and manage water quality which will enter and exit the processing plant. These ponds will be required during the production of lithium carbonate
Mine water treatment system	<ul style="list-style-type: none"> • A mine water treatment system by osmosis is installed in the ore processing plant and treats the waters of the B-West tailings storage facility • A secondary mobile water treatment system will be installed when required at different discharge points into the receiving environment.
Domestic wastewater treatment plant	<ul style="list-style-type: none"> • This treatment system will be built in 2018. Domestic wastewater will continue to be collected by a specialized firm until the plant is operational.
Pipelines for tailings and recirculated water	<ul style="list-style-type: none"> • Two pipelines have been built. They connect the crusher to tailings storage facility B-West (one for tailings, the other for recirculated water).
Related facilities: <ul style="list-style-type: none"> • administrative building • workers' drying shed • garage • storage area 	<ul style="list-style-type: none"> • All of these buildings have been built. The administrative building comprises offices and sanitary facilities. • The storage area is a containment area near the plant used for the storage of propane gas.
Access and service roads (transportation of ore on site)	<ul style="list-style-type: none"> • The access road between Lithium Road (municipal road) and the administrative building and plant has been built. • The main roads for mine operations have been constructed (roads between the pit, tailings storage facility B-West, the ore processing plant and waste rock pile No. 2 and low-grade ore stockpile). • The roads between waste rock pile No. 3 and the tailings storage facility West Extension will be built at a later date.
Water intakes	<ul style="list-style-type: none"> • A water intake has been constructed and is currently operational. It supplies water to the administrative buildings (sanitary water) and plant. • A second water intake for supplying the plant is planned north of the site.
Borrow pits	<ul style="list-style-type: none"> • The borrow pits were present prior to the construction of the mine site and are owned by the surrounding municipalities. They are currently being operated by the proponent, and the material extracted is being used to construct the various infrastructure components, such as the access and service roads.

Some of the related work is not included in the Project scope because it falls under the responsibility of other proponents. This includes the realignment of a stretch of the Lithium road over 1.8 km (municipal road), a satellite site for the transfer of explosives via trucks, the relocation of a communications tower by Astral Média, and the construction of a power substation and extension of a 125 kilovolt power line by Hydro-Québec.

Figure 3 General layout of the key mine infrastructure and status as of the summer of 2017 (Note: The term “Waste Rock Piles” used in this report corresponds to “Waste Rock Dump” in the figure below).



Source: WSP 2018

2.3 Project Activities

The activities required for the construction and implementation of the Project are described in Table 3, broken down by project life-cycle phase. From construction to post-closure, the entire Project could last approximately 22 years. Since the resumption of project activities in 2017, the proponent has developed a two-phase work program to either complete the facilities or bring them online. The first phase was completed in the summer of 2017 when the concentrator facilities were finalized, enabling commercial spodumene production to begin. The second phase will start up in 2018 and will involve completing the various infrastructure required to implement the Project in its entirety, including the hydrometallurgical refinery for the production of lithium carbonate.

Table 3 **Project activities (activities followed by a * are completed)**

Activities and works associated with the Project	Description
Construction phase (2011–2019)	
Site preparation	<ul style="list-style-type: none"> • Mobilization and installation of construction infrastructure;* • Clearing and grubbing; • Removal and stockpiling of overburden; • Site levelling and excavation; • Ditch construction; installation of surface water regulation system, and erosion and sediment protection; • Operation of borrow pits.
Construction of mine site infrastructure	<ul style="list-style-type: none"> • Construction of access road and service roads;* • Construction of the administrative building, workers' drying shed and garage for mechanical equipment maintenance;* • Construction of the containment and storage areas (low-grade and high-grade ore stockpiles, waste rock pile 2, B-West tailings storage facility, overburden stockpile 1);* • Construction of the refinery (hydrometallurgical processing); • Construction of service roads for waste rock pile 3 and the West Extension tailings storage facility; • Culvert installation; • Construction of the containment and storage areas (waste rock pile 3, West Extension storage facility, overburden stockpiles 3 and 4).
Construction equipment – transportation and traffic	<ul style="list-style-type: none"> • Use, maintenance and movement of the equipment needed on site (bulldozers, drilling machines, excavators, etc.); • Road transportation of construction materials and equipment and workforce traffic.
Hazardous materials and waste management and disposal	<ul style="list-style-type: none"> • Handling, management and transportation of waste and hazardous materials for disposal, recycling and reuse.

Activities and works associated with the Project	Description
Operation phase (until 2030)	
Open pit mining	<ul style="list-style-type: none"> • Drilling, blasting and extraction of rock for a total of some 102 million tonnes for the entire duration of the Project; • Pit dewatering through pumping of mine water; • Transportation of ore to processing facilities; • Transportation of waste rock to stockpiles.
Ore processing	<ul style="list-style-type: none"> • Crushing, storing, grinding, sieving, flotation concentration and magnetic separation of ore; • Production of spodumene concentrate; • Production of lithium carbonate (Li₂CO₃); • Transportation, storage and use of chemicals.
Waste management	<ul style="list-style-type: none"> • Disposal of tailings at the tailings storage facility by pipeline; • Dewatering of waste and pumping; • Progressive rehabilitation of site.
Water management and Water balance	<ul style="list-style-type: none"> • Supply from groundwater well to meet water needs; • Water management: effluents, mine water, process water, runoff and domestic wastewater. Clean water that has not been in contact with the mine site will be redirected to a discharge point.
Hazardous materials and waste management	<ul style="list-style-type: none"> • Handling, management and transportation of waste and hazardous materials for disposal, recycling and reuse.
Mining equipment	<ul style="list-style-type: none"> • Use, maintenance and movement of heavy machinery and vehicles. The equipment expected is as follows: mine trucks with a capacity up to 100 tonnes, excavators, drilling machines, percussive drill, backhoe loader, water and fuel tanker trucks, one grader, one snow plow and sander, one bulldozer (track or wheel).
<ul style="list-style-type: none"> • Closure and restoration phase (2030–2032) 	
Site decommissioning	<ul style="list-style-type: none"> • Mine site: <ul style="list-style-type: none"> ○ Dismantling of buildings and support infrastructure; ○ Removal of mine water collection and treatment system and water supply infrastructure; • Capping of dewatering wells and abandoning of groundwater wells; • Installation of warning signs around the open pit.
Site reclamation	<ul style="list-style-type: none"> • Final site rehabilitation and revegetation of the mine site, waste rock piles and tailings storage facilities; • Flooding and securing of the pit area; • Management of waste and hazardous materials; • Rehabilitation of contaminated sites, if applicable; • Management of access to site.

The closure and restoration phase of the Project was detailed on the basis of the information available. According to the information provided by the proponent, all the surface infrastructure will be dismantled when the mine is closed. Given the topography of the site, runoff will be partly directed naturally to the waste accumulation site and then discharged into the environment. The pond will remain operational until no water remains and until the effluent met all regulatory requirements. The pond will then be filled in and covered with overburden to promote revegetation and allow for the recovery of a natural forest landscape. In addition to this work, the restoration of the mine site will include backfilling of the water collection ditches, grading, scarification of the surface and, lastly, revegetation of the entire site. The post-closure phase, which will take 10 years, will be devoted to monitoring the quality of the effluent and groundwater, agronomic monitoring and controlling the integrity of the works.

Decommissioning of the mine site will be subject to all provincial and federal regulatory requirements, including the *Quebec General Mining Site Rehabilitation Requirements, Directive 019 on the mining industry* and any other applicable provisions, such as the *Soil Protection and Rehabilitation of Contaminated Sites Policy* and the *Land Protection and Rehabilitation Regulation*.

3 Project Rationale and Alternatives considered

3.1 Purpose of the Project

The proponent indicates that the Project's purpose stems from a business opportunity, based in particular on global economic growth and a promising forecast for lithium carbonate on the market. Lithium is a soft metal of major interest for the manufacturing of batteries as an alternative source of energy production. Lithium batteries are cheaper, longer-lasting, lighter and easier to charge. These properties make them an ideal energy source for electronic devices. According to the proponent, with the advent of electric and hybrid vehicles, demand for lithium is expected to increase because most automobile manufacturers have opted for lithium technology rather than nickel as the source of their vehicles' energy supply. The proponent estimates that the Project is necessary to better respond to this demand by generating a new supply.

3.2 Alternatives to the Project and Alternative Means

The following sections present the alternatives and other means analyzed and the options chosen by the proponent.

3.2.1 *Project alternatives*

The alternatives to the Project are different ways to respond to the Project's rationale and need. The Project involves the operation of an open pit mine with a maximum production of some 20,000 tonnes of lithium carbonate annually that will be chiefly intended for export to international markets. The alternatives to the Project are limited because the resource sought can only be found by mining another deposit located on the same site as the Project being developed. While it is true that the overall world demand for lithium carbonate could be met through the mining of other deposits, the proponent believes that this would deprive the region of the associated socio-economic benefits. The only alternative to the mine Project would be the status quo, that is, not carrying out the Project.

3.2.2 *Alternative means of carrying out the Project*

Pursuant to paragraph 16(2)(b) of the former Act, the proponent must conduct an assessment of technically and economically feasible alternative means and their environmental effects is also required. The proponent looked at a number of alternatives for the following Project components:

- the ore extraction method;
- the location of the mine complex, which includes the ore processing plant, the refinery, the administrative buildings and the drying shed for the workers;
- the location of the waste rock, overburden and low-grade ore accumulation sites;
- the location of the tailings storage facilities;
- the plant's water supply.

A table providing a summary of the alternative means analyzed by the proponent and their advantages and disadvantages is presented in Appendix F.

3.2.3 *Ore extraction method*

The proponent looked at two methods for extracting the ore: open pit and underground mining. Since the ore deposit is shallow, the proponent judged that the Project would not be viable as an underground mine for technical and economic reasons, specifically because of the need to excavate numerous access shafts, the greater need for equipment and constraints for workers, particularly with respect to safety. The proponent selected an open pit mine for the following reasons: it would reduce capital and operating costs, while improving the recoverability of the ore.

3.2.4 *Location of the mine complex*

The mine complex, which consists of the processing plant and various service buildings, required an area of some five hectares. The proponent looked at four possible locations in terms of economic, technical and environmental considerations (Figure 4). The proponent paid particular attention to the presence of wetlands because of their environmental interest and the technical constraints involved in intervening in such an environment. The various options were thus assessed with a view to minimizing the complex's impact on wetlands. The option chosen by the proponent, namely the site that is located close to the pit, is the one that encroaches the least on the wetlands (an area of approximately 0.4 hectares) and that minimizes the economic and technical constraints.

3.2.5 *Location of waste rock, overburden and low grade ore*

In order to determine the location of waste rock and overburden accumulation sites, the proponent took into account a number of technical, economic, environmental and socio-economic criteria. It considered only sites located at a maximum distance of three kilometres from the pit to minimize transportation-related costs and air emissions. From a technical standpoint, the main constraint was the hilly topography of the sector around the pit, which limited the number of potential sites. Moreover, the proponent took into account the public's concerns and chose to preserve a minimum one-kilometre buffer zone between the site and the residences located on Legendre Lake, and to not encroach on the area to the east of the pit in order to limit the visual impact from the top of Mont Vidéo. The proponent also chose to avoid locating the overburden stockpiles at the bottom of valleys or in stream beds, as well as on the permeable deposits of the Harricana moraine. This will limit the possible impact on groundwater and on fish and their habitat.

The preferred option for waste rock management is storage in two waste rock piles north of the mine complex co-managed at the B-West tailings storage facility. This option would minimize the footprint of the waste rock on the overall Project.

Moreover, the proponent chose to locate three overburden stockpiles next to the mine infrastructure, two to the west of waste rock pile 3 and one south of the pit.

3.2.6 *Location of tailings storage facilities*

To determine the best place to store mine waste, the proponent conducted an analysis of the options using the methodology proposed in the *Guidelines for the Assessment of Alternatives for Mine Waste Disposal*. The proponent first identified 11 different sites, 9 of which were located within a 10-kilometer radius of the ore extraction site (Figure 5). After eliminating the sites presenting major constraints, such as inadequate storage

and a potential impact on groundwater, wetlands and fish habitat, 7 sites were selected and underwent further characterization. The proponent then evaluated the sites based on environmental, technical, economic and socio-economic criteria. The analysis was performed using a decision matrix with quantitative weighting of the criteria in order to compare the site options with each other.

On the basis of this analysis, the B-West and West Extension sites were considered to be the option that offered the best balance of the environmental, economic and social aspects of the Project (Figure 3). According to the proponent, this option has the following benefits:

- the tailings storage facilities are located less than two kilometres from the concentrator, which reduces the length of the pipeline and the impact of tree clearing;
- it limits the impact on wetlands and old-growth forests and maximizes the use of areas that have already been disturbed;
- it offers a water supply and sufficient potential for expansion;
- it avoids the storage of mine waste in a natural fish bearing water body.

3.2.7 *The plant's water supply*

For the plant's operations, the proponent wanted to maximize the use of mine waste water produced on site and minimize liquid discharges and the use of fresh water. The proponent estimates that its total water needs will be 1,780,000 cubic metres annually, and the majority of this need will be met by the recirculation of plant process water (1,100,000 cubic metres annually). The proponent therefore estimates an additional supply of water (680,000 cubic metres annually) will be required and that a limited portion of this additional water will have to be fresh water in order to meet the plant's needs and the needs of some mixes in the ore processing.

The proponent considered the following additional water sources as options:

1. water from Roy Lake;
2. offsite runoff;
3. Pit dewatering water, onsite runoff from the mine site and water from the mine waste storage site after treatment;
4. Groundwater (well).

Since option 1 would not fully meet the mine complex's needs, it was rejected. The proponent also rejected option 2, because it felt that using offsite runoff could potentially impact aquatic wildlife and that options 3 and 4 were sufficient to meet the plant's operational needs.

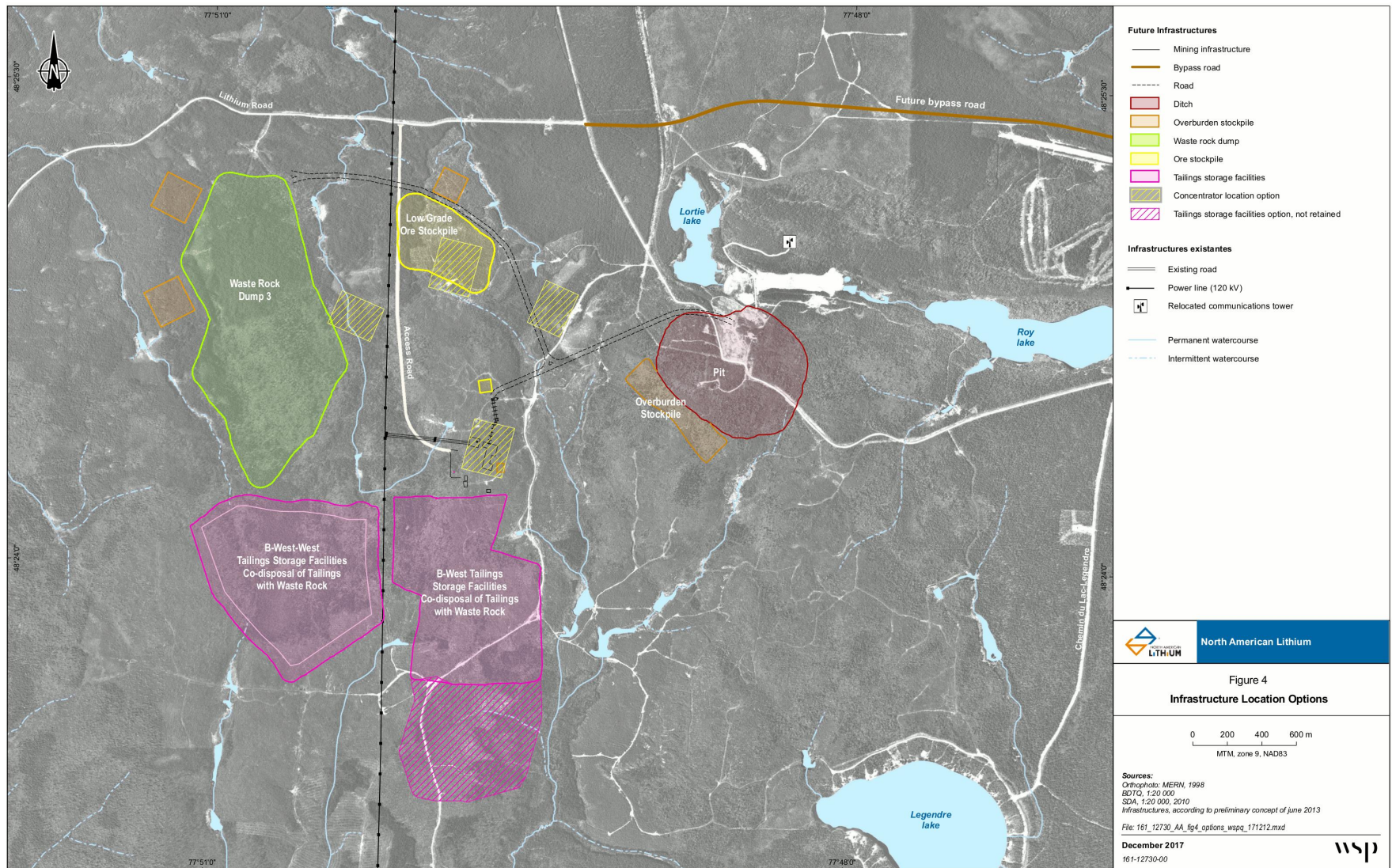
The proponent estimated that an additional 680,000 cubic metres of water will be needed annually to operate the plant, and that the water will come primarily from pit dewatering water, onsite runoff and water from the mine waste accumulation site (option 3). In order to meet the demand based on needs and supply the plant with a certain amount of fresh water, an estimated 13,000 cubic metres of this 680,000 cubic metres annually will come from a water inlet (option 4).

3.3 Conclusion of the Agency on the Selected Alternatives and Other Means to Carry Out the Project

The Agency is of the opinion that the proponent sufficiently assessed alternative means to carry out the Project and other means to carry out the Project for purposes of the environmental assessment under the previous Act.

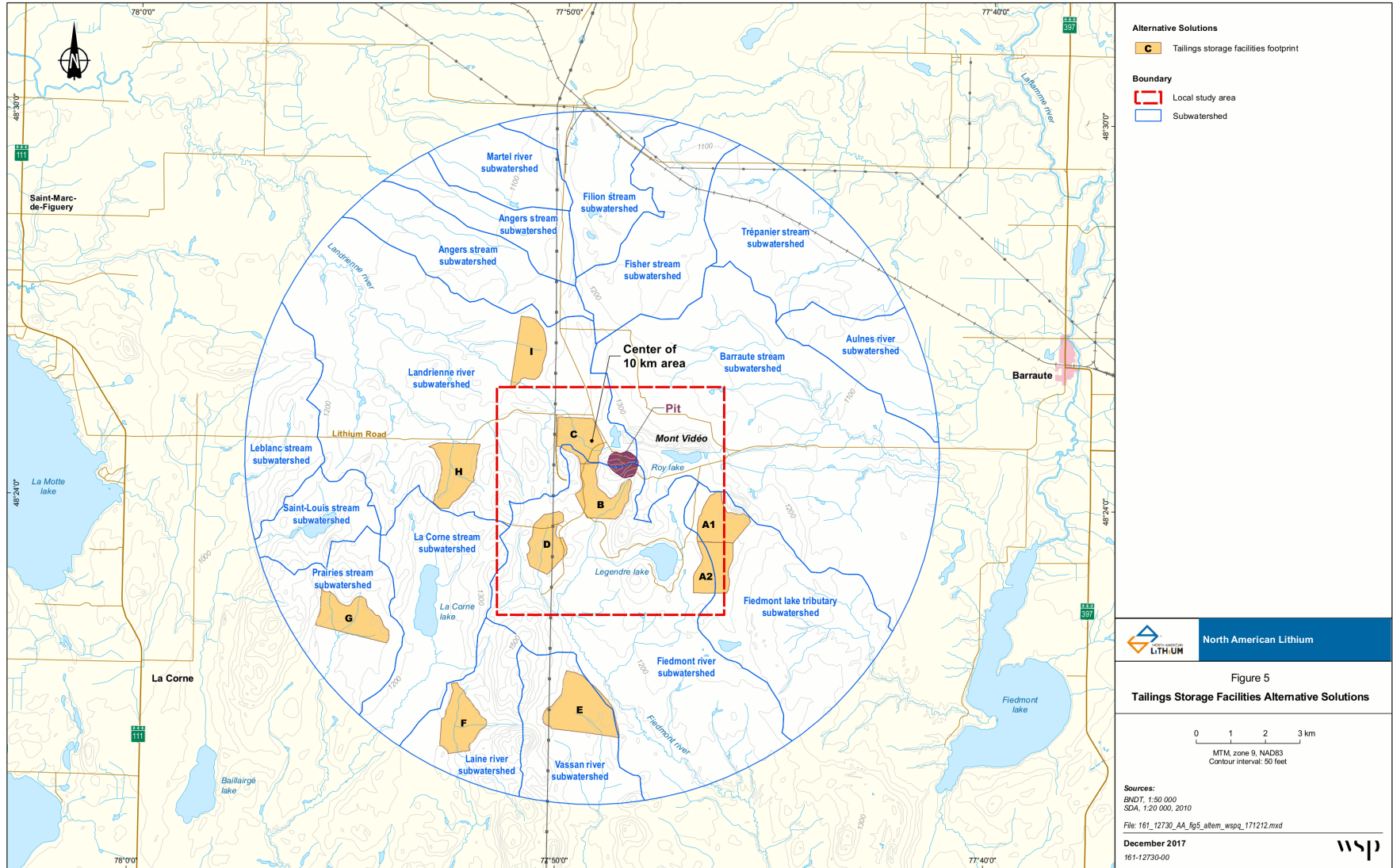
The Agency reviewed the assessment of the alternatives and other means to carry out the Project conducted by the proponent and its responses to the concerns raised during consultations with First Nations and the public. For each component required in the environmental impact statement guidelines, the proponent defined other technically and economically feasible means to carry out the Project, identified the environmental effects of these other means, and chose a preferred means that should be submitted to a full assessment.

Figure 4 Options for the location of the mine complex and tailings storage facilities (*See figure 3 to view the updated layout of the various facilities)



Source: Genivar 2013

Figure 5 Options for the location of tailings storage facilities



Source: Genivar 2013

4 Consultation Activities and Advice Received

Public and Aboriginal consultations improve the quality and credibility of environmental assessments. Comments and concerns expressed in consultations help identify the potential impacts of a Project, starting at the planning stage. As part of this Project, the Agency, in cooperation with the Federal Environmental Assessment Committee, held several public and Aboriginal consultation activities.

4.1 Crown Consultation by the Agency

In order to fulfill the federal government's consultation obligations, the Agency held consultations with First Nations, integrating consultations in the environmental assessment process.

For this environmental assessment, the Agency assumed the role of Crown Consultation Coordinator. The Agency consulted with the Cree Nation Government, the Abitibiwinni First Nation and the Anishinabe First Nation of Lac Simon.

The Agency supports First Nations' participation through the Participant Funding Program. The Cree Nation Government received and declined this offer having determined that the Project would have no impact on their rights. The Algonquin Nations of Abitibiwinni and Lac Simon applied for and received financial assistance from the program. The Agency provided a total of \$40,211 in funding to ensure that the First Nations could participate in the environmental assessment.

Cree Nation

The Cree Nation Government is a signatory to the *James Bay and Northern Quebec Agreement (JBNQA)*, a protected treaty under section 35 of the *Constitution Act, 1982*. The Project is located in the southern part of the territory covered by the JBNQA. Initially, the Cree Nation Government expressed interest in participating in the environmental assessment process, since the Project is located near the Harricana River watershed, a territory valued by the Cree. Later, the Cree Nation Government specified that it was interested only in being consulted about the environmental effects or the mitigation measures affecting that river. After analysis, the Cree Nation Government and the Agency concluded that the Project posed a very low risk of potential environmental effects on the Harricana River. The Agency proposed that the Cree Nation Government continue to be informed during the main phases of the environmental assessment for the Project, even though the Cree Nation did not anticipate that its rights would be negatively impacted.

Algonquin Nations

The mining Project is located on an Algonquin asserted ancestral land that they identify as Nitakanin. The territory, which includes nine communities in Quebec, is the subject of land claims by the Algonquin Nations. The Agency invited the First Nations who have an interest in the Project to participate in the consultations. Two Algonquin Nations, the Abitibiwinni First Nation and the Anishinabe Nation of Lac Simon, stated that they use the Project area for activities such as hunting, trapping, berry picking and fishing.

Both First Nations indicated that the Project was likely to have adverse effects on their current use of the land for traditional purposes, due to the anticipated impacts on wildlife and plants and on the ecosystem as a whole.

For the two Algonquin Nations with a potential interest in the Project, the Agency proposed a consultation plan that provided for participation activities at various stages of the environmental assessment. At the end of the process, the Abitibiwinni First Nation and the Anishinabe Nation of Lac Simon will have had three formal consultation opportunities. The Agency informed the councils of these two Algonquin Nations of the three opportunities by letter and maintained regular communications with them throughout the comprehensive study process.

Paper copies of the draft EIS guidelines and the environmental impact statement summary were provided to the members of the Algonquin Nations at Pikogan (Abitibiwinni) and at Lac Simon. In addition, calls and meetings were organized to facilitate discussion.

During the first consultation period, which sought comments on the draft EIS guidelines (June 8 to July 23, 2012), the Agency did not receive any comments from either of the two Algonquin Nations.

The second consultation gave the Abitibiwinni and Lac Simon communities an opportunity to comment on the potential environmental effects of the Project, the potential impacts on asserted or treaty rights, and the accuracy of the information provided by the proponent in the environmental impact statement. During that phase, both Algonquin Nations provided a submission and comments to the Agency. The concerns of the First Nations are summarized in Appendix G.

For the third consultation period, the Agency invited the Abitibiwinni First Nation and the Anishinabe First Nation of Lac Simon to provide comments on the content, conclusions, and recommendations of this comprehensive study report. The Agency will present the comments received to the Minister of the Environment and Climate Change Canada to inform her decision concerning the environmental assessment for this Project. If the environmental assessment decision is favourable, Fisheries and Oceans Canada may hold further consultations on the authorizations to be issued for the Project under the *Fisheries Act* for activities likely to cause serious harm to fish.

4.2 Public Consultation by the Agency

The Agency offered members of the public the opportunity to submit comments on the draft EIS guidelines and on the summary of the proponent's environmental impact statement. The Agency is now soliciting comments on the comprehensive study report.

The Agency supported public participation through its Participant Funding Program. In total, \$33,499 was granted to six organizations: Société de l'eau souterraine Abitibi-Témiscamingue, Organisme de bassin versant Abitibi-Jamésie, Mining Watch Canada, Société pour vaincre la pollution, Nature Québec and Action boréale de l'Abitibi-Témiscamingue.

To announce the consultation periods and the Participant Funding Program, the Agency posted notices on the Canadian Environmental Assessment Registry Internet Site and in the following local newspapers: *Le Citoyen de l'Harricana*, *L'Écho Abitibien*, and *The Nation*.

Paper copies of the draft EIS guidelines and the summary of the environmental impact statement were made available to the public in the consultation centres in Amos and Barraute. The Agency also sent copies of those documents to the organizations which it had provided with funding.

The first consultation period on the draft guidelines was held from June 8 to July 23, 2012. During that consultation period, the Agency did not receive any comments from the public.

The second consultation period, from September 3 to October 3, 2013, sought comments from interested parties on the potential environmental effects of the Project and the mitigation measures proposed by the proponent in its environmental impact statement. During that consultation period, the Agency received submissions from three environmental organizations. The main concerns expressed were related to the effects of the Project on fish and fish habitat due to water management and possible contamination of surface water. Concerns were also expressed about the fact that mine operations had begun and that accidental spills had occurred on the Project site. Other issues raised included the Project's effects on groundwater and wildlife, and the risks of accidents or malfunctions related to the Project.

For the third consultation period, the Agency invites the public to submit comments on the content, conclusions and recommendations in this comprehensive study report.

4.3 Participation Activities by the Proponent

The proponent noted in its environmental impact statement that a public communication and consultation plan had been developed and implemented since at the exploration phase of the Project in 2009. The consultation process was divided into two separate phases. The objectives of the first phase of consultation activities were to inform community representatives and the general public and give them the opportunity to express their concerns and expectations. That phase took place from January to May 2010. Eighteen meetings were held with stakeholders from various groups, including representatives of governments, municipalities, the Abitibiwinni First Nation Council, recreation and tourism groups, and the public.

The purpose of the second consultation phase was to inform the stakeholders about progress on the Project and to hear their concerns and expectations. That phase took place from October 2010 to March 2011. About 30 meetings were held with 27 stakeholder groups, including representatives of governments, municipalities, the Abitibiwinni First Nation, Natural Resources Canada, the Anishinabe First Nation of Lac Simon Council, recreation and tourism groups, local and regional development organizations, environmental groups, and the public. That process resulted in a follow-up committee being established. The follow-up committee would ensure active monitoring of mine development, respond to participants' questions and concerns, and solve problems quickly should any arise.

The proponent signed a pre-operational collaboration agreement with the Abitibiwinni First Nation and the Anishinabe First Nation of Lac Simon which provides for discussions between the three parties for the purpose of drawing up and implementing an impacts and benefits agreement.

4.4 Concerns raised

The Agency took the concerns and comments received from the public and the Algonquin Nations into consideration in its analysis (see Chapter 6). The Agency also forwarded the comments received to the proponent. Appendix G contains a summary of the concerns expressed by the First Nations during the environmental assessment process until publication of the comprehensive study report; the annex also includes the responses from the proponent and the Agency. The main issues raised by the participants are the following:

Impacts on surface water and groundwater

A number of intervenors, including the Abitibiwinni First Nation and the Anishinabe First Nation of Lac Simon, are concerned about water management on the site and about the risk that surface water and groundwater will become contaminated, particularly by infiltration of water from the waste rock and tailings piles and plant process water. They are worried about the risks of contamination in the Harricana River and Fiedmont River sub-watersheds located to the south and downstream of the mining operations, as well as the potential impacts associated with groundwater pumping, particularly on the water levels of Lortie, Roy and Legendre lakes.

Impacts on fish and fish habitat

The organizations consulted ask that the Project's impacts on fish and fish habitat be assessed thoroughly. The impact analysis and the implementation of mitigation measures must cover not only Lortie Lake, but also Roy Lake and Legendre Lake. The Abitibiwinni First Nation fears that potential spills of contaminated water would have a long-term impact on lake sturgeon, a species valued by this Algonquin Nation.

Environmental monitoring

Some intervenors believe that the environmental monitoring should be the responsibility of an independent committee. In addition, the Organisme de bassin versant Abitibi-Jamésie recommends that water quality monitoring points be added in the Bell River watershed. The Abitibiwinni First Nation has asked the proponent to carry out environmental monitoring of lithium concentrations at all the necessary locations during the operation, closure and restoration phases. The Anishinabe First Nation of Lac Simon wants to participate in the environmental monitoring and restoration work.

Contamination of traditional food

The Anishinabe First Nation of Lac Simon states that its members are wondering about the impacts of the mining operations and lithium production on the animals they normally eat, particularly beaver, partridge and moose.

Traditional land use

The Abitibiwinni First Nation and the Anishinabe First Nation of Lac Simon are afraid that the Project will negatively impact their hunting, fishing and trapping activities in the region. For example, the noise of mine operations could interfere with auditory hunting.

Mine restoration

A number of intervenors, including the Abitibiwinni First Nation and the Anishinabe First Nation of Lac Simon, asked questions about the quality of the restoration plan to be applied, and about potential future use of the site. These Algonquin Nations and many other intervenors want to be involved in restoration of the site.

Accidents and malfunctions

Many intervenors are concerned about risk management, particularly regarding management of water and of the tailings storage facilities. There were two accidental spills in 2013 and 2014, and the intervenors want the proponent to implement measures for preventing any recurrence of such an accident. The Anishinabe First Nation of Lac Simon wants to be informed of any disaster or spill, regardless of whether or not the proponent is of the opinion that there could be impacts on land users.

4.5 Participation of the Federal Government and Other Experts

Several federal departments provided expertise, Project-relevant information and knowledge according to their respective areas of jurisdiction pursuant to subsection 12(3) of the former Act. Federal authorities who are members of the Federal Environmental Assessment Committee provided advice during the review of the proponent's environmental impact statement and the preparation of this comprehensive study report. They represented Fisheries and Oceans Canada, Environment and Climate Change Canada, Natural Resources Canada and Health Canada.

Fisheries and Oceans Canada, which has regulatory and legal responsibilities under the *Fisheries Act*, provided comments and information on the potential adverse effects of the Project on fish and fish habitat.

Environment and Climate Change Canada (ECCC) has regulatory and legal responsibilities under the *Canadian Environmental Protection Act, 1999*, the *Migratory Birds Convention Act, 1994*, the *Species at Risk Act*, section 36 of the *Fisheries Act*, and the *Metal Mining Effluent Regulations*. Environment and Climate Change Canada provided comments and information on water quality, air quality, greenhouse gases, accidents and malfunctions, migratory birds and their habitats, and species at risk including the Canada warbler and the common nighthawk.

Natural Resources Canada provided expertise in mine waste management, acid mine drainage and metal leaching, geology and hydrogeology related to the mining sector. Natural Resources Canada has regulatory and legal responsibilities under the *Explosives Act*. In the event that the manufacture or storage of explosives is required for the Project, Natural Resources Canada may be required to issue a license, permit or certificate under the *Explosives Act* and its regulations.

Health Canada provided comments and information about the Project's potential adverse effects on the health of First Nations communities due to changes in air quality, water quality, the sound environment, and contamination of traditional foods.

5 Geographic Setting

5.1 Physical Environment

The regional study area is located in the Canadian Shield, within the physiographic unit of the Abitibi–James Bay Lowlands. The gently rolling terrain was formed and smoothed by thick clay deposits from the vestiges of a proglacial lake, Ojibway–Barlow. Several discontinuous lines of rocky hills, including Mont Vidéo (470 m), rise above the clay plain.

A major feature created by the last deglaciation in Abitibi–Témiscamingue was the Harricana moraine. The Regional County Municipality of Abitibi identifies the Harricana moraine as an esker. Beneath the moraine lies a productive granular aquifer that provides water recognized for its very high quality. The moraine is located to the north and northeast of the pit, at the divide between the waters flowing northwest toward the Landrienne River and those flowing northeast toward Barraute Creek (a tributary of the Laflamme River). Within the mining complex, the groundwater flows toward the east and the south; in the tailings storage areas, it flows toward the south.

The mining Project is located in the headwaters of the Laflamme, Fiedmont and Landrienne rivers. The main Project infrastructure, such as the mining complex, the pit and the mine waste storage areas, is located within the watersheds of the Fiedmont and Landrienne rivers. The pit is at the intersection of the three watersheds. Three main bodies of water dominate the local study area, namely Roy Lake, Legendre Lake and Lortie Lake (see Figure 6).

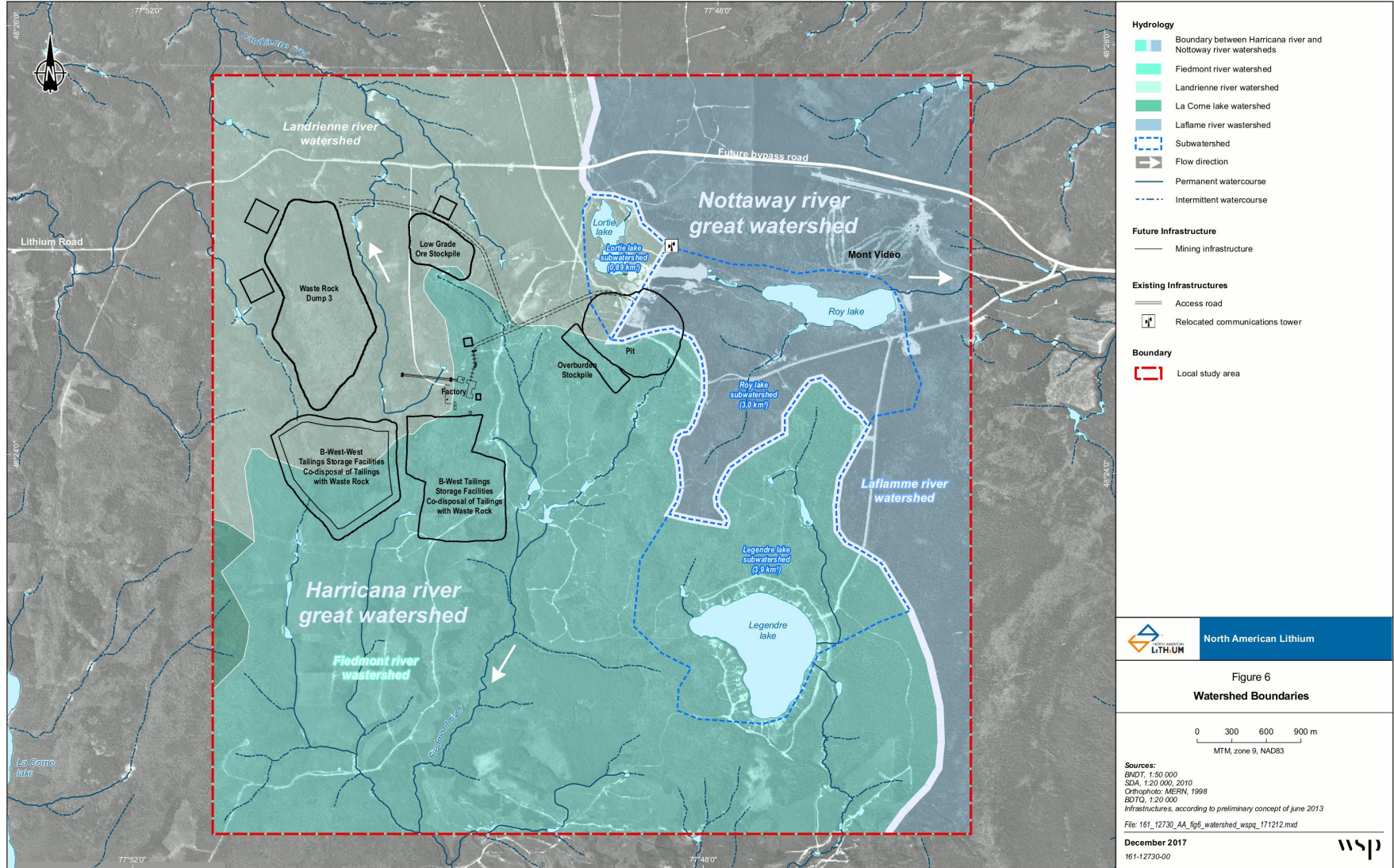
The Project is located in the Abitibi–Témiscamingue region, which has a cold temperate continental climate. The average temperature in July is 17.2°C; in January, it is -17.2°C. Average annual rainfall is 635 milliliters, and average annual snowfall is 300 centimeters.

The study area lies within the western portion of the balsam fir–white birch bioclimatic western sub-domain. Out of a total terrestrial surface area (excluding water bodies) of 4,193 hectares, more than 90% (3,879 hectares) of the local study area is covered by forests. Softwood stands are the most abundant, followed by mixed stands. Hardwood stands are much rarer and consist almost exclusively of trees that are young or regenerating, mostly due to logging. The Project area is also characterized by a large number of wetlands, including many peat bogs.

Most of the water bodies and watercourses in the local study area constitute fish habitat, and 15 species have been identified in the peripheral areas of the Project site, including brook trout, walleye and northern pike. Numerous mammal species including moose, black bear and beaver are likely to be found in the local and regional study areas, as are many bird, reptile and amphibian species that depend on the forests, lakes, rivers and wetlands as habitats for foraging and reproduction.

Six bird species listed in Schedule 1 of the *Species at Risk Act* may be found in the local study area: short-eared owl, olive-sided flycatcher, rusty blackbird, bobolink, Canada warbler and common nighthawk.

Figure 6 Boundaries of the watersheds in the local study area (* See figure 3 to view the updated layout of the various facilities)



Source: Genivar 2013

5.2 Human Environment

The Project is located in the administrative region of Abitibi-Témiscamingue, within the territory of the municipality of La Corne, a community with a population of 719 located about 30 kilometres southwest of the mining site. The regional study area encompasses the territory of the municipalities of Barraute (population 1,968) and Landrienne (population 967), respectively located about 15 kilometres to the east and 20 kilometres to the northwest of the Project site.

The majority of the land in the regional study area is provincial Crown land, which falls under the administrative jurisdiction of the Quebec Department of Energy and Natural Resources (MERN). That is the case with the land at the periphery of the Project site. Other public land in the regional study area is Category III land, located in the southern part of the territory covered by the *James Bay and Northern Quebec Agreement* (JBNQA). Under the JBNQA, the Cree Nation has hunting, fishing and trapping rights at all times, with no permits required and no harvest or catch limits, subject to the principle of conservation. Non-Aboriginal users are allowed to hunt and fish recreationally.

The North American Lithium mining site is located on the traditional territory of the First Nations of Abitibiwinni (population 572) and Lac Simon (population 1,711), which have expressed an interest in the Project and stated that they use the territory for activities including hunting, fishing, and berry picking.

The main economic activities in the regional study area are forestry, mining and tourism. According to the Institut de la statistique du Québec (2016), Abitibi-Témiscamingue is the administrative region with the second-highest investment in mining, accounting for 32.6% of total mining investment in Quebec. Near the Project site, recreational and tourism activities are offered at the Centre de plein air du Mont-Vidéo, an outdoor centre about 2 km east of the mine. The Mont-Vidéo complex includes a ski centre, an inn, about 50 condos and rental chalets, cross-country skiing and snowshoeing trails, hiking and mountain biking trails, and a campground with a beach. It also offers summer camps. Other than the outdoor centre, there are about 50 private year-round and vacation homes around Legendre Lake, about 2 km from the mining site and within the Project's local study area.

6 Predicted Effects on Valued Components

6.1 Atmospheric Environment

This section discusses the key issues related to the atmospheric environment, namely issues related to air quality, greenhouse gas emissions and the soundscape.

6.1.1 *Assessment of environmental effects*

Primary potential effects on the atmospheric environment would be the result of:

- increased particles, metals and gaseous compounds in the air;
- greenhouse gas emissions;
- increased noise levels on the periphery of the mining complex.

Increased particles, metals and gaseous compounds in the air

According to the proponent, the initial quality of the ambient air around the mine sites can be qualified as good since few human activities causing the emission of contaminants in the air are present in the local study area with the exception of a gravel pit near Mont Vidéo.

The main sources of air emissions linked to the Project are the construction of infrastructure, the extraction of waste rock and ore, and the processing of ore. These activities include clearing, excavation of loose deposits, drilling and blasting at ground level and in the pit, loading and unloading of materials, transportation and traffic on the mine site and crushing of the mine ore. During the closure phase, the air quality would be mainly affected by the various site restoration work involving the movement and operation of machinery, as well as the demolition of the mine's infrastructure. All of these activities are likely to affect the quality of the air by the emission of particles, metals and gaseous compounds.

In order to assess the impacts of the Project on air quality, the proponent conducted a modelling study of the atmospheric dispersion of particulate emissions (total suspended particulates and fine particulate matter), of gaseous compounds (sulfur dioxide, nitrogen dioxide and carbon monoxide) and of 14 metals and metalloids present in the mine tailings. This modelling involved three scenarios in order to represent the conditions that would predominate at certain stages of the Project, namely: (1) at the beginning of the operation, when blasting and excavation operations take place on the surface; (2) when the pit and mill operations will be at maximum and (3) when the operation of the pit will come to an end. For these three scenarios, the proponent modelled the atmospheric dispersion on a 7-kilometre-by-6.6-kilometre grid that covers the various Project components of the mine and the sensitive receptors located nearby, at Legendre Lake and Mont Vidéo. The results of the modelling of all the contaminants assessed were compared to the standards of the Quebec Clean Air Regulation (RAA) at the locations of the sensitive receptors and at a distance of 300 metres from the mining facilities. The modelling results for PM_{2.5} were also compared to the Canadian Ambient Air Quality Standards (CAAQS).

The modelling results show that the provincial standards of the *Clean Air Regulation* and Canadian Ambient Air Quality Standards for fine particulates would be met. It is important to specify that the results correspond to the expected residual effects, since the modelling takes into account the implementation of all the mitigation

measures proposed by the proponent (refer to Appendix A). It should be noted that the proponent considered the mitigation measures made it possible to reduce dust by 95%.

According to the proponent, increased dust and suspended tailings will further affect a small portion of the local study area in the early years, where surface work is concentrated. The proponent mentioned that this area is not considered particularly sensitive since there are no residences and the current air quality is good.

Greenhouse gas emissions

The use of the machinery necessary for the construction and operation of the mine, the transportation activities on the Project's peripheral roads and the energy consumption of the ore processing plant are the main sources of direct greenhouse gas (GHG) emissions related to the Project.

The proponent conducted an assessment of the direct greenhouse gas emissions from the diesel consumption of the mobile equipment, and the natural gas consumption associated with the ore processing plant. According to his calculations, the Project would emit an approximate total of 314,000 tonnes of carbon dioxide equivalent, for an average of nearly 21,000 tonnes of carbon dioxide equivalent per year. If the Project emits between 10,000 and 25,000 tonnes of carbon dioxide equivalent per year during its operational phase, the Project will have to undergo mandatory reporting at the provincial level (refer to Appendix B), which means that emissions monitoring will have to be done.

Increased noise levels on the periphery of the mining complex

The proponent has identified activities that represent potential sources of noise for each phase of the Project and that may have an impact on the ambient soundscape. This is mainly the movement of machinery, the construction and dismantling of infrastructure, transportation, the use of explosives, the excavation of the pit, and the crushing and milling ore.

The proponent conducted a sound impact study that allowed a characterization of the soundscape in the residential areas adjacent to the Project, simulating the soundscape during the operation phase, identifying and assessing the noise impacts, and comparing these with provincial noise standards of the province's Directive 019 on the mining industry.

In order to characterize the existing soundscape in the Project's adjacent residential areas and to establish a baseline, the proponent measured the ambient sound level at three receiver points in the Legendre Lake and Mont Vidéo areas in October 2010. According to the proponent, these sectors, located more than one kilometre from the area where the mining activities are located, are the most sensitive to an increase in noise levels. The levels recorded during these measurements were low and the recorded noise came mainly from the fauna and flora (e.g. singing birds and rustling leaves). In the case of Mont Vidéo, noise due to grounds maintenance at the ski resort was also recorded.

Four sound propagation simulations were conducted by the proponent based on the activity planning for the duration of the mining operation. Based on the results, the proponent concluded that the noise levels generated in adjacent residential and recreational areas will meet the noise criteria of province's Directive 019 on the mining industry for day and night. The main source of noise would come from the operation of the primary crusher. Bulldozers would also be significant sources of noise because of their elevated position relative to the ground level. Equipment in the mine pit would have the least sound impact at the receiver point.

Mitigation, monitoring and follow-up measures

The proponent agrees to apply several mitigation measures to reduce the potential effects of the Project on the atmospheric environment. All of these measures are presented in Appendix A.

To mitigate the Project's effects on air quality, the proponent will implement a dust management plan including various standard measures. The proponent plans to use dust control liquid and watering the traffic lanes at the mine site during dry weather. The proponent also agreed to watering transport truck loads, dry soil and dry areas to maintain wet surfaces and control dust dispersion.

Beginning in 2018, the proponent will implement a two-part air quality follow-up program that will measure the impact of mining activities on air quality. The first component will measure total suspended particulate matter from a sampling station at the mine site and assess the compliance of the results with the province's *Clean Air Regulation*. The second component will include measurements of different contaminant emission point sources. The proponent plans to carry out this monitoring for one year and to fine-tune it for subsequent years according to the results collected.

Moreover, in order to limit greenhouse gas emissions, the proponent agrees to stop the engines of immobilized vehicles and to perform regular inspections of the machinery to ensure its good condition and proper operation, including exhaust and pollution control systems.

To reduce noise, the proponent agrees to maintain noisy equipment and to keep the machinery's mufflers and catalysts in good condition. Crushing ore would be initially the main source of noise, and the proponent installed the crushers inside a building to reduce the Project's impact on noise and air quality. Finally, the proponent has setup a noise follow-up program at Legendre Lake to measure noise levels and ensure compliance with the criteria of Directive 019 on the mining industry.

6.1.2 *Comments received*

Concerns were raised by residents and industry stakeholders regarding the potential cumulative effects on sound and air quality associated with the presence of a gravel pit near Mont Vidéo. The Agency notes that, at the beginning of the operation phase, the proponent started its follow-up program at Legendre Lake, which aims to measure the continuous noise associated with mining activities. The data collected to date would indicate that noise levels, not necessarily attributable to mine activities, are similar to those measured at the baseline established in 2010 and that there are few exceedances of the allowable limits permitted in Directive 019 on the mining industry.

Noise was a recurring theme during the initial meetings between the proponent and the First Nations, and Health Canada recommended the establishment of a noise complaint resolution system. The proponent has put in place a follow-up committee bringing together area residents and First Nation members to facilitate, as required, the identification and implementation of additional mitigation measures related to the Project's impacts on sound and air quality. According to the Lac Simon First Nation, this follow-up committee would enable the proponent to keep the parties informed rather than giving the various participants the opportunity to state their requests, suggestions and interests. For this reason, this First Nation questions the relevance of continuing to participate in the follow-up committee.

Environment and Climate Change Canada, Health Canada and the Conseil régional de l'environnement de l'Abitibi-Témiscamingue expressed doubts about the proponent's dust dispersion scenario. Among other things, Environment and Climate Change Canada considers that reaching a drawdown rate of 95% of the dust load in the air could be difficult, which means that airborne contaminant levels could be underestimated. Environment and Climate Change Canada also noted that the proponent did not consider wind erosion as an emission source in its modelling and that it underestimated the potential impact of blasting on the air quality.

Considering the many uncertainties and concerns raised, the proponent agreed, at the request of the Federal Committee, to implement a dust management plan. As mentioned, an air quality follow-up program is also planned. Environment and Climate Change Canada recommends that the proponent track fine particulate matter less than 10 and less than 2.5 microns (PM₁₀ and PM_{2.5}) and compare these results with Canadian Ambient Air Quality Standards in addition to the provincial standards (RAA). According to Health Canada, from a public health perspective, it would be important to track PM_{2.5} because of its impact on respiratory health. Environment and Climate Change Canada also recommends that the proponent establish multi-year follow-up to have representative data during the various phases of the Project and according to the activity levels on the site. Following these recommendations, the proponent has committed to add PM₁₀ and PM_{2.5} to the follow-up and undertake the follow-up on a multi-year approach in order to consider years where emissions of contaminants will be at their highest.

The Abitibiwinni First Nation acknowledges that the proponent has committed to establish an air quality follow-up program and a dust emissions management program. However, this Algonquin Nation remains concerned about the potential runoff of dust deposited at Lortie Lake.

6.1.3 Agency analysis and conclusion

Air emissions will be generated over a long period of time, throughout the mine's entire operating period. However, they should be below the limits set in the *Clean Air Regulation* and the Canadian Ambient Air Quality Standards (CAAQS). These emissions should also be concentrated on a limited portion of the territory of the local study area. However, this conclusion is conditional on the implementation of the dust emissions management plan that the proponent has committed to implement.

The increase in noise will be felt especially within a radius of a few hundred metres around construction sites (local extent). Its duration will be long since the noise emissions will be felt during all phases of the Project. Based on the studies conducted by the proponent and the data collected to date at Legendre Lake, as part of the soundscape follow-up program, sound levels should meet the noise requirements established by Directive 019 on the mining industry.

Taking into account the implementation of the proposed mitigation measures and the follow-up that will be implemented by the proponent, the Agency concludes that the Project is not likely to cause significant adverse environmental effects on the air quality and the sound environment.

6.2 Water Quality

This section addresses the main issues related to the quality of surface water and groundwater.

It should be noted that changes in water quantity are examined in the context of the effects of the Project on fish and fish habitat (refer to Section 6.3).

Surface water and sediments

Lakes Roy, Legendre and Lortie are the three main bodies of water in the local study area. About ten small lakes, about thirty beaver dams and several low-flow streams are also present within the local study area. According to the proponent, approximately 51% (21,700 hectares) of the water network is drained to the Fiedmont River, 23% (9,900 hectares) to the Landrienne River, while 26% (11,200 hectares) is drained to the Laflamme River (see Figure 6).

Surface water and sediment quality was assessed by the proponent in four lakes (Lortie, Roy, Legendre and La Corne³), as well as in three unnamed streams in the local study area in fall 2009 and in the summer of 2010.

The results show that the quality of surface water is generally good for the majority of the characterized bodies of water and watercourses. Surface waters are generally mild and slightly mineralized, but rich in dissolved organic carbon. They are generally slightly turbid and have pH values between 6.5 and 7.3. However, Lortie Lake, located near the pit, is an exception since the water has a higher pH (8.1 and 8.7), is more saline and has a higher lithium concentration.

For sediment, the results of the proponent characterization show great variability in metal and organic matter contents. Lortie Lake differs from other sectors in that it contains higher concentrations particularly in aluminum, lithium, potassium, sodium and zinc.

Groundwater

According to the hydrogeological studies conducted by the proponent, groundwater would flow in several directions in the pit area but there would be no hydraulic link between Lortie Lake and the aquifers in the pit area.

The proponent assessed the groundwater quality in the pit area. The results indicate that groundwater is generally of good quality as it meets provincial and federal drinking water criteria (refer to Appendix B). Only one water sample, from the overburden horizon, indicated the presence of iron and nickel beyond these criteria.

According to available information, there is no collective groundwater collection facility near the local study area. Only some of the individual groundwater intake works, located along Lake Legendre and in the Mont Vidéo, area are listed and are located more than one kilometre away from the mining facilities.

Finally, the aquifers of loose deposits and rock on the mine site are not considered irreplaceable sources of water supply. The proponent considers that these are potentially class II or III according to the groundwater classification guide of the Quebec ministère du Développement durable, Environnement et Lutte contre les changements climatiques (formerly MDDEP, 1999).

³ La Corne Lake is located outside the local study area, southwest of it (see Figure 5).

6.2.1 *Assessment of environmental effects*

The issue related to this component is to determine whether water quality will meet applicable regulatory requirements and whether it will remain adequate to support aquatic life, terrestrial and avian wildlife, and human use.

The primary potential effects on the quality of the surface and groundwater would be caused by:

- leachate contamination;⁴
- hydrocarbon contamination;
- contamination by suspended solids.

Leachate contamination

In general, a major issue related to mining projects involves the management of water (water in contact with mining waste, water from pit dewatering and process water from ore processing). In the event of inadequate water management at the mine site, potentially leachate-contaminated waters could reach various bodies of water (e.g. during periods of heavy rainfall). These waters could also contaminate groundwater if toxic substances percolate through the ground.

The proponent assessed the potential for acidic mine drainage⁵ and the leaching of various materials such as tailings, waste rock, overburden, and those from quarries and sand pits. The results would indicate that these materials are of low risk to the environment. Their non-acidic and low-leaching nature suggests that dissolved metal concentrations and leachate pH would meet the discharge standards specified in the *Metal Mining Effluent Regulations* and the province's Directive 019 on the mining industry.

Several bodies of water and watercourses in the Fiedmont and Landrienne watersheds could be contaminated by the discharge of mine effluents associated with the Project. Stream R1 in particular could be contaminated because it would be the receiving watercourse of the main mining effluent (see Effluent EF_01 in Figure 3). However, the proponent anticipated that the mine effluent will meet the standards specified in the *Metal Mining Effluent Regulations* and Directive 019 on the mining industry.

Hydrocarbon contamination

The proponent estimated there are several sources of potential contamination of surface water and groundwater through accidental spills related to, among other things, traffic, vehicle and machinery maintenance, as well as fuel storage when located near bodies of water and watercourses. The local area watercourses that are located near the mining infrastructures and that are at risk are the secondary tributaries

⁴ Leachate: in the context of a mine site, it is water in contact with mining waste.

⁵ Certain rocks, such as sulphide minerals, when exposed to air and water, undergo a relatively slow chemical oxidation which tends to acidify the environment. This acidification facilitates the proliferation of bacteria which accelerate the oxidation reactions, thereby causing acidification of the water, which can dissolve the heavy metals contained in sulphide minerals. This issue, called acid mine drainage or acid rock drainage, can result in contamination of water resources over a long period.

of the Fiedmont River (Streams R1, R4 and unnamed, see Figure 3) and those of the Landrienne River that flow north (Streams R2, R3 and upstream of the Landrienne River, see Figure 3).

Contamination by suspended solids

According to the proponent, all mining activities, including deforestation work carried out for the development of the West Extension tailings site, the discharge of effluents, the reworking of surfaces and the machinery traffic could cause soil erosion. The erosion could result in sediment loading and loading of any associated contaminants such as nitrogen, phosphorus and metals towards nearby bodies of water and watercourses through runoff and alter the quality of aquatic habitats. A portion of this runoff could also infiltrate into the ground and reach the groundwater by percolation.

Still according to the proponent, an effluent (Effluent EF_01, see Figure 3) could be discharged into Stream R1 during flood conditions. Although this effluent would be treated, it could contain certain metals and/or suspended fine particles that could alter the quality of the water and modify aquatic communities. Sediment suspension and subsequent increase in water turbidity may affect some fish activities and damage their gills. Depending on the degree of exposure, lethal effects may be observed, particularly for sensitive stages such as egg and fry.

Mitigation, monitoring and follow-up measures

In order to minimize the potential environmental effects of the Project on water quality, the proponent proposed several mitigation measures, the full list of which is presented in Appendix A.

Water management on the scale of the mine site will be ensured by a set of hydraulic structures allowing the collection, storage, treatment and evacuation to receiving environments. The mine water collection and treatment system will consist of developing a 23-kilometre network of ditches around all the ore and mine waste accumulation areas (tailings sites, waste rock piles, paddocks, overburden stockpiles, aggregate storage terraces) to collect and channel drainage water from these (see Figure 3). Ditches are also planned along the traffic routes. A total of four mine effluents are included in the mine water collection and treatment system proposed by the proponent, which are effluents BO_01, BO_09, BO_11, and EF_01 (see Figure 3).

The proponent will be required to monitor the quality of the mine effluent and the receiving environment in accordance with the requirements of Directive 019 on the mining industry and the *Metal Mining Effluent Regulations*. To avoid any risk of exceeding the standards, the mining water will be diverted to sedimentation ponds or tailings storage areas, for analysis and treatment, if necessary, before its discharge into the environment. An osmosis mine water treatment system is in place in the plant and treats the water of the B-West tailings site. A complementary mobile water treatment system will be put in place when necessary at the various discharge points in the receiving environment.

In addition, although the results of the geochemical analyzes carried out by the proponent suggest that the leachate should not cause contamination of the groundwater table, the B-West tailings storage facility has been equipped with a waterproof geomembrane covering its entire footprint to prevent water infiltration under the tailings site.

To avoid hydrocarbon contamination of surface water and groundwater, the proponent has planned to develop the machinery parking, washing and maintenance areas more than 60 metres from any watercourse, and restrict traffic to designated areas and protect undisturbed areas.

The proponent also proposed the gradual stabilization of overburden and waste rock piles to control erosion and promote the restoration of a natural ecosystem. The proponent believes that progressive planting of various plant species and the construction of terraces should control the runoff and erosion of the slopes of the overburden and waste rock piles. This measure should help to reduce the influx of suspended solids in the local study area's bodies of water and streams.

The risk management program will help reduce the risks of accidents and malfunctions, and the emergency plan will limit the effects of the Project on water quality in the event an accident occurs (see section 7.1).

6.2.2 *Comments received*

The Federal Committee, community organizations as well as the First Nations consulted, asked for details of the mine site's water management plan. The proponent submitted a conceptual plan for a mine water collection and treatment system that includes collection ditches, pumping stations and water treatment ponds. Initially, the collected water was directed to sampling points before being discharged into the environment or pumped to the tailings site. In the initial Project, a total of 19 effluent points and sampling ponds were planned around the mining infrastructure. The Federal Committee raised concerns regarding the potential for non-compliance with the *Metal Mining Effluent Regulations* and invited the proponent to review its mine water collection and treatment system. The proponent made adjustments to the water collection system, changing the number of mine effluents from 19 to 4. The proponent also agreed to collect all runoff from the mine site, including those associated with all routes and roads already built and to be constructed.

Various public stakeholders, the Federal Committee and the Algonquin First Nations of Lac Simon and Abitibiwinni raised questions regarding the quality of water discharged into the environment and the planned treatment methods in case of contamination or exceeded standards. According to the proponent, the geochemical tests showed that the various mining wastes would not present a risk of acidic mine drainage. These tests also shown that mine waste would have a low potential for metal leaching. Environment and Climate Change Canada is of the view that uncertainties remain regarding the geochemistry of mine waste and, consequently, the risk of discharges of metals or substances harmful to fish and fish habitat. In particular, the proponent does not seem to have taken lithium into account as a potentially harmful substance for aquatic life in the interpretation of the results. Also, criteria exceedances⁶ were observed for overburden and for the gravel and sand pits, the material from which is used for the construction of the mining site roads. The proponent also classified the waste rock as leachable for chromium.

⁶ For gravel pits and sand pits, the results of the leaching tests demonstrated some exceedances of the groundwater quality criteria for resurgence in surface water. For the overburden, exceedances of the criteria of the Quebec ministère du Développement durable, Environnement et Lutte contre les changements climatiques' Soil Protection and Contaminated Sites Rehabilitation Policy were observed for half of the samples.

Natural Resources Canada completed a review of the results of leaching tests on the overburden and the material from gravel and sand pits and confirmed that these materials would represent a low risk of acid mine drainage and low acid generating potential. Natural Resources Canada also reviewed the results of the tailings leach tests and determined that the proponent's conclusions were reasonable regarding the low probability that the waste rock was acid-generating. However, following the assessment of the various studies submitted by the proponent, Natural Resources Canada recommends the addition of chromium in effluents in addition to the criteria that will be followed under the *Metal Mining Effluent Regulations* and the Directive 019 on the mining industry.

In response to the Federal Committee's concerns, the proponent has agreed to add chromium and lithium to the list of parameters that will be followed at the effluent, according to the same requirements as for the other substances defined in Appendix 5 of the *Metal Mining Effluent Regulations*.

The potential impact of the Project on groundwater has been of particular concern given the importance of the Harricana Moraine aquifer. According to the proponent, the risks of groundwater contamination would be low since the concentrator and waste rock discharges are non-acid generating and mildly leachable. In addition, B-West tailings site is equipped with an impervious geomembrane that prevents water infiltration under the tailings site. In addition, the implementation of measures to prevent the infiltration of petroleum products and hazardous materials into the water table (see Appendix A) reinforces the protection of the Harricana Moraine. The risks of contamination associated with the presence of the mining infrastructure are considered low according to the proponent due to the fact that the mining water would flow toward the west, without joining the Harricana Moraine which is to the northeast of the mine site.

6.2.3 Agency analysis and conclusion

The Agency notes that the mine water collection and treatment system will be put in place to meet both federal and provincial mining regulatory requirements. Monitoring of the effluent and the receiving environment will make it possible to verify whether the predictions made in the context of the environmental assessment are accurate and to take corrective measures, if necessary. Fisheries and Oceans Canada, the responsible authority, must ensure that a follow-up program is developed and implemented with the support of federal authorities.

The proposed mitigation measures should prevent hydrocarbon contamination of surface water and groundwater. In addition, planned erosion control measures are expected to significantly reduce the sediment contribution and increase suspended solids in the water.

Taking into account the implementation of mitigation measures, including the proponent's proposed mine water collection and treatment system, the Agency is of the view that the Project is not likely to cause adverse environmental effects on water quality.

6.3 Fish and Fish Habitat

This section discusses the main issues related to fish and fish habitat.

In the regional study area, the fish habitat consists of spawning grounds, nursery areas, growth areas, foraging areas, and fish migration routes. In the local study area, the lakes representing fish habitats are lakes Lortie, Roy and Legendre. Lortie Lake, which is located near the pit, is a 13-hectare lake with a maximum depth of six

metres. According to the studies conducted by the proponent, this lake has no tributaries and only one temporary outlet that flows during overflows occurring during spring flooding, i.e. approximately 11 days per year. Lortie Lake is according to the proponent primarily fed by meltwater and runoff. The characterization results indicate that the water quality is adequate to maintain populations of fish. This lake has breeding, nursery and feeding areas for Brook Sticklebacks and cyprinids; as well as feeding, rearing, and possibly breeding areas for Brook Trout, Lake Whitefish, Goldeye, and Burbot.

Also in the local study area are six small watercourses located at the head of the Fiedmont River watershed (Streams R1, R4 and Unnamed) and the Landrienne River (Streams R2, R3 and the upstream section of the Landrienne River) are affected by the Project. These rivers provide breeding, rearing, nursery and feeding areas for Brook Trout, Brook Stickleback, and cyprinids. Good quality spawning grounds used by Brook Trout have been identified by the proponent in the western branch of Stream R1 and north of Route du Lithium in Stream R2. For all the watercourses, the flow is mainly in channels with transitions in ponds. There are also, but to a lesser extent, sections with rapids, thresholds and waterfalls. The upstream section of these rivers is, however, characterized by relatively limited conditions for the productivity of brook trout. The presence of diffuse and underground flow segments that obstruct fish movement upstream has been noted, as have many beaver dams that limit the free movement of fish in these streams.

No endangered fish species listed in Schedule 1 of the *Species at Risk Act* are present in the water bodies of the local study area.

6.3.1 *Assessment of environmental effects*

The primary potential effects on fish and fish habitat would be caused by:

- the modification of water inflows into watercourses;
- the decrease of water inflows into Lortie Lake;
- the sediment inflows into fish habitat;
- the restriction of free fish passage.

The modification of water inflows into watercourses

The mining infrastructure footprint in the watershed on the periphery of the mine site as well as the implementation of a system for the collection and treatment of mining water will lead to changes in the flow pattern of the surface water.

The reduction of the drainage area that feeds Streams R1, R2, R3, R4, and Unnamed, and the upstream section of the Landrienne River would help reduce their average flow. According to the data provided by the proponent, it is estimated that flow reductions of between 20 and 60% could occur over more than 20 km of watercourses.

The discharge of mining effluents into certain rivers could lead to an increase in the average flow of these rivers. In particular, increases of the flow on the order of 30 to 60% are envisaged downstream of the mining effluents in Streams R1 and R2.

These hydrological effects would be progressive, following the construction of the infrastructure and the installation of the collector ditches which surround them, and would reach their maximum with the full

development of the mine. The proponent estimates that these effects are expected to result in the permanent loss and alteration of approximately 3.2 hectares of habitats used by Brook Trout in Streams R1, R2, R3, R4, Unnamed, and the upstream portion of the Landrienne River. This serious damage to the fish would be due, among other things, to changes in the hydraulic conditions on the spawning grounds and the appearance of obstacles to the free movement of these streams, which also contribute to the productivity of the Fiedmont and Landrienne rivers located downstream.

Decrease of water inflows into Lortie Lake

According to the proponent, the presence of the pit would reduce the Lortie Lake watershed area by 16%, reducing the lake's surface water input and reducing its water level by approximately 14 cm. This decrease could result in the drying of 0.7 hectares of littoral habitat used by fish species on Lortie Lake, including Brook Trout.

Moreover, the operation of the pit, and the pumping of the associated dewatering water, could cause a drawdown of the water table, thus a drop in the groundwater level, on the periphery of the mine site. In general, the presence of a hydrological relationship between groundwater and surface water could result in reduced flows and levels of surface water. Such a reduction, when it occurs, can lead to a degradation of the habitats of aquatic fauna. As part of this Project, the proponent estimated the impact of pit mining on the water level of Lortie Lake by conducting a hydrogeological study. The results of the study indicate that Lortie Lake would respond to the description of a perched lake⁷ and thus have a weak water relationship with groundwater. As a result, the proponent does not anticipate that dewatering the pit will result in a further decrease in the water level of Lortie Lake.

Sediment inflows into fish habitat

All construction and operation activities that may cause leaching of fine particles into the aquatic environment could alter the quality of fish habitat. For example, the increase in the flow rate, induced by Effluent BO_11, could cause erosion in Stream R2 and the fine particles then suspended could be deposited and lead to clogging or even destruction of the Brook Trout spawning grounds.

Restriction of free fish passage

The construction of a path connecting the pit to waste rock pile 3 will require the installation of a new culvert on Stream R2, in a section where the free passage of Brook Trout must be maintained. Another culvert, also located on Stream R2 at its intersection with Route du Lithium, may need to be replaced by the proponent due to the anticipated flow increase downstream of the mine discharge Effluent BO_11, in a section where the free passage of Brook Trout is also required.

When poorly designed, river crossings can potentially limit or prevent free fish passage, and thus fragment fish habitat.

⁷ Without a hydraulic link with the aquifers, that is to say having a limited water exchange with the water table and whose water supply comes mainly from rainfall on its watershed.

Mitigation, monitoring and follow-up measures

The proponent agrees to apply a number of mitigation measures (refer to Appendix A) to reduce the effects of the Project on fish and fish habitat.

The measures to mitigate the effects of the Project on water quality identified in Section 6.2 and Appendix A will also mitigate potential effects on fish and fish habitat, specifically those related to sediment input into fish habitat.

In order to mitigate the effects attributable to the restriction of free fish passage, the proponent commits to use the criteria and measurements presented in the *Guidelines for Watercourse Crossings in Quebec* (Fisheries and Oceans Canada, 2016).

The proponent also agrees to carry out work in the aquatic environment (culverts) during the authorized period of work in fish habitat for the Abitibi-Témiscamingue region, from May 15 to September 30 inclusively.

The proponent has committed to carrying out a compensation program to counterbalance serious harm to fish caused by the Project. This program will also be the subject of a follow-up program. The compensation program and its follow-up will be developed in co-operation with Fisheries and Oceans Canada in the issuance of its authorization under paragraph 35(2)(b) of the *Fisheries Act*.

The environmental follow-up program will also monitor the evolution of the water level and the physical chemistry of Lortie Lake throughout the mine's operating phase. This will include a baseline for the lake that has been considered adequate by Fisheries and Oceans Canada.

6.3.2 *Comments received*

Fisheries and Oceans Canada estimates that approximately 4 hectares of serious harm to fish associated with the Project has occurred despite the proponent's mitigation measures. However, the federal committee is uncertain about the potential hydrological and hydrogeological effects on Lortie Lake, as these are difficult to accurately predict.

Natural Resources Canada conducted a review of the hydrogeological model for the Project based on the most up-to-date information provided by the proponent and concluded that the predictions of the hydrogeological model were reasonable. However, recent changes to the pit configuration create uncertainty about the potential impacts of pit dewatering on the drawdown of the water table and the water levels of Lortie Lake.

Considering these uncertainties, the Federal Committee recommends that the proponent carry out the necessary follow-up to verify the predictions of the environmental assessment on the water levels of Lake Lortie. Natural Resources Canada recommends that the proponent use boreholes developed as monitoring wells throughout the operation of the mine, in conjunction with the development of a Lortie Lake water level monitoring plan. This follow-up, which will verify the maintenance of the conditions (water level, physical chemistry) of Lortie Lake, will make it possible to determine if serious harm to additional fish could be attributable to the Project and, if necessary, to consequently adjust the compensatory plan.

Fisheries and Oceans Canada considers that this serious harm to fish is acceptable to the extent that the proponent will be required under the *Fisheries Act* to develop and implement a compensation plan to offset the

serious harm that will be caused to the fish. This compensation plan will be monitored to ensure that the set compensation targets are met. Appropriate corrective measures could be put in place depending on the results.

Additionally, Fisheries and Oceans Canada believes that no particular issue is anticipated with respect to sediment inputs into fish habitat and free fish passage, provided the mitigation measures presented in this report are implemented by the proponent. However, Fisheries and Oceans Canada is asking the proponent to submit a proposal for a detailed design for culverts at the two crossing sites at Stream R2 to ensure the free passage of Brook Trout.

The Abitibiwinni First Nation is concerned about potential habitat loss for Brook Trout. The responses provided by the proponent did not satisfy the Abitibiwinni First Nation with respect to the impact on fish habitat. The Algonquin Nations of Abitibiwinni and Lac Simon wish to collaborate on fish habitat compensation plan, discuss options and other types of projects that could be proposed, for example, for Brook Trout. It should be noted that Fisheries and Oceans Canada will consult with the First Nations involved in the development of fish habitat compensation plan.

6.3.3 *Agency analysis and conclusion*

Although the proponent does not foresee direct encroachment into the aquatic environment, the Project would still cause serious harm to fish habitat due to the presence of the mining infrastructure that will alter the water flow pattern in the various watersheds of the local study area. Uncertainties remain as to the extent of the serious harm that may occur relative to the modelling of hydrological and hydrogeological effects on Lortie Lake. These, currently estimated at 4 hectares by the proponent, could be revised after the follow-up of the Project effects (see Chapter 9). Fisheries and Oceans Canada is of the view that the serious harm could be offset by the proponent's implementation of a compensation plan approved by the department under the *Fisheries Act*.

In addition, the Agency is of the view that the proponent's mitigation measures would be effective in limiting the effects on fish and fish habitat associated with sediment inflows into the habitat, and to avoid the effects associated with restricting free fish passage.

Taking into account the implementation of the proposed mitigation measures and the compensation plan for habitat losses, the Agency concludes that the Project is not likely to cause significant adverse environmental effects on fish and fish habitat.

6.4 **Birds and Bird Habitat**

This section covers the main issues related to birds and bird habitat. This component includes landbirds and waterbirds (including waterfowl) as well as their habitats, namely forests, wetlands and open environments as well as water bodies. However, the Agency focused its environmental assessment on migratory birds as defined in the *Migratory Birds Convention Act, 1994* and the bird species listed under Schedule 1 of the *Species at Risk Act*.

The various sources consulted⁸ by the proponent, covering the municipalities of Barraute, La Corne and Landrienne, report the potential presence of 83 bird species in the local study area, including six (6) with special status under the *Species at Risk Act*, namely the Short-eared Owl (*Asio flammeus*), the Olive-sided Flycatcher (*Contopus borealis*), the Rusty Blackbird (*Euphagus carolinus*), the Bobolink (*Dolichonyx oryzivorus*), the Canada Warbler (*Wilsonia canadensis*) and the Common Nighthawk (*Chordeiles minor*).

In spring and summer of 2011, the proponent conducted surveys in the local study area to complement existing information on avifauna. The survey identified 71 bird species, including the Canada Warbler and the Common Nighthawk, which are classified as Threatened under the *Species at Risk Act*. A new survey in the local study area in summer 2017 identified 40 bird species and reconfirmed the presence of the Common Nighthawk. Table 4 below summarizes the survey results for special-status species.

Table 4 Special status birds species with confirmed or potential presence in the local study area

Species	Federal Status—COSEWIC ⁹	Federal Status— <i>Species at Risk Act</i>	Provincial Status— <i>Act respecting threatened or vulnerable species</i>	Presence in local study area
Short-eared Owl	Special Concern	Special Concern	Likely to be Designated as Threatened or Vulnerable	Potential
Olive-sided Flycatcher	Threatened	Threatened	Likely to be Designated as Threatened or Vulnerable	Potential
Rusty Blackbird	Special Concern	Special Concern	Likely to be Designated as Threatened or Vulnerable	Potential
Bobolink	Threatened	Threatened	None	Potential
Canada Warbler	Threatened	Threatened	Likely to be Designated as Threatened or Vulnerable	Confirmed
Common Nighthawk	Threatened	Threatened	Likely to be Designated as Threatened or Vulnerable	Confirmed

6.4.1 Assessment of environmental effects

The main potential effects on birds and bird habitat would be caused by:

- disturbance of avian fauna by changes to the normal ambient noise level;
- loss or degradation of avian breeding and feeding habitat;
- increased risk of mortality.

⁸ The Étude des populations d’oiseaux du Québec, a database managed by the Regroupement Québec Oiseaux; the Atlas of the Breeding Birds of Southern Quebec and the Quebec species at risk database (SOS-POP).

⁹ COSEWIC: Committee on the Status of Endangered Wildlife in Canada

These impacts are mainly related to clearing, excavation and blasting work, movement of machinery and the daily operational activities of the mine and to the activities that will take place upon mine site closure and during restoration.

Disturbance of avian wildlife by changes to the normal ambient noise level

The various activities that will generate noise and vibrations (refer to section 6.1), such as the use of machinery and the presence of workers, may be disruptive to avian life. Birds in the breeding phase (nesting and rearing of young) are more sensitive to changes in ambient noise levels and in some cases may even abandon their nests when the disturbance is too intense.

In the operations phase, noise disruption would be more intense around the pit, near the mine complex and along the road connecting the two infrastructures, as a result of the movement of heavy vehicles. Because woodland habitats predominate in the area affected by the work, forest birds would be the most impacted.

Birds that are more sensitive to the disturbance may avoid the most affected areas by opting for nesting sites that are sufficiently removed from the heavy-traffic areas. The residual habitats remaining between the mining infrastructures would become unusable for several species, while they may be taken over by others that are more opportunistic and less sensitive to the disruption.

Loss or degradation of avian breeding and feeding habitat

The various mine infrastructures, namely the West Extension tailings management facility and number 3 waste rock pile, would encroach on areas considered potential bird habitats (forest environments and wetlands).

The losses of nesting and foraging habitat will have the potential impact of disturbing birds, namely breeding pairs, which will have to relocate to similar habitats nearby. When similar habitats become scarcer, this can result in an increase in the density of birds in the same habitat and lead to a shortage of resources and an increase in predation. Generally, habitat destruction and degradation contribute directly or indirectly to the decline of certain more vulnerable species. Some breeding pairs will manage to establish themselves elsewhere, but others will not, due to greater sensitivity to disturbances to their breeding habitat, intraspecies and interspecies competition, or predation.

Although the surveys indicate that the affected habitats are used by a variety of species, the proponent asserts that these are not exceptional habitats for avian wildlife and that habitats similar to those that would be impacted by the Project are abundant in the area, not to mention very close to the mining site. According to the proponent, birds found in the areas affected by the construction of the mining infrastructures would have to move to similar habitats around the periphery of the mine site.

Habitat loss and alteration could affect two avian species at risk: the Common Nighthawk and the Canada Warbler. Based on the densities of birds observed in the field during the surveys in the various habitats, the proponent produced an estimate of the number of breeding pairs that could be affected.

The Canada Warbler occurs in a variety of forest habitats, specifically those featuring a significant shrub layer, including young and regenerating stands (Gauthier and Aubry, 1995). Although the Project would result in habitat loss of approximately 315 hectares once all of the mine infrastructure has been built, similar habitat covers nearly two thirds of the local study area, which is always subject to logging, that is, 2,750 hectares over a

total of 4,300 hectares (64%). The proponent estimates that 20 Canada Warbler breeding pairs could be affected and might have to relocate.

For its part, the Common Nighthawk's preferred habitat consists of open areas with little or no vegetation, like clearings or other forest openings, rock outcroppings, beaches, burns, cut blocks, old fields and cultivated fields (Gauthier and Aubry, 1995). Once all of the mine infrastructure has been built, the open areas disrupted by the Project would cover a surface area of approximately 52 hectares. The proponent estimates that five breeding pairs are likely to be affected by the Project.

Increased mortality risk

In addition to habitat loss, a number of Project-related activities during the construction, operation and closing phases may kill or harm avian fauna or destroy or disturb their nests or their eggs resulting in an increase of the risk of mortality. Among the activities that may adversely impact birds are the cutting of trees and other vegetation as well as overburden stripping.

Mitigation measures, monitoring and follow-up

The proponent proposes the following routine mitigation measures:

- Restricting machinery traffic to work areas;
- Erecting fencing along the perimeter protecting sensitive environments, particularly birds' nests and potential species at risk habitats;
- Refraining from tree clearing during the nesting period, which occurs from May 15 to August 30. If tree-clearing operations are necessary during the nesting period, special mitigation measures will be taken and the monitoring actions described below would protect any nests and/or chicks.

During periods where there is a risk for migratory birds, all work will be monitored to avoid negative effects on birds, their nests or eggs. As well, areas of planned operations will be inspected before any work is authorized. If nests are detected before or during operations, the work will be stopped until the area where nests are present are delimited and protected by fencing. The protected area will be sufficiently large to prevent disturbance of the species during the nesting period. For the Common Nighthawk, the protected radius would be 50 metres, because it nests in open areas and the chicks can travel 5 to 48 metres (Kramer and Chalfoun, 2012).

The proponent also commits to implementing follow-up measures in the operations and closing phases. This follow-up would be focused on identifying, by means of surveys in the local study area, the actual impacts on special-status bird species. This would then make it possible to verify opportunities for intervention in the restoration phase to create or improve the habitat conditions for certain special-status bird species on or along the periphery of the mine site.

6.4.2 *Comments received*

Environment and Climate Change Canada asked the proponent to improve its analysis of the effects of the Project on the Common Nighthawk and the Canada Warbler, notably by assessing habitat loss and alteration, as well as the number of breeding pairs potentially affected. Environment and Climate Change Canada also asked the proponent for details on the loss of wetlands and for the methods used to estimate the loss of wetland functions. The proponent explained that wetlands occupy 15% of the local study area, or 650 of 4,300 hectares.

Based on the updated plans from fall 2017, the proponent explained that 47 hectares of wetlands will be affected.

Moreover, Environment and Climate Change Canada believes that there is a risk of contamination to migratory birds that use the water ponds located on the mine site. In response to this concern, the proponent has committed to developing a contingency plan specific to migratory birds in order to minimize the potential impact of this water on the birds likely to use the ponds. Among other things, the proponent commits to putting proven bird-scaring equipment in place around the mine water ponds posing a risk to avian wildlife, notably the pond at the B-West tailings management facility.

Environment and Climate Change Canada emphasizes that the proponent must be particularly attentive to the potential presence of Common Nighthawk nests in open or barren areas used for mining operations, as they could provide favourable nesting sites for this species. It is therefore possible that workers may discover nests on the ground during the mine construction and operation phases. The proponent is required to comply with the *Migratory Birds Convention Act, 1994* (MBCA) and the *Species at Risk Act*, which prohibit the disturbance and destruction of birds' nests. In addition to the mitigation measures, monitoring and follow-up identified in the preceding section, the proponent commits to implementing an employee awareness and training program regarding the presence of nests of migratory birds, including the nests of species at risk, and the procedure to follow if a nest is discovered.

Environment and Climate Change Canada reminds the proponent to contact the Canadian Wildlife Service in the event of any bird mortality in the ponds or if any unusual behaviour is observed in order to determine what corrective action should be taken. The same applies if any nests of avian species at risk are discovered.

6.4.3 Agency analysis and conclusion

The Agency is of the view that the proponent's proposed mitigation measures would help to prevent negative effects to migratory birds and limit the disturbance of birds in the local study area. This view takes into account the environmental monitoring measures that the proponent identified in response to the recommendations issued by Environment and Climate Change Canada.

The habitat loss resulting from the Project should not adversely affect the integrity of bird populations because the species in question are able to move to replacement habitats on the periphery of the mine site. Indeed, thanks to the abundance of similar habitats in the region, it is likely that the bird species, including those species at risk, affected by the predicted habitat loss, including Common Nighthawk and Canada Warbler breeding pairs, will be able to establish themselves successfully elsewhere. Under the *Species at Risk Act*, no habitat identified as critical by the recovery strategy for these two species would be affected. The Agency finds that the Project would have no significant impact on the recovery of the special-status species likely to use the site or whose presence in the local study area has been confirmed.

Taking into account the implementation of the proposed mitigation and follow-up measures, the Agency concludes that the Project is not likely to cause significant adverse environmental effects on birds and bird habitat.

6.5 Current Use of Lands and Resources for Traditional Purposes

This section addresses the Project's effects on the current use of lands and resources for traditional purposes by the Abitibiwinni and Lac Simon Algonquin First as well as on structures, sites or things that are of historical, archaeological, paleontological or architectural significance. The Cree Nation Government determined that this Project would have no impact on their land.

The current use of lands and resources for traditional purposes takes into account the practices or activities that are part of the distinctive culture of First Nations and that were commonly practised by this group over a period extending from the recent past to the present. Current use of lands and resources for traditional purposes includes in particular hunting, fishing, trapping, berry picking, cultural and other traditional uses of the land (e.g. gathering of medicinal plants or use of sacred sites).

The historical, archaeological, paleontological or architectural significance of structures, sites or things is defined by the value that has been assigned to them. It stems namely from its association with one or more important aspects of the history or culture and its connection to practices, traditions or customs of a specific group.¹⁰

In order to assess the effects of the Project on this valued component, the Agency took into account the documentation from its own consultations conducted during the federal environmental assessment process and the documentation provided by the proponent in the preparation of its environmental impact statement. Although the effects analysis focused on the local study area, the analysis also took into account the regional study area, particularly in terms of the habitat availability of the various wildlife and aquatic resources.

The Lac Simon and Abitibiwinni Algonquin First Nations report that traditional activities are practised regularly on the land that they claim (Nitakinan). These activities include hunting migratory birds as well as small and large game, fishing, trapping fur animals, picking berries and medicinal plants and generally using the forest and its products, as well as spiritual activities. The Nitakinan includes the Project's local and regional study areas. The land encompassing the local study area is not used very much by the Algonquin and they have reportedly no permanent structures there. There are no trapping plots or family plots. The First Nations state that this is the result of past mining activities at the Project site, which made certain trails and roads that were once used for traditional activities unusable.¹¹

One Algonquin family is still reportedly using the roads and trails adjacent to the land used by the mine. This family occasionally engages in the traditional activities of berry picking and moose hunting.

¹⁰ Canadian Environmental Assessment Agency, 2015: Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing.html>

¹¹ The deposit targeted by the project has been the subject of mining activities since 1943, including underground operations between 1955 and 1965.

6.5.1 *Assessment of environmental effects*

The changes to the biophysical environment attributable to the Project could cause the following potential effects on the current use of lands and resources for traditional purposes:

- Loss of areas currently used for traditional activities;
- Disturbance of traditional activities on the periphery of the mine site as a result of noise, loss of access to the land or avoidance of the resources for fear of contamination;
- Disturbance or destruction of remnants of interest or historical importance.

Loss of areas currently used for traditional activities

The Agency notes that the presence of the infrastructure and mining activities as a whole will make it so that the area corresponding to the mine site's footprint, a surface area estimated at 569 hectares by the proponent, will not be usable for traditional activities for the duration of the Project. As mentioned by the proponent, the area directly affected by the mining infrastructure was not the site of traditional activities in the recent past. There is no occupancy site or valued sector. However, the Algonquin Nations mentioned that although this area is not being used, it must still be considered a loss of areas of land use since use may have stopped as a result of external factors, i.e. the presence of mining activities on this site for several decades.¹² According to consultations conducted by the Agency with the Algonquin Nations, it is possible that these activities could resume once the mining activities are finished.

Disturbance of traditional activities on the periphery of the mine site

The Algonquin Nations consulted believe that changes to the atmospheric and land environment could indirectly cause a reduction in the quality of the resources harvested for traditional purposes, notably moose hunting and blueberry picking.

The Abitibiwinni and Lac Simon First Nations also consider that the Project could result in changes to the sound environment that could disrupt the traditional activities of the Algonquin family that still makes use of the roads and trails adjacent to the mine site. More specifically, the noise could disturb moose hunting activities. The noise could disrupt auditory hunting techniques or result in the animals staying away. The proponent stated that avoidance of the Project's peripheral areas by wildlife is not likely since the activities will be taking place on an ongoing basis and the vast majority of species acclimatize quickly to noise.

Moreover, the Algonquin Nations consulted mentioned the problem of accessing the land to the south of the mine, given that the existing road will be cut off during construction and the fact that the presence of infrastructure, including the roads on the mine site, could affect access to certain sites used for traditional activities. In 2013–2014, the proponent built a new road going around the mine, thereby providing access to the south portion of the land.

¹² <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/technical-guidance-assessing-current-use-lands-resources-traditional-purposes-under-ceaa-2012.html>

Lastly, the First Nations consulted mentioned that dust falling to the ground and changes to water quality could lead to the contamination of traditional foods. The proponent reported that atmospheric emission models show that the emission of particles and metals from the mine would fall within applicable ambient air standards. The Agency acknowledges that changes to water and air quality could lead to the contamination of traditional foods, especially if mitigation measures are not put in place.

The Agency is also of the opinion that the Project might result in the avoidance of traditional foods if land users feel that it is contaminated.

Disturbance or destruction of remnants of interest or historical importance

The Algonquin Nations note that the construction of infrastructure and several mining activities, namely the operation of the pit, could damage or destroy remnants of interest or historical importance. An archaeological study completed by the proponent and updated in 2016 shows the presence of three known archaeological sites in the Roy Lake sector. This study also identifies the riparian buffer strips of Roy and Lortie lakes as sectors with high archaeological potential. The Abitibiwinni First Nation indicates that it has been occupying the sector for this Project for time immemorial, that specific sites of interest have been found in this region, namely gathering and burial sites, and that, consequently, this region contains archaeological sites.

Proposed mitigation, monitoring and follow-up measures

Several mitigation measures that concern the other valued components discussed in this report, namely air quality, sound environment and water quality, will also help mitigate the effects of the Project on the current use of lands and resources for traditional purposes. This will be the case with the mine water collection and treatment system and the dust management plan, which will reduce the release of contaminants that could contaminate traditional foods.

Measures for mitigating noise emissions should reduce disturbances to traditional activities on the periphery of the mine site. According to the proponent, noise will be constantly monitored and the results will be provided and discussed by the follow-up committee. This follow-up committee, implemented by the proponent, includes, among others representatives from Lac Simon and Abitibiwinni.

The proponent has also planned measures to protect sites of interest in the event archaeological remains are discovered. The Abitibiwinni First Nation mentions that the visual inspection conducted by the company Archéo-08 in November 2016 indicates low archaeological potential in the sectors visited. The existing and planned infrastructure for the duration of the mine's lifespan do not seem to impact the sectors with high and moderate archaeological potential. According to the technical opinion issued by Archéo-08, precautions should be taken along the banks of lakes and small watercourses, particularly within a 30-metre riparian buffer strip. From a perspective of enhancing the historical knowledge of the land, the Abitibiwinni First Nation reiterates its willingness to collaborate in any archaeological inventory that would be conducted in the event of an impact in an area with high archaeological potential.

The aforementioned follow-up committee will make it possible to monitor the Project's effects on Algonquin Nations current use, including air and water quality. Sharing the monitoring results with committee members could mitigate the Algonquin's avoidance of traditional foods that they consider to be contaminated.

6.5.2 *Comments received*

The First Nations expressed fears regarding this Project's impact on water and air quality that might cause contamination and a decrease in wildlife populations, including moose, bear, martens, hares, beavers and partridge. These Algonquin Nations remain concerned by what effects the contamination on wildlife, their traditional food, will have on their health. For example, the First Nations fear that metals present in sediment in Lortie Lake will find their way into the food chain and ultimately be found in fish. The Abitibiwinni First Nation recommends that an analysis of the meat and liver of fish, particularly rainbow trout, be conducted to ensure that the presence of tailings does not have an impact on the health of the Abitibiwinni and the general public. The proponent indicated that the monitoring of fish and metal concentrations in their flesh is required under the Environmental Effects Monitoring Program (EEM) managed by Environment and Climate Change Canada. It should be remembered, however, that an analysis of fish tissues is only required if, during an effluent characterization, the mine has measured a mercury concentration that is equal to or greater than 0.10 microgram per litre ($\mu\text{g/l}$) in the effluent. Such a concentration of mercury is not expected as part of this Project, but compliance with that concentration must be demonstrated.

Health Canada could not provide a technical opinion about the potential risks of contamination of food by dust and mining effluent because information on the environmental fate of contaminants generated by mining operations, the actual and predicted contaminations rates in food, and the types and amounts of species consumed by First Nations was insufficient.

6.5.3 *Agency analysis and conclusion*

The sector corresponding to the Project's footprint, i.e. a surface area of approximately 569 hectares, will not be usable for traditional activities for the lifespan of the Project. However, only 63 hectares will be permanently lost, which is the sector corresponding to the mine pit. The Agency notes that most of the surface area will be restored once the mine closes (approximately 89%). Furthermore, this sector is not used much by land users and there is no site valued for traditional activities there. The Agency is of the opinion that this loss in land use will not compromise the current use of lands for traditional purposes and will have a low impact on the continuity of the way of life of the Lac Simon and Abitibiwinni First Nations.

Changes to the sound environment could disturb traditional activities along the periphery of the mine site, namely moose hunting by the Algonquin family using this land. The proponent has demonstrated that the standards contained in Directive 019 on the mining industry regarding sound levels should be respected given the mitigation measures that will be implemented and which will at the same time reduce repercussions on land users.

The Agency notes that construction by the proponent of a new road going around the mine will help significantly reduce the problem of access to the land.

The implementation of the mine water collection and treatment system and the dust emission management plan will reduce the risk of traditional food contamination. The proponent has demonstrated that the atmospheric emissions associated with the Project would respect the limits set by regulations and would be focused in the limited section of the local study area. The effluent must meet the criteria prescribed under the *Metal Mining Effluent Regulations* and Directive 019 on the mining industry.

Lastly, the Agency notes the measures that will be taken by the proponent regarding the protection of sites of interest in the event archaeological remains are discovered.

Given the mitigation measures planned, the Agency concludes that the Project is not likely to cause significant adverse environmental effects on the current use of lands and resources for traditional purposes or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance in the study area.

The participation of First Nations on the follow-up committee that has been put in place should help determine whether other measures need to be implemented to mitigate the Project's negative effects on this valued component.

7 Other Effects Considered

7.1 Effects of Accidents and Malfunctions

The environmental effects of accidents or malfunctions are among the factors to consider under the former Act. The proponent has identified the activities most likely to cause accidents or malfunctions during the mine construction and operations phases, potential adverse environmental effects and emergency preparedness measures.

Moreover, the Agency considered in its analysis the effects of the accidents and malfunctions of the two accidental spills that occurred in 2013 and 2014. The mitigation and follow-up measures that the proponent has implemented in order to remedy the events and prevent that such events occur in the future were also considered.

7.1.1 *Accidental spills which occurred in 2013 and 2014*

Assessment of environmental effects

Following the mine start-up of the operations, two accidental spills occurred on the mine site.

The first accident, a spill into the R1 stream of 50,000 cubic meters of water resulting from the breach of tailings dam B-West, occurred on March 18, 2013. According to the proponent, the failure of the dam would have been caused by the accumulation of water under the geomembrane of the tailing management facility B-West. The accumulation of water caused erosion of the soil, in turn causing a pocket and exposing a jagged rock. This jagged rock would have pierced the geomembrane due to the pressure generated by the accumulation of water in the tailing management facility. Because the concentrator of the processing facility had not begun to produce lithium carbonate, the proponent is of the view that the tailings management facility only contained water cycled through the pipes to prevent them from freezing. According to the proponent, the cause of the spill was due to hydraulic events as opposed to geotechnical matters, and did not affect the integrity of the dams. Following the spill, a survey that was conducted on the crest of the dam found that the dam had not been compacted and as a result no modification of its shape was required to prevent a subsequent failure.

In order to assess the effects of the spill of water from the tailings management facility on fish habitat, the proponent sampled sediments in October 2016 in five locations (4 near the tailings management facility B-West in the R1 stream and one in a more southern location in the Fiedmont river). These sampling stations correspond to sedimentation sites, in locations where water current speeds are low. The average lithium concentrations in the sediments of the R1 stream were 4 to 6 times higher (between 17.0 and 27.3 milligram per kilogram) compared to a baseline sample from another stream (4.3 milligram per kilogram) and the Fiedmont river (5.0 milligram per kilogram). However, according to the proponent, these results would not indicate an impact as a result of the spills because the lithium concentrations are similar to those that were measured in sediments in water bodies that are not impacted by the proponent's mining activities. Taking into account these results, the proponent has concluded that changes to fish habitat found in the R1 stream were not anticipated.

The second accident, which occurred on June 15, 2014, consisted of a spill of approximately 490 cubic meters of mud in an area upstream of the western branch of the R1 stream and would have been caused by a failure of a

pipe between the concentrator and the tailings management. According to the proponent, the most likely cause of the failure would be a weakness in a “T” shaped part of the pipe. According to the proponent, out of the 490 cubic meters of spilled mud, 195 cubic meters would have been confined by the woods adjacent to the mine site and would not have reached the water course. These residues would be primarily be comprised of silica solids. This spill could have resulted in impacts on the ground, watercourses and fish habitat adjacent to the tailings management facility.

Mitigation, monitoring and follow-up measures

The first spill is subject to an investigation by Environment and Climate Change Canada to verify if infractions were committed in accordance with the *Fisheries Act* and the *Metal Mining Effluent Regulations*.

After the 2013 spill, the proponent fixed the leak area under the tailing management facility and installed pumped wells in three locations under the geomembrane in order to verify if water was found between the geomembrane and the dam. During this follow-up, the wells did not indicate any presence of water during several months after which the wells were decommissioned. The proponent has also revised its groundwater follow-up program and added several groundwater quality observation wells. The proponent commits to install a linear low density polyethylene geomembrane (LLDPE) on all of its tailings management facilities in order to prevent process water seepage into the groundwater. Since the spill, the proponent has revised its emergency response plan to improve the framework with respect to implementation of measures and included a dam failure to that plan.

Following the second spill in 2014, the proponent removed all “T” shaped parts found in the pipe. Furthermore, the pipe was relocated closer to the access road for easier access for inspection purposes and faster response times in case of another spill. The proponent has also placed additional emphasis on the need for more frequent inspections of the pipe and of the maintenance of a log with mine employees.

7.1.2 *Potential accidents and malfunctions*

Assessment of environmental effects

The proponent has identified the following potential accidents and malfunctions that may significantly impact the environment:

- hazardous materials spills or leaks;
- breaches in tailings storage facility dams;
- lithium concentrate spills;
- petroleum product spills;
- machinery breakdowns;
- fires.

Among these potential accidents and malfunctions, some—like a breach in a tailings storage facility dam—can lead to major environmental damage. When sedimentation ponds containing tailings fail, large quantities of

contaminated water and solids spill, which can deteriorate terrestrial and aquatic ecosystems, kill aquatic fauna and contaminate water bodies over many kilometres downstream from the accident.

Moreover, accidental spills of petroleum products or hazardous materials can also result in significant adverse effects on fish and wildlife habitat in general.

Proposed mitigation, monitoring and follow-up measures

The proponent has implemented certain measures in order to reduce the risk of accidents and malfunctions. In addition to the aforementioned measures in section 7.1.1, measures were introduced for machinery maintenance, repair and cleaning in an area designed for that purpose. Fuel supply in the pit will be done with a truck that has a double-walled tank and is equipped with an emergency spill kit. The proponent will apply regular and systematic machinery inspection measures, which will be documented.

The proponent has undertaken to implement a periodic monitoring program for the physical stability of the tailings containment structure and its adjacent structures, including the dikes, dams, trenches, ponds, spillways and sedimentation structures. These matters are governed by Directive 019 on the mining industry and overseen by the Quebec ministère du Développement durable, Environnement et Lutte contre les changements climatiques (MDDELCC).

The proponent is required to comply with current regulations in order to minimize the risk of accident or malfunction, in particular, Quebec's Hazardous Materials Regulations, Transport Canada's Transportation of Dangerous Goods Regulations and Quebec building legislation.

In addition, the proponent has undertaken to develop an environmental emergency measures program and documented procedures specific to accidents and spills. The program must detail the planned measures in case of structure failure or major events like a forest fire. It must also detail emergency procedures, the roles and responsibilities of the stakeholders responsible for implementing the response plan as well as the communication mechanisms.

A key element of the proponent's emergency management program is the communication mechanism with the public, specifically to ensure that impacted nearby communities and local stakeholders are adequately informed in a timely manner of emergencies or spills that may affect users in the sector.

7.1.3 *Comments received*

Many public and First Nations stakeholders are concerned about risk management, particularly regarding management of water and of the tailings storage facilities. Stakeholders have asked to be kept informed about any emergencies or spills that may occur at the mine site whether or not the proponent believes these may affect the users of the territory. In this context, the Federal Committee has asked the proponent to include in its emergency preparedness protocol a communication plan for informing the public of all spills or other types of accidents at the mine site.

Environment and Climate Change Canada recommends that the proponent plan for specific measures for migratory birds in its emergency response plan, notably in the event of accidental spill in the aquatic

environment. In the event that birds are impacted following an accident or malfunction, the proponent should contact the Canadian Wildlife Service of Environment and Climate Change Canada to know what actions to take.

7.1.4 *Agency analysis and conclusion*

The Agency notes that the proponent took corrective measures following the two spills which took place on the mine site in 2013 and 2014. Furthermore, the Agency is of the opinion that the proponent has identified and assessed the potential accidents and malfunctions related to the Project. The proponent commits to implement several mitigation, monitoring and follow-up measures to reduce the risk of accidents and malfunctions, as well as to implement an emergency preparedness and response plan should an accident occur. The Agency is of the view that if the proponent diligently implements all its commitments, accidents or malfunctions resulting in significant adverse effects are unlikely to occur.

7.2 **Effects of the Environment on the Project**

According to the former Act, any changes to the Project that may be caused by the environment must also be taken into account in the determination of the environmental effects. The proponent has examined the effects of the environment on the Project and has proposed measures aimed at reducing them.

7.2.1 *Assessing environmental effects*

The environmental factors likely to have an impact on the Project and to result in environmental effects include earthquakes and the impacts of climate change, such as more intense precipitation and forest fires.

The proponent believes that there is a low risk that the Project will be affected by flooding as the site is at the head of a watershed in rolling terrain. Also, there is no permafrost in this region. For these reasons, climate change is unlikely to affect the stability of the structures.

The Project is located in the Western Quebec Seismic Zone which is a large territory comprised of the Outaouais valley from Montreal to Timiskaming, including the Laurentians and eastern Ontario. The proponent looked at the risk of earthquake occurrence and determined that it is very low given that the location of the Project is in a stable continental region of North America. According to data from Natural Resources Canada's website¹³, earthquakes of low amplitude (magnitude of 4 or less) can be felt in the study area. According to the same source, the southern part of the Western Quebec Seismic Zone has known at least three significant earthquake (Montreal in 1735, Timiskaming in 1935 and Cornwall in 1944).

The Project's mine infrastructure may also be affected by forest fires. According to the information available in the Canadian National Fire Database¹⁴, no forest fire greater than 200 hectares would have disturbed the study area since 1980.

¹³ Natural Resources Canada. [Earthquake zones in Eastern Canada](#). Page consulted by the Agency in November 2017.

¹⁴ Natural Resources Canada. [Canadian Wildland Fire Information System](#). Page consulted by the Agency in November 2017.

Mitigation, monitoring and follow-up measures

The proponent has factored the impact of climate into the design of its Project. For instance, in order to minimize the risk associated with precipitation, the design of the tailings storage facility area is consistent with Directive 019 on the mining industry, which specifies that water storage structures, in the case of non-acid generating waste, must be able to contain the water from a 1,000-year flood event.

To reduce the risk of earthquake, Project infrastructure respects the design and construction standards required under the seismic hazard map in the 2010 National Building Code of Canada.

Forest fire risks associated with human activity or lightning are mitigated by conventional measures applied by the proponent: brush clearing at the site, restrictions on open fires, employee information and awareness, emergency preparedness measures and firefighting equipment.

7.2.2 Agency analysis and conclusion

The Agency considers that the proponent has identified the potential risks associated with environmental effects on the design of its Project. Taking into account the proposed mitigation measures planned by the proponent, the Agency concludes that the environmental conditions are not likely to have significant adverse effects on the Project.

7.3 Cumulative Environmental Effects

Cumulative environmental effects are defined as the effects on the environment that are likely to result from a Project when a residual effect combines with the effects of other projects or human activities that have been or will be carried out. The purpose of the cumulative effects assessment is to determine the extent to which the residual environmental effects of the Project on a valued component may combine with the effects of other physical activities that have been or may be carried out.

7.3.1 Approach and scope

The methodological approach applied by the proponent for the assessment of cumulative effects includes the following steps:

- identification of the valued components, determination of the spatial and temporal boundaries considered for each as well as the description of the indicators used;
- identification of projects, actions and events that may affect valued components, that currently affect them or that will affect them;
- the description of the reference state for each valued component and their historical trends;
- identification of the cumulative effects for each valued component selected;
- identification of the environmental mitigation, monitoring and follow-up measures;
- determination of the significance of cumulative effects.

The following valued components have been selected for the purpose of assessing cumulative effects: brook trout and its habitat as well as wetlands. The proponent justified the choice of these valued components based on the fact that they are highly valued by the populations in question or by the experts and the fact that the Project is likely to result in residual effects on these.

For the two valued components selected for the cumulative effects analysis, the proponent has determined that the temporal boundaries cover the period from 1950 to 2032. The proponent has justified the choice of the lower limit based on the fact that it corresponds to when mining activities commenced in the study area, while the upper limit corresponds to the probable year of mine closure.

The spatial boundaries established for the brook trout are 13,000 ha. This zone covers the Fiedmont River watershed, which will receive the main effluent, as well as Lortie Lake. For the wetlands, the proponent has estimated that a study area of 155,800 ha was sufficient for assessing the cumulative effects. This area encompasses, in particular, the municipalities of La Corne, Landrienne and Barraute as well as the town of Amos.

In its EIS, the proponent identified past, current and reasonably foreseeable projects and activities that could cause cumulative effects. Past mining projects resulted in impacts on wetlands by causing degradation in certain areas. Fish and fish habitat have been primarily affected by forestry activities, felling of trees and opening of forestry roads. The increase in access of the land in the last decades from the resource exploration activities has resulted in an increase in the use of the land for recreational activities such as use of trails by all-terrain vehicles, snowmobiles, hunting camps and secondary residences and creation of a beach. All these activities can cause effects on fish habitat through modifications or loss of habitat but also on wetlands due to discharge of domestic waste water, pressure via fishing and roads passing through sensitive areas.

The proponent has also identified projects or activities beneficial to the brook trout and wetlands, namely the presence of protected sites that assures the protection and conservation of certain areas of the natural environment. Furthermore, although beavers build dams on various waterbodies and these structures can create obstacles for the free passage of fish, their presence can be beneficial because they create aquatic environments and wetlands.

7.3.2 Potential cumulative effects on brook trout

The proponent estimates that the Project's residual effects on brook trout, which may be compounded by the effect of other activities, would not be significant. This is because of the water collection and treatment system for mining water that would allow for compliance with water quality standards, the measures against erosion and sediment transport in watercourses and, where applicable, the compensation plan to offset the serious harm to fish. According to the proponent, the follow-up measures that will be applied during the operations phase would allow for verifying the effectiveness of the measures intended to minimize the impact on fish and fish habitat.

According to the proponent, logging activities are more likely to have had or have adverse impacts on fish and fish habitat in the study area. Logging, construction and maintenance of logging roads may alter the hydrological and sediment regimes of the watercourses where the fish live. The increase in sediment leads to silting of the spawning substrate, which can reduce successful fish reproduction. If the culverts are not properly installed, they can jeopardize free fish passage, thereby fragmenting brook trout habitat.

Although logging activity may have or may yet alter brook trout habitat in the Fiedmont River watershed, the proponent believes that these alterations would be short term and would not significantly affect brook trout populations across the watershed. Moreover, no other physical activity was identified as contributing significantly to a loss of brook trout habitat.

The proponent concludes that no past or future events, actions or projects are likely to have affected or to affect, to a significant degree, the brook trout populations found in the watercourses of the Fiedmont River watershed or in Lortie Lake. Thus, the proponent does not expect substantial cumulative effects on this valued component.

7.3.3 *Potential cumulative effects on wetlands*

According to the proponent, the mining Project will result in the loss of an area of about 47 ha of wetlands. It would be inevitable for the Project to create certain encroachments into wetlands given that these occupy a high percentage of the territory. However, the location of the concentrator and the service buildings has been optimized to reduce encroachment on a vast 18 ha peat bog located south of Lortie Lake. Based on the proponent's data, about 15% of the local study area consists of wetlands, i.e., 659 ha. Less than 5% of this area would be affected by the Project.

In terms of the cumulative effects, the proponent acknowledges that past mining, logging and recreational/tourism activities have impacted the wetlands. Nonetheless, the proponent considers these wetland losses to be minor given how extensive the wetlands are in the study area. There would be few reasonably foreseeable projects, actions or events in the mine area that are likely to lead to effects on the wetlands and that may compound with those of current and future mining infrastructure and activities.

Furthermore, as mentioned in section 7.3.1, other physical activities would have positive effects and would contribute to protecting and conserving wetlands in the study area.

7.3.4 *Comments received*

The Abitibiwinni First Nation is concerned by the loss of brook trout habitat, if not adequately compensated, due to the cumulative effects of anthropogenic pressure on these habitats in recent decades. These habitats are necessary to the traditional Algonquin lifestyle and to their culture's transmission.

7.3.5 *Agency analysis and conclusion*

The Agency has concluded that the Project's cumulative effects on brook trout would be low. The Project's effects on brook trout would be limited, in particular by the water collection and treatment system for mine water implemented by the proponent in order to comply with the *Metal Mining Effluent Regulations*. Moreover, no physical activity that may lead to significant impacts on the species in the future is planned at this time. Finally, the development and implementation of a compensation plan to offset serious harm to fish would mitigate the effects of the Project on the valued component.

The Agency believes that the cumulative effects on wetlands would be low. This conclusion is based specifically on the abundance of wetlands across the region and in the study area, the low significance of the Project's

adverse residual effects, and the low probability that reasonably foreseeable physical activities would lead to major effects on this valued component in the future.

The Agency is of the opinion that the Project is not likely to result in substantial cumulative effects and that no additional mitigation, monitoring or follow-up measures are necessary, other than those that are designed to mitigate the Project's effects on valued components and that are described in Appendix A.

7.4 Effects on Renewable Resource Capacity

In accordance with the requirements of subsection 16(2) of the former Act, the Agency must consider the capacity of renewable resources likely to be significantly affected by the Project in order to meet present needs without compromising the ability of future generations to meet their needs.

The potential effects of the Project on renewable resources, water, terrestrial wildlife, birds and fish were assessed in detail in the environmental impact statement. Special attention was paid to water resources, fish and fish habitat, birds and other wildlife species.

The effects of the Project on each of these resources were assessed in accordance with the scope of the Project assessment (see Sections 6.2 and 6.4). The significance of the residual effects was also assessed. This assessment shows that the Project's effects will not compromise the environmental integrity of these valued components and will not significantly or irreversibly alter their use. Consequently, the Project will not significantly reduce the ability of current or future generations to obtain drinking water supplies or harvest wildlife, and will not compromise the viability of fisheries and the sustainability of ecosystems.

Considering the implementation of the mitigation and compensation measures proposed by the proponent, the Agency concludes that no renewable resources will be significantly impacted by the Project and, therefore, the Project is not likely to cause significant adverse environmental effects on renewable resource capacity.

8 Impacts on Potential or Established Aboriginal Rights or Titles

8.1 Potential or Established Aboriginal or Treaty Rights in the Project's Study Area

8.1.1 Cree Nation Government

The Project is located on land covered by the *James Bay and Northern Quebec Agreement* (the Agreement). Under the Agreement, the lands are divided into three categories. Category I lands are located around and within communities over which the Cree have exclusive use. Category II lands are land over which the Cree have exclusive rights for hunting, fishing and trapping and the operation of outfitters and commercial fisheries, and Category III lands are public lands in Quebec where the Cree have certain exclusive hunting, trapping, fishing and commercial fishing rights for certain animal and aquatic species.

The Project site is located in the southern part of the territory of the Agreement lands where the Cree have hunting, fishing and trapping rights under chapter 24 of the Agreement solely on Category I and II lands as well as along Cree traplines.

The Project study area is located in a sector where there are no Cree traplines and no category III public lands on which Aboriginal and non-Aboriginal people can hunt and fish.

8.1.2 Algonquin First Nations

The land claimed by the Algonquin in Quebec, the Nitakinan, extends from Sault Ste. Marie in Ontario to Trois-Rivières in Quebec. The regions of Montreal and Ottawa, the Montérégie region, the Laurentians and Abitibi-Témiscamingue are encompassed in the claim that also overlaps the Agreement territory.

Over the years, the Algonquin have made several claims and declarations as part of the Comprehensive Land Claims Policy in regards to their Aboriginal rights, their Aboriginal title as well as use of the land in the Project's vicinity. Some of these claims have been analyzed by the Government of Canada and various positions have been communicated to the Algonquin First Nations of Quebec, but no final position has been expressed.

In a declaration dated August 2013, several Algonquin Nations of Quebec, including the Abitibiwinni and Lac Simon First Nations, stated that they have Aboriginal rights, exclusive or not, that could include Aboriginal title to traditional land overlapping part of the territory targeted by the Agreement. They argue that subsection 3(3) of the *James Bay and Northern Quebec Native Claims Settlement Act*, S.C. 1976-77, c. 32, which nullifies the rights of third parties under the treaty, does not apply to them. In the event a Court were to conclude that subsection 3(3) of the aforementioned Act applies to them, they will state that this provision is unconstitutional. The reserve lands of the Lac Simon and Abitibiwinni First Nations are located inside the "south zone" of the Agreement territory.

In 1996, in *Côté*, the Supreme Court of Canada upheld the Algonquins' Aboriginal right to fish for food, and, based on the testimony on the history examined by the Court, upheld their claim that their ancestral lands lie at the heart of the Ottawa River Basin.

The Lac Simon and Abitibiwinni Algonquin First Nations have declared that they use the land, including on the periphery of the Project study area.

For these reasons, the effects on the current use of lands and resources for traditional purposes by these Nations have been considered and evaluated in section 6.5 of this report.

8.2 Potential Adverse Impacts of the Project on Potential or Established Aboriginal or Treaty Rights

In the course of consultations conducted by the Agency, the Cree Nation Government stated that it does not anticipate that the Project will negatively affect their treaty rights. Consequently, the Cree Nation has expressed the desire to be consulted exclusively on any environmental effects or offsetting measures for the Harricana River, which is valued by the Cree. After analysis, the Cree Nation Government and the Agency concluded that the Project posed a very low risk of potential environmental impacts on the river. The Agency does not feel that the Project is likely to have detrimental effects on the rights of the Cree.

Algonquin Nations are concerned that the Project may have an impact on their Aboriginal rights, including their Aboriginal title, their way of life, culture and traditions as well as on their health and the ecological integrity of the area. They are specifically concerned about the practice of their traditional activities of hunting, fishing, trapping and berry picking, as well as their spiritual activities in their claimed ancestral land.

As presented in section 6.5, the Project's residual effects on the current use of lands and resources for traditional purposes by the First Nations have been deemed to be not significant.

8.3 Proposed Mitigation and Accommodation Measures

With respect to the Algonquin First Nations, several mitigation measures planned by the proponent will minimize the Project's effects on the practice of their traditional activities. These measures would focus on the various valued components of the Project, i.e. air quality and noise, water quality, birds and aquatic wildlife and also the establishment of fish habitat offsetting projects (namely for rainbow trout) and the site's restoration after the mine is closed. The Agency is also asking the proponent to establish a participatory follow-up process within the follow-up committee in order to work with the Lac Simon and Abitibiwinni First Nations on the resolution of potential incidents in mining operations, fish habitat offsetting project as well as corrective measures, if applicable. All of these measures are outlined in Appendix A.

No accommodations have been proposed for the Cree Nation Government since there is no expected impact on their rights.

8.4 Issues outside the Scope of the Environmental Assessment

The Project is located on land where Aboriginal rights are being claimed by the Lac Simon and Abitibiwinni First Nations who mention their historic occupation and current use of the land and who argue they have never given up their Aboriginal rights or title. The issues associated with the determination of rights and title (in other words, issues of governance of the area) fall outside the scope of the environmental assessment and must be settled in the context of negotiations with the governments of Quebec and Canada or before the courts. These issues have been sent to the Department of Indigenous and Northern Affairs Canada (INAC).

8.5 Agency's Conclusion regarding the Impacts on Potential or Established Aboriginal or Treaty Rights

The Agency is of the opinion that the mitigation measures and accommodations presented in this comprehensive study report will adequately minimize the impacts on First Nations in terms of the potential impacts of the Project on potential or established Aboriginal or treaty rights, including the rights to fish, hunt, trap, pick plants and use important cultural and spiritual sites.

9 Follow-Up Program under the Canadian Environmental Assessment Act

Pursuant to the former Act, every comprehensive study must include a consideration of the need for, and the requirements of, a follow-up program, for verifying the accuracy of the conclusions of the environmental assessment and determining the effectiveness of the measures taken to mitigate the adverse environmental effects of a project. The results of a follow-up program can also support the implementation of adaptive management measures designed to mitigate unanticipated adverse environmental effects.

Fisheries and Oceans Canada, the responsible authority, must ensure that a follow-up or monitoring program is developed and implemented with the support of federal authorities.

The proponent has undertaken to conduct follow-up of air quality, noise levels and vibrations, groundwater and surface water quality, sediments, benthos, fish and its habitat, and soil quality. It has also created a permanent follow-up committee made up of citizens from the regional county municipality as well as regional and First Nations representatives.

To develop the directions of the federal follow-up program required as part of the environmental assessment, the Federal Committee took into account the proponent's commitments and the provincial requirements, and identified follow-up requirements that fall within the federal government's areas of jurisdiction. These requirements were determined on the basis of the nature of the Project's environmental effects, the uncertainties concerning the predictions or effectiveness of the mitigation measures, as well as the concerns raised by the public and First Nations. The proponent has agreed to implement the monitoring measures described below.

Table 5 Elements of the federal follow-up program

Valued component	Program elements	Timetable and/or frequency
Water quality	Follow-up of lithium and chrome concentrations in effluents in accordance with the same requirements as other substances defined in Schedule 5 of the <i>Metal Mining Effluent Regulations</i> with the goal of verifying the accuracy of the environmental assessment with respect to water quality.	During the operations and closure phases, in accordance with the provisions of the <i>Metal Mining Effluent Regulations</i> .
Fish and fish habitat	Monitoring of fish habitat compensation objectives as well as the integrity and effectiveness of compensation works. Implementation of corrective actions, where necessary	Will be specified in the conditions of the permit issued by Fisheries and Oceans Canada.
	Monitoring of changes in water level and the physical chemistry of Lortie Lake. This will include a reference state for the lake deemed appropriate by Fisheries and Oceans Canada. Quality control will be carried out on the measured water level values and for the physical chemistry parameters.	The entire operations period of the mine site.
	Follow-up of groundwater levels and potential impacts on Lortie Lake via two monitoring wells in the basement rock and the unconsolidated deposits near the lake.	The entire operations period of the mine site.

Valued component	Program elements	Timetable and/or frequency
	Demonstrate compliance with the various measures to protect fish habitat (refer to Appendix A).	
Birds and bird habitat	Production of environmental monitoring reports to document the presence of nesting pairs of migratory birds, specifically the avian species at risk, and document measures taken to ensure their protection	At every phase of the Project (construction, operation, closure and restoration), during the periods of the year at risk of causing adverse effect on birds, their nests or eggs.
	Follow-up of effects on avian special status species by way of surveys conducted in the local study area. Assess the possibility of intervention to create or improve favorable habitat conditions for certain avian species with special status on the mine site during the restoration phase.	Every five years, during the operations phase (years 6 and 11) and after restoration (years 16 and 21)

The federal authorities will collaborate with the proponent in developing the details of the follow-up program in keeping with their respective mandates and expertise. The program will take into account the conditions and requirements of federal and provincial authorizations and approvals necessary to carry out the Project, any changes in environmental conditions, and the environmental effects that may occur during Project implementation. The results of the follow-up program will be reported to the relevant departments and agencies. The results or an indication of how the results may be obtained will be available to the public through the Canadian Environmental Assessment Registry (www.ceaa-acee.gc.ca).

10 Conclusions and Recommendations of the Agency

In reaching its conclusion on the significance of the Project's environmental effects, the Agency took the following elements into account:

- the documentation submitted by the proponent;
- the analyses and findings of the Federal Committee;
- comments from the public, the Abitibiwinni First Nation and the Anishnabe First Nation of Lac Simon;
- the proponent's obligations, as described in the certificate of authorization issued in accordance with the Quebec *Environment Quality Act*;
- the obligation to apply for authorization under the *Fisheries Act* for work that would lead to serious harm to fish.

Taking into account the implementation of the proposed mitigation measures and commitments made by the proponent, the Agency concludes that the Project is not likely to cause significant adverse environmental effects.

Upon completion of a public consultation on this report, the Minister of Environment and Climate Change Canada will consider the report and the observations presented in order to decide whether, given the implementation of the proposed mitigation measures and follow-up program that she deems appropriate, the Project is likely to cause significant adverse environmental effects. The Project will then be referred back to the responsible authority, Fisheries and Oceans Canada, for a decision under section 37 of the former Act.

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12 Appendices

Appendix A Mitigation Measures

This appendix presents, for each valued component, the mitigation measures that the Canadian Environmental Assessment Agency believes are necessary to mitigate the environmental effects of the North American Lithium Project. The proponent has committed to implementing all of these measures, in addition to those set out in its environmental impact assessment and supplementary documents.

To avoid repetition, some mitigation measures in a particular section may apply to more than one valued component.

Note that additional mitigation measures may be prescribed by the Minister as part of her decision-making process and issuance of a decision statement and in other authorizations that may be issued by the federal government.

Atmospheric environment

Air quality

1. Implement the dust management plan, which includes numerous detailed measures to mitigate the main sources of dust emissions at all phases of the Project. The plan includes using dust suppressants, spraying roads within the mine site and reducing the speed limit to 30 km/h in dry weather, in addition to spraying haul-truck loads, dry soil and dry areas. The dust management plan will be updated on the basis of the results of the air quality monitoring done by the proponent.
2. Take weather conditions into account for planning blasting operations (e.g., winds, atmospheric ceiling) in order to reduce emissions of gas and particulate matter due to the use of explosives.

Greenhouse gas emissions

3. Shut off vehicle engines, no idling.
4. Use machinery that meets Environment and Climate change Canada's emissions standards.
5. Inspect machinery before use and on a regular basis to ensure good condition and proper operation, particularly exhaust and pollution-abatement systems.

Ambient noise

6. Site superintendent to ensure that noisy equipment is in good repair and that noise-reduction devices and catalysts on the machinery are in good condition.
7. Limit machinery traffic to work areas.
8. Install permanent crushers under a building.

Water quality

9. Construct a system of ditches to collect water from mining infrastructure and site roads, including water from the processing plant, mine water and runoff from various mine waste and tailings dumps. All of this effluent must be treated before it is discharged into the environment to ensure that it meets regulatory standards.
10. Locate the parking, washing and maintenance areas for the machinery at least 60 m away from any watercourse.
11. Refuel machinery under constant supervision at least 30 m away from any watercourse. Maintain and refuel machinery in locations designated for that purpose. Refuelling stations will be clearly identified by signage. Fuelling in the pit will be done by a truck with a double-walled tank and an emergency spill kit.
12. Dispose of used oil from machinery at a site designed for that purpose.

13. Use clean granular material for the installation of cofferdams in dam construction.
14. Install mine wastewater treatment units.
15. Treat domestic wastewater with a system that includes a septic tank, pre-filters, a pumping station, waste stream separation and biofilters operating in parallel, with effluent disinfection treatment capability, if applicable.
16. Gradually stabilize overburden and banks to control erosion and promote recovery of a natural ecosystem. Gradually plant grasses. Terrace inverse slopes at least 3 m wide every 20 m along banks in the upper portion, where the slopes are 4H:1V, and every 30 m in the lower portion, where the slopes are less steep (control of runoff and the formation of rills and trenches and sediment transport along the slopes of overburden dumps).
17. Create a plateau in the upper portion of each waste rock pile for their restoration and to control water and wind erosion of fine particles. Plant seedlings, young shrubs and trees on the plateau to serve as a seed bank, stabilize the pile, increase ecological diversity and enhance integration into the surrounding landscape. This planting will be carried out on the plateau with ramial chipped wood and mycorrhizae. In the final phase of restoration, ramial chipped wood or other wood mulch will be thrown onto the slopes to partially fill in rock interstices and promote germination. Finally, the area will be seeded with grasses and pulses.
18. Install an evaporation and crystallization system to reduce the salt load in the mine tailings pond if lithium carbonate is produced.
19. Develop an environmental emergency measures program and procedures applicable to accidents and spills to limit impacts on water resources.
20. Immediately report any accidental spill to the person in charge of the emergency measures program and take the following action:
 - The affected area will be contained and cleaned immediately.
 - The alert networks of Environment and Climate Change Canada and the Quebec ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques will be informed without delay.
 - Contaminated soil will be removed and disposed of in an authorized location.
 - The spills and corrective measures taken will be recorded in an internal log.
21. Inspect machinery before use and on a regular basis to ensure good condition, proper operation and, in particular, the absence of any oil leaks.
22. Install a geomembrane in the southern end of the B-West tailings pond to prevent infiltration of water under the B-West tailings pond.
23. Implement an explosives management plan designed to reduce the release of nitrogen compounds into surface water and groundwater (e.g., by using only water-resistant explosives).

Fish and fish habitat

24. Implement an offsetting plan to offset serious harm to fish, if necessary, in accordance with the *Fisheries Act*.
25. Comply with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Water (Wright and Hopky, 1998) during blasting operations.
26. Use the criteria and measures presented in the document entitled Guidelines for Watercourse Crossings in Quebec (2016) for the design of stream crossings where the free passage of fish is required.

27. Put effective structures/measures in place to limit the flow of sediment from mine facilities into aquatic environments beyond the immediate work area and maintain them (e.g., sediment barriers, berms, sediment traps, settling basins, temporary slope stabilization, etc.).
28. Complete in-water works during the period authorized for work in fish habitat in the Abitibi-Témiscamingue region, which is May 15 to September 30 inclusive.
29. Do not carry out any earthwork or excavation work near watercourses during flood periods or during heavy rains.
30. Apply the mitigation measures recommended in the section on water quality to lessen the impact of the Project on fish and fish habitat.

Birds and bird habitat

31. Carry out all work that is potentially harmful to migratory birds, mainly clearing and grubbing, outside of the key nesting season for migratory birds and use the tools available at the following link: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html> to identify the nesting periods of migratory birds.
32. Machinery will not circulate beyond the work areas, and fencing will be installed along the perimeter of protection of sensitive areas, particularly birds' nests and potential habitats of species at risk.
33. Work areas will be clearly delimited on the ground to avoid any additional encroachment.
34. Work will be monitored to ensure that no adverse effect on birds, their nests or eggs occurs and areas of planned operations will be inspected beforehand. If nesting birds or nests are detected before or during operations, the work will be stopped until the area where nests are present has been delimited and protected by fencing. The protected area will be sufficiently large to prevent disturbance of the species during the nesting period. For the Common Nighthawk, the protected radius would be 50 metres, because it nests in open areas and the chicks can travel 5 to 48 metres.
35. Raise employee awareness around the presence of nests of migratory birds, including the nests of species at risk, such as the Canada Warbler and the Common Nighthawk, and the procedure to follow if a nest is discovered.
36. Put proven bird-scaring equipment in place around the mine water ponds posing a risk to avian wildlife, notably the pond at the B-West tailings management facility.

Current use of lands and resources for traditional purposes

37. Apply the mitigation measures recommended in the sections on air quality, ambient noise, water quality, birds and bird habitat and fish and fish habitat to lessen the impacts of the Project on any current use of lands and resources for traditional purposes.
38. Implement a participatory monitoring process with the First Nations of Lac Simon and Abitibiwinni to inform and share about any potential incidents arising from the operations of the mine, follow-up of mitigation measures and other corrective action, if applicable.
39. Develop a fish habitat compensation plan (e.g., for Brook Trout) in collaboration with the First Nations of Abitibiwinni and Lac Simon.
40. Stop work if archeological resources are discovered in order to implement measures to protect the site of the discovery.

Appendix B Summary of the Federal and Provincial Regulatory Framework for Valued Components in the Environmental Assessment

The table below summarizes the provincial and federal regulatory framework for each valued component identified in the environmental assessment. To determine the significance of the residual environmental effects of the North American Lithium Spodumene Mine Project, the Agency took into consideration, to the extent possible, all applicable federal and provincial acts and regulations as well as criteria and/or guidelines.

Valued Component	Regulatory Framework	
	Federal	Provincial
Atmospheric environment	<p>Air Quality</p> <p>Canadian Ambient Air Quality Standards http://www.ec.gc.ca/default.asp?lang=En&n=56D4043B-1&news=A4B2C28A-2DFB-4BF4-8777-ADF29B4360BD</p> <p>These standards are health-based air quality objectives for pollutant concentrations in outdoor air. They relate solely to fine particulate matter and ground-level ozone, two pollutants of concern to human health and the major components of smog.</p> <p>Greenhouse Gases (GHGs)</p> <p>Greenhouse Gas Reporting Program https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting.html</p> <p>Any installation generating annual GHG emissions of 50,000 tonnes or more in equivalent units of carbon dioxide per year must declare these under this Environment and Climate Change Canada program (refer to section 46 of the <i>Canadian Environmental Protection Act</i>).</p>	<p>Air Quality</p> <p>Clean Air Regulation and air quality criteria http://www.mddelcc.gouv.qc.ca/air/criteres/index.htm</p> <p>The province uses standards and criteria to assess air quality and to study projects generating air contaminant emissions that are submitted to it for authorization. The standards consist of maximum values and are set out in the <i>Clean Air Regulation</i>. The criteria are reference levels used to evaluate emissions of certain unregulated contaminants.</p> <p>Greenhouse Gases (GHGs)</p> <p>Regulation Respecting Mandatory Reporting of Certain Emissions of Contaminants into the Atmosphere http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/Q-2,%20r</p> <p>Emitters are required to report their GHG emissions. The reporting threshold for GHG emissions is 10,000 tonnes of CO₂ equivalent emissions.</p> <p>Ambient Noise</p> <p>Directive 019 on the mining industry http://www.mddelcc.gouv.qc.ca/milieu_ind/directive019/</p> <p>This directive stipulates that the reference noise level for a stationary source associated with a mining activity must be assessed in accordance with the prescriptions of Instruction Note 98-01 (handling of noise-related complaints and requirements pertaining to companies causing the noise). The noise levels measured must meet the requirements established under this instruction note.</p>

Valued Component	Regulatory Framework	
	Federal	Provincial
		<p>The directive also includes requirements related to vibrations caused by blasting, including maximum vibration velocities as a function of ground vibration.</p> <p>Instruction Note 98-01 http://www.mddelcc.gouv.qc.ca/publications/note-instructions/98-01.htm</p>
Water quality	<p>Metal Mining Effluent Regulations http://laws-lois.justice.gc.ca/eng/regulations/SOR-2002-222/</p> <p>These regulations apply to all Canadian metal mines (except placer mines) exceeding an effluent flow rate of 50 cubic metres per day at any time after the regulations were registered and that deposit effluent into natural water bodies frequented by fish. They specify the maximum concentration limits for arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids, radium-226 and pH in mine effluent (the pH of the effluent must be equal to or greater than 6.0 but not greater than 9.5).</p> <p>Mines subject to these regulations are also required to conduct environmental effects monitoring (EEM) studies in accordance with prescribed criteria. The objective of EEM is to evaluate the effects of mining effluent on the receiving aquatic environment, specifically with regard to effects on fish, fish habitat and the use of fisheries resources. The substances that must be measured in EEM studies are aluminum, cadmium, iron, mercury, molybdenum, selenium, ammonia and nitrate.</p> <p>Canadian Water Quality Guidelines http://ceqg-rcqe.ccm.ca/download/en/201</p> <p>These guidelines are intended to provide protection of freshwater and marine life from anthropogenic stressors such as chemical inputs or changes to physical components. Guidelines are numerical concentrations or narrative statements. Ambient water quality guidelines developed for the protection of aquatic life provide the science-based benchmarks for a nationally</p>	<p>Directive 019 on the mining industry http://www.mddelcc.gouv.qc.ca/milieu_ind/directive019/</p> <p>This directive is used to analyze mining projects that require issuance of an authorization certificate under the Quebec <i>Environment Quality Act</i>. It contains provisions designed to protect surface water and groundwater. With regard to surface water, the directive sets out the allowable concentrations related to mining effluent (e.g., pH, arsenic, copper, iron, nickel, lead, zinc, cyanide, hydrocarbons and suspended solids).</p> <p>To protect groundwater, the operator must, among other obligations, install a groundwater monitoring system around at-risk facilities, except where all the underlying hydrogeological formations are Class III and have no hydraulic connections.</p> <p>Provincial Effluent Discharge Objectives (EDOs) http://www.mddelcc.gouv.qc.ca/Eau/oer/index.htm</p> <p>The effluent discharge objectives are concentrations and loads that may be discharged into an aquatic environment and which take into account the characteristics of the discharge and of the receiving environment as well as the level of quality necessary to maintain the uses of the water. In the mining sector, proponents are required to comply with the standards (limits) set out in Directive 019 on the mining industry, and sometimes, when treatment technology permits, to strive to meet the EDOs. The province encourages proponents to consider EDOs as continuous improvement targets and to study the proposed EDOs with regard to the analytical, economic and technical feasibility related to water treatment.</p> <p>Quality Criteria for Protection of Aquatic Life</p>

Valued Component	Regulatory Framework	
	Federal	Provincial
	<p>consistent level of protection for aquatic life in Canada.</p> <p>List of Toxic Substances Managed under the <i>Canadian Environmental Protection Act (1999)</i> https://www.canada.ca/en/environment-climate-change/services/management-toxic-substances/list-canadian-environmental-protection-act.html</p> <p>The List of Toxic Substances in Schedule 1 of the <i>Canadian Environmental Protection Act (CEPA)</i> includes substances that are considered to be toxic as defined in Section 64 of the Act. The Government of Canada has the authority to regulate and authorize other instruments to prevent or control the use and/or discharge of these substances. The Government of Canada adds substances to Schedule 1 of CEPA based on the recommendation of the Minister of the Environment and the Minister of Health.</p> <p>Canadian Drinking Water Guidelines https://www.canada.ca/en/health-canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html</p> <p>These guidelines are intended to protect the health of the most vulnerable members of society, such as children and the elderly. They set out the basic parameters that every water system should strive to achieve in order to provide the cleanest, safest and most reliable drinking water possible.</p>	<p>http://www.mddelcc.gouv.qc.ca/Eau/criteres_eau/fondements.htm#sante-humaine</p> <p>Quality criteria are established for each contaminant and each water use. The quality criteria for preventing the contamination of water and aquatic organisms are intended to protect water and aquatic organisms from contamination that may pose a threat to current and future human consumption.</p> <p>Regulation Respecting the Quality of Drinking Water http://www.mddelcc.gouv.qc.ca/eau/potable/brochure/</p> <p>This regulation sets out water quality standards and controls. Municipal, private, institutional and tourism-related systems providing drinking water for more than 20 people are subject to monitoring of drinking water quality. Operators of drinking water systems have primary responsibility for providing Quebecers with quality drinking water. The province assumes responsibility for regulatory monitoring and issuance of the authorizations required for facilities.</p>
Fish and fish habitat	<p>Fisheries Act http://laws-lois.justice.gc.ca/eng/acts/f-14/</p> <p>The Act is intended to protect the productivity of commercial, recreational and First Nations fisheries. Section 35 of the Act states that no work, undertaking or activity may be carried out that results in serious harm to fish that are part of a commercial, recreational or First Nations fishery, or to fish that support such a fishery, unless authorization for such purpose is obtained from</p>	<p>Act Respecting the Conservation and Development of Wildlife http://legisquebec.gouv.qc.ca/en/ShowDoc/cs/C-61.1</p> <p>Regulation Respecting Wildlife Habitats http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/C-61.1,%20r.%2018/</p> <p>The Act sets out various prohibitions related to the conservation of wildlife resources as well as various safety measures. It also specifies the rights and obligations of hunters, fishers and trappers. Under section 128.6, it is prohibited to carry out any activity that is likely to alter a biological, physical or chemical component peculiar to</p>

Valued Component	Regulatory Framework	
	Federal	Provincial
	<p>the Minister of Fisheries and Oceans Canada. All serious harm to fish must be addressed through a fish habitat compensation plan to offset the loss of fish habitat.</p> <p>Furthermore, section 36 of the Act states that “no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish, or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.” The Governor in Council may, however, permit the use of a natural water body frequented by fish for the disposal of mine waste. This requires an amendment to the <i>Metal Mining and Effluent Regulations</i> so that the water body can be added to Schedule 2 thereof. In such a case, the project proponent must develop and implement a fish habitat compensation plan to offset the loss of fish habitat in accordance with section 27.1 of the <i>Metal Mining and Effluent Regulations</i>.</p> <p>Certain fish species are protected under the <i>Species at Risk Act</i> (see the birds component for more details on this legislation).</p>	<p>an animal or fish habitat. However, the Minister may authorize such an activity subject to certain conditions. Wildlife habitats include fish habitats and are defined in the <i>Regulation Respecting Wildlife Habitats</i>.</p> <p>In Quebec, eight fish species are designated as vulnerable or threatened within the meaning of the <i>Act Respecting Threatened or Vulnerable Species</i>. Twenty-five other species are identified as likely to be designated as threatened or vulnerable (refer to the birds component for more details concerning this Act).</p>
Birds and bird habitat	<p><i>Migratory Birds Convention Act, 1994</i> http://laws-lois.justice.gc.ca/eng/acts/M-7.01/index.html</p> <p><i>Migratory Birds Regulations</i> http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.%2C_c._1035/ <i>Migratory Bird Sanctuary Regulations</i> http://lois-laws.justice.gc.ca/eng/regulations/C.R.C.%2C_c._1036/</p> <p>In Canada, as many as 658 different species of birds have been identified, including 555 migratory species covered by the Act.</p>	<p>The provisions of the above-mentioned <i>Act Respecting the Conservation and Development of Wildlife</i> and the <i>Regulation Respecting Wildlife Habitats</i> apply to birds and their habitat (refer to the section on fish and fish habitat).</p> <p><i>Act Respecting Threatened or Vulnerable Species</i> http://legisquebec.gouv.qc.ca/en/ShowDoc/cs/E-12.01</p> <p>This Act applies to threatened or vulnerable plant and animal species designated under the Act which live in Quebec or are imported into Quebec. It covers 15 bird species, of which 8 are designated threatened and 7 vulnerable. To this is added the list of bird species likely to be designated as threatened or vulnerable, which comprises 16 bird species. Recovery plans are established for threatened and vulnerable species, and committees of experts monitor the implementation of these plans. Once a species is officially designated as “threatened” or “vulnerable,”</p>

Valued Component	Regulatory Framework	
	Federal	Provincial
	<p>This Act and its regulations provide protection for migratory birds, including the prohibition against disturbing or destroying the nests and eggs of migratory birds. For example, under subsection 5.1 of the Act, it is prohibited to deposit a substance that is harmful to migratory birds in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.</p> <p>Species at Risk Act http://laws-lois.justice.gc.ca/eng/acts/S-15.3/ Some bird species are protected under this Act. The purposes of the Act are to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.</p> <p>As part of an environmental assessment carried out under the <i>Canadian Environmental Assessment Act, 2010</i> (the former Act), the Agency is legally bound to address matters pertaining to the <i>Species at Risk Act</i> (section 79). The Agency must identify the adverse effects of the project on species and their critical habitat, and ensure that measures are taken to avoid or lessen those adverse effects; and to monitor them and ensure that such measures are consistent with any applicable recovery strategy and action plans.</p> http://laws-lois.justice.gc.ca/eng/acts/C-15.2/20100712/P1TT3xt3.html	<p>management and protection of the species falls under the <i>Act Respecting the Conservation and Development of Wildlife</i>.</p>
Current use of lands and resources for traditional purposes		<p>Cultural Property Act http://legisquebec.gouv.qc.ca/en/ShowDoc/cs/B-4 Research on and discovery of archeological sites are governed by this Act. It states that legal protection is accorded to “recognized” and “classified” archeological sites. It specifies that no person may alter, restore, repair, change in any manner or demolish all or part of any recognized cultural property or any classified cultural property.</p>

Appendix C Criteria for Determining the Significance of Residual Effects

Evaluation Criteria	Degree of Residual Effect		
	Low	Medium	High
Intensity of the effect concerns the relative importance of the environmental consequences of a change in a specific component of the environment. The assessment of intensity takes into account the natural and social environment (context) of which the component is a part and/or environmental quality standards.	<u>Atmospheric environment</u> : Emission of the contaminant or increase in level of noise is detectable but within normal variability of the baseline.	<u>Atmospheric environment</u> : Emission of the contaminant or increase in level of noise would cause an increase in the baseline conditions, but respects the limits of standards under the <i>Clean Air Regulation</i> , Canadian Ambient Air Quality Standards and Directive 019 on the mining industry.	<u>Atmospheric environment</u> : Emission of the contaminant or increase in level of noise would cause an increase in the baseline conditions, beyond the standards under the <i>Clean Air Regulation</i> , Canadian Ambient Air Quality Standards and Directive 019 on the mining industry.
	<u>Water quality</u> : Emission of the contaminant attributable to the Project is detectable but well below the standards of the <i>Metal Mining Effluent Regulations</i> and Directive 019 on the mining industry.	<u>Water quality</u> : Emission of the contaminant attributable to the Project is close to the standards of the <i>Metal Mining Effluent Regulations</i> and Directive 019 on the mining industry. No exceedance is expected.	<u>Water quality</u> : Emission of the contaminant would cause an increase in the baseline conditions, beyond standards under the <i>Metal Mining Effluent Regulations</i> and Directive 019 on the mining industry.
	<u>Fish and fish habitat</u> : The effect leads to alternation of habitat that neither limits nor reduces the fish's ability to use these habitats. No fish mortality and/or permanent alteration or destruction of fish habitat is anticipated.	<u>Fish and fish habitat</u> : Mortality of one or more fish and/or permanent alteration or destruction of fish habitat that can be compensated through a compensatory plan under the <i>Fisheries Act</i> .	<u>Fish and fish habitat</u> : Mortality of one or more fish and/or permanent alteration or destruction of fish habitat that cannot be compensated through a compensation plan under the <i>Fisheries Act</i> .
	<u>Birds</u> : Habitat disturbance or alteration that is not likely to result in relocation of several breeding pairs, including at-risk species targeted by a recovery program within the meaning of the <i>Species at Risk Act</i> .	<u>Birds</u> : Habitat disturbance or alteration that is likely to lead to relocation of several breeding pairs. No anticipation of incidental take or effect prejudicial to recovery of one or more at-risk species targeted by a recovery strategy within the meaning of the <i>Species at Risk Act</i> .	<u>Birds</u> : Accidental intake of a migratory bird's nest or eggs and/or mortality of one or more migratory birds and/or any effect that would significantly prejudice the recovery of one or more at-risk species targeted by a recovery strategy within the meaning of the <i>Species at Risk Act</i> , notably loss of critical habitat.

Evaluation Criteria	Degree of Residual Effect		
	<p><u>Current use of lands and resources for traditional purposes</u>: Small detectable change from baseline; low exacerbation of existing conditions. Little to no alteration of behaviour is required to carry out current use by First Nations.</p> <p>The Project is not located in proximity to archeological sites and no indirect effects are expected to the integrity of sites.</p>	<p><u>Current use of lands and resources for traditional purposes</u>: Varies from baseline and may result in noticeable changes to current use by First Nations. The Project leads to impacts that alter the quantity and quality of the available resources or territory access such that current use is impacted. A few behaviours are altered, but current use is not jeopardized.</p> <p>Relocation or compaction of small parts of archeological sites, modifications resulting in an indirect effect of the integrity of archeological sites, loss of access.</p>	<p><u>Current use of lands and resources for traditional purposes</u>: Varies from baseline to a high degree. The Project leads to impacts that alter the quantity and quality of the available resources or territory access. Current use by First Nations can no longer be carried out in preferred locations and ways.</p> <p>Relocation or compaction of substantial area and untouched of at least one significant site. Modifications having a direct effect on the integrity of archeological sites, significant loss of access to important sites.</p>
Extent	Isolated	Local	Regional
<p>The extent of the effect refers to the geographic scope and/or the number of individuals who will be affected.</p>	<p>Where the extent of the impact is isolated, the disturbance is circumscribed and affects a small portion of the local study area.</p>	<p>Where the extent is local, the disturbance affects an area extending to the boundaries of the local study area.</p>	<p>A regional extent extends to the regional study area or beyond, relates to a disturbance that affects vast territories (e.g., one or more distribution ranges, home ranges, several watersheds, several trapping grounds or several urban neighbourhoods).</p>
Duration of Effect	Short	Medium	Long
<p>The duration of effect indicates its timeline. It concerns the temporal extent of the impact, i.e., the period of time during which the valued component will be affected.</p>	<p>The duration ranges from a few days to the entire construction period, including the first few months of the operations phase.</p>	<p>The effect persists for several months after the end of construction work, but lasts less than 5 years.</p>	<p>The effect persists on a continuous or discontinuous basis for more than 5 years. This may be a permanent and irreversible effect.</p>

The significance of the effect encompasses the criteria of intensity, extent and duration. The combinations used to determine the level of significance of the effect are pre-established. The relationships among the criteria, as presented in Appendix D, allow an overall judgement to be made on the significance of the effect according to a three-point scale: high, medium and low.

Effects at the high level are considered significant, whereas effects at the medium and low levels are considered not significant

Appendix D Grid for Evaluating the Significance of Environmental Effects

Intensity	Extent	Duration	Significance
High	Regional	Long	High
		Medium	High
		Short	Medium
	Local	Long	High
		Medium	High
		Short	Medium
	Isolated	Long	Medium
		Medium	Medium
		Short	Low
Medium	Regional	Long	High
		Medium	High
		Short	Medium
	Local	Long	Medium
		Medium	Medium
		Short	Low
	Isolated	Long	Medium
		Medium	Low
		Short	Low
Low	Regional	Long	Medium
		Medium	Medium
		Short	Low
	Local	Long	Medium
		Medium	Medium
		Short	Low
	Isolated	Long	Low
		Medium	Low
		Short	Low

A medium intensity impact with a local extent and short duration is an effect whose importance is considered of low significance.

Effects at the high level are considered significant, whereas effects at the medium and low levels are considered not significant.

Appendix E Cumulative Effects on Valued Environmental Components

Valued component	Activity	Potential effects	Mitigation measures	Residual effects	Evaluation of the significance of residual effects			
					Intensity	Extent	Duration	Significance
6.1 Atmospheric environment	Road transport and movement of machinery; Stripping, grading, earthwork of topsoil; Use of explosives; Operation of borrow pits and open-pit mine;	Emissions of particulates, metals and gases components into the air.	1 to 5	The Project would cause air emissions of particulates and gases in the air of the local study area for the Project's entire life cycle. No exceedances of standards of the <i>Clean Air Regulation</i> and the Canadian Ambient Air Quality Standards.	Medium	Isolated	Long	Medium <i>Not Significant</i>
	Crushing, milling and transport (loading and unloading) of ore, concentrate and waste rock;	Green house gas emissions	3 to 5	The Project would emit approximately 314,000 tonnes of carbon dioxide equivalent	Low	Regional	Long	Medium <i>Not Significant</i>
	Accumulation of tailings and waste rock; Demolition of infrastructure during the closure phase.	Increase in noise level at the mine site and its periphery.	6 to 8	The Project would cause an increase in noise especially around construction areas. No exceedance is predicted for the noise criteria of Directive 019 on the mining industry for day and night.	Low	Local	Long	Medium <i>Not Significant</i>
6.2 Water quality	Transport and traffic; Stripping, earthwork, forest clearing; Culvert installation; Maintenance and refuelling of machinery; Fuel storage Mine effluent; Discharge of domestic	Contamination of surface water and groundwater by inputs of leachates, hydrocarbons, suspended solids and fecal coliforms.	9 to 23	The water collection and treatment system for mine water at the mine site will significantly limit contamination of water resources. The receiving environment for mine effluent would nonetheless be affected by inputs of contaminants throughout the operations period in	Medium	Local	Long	Medium <i>Not Significant</i>

Valued component	Activity	Potential effects	Mitigation measures	Residual effects	Evaluation of the significance of residual effects			
					Intensity	Extent	Duration	Significance
	waste water.			<p>spite of compliance with the requirements of the <i>Metal Mining Effluent Regulations</i> and Directive 019 on the mining industry.</p> <p>The risk of contamination associated with a spill of petroleum products is limited and the magnitude of the risk is small as well.</p> <p>A temporary and small influx of sediment may occur in some watercourses. Waste water treatment will prevent water contamination with fecal coliforms.</p>				
6.3 Fish and fish habitat	All operating activities.	Disruption of fish spawning caused by sediment.	25,27,29,30	Mitigation measures can prevent or significantly reduce sediment inputs and associated effects on fish.	Low	Local	Long	Medium <i>Not Significant</i>
	Culvert installation.	Potential restriction of the free passage of fish upstream at the stream crossing sites.	26	Compliance with the criteria and measures presented in the <i>Guidelines for Watercourse Crossings in Quebec</i> should ensure free passage of the fish.	n/a	n/a	n/a	n/a
	Construction of mine infrastructure; Mine water collection and treatment system; Operation of the pit.	Changes to influx of water in water courses an Lortie lake; Permanent loss of fish habitat in streams R1, R2,	24, 28	Permanent alteration of about 3.2 ha of habitat used, in particular, by brook trout in streams R1, R2, R3, R4, Unnamed and upstream from Landrienne River.	Medium	Isolated	Long	Medium <i>Not Significant</i>

Valued component	Activity	Potential effects	Mitigation measures	Residual effects	Evaluation of the significance of residual effects			
					Intensity	Extent	Duration	Significance
		R3, R4, Unnamed and upstream from Landrienne River, as well as in Lortie Lake. These changes and losses would be caused by mine infrastructure, including the pit, which would change the flow pattern of surface water.		Drying up of 0.7 ha of shoreline habitat used by fish species in Lortie Lake, including brook trout. Fisheries and Oceans Canada considers that this serious harm to fish is acceptable to the extent that the proponent will be required under the <i>Fisheries Act</i> to develop and implement a plan to offset the serious harm that will be caused to the fish.				
6.4 Birds and bird habitat	Forest clearing; Excavation and earthwork; Site preparation.	Loss or degradation of bird nesting and feeding habitat.	32, 33, 36	Twenty nesting pairs of Canada warbler and five pairs of common nighthawk could be affected and could need to relocate. Given the abundance of similar habitat in the Project region, the bird populations are likely to successfully establish elsewhere. Gradual restoration of the mine site will limit the duration of the effect.	Low	Local	Long	Medium <i>Not Significant</i>
	Use of machinery; Transport and traffic; Presence of workers Blasting.	Disturbance of breeding pairs and birds at the site and nearby due to disruptions to the acoustic	32	The noise and comings and goings associated with construction, development and operation activities may disturb birds and cause behavioural changes that	Low	Local	Long	Medium <i>Not Significant</i>

Valued component	Activity	Potential effects	Mitigation measures	Residual effects	Evaluation of the significance of residual effects			
					Intensity	Extent	Duration	Significance
		environment.		may affect feeding and reproduction.				
	Forest clearing and site preparation.	Disruption of bird breeding and bird and increased risk of embryo mortality associated with nest destruction.	31, 32, 34, 35	The implementation of mitigation measures should prevent the destruction of birds' nests.	n/a	n/a	n/a	n/a
6.5 Current use of lands and resources	Forest clearing and site preparation Stripping of topsoil, grading, earthwork;	Loss of area for the practice of traditional activities	38, 39	Temporary loss of 569 ha of use of territory and permanent loss of 63 ha	Medium	Local	Long	Medium <i>Not Significant</i>
	Construction of transport and mine complex infrastructure; Road transport and movement of machinery; Expansion of accumulation sites.	Disturbance of traditional activities in the mine site periphery cause by noise, loss of access to the territory or by avoidance of resources because of fear of contamination.	37, 38, 39	The implementation of mitigation measures should mitigate the risk of contamination of traditional foods. The changes to the soundscape could disrupt traditional activities in the mine site periphery in spite of not exceeding the noise criteria in the 019 Directive (mining industry)	Medium	Local	Long	Medium Not Significant
		Disturbance or destruction of vestiges of interest or historical traces.	40	The implementation of mitigation measures should prevent the disturbance or destruction of vestiges of interest or historical traces.	n/a	n/a	n/a	n/a

Appendix F Summary of Proponent's Assessment of Alternative Means

Activity	Variants	Benefits	Drawbacks
Method of Extraction	Open-pit mine (selected variant)	<ul style="list-style-type: none"> - Lower capital and operating costs. - Greater potential for ore recovery. - Facilitates mining from a technical perspective. 	<ul style="list-style-type: none"> - Higher volume of rock waste and overburden to manage. - Use of a larger area.
	Underground galleries	<ul style="list-style-type: none"> - Lower volume of rock waste and overburden to manage. 	<ul style="list-style-type: none"> - Technical challenges involving excavation of numerous access shafts, increased equipment requirements and work safety constraints. - Risk of abandoning a significant portion of deposit. - Not economically viable.
Location of Mine Complex	Option 1	<ul style="list-style-type: none"> - No benefits identified. 	<ul style="list-style-type: none"> - Approximate area of wetland encroachment: 3.0 ha.
	Option 2	<ul style="list-style-type: none"> - No benefits identified. 	<ul style="list-style-type: none"> - Approximate area of wetland encroachment: 0.6 ha.
	Option 3	<ul style="list-style-type: none"> - No benefits identified 	<ul style="list-style-type: none"> - Approximate area of wetland encroachment: 4.5 ha.
	Option 4 (selected variant)	<ul style="list-style-type: none"> - Minimizes the distance between the mine complex and the pit. - Site has no hydraulic link to a Class I aquifer. - Option that encroaches least on wetlands (approximately 0.4 ha). 	<ul style="list-style-type: none"> - No drawbacks identified.
Tailings Management	Site A	<ul style="list-style-type: none"> - No wetlands or streams in this sector. - No watersheds affected. - No fish habitat on the site. 	<ul style="list-style-type: none"> - Risk of impact on streams whose source is at the foot of the slope and that discharge into Fiedmont Lake. - Proximity to cottages on Legendre Lake. - Presence of a biological refuge on the east side. - Poor topographic confinement. - Would require membrane due to site permeability. - Visual impact from the peak of Mont Vidéo. - Requires 6 km of forest clearing for access corridor. - Claims not controlled by proponent.
	Site B (selected variant)	<ul style="list-style-type: none"> - Requires less than 2 km of forest clearing. - Partial control of mining claims by proponent. - Site would not be used by public or First Nations. 	<ul style="list-style-type: none"> - Presence of wetlands on the site (14% of its area). - Cottages on Legendre Lake about 1 km away. - Visual impact from the peak of Mont Vidéo.

Activity	Variants	Benefits	Drawbacks
	Site C	<ul style="list-style-type: none"> - Requires no upstream water management. 	<ul style="list-style-type: none"> - Partial encroachment on an esker. - Located at the head of a stream that drains into farmland. - Presence of wetlands. - Poor geological confinement. - Visual impact from the peak of Mont Vidéo.
	Site D	<ul style="list-style-type: none"> - Only one watershed would be impacted. - Few wetlands on the site (3% of its area). - Few old-growth forests and ecosystems on the site (less than 1%). - Requires 4 km of forest clearing for access corridor. 	<ul style="list-style-type: none"> - Presence of a stream with good potential for fish habitat. - An electrical transmission line crosses the site. - Requires upstream water management. - Logging in progress. - Visual impact from the peak of Mont Vidéo. - Mining claims not controlled by proponent.
	Site E	<ul style="list-style-type: none"> - A single stream located on the site with low potential for fish habitat. - Site would not be used by public or First Nations. 	<ul style="list-style-type: none"> - Would impact two watersheds. - Substantial presence of wetlands (32%). - Site far from concentrator. - Visual impact from the peak of Mont Vidéo. - Claims not controlled by proponent.
	Site F	<ul style="list-style-type: none"> - Not visible from Mont Vidéo. - Site would not be used by public or First Nations. 	<ul style="list-style-type: none"> - Technical constraint: requires significant diversion of water around site periphery. - Requires 10 km of forest clearing for access corridor. - Mining claims not controlled by proponent. - Substantial presence of wetlands on the site (38%). - Significant presence of old-growth forests and ecosystems on the site (42%).
	Site G	<ul style="list-style-type: none"> - No benefits identified. 	<ul style="list-style-type: none"> - Presence of three streams that are tributaries for Rivière des Prairies. - Forest environment with a mature growth area, a few wetlands and a few areas where the natural environment has been disturbed. - Designated as a biological refuge by the MDDELCC. - Requires significant diversion of water and will be visible from the peak of Mont Vidéo.
	Site H	<ul style="list-style-type: none"> - Site easily accessible by the main road. - Site would not be used by public or First Nations. - Not visible from Mont Vidéo. 	<ul style="list-style-type: none"> - Substantial presence of wetlands on the site (43%). - Significant presence of old-growth forests and ecosystems on the site (22%). - Presence of three streams that are tributaries of Landrienne River, which is distinguished by its potential

Activity	Variants	Benefits	Drawbacks
			<p>habitat.</p> <ul style="list-style-type: none"> - Technical constraint: requires significant diversion of water around site periphery. - Requires 5 km of forest clearing for access corridor. - Claims not controlled by proponent.
	Site I	- Few or no old-growth forests and ecosystems on the site.	<ul style="list-style-type: none"> - Located near an esker. - Presence of several streams with good potential for fish habitat. - Presence of several wetlands. - Requires significant diversion of water and will be visible from the peak of Mont Vidéo. - Mining claims not controlled by proponent. - A blueberry farm project is being considered for this site.
	Barvue site	- No benefits identified.	<ul style="list-style-type: none"> - Presence of acid drainage and heavy metals. - Water quality incompatible with planned operations. - Site being restored by the MERN.
	Molybdenite site	- No benefits identified.	<ul style="list-style-type: none"> - Site bordered by a wetland. - Potential impact on an esker.
Water management and water supply for the plant	Water from Roy Lake	- No benefits identified.	- Cannot meet the water requirements for the mine complex without impacting the biophysical environment and summertime activities.
	Offsite runoff (selected variant)	- Allows for recycling of mine water as part of the process and minimizing environmental impacts.	- No drawbacks identified.
	Pit dewatering water and water from the tailings storage site, after treatment (selected variant)	- Allows for recycling of mine water as part of the process and minimizing environmental impacts.	- No drawbacks identified.
	Groundwater (180,000 m ³ /year) (selected variant)	- Meets process water requirements.	- No drawbacks identified.

Appendix G Concerns Raised by First Nations

The following table provides a summary of the concerns raised by First Nations during the consultations conducted as part of the environmental assessment of the North American Lithium Project.

First Nations	Comment or concern	Summary of proponent response	Agency response
Land Use			
Lac Simon First Nation	Concern that land use activities such as blueberry picking and moose hunting will be disturbed.	<p>There is no permanent occupation site on the mining property, although the communities claim Aboriginal rights to the land where the Project is located.</p> <p>There was a road in the tailings storage area to provide access to people who wanted to hunt and fish as well as to forestry companies for their operations. To avoid cutting off the road during construction of the mine, the proponent built a new road going around the site in order to allow users to continue with their activities in the southern portion of the territory.</p>	The Agency considers that there will be residual environmental effects, in particular relating to the 63 ha within the lands used for traditional purposes that will be permanently lost in the local study area (area of the pit). The Agency notes, however, that most of the surface area will be restored at the end of operation phase (approximately 89%). The Agency is of the opinion that this loss of land use will not compromise the current use of lands for traditional purposes and the continuity of the way of life of the Lac Simon and Abitibiwinni First Nations in this area.
Lac Simon and Abitibiwinni First Nations	Concerns regarding the contamination of traditional foods by metals, in particular lithium. For example, the First Nations fear that metals present in sediment in Lortie Lake will find its way into the food chain and ultimately end up in fish.	The monitoring of fish and metal concentrations in their flesh is required under the Environmental Effects Monitoring Program (EEM) managed by Environment and Climate Change Canada. It should be remembered, however, that an analysis of fish tissues is only required if, during an effluent characterization, the mine measures a mercury concentration that is equal to or greater than 0.10 microgram per litre in the effluent. Such a concentration of mercury is not expected as part of this Project, but compliance with that concentration must be demonstrated.	<p>The Agency notes that the proponent also plans to implement a mine water collection and treatment system which will ensure that all water from the mine site will be collected and treated before being discharged into the stream. The effluent must meet the criteria prescribed by the <i>Metal Mining Effluent Regulations</i> and Directive 019 on the mining industry. The proponent demonstrated that the atmospheric emissions associated with the Project would respect the limits set by regulations and would be focused in a limited section of the local study area. Through water management measures and the dust management plan, it will be possible to reduce the risks of wildlife tissue contamination.</p> <p>The follow-up committee put in place by the</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
			<p>proponent and that includes the Algonquin First Nations consulted will make it possible to monitor the Project's effects on their current use. The results from the monitoring of air and water quality that will be shared with the members of the committee could mitigate the avoidance of traditional food as a result of the perception it could be contaminated.</p>
Abitibiwinni First Nation	<p>Concern regarding the effects of mining activities on sites of interest, specifically gathering and burial sites as well as archaeological sites.</p>	<p>Studies on archaeological potential that were completed by Archéo-08 (2011 and 2016) indicated that most of the study area in the immediate vicinity of the Project has low archaeological potential or has already been disturbed. Precautions should, however, be taken given that the work is taking place near spaces where the archaeological potential is undeniable.</p>	<p>The Agency asked the proponent to provide a study of the site's archaeological potential. The study showed three known archeological sites near Roy Lake. Moreover, the study indicated that the riparian buffer strips around Lortie and Roy lakes have strong archaeological potential.</p> <p>The Agency notes the proponent's commitment to take measures in the event specific sites of interest are discovered. Given the results of the study on the archaeological potential and mitigation measures put in place by the proponent, the risk that the Project would have an impact on specific sites of interest is low.</p>
Abitibiwinni First Nation	<p>Fear of a decrease in wildlife populations (e.g. moose, bear, American marten, snowshoe hare) following disruptions in this sector. If wildlife begin to avoid the sector and its surrounding areas, causing a drop in the populations of wildlife species of interest, it would have a direct impact on traditional activities (e.g. hunting and trapping).</p>	<p>The proponent indicated that the forest environment on the periphery of the mine is likely to be home to wildlife that will need to relocate as a result of lost habitat.</p> <p>The avoidance of the Project's peripheral areas by wildlife is not likely since the activities will be taking place on an ongoing basis and the vast majority of species acclimatize quickly to the noise of machinery.</p> <p>The potential impact on wildlife can be attributed in part to mining operations, but forestry operations in the area also have an impact.</p>	<p>The Agency is of the opinion that the Project should not significantly modify the population numbers or the range of the species valued by the First Nations since there is a lot of similar habitat on the periphery of the Project.</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
Abitibiwinni First Nation	The First Nation feels that the noise and vibrations from the Project will be felt beyond the study area. This noise would have a negative impact on their hunting techniques as well as the teaching of these techniques to young people and on the inter-generational transmission of traditional knowledge.	The proponent has conducted studies on the sound emissions that demonstrate that the noise levels generated will comply with the noise criteria in Directive 019 on the mining industry, both during the day and at night. The proponent will take the necessary measures to ensure that constraints imposed upon the Project will be respected. The proponent states that avoidance of the Project's peripheral areas by wildlife is not likely since the activities will be taking place on an ongoing basis and the vast majority of species acclimatize quickly to noise.	<p>The Agency is satisfied with the Proponent's response.</p> <p>The Agency acknowledges that certain impacts on hunting activities and the transmission of knowledge about this activity cannot be avoided. The proponent demonstrated that the standards contained in Directive 019 on the mining industry regarding sound levels should be respected given the mitigation measures that will be implemented and which will at the same time reduce repercussions on land users.</p> <p>Given the major availability of land suitable to hunting in this sector, the Agency is of the opinion that the current use of the land for traditional purposes, including auditory hunting, can still be maintained.</p>
Air Quality			
Abitibiwinni First Nation	Concerns regarding the runoff of dust into Lortie Lake, which replenishes itself through precipitation and runoff.	<p>The modelling study indicates that the standards for ambient air concentrations will be respected.</p> <p>The proponent will implement an air quality monitoring program, with two components, and the objective will be to measure the impact of mining activities on air quality. The purpose of the first component will be to evaluate the quality of the ambient air using a sampling station at the mine site and to determine the compliance of the results with the Air Quality Regulations. The second component will include measurements at the source of various emission sources.</p>	Atmospheric emissions will be produced over a long period, i.e. for the entire duration of the mine's operations. They must, however, be under the limits set by provincial regulations and be focused in a limited section of the local study area.

First Nations	Comment or concern	Summary of proponent response	Agency response
Water Quality			
Abitibiwinni First Nation	Concerns regarding the effects of the Project on the aquatic environment.	The proponent has completed an in-depth review of its water collection and treatment system. The four effluents now included in the Project will be managed in accordance with the provisions of the <i>Metal Mining Effluent Regulations</i> . The grouping of effluents (4 rather than 19) is deemed beneficial for the surface water quality component.	<p>The Agency requested several clarifications from the proponent regarding water management.</p> <p>In order to comply with the <i>Metal Mining Effluent Regulations</i> and its obligations under the <i>Fisheries Act</i>, the proponent must ensure the monitoring of several parameters and deleterious substances that can impact the quality of aquatic habitat, as well as the monitoring of fish populations.</p> <p>The presence of 4 effluents rather than 19 will facilitate the compliance monitoring of the <i>Metal Mining Effluent Regulations</i>, which is under the responsibility of Environment and Climate Change Canada.</p>
Abitibiwinni First Nation	<p>Concerns regarding the enforcement of water protection regulations.</p> <p>Concern regarding the effects of open pit mining on water and the effectiveness of the contaminated water treatment plant.</p>	Monitoring of surface water and groundwater quality and of the mining effluent will be conducted according to the requirements of Directive 019 on the mining industry and the <i>Metal Mining Effluent Regulations</i> .	<p>Potential effects of the Project on water quality will be subject to monitoring in accordance with the requirements of Directive 019 on the mining industry and the <i>Metal Mining Effluent Regulations</i>. Under the Directive, the proponent will be required to implement corrective actions if water quality does not meet mandatory limits.</p> <p>The Agency is of the opinion that Directive 019 on the mining industry will make it possible to ensure water protection.</p> <p>The Agency also asked for clarifications regarding the water treatment planned by the proponent and is satisfied with them.</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
Aquatique Wildlife			
Lac Simon and Abitibiwinini First Nations	<p>Concerns regarding the Project's effects on rainbow trout.</p> <p>Concerns regarding the loss of habitat and health of rainbow trout. These habitats are necessary for the traditional way of life of the Algonquin and the transmission of their culture. Demand that the offsetting measures be equivalent to the productivity of current habitats and be a part of the discussions regarding these measures.</p>	<p>The proponent has worked with the Lac Simon First Nation. A biologist employed by the community has identified works that the community would like to see completed as a fish offsetting Project. They were not deemed admissible as offsetting projects by Fisheries and Oceans Canada. The proponent is still working to identify an offsetting project to counterbalance serious harm to fish associated with its infrastructure and mining activities.</p>	<p>The <i>Fisheries Act</i> requires that the proponent put in place appropriate measures to compensate for serious harm to fish.</p> <p>The proponent took steps to identify fish offsetting projects. However, it has been determined that none of the proposed offsetting projects submitted to Fisheries and Oceans Canada to date meet the guiding principles of the Fisheries Productivity Investment Policy.</p> <p>The proponent commits to develop and implement a plan to offset the loss of fisheries productivity that results from the serious harm caused to fish. The offsetting plan will be finalized in collaboration with Fisheries and Oceans Canada, and the First Nations will be consulted. This plan will be monitored in order to ensure that the prescribed offsetting objectives are met.</p>
Geochemical Characterization			
Lac Simon First Nation	<p>Concerns following the geochemical characterization of the tailings. Issue regarding the potential effects of a release of elements into the surface water as well as the groundwater, given that the tailings storage area as well as the mine site as a whole is located on a moraine.</p>	<p>The proponent conducted kinetic tests that concluded that the potential for acid generation and metal leaching from the materials extracted from the deposit is low.</p> <p>According to the proponent, the risk of groundwater contamination would be low since the waste from the concentrator and tailings does not generate acids and has little likelihood of leaching. The proponent predicted that the effluent will meet the criteria prescribed by the <i>Metal Mining Effluent Regulations</i> and Directive</p>	<p>The Agency notes that the system to collect and treat mine water will be put in place in order to comply with the requirements of the <i>Metal Mining Effluent Regulations</i> and Directive 019 on the mining industry. Although some uncertainty remain regarding the geochemistry of the materials, monitoring of the effluent and the receiving environment, which has been enhanced by the proponent, should make it possible to validate the predictions made as part of the environmental assessment and to take corrective action, if applicable.</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
		<p>019 on the mining industry.</p> <p>Furthermore, the B-West tailings area is equipped with a watertight geomembrane that prevents the infiltration of water underneath the tailings storage area. The implementation of measures to prevent the infiltration of petroleum products and hazardous materials into the water table (refer to Appendix A) will also strengthen the protection of the Harricana moraine. The risk of contamination associated with the presence of the tailings storage area is considered low due to the fact that the mine water would drain west, without reaching the Harricana moraine, which is located northeast of the mine site.</p>	<p>Fisheries and Oceans Canada, as the responsible authority, is responsible for to ensure that monitoring is developed and implemented with the support of federal expert authorities.</p>
Monitorind and Follow-Up			
Lac Simon and Abitibiwinni First Nations	<p>The First Nations wish to participate in the environmental monitoring in all phases of the Project, including the implementation of the methodology and the presentation of the results. They are asking that the lithium be analyzed with various characterizations, that it be the subject of environmental monitoring and that the proponent inform them of any event pertaining to accidents or malfunctions.</p> <p>The Lac Simon Algonquin Nation is also recommending that aluminum levels be monitored along with certain other indicator metals (for surface water and groundwater),</p>	<p>In 2011, the proponent created a permanent follow-up committee comprising citizens from the regional county municipality (RCM), regional representatives and First Nations in order to monitor the Project during the construction, operation and closing phases.</p> <p>Lithium has been included in all analyses conducted since the beginning of the pre-feasibility phase, whether in terms of leaching tests and analyses of water, sediment or soil quality.</p>	<p>At the request of the Federal Environmental Assessment Committee and the First Nations, the proponent has agreed to add chrome and lithium to the monitoring list in addition to the monitoring under the <i>Metal Mining Effluent Regulations</i>. Monitoring of mining effluents is also required under Directive 019 on the mining industry and this monitoring includes aluminium and copper.</p> <p>The air modelling study indicates that the standards for ambient air concentrations will be respected for all metals that were included in the study, including beryllium. Moreover, the dust management plan will reduce the emission and deposit of dust containing metals in watercourses.</p> <p>The follow-up committee put in place by the</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
	<p>such as beryllium, in order to look for changes that might occur during operations. Lastly, the Algonquin Nation is recommending that chrome and copper levels be monitored in waters that come into contact with the tailings.</p>		<p>proponent and that includes the Algonquin First Nations consulted will make it possible to monitor the Project's effects.</p> <p>The Agency is encouraging the proponent to ensure the increased participation of the First Nations in the environmental monitoring efforts.</p>
Lac Simon First Nation	<p>The proponent does not foresee any monitoring of the works storing mining waste between the 5th and 10th year following restoration.</p> <p>The First Nation is asking that the annual inspections be continued until the 10th year.</p>	<p>As required under Quebec Directive 019 on the mining industry, the storage areas will be inspected annually by a geotechnical specialist for the five years following restoration, then the 10th year following restoration. The purpose of the inspections will be to check the integrity of the dikes and storage areas, as well as the absence of any notable soil erosion, settling or movement, otherwise corrective measures must be undertaken.</p>	<p>Given the proponent's commitments, the Agency is of the opinion that the restoration of the mine site will be completed in accordance with the requirements of Directive 019 on the mining industry.</p>
Lac Simon and Abitibiwinni First Nations	<p>Concerns regarding the environmental restoration of the site.</p> <p>Request to be involved in the updating of the mine closure plan so that traditional knowledge is included in order to ensure the restoration of lost habitat, to promote the traditional way of life and to leave a positive inheritance for future generations.</p>	<p>Project operations fall under the provincial Mining Act. Therefore, North American Lithium is obligated to submit a restoration plan for approval to the Quebec Department of Energy and Natural Resources. The work to close and rehabilitate the mine site must make the site safe and restore it to a condition that is compatible with its environment, in a state that is satisfactory to government departments and the community. The restoration must also contain financial guarantees.</p>	<p>The Mining Act of Quebec establishes requirements in order to ensure the restoration of land affected by mining activities. Under the Act, the proponent must submit a restoration plan and a financial guaranty to the Government of Quebec for the site's restoration.</p> <p>The Agency is of the opinion that the proponent's obligations to respect the regulatory requirements ensure that the restoration of the mine site will take place in a compliant manner.</p> <p>The follow-up committee put in place by the proponent and that includes the Algonquin First Nations consulted will allow for monitoring of the Project's closure plan.</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
Accidents and Malfunctions			
Lac Simon and Abitibiwinni First Nations	<p>Concern regarding the risk of accidents and major spills, considering that spills have already occurred as part of this Project.</p> <p>Concern that disasters will have a negative impact on lake sturgeon.</p>	<p>In order to mitigate the potential environmental effects of accidental spills, the proponent has defined measures to ensure the maintenance, repair and cleaning of the machinery where the facilities have been set up for that purpose.</p> <p>The emergency plan has been reviewed since the spill of March 18, 2013, to provide better supervision of the response required if such a situation was to reoccur.</p> <p>The spill is of hydraulic origin, not geotechnical, and did not affect the integrity of the dams.</p>	<p>In response to spills that occurred in 2013, an investigation is under way by Environment and Climate Change Canada to see if violations were committed under the <i>Fisheries Act</i> and the <i>Metal Mining Effluent Regulations</i>. The Agency also acknowledges that following the two accidents, the proponent implemented corrective measures to prevent re-occurrence of the accidents.</p> <p>The Agency also notes that the proponent has agreed to put in place several mitigation, surveillance and monitoring measures to reduce the risk of accidents and malfunctions, as well as to put in place an emergency and response plan in the event an accident were to occur. In view of these considerations, the Agency is of the view that accidents or malfunctions that could result in significant effects are unlikely to occur. The proponent, however, must notify the First Nations of all accidents at all times.</p>
Aboriginal Rights			
Abitibiwinni First Nation	<p>As part of the Canadian environmental process, no appropriate study on the traditional use of lands by the Abitibiwinni Algonquin First Nation has been conducted. A study on the practices and traditional knowledge is an essential element of the consultations. The gathering, sharing and evaluation of traditional knowledge are an essential step in understanding the concerns of a First</p>	<p>The proponent and the representatives of the Algonquin Nations have signed an agreement which states that the communities claim Aboriginal and territorial rights to the land where the mine is constructed. In fact, the study area overlaps the boundaries of the lands of the two communities.</p>	<p>The Agency supports First Nation participation through its Participant Funding Program. The Abitibiwinni and Lac Simon First Nations have asked for and received financial assistance under this program.</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
	<p>Nation. This Algonquin Nation would have liked to see independent studies conducted under their direction in order to identify and understand the technical data and the potential repercussions on their rights. However, no amount has been proposed by Canada to fund such studies.</p>		
Lac Simon First Nation	<p>The creation of Indian reserves, the assimilation policies of the Indian Act, the implementation of beaver reserves and colonization of the lands in the Barraute sector are all factors that have pushed the Lac Simon Anishnabeg to mainly occupy the land further to the north of the Lac Simon reserve. Nevertheless, the Lac Simon Anishnabeg still consider themselves the guardians of the land for the benefit of future generations and have expressed a real desire to have their Aboriginal rights recognized, over the entirety of the land they once occupied, including the site of the North American Lithium mine.</p>	Question addressed to the Crown	<p>The federal environmental assessment is not intended to establish Aboriginal rights or titles. The Agency has developed a flexible approach which incorporates Crown consultations with First Nations in the environmental assessment process.</p> <p>The Agency has submitted the concern to the proponent and the Minister of Indigenous and Northern Affairs Canada.</p> <p>Throughout the environmental assessment, the Agency took into account the anticipated impacts on First Nations. The mitigation measures detailed in the report regarding the atmospheric environment, water quality, fish and current use of the land for traditional purposes are measures that minimize the potential impacts of the Project on the affirmed rights of the Lac Simon First Nation.</p>
Legal Duty to Consult			
Abitibiwinni First Nation	<p>The Abitibiwinni Algonquin Nation is formally requesting that a consultation and accommodation process be put in place to guarantee its real participation in the decision-making process regarding the North American Lithium Project, in addition to being flexible enough to allow for</p>	Question addressed to the Crown	<p>The federal environmental assessment is not intended to establish Aboriginal rights or titles. The Agency has developed a flexible approach which incorporates Crown consultations with First Nations in the environmental assessment process.</p> <p>Under sections 2, 16.1 and 16.2 of the former Act, the environmental effects taken into account include the repercussions of changes to the environment in</p>

First Nations	Comment or concern	Summary of proponent response	Agency response
	<p>accommodation measures to be adopted in response to their concerns.</p>		<p>terms of health and socio-economics; current use of lands and resources for traditional purposes by First Nations; structures, sites or things of historical, archaeological, paleontological or architectural importance; as well as changes likely to be made to the Project due to the environment.</p> <p>The Agency considers that the mitigation measures to reduce the Project's environmental effects on Algonquin First Nations are appropriate. These measures, described in section 6.5 of Chapter 8 in Appendix A of this report, focus in particular on air quality and sound environment, water quality, birds and aquatic wildlife, an offsetting plan for serious harm to fish, restoration of the site following the closure of the mine and active participation in the follow-up committee established by the proponent. Furthermore, Fisheries and Oceans Canada will consult with the First Nations involved in the development of fish habitat compensation plan.</p> <p>On the basis of these measures, the Agency concludes that the potential adverse impacts of the Project will be satisfactorily avoided or mitigated.</p>