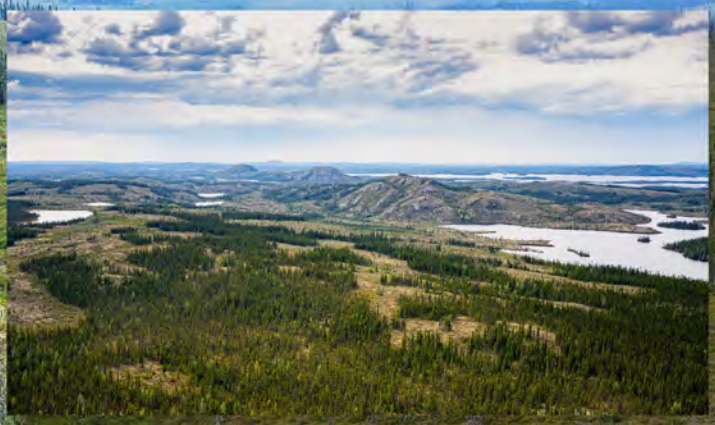
PN3.1 (1 of 2) Environmental Impact Assessment - Volume 1

RESSOURCES PMET RESOURCES

Shaakichiuwaanaan Mining Project

SHAAKICHIUWAANAAN

Environmental Impact Assessment







Volume 1

March 2026

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wsp

CHAPTER LIST– VOLUME 1

CHAPTER 1 INTRODUCTION
CHAPTER 2 PROJECT CONTEXT AND RATIONALE
CHAPTER 3 COMMUNITY RELATIONS
CHAPTER 4 SITE LOCATION AND TECHNOLOGY ALTERNATIVES
CHAPTER 5 PROJECT DESCRIPTION
CHAPTER 6 DESCRIPTION OF THE RECEIVING ENVIRONMENT
CHAPTER 7 IDENTIFICATION OF ISSUES

PMET RESSOURCES INC.

SHAAKICHIUWAANAAN MINING PROJECT

ENVIRONMENTAL IMPACT ASSESSMENT

EEYOU ISTCHEE JAMES BAY

MARCH 2026

REFERENCE WSP: CA0001724.3318

FINAL VERSION



PMET RESSOURCES INC.

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ENVIRONMENTAL IMPACT ASSESSMENT

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MARCH 2026

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CROSS-REFERENCE TABLE

The following table shows the concordance between the information contained in this Environmental Impact Statement (EIS) for the Corvette (Shaakichiuwaanaan) Mining Project to the requirements set forth in:

- The Guidelines for the Corvette Mining Project of Patriot Battery Metals Inc. (Innova Lithium inc.) issued by the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP) (ref.: 3214-14-072; March 2024).

Table of concordance between the elements of the MELCCFP guidelines and the EIS

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
1. BACKGROUND	This section of the impact statement must outline the factors that led to the project. It includes a brief introduction to the proponent, the project's site integration, and the project's purpose. The description of the project's context and purpose should identify the environmental, social, economic, and technical issues at the local and regional levels, as well as at the national and international levels, where applicable.	Chapters 1 and 2
1.1 About the proponent	The impact statement must identify the project proponent and, if applicable, its consultants. This information includes general details about the proponent's history in relation to the proposed project and the industry sector in which the project is situated. The statement must also clearly outline the company's administrative structure, thus providing the necessary financial guarantees when environmental restoration, decontamination, infrastructure dismantling, or other measures must be undertaken.	Chapter 1, Section 1.1
Description of the project and its site integration	The proponent must provide a description of the project, including its geographic coordinates and its main technical and economic characteristics, as set forth in the feasibility study that must be submitted as an appendix to the impact statement and defined by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM).[1] The proponent must also provide confirmation of the geological suitability of the sites designated for the mine's infrastructure. The proponent must provide an overview of the project's site integration, its objectives, related components, the construction and operations schedule (including subsequent phases of the project), its cost, and the possibility of expansion. The promoter must also provide details on the main environmental constraints affecting the project's implementation and outline the mining and surface leases and mining claims held by the proponent and other mining companies in the vicinity of the property. The proponent must also discuss events that could cause a slowdown or temporary halt in operations, or even the abandonment of the project. The impact statement must present and take into account the project's main technical and economic characteristics as set forth in the feasibility study. The impact statement must therefore be based on these characteristics and submitted only after the feasibility study has been completed. This ensures that the project is not significantly altered during the environmental assessment process and that the anticipated and analyzed impacts are the ones that will actually occur during project implementation and be presented to the public. The project's history, business opportunities in the project's area of activity, and estimated mineral resources and reserves must also be described in the presentation of the project's background and purpose. Any physical infrastructure established during mineral exploration or previous mining operations must be described, along with any environmental or social issues encountered during those activities, if applicable. It will also outline existing agreements regarding the use of certain services or partnership efforts with local communities. Where applicable, it will address similar projects currently under assessment, under construction, or in operation in the sector. The proponent and its consultant must ensure significant participation by Indigenous communities in the development, operation, and monitoring of the project and provide evidence of such participation.	Chapter 2, Section 2.1

[1] CIM Definition Standards on Mineral Resources and Mineral Reserves, prepared by the CIM Standing Committee on Reserve Definitions, adopted by the CIM Council on November 27, 2010. Available on the following website: https://mrmr.cim.org/en/standards/

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
1.3 Project purpose	The presentation of the project's purpose should help explain why it is necessary to carry it out in the current or future context. The proponent must describe the main economic, technical, social, and environmental opportunities and constraints of the area where the project will be located and explain how the project fits into the company's overall operations. In particular, it must describe the current situation in the industry and explain the needs that justify the project. If applicable, it must include the results of any public consultations conducted that justify the purpose of the project. At the regional level, the proponent must explain the environmental and socioeconomic context of the project and outline its local and regional economic impacts, drawing parallels with the project's lifespan and the presence of other similar projects in the region.	Chapter 2, Section 2.3.1
1.4 Laws, Regulations, Agreements, and Policies	The legal framework for the project's integration must be described by listing the laws, regulations, policies, and guidelines applicable to the project. Directive 019 is intended, among other things, to serve as a framework for the preparation of the impact statement. The proponent must address this in the relevant sections of the impact statement and describe how it plans to comply. It should be noted that a new version of Directive 019 may be published shortly and that the proponent will be required to comply with it if applicable. The proponent must explain how their project aligns with the guidelines of Quebec's Mineral Strategy. In addition, the proponent must explain how the project aligns with Quebec's policies on sustainable mobility, the energy transition, and other related areas. It must also demonstrate that the project was developed in accordance with the guiding principles of Section 22 of the JBNQA. Lastly, the proponent must explain how the project takes into account the guidelines of the Plan Nord.	Chapter 2, Section 2.2
2. SELECTION OF SITE AND TECHNOLOGY ALTERNATIVES		
2.1 Alternatives for locations and routes	The proponent shall describe the various locations under consideration for the installation of the infrastructure required for the project. This description must be sufficiently detailed and illustrated to allow for a comparison of the various proposed sites and an assessment of their respective advantages from biophysical, social, technical, and economic perspectives. In any case, the proponent must demonstrate a commitment to reducing the project's environmental footprint. If it is physically possible to select only one site, the proponent must justify its reasoning. In the preliminary information document, the proponent states that La Grande Alliance's projects—including the extension of Route 167 and the construction of the railway line along Billy-Diamond Highway—could benefit the project. The proponent must outline how it could collaborate with the Grand Alliance and other stakeholders to support the development of this infrastructure. In addition, the proponent must explain the reasoning and criteria that led to the selection of the chosen sites, specifying exactly how those criteria were taken into account. In particular, choices should take into account: – land-use planning constraints (municipal, regional, or government guidelines; land tenure; zoning; restricted areas; characteristics of the human and built environment; land accessibility, etc.);	Chapter 2, Section 2.4 Chapter 4, Section 4.2

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– biological constraints, particularly with regard to designated threatened or vulnerable plant species, since, depending on the species encountered, and pursuant to section 16 of the Act respecting threatened or vulnerable species (LEMV; Chapter E-12.01), avoidance is the only solution considered, except for the exceptions provided for in the LEMV and the Regulation respecting threatened or vulnerable plant species and their habitats (REFMVH; Chapter E-12.01, r.3); – physical, hydrographic, and hydrogeological constraints (presence of wildlife habitat or wetlands, topography, level of soil and groundwater contamination, geotechnical capacity, risk of ground movement, potential for groundwater infiltration, etc.); – the environment's vulnerability to the impacts of climate change; – technical, operational, and financial constraints or opportunities (capacity, the presence of buildings or equipment, the availability of services or a workforce, connection arrangements to networks, possibilities for facility layout or expansion, implementation schedule, costs, etc.); – geological data that precludes the use of sites designated for the construction of various types of infrastructure sensitive to any mining-related activity (e.g., mine water ponds); – the magnitude of certain anticipated impacts, particularly on valued ecosystem components or on elements of the social environment (sensitive areas, proximity to residences, sites of interest to Indigenous communities, traditional and current [community] land use, health and safety risks, etc.); – the social and economic situation (major concerns, economic impacts, sources of employment, etc.). Geographic information must make it possible to locate project elements, as well as alternatives and temporary infrastructure, including the names and locations of bodies of water. Where Cree place names exist, they should be indicated. If the construction of dikes and the diversion of watercourses are considered as alternative options, various scenarios must be compared, including the option of not building any dikes and not diverting any watercourses. In addition, the proponent must comply with the following environmental principles: – Flow management must ensure continuous compliance with the policy on reserved flows and provide maximum protection for the spawning periods of the main fish species present; – The management of contaminated sediments must comply with the Criteria for the Assessment of Sediment Quality in Quebec and Application Frameworks:[2] Prevention, Dredging and Remediation; – Soil and sediment management in terrestrial environments must comply with the Guide d'intervention: Protection des sols et réhabilitation des terrains contaminés [Response Manual – Soil Protection and Contaminated Sites Rehabilitation];[3]	

[2] Environment Canada and the Ministère du Développement durable, de l'Environnement and des Parcs du Québec, 2007. Criteria for the Assessment of Sediment Quality in Quebec and Application Frameworks: Prevention, Dredging and Remediation. 39 pages.

[3] Beaulieu, M. 2021. Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés [Response Manual – Soil Protection and Contaminated Sites Rehabilitation] (2021); Ministère de l'Environnement et de la lutte contre les changements climatiques, Quebec, May 2021, 326 p. [http://www.environnement.gouv.qc.ca/sol/terrains/guide-intervention/guide-intervention-protection rehab.pdf]

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– lasting in water environments must be kept to an absolute minimum; – ecological and hydrosedimentary continuity must be promoted.	
2.2 Technological alternatives	The choice of factors to consider depends largely on the scope and nature of the project. All these considerations must be made while taking into account the unique characteristics of the northern environment and how it is changing due to climate change. In this regard, the proponent must indicate how it plans to adapt its project to climate change to ensure the integrity of its facilities and their long-term stability. The proponent must identify and describe the factors that could affect greenhouse gas (GHG) emissions. For example, the proponent may consider using the best available technology, utilizing alternative low-carbon energy sources, switching to alternative fuels, and selecting routes that minimize the distances required for the procurement and transport of materials and ore. In particular, the comparison of alternatives must be conducted with a view to avoiding, reducing, or limiting GHG emissions. The proponent shall explain how the mineral composition of the deposit influences the choice of technologies. The proponent shall then present the preferred technology or technologies and the criteria justifying this choice from technical, economic, social, and environmental perspectives. When making this decision, the proponent will also take into account liquid discharge targets, air emission standards, and regulations governing the management of residual and hazardous materials to ensure the protection of water, land, and air environments. With regard to energy supply and the technologies used, the proponent shall present the preferred technologies, outlining the rationale and the technical, economic, environmental, and social criteria underlying these choices. The method used to select technologies must be clearly explained and include the following elements: – the effectiveness of the technologies compared to the latest technologies in the industry; – the ability to meet demand (goals, needs, business opportunities); – availability and technical feasibility; – implementation at costs that do not compromise the project's economic viability; – the technology's potential for further development (the technical and economic capacity to upgrade or improve it); – a report quantifying annual GHG emissions attributable to different energy supply scenarios and technological scenarios; – the ability to reduce GHG emissions, either from the outset or as technology evolves; – the ability to limit the extent of negative impacts on the biophysical and social environments while maximizing positive impacts.	Chapter 4, Section 4.1
2.3 Cost-benefit analysis	Where there are significant socioeconomic and human impacts, the impact statement presents a cost-benefit analysis of the project, a feasibility study, a life-cycle analysis, or both, including a comparison of the alternatives under consideration and the status quo.	Chapter 4, Section 4.3

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
3. PROJECT DESCRIPTION	In this section, the proponent must describe the various infrastructure components and technologies selected from those presented in the previous section. It will also establish the required connections with its energy supply and its use of road, airport, and/or port infrastructure, as applicable. It will provide sufficient detail to fully understand the issues involved, including whether certain infrastructure will need to be built near sites that are expected to impact water environments or wetlands. Maintaining air quality and conserving and protecting water resources are issues that must also be taken into account during the implementation of the project. The proponent must demonstrate that the project complies with legal and regulatory standards, criteria, and requirements. Directive 019 should serve as a framework for preparing the impact statement, particularly Section 3 for the project description and Section 2 for the requirements. The proponent shall specify the project timeline and indicate the dates or periods scheduled for the work and the anticipated duration of the work.	Chapter 5
3.1 Description of the deposit and the facilities	The proponent must present, in summary form and on maps where appropriate, the following information: — the location, land tenure, and titles—including mining leases—for the portions of land where the infrastructure necessary for mining operations is to be located, including, if possible, a recent aerial photograph of the area (geographic coordinates must be provided in decimal degrees); – a summary description (geological and structural) of the deposit and the lithologies from which the ore and waste rock will be extracted, describing their mineralogical characteristics and metal associations, while demonstrating the representativeness of the sampling conducted, particularly in terms of acid-generating potential or leaching. It is important to thoroughly examine the characteristics of waste rock and tailings, particularly to determine whether these wastes are high-risk as defined in Directive 019 on the mining industry; – plans and cross-sections of the deposit, showing the location of these cross-sections in relation to the bodies of water adjacent to the project; – the dimensions and location of all proposed infrastructure; – the type or types of metals mined; – the duration of the various phases of the deposit's operations, their area, and their location; – transfer points and storage areas for ore, waste rock, processing residues, and various materials and products within the mine site and at the plant; – the method and location of shipment of the finished product; – garages, machine shops, equipment maintenance facilities, and warehouses for hazardous materials (reagents, hydrocarbons, explosives, etc.); – water supply facilities; – the location of wastewater treatment facilities, if required (mine water, process water, sewage); – the location of the required borrow pits, including access points and an estimate of their area; – how the project is designed to address climate change and its potential for adaptation; – the establishment of firebreaks around certain infrastructure;	Chapter 5, Sections 5.2.1 and 5.3

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– how consultations with the tallyman and other land users were taken into account in the project design and the location of infrastructure. The proponent must describe the activities and preparatory work required for the construction of the facilities, including, but not limited to, clearing (specifying the areas and characteristics of the cleared forest stands), blasting, diversion of watercourses, dewatering and water discharge, earthworks, backfilling, and the relocation or dismantling of buildings. It shall specify the locations, approximate boundaries, and approximate volumes, as well as the methods of collection, transport, and disposal of the excavated material. It shall provide a description of the nature, approximate volumes, method, and location of storage for topsoil and overburden.	
3.2 Extraction	The proponent must describe the extraction technology or technologies used and specify the average and maximum extraction rates in tonnes per day. Where applicable, it must also describe: access ramps, wells, pits, and all other excavations (surface openings, etc.) and their locations on plans and cross-sections; – dike development; – the extraction equipment and process; – the use of explosives and information regarding their storage and manufacture; – ore storage areas; – an estimate of the volume and flow rate of mine water generated, and the components of the mine dewatering system, if applicable. The proponent must submit its mining plan along with a map showing how the plan aligns with the mining claims it holds. The proponent must identify the location of its process plant and provide the average and maximum daily processing rates. When the process plant is located at the mine site, the proponent must include the following information about the selected technology in its impact statement: – the list and composition of the required products and the table showing their annual consumption; – a description of the various stages of the processing method (feed and discharge points, recirculation, points where chemicals are added, and their representation on a diagram); – the quantities and detailed physical and chemical characteristics of liquid, solid, and gaseous discharges from operations, the locations of their discharge points, noise and other sources of nuisance, as well as the associated equipment and facilities (collection, purification, treatment, dispersion, diffusion, disposal, monitoring, reception, storage, handling, etc.).	Chapter 5, Section 5.2.2
3.3 Ore processing	The proponent must identify the location of its process plant and provide the average and maximum daily processing rates. When the process plant is located at the mine site, the proponent must include the following information about the selected technology in its impact statement: – the list and composition of the required products and the table showing their annual consumption; – a description of the various stages of the processing method (feed and discharge points, recirculation, points where chemicals are added, and their representation on a diagram);	Chapter 5, Section 5.2.3

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– the quantities and detailed physical and chemical characteristics of liquid, solid, and gaseous discharges from operations, the locations of their discharge points, noise and other sources of nuisance, as well as the associated equipment and facilities (collection, purification, treatment, dispersion, diffusion, disposal, monitoring, reception, storage, handling, etc.).	
3.4 Tailings and waste rock management	Characterizing waste rock, tailings, and ore helps assess a project's environmental impacts. This provides an adequate understanding of the geochemical and environmental properties of the various materials to be managed and enables predictions of how these properties will change under different storage conditions (air, water, local climate, etc.). The *Guide de caractérisation des résidus miniers et du minerai* ["Guide to the characterization of tailings and ore"] must be used for this purpose.[4]	Chapter 5, Section 5.2.6
3.4.1 Tailings management	The impact statement must describe the method for managing tailings, taking into account their physicochemical properties. The management scenarios that were assessed must be presented, along with a justification for the chosen management approach. The proponent must also submit a comparative analysis of the locations of the assessed tailings storage facilities and provide an assessment of the risks and environmental impacts for each location. Once the location(s) for the tailings storage facilities have been identified, more detailed studies must be prepared that include the following elements: – a detailed map of the site describing the topography and indicating the location of rock outcrops, deposits of sand, gravel, silt, and clay, watercourses and bodies of water, the drainage basin(s), wetlands, and vegetation; – the results of geotechnical and hydrogeological analyses used to determine the thickness and properties of the soil at the locations of the storage areas (hydraulic conductivity, density, and shear strength, etc.); – the management approach for tailings storage facilities; – the physical and chemical composition of the tailings; – design criteria for retention infrastructure in tailings storage facilities, if required: analysis of dike stability, foundation conditions, percolation control, and impermeability; – potential issues related to seepage through the tailings storage facility's dikes; – the feasibility and procedures for returning tailings to pits or underground, where applicable, at sites that remain in operation following their closure. In the case of processing waste, the proponent must provide the following information: – the approximate amount of waste generated; – its chemical and physical composition; – determining the acid-generating or leachability potential of certain metals using representative samples; – details of the design of the retention infrastructure, if required: stability, impermeability, and maximum height of the dikes; storage capacity; management method (cell-based or conventional); and the filling pattern; – the proximity of the treatment plant and accessibility around the storage facility.	Chapter 5, Section 5.2.6.1

[4] https://www.environnement.gouv.qc.ca/Industriel/secteur-minier/guide-caracterisation-minerai.pdf

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
3.4.2 Waste rock management	With regard to waste rock, the proponent must document the following: – the total volumes of waste rock (in thousands of m^3); – storage periods; – a mineralogical description of the various types of waste rock and the determination of all major and trace elements based on representative samples; – determining the acid-generating potential and the leachability of certain metals for each of the rock types from which the waste rock originates, based on representative samples; – estimation of the required area of the stockpiles; – a description of the hydrogeological and drainage conditions; – a detailed description of management and monitoring procedures, particularly in the case of acid-generating or leachable waste rock; – the dumping method; – a comparative analysis of locations with options for returning to the pit; – where applicable, the procedures for using waste rock as backfill.	Chapter 5, Section 5.2.6.1
3.5 Water management	Reducing the use of surface water and protecting and conserving groundwater are top priorities. In this section, the proponent must demonstrate that it has taken steps to ensure water recirculation with the goal of minimizing discharges into the environment. It must also describe the measures that will be taken to prevent clean water entering the site from coming into contact with contaminated areas of mining operations.	Chapter 5, Section 5.4
3.5.1 Water balance	The proponent must submit a comprehensive water balance for mining operations and various services across the entire mine site. This balance sheet must be prepared and itemized over a full year to account for seasonal variations. More specifically, the proponent must provide the following information: – water sources, specifying the required volumes and describing the work to be done in the event that watercourses need to be diked; – water needs for domestic use; – a description of the water circulation and flow rates required for ore extraction and processing (if applicable), including a description of the recirculation systems and a table showing the daily and annual water consumption associated with these activities and their intended uses; – runoff and mine water that could be pumped must be included in the mine site's water management system; – work to lower the water table; – the dimensions and locations of drainage and diversion ditches (if any).	Chapter 5, Section 5.4.1

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
3.5.2 Treatment and disposal of contaminated water	A mine water treatment plant must be operational by the time the project begins operations. The project must use the best available and economically feasible technologies to treat water at each of its sites. The proponent must provide the physical and chemical characteristics of the industrial wastewater to be treated, including mine water, and a detailed description of the treatment technology, including in particular: – water entry and exit points; – a list of the chemicals used in their treatment, the points at which they were added, and the quantities used; – the expected effectiveness in terms of the percentage reduction in contaminants or the toxicity level of the treatment; – the approximate volumes and the method of managing sludge and byproducts resulting from the treatment.	Chapter 5, Sections 5.4.3 and 5.4.6
3.5.3 Effluent(s)	The proponent must describe: – the contaminants, volumes, and average daily flow rates of the effluent(s); – a description of the discharge methods (pipes, channels, pumping, diffusers); – the location of the discharge point(s) and the route leading to the receiving environment (the proponent should strive to have only one final discharge point); – the development of the receiving environment at the point where the final effluent is discharged (riprap, diking, etc.); – the expected characteristics of the effluent, with particular emphasis on its quality, concentration, and pH. The information must be mapped at an appropriate scale. The proponent must comply with the calculation of environmental discharge objectives (EDOs) provided by the MELCCFP. The performance and effectiveness of effluent treatment systems will be determined in accordance with applicable laws and regulations and adjusted to account for the specific characteristics of the receiving environment. The management of these systems should focus on reduction at source, aim to minimize discharges, and include a program for continuous improvement.	Chapter 5, Section 5.4.7
3.6 Waste management	The proponent must describe the waste generated during all phases of the project (type, volume, etc.) and how it will be managed. The project must be designed in accordance with resource conservation principles by applying the "3R-R" approach (reduction at the source, reuse, recycling, and reclamation). In addition, initiatives such as composting should be considered. This section should include: – the nature and volume of waste generated; – the methods and locations for waste disposal, the location and conditions of existing or future sites for waste management, including projected capacities, the anticipated duration of storage or disposal at the proposed site, and the facilities planned for the site; – measures promoting waste recycling and source reduction. The proponent must also provide details of any agreements in place regarding the use of particular services or partnership efforts with local communities for waste management.	Chapter 5, Section 5.6

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
3.7 Related developments and projects		
3.7.1 Access infrastructure	The proponent must identify the road and rail access networks in the project area and specify how it intends to use them. Current access to forest resources must be maintained. If the proponent cannot retain the existing road network, it will have to provide new access roads and improve existing ones. It must describe the activities or work required to upgrade the access road it intends to use and other roads, including temporary roads. Where applicable, the proponent must provide the length and width of the new roads, as well as a description of the work to be performed, including the installation of watercourse crossings and any work or activities planned below the natural high-water line. The proponent must also specify whether, and to what extent, it will be responsible for maintaining the roads it will use. To describe the project's impact on fish habitat, the proponent must identify and describe the proposed interventions along the banks and within watercourses—both perennial and intermittent—as well as the dimensions of the structures (permanent and temporary), the materials required, and so on. These interventions may include, but are not limited to, bank filling, and the repair and construction of culverts or bridges.	Chapter 5, Section 5.3.1
3.7.2 Workforce accommodation and transportation logistics	The proponent must provide the required accommodation facilities and transportation logistics for its project workforce during the construction, operations, and closure phases. This must include the exact location of these facilities, their capacity, their lifespan, and their periods of use. It must outline what has already been put in place during the exploration phase and, whenever possible, prioritize the reuse of existing sites. The proponent must specify what will happen to these facilities once the site closes. For accommodation facilities, the proponent must provide a description of the required work and details regarding: – drinking water treatment and supply facilities; – the method of managing domestic wastewater and the discharge areas, specifying, where applicable, the dilution rates after treatment; – the method of managing septic sludge from wastewater treatment systems; – regular, emergency, or interim energy supply arrangements; – the management of any other infrastructure required for the operation of a workers' camp that may have an impact on the environment. The proponent must describe the logistics for transporting workers to the mine site, providing details on the following: – where the workers are coming from; – the mode of transport (road, air, etc.); – the travel routes that will be taken; – the frequency of transportation and the number of vehicles, taking work schedules into account; – the option of shuttling.	Chapter 5, Section 5.3.4

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
3.7.3 Storage sites for fuel or hazardous materials	The proponent must specify the location and nature of the structures, equipment, and facilities used for the storage and containment of chemicals, hydrocarbons, and explosives, as well as the method for recovering or disposing of certain products, equipment, or materials that may pose a risk to the environment. It must specify the quantities and concentrations of the products that will pass through the facility, their storage methods, and the storage capacity of the tanks used. The proponent must demonstrate that these comply with applicable laws and regulations and describe the preventive and emergency measures that have been developed.	Chapter 5, Sections 5.3.6 and 5.3.7
3.7.4 Borrow pits	In this section, the proponent must indicate whether it intends to use borrow pits to carry out its project, whether during construction or operations. The proponent must identify and map existing and proposed borrow pits that could be used, specifying their proximity to roads, watercourses, and protected areas (both existing and projected) to take into account regulations, local conditions, and environmental constraints. It must assess the affected areas and the volumes of materials required and, if necessary, submit survey reports describing the stratigraphy and grain size distributions. The proponent must explain how it has optimized the use of the required borrow materials and provide an overview of the measures for the redevelopment, restoration, and decommissioning or enhancement of these sites.	Chapter 5, Section 5.3.8
3.7.5 Transport of ore and other goods	The proponent must outline all transportation-related activities associated with the project, including the road and rail infrastructure that will be used. It must also specify the volumes transported, the type and number of trucks and trains used, as well as the number of scheduled trips (daily and weekly round trips). It must also describe any planned transshipment activities, if applicable, for the transport of ore, as well as for the transport of goods and materials needed for the operation of the mine site and the transport of employees. The proponent must indicate whether there will be secondary processing of the ore in Quebec, specify where it will take place if applicable, and indicate whether that location is within or outside the territory covered by the JBNQA. If the use or construction of facilities or infrastructure is required within the boundaries of treaty lands, the proponent must describe them and assess their impacts. The proponent must provide information regarding the construction of an access road to the mine site from the Trans-Taiga Road, as well as roads and culverts to facilitate the movement of the mining equipment fleet during mine operations. The proponent must also provide all necessary information regarding the construction of new infrastructure at the transfer station at the intersection of the Trans-Taiga Road and the Billy-Diamond Highway, and at the Matagami railway station for transshipment activities. The proponent must also describe the impacts of all the project's transportation activities on the social environment and on land use, indicating which elements and sensitive areas are affected by the transportation and transshipment of ore (dust, noise, safety, etc.). The proponent must outline the measures that will be implemented during periods of cultural significance to the Cree (e.g., goose and moose hunting) so as to limit or reduce the impact of transportation on land users. It must describe the measures that will be implemented to ensure the safety of all road users on and near the roads, specifying speed limits for vehicles, particularly near Cree campsites, where applicable.	Chapter 5, Section 5.2.4

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
3.7.6 Energy supply	The proponent must describe its energy supply needs and specify the primary and backup energy sources required to operate the mine site, as well as any alternative options considered, and must demonstrate that it has assessed and prioritized the use of renewable energy. It must report, where applicable, on any agreements that have been or will be made in this regard.	Chapter 5, Section 5.7
3.8 Jobs and training	The proponent must present its corporate policy regarding on-the-job training and the hiring of members of Indigenous communities, as well as their integration into the workforce. In developing this policy, the proponent must review Section 28 of the JBNQA and refer to it. In particular, it will address potential measures (such as transportation, information, work schedules, and frequency) to help local workers access the job and business opportunities created by the project and to retain those workers. It must take into account similar experiences, including those related to recent projects carried out in the area. It will also need to present regional hiring targets as part of a collaborative effort between the communities concerned.	Chapter 5, Section 5.10
3.9 GHG emissions, climate change mitigation, and adaptation	The proponent must submit a detailed report identifying and quantifying the annual GHG emissions attributable to all emission sources associated with the project and to the various phases of the project. In this regard, the proponent is asked to consult the following document: *Guide de quantification des émissions de gaz à effet de serre* ["Guide to quantifying greenhouse gas emissions"] (MELCC, 2019),[5] which details the calculation methods to be used for different types of GHG sources, sinks, or reservoirs. The proponent will also be required to conduct a technical and economic study on the feasibility of using a fleet of low-carbon electric vehicles and equipment. The proponent must also assess the potential effects of climate change on the project and its surrounding area, particularly if such effects are likely to alter the nature and extent of the project's impacts on the environment, the social environment, the local economy, public safety, or the stability and sustainability of infrastructure. It must indicate whether it plans to implement measures to adapt to climate-related risks in light of the identified impacts and, if so, specify and describe those measures.	Chapter 5, Section 5.8
3:10 Dikes and watercourse diversion	The proponent must describe the main characteristics of the project as they relate to the proposed isolation of Lake 01 and the diversion of watercourses, including information regarding: – the proposed dams, dikes, and flow control structures (gates, spillways, weirs, or other); – the reservoirs (area, total and usable volume, bathymetry) affected; – the physical and biological characteristics of diverted watercourses, free-flowing sections, and diversion channels; – diverted watercourses, free-flowing areas, and diversion channels; – fish passage structures, where applicable; – the amount of water diverted to another watershed (if applicable). – the management of dredged materials, including: • the transport, placement in water environments or on land (recovery, treatment, or disposal), containment, stabilization of shorelines or riverbanks, habitat restoration, etc., and the methods planned for treating these sediments, if applicable (decontamination, dewatering, etc.);	Chapter 5, Sections 5.4.3, 5.4.4, and 5.4.5

[5] https://www.environnement.gouv.qc.ca/changements/ges/guide-quantification/guide-quantification-ges.pdf

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	• sites for sediment dewatering on land, if applicable; • the final deposition sites of sediments on land or in water environments; – the hydrological and hydrodynamic data used in the design of the structures; – consideration of the dynamics of the watercourse; – management of the dispersion plume resulting from the suspension of sediments at dredging sites and during discharge into open water, where applicable; The proponent must make every effort to keep the water within the same watershed.	
3.11 Restoration	The proponent must submit the rehabilitation and restoration plan (RRP) required by the Mining Act at the same time as the impact statement. The proponent is encouraged to consult the *Guide de bonnes pratiques en restauration minière dans un contexte de changements climatiques* ["Guide to best practices in mine restoration in the context of climate change"]. The version of the RRP submitted at the same time as the impact statement must be identical to the version of the RRP submitted to the MRNF.	Chapter 5, Section 5.5.3
4. DESCRIPTION OF THE ENVIRONMENT	In this section, while taking into account Indigenous knowledge and cultural values, the proponent must describe the environmental, cultural, and socioeconomic context in which the project is situated within this region and sector. It must define the study area for the purpose of describing the components of the biophysical and social environments relevant to the project.	Chapter 6
4.1 Delimitation of the study area	The proponent must define a study area that encompasses all proposed activities and their direct and indirect effects on the biophysical and social environments likely to be affected by the project and its related infrastructure. Depending on the impacts being studied—whether biophysical or social—the study area may consist of various defined sub-areas. In addition to the mining operations themselves, the study area must include access routes to the mining project and energy supply infrastructure, and must define current land-use patterns and future development plans, taking into account both Indigenous and non-Indigenous communities. The proponent must justify the boundaries of this study area as well as its extent and describe the biophysical, technical, economic, and social constraints that led to its establishment. It must demonstrate that it has taken into account Indigenous and local cultural knowledge and values in determining the boundaries of the study area.	Chapter 6, Section 6.1
4.2 Description of the environment	The proponent must describe the state of the environment as it exists in the study area prior to the project's implementation, specifically by clearly delineating and mapping the areas currently used for exploration activities, the areas of the natural environment that may be disturbed, and the areas of the natural environment that remain undisturbed. It must describe, as objectively as possible, the components of the biophysical and social environments that are likely to be affected by the project's implementation, including the valued ecosystem components. If the data available from government, municipal, Indigenous, or other agencies is insufficient or no longer representative, the proponent must supplement the environmental description with inventories conducted in accordance with best practices. The proponent must indicate the source of all data used to describe the environment, as well as the purposes for which it is used. In addition, it must comment on the quality and reliability of the available data. For many environmental components, government agencies have developed guidelines or reference documents to assist proponents and their consultants in collecting and presenting information. We encourage the proponent to consult these documents in advance to ensure that the basic information will be provided.	Chapter 6, Sections 6.2 to 6.4

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
4.2.1 Biophysical environment	The proponent must present the components of the biophysical environment of the study area using maps that show existing and proposed infrastructure. Where appropriate, the information will be mapped, and photographs must be provided for the study area. Biophysical components include, in particular: – the general geology and topography; – climatic conditions: annual temperature values, periods of frost, average and maximum precipitation amounts, estimated annual evaporation (mm), frost zones, areas at risk of ice accumulation, and a map of prevailing winds; – the nature of the soils and surface deposits, lithology, drainage, topography, extraction areas, and areas susceptible to erosion and landslides; – a soil characterization and a description of past land uses in cases where contamination is suspected;[6,7] – the delineation of all wetlands and water environments disturbed by the project, including the delineation of the high-water line; – intermittent and perennial watercourses and bodies of water likely to be affected by the project, as well as their physical characteristics (bathymetry, substrate, width, depth, obstacles to fish passage, and water levels), their physicochemical quality (pH, temperature, conductivity, water hardness, etc.), their hydrological regime (discharge, current velocity, etc.), their uses, particularly downstream of discharge points, and the characteristics of the sediments (organic matter, grain size, and metal content) of the receiving watercourse(s); – the sub-watersheds; – riverbanks, floodplains, and wetlands (including detailed mapping by wetland type and the areas affected); – the uses of watercourses and other bodies of water; – the relevant hydrogeological characteristics associated with the project; – the anticipated climate changes in the region; – carbon stocks in peatland and forest ecosystems; – vegetation cover, including aquatic and riparian vegetation, noting the presence of fragile or exceptional stands, as well as forest stands and their characteristics (type, age, area); – wildlife species (mammals, birds, reptiles, amphibians) and their habitats; – the fish species present, as well as the location and size of habitats—whether potential or confirmed—for reproduction, fry rearing, growth, feeding, migration, and overwintering;	Chapter 6, Section 6.2 and 6.3

6 https://www.environnement.gouv.qc.ca/sol/terrains/guide/guidecaracterisation.pdf

7 *Caractérisation physicochimique des sols avant l'implantation d'un projet industriel* ["Physicochemical characterization of soils prior to the implementation of an industrial project"] (gouv.qc.ca)

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	— species of interest to both Indigenous and non-Indigenous communities; — rare, threatened, or vulnerable species, or those likely to be designated as such, including a description of the wildlife and plant species (terrestrial or aquatic) and the habitats of these species; — the existence of protected areas listed in the Register of Protected Areas in Quebec as well as projected areas; — the existence of proposed wildlife refuges and existing wildlife refuges under the jurisdiction of the MELCCFP; — the status of invasive alien species; — the baseline (background) air quality; — the natural sound level. The proponent is encouraged to consult Section 2.3.2 of the *Directive pour la réalisation d'une étude d'impact*[8] ["Guidelines for preparing an impact statement"] and Section 2.3.2 of the Appendix, "Additional information required for a mining project"[9] to complete the required components of the environmental description and the recommended methodologies. **Dikes and watercourse diversion** Specifically for Lake 01, which will be diked twice (phases II and III of the project), and for the watercourses that will be diverted, the following information must be provided: – the topography and bathymetry; – the drainage, soil type, and surface deposits; – the hydrological regime, including regulated river flows, average daily and monthly flows, low-water and high-water flows, and classified flow rates—that is, flows measured at the project site or flows extrapolated from a hydrometric station (the flow series used must cover a period of at least 30 years; otherwise the study must indicate the statistical reliability of the series used and the reasons for choosing a series of less than 30 years). If the total or partial diversion or redirection of a river or lake is planned, these characteristics must be provided for all affected watercourses; – watercourse dynamics: • coastal drift, river morphology, river type, areas prone to erosion or landslides; • the sedimentary regime (source, transport, and areas of sediment accumulation), particularly in areas where dredging and backfilling operations are taking place and in potential sites for sediment deposition in water environments;	

8 Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques. Directive pour la réalisation d'une étude d'impacts sur l'environnement. [https://www.environnement.gouv.qc.ca/evaluations/directive-etude-impact/directive-realisation-etudeimpact.pdf].

9 Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques. Autres renseignements requis pour un projet minier. [https://environnement.gouv.qc.ca/evaluations/directive-etudeimpact/minier.pdf].

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– the flow regimes and hydrodynamics of the watercourse or body of water, under current climate conditions and in light of future climate projections: • a description of the watershed and the longitudinal profile of the watercourses and their homogeneous sections; • flood and low water flows for different return periods and under normal and extreme conditions in watercourses; – hydraulic modelling of watercourses before and after the impact (water levels and flow velocities for different return periods); – ice conditions, including the formation of frazil ice, ice cover, ice jams, and ice break-up; – the physicochemical characteristics of the water in the affected watercourses on an annual basis; – current and future flood zones that take climate projections into account; – the in situ physicochemical characterization of sediments over the entire dredging depth and their toxicity, if necessary, through toxicity testing; where land-based sediment management is planned, the sediment characterization program must be designed accordingly; – the topography, drainage, geology, and hydrogeology in the areas where sediments or soil might be deposited on land; – the identification of fish species present in water bodies and watercourses, the type of habitat (substrate, vegetation, current, riverbed), their function (spawning ground, fry rearing or feeding area, migration corridor, or other), and the areas corresponding to each habitat function; – barriers to fish migration; – navigation in the study area (type, density, travel routes, etc.).	
4.2.3 Social environment	The proponent must describe the social environment affected by the project, explaining the limitations of the data it possesses and will collect. The description of the social environment should enable an assessment of the likely changes in the lifestyles of the various communities affected by the project. Special attention must be given to all users of the territory, particularly the Cree, Cree leaders from the affected communities, and the affected tallymen, taking into account traditional hunting grounds and travel routes (both land and water). The periods during which communities and users utilize the land, as well as the project's impact on access to and use of hunting, fishing, trapping, and gathering areas, must be detailed. At a minimum, the proponent must describe: – the socioeconomic profiles of the affected populations and the region (demographic characteristics, lifestyle, etc.); – the local and regional economy and development prospects (labour force participation and unemployment rates, sources of income, wages, major economic sectors, training, etc.); – the vacancy rate for housing; – the pool of qualified workers and businesses capable of filling positions or fulfilling contracts related to the planned mining activities and those associated with the project's construction;	Chapter 6, Section 6.4

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– the concerns and views of local communities, particularly those directly affected, including a summary of the consultations conducted by the proponent and the key elements of its public information, consultation, and participation plan; – the consultation schedule; – the archaeological and cultural potential of the area, particularly at the sites selected for the project components, by identifying known archaeological sites, areas with archaeological potential, and other elements of heritage interest, whether protected or not; – what approach will be taken to collect, compile, and integrate the traditional knowledge of the Cree; – the boundaries of Cree communities and Category I, II, and III lands; – current and planned land use, including: • water supply sources; • fishing and hunting zones, including the target species and their abundance; • areas where berries are picked or medicinal plants are gathered; • navigable watercourses, as well as those with potential for navigation; • traditional travel routes and the periods during which they are used; • Cree or other campsites; • roads and other transportation infrastructure (including the access road to the site from the Trans-Taiga Road) as well as the potential to use future road or rail infrastructure; Particular attention will be paid to the Cree people's use of the land, taking into account the identification of hunting grounds and traditional travel routes (both land and water routes). In addition, issues related to access (particularly those involving the construction of temporary roads) must be clearly addressed during meetings with the tallymen of the traplines that are likely to be affected by the project.	
5. PROJECT IMPACT ANALYSIS	The proponent must describe the method used to analyze the project's impacts, as well as any associated uncertainties or biases. The methods and techniques used must be objective, concrete, and reproducible. The reader should be able to easily follow the proponent's reasoning in determining and assessing the impacts. At the very least, the analysis must serve as a monitoring tool to link project activities and the presence of structures to environmental factors. It may include summary tables, checklists, or impact data sheets. Implementing mechanisms for public participation and reviewing literature specific to the type of project in question (including impact statements of similar projects) are other ways to identify and assess potential impacts at each stage of the project. The analysis must address short-, medium-, and long-term impacts, covering the phases of preparation, construction, infrastructure installation, mining of the deposit, mine closure, and site restoration. Impacts must be identified in accordance with the "Description of the environment" section. When assessing the expected impacts of the project, the proponent must identify which elements and functions of the environment will be affected—in which locations, to what extent, and for how long.	Chapters 7 and 8

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	The proponent must conduct a detailed assessment of the anticipated positive and negative impacts and, where applicable, describe the measures it intends to take to mitigate negative impacts and maximize positive impacts. The proponent must specify the degree of validity and accuracy of its forecasts. The proponent must pay particular attention to the selection and scope of mitigation measures, as well as to the identification of environmental components to be included in an environmental and social follow-up program. The project assessment must take into account any renewable resources that may be affected. The entire impact analysis process should therefore be designed and carried out with due consideration for the environment's carrying capacity. In addition, the proponent must identify environmental changes that could affect the project and document those effects and the associated risks. Encroachment into sensitive habitats must be avoided and minimized as much as possible, particularly in aquatic environments, floodplains, and wetlands. If infrastructure encroaches on sensitive habitats, the proponent must demonstrate that it has assessed other options and explain why it cannot avoid the sensitive habitats. In addition, it must determine the resilience thresholds for any impact. The proponent must pay particular attention to the project's impacts on current and future land use. The proponent must identify the key issues of its project, drawing in particular on the consultations it conducts with the affected communities. During the analysis process, it must pay particular attention to the values conveyed during consultations and to traditional knowledge.	
5.1 Identification and assessment of impacts		Chapter 8
5.1.1 Biophysical environment	The assessment of impacts on the biophysical environment must address, among other things: – water quality, including temperature, as well as variations in flow and water level in the receiving watercourse(s) and the effluent(s), and the short- and long-term preservation of habitats and uses; – a comprehensive and detailed characterization study of the entire area surrounding the construction site (description of the ecological functions of the habitats that will be affected by the project), including a comprehensive characterization study of all wetlands and water environments in the study area; – the areas of permanent and temporary encroachment by the project into wetlands and water environments, indicating how the "avoid and minimize" principle was applied; – the preservation of existing fish habitats and populations in relation to the potential toxicity of mine effluents, surface water management, and the presence of barriers to free passage (culverts, bridges, etc.); – the risk of metal accumulation in fish flesh; – the consequences of the loss or alteration of watercourses and bodies of water during the construction and operations phases (diversion, drainage, reduction in surface water supply); – the effects of lowering the water table on the hydrographical network, nearby wetlands, and fish habitat; – the survival and movement of terrestrial, aquatic, and avian wildlife, as well as the destruction or alteration of their habitats or the potential destruction and alteration of habitats for other species at risk;	Chapter 8, Sections 8.2.1, 8.2.2, 8.2.3, 8.2.4, and 8.2.7

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– the presence of threatened or vulnerable wildlife species that may be found in the study area. These species must be taken into account when developing new infrastructure (confirming their presence, monitoring, implementing mitigation measures, establishing measures to support the survival of populations, etc.). Inventories of wildlife species of special status documented in the area are expected; – the impact on woodland caribou, migratory caribou, and moose (including, but not limited to, the project's potential impact radius of disturbance to the species, as well as the potential impacts of increased road traffic); – the effects on plant species designated as threatened or vulnerable, or likely to become so, particularly those of special interest to local communities; – the impact on aquatic or terrestrial environments of the use of dust suppressants, de-icing agents, and abrasives on roads and bridges; – drainage, erosion caused by runoff or wind; – potential dust generation issues; – noise pollution; – the impacts on wildlife resources in terms of population dynamics, behaviour, and, where applicable, toxicity to wildlife or toxicity resulting from environmental contamination; – the impact on the visual environment caused by the introduction of new elements into the view of land users and changes to the landscape; – GHG emissions; – disruption of carbon stocks, particularly in important peatland ecosystems; – accidental spills of petroleum products or any other chemicals; – the impact on access to, use of, and occupation of hunting and fishing grounds, – trapping and plant gathering; – air pollution, by focusing on issues that have a significant impact on the environment and land users; – atmospheric emissions to assess the concentrations of contaminants potentially emitted by the project across the entire area that may be affected. The proponent must carry out a modelling study of the atmospheric dispersion of these contaminants, in accordance with the Clean Air Regulation and the following documents: • Guide de la modélisation de la dispersion atmosphérique [Guide to atmospheric dispersion modelling];[10]	

[10] Ministère du Développement durable, de l'Environnement et des Parcs, Direction du suivi de l'état de l'environnement, 2005. Guide de la modélisation de la dispersion atmosphérique. [http://www.mddelcc.gouv.qc.ca/air/atmosphere/guide-mod-dispersion.pdf].

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	• Guide d'instructions – Préparation et réalisation d'une modélisation de la dispersion des émissions atmosphériques – Projets miniers [Instruction guide – Preparation and implementation of an atmospheric emissions dispersion model – Mining projects];[11] • Devis de modélisation de la dispersion atmosphérique ["Specifications for atmospheric dispersion modelling"].[12] The proponent must provide a comprehensive report detailing the methodology used to perform the modelling and presenting the results in tables and maps, at an appropriate scale, showing the isoconcentration curves. The proponent must also compare the study's results with ambient air quality standards.[13] It should be noted that the mitigation measures proposed by the proponent must be an integral part of the modelling scenarios and that their effectiveness must be assessed through atmospheric dispersion modelling. **Dikes and watercourse diversion** Given that the diking of Lake 01 will result in a significant loss of habitat, the proponent must address the following impacts when preparing the impact statement: – the effect on erosion within the project's area of influence (the project section, upstream and downstream); – the impact on flow and hydrodynamic regimes (velocity, water levels, currents, drainage), ice conditions, sedimentation patterns, thermal conditions, and the physicochemical characteristics of the water; – if the diversion is directed to another watershed, the following impacts must be assessed: • water withdrawal and inflow between watersheds based on current land uses; • changes to the affected watersheds and their resulting consequences (for example, the ability of watercourses to absorb increased flood flows, changes in sediment transport patterns, loss of riparian and aquatic habitats, changes in fish communities, and the spread of undesirable fish species from one watershed to another); – the effects on wildlife (aquatic, small mammals, avian fauna, and herpetofauna) that use the shoreline or banks of the watercourse to be diverted (e.g., the presence of southern bog lemmings); – the effects of reservoir construction, changes in the river's hydrological regime, or the temporary or permanent drying up of watercourses on valued ecosystem components; – the surface areas affected by construction work in wetlands and water environments;	

[11] Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques, 2017. Guide d'instructions – Préparation et réalisation d'une modélisation de la dispersion des émissions atmosphériques – Projets miniers. [http://www.mddelcc.gouv.qc.ca/air/criteres/secteur_minier.pdf].

[12] Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques, 2015. Devis de modélisation de la dispersion atmosphérique – Modélisation de niveau 2. [http://www.mddelcc.gouv.qc.ca/air/criteres/Formulaire-Devis-de-modelisation.doc].

[13] Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques, Direction du suivi de l'état de l'environnement, 2018. Norme et critères québécois de qualité de l'atmosphère – Version 6 ["Atmospheric quality standards and criteria, Version 6"]. [https://www.environnement.gouv.qc.ca/air/criteres/Normes-criteres-qc-qualite-atmosphere.xlsx].

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– the effects of maintenance and inspection programs on the preservation of upstream and downstream ecosystems, as well as on the various mitigation and compensation measures implemented during the construction or operations of the project; – the impacts on accessibility and the current and projected use of the land and resources, including cultural activities and fishing, hunting, and trapping; – the impacts on water use, including water withdrawals and navigation.	
5.1.2 Social environment	The assessment of impacts on the social environment must address, but is not limited to: – the economic benefits associated with the construction and operation of the facilities; – the effects (direct and indirect) associated with job creation; – the impacts on land users, particularly Indigenous communities, including on the practice of traditional activities for food, ritual, or social purposes (hunting, fishing, trapping, berry picking, gathering medicinal plants, use of sacred sites, etc.), taking into account the impact on the abundance and quality of resources, the user experience, and access; – impacts on terrestrial or submerged archaeological heritage: sites (including burial sites and paleontological sites), areas, and zones with archaeological potential. The proponent must take into account all social impacts, including an assessment of the likely changes in the lifestyles of the various communities living in or using the area covered by the project. The proponent should take into account the fact that a significant portion of the project's social impacts could more directly affect the communities of Chisasibi, Wemindji, and Mistissini, and the locality of Radisson. The proponent may refer to other similar projects in Quebec and to the experience it gained during the exploration phase of this project. In particular, the proponent must address the impacts related to: – the use of road access, the preservation of current uses by local communities, as well as potential conflicts among users over the sharing of land and existing facilities; – the participation of the Cree in significant cultural activities; – potential conflicts regarding competition for jobs; – the safety of land users; – opportunities for training, employment, or securing contracts for individuals or businesses; – the risks of nuisance (noise, dust) and their effects on land users; – the changes or adjustments that tallymen will need to make to the operation of the trapline(s) affected by the project; – any individual, group (women, elders, youth, etc.), community, or organization that may be affected by the project; – social and intercultural tensions among workers; – the use of wildlife resources by hunters and fishers related to changes in access to the land; – the limited duration of operations, which could lead to changes in the social fabric when the mine closes; – the site's appearance after the work is completed;	Chapter 8, Sections 8.2.5 and 8.2.6

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	– the influx of short- and long-term economic benefits for local businesses (the nature and number of temporary and permanent jobs created by the project for Indigenous Peoples and those from outside the region, or jobs lost, if any), including development opportunities in related sectors for local or regional communities, as well as potential impacts on development opportunities that could be negatively affected by the project (e.g., recreational and tourism potential); – the family life of workers; – changes in lifestyle habits due to fears of potential environmental contamination; – potential competition for certain services (health care, communications, procurement, etc.) provided in the region; – housing availability in the context of regional real estate development; – competition between local employers in related industries and the proponent for the recruitment of employees; – the phenomenon of cycles of expansion and slowdown in mining development, explaining the scope of this phenomenon and the changes it is likely to bring to the region; – the health of land users; – archaeological heritage on land or underwater: sites (including burial sites and paleontological sites), areas, and zones with archaeological potential; – the preliminary draft of the details of the follow-up committee established under the Mining Act (composition, frequency of meetings, etc.). In this regard, the proponent is encouraged to consult the *Guide des bonnes pratiques sur les comités de suivi et obligations légales des promoteurs pour des projets miniers et d'hydrocarbures* ["Guide to best practices regarding follow-up committees and legal obligations of proponents for mining and hydrocarbon projects"].[14]	

[14] Ministère de l'Énergie et des Ressources naturelles, 2019. Guide des bonnes pratiques sur les comités de suivi et obligations légales des promoteurs pour des projets miniers et d'hydrocarbures. [https://cdn- contenu.quebec.ca/cdn-contenu/adm/min/energie-ressources-naturelles/publications-adm/documents-ministeriels/GU_bonnes-pratiques-acceptabilite-sociale_complet_MERN.pdf?1560970077]

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
5.2 Cumulative impacts	Cumulative impacts are generally defined as changes to the environment resulting from an activity combined with other past, present, and future activities. The concept of cumulative effects is based on the idea that each impact, taken individually and regardless of its magnitude, can represent a high marginal cost to the environment. The proponent must provide a justification for the spatial and temporal boundaries of the cumulative impact assessment. It should be noted that these boundaries may vary depending on the components selected to assess cumulative impacts, based on their specific distributions and characteristics. It must propose and justify the selection of projects and activities to be included in the cumulative impact analysis, which must encompass past, ongoing, and future activities or projects (those with a high probability of being implemented). The methods used to predict cumulative environmental impacts must be clearly described to provide a better understanding of how the analysis was conducted and the rationale behind the conclusions presented. It is understood that the Indigenous cultural knowledge and values of the affected communities must be incorporated into the assessment of cumulative environmental impacts. The assessment of cumulative environmental impacts must, in particular: – take into account activities and effects in conjunction with other past, present, and future activities; – take natural disturbances into account; – identify the valued components; – identify spatial boundaries based on the characteristics of the valued components; – identify or map characteristics, impacts, and other land uses; – identify trends or changes in the status of the valued components over time; – the cumulative environmental impacts at the level of each affected trapline, taking into account the practice of traditional activities. Thus, the proponent must identify the valued components that will be the focus of the cumulative effects assessment. The ecosystem components for this analysis should be those related to the project's objectives, including land use by the various users, as well as wildlife and wildlife habitat.	Chapter 9
6. MITIGATION MEASURES, RESIDUAL IMPACTS, AND COMPENSATION MEASURES		
6.1 Impact mitigation	The proponent must describe the measures it will implement to maximize the positive effects on the natural and social environments, as well as the mitigation measures it intends to implement to reduce the project's negative impacts (including cumulative effects). The proponent must prioritize measures designed to prevent negative impacts, followed by those aimed at reducing the severity of negative impacts, and, for any residual negative impacts that cannot be mitigated, propose compensation or restoration measures. The proponent must follow the "avoid–minimize–compensate" sequence in the project design, meaning that it must prioritize measures that prevent negative impacts, followed by those aimed at reducing their severity, and propose compensation or restoration measures for any remaining impacts. Compliance with laws and regulations, as well as the measures taken to ensure such compliance, are not considered mitigation measures. The proponent must also outline the measures it will implement to maximize the positive impacts on the natural and social environments.	Chapter 8, Section 8.2, and Appendix 8-2

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	Special attention should be paid to the implementation of the following measures: – specific environmental protection provisions in the various contracts granted; – selection of construction periods during infrastructure development; – proposed methods for constructing infrastructure near bodies of water and wetlands; – precautions taken to limit the introduction and spread of invasive alien species; – protection of wetlands by refraining from disturbing them whenever possible, avoiding them, minimizing impacts on these habitats as much as possible, or offsetting unavoidable impacts; – a description of the mitigation measures that will be implemented to protect these sensitive environments; – methods for restoring certain sections of existing roads or crossings over watercourses that are prone to problems; – protection of water environments and fish habitats to prevent or reduce their degradation, destruction, or disruption; – selecting the timeframe of the work to avoid sensitive areas and periods for terrestrial, avian, and aquatic wildlife, and to avoid disrupting recreational activities; – the visual integration of structures and infrastructure; – standards for the restoration and rehabilitation of borrow pits and, where applicable, abandoned road sections and disturbed sites; – measures related to the presence of waste rock or tailings that are potentially acid-generating or leachable, if applicable; – procedures for dismantling housing infrastructure; – protection of the nesting season for migratory birds; – protection of at-risk species as defined by provincial and federal legislation, or of any species of interest to local communities; – protection of archaeological sites and sites of cultural interest; – reducing the project's impact on Cree cultural activities carried out on the land; – the participation of Indigenous workers in the workforce, or as contractors, during the construction and operations phases of the project; – programs designed to support workers and their families (e.g., to facilitate communication and coexistence between non-Indigenous and Indigenous workers); – consideration of hunting leave for Cree workers to carry out their traditional activities; – sharing information with interested parties (affected communities, families directly affected by the project, band councils, and the Cree Nation Government); – cultural integration program for non-Indigenous and Indigenous peoples.	

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	The proponent must distinguish between mitigation measures applicable to the operations, closure, and restoration phases. In particular, it must submit: – the program for progressive restoration during operations, the containment and monitoring program during a temporary closure, and a copy of the rehabilitation and restoration plan as filed with the MRNF and required under the Mining Act (Chapter M-13.1); – the methods for rearranging storage areas and stabilizing them to combat wind erosion or erosion caused by runoff; – the potential uses of overburden in the restoration of abandoned sites; – taking into account the "landscape" aspect, that is, the integration of remaining mine infrastructure (e.g., waste rock stockpiles) into the natural landscape; – the recovery of certain equipment and structures.	
6.2 Residual impacts and compensation measures	The proponent must provide a summary list of mitigation measures, specific compensation measures, and proposed commitments. The proponent must indicate the nature and extent of any residual impacts that are likely to remain after mitigation measures have been implemented. Proposals for management measures, commitments, and compensatory measures to offset habitat loss must be provided. This section will address compensation measures for changes or losses related to the practice of traditional activities. It must also provide details of any financial or other environmental guarantees that may be required during the construction, operations, and decommissioning phases of the project. The restoration of abandoned mining sites and the potential reuse of equipment or temporary facilities for public or community purposes should be considered as compensatory measures, as should the setting aside of certain construction waste—such as excavated material or other waste—for future use. More specifically, with regard to the restoration program, the proponent must carefully consider the available options, taking into account, among other things, the requirements of the Mining Act. **Loss of numerous wetlands and water environments** Since the project is expected to result in the loss of wetlands and water environments, the environmental impact assessment must include a wetland and water environment compensation plan, as well as a fish habitat compensation plan.	Chapter 8, Section 8.2 (residual impacts), Chapter 10 (review) Chapter 14 (compensation)
6.3 Summary	The proponent must provide, in tabular form, a summary of the impact statement including impacts on valued components, mitigation measures, residual impacts, and planned compensation measures.	Chapter 10
7. RISK MANAGEMENT	The impact statement must include an analysis of the risks of major technological accidents, a description of emergency measures, and a preliminary plan for emergency measures to be implemented during the construction and operations phases.	Chapter 12

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
7.1 Risks of technological accidents	The analysis of major technological accident risks is based on the identification of hazards (hazardous properties of products, system failures, sources of failure, etc.), which are used to develop accident scenarios. A review of accidents that have occurred (over the past five years or so) in similar projects, or, failing that, in facilities using similar processes, provides additional information for developing these scenarios. All activities related to the project (handling, operations, transportation, etc.) must be taken into account. Attention must be paid to any event (e.g., a spill) that could adversely affect the quality of the environment, its use, and its users. The proponent must outline the measures to be taken to manage water safely, particularly in situations that could jeopardize the safety of people and property. It must also specify, among other things, the maximum operating level, the level corresponding to the design flood, the discharge curve, the measures the owner will take to manage the water retained by the dam, and, where applicable, a description of the owner's strategy for communicating risks to affected persons and to the authorities responsible for public safety. If the project involves the construction of dikes or dams subject to the Dam Safety Act (DSA) (Chapter S-3.1.01), the proponent must submit the steps taken with the Direction de la sécurité des barrages du Ministère (Ministère's dam safety branch) to ensure that its structures comply with the DSA and to obtain the authorizations required under that Act. It must indicate the classification of the retaining structures and the level of consequences in the event of a failure that has been assigned to these structures by the competent authority. It must also outline the safety standards and requirements set forth by the DSA that apply to these structures. Accidents or damage that could affect the project's infrastructure, other components, or its operations due to natural disasters or extreme weather events must be assessed. This assessment must take into account anticipated climate change.	Chapter 12, Section 12.2
7.2 Safety measures	The impact statement will describe the safety measures planned for the operational sites, including related facilities located outside the main site.[15] Among other things, it will describe the following: – restrictions on access to the sites (marking out the area); – the safety measures in place for the transport of employees, ore, and hazardous materials; – safety facilities and preventive measures (surveillance systems, emergency shutdown systems, fire suppression systems, ventilation and safety stacks, automatic fire extinguishers, emergency generators, leak detectors, high-level alarms, retention basins, safety distances, etc.); – storage methods for products based on their level of hazard.	Chapter 12, Section 12.4

[15] Ministère de la Sécurité publique, 2009. *Gestion des risques en sécurité civile [Risk management in public safety]*. [https://www.quebec.ca/securite-situations-urgence/securite-civile/fonctionnement/bases/gestion-risques-securite-civile].

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
7.3 Preliminary emergency response plan	The impact statement must include a preliminary plan outlining the emergency measures intended to ensure an adequate response in the event of an accident, both during the construction phase and the operations phase. This plan will outline the key measures to be taken in the event of an incident or accident, as well as the procedures for issuing alerts. It must describe the relationship with the relevant municipal authorities or communities, other relevant regional entities, and, where applicable, how the various emergency response plans are coordinated.[16] The proponent is encouraged to review the various publications on the preparation of emergency response plans, including the information document on public safety risk management, the guide to managing the risks of major industrial accidents, and the standard governing the planning of emergency response measures and operations.[17] The proponent must finalize a comprehensive emergency response plan, including scenarios for each type of major accident anticipated, before operations begin. Given the remote location of the project, the proponent must implement initial emergency measures in the event of a technological accident, spill, etc. In particular, the proponent must provide information on its response capabilities and handling procedures in the following situations: – transportation of chemicals (petroleum products, explosives, etc.) or substances deemed potentially hazardous; – ore transport; – spills of petroleum products and/or hazardous materials at the project site or along the road, emphasizing the speed and resources available for on-site response; – storage of chemicals, petroleum products, and hazardous materials; – fire hazards along roads or at the project site; – coordination with relevant regional entities during evacuations or incidents involving a large number of victims; – risk of dike failure or leakage. The proponent must also submit a preliminary emergency response plan for each dike or dam where the level of consequences in the event of a failure is considered “moderate,” “high,” “very high,” or “severe” in accordance with the Dam Safety Regulation (Chapter S-3.1.01, R. 1). This plan is intended to establish the measures that will be taken in the event of an actual or imminent dam failure to protect people and property upstream and downstream of the dam or to mitigate the effects of the failure. This plan must include, among other things, an inventory of situations that could lead to a failure, a general description of the flooded area, warning procedures, and flood maps.	Chapter 12, Section 12.7

[16] Conseil pour la réduction des accidents industriels majeurs [Council for the prevention of major industrial accidents], 2017. *Guide de gestion des risques d’accident industriels majeurs*. [http://www.craim.ca/produit/guide-de-gestion-risques-daccidents-industriels-majeurs-2017/].

[17] Standard CSA-Z731-F03 (R2014). Emergency Preparedness and Response [https://www.scc.ca/standardsdb/standards/18900].

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
8. MONITORING AND FOLLOW-UP PROGRAM	The following sections are intended to establish the procedures for designing and implementing the project's monitoring and follow-up programs. Programs must be designed with sufficient flexibility to allow for adjustments in response to new information and unforeseen events.	Chapter 13
8.1 Monitoring program	Environmental monitoring will be conducted by the proponent and will aim to ensure the application of: – requirements under relevant laws and regulations; – the measures proposed in the impact statement, including mitigation or compensation measures; – the proponents' commitments as set forth in the ministerial authorizations; – the conditions set forth in the authorization certificate. Environmental monitoring will cover the construction phase as well as the project's operations, closure, and decommissioning phases. The proponent must include a preliminary environmental monitoring plan in the impact statement. This preliminary plan will be refined once all aspects of the project have been better defined. It will be finalized, if necessary, following approval of the project. This program will describe the measures and mechanisms put in place to ensure compliance with legal and environmental requirements. It will help ensure the proper functioning of the work, equipment, and facilities, and will monitor any environmental disturbances caused by the construction, operations, closure, or decommissioning phases of the project. The monitoring program will make it possible, if required, to reorient the work and potentially improve the progress of construction activities and the establishment of the various elements of the project. The environmental monitoring program must include, in particular: – the list of items requiring environmental monitoring; – all measures and resources planned to protect the environment; – the characteristics of the monitoring program (for each environment: surface water, atmosphere, soil, etc.), where these can be anticipated (e.g., location of activities, planned protocols, list of measured parameters, analytical methods used, implementation schedule, human and financial resources allocated to the program, participation of the Cree and other affected communities, where applicable); – a mechanism for taking action in the event of non-compliance with legal and environmental requirements or the proponent's commitments; – the proponent's commitments regarding the submission of monitoring reports (number, frequency, content, and distribution); – the proponent's commitments regarding the dissemination of environmental monitoring results to the affected community. The monitoring program should also include GHG emissions. In general, this program will include the elements required from the project's design phase onward to quantify the GHG emissions generated by the project and track their trends over time.	Chapter 13, Section 13.1
8.2 Environmental and social follow-up program	The environmental and social follow-up conducted by the proponent will serve to verify the accuracy of the assessment of certain impacts and the effectiveness of certain mitigation or compensation measures outlined in the impact statement.	Chapter 13, Section 13.2

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	The proponent must submit a preliminary environmental and social follow-up program, which will be finalized, if necessary, following approval of the project. In particular, this program should include the following elements: – the rationale for the follow-up, including a list of items requiring environmental follow-up (such as valued components); – the minimum duration of the follow-up program, its objectives, and the components covered by the program (e.g., validating the impact assessment, evaluating the effectiveness of mitigation measures for the following components: water, air, soil, etc.); – the number of planned follow-up studies and their main characteristics (list of parameters to be measured, projected timeline, and participation of the Cree and other communities targeted by the follow-up, if applicable); – the procedures for producing follow-up reports (number, frequency, format, and distribution); – the response mechanism implemented in the event that unexpected environmental degradation is observed; – the response mechanism implemented in the event that an unforeseen impact on the social environment is observed; – a plan for communicating the results of follow-up studies to the relevant populations in an appropriate format.	
9. PRESENTATION OF THE IMPACT STATEMENT	It is the proponent's responsibility to submit, upon filing with the Administrator, an optimized impact statement that fully complies with these guidelines and avoids delays resulting from a misunderstanding of the project and its environmental and social impacts. The impact statement must be presented in a clear and concise manner and should be limited to the information necessary for a proper understanding of the project and its impacts. The proponent must minimize redundancy as much as possible. A glossary defining technical terms, acronyms, and abbreviations must be included. A table of concordance, showing the page on which each element of the guidelines is located, must also be provided. Information of a more technical nature should not be included in the main document unless it is essential for the reader's understanding. Anything that can be represented schematically or shown on a map should be, and at appropriate scales. The project components must be included on both the thematic maps and the summary maps. The proponent must illustrate the key points of its study using high-quality charts, maps, and photographs. The maps must be presented at the same scale and with common reference data to allow for the comparison and overlay of the mapped features. The proponent must also assess the availability and quality of the data used. All sources of information must be cited. In addition, the methods used in preparing the impact statement (inventories, surveys, interviews, comparative analyses, etc.) must be presented, explained, and scientifically validated. The proponent must also prepare a summary of the impact statement, including illustrations and maps. The summary must be sufficiently detailed to provide an overview of the project and to explain the issues at stake, the main anticipated impacts, the proposed mitigation measures, the residual impacts, and the conclusions regarding the significance of these effects. Other initiatives by the proponent that promote public participation—such as the production of videos, radio segments, scale models, informational brochures—are also encouraged. The proponent is requested to translate the summary into French to make the information more accessible to the community or communities affected by the project, if applicable.	N/A

MELCCFP guidelines section (2024)		Corresponding chapter or section in the EIS
	To encourage public participation in the assessment process, all documents submitted by the proponent will be posted on the COMEX[18] website and in the MELCCFP's public registry of environmental assessments.[19] If the proponent considers that certain information or data is confidential, it must ensure that such information is excluded (along with any information that could be harmful to the environment or to individuals) and submitted in a document separate from the impact statement, clearly indicating that it is confidential. The proponent is encouraged to review the document titled, "Public or confidential nature of information sent to COMEX,"[20] for further information on this subject.	

[18] https://comexqc.ca/

[19] http://www.ree.environnement.gouv.qc.ca/index.asp

[20] https://comexqc.ca/wp-content/uploads/Caractere-public-ou-confidentiel_COMEX-EN-1.pdf

TABLE OF CONTENTS

1 Introduction 1-1
1.1 About the proponent 1-1
1.1.1 Proponent's experience 1-1
1.1.2 Policies, corporate initiatives, and environmental and sustainable development agreements 1-3
1.2 Consultant mandated by the project initiator 1-5

2 Project context and rationale 2-1
2.1 Context of project integration 2-1
2.1.1 Location 2-1
2.1.2 Brief overview of the project 2-1
2.1.3 History of mining and exploration activities 2-5
2.1.4 Mining rights and land ownership 2-5
2.2 Regulatory context 2-5
2.2.1 Quebec 2-6
2.2.2 Canada 2-10
2.2.3 James Bay and Northern Quebec Agreement 2-11
2.2.4 Municipal 2-12
2.2.5 Permits and authorizations 2-12
2.3 Project rationale 2-13
2.3.1 Purpose of the project 2-13
2.3.2 Alignment with policies, government guidelines, and local agreements 2-15
2.3.3 Constraints and issues identified 2-25
2.4 Analysis of project alternatives 2-25
2.4.1 Consequences of non-completion or postponement of the project 2-25
2.4.2 Solutions proposed during consultations 2-25
2.4.3 Line of reasoning and criteria leading to the decision 2-26
2.5 Similar projects 2-26

3 Community Relations 3-1
3.1 Engagement Process 3-1
3.1.1 Approach 3-1
3.1.2 Objectives 3-2
3.1.3 Engagement tools 3-3
3.2 Regional Context 3-4
3.3 Cree Communities of Eeyou Istchee and Indigenous Organizations 3-5
3.3.1 Eeyou Istchee Cree communities and engaged Indigenous organizations 3-5

3.3.2 Engagement Activities During the Exploration Phase 3-9
3.3.3 Engagement Activities During the Environmental Impact Assessment Phase 3-9
3.3.4 Results of engagement activities and PMET responses 3-19
3.3.5 Contributions and participation of the Cree 3-31
3.3.6 Upcoming information and consultation activities 3-32
3.4 Non-Indigenous Stakeholders and Government Authorities 3-33
3.4.1 Identified non-Indigenous stakeholders and government authorities 3-33
3.4.2 Engagement Activities 3-35
3.4.3 Results of Engagement Activities and PMET Responses 3-47
3.4.4 Upcoming Engagement Activities 3-52

4 Site location and technology alternatives 4-1
4.1 Technology alternatives 4-1
4.1.1 Ore processing 4-1
4.1.2 Tailings and waste rock management 4-2
4.1.3 Water treatment 4-3
4.1.4 Mode of transport for the spodumene concentrate 4-7
4.1.5 Energy supply sources 4-9
4.2 Site location alternatives 4-14
4.2.1 Alternative locations for main infrastructure 4-14
4.2.2 Other infrastructure 4-29
4.3 Cost-benefit analysis 4-35

5 Project description 5-1
5.1 Project summary 5-1
5.2 Description of the mine and operations 5-2
5.2.1 Mineral deposits, resources, and reserves 5-5
5.2.2 Ore extraction 5-9
5.2.3 Ore processing 5-12
5.2.4 Shipping of spodumene concentrate 5-19
5.2.5 Geochemistry of tailings and waste rock 5-19
5.2.6 Stockpile management 5-24
5.3 Planned infrastructure and related developments 5-25
5.3.1 Road access to the mine site and internal road network 5-28
5.3.2 Power supply 5-28
5.3.3 Surface buildings and infrastructure 5-33
5.3.4 Communication and security systems 5-37
5.3.5 Fuel storage and distribution 5-37

5.3.6 Compressed natural gas (CNG) 5-38
5.3.7 Quarries and borrow pits for construction 5-38
5.4 Water management 5-39
5.4.1 Water balance 5-39
5.4.2 Contact water management infrastructure 5-43
5.4.3 Dikes and watercourse diversion 5-53
5.4.4 Dewatering of Lake 01 – Sediment and water management 5-58
5.4.5 Mine and industrial water treatment plant 5-58
5.4.6 Mine effluent 5-62
5.4.7 Potable water 5-63
5.4.8 Sewage water 5-63
5.4.9 Other water treatment systems 5-63
5.5 Activities planned during the construction, operations, and closure phases 5-64
5.5.1 Construction activities 5-64
5.5.2 Mining operations 5-67
5.5.3 Mine site restoration 5-68
5.6 Waste management and the 4R approach 5-70
5.6.1 Solid household waste 5-70
5.6.2 Dry waste 5-70
5.6.3 Hazardous materials 5-71
5.7 Energy consumption 5-71
5.7.1 Total requirements 5-71
5.7.2 Energy optimization 5-72
5.7.3 Autonomy in emergencies 5-72
5.8 Greenhouse gases 5-72
5.8.1 Emission sources 5-72
5.8.2 Reduction and compensation measures 5-73
5.8.3 Climate performance target 5-73
5.9 Project timeline 5-74
5.9.1 Key milestones 5-74
5.10 Workforce, economic spin-offs, and overall project costs 5-75
5.10.1 Workforce and economic spin-offs 5-75
5.10.2 Total project costs 5-77

6 Description of the receiving environment 6-1
6.1 Delineation of study areas 6-1
6.1.1 Regional study area of the social environment 6-1
6.1.2 Regional study area of the biophysical environment 6-1

6.1.3 Local study area of the social environment 6-2
6.1.4 Local study area of the biophysical environment 6-2
6.1.5 Project area 6-2
6.2 Physical Environment 6-7
6.2.1 Climate 6-7
6.2.2 Ambient air 6-14
6.2.3 Greenhouse gases (Energy transition) 6-20
6.2.4 Acoustic environment 6-20
6.2.5 Ambient light 6-25
6.2.6 Geology and geomorphology 6-30
6.2.7 Hydrology 6-36
6.2.8 Surface water 6-45
6.2.9 Sediments 6-51
6.2.10 Hydrogeology 6-56
6.2.11 Groundwater quality 6-61
6.3 Biological environment 6-64
6.3.1 Vegetation and wetlands 6-64
6.3.2 Ichthyofauna and benthos 6-77
6.3.3 Herpetofauna 6-93
6.3.4 Avian fauna 6-94
6.3.5 Mammals – Large wildlife 6-113
6.3.6 Mammals – Chiropterans 6-119
6.3.7 Mammals – Other species 6-125
6.3.8 Plant and wildlife species of special status 6-130
6.4 Human environment 6-132
6.4.1 Land tenure and governance 6-139
6.4.2 Land use planning and development 6-140
6.4.3 Cree communities of Eeyou Istchee 6-142
6.4.4 Jamesian localities and municipalities 6-167
6.4.5 Regional economy 6-178
6.4.6 Traffic 6-179
6.4.7 Archeology 6-180
6.4.8 Landscape 6-182

7 Identification of issues 7-1
7.1 Issues identified by the regulators during consultations 7-1

7.2 Issues raised during information sessions and consultations 7-2
7.3 Issues selected 7-2

8 Identification and assessment of impacts 8-1
8.1 Method for identifying and assessing impacts 8-1
8.1.1 Identification of potential impacts 8-1
8.1.2 Assessment of residual impacts 8-5
8.2 Assessment and mitigation of project impacts 8-5
8.2.1 Issue No. 1 – Preservation of aquatic habitat quality 8-5
8.2.2 Issue 2 – Preservation of soil and groundwater quality 8-35
8.2.3 Issue 3 – Preservation of wetlands and habitats of interest to terrestrial wildlife and plants 8-44
8.2.4 Issue 4 – Preserving the quality of life of the local population 8-106
8.2.5 Issue 5 – Preservation of the health, safety, and socioeconomic conditions of the regional population (Health, social, and economic conditions of Indigenous Peoples) 8-121
8.2.6 Issue 6 – Preservation of the traditional activities and practices of the Indigenous population and the activities and practices of the non-Indigenous population (Current use of lands and resources for traditional purposes) 8-138
8.2.7 Issue 7 – Consideration of climate change 8-155

9 Cumulative Impact Assessment 9-1
9.1 Methodology 9-1
9.1.1 Selected valued components 9-2
9.1.2 Determination of spatial and temporal boundaries 9-2
9.1.3 Identification, selection, and description of past, present, and future activities, projects, and events 9-4
9.1.4 Description of the baseline conditions and historical trends 9-4
9.1.5 Identification and significance of cumulative effects 9-4
9.2 Assessment parameters 9-5
9.2.1 Review of the project's issues 9-5
9.2.2 Identification and rationale for selected VECs 9-7
9.2.3 Spatial and temporal boundaries 9-10
9.2.4 Projects, activities, and events considered in the assessment 9-15
9.3 Cumulative impact assessment 9-80
9.3.1 Surface water quality 9-80
9.3.2 Aquatic wildlife (fish) and habitat 9-80
9.3.3 Wetlands and water environments 9-83

9.3.4 Wildlife species of special status 9-85
9.3.5 Terrestrial wildlife and wildlife habitats 9-94
9.3.6 Physical, psychological, and social health of the regional population (health, social, and economic conditions of Indigenous Peoples) 9-98
9.3.7 Road safety 9-101
9.3.8 Hunting and trapping 9-104
9.3.9 Well-being on the land 9-106
9.3.10 Climate change (GHG emissions, energy transition) 9-106
9.4 Review of cumulative impacts 9-109
10 Summary of residual impacts on issues 10-1
11 Climate change resilience 11-1
11.1 Methodology 11-1
11.2 Future trends in climate hazards that may impact the project 11-2
11.2.1 Reference climate profile 11-3
11.2.2 Future climate profile 11-4
11.3 Climate change impacts in the construction and operations phases, and mitigation measures 11-7
11.4 Climate change impacts in the closure phase and mitigation measures 11-13
12 Accident risk management 12-1
12.1 Introduction 12-1
12.2 Assessment of major technological accident risks 12-2
12.2.1 Objectives and scope 12-2
12.2.2 Methodology for determining risks 12-2
12.2.3 Identification of sensitive environmental components 12-7
12.2.4 Historical record of accidents 12-13
12.3 Hazard identification 12-19
12.3.1 External hazards of natural origin 12-19
12.3.2 External hazards of anthropogenic origin 12-21
12.3.3 Identification of hazards related to site activities 12-21
12.4 Potential accident risks 12-23
12.4.1 Open pit mining 12-23
12.4.2 Underground mine 12-25
12.4.3 Ore processing 12-28
12.4.4 Storage and use of chemicals 12-30
12.4.5 Storage and handling of explosives 12-33
12.4.6 Storage and use of petroleum products 12-37

12.4.7 Storage and use of flammable gases 12-42
12.4.8 Mine water treatment 12-45
12.4.9 Accumulation areas and retention structures 12-46
12.4.10 Road transportation 12-49
12.4.11 Risks associated with outside hazards 12-53
12.4.12 Summary of risks 12-56
12.5 Quantitative assessment of consequences 12-57
12.5.1 Incident involving hazardous materials 12-57
12.5.2 Failure of a retention structure 12-61
12.6 Risk management program 12-62
12.7 Preliminary emergency response plan (ERP) 12-63
13 Preliminary monitoring and follow-up program 13-1
13.1 Environmental monitoring 13-1
13.2 Environmental follow-up 13-2
13.2.1 Mining operations 13-3
13.2.2 Physical environment 13-8
13.2.3 Biological environment 13-32
13.2.4 Social environment 13-60
13.2.5 Other follow-ups 13-71
13.2.6 Annual monitoring and follow-up report 13-72
13.2.7 Follow-up program calendar 13-73
14 Preliminary compensation program 14-1
14.1 Summary of loss of fish habitat, wetlands, and aquatic environments 14-1
14.2 Fish habitat compensation plan 14-2
14.2.1 Context and losses to be compensated 14-2
14.2.2 Compensation project identification 14-2
14.2.3 Identified projects 14-3
14.2.4 Summary 14-5
14.3 Wetland and aquatic environment compensation plan 14-8
14.3.1 Context and losses to be compensated 14-8
14.3.2 Project search 14-8
14.3.3 Selected projects 14-8
14.3.4 Summary 14-10
15 Bibliographic references 15-1

Tables

Table 1-1 Contact details for the proponent and its representative 1-2
Table 1-2 Information on the mandated consultant 1-5
Table 2-1 Specific rights according to land category 2-12
Table 2-2 Alignment between the elements of Section 22 of the JBNQA and the environmental impact assessment 2-16
Table 2-3 Alignment between the Cree Nation Mining Policy and the environmental impact assessment 2-19
Table 2-4 Alignment between the Quebec Plan for the Development of Critical and Strategic Minerals and the project 2-21
Table 2-5 Alignment between the Plan d'action nordique 2023–2028 and the environmental impact assessment 2-22
Table 2-6 Sustainable development principles integrated into the project 2-23
Table 3-1 List of Indigenous stakeholders 3-6
Table 3-2 Meetings with elected officials from the Chisasibi Band Council and representatives of the Cree Nation Government 3-10
Table 3-3 Meetings with elected officials of the Mistissini and Wemindji Band Councils 3-12
Table 3-4 Meetings with representatives of the Cree Nation Government 3-12
Table 3-5 Meetings with the tallyman of trapline CH39 from Chisasibi and his family 3-13
Table 3-6 Meetings with the tallymen of Mistissini and Wemindji and their families 3-15
Table 3-7 Public information and engagement sessions in Chisasibi 3-16
Table 3-8 Meetings with other Cree authorities 3-17
Table 3-9 Other engagement activities (cultural events, site visits, etc.) 3-19
Table 3-10 Concerns identified during engagement activities with the Cree Nation of Chisasibi 3-20
Table 3-11 Main results of engagement activities with the Cree Nations of Mistissini and Wemindji 3-27
Table 3-12 Key results of engagement activities with regional Indigenous stakeholders (Cree Nation Government, CHB, CSB) 3-28

Table 3-13 Identified non-Indigenous stakeholders and government authorities 3-33
Table 3-14 Main engagement activities conducted with federal and provincial government authorities ... 3-36
Table 3-15 Main engagement activities carried out with communities of the James Bay region and other regional authorities 3-45
Table 3-16 Key results of engagement activities with of the James Bay region and municipalities and other regional authorities 3-48
Table 4-1 Costs per segment and annual totals (Millette road transport company) 4-8
Table 4-2 Costs per tonne and annual costs based on destination and transport company 4-8
Table 4-3 Description of the scenarios considered 4-10
Table 4-4 Comparison of energy supply scenarios 4-13
Table 4-5 Water diversion scenarios considered for the project 4-17
Table 4-6 Correspondence between risk assessment criteria and POETS matrix criteria 4-25
Table 4-7 Scenarios for waste rock and tailings storage areas 4-26
Table 4-8 Relative performance of scenarios for the location of waste rock and tailings storage facilities 4-27
Table 4-9 Comparative analysis of two routing options for the proposed 120 kV line 4-30
Table 5-1 Main equipment planned for open pit mining operations 5-11
Table 5-2 Main equipment planned for underground mining operations 5-12
Table 5-3 Summary of geochemical classification of mine lithologies 5-23
Table 5-4 Estimated maximum volume for the selected quarries 5-38
Table 5-5 Estimated maximum volume from borrow pits ... 5-39
Table 5-6 Summary of the design specifications of the proposed collection ponds 5-53
Table 5-7 Summary schedule of key construction milestones (surface work only) 5-67
Table 5-8 Estimated annual energy consumption 5-71
Table 5-9 Timeline of the main phases of the project 5-74
Table 5-10 Labour force requirements by project phase 5-75
Table 5-11 Cost estimates for the mining project 5-77

Table 6-1 Temperature normals at the Grande IV weather station (1991 to 2020 period) 6-7
Table 6-2 Average monthly precipitation norms at La Grande IV weather station (1991 to 2020 period) 6-8
Table 6-3 Average monthly precipitation normals at the Nitchequon weather station (1961 to 1990 period) 6-9
Table 6-4 Extreme precipitation (long-term) at La Grande IV weather station (1991 to 2020 period) 6-11
Table 6-5 Standards and criteria associated with the modelled components 6-16
Table 6-6 Identified sensitive receptors 6-23
Table 6-7 Sound measurement stations around the project site 6-23
Table 6-8 Measured noise levels 6-24
Table 6-9 Results of ambient noise surveys – federal criteria 6-24
Table 6-10 Description of ambient light survey stations 6-29
Table 6-11 Watersheds at the 11 points of interest, under existing conditions 6-36
Table 6-12 Flood and low water flows selected for calculation points in the study area 6-44
Table 6-13 Average monthly flows used for calculation points in the study area 6-44
Table 6-14 Summary of exceedances of water quality criteria 6-49
Table 6-15 Summary of exceedances of sediment quality criteria 6-55
Table 6-16 Piezometry for the various wells 6-58
Table 6-17 List of wells sampled in 2023–2024 6-61
Table 6-18 Analytical results for radionuclides (2023, 2024) 6-63
Table 6-19 Summary of exceedances observed for the 2023–2024 campaign 6-63
Table 6-20 Areas of natural environments in the biophysical LSA 6-65
Table 6-21 Plant species of special status likely to be present in the biophysical LSA 6-73
Table 6-22 Vascular and non-vascular plants with traditional Cree uses observed in the biophysical LSA 6-75
Table 6-23 Ecological indicators by benthos sampling station in 2024 and 2025 6-83

Table 6-24 Summary of information collected in water bodies 6-87
Table 6-25 Summary of information collected in watercourses 6-91
Table 6-26 Metal content in fish caught in Lakes L01, L27, and L823 6-93
Table 6-27 Occurrence of waterfowl and other water bird species detected during helicopter surveys during the spring migration period in 2025 6-96
Table 6-28 Occurrences and densities of waterfowl and other water bird species surveyed by helicopter during the nesting season in 2024 and 2025 6-97
Table 6-29 Observations of birds of prey and corvids during helicopter surveys in 2024 and 2025 6-99
Table 6-30 Species richness and abundance observed at automated recording stations by year and inventory period 6-101
Table 6-31 Species richness and density counted by habitat in 2024 and 2025 6-101
Table 6-32 Presence and frequency of bird species recorded at segments and transects in winter 2023 6-103
Table 6-33 List of bird species at risk recorded in the biophysical LSA in 2023, 2024, and 2025 or are likely to be found there 6-105
Table 6-34 Species recorded and respective percentages for the 2023, 2024, and 2025 seasons 6-123
Table 6-35 Species and number of individuals captured per species during the small mammal inventory 6-126
Table 6-36 List of plant and wildlife species of special status present or potentially present in the biophysical LSA 6-130
Table 6-37 Indigenous and non-Indigenous communities in the Eeyou Istchee James Bay territory, and distance from the local human environment study area 6-133
Table 6-38 Gender and age groups in Chisasibi 6-146
Table 6-39 Housing occupancy patterns and rates for Chisasibi and the Cree communities of Eeyou Istchee, 2021 6-147
Table 6-40 Highest level of education attained in Chisasibi in 2021 6-147
Table 6-41 Key labor market indicators for Chisasibi and all Cree communities, 2021 6-149

Table 6-42 Chisasibi – Economic Security Program (ESP) recipients, 2021-2022 6-152
Table 6-43 Genders and age groups in Radisson and Matagami 6-168
Table 6-44 Dwelling tenure and occupancy rates 6-169
Table 6-45 Highest level of education attained by the population aged 15 and over, 2021 6-170
Table 6-46 Labour force participation, employment, and unemployment rates, 2021 6-172
Table 6-47 Distribution of the labour force by sector of activity, 2021 6-172
Table 6-48 Valley landscape unit (VA-01) 6-188
Table 6-49 Hills landscape unit (CO-01) 6-191
Table 6-50 Undulating plain landscape units (PL-01 and PL-02) 6-192
Table 6-51 Lake landscape units 6-194
Table 7-1 List of issues arising from the project and associated valued ecosystem components, selected or not selected for the impact assessment 7-3
Table 8-1 Grid of possible interactions between the ecosystem components and the activities 8-3
Table 8-2 Increase in flooded area by return period 8-7
Table 8-3 Impact (in %) of catchment and diversion of water, as well as mine effluent, on the average flow of watersheds 8-18
Table 8-4 Maximum metal concentrations calculated in the final effluent and quality criteria set forth in Directive 019 and the MDMER 8-24
Table 8-5 Summary of estimated losses in wetlands and water environments 8-46
Table 8-6 Rate of disturbance to woodland caribou habitat in the biophysical LSA according to the approach of the Quebec government 8-61
Table 8-7 Rate of disturbance to woodland caribou habitat in the biophysical LSA according to the Government of Canada's methodological approach 8-62
Table 8-8 Rate of disturbance to woodland caribou habitat in the biophysical LSA according to the Cree Nation Government's methodological approach 8-63
Table 8-9 Areas and Project Footprint of Potential Habitats for Bird Species of Special Status 8-66

Table 8-10 Summary of Criteria Used to Identify Potential Habitats for Target Species of Special Status 8-67
Table 8-11 Rate of disturbance to migratory caribou habitat in the biophysical LSA 8-89
Table 8-12 Summary of GHG emissions during the construction phase 8-156
Table 8-13 Summary of GHG emissions during the operations phase 8-158
Table 9-1 Identification of VECs selected for the cumulative impact assessment 9-7
Table 9-2 Temporal and spatial boundaries and indicators related to the valued components selected for the cumulative impact assessment 9-10
Table 9-3 Projects, actions, and events likely to influence the valued components selected for the cumulative impact assessment 9-17
Table 9-4 Projects, activities, and events that may influence valued components 9-25
Table 9-5 List of fish species recorded in the biophysical LSA (Niigaan, 2025) 9-81
Table 9-6 Annual index of abundance of bird species of special status for the BCR 7 in Canada for the reference year (1970), 2016, and 2023 9-89
Table 9-7 Population trends of bird species of special status that are likely to nest in the RSA 9-92
Table 10-1 Summary of impacts by issue 10-3
Table 11-1 Interactions considered between component categories and climate hazards (operations phase) 11-3
Table 11-2 Summary of climate projections (SSP5-8.5) 11-5
Table 11-3 Risk profile of the operations phase for future horizons (SSP5-8.5) 11-7
Table 11-4 Risks and adaptation measures for the operations phase 11-9
Table 11-5 Risk profile of the restoration and post-restoration phase for future horizons (SSP5-8.5) 11-13
Table 11-6 Risks and adaptation measures for the restoration and post-restoration phase 11-15
Table 12-1 Probability of occurrence level 12-4
Table 12-2 Level of severity of consequences 12-5
Table 12-3 Risk levels 12-7
Table 12-4 Project acceptability criteria 12-7

Table 12-5 Accidents related to extractive activities 12-14
Table 12-6 Risk level for the open pit – Flooding due to water infiltration 12-24
Table 12-7 Risk level for the open pit – Rockfall along the pit walls 12-24
Table 12-8 Risk level for flooding due to water infiltration in the underground mine 12-26
Table 12-9 Fire risk level in the underground mine 12-27
Table 12-10 Risk level for underground subsidence 12-27
Table 12-11 Fire risk level at ore processing facilities 12-29
Table 12-12 Risk level for dust exposure 12-30
Table 12-13 Main products used in ore processing 12-30
Table 12-14 Characteristics of the main products used in ore processing 12-31
Table 12-15 Main products used for water treatment 12-31
Table 12-16 Characteristics of the main products used for water treatment 12-31
Table 12-17 Risk level associated with chemical spills 12-33
Table 12-18 Risk level for an uncontrolled surface explosion 12-36
Table 12-19 Risk level for the theft of explosives 12-37
Table 12-20 Diesel fuel characteristics 12-37
Table 12-21 Risk level associated with spills of petroleum products 12-40
Table 12-22 Risk level for fire involving petroleum products 12-41
Table 12-23 Risk level for oil and grease spills 12-42
Table 12-24 CNG characteristics 12-43
Table 12-25 Risk level for fire involving a CNG tank 12-44
Table 12-26 Risk level for explosion of a CNG tank 12-45
Table 12-27 Risk level associated with the discharge of water that does not meet final effluent standards 12-46
Table 12-28 Risk level for a stockpile collapsing 12-47
Table 12-29 Risk level for the failure of a retention structure 12-48
Table 12-30 Risk level for a road accident involving hazardous materials 12-52
Table 12-31 Risk level for a road accident involving ore concentrate 12-53
Table 12-32 Forest fire risk level 12-55
Table 12-33 Risk level for extreme weather conditions 12-55
Table 12-34 Summary of technological risks 12-56

Table 12-35 Thresholds of overpressure effects 12-58
Table 12-36 Thermal exposure thresholds 12-58
Table 12-37 Maximum impact distances calculated for different scenarios involving CNG (emergency planning thresholds) 12-60
Table 12-38 Water levels and wave arrival times at various sensitive points for the scenario involving favourable weather conditions 12-62
Table 12-39 Water levels and wave arrival times at various sensitive points for the scenario involving worsening weather conditions 12-62
Table 13-1 Sampling frequency and applicable physicochemical and biological parameters 13-7
Table 13-2 Air quality standards and criteria applicable to the parameters assessed at the project site 13-9
Table 13-3 Sampling, analysis, and measurement frequencies for routine monitoring of the final effluent 13-22
Table 13-4 Parameters and measurement or sampling frequency for final mine effluent under the MDMER 13-23
Table 13-5 Parameters considered for surface water monitoring under the MDMER 13-24
Table 13-6 List of stations where avian fauna are monitored 13-37
Table 13-7 Recommended buffer zones around bird nests 13-48
Table 13-8 Species of special status that are present or potentially present in the local study area 13-58
Table 13-9 Distribution of plant quadrats by habitat type .. 13-62
Table 13-10 List of parameters to be analysed in leaf tissue and berry samples 13-65
Table 13-11 List of parameters to be analyzed in biological samples from the snowshoe hare 13-68
Table14-1 Summary of estimated direct loss of fish habitat, wetlands, and aquatic environments 14-1
Table 14-2 Summary of potential fish habitat compensation projects 14-5
Table 14-3 Summary of potential wetland and aquatic environment compensation projects 14-10

Figures

Figure 5-1 Plan view of CV5 Pegmatite Geological Model – All Lenses 5-6
Figure 5-2 Property geology and mineral exploration trends 5-10
Figure 5-3 Conceptual diagram of the pit by phase 5-13
Figure 5-4 Flow diagram of the crushing and dense media separation (DMS) process 5-17
Figure 5-5 Conceptual diagram of a foundation equipped with a membrane for Stockpile 02 5-26
Figure 5-6 Conceptual diagram of the proposed slopes for the various stockpiling areas 5-27
Figure 5-7 Main Site Infrastructure – Perspective View 5-34
Figure 5-8 Site water management flow diagram 5-45
Figure 5-9 Typical section for Stockpile 01 water collection ditch 5-47
Figure 5-10 Typical section for Stockpile 02 lined water collection ditch 5-47
Figure 5-11 Typical section of a contact water retention embankment designed for ponds 5-54
Figure 5-12 Profile of diversion channel with proposed fish habitat/passage 5-56
Figure 5-13 Typical cross-section for cut-off dike (critical section) 5-57
Figure 5-14 Open pit sediment and water management layouts – West Pit 5-59
Figure 5-15 Open pit sediment and water management layouts – East Pit 5-60
Figure 5-16 General process flow diagram of the mine and industrial wastewater treatment plant 5-61
Figure 5-17 Conceptual diagram of the restoration of Stockpiles 01 and 02 5-69
Figure 6-1 Variation of average temperature (1991 to 2020 period) 6-8
Figure 6-2 Monthly rainfall at the Nitchequon weather station (period from 1961 to 1990) 6-10
Figure 6-3 Monthly snowfall at the Nitchequon weather station (period from 1961 to 1990) 6-11
Figure 6-4 Wind rose illustrating the direction from which the winds originate – Fall 6-12
Figure 6-5 Wind rose illustrating the direction from which the winds originate - Winter 6-13
Figure 6-6 Wind rose illustrating the direction from which the winds originate - Spring 6-13

Figure 6-7 Wind rose illustrating the direction from which the winds originate - Summer 6-14
Figure 8-1 Areas flooded with a 2-year return period 8-8
Figure 8-2 Areas flooded in the event of probable maximum flood (>100 years) 8-8
Figure 8-3 Potential erosion areas between the diversion channel and Lake L27 8-8
Figure 11-1 Monthly climate norms for temperature and precipitation 11-4

Maps

Map 2-1	Planned infrastructure	2-4
Map 4-1	Alternative location for the diversion channel	4-19
Map 4-2	Alternative location for waste rock and tailings storage and management facilities	4-23
Map 5-1	Planned infrastructure	5-3
Map 5-2	Geological setting	5-7
Map 5-3	Underground infrastructure	5-14
Map 5-4	Off-site transportation management	5-21
Map 5-5	Existing infrastructure	5-29
Map 5-6	Location of substations, planned transmission line, and electrical connections at the mine site	5-31
Map 5-7	Site collection ponds and ditches	5-49
Map 5-8	Planned pipelines for drinking, sewage, and industrial water	5-51
Map 5-9	Water management during the construction period	5-65
Map 6-1	Regional study areas	6-3
Map 6-2	Local and project study areas	6-5
Map 6-3	Baseline acoustic environment	6-21
Map 6-4	Sky brightness and light-environment sampling results	6-27
Map 6-5	Geology of the local and regional study areas	6-31
Map 6-6	Superficial deposits in the local and regional study areas	6-35
Map 6-7	Location of soil sampling sites	6-37
Map 6-8	Existing watersheds	6-39
Map 6-9	Surface water sampling stations	6-45
Map 6-10	Sediment sampling stations	6-51
Map 6-11	Rock piezometry (August to November 2024) and borehole and well locations	6-57
Map 6-12a	Vegetation – Mining and road sector	6-65
Map 6-12b	Vegetation – Electrical line Sector	6-65
Map 6-13	Fish habitat	6-77
Map 6-14	Benthos sampling stations	6-79
Map 6-15	Occurrences of special-status avian species and associated habitats	6-105
Map 6-16	Chiroptera inventory results	6-119
Map 6-17	Small mammal inventory results	6-125
Map 6-18	Inventory of the human environment in the regional study area	6-133

Map 6-19 Inventory of the human environment in the local study area....6-135
Map 6-20 Landscape units....6-183
Map 8-1 Groundwater drawdown....8-13
Map 8-2 Watersheds, intermediate watersheds and sub-watersheds potentially affected by the project....8-15
Map 8-3 Project's encroachment on fish habitat....8-29
Map 8-4 Project encroachment on wetlands and water environments....8-49
Map 8-5 Project Encroachment on Potential Forest Caribou Habitat....8-57
Map 8-6 Project Encroachment on Potential Habitat for Terrestrial Birds....8-69
Map 8-7 Project Encroachment on Potential Habitat for Wetland-Associated Birds....8-71
Map 8-8 Project Encroachment on Potential Habitat for Crepuscular Birds....8-73
Map 8-9 Project encroachment on the potential habitat of migratory caribou....8-91
Map 8-10 Maximum modelled concentrations of total particulate matter over a 24-hour period....8-111
Map 8-11 Maximum modelled concentrations of fine particulate matter (PM2.5) over a 24-hour period....8-113
Map 8-12 Maximum modelled concentrations of crystalline silica over a one-hour period....8-115
Map 8-13 Maximum modelled concentrations of crystalline silica over a one-year period....8-117
Map 9-1 Cumulative impact assessment study areas....9-13
Map 9-2 Projects that impact the territory and are considered in the assessment....9-65
Map 13-1 Hydrological Monitoring Stations and Potential Erosion Zones....13-19
Map 13-2 Surface water, sediments, fish communities, and benthic communities water monitoring stations....13-25
Map 13-3 Groundwater Monitoring System....13-29
Map 13-4 Avian Fauna Inventory Plan....13-35
Map 13-5 Bat monitoring stations....13-55
Map 13-6 Location of plant and game quadrats by habitat type....13-63

Photos

Photo 6-1	Aerial view from the top of a hill looking southeast (landscape unit VA-01)	6-185
Photo 6-2	Deep perspective along the La Grande Rivière axis looking southwest (landscape unit VA-01)	6-185
Photo 6-3	Aerial view from a helicopter looking east (landscape unit CO-01)	6-188
Photo 6-4	Aerial view from a helicopter looking southeast (landscape unit PL-01)	6-190
Photo 6-5	Aerial view from a helicopter looking southeast (landscape unit LA-01)	6-192

Appendices

4-1 TOS 2 – WET PLANT FLOWSHEET – DMS VS HYBRID

4-2 NOTE ON THE TRANSPORT OF SPODUMENE CONCENTRATE

4-3 TECHNO-ECONOMIC ANALYSIS OF ELECTRICAL POWER GENERATION AT THE MINING COMPLEX

4-4 HEATING FUEL SUPPLY – COMPARATIVE ANALYSIS

4-5 SITE SELECTION ALTERNATIVES FOR STORAGE OF MINE WASTE

4-6 DIVERSION CHANNEL LAKE 01 TO LAKE 05 – DESIGN OPTIONS SUMMARY

4-7 120 KV TRANSMISSION LINE STUDY

5-1 GEOMECHANICAL DESIGN STUDY OF THE CV5 PEGMATITE

5-2 ANALYSES AND INTERPRETATION OF THE CV5 STATIC AND KINETIC GEOCHEMISTRY CHARACTERIZATION RESULTS

5-3 GEOCHEMICAL MODELLING OF ARSENIC LEACHING RISK FOR CV5 WASTE ROCK STOCKPILES

5-4 GEOCHEMICAL STUDIES

- 5-4-1 GEOCHEMICAL CHARACTERIZATION OF MINE WASTE MATERIALS & MODELLING OF STOCKPILES FOR THE SHAAKICHIUWAANAAN PROJETC (CV5 PEGMATITE))
- 5-4-2 CLASSIFICATION OF MINING MATERIALS FROM THE SHAAKICHIUWAANAAN PROJECT ACCORDING TO THE CRITERIA OF “GUIDE DE CARACTÉRISATION DES RÉSIDUS MINIERS ET DU MINERAI (GCRMM)”

5-5 WASTE MANAGEMENT INFRASTRUCTURE PRELIMINARY GEOTECHNICAL DESIGN REQUIREMENTS

5-6 CONDEMNATION OF WASTE ROCK STOCKPILES 001 AND 002, SHAAKICHIUWAANAAN PROPERTY

5-7 LABORATORY GEOTECHNICAL TAILINGS TESTING REPORT

5-8 STOCKPILE 001 AND 002 STABILITY ANALYSIS TECHNICAL NOTE

5-9 BORROW PIT OPTIONS FOR INFRASTRUCTURE CONSTRUCTION

5-10 FEASIBILITY STUDY FOR TAILINGS, WASTE ROCK AND WATER MANAGEMENT

5-11 FRESHWATER INTAKE – LAKE 308

5-12 GREENHOUSE GAS EMISSIONS ASSESSMENT

5-13 ECONOMIC IMPACTS STUDY

6-1 ATMOSPHERIC DISPERSION MODELLING

6-2 NOISE AND VIBRATION ENVIRONMENT

6-2-1 MINE SECTOR

6-2-2 OFF-SITE TRANSPORTATION

6-3 LIGHTING ENVIRONMENT

6-4 ASSESSMENT OF NATURAL BACKGROUND CONCENTRATIONS IN SOILS

6-5 PHASE I ENVIRONMENTAL SITE ASSESSMENT (ESA)

6-6 HYDROLOGY

6-7 SURFACE WATER AND SEDIMENTS

6-8 HYDROGEOLOGICAL BASELINE STUDY – FUTURE OPEN PIT /UNDERGROUND CV5

6-9 PACKER TESTING FACTUAL REPORT

6-10 HYDROGEOLOGICAL CHARACTERISATION – CV5 MINING SITE, SHAAKICHIUWAANAAN LITHIUM PROPERTY

6-11 HYDROGEOLOGICAL MODELLING OF THE PLANNED OPEN PIT AND UNDERGROUND MINE

6-12 HYDROGEOLOGY BASELINE AND NUMERICAL MODELING FOR STOCKPILE DESIGN

6-13 VEGETATION AND WETLANDS

6-14 VEGETATION AND WETLANDS – ELECTRICAL CONNECTION LINE

6-15 PLANT ECOTOXICOLOGY

6-16 FISH AND FISH HABITAT CHARACTERIZATION

6-16-1 FISH AND FISH HABITAT CHARACTERIZATION

6-16-2 RESPONSES TO THE IAAC'S COMMENTS ON THE AQUATIC ENVIRONMENT BASELINE CONDITION
6-17 BENTHIC INVERTEBRATES
6-18 METAL CONCENTRATIONS IN FISH TISSUE
6-18-1 METAL CONCENTRATIONS IN FISH TISSUE
6-18-2 REVIEW OF THE REPORT'S STATISTICAL ANALYSIS
6-19 AVIFAUNA, MAMMALS AND HERPETOFAUNA
6-20 2025 AVIFAUNA INVENTORY SURVEY
6-21 WOODLAND AND MIGRATORY CARIBOU
6-22 BATS
6-23 BASELINE CONDITIONS OF SMALL TERRESTRIAL FAUNA FOR THE SHAAKICHIUWAANAAN PROJECT
6-24 HEALTH IMPACTS
6-25 TRAFFIC
6-26 DESKTOP ARCHAEOLOGICAL POTENTIAL STUDY
6-27 ARCHAEOLOGICAL SURVEY
6-28 LANDSCAPE
8-1 IMPACT ASSESSMENT METHODOLOGY
8-2 MITIGATION MEASURES
8-3 FLOOD AND EROSION STUDIES OF THE DIVERSION CHANNEL AND CE15 RIVER AT POST-CONSTRUCTION OF MINING FACILITY
11-1 CLIMATE CHANGE RISK AND VULNERABILITY ASSESSMENT
12-1 DAM BREACH ANALYSIS AND CONSEQUENCE CLASSIFICATION FOR LAKE 001 DAMS
12-2 CONSEQUENCE MODELLING
12-3 EMERGENCY RESPONSE PLAN
13-1 MONITORING SCHEDULE
14-1 AQUATIC FAUNA RELOCATION PLAN
14-2 COMPENSATION PLAN – PROJECT IDENTIFICATION AND PREFEASIBILITY STUDY
14-3 PRELIMINARY COMPENSATION PLAN FOR THE LOSS OF WETLANDS

ABBREVIATIONS AND ACRONYMS

2ELGBTQ+	Two spirits, Lesbian, Gay, Bisexual, Transgender, queer, intersex and others
3RV	Reduction at the source, reuse, recycling, and recovery (residual materials)
AACE	Association for the Advancement of Cost Engineering
AARQ	Atlas of Amphibians and Reptiles of Quebec
AAS	Atomic Absorption Spectrometry
ABA	Static testing
AISC	*All-in Sustaining* Cost
AMCE	Other Effective Conservation Measures
AMQ	Mining Association of Quebec
AONQ	Atlas of Breeding Birds of Quebec
API	*American Petroleum Institute*
APNQL	Assembly of First Nations of Quebec and Labrador
ARBJ	James Bay Regional Administration
ARC	Canada Revenue Agency
ARIA	Accident Analysis, Research, and Information (French database)
ATI	Authorisation for impacting exploration work
ATM	Bank ATMs
ATV	All-Terrain Vehicle
BAB	Acid-base balance
BARPI	Office for the Analysis of Industrial Risks and Pollution (French Ministry of Ecology and Sustainable Development)
BBS	*Breeding Bird Survey*
BESS	*Battery Energy Storage* System
BEV	Battery-powered mining equipment

BEX	Exclusive operating leases
BV	Watersheds
CACA	Red minnow (*Catostomus catostomus*)
CACO	Black mullet (*Catostomus commersonii*)
CAEFMVQ	Advisory Committee on Threatened or Vulnerable Wildlife Species in Quebec
CAPEX	Capital Expenditures
CASP	Mullet sp. (*Catostomus sp.*)_
CBDG	*Chisasibi Business Development Group*
CBSC	*Chisasibi Business Service Center*
CCCEP	Canadian Council for the Conservation of Endangered Species
CCE	Commission for Environmental Cooperation
CCME	Canadian Council of Ministers of the Environment
CCQ	Quebec construction commission
CCSSSBJ	Cree Health and Social Services Board of James Bay
CDA	Canadian Dam Association
CDPNQ	Quebec Natural Heritage Data Centre
CEAEQ	Quebec Centre of Expertise in Environmental Analysis
CEP	Concentration likely to cause an effect
CER	Concentration causing rare effects
CERRI	Chisasibi Eeyou Research and Resource Centre
CFIA	Canadian Food Inspection Agency
CFP	Professional training center
CFTP	Surface Water Quality Criteria – Protection of Fish-Eating Terrestrial Wildlife by the MELCCFP
CIE	International Commission on Illumination
CIM / ICM	Canadian Institute of Mining
CIP	Carbon-in-pulp (process)

CLSC	Local Community Service Centre
CMEB	*Cree Mineral Exploration Board*
CMC	*Miyupimaatisiiun* community center
CNESST	Commission on Occupational Health and Safety Standards
CNG	Cree Nation Government
CNG	Compressed natural gas
CNPI	National Fire Prevention Code
Co	Hilly landscape
COCL	Whitefish (*Coregonus clupeaformis*)
COFEX	Federal Review Committee
COMEV	Committee for the Assessment of Environmental and Social Impacts
COMEX	Committee for the Review of Environmental and Social Impacts
COPC	Potentially Concerning Contaminant
COPD	Chronic obstructive pulmonary disease
COPL	Lake chub (*Couesius plumbeus*)
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSP	Chub (sp.)
COT	Total Organic Carbon
CPC (EO)	Surface Water Quality Criteria – Prevention of Contamination (Water and Aquatic Organisms) by the MELCCFP
CPC (O)	Surface Water Quality Criteria – Prevention of Contamination (Aquatic Organisms Only) from MELCCFP
CPE	Early Childhood Centre
CRAIM	Council for the reduction of major industrial accidents
CRE	Regional Conference of Elected Officials
CREECO	*Cree Regional Economic Enterprises Company*
CRSP	*Coregonus sp.* (fish)
CRSSSBJ	James Bay Regional Health and Social Services Centre

CSE	Concentration threshold producing an effect
CSMO Mines	Mining Industry Labor Sector Committee
CTA	*Cree Trappers' Association*
CVAA	Acute aquatic life criteria
CVAC	MELCCFP Surface Water Quality Criteria – Protection of Aquatic Life (Chronic Effect)
CVE	Valued Components of the Environment
CYPR	*Cyprinidae* (fish)
DDT	Dichlorodiphenyltrichloroethane (insecticide)
DEE	Exclusive exploration rights
DFO	Department of Fisheries and Oceans
DHP	Diameter at breast height
DJC	Growth degree-days
DJR	Cooling degree-days
DMS	Dense-medium separation
DRA	Acid rock drainage
DRE	Explosives Regulation Division
DRL	Limited-range enumeration
ECCC	Environment and Climate Change Canada
EDF	Meltwater
EE	Environmental evaluation
EIA	Environmental Impact Assessment
ELOS	*Equivalent Linear Overbreak Slough* (dilution model)
EPC	*Eeyou Planning Commission*
ERA	Impact and Benefit Agreement
ERSH	Human Health Risk Assessment
ESEE	Environmental Effects Monitoring Study
ESLU	Northern pike (*Esox lucius*)

EVD	Endangered species
EVEE	Invasive alien plant species
FIFO	Fly-in/Fly-out
FIRFF	Forest Fire Reconstruction Initiative Fund
FISIM	Mining Industry Social Investment Fund
FLAP	*Fatal Light Awareness Program*
FOB	*Free on board* (shipping costs not included)
GC	Government of Canada
GCC	Cree Grand Council
GDP	Gross Domestic Product
GHG	Greenhouse gases
GIRT	Integrated Resource and Land Management
GJ	Gigajoule
GPS	Global Positioning System
GREIBJ	Eeyou Istchee James Bay Regional Government
HA	*Highly Annoyed* (noise criterion)
HCT	Kinetic tests
HG	High-grade ore
HIV	Human Immunodeficiency Virus
HP	Petroleum hydrocarbons
HQ	Hydro-Québec
HRT	Hydraulic retention time
IAAC	Impact Assessment Agency of Canada
IC	Total abundance index
ICM	Canadian Institute of Mining
IDF	Reference flood
IFM	Forest-Weather Index (related to wildfires)

INRP	National Pollutant Release Inventory
IPA	Point Abundance Index
ISO	International Organization for Standardization (quality)
ISQ	Quebec Institute of Statistics
JBNQA	James Bay and Northern Quebec Agreement
La	Lake landscape
LCE	Lithium carbonate equivalent
LCMVF	Act respecting the conservation and development of wildlife
LCT	Lithium, Cesium, and Tantalum
LDR	Reported Detection Limit
LEET	Trench landfills
LEI	Environmental Impact Assessment Act
LEMV	Act respecting threatened or vulnerable species
LEMVQ	List of Threatened or Vulnerable Wildlife Species in Quebec
LEP	Species at Risk Act
LG	Low-grade ore
LHD	*Load-Haul-Dump* (specialized vehicle)
LHOS	Long-Hole Open Stoping (long-hole drilling and blasting)
LiDAR	Light Detection and Ranging
LII	Lower flammability limit
LLDPE	Linear Low-Density Polyethylene Membrane
LNC	Unincorporated community
LNG	Liquefied natural gas
LOLO	Lotte (*Lota lota*)
LOM	Mine life
LOWL	Lowest water level
LPG	Liquified propane gas

LQE	Environmental Quality Act
LSB	Dam Safety Act
LSI	Upper Flammability Limit
LTE	Energy transport line
M	Threatened
MAMA	Pearl mullet (*Margariscus margarita*)
MBBR	Moving Bed Biofilm Reactor
MBR	Membrane bioreactor
MCN	Mistissini Cree Nation
MCS	Critical and strategic minerals
MDF	Dense-medium separation of fines
MDG	Dense-medium separation of coarse particles
MDMER	*Metal and diamond mining effluent regulations*
MDR	Dense medium separation of re-crushed material
MDUF	Ultra fine separation in dense medium
MELCC	Ministry of the Environment and Climate Change
MELCCFP	Ministry of the Environment, Climate Change, Wildlife, and Parks
MERN	Ministry of Energy and Natural Resources
MES	Suspended solids
MFFP	Ministry of Forests, Wildlife, and Parks
MISQ	Quebec intersectoral model
ML	Metal leachate
MM	Moving average
MMU	Mobile manufacturing units
MOWL	Highest water level
MRNF	Minister of Natural Resources and Forests
MT	Megaton

MTESS	Ministry of Employment and Social Solidarity
MTMD	Ministry of Transport and Sustainable Mobility
MTQ	Quebec Ministry of Transport
MW	Megawatt
NCC	Chisasibi Cree Nation
NCM	National Community of Managers
NCQAA	Canadian Ambient Air Quality Standards
NCQQA	Quebec Air Quality Standards and Criteria
NCW	Wemindji Cree Nation
NEP	Not at risk
NEQ	Quebec Business Number
NFPA	*National Fire Protection Association*
OER	Environmental Discharge Objectives
OPEX	Operating costs
ORP	*ORP*
OSRCPC	Cree Hunters and Trappers Income Security Office
P	Worrying
PAH	Polycyclic Aromatic Hydrocarbons
PCCN	Joint Plan for the American Wigeon
PGA	Acid Generation Potential
PHAST	*Process Hazard Analysis Software Tool*
Pl	Undulating plain landscape
PMET	PMET Resources
PMNC	Cree Nation Mining Policy
PMPA	Aboriginal Mobilization and Partnership Plan
PMT	Total Particles
PMU	Emergency Response Plan

PN	Northern Projects
PNCC	Chisasibi Cree First Nation
PNM	Mistissini Cree First Nation
PNW	Cree First Nation of Wemindji
POETS	Costs, Operations, Environment, Technical, Social
PPMU	Preliminary Emergency Response Plan
PQVMCS	Quebec Plan for the Valorization of Critical and Strategic Minerals
PRCY	Round-leaved Menominee (*Prosopium cylindraceum*)
PRP	Global warming potential
PSE	Economic Security Program
PSR	Income Security Program for Cree Hunters and Trappers
PST	Total Suspended Particles
PTRA	Gross Vehicle Weight Rating
PUE	Smallest extraction unit
RAA	Air Quality Regulation
RADF	Regulations on Sustainable Forest Management
RCM	Regional County Municipality
RCO	Bird Conservation Areas
RCQE	Canadian Environmental Quality Guidelines
RDOCECA	Regulations on the Mandatory Reporting of Certain Atmospheric Contaminant Emissions
REAFIE	Regulations on the Regulation of Activities Based on Their Environmental Impact
REMMMD	Regulation respecting effluents from metal and diamond mines
RES	Criteria for Resurgence in Surface Water
RFID	Radio Frequency Identification
RGBS	Suspended Bed Biological Reactor
RLRQ	Compilation of the Laws and Regulations of Quebec

RLRUP	*Regional Land and Resource Use Plan*
RNC	Natural Resources Canada
RNSPA	National Air Pollution Monitoring Network
ROM	Raw Ore Stockpiles
RSQAQ	Quebec Air Quality Monitoring Network
RUE	Regulation on Environmental Emergencies
SAAQ	Quebec Automobile Insurance Corporation
SADC	Community Development Assistance Corporation
SAFO	Brook trout (*Salvelinus fontinalis*)
SANA	Lake trout (*Salvelinus namaycus*)
SDBJ	James Bay Development Corporation
SDC	Cree Development Corporation
SDMV	Likely to be designated as threatened or vulnerable
SEC	Business and Community Services
SEG	Scientific, Educational, or Wildlife Management (permit)
SGSS	Health and Safety Management System
SIGEOM	Geomining Information System
SLSP	*Salvelinus sp*. (fish)
SMB	White Nose Syndrome
SME	Small and medium-sized enterprises
SMS	*Short Message Service* (text messaging)
SMVD	Likely to be designated as threatened or vulnerable
SOPFEU	Society for the Protection of Forests Against Fire
SPEDE	Cap-and-trade system
SPLP	S*ynthetic Precipitation Leaching Procedure*
SPN	Northern plan Society
SRPNI	Secretariat for Relations with First Nations and Inuit

STE	Water Treatment Plant
TCLP	*Toxicity Characteristic Leaching Procedure*
TDFN	Natural background levels
TRAF	Rivière aux Feuilles herd (caribou)
TRG	George River herd (caribou)
UAF	Forest Management Units
UF	Ultrafiltration (treatment)
UGAF	Fur Animal Management Units
UNKN	Unidentified species
UTM	Universal Transverse Mercator
UV	Ultraviolet
V	Vulnerable
Va	Valley landscape
VOD	Video on Demand
WHMIS	Workplace Hazardous Materials Information System
XRD	X-ray diffraction room
YKU	Chisasibi Airport (code)
ZEL	Local study area
ZER	Regional study area

GLOSSARY

Acid-generating potential	The acid-generating potential associated with the oxidation of tailings.
Anthropogenic	Refers to phenomena that essentially result from man's direct or indirect intervention.
Aquifer	A geological stratum or formation that is sufficiently porous and permeable to stock a significant quantity of water while being sufficiently permeable to allow water to flow freely through it.
Background concentration	The concentration of a chemical substance that corresponds to said substance's ambient presence.
Carbon oxide equivalent (CO_2 eq.)	A unit used to compare the radiative forcing of a GHG to carbon dioxide.
Criteria	Concentrations of a contaminant that, if they are exceeded, risk causing a complete or partial loss of the use for which they were established.
Deposit	A series of mineral layers in the ground. A mineralized zone that is large enough to justify its commercial development.
Dewatering	The action of evacuating infiltration water from a mine.
Effluent Discharge Objectives	The maximum concentrations and loads of different contaminants that may be released into a receiving environment while ensuring the maintenance or retrieval of their uses.
Expected detection limit	The detection limit associated with the analytical method of a given parameter specified in the list of analytical methods published by the Centre d'analyse environnementale du Québec of the MELCCFP.
Extraction	The action of removing mineral material from excavation - open pit or underground.
Filter press	An intermittently operating filter consisting of a series of flat vertical filtering surfaces into which the pulp to be filtered is injected under pressure. The pulp is released by separating the filter plates.
Final effluent	Mine wastewater that is no longer treated before being released at the discharge point into the receiving environment or a sewer system.
Flood period	A significant increase in the water flow (and consequently the level) of a watercourse, a lake or a reservoir, most often attributable to precipitations or melting snow.
Geochemistry	The study of the chemical behaviour of the elements, in particular in rocks (magmatic, metamorphic and sedimentary) as well as in water (coastal and marine) and the atmosphere.

Glaciary deposits	Continental sediments originating from matter ripped off by a glacier.
Greenhouse gas	Gaseous component in the atmosphere, both natural and artificial, that absorbs and re-radiates the infrared radiation of a specific wavelength emitted by the surface of the Earth, the atmosphere and the clouds.
Hazardous material	A material which, by reason of its properties, is a hazard to health or to the environment and which is explosive, gaseous, flammable, poisonous, radioactive, corrosive, oxidizing or leachable or is designated as a hazardous material, and any object classed by regulation as a hazardous material by virtue of the *Environment Quality Act.*
High water	Elevation of the water level following abundant rainfalls or melting snow or ice.
High-water mark	This line is located at the natural high-water mark, i.e., where the predominance of aquatic plants passes to a predominance of terrestrial plants or, if there are no aquatic plants, where the terrestrial plants stop towards the body of water. This mark delineates the shorelines and shores of lakes and watercourses.
Hydraulic conductivity	A property of geological materials that characterizes the ease with which they allow the movement of water.
Hydrogeological conditions	A set of elements and characteristics that define the hydrology (groundwater science) and geology of a sector. It includes, among other things, the hydrostratigraphic units, granulometry and hydraulic properties of geological materials as well as groundwater levels and characteristics.
In situ	Latin expression that means on site.
Land use	The traditional and contemporary use of resources and the full occupation of the traditional territory.
Leaching tests	These tests make it possible to establish the risks associated with the potential leaching of toxic substances into the groundwater table.
Lixiviation	A technique consisting of using a solvent, namely water flowing in the soil or a substrate containing toxic products, to extract soluble products.
Low water level	The lowest recorded level of a watercourse or any other body of water.
Low-water period	The period of the year during which the flow of a watercourse reaches its lowest level (minimum flow).
Maternity	A fauna breeding site.
Mine water	Water, not including domestic wastewater, that is pumped from a mine excavation to keep it dry during exploration and development operations.
Mining lease	A mineral title that confers on its holder, on a given public territory, the exclusive right to mine mineral substances, except for those found on the surface. Since 1966, mining leases have replaced mining claims for new applications to operate.
Mitigation measure	A measure designed to reduce or eliminate the adverse effects of a project.

Modelling	The design of a model, i.e., a diagram representing a defined system, chosen following its intended use, followed by the development of a simulator (or an analogue, digital or other simulation model) of the system.
Observation well	A well used to observe, on an episodic or regular basis, a characteristic of the groundwater that may vary: level, chemical quality, temperature, etc. More specifically, a well used to measure the hydraulic load of a water table, in general near its surface, by surveying the depth of the table, and to observe its natural or influenced variations, through periodic measurements (less rigorously than when using a piezometer).
Organic matter	A substance of biological origin that results from the decomposition of plant debris, dejections and animal carcasses.
Outflow	A watercourse that releases the water of a lake or pond.
Overburden	The unconsolidated natural layer of sediments that must be penetrated to reach the economic material, i.e., soil that does not contain any material of value to mining companies.
Pond	A wetland with a water level of less than 2 m during the low-water season. It is characterized by the presence of floating or submerged aquatic vegetation as well as emergent vegetation covering at least 25% of the environment's surface area. Temporary ponds, often called vernal or forest pools, are shallow (< 1 m), isolated and usually fed in water by precipitations, melting or the water table. Ponds retain stagnant water in the spring for a period of approximately two months and then dry out during the summer. Given they are not inhabited by fish, they tend to favour species that are adapted to the recurrent flood/drought cycles such as salamanders and certain frog species.
Post-rehabilitation	The period that follows the end of the rehabilitation work planned to return the receiving environment to a satisfactory state for its protection.
Receiving environment	The environment in which the project unfolds and that is likely to be affected by the completion of the project.
Recirculation	Action by which mine wastewater is retrieved to be reused in equipment and processes.
Reference state	The characteristics of an environmental component as they were before the project.
Shoreline	The part of a lake or watercourse that extends from the high-water line to the centre of the body of water.
Special status species	Special status species are plant and animal species at risk according to the MELCCFP, i.e., those that are designated as threatened or vulnerable Québec by virtue of the *Act respecting threatened or vulnerable species* and those that are likely to be designated as such as well as plant and animal species that are at risk in Canada by virtue of the *Species at Risk Act*.
Stockpile	Land where mineral substances, topsoil, concentrates or mine tailings are accumulated.

Surface mineral substances	Peat; sand including silica sand; gravel; limestone; calcite; dolomite; common clay and argillaceous rocks used in the manufacture of clay products; all types of rocks used as dimension stone, crushed stone, silica or mineral in the making of cement; and every mineral substance that is found in its natural state as a loose deposit, except the tilth, as well as inert mine tailings, where such substances and tailings are used for construction purposes, for the manufacture of construction materials, or for the improvement of soils *(chapter I-1, Mining Act).*
Surface or superficial deposits	Unconsolidated sediments (clay, sand, gravel, stones, etc.) of various origins, natures, morphologies and thicknesses that rest on the surface of the bedrock.
Tailings	Solid or liquid substances, with the exception of the final effluent, resulting from the extraction, preparation, enrichment and separation of an economic material, including the sludge and dust resulting from the treatment or purification of mine wastewater or air emissions. Are considered as tailings the slag and sludge, including sewage sludge, released during the treatment by pyrometallurgy, hydrometallurgy or electroextraction. Are also considered as tailings the substances released during the extraction of a marketable substance from tailings and that correspond to those already defined in the first two paragraphs. Are excluded the tailings resulting from the working of a pit within the meaning of the *Regulation respecting pits and quarries* (R.Q., c.Q-2, r.2).
Tallyman	A trapper in charge of supervising other trappers and whose primary responsibility is managing animal populations within the limits of the land for which he is responsible.
Topsoil	Surface soil that is composed of a mix of organic matter as well as sand, silt and clay or a combination thereof and that is conducive to vegetation growth.
Traditional practices (traditional activities)	All of the traditional hunting, fishing, gathering and general activities as well as land and resource use activities for livelihood, ritual and social purposes.
Tributary	A watercourse that flows into a larger watercourse or into a lake (affluent).
Unconsolidated deposits	Unconsolidated matter that covers a deposit or the bedrock.
Waste rock	Rocks that do not contain enough minerals to make them economically viable.
Water table	The underground water table that feeds catchment works. The water table is the first table of groundwater under the soil surface.
Watercourse	Any water mass that flows into a bed at a regular or intermittent rate, including those created or modified by human intervention as well as the St. Lawrence River and the Gulf of St. Lawrence and all seas surrounding Québec.
Watershed	A watershed is a territory, bounded by drainage divides, over which water flows to a single point called an outflow.

1 Introduction

The Shaakichiuwaanaan mining project (the "project") located in northern Quebec, within the Cree territory of Eeyou Istchee, is undergoing a detailed environmental impact assessment, which is described in this report. Further information on the project integration context, the regulatory context, and the rationale for the project is presented in Chapter 2. It should be noted from the outset that this impact assessment, while not applying a formal issues-based approach, takes into account issues that reflect the concerns of stakeholders in the project's context. This aspect will be particularly evident from chapter 7 onwards.

In addition to this introduction, the project impact assessment report consists of 15 chapters, including:

- the context and rationale for the project (Chapter 2);
- the record of communication activities and ongoing stakeholder and community relations approach (Chapter 3);
- a description of the project alternatives considered (Chapter 4);
- a description of the construction and operations of the mining project (Chapter 5);
- a description of the biophysical and socioeconomic components of the area where the project will be carried out (Chapter 6);
- a presentation of the key issues identified based on the main concerns of the project stakeholders (Chapter 7);
- the methodological approach adopted and the analysis of the impacts associated with project activities (Chapter 8);
- the assessment of the project's cumulative impacts (Chapter 9);
- the residual impacts identified in the analysis (Chapter 10);
- the assessment of the project's resilience to anticipated climate change (Chapter 11);
- the assessment of risks and hazards associated with the construction and operations phases of the mining project (Chapter 12);
- a description of the environmental monitoring and follow-up program that will be implemented (Chapter 13);
- a description of the proposed habitat compensation programs (Chapter 14);
- the references cited in this report (Chapter 15).

1.1 About the proponent

1.1.1 Proponent's experience

PMET Resources (PMET) is a mineral exploration company focused on acquiring and developing base metal and critical minerals and strategic mining projects.

In 2023, PMET created a wholly owned Quebec subsidiary, Innova Lithium Inc. (Innova), which is the registered claim owner of the Shaakichiuwaanaan project, the proponent's flagship property located in the Eeyou Istchee James Bay region of Quebec, Canada. PMET is a publicly traded company listed on the Toronto Stock Exchange (TSX: PMET, ASX: PMT, OTCQX PMETF, WB: R9GA), which was incorporated in 2007 under the British Columbia regime (*Business Corporations Act*, S.B.C. 2002, c. 57). The corporation's head office is in Montréal. PMET also has offices in Australia, Chisasibi, and at the exploration camp north of the Shaakichiuwaanaan property.

PMET, which owns 100% of the Shaakichiuwaanaan property, wishes to pursue development of the project, namely a mining complex consisting of an open pit and underground mine workings, for the purpose of extracting spodumene pegmatites containing lithium.

The planned extraction of spodumene from the property at a rate exceeding 5 kt per day is therefore subject to federal and provincial environmental and social impact assessment regimes applicable to the territory covered by the James Bay and Northern Quebec Agreement (JBNQA) (south of the 55th parallel—via the Evaluating Committee [COMEV] and the Review Committee [COMEX]), as well as to the federal impact assessment procedure provided for under the Impact Assessment Act (S.C. 2019, c. 28, s. 1).

A directive has been issued by the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP)[1] for the project (réf. : 3214-14-072; mars 2024 [MELCCFP, 2024]). A directive was also issued by the Impact Assessment Agency of Canada on August 18, 2025 (ref.: 89271; IAAC, 2025)

The contact details of the project initiator and its representative are provided in Table 1-1.

Table 1-1 Contact details for the proponent and its representative

Name of project initiator	PMET Resources (PMET)
NEQ (Quebec Enterprise Number)	1173512535
Civic address	1801 McGill College Avenue, Suite 900 Montréal, Quebec H3A 1Z4
Name and position of representatives	Grace Barrasso, EVP Corporate Affairs **Cathryn Moffett, VP Environment and Permitting**
Phone number	438-334–4968
Email	cmoffett@pmet.ca
Website	www.pmet.ca

1 Formerly the Ministère de l'Environnement du Québec (MENV), the Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP), the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC), and the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC). The acronym MELCCFP will be used to refer to this department throughout the report, regardless of when the documents are published.

1.1.2 Policies, corporate initiatives, and environmental and sustainable development agreements

As part of its activities, PMET considers social, environmental, and ethical responsibility to be of paramount importance. To ensure rigorous and transparent management of its projects, the company has adopted policies and codes of conduct that govern its practices in the following key areas: environment, community relations, health and safety, responsible procurement and supplier conduct, and cultural heritage (available on its website: Lithium Exploration | PMET RESOURCES (www.pmet.ca)). The following sections provide a summary of each policy and code of conduct.

Community Relations Policy

PMET places great importance on the quality of its relationships with the communities that host it. The company is committed to establishing open, ongoing, and respectful dialogue with all stakeholders, whether Indigenous or otherwise, to promote mutual understanding and maximize the positive impacts of its activities.

The community relations policy is designed to consult and inform communities from the earliest stages of projects, respect everyone's rights and expectations, and work together to address concerns that are raised. PMET is committed to avoiding operations on sensitive cultural sites, prioritizing local employment and procurement, and investing in sustainable initiatives that support the social and economic growth of host communities.

The company promotes diversity, equity, and inclusion, both within its teams and in its relationships with partners and communities. It establishes accessible communication mechanisms to gather feedback, handle complaints, and continuously improve its practices. Finally, the policy provides for regular assessment of commitments and results to ensure responsible and transparent management of community relations.

Environmental Policy

PMET's environmental policy applies to all its employees, partners, and sites, at every stage of the project life cycle.

The company is committed to complying with laws and consulting with stakeholders, while developing an organizational culture focused on respect for the environment. It sets clear objectives for reducing emissions and waste, protecting biodiversity, using resources efficiently, and avoiding sensitive areas. Each project undergoes a rigorous assessment of risks and impacts, and mitigation or compensation measures are systematically implemented.

Continuing education, transparent communication, and improved practices are encouraged so that everyone involved can contribute to environmental performance. Lastly, site closure and rehabilitation are carefully planned in consultation with the communities concerned to ensure responsible long-term management.

Health and Safety Policy

PMET considers health and safety top priorities, placing the well-being of its employees, partners, and host communities first. The company prioritizes prevention and is committed to creating healthy and safe work environments where everyone is encouraged to act responsibly and report any situations that pose a risk.

The policy provides for compliance with laws and the establishment of clear objectives to continuously improve health and safety performance. Risks are identified and assessed at each project stage, and mitigation measures are systematically applied. PMET ensures that all workers receive the necessary training and tools, while promoting communication and the reporting of concerns.

Lastly, the company ensures that its practices are regularly reviewed and adapted to guarantee a work environment where safety takes precedence over all other considerations.

Responsible Procurement Policy

PMET takes a responsible approach to procurement aimed at generating sustainable and positive economic benefits for host communities. The company ensures compliance with laws, labour and human rights, and its ethical commitments, while incorporating health, safety, environmental, and governance criteria into its purchasing decisions.

The policy encourages the development of strong relationships with suppliers, the promotion of local purchasing, and equitable access to opportunities for businesses owned by Indigenous people, women, or underrepresented groups. PMET ensures that its needs and requirements are clearly communicated, that risks are identified and managed, and that goods and services are obtained in a secure, ethical manner that complies with industry best practices.

The company promotes transparency, a culture of listening, and continuous improvement by providing communication channels to hear the concerns and suggestions of all stakeholders. This approach aims to maintain a culture of integrity and accountability at every stage of the supply chain.

Internal Code of Conduct

PMET's Internal Code of Conduct sets out the ethical and professional principles that all employees, officers, directors, consultants, and contractors acting on behalf of the company must follow. The code requires, among other things, compliance with internal policies, responsible performance of duties, and transparent reporting of any misconduct or observed deviations.

The document emphasizes the importance of maintaining exemplary behaviour, free from conflicts of interest, corruption, or misuse of company resources. It governs the management of confidential information, the acceptance of gifts or invitations, and the use of corporate assets. PMET also imposes requirements related to health, safety, and respect in the workplace: all forms of discrimination, harassment, or unfair treatment are prohibited, and everyone is expected to contribute actively to maintaining a safe, inclusive, and professional environment.

Supplier Code of Conduct

PMET expects its suppliers to share its ethical values, sense of accountability, and respect for the law. The Supplier Code of Conduct sets clear standards: it requires compliance with laws, integrity in business, prevention of corruption, and protection of confidential information. Suppliers must also comply with company policies, particularly those relating to ethics, health and safety, human resources, and the environment.

The code emphasizes the importance of ensuring healthy, safe, and inclusive workplaces, eliminating all forms of discrimination or harassment, and promoting diversity and equity. It prohibits forced labour and child labour, and ensures the protection of workers' fundamental rights.

Suppliers are also required to treat host communities with respect, promote local employment and responsible procurement, and collaborate with the company to improve social and environmental practices. Lastly, they must proactively manage risks, document their actions, and demonstrate transparency, or risk having their business relationship reassessed in the event of non-compliance.

1.2 Consultant mandated by the project initiator

The consultant mandated by the project initiator to coordinate and prepare the documents required for this environmental impact assessment process is WSP Canada Inc., whose information is presented in Table 1-2.

Table 1-2 Information on the mandated consultant

Name	WSP Canada Inc.
Civic address	**Head Office** 1600 René-Lévesque Boulevard West, 11th Floor Montréal, Quebec H3H 1P9 **Project Coordination Office** 1135 Lebourgneuf Boulevard Québec, Quebec G2K 0M5
Mailing address (if different from civic address)	n/a
Phone number	1-581-814-5976
Phone number (other)	n/a
Email:	marie-helene.brisson@wsp.com
Description of the mandate	Coordination and preparation of documents required as part of the environmental and social assessment process

The other consulting firms supporting WSP in its mandate are:

- **Nigaan Synergi**s — Field studies: small mammals, herpetofauna, avifauna, ichthyofauna and benthos, surface water and sediments, characterization of mercury and other metals in fish flesh, and offsetting plan for loss of fish habitat.
- **BBA Inc.** — Hydrogeological studies, groundwater background levels, analysis of alternatives
- **AtkinsRéalis** — Feasibility study, geotechnical analyses, study of water quality at the mine effluent and plant, dilution study
- **G Mining Services Inc**. — Project engineering
- **Vision Geochemistry** — Geochemical characterization of mining materials
- **Emphase environnement** — Phase I Environmental Site Assessment (ESA)
- **GCM Consultants Inc.** — Rehabilitation and restoration plan
- **Archéoconsultant** — Archaeological survey
- **Mailloux Hydrogéologie Inc.** — Hydrogeological modelling of the pit and underground mine

2 Project context and rationale

2.1 Context of project integration

2.1.1 Location

The Shaakichiuwaanaan mining project (the "project") is located in Quebec in the administrative region of Nord-du-Québec (region10), which is divided into two territories: Eeyou Istchee James Bay, where Category III lands are administered by the Eeyou Istchee James Bay Regional Government, and Nunavik, where regional services are coordinated by the Kativik Regional Government. Located north of the 49th parallel, entirely within the Canadian Shield, the region covers just over half of Quebec's total area and is the province's largest administrative region, covering 860,553 km² (MAMH, 2023).

More specifically, the project is located in the territory of the Eeyou Istchee James Bay Regional Government (EIJBRG), which replaced the Municipality of Baie-James in 2014. It is the only regional government in Quebec. This territory, located between the 49th and 55th parallels, corresponds to Category III lands under the James Bay and Northern Quebec Agreement (JBNQA), where the Cree have exclusive rights to trap fur-bearing animals and fish certain species. The EIJBRG exercises the powers, functions, and authorities conferred on a regional county municipality.

The project's local study area is located 220 km east of the town of Radisson and touches on the traditional territory of three Cree communities: Chisasibi (whose village is located 330 km to the west), Wemindji (330 km to the southwest), and Mistissini (350 km to the south). The geographic coordinates at the centre of the mine site are:

- Latitude: 53° 32′00″ N
- Longitude: 73° 55′00″W

The regional study area, which is crossed by the Trans-Taiga Road and the Billy-Diamond Highway, includes, in addition to the territories mentioned above, notably the territories of the Cree communities of Eastmain, Waskaganish, Nemaska, and Waswanipi, as well as the municipality of Matagami.

2.1.2 Brief overview of the project

The project has as its goal to mine a deposit of spodumene pegmatites (lithium). In 2023, PMET Resources Inc. (PMET) created a wholly owned Quebec subsidiary, Innova Lithium Inc. (Innova), which is the registered exclusive exploration rights holder of the Shaakichiuwaanaan project, PMET's flagship property located in the Eeyou Istchee James Bay region of Quebec, Canada.

PMET's primary objective is to mine its CV5 deposit on the Shaakichiuwaanaan property (the current project). The Shaakichiuwaanaan property hosts numerous other spodumene pegmatites, and PMET believes it has the potential to become the next lithium district in North America.

Spodumene mining at the Shaakichiuwaanaan property will be carried out using a hybrid mining method (open pit and underground mining).

The expected life of the mine is 21 years, including construction, development, the pre-production period, and the commercial production period. At full production, the underground mine is expected to reach a maximum extraction rate of 5,500 tons of ore per day.

A total of 84.3 million tons (Mt) of ore are expected to be mined over the life of the mine. The lithium concentrate produced will have a grade of 5.50% Li_2O, with a Li_2O recovery rate of 68.9%. The dense media separation (DMS) plant will have a nominal processing capacity of 5.1 million tons per year (Mtpa) at maximum throughput.

A total of 155.2 Mt of waste rock, including overburden, leachable waste rock, and low-risk waste rock (non-leachable), as well as 14.0 Mt of overburden and 3.2 Mt of organic material will be stored in the stockpiles and pit.

The storage of tailings and waste rock will mainly take place in two stockpiles. Stockpile 01, located northwest of the plant, will be used exclusively for the storage of low-risk waste rock due to its proximity to the open pit. It will hold approximately 43.5 Mt of non-leachable waste rock, while the remainder (29.6 Mt) will be deposited in the pit once extraction is complete. Stockpile 02, located northeast of the plant, will be used for the co-disposal of leachable waste rock (81.0 Mt) and tailings. It will be fully equipped with a sealed membrane to prevent any risk of contamination. Tailings will be deposited separately from waste rock storage. Lastly, overburden (14.0 Mt) and organic matter (3.2 Mt) will be stored in their respective stockpiles, notably Stockpiles 04 and 05, which will receive material from the excavation of the pit.

Spodumene concentration will be carried out at the mine site. The main treatment processes will be as follows:

- crushing circuit (primary, secondary, and tertiary crushing);
- stack storage for crushed material supply;
- dense media separation (coarse, fine, and re-crushed);
- magnetic separation and handling of the final product;
- drying of fine and intermediate particulate matter, and handling;
- tailings management.

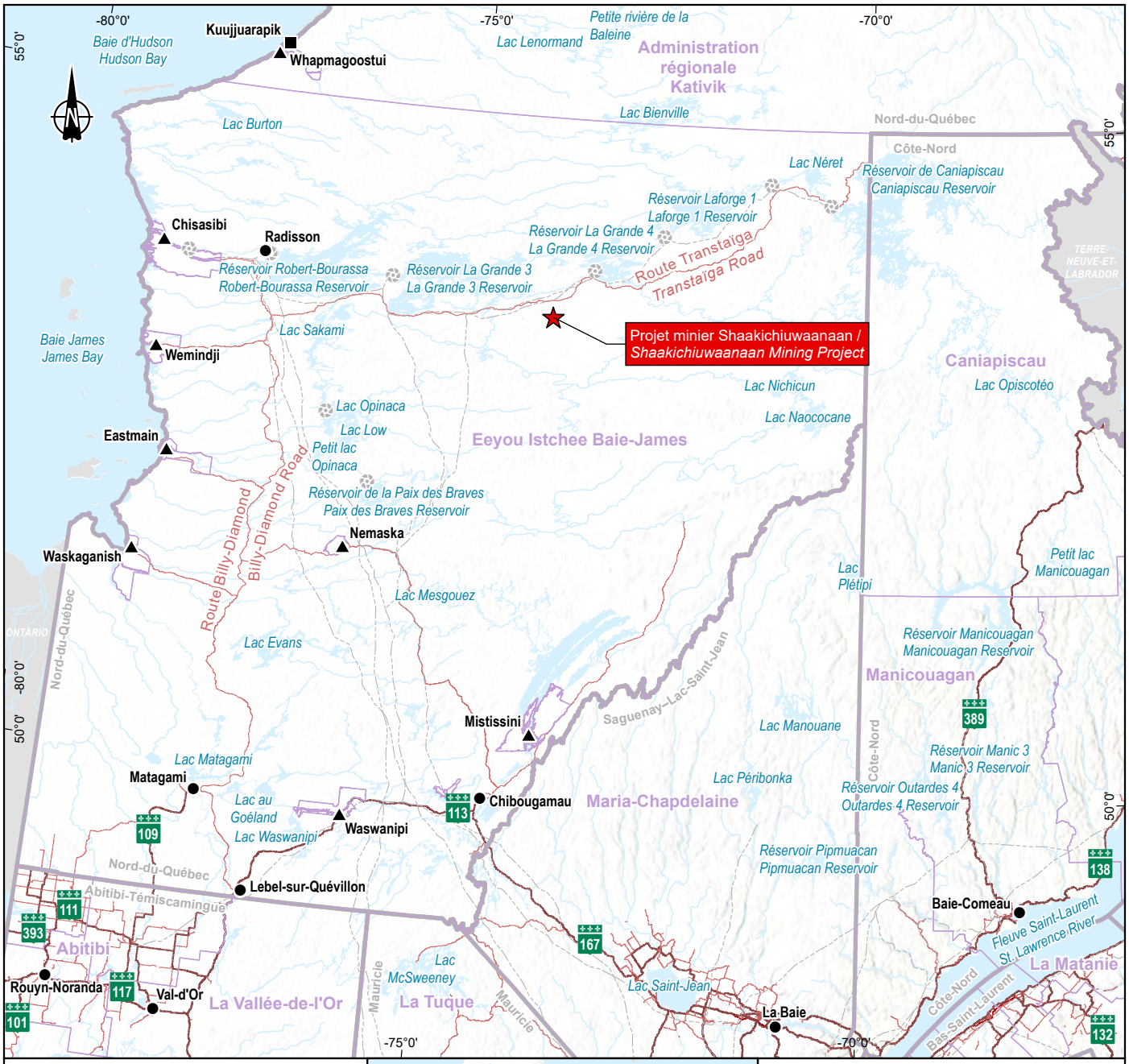
A fleet of trucks will transport the concentrate via the Trans-Taiga Road and Billy-Diamond Highway to the Matagami transshipment yard. The construction of new infrastructure by the Town of Matagami will be required to load the concentrate onto train cars. The product will then be transported by train to the port of Grande-Anse via railroad.

The mining complex will consist of various types of infrastructure (Map 2-1), including:

- an access road to the mining site from the Trans-Taiga Road (existing infrastructure);
- roads and culverts to enable the movement of mining equipment during mine operations;
- a workers' camp during the construction and operations phases of the mine;
- a pit and underground mine workings for mining the CV5 deposit;
- dikes to isolate the CV5 deposit mining pit from Lake L01, which partially covers it;

- storage areas for waste rock, tailings, overburden, and organic material;
- an ore storage area;
- a power supply line;
- an electrical substation and an electrical distribution network;
- an ore processing plant;
- a water treatment plant;
- an emulsion explosives storage area;
- a garage and other auxiliary buildings;
- a fuel storage area and a refuelling station.

After the deposit has been mined, restoration and rehabilitation measures will be implemented to restore the original ecosystem or create a new sustainable ecosystem that is as similar as possible to the original state.



Repères géographiques / *Geographical Landmarks*

- Communauté crie (zone d'étude régionale) / *Cree community (regional study area)*
- Village inuit / *Inuit village*
- Municipalité / *Municipality*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Autoroute / *Highway*
- Route nationale ou régionale / *National or regional road*
- Autre / *Other*

Limites / *Boundaries*

- Région administrative / *Administrative Region*
- Municipalité régionale de comté (MRC) et Territoires autochtones / *Regional County Municipality (RCM) and First Nations Territories*



Projet minier Shaakichiuwaanaan /
Shaakichiuwaanaan Mining Project

Étude d'impact sur l'environnement /
Environmental Impact Assessment

Carte 2-1 / *Map 2-1*
Localisation du projet minier Shaakichiuwaanaan / *Location of the Shaakichiuwaanaan Mining Project*

Sources :
SDA, 1/20 000, MRNF, 2024-02
Canvec, 1/250 000, 1/5 000 000 et 1/15 000 000, RNCan, 2019
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/5 000 000, MRNF Québec, 2010
AQréseau+, réseau routier, MERN, 2024-03-01
RNCan, Frontières géopolitiques, 2002

0 50 100 km

NAD 1983 Quebec Lambert

2026-02-05

Préparation / Preparation : M.-H. Brisson
Dessin / Drawing : J. Roy
Approbation / Approval : M.-H. Brisson
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CA0001724_3318_eie_c02_1_084_loc_projet_260218

La précision des limites et les mesures montrées sur ce document ne doivent pas servir à des fins d'ingénierie ou de délimitation foncière. Aucune analyse foncière n'a été effectuée par un arpenteur-géomètre. / Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.

2.1.3 History of mining and exploration activities

From 1950 to 1997, exploration work on the property focused on the search for base metals and precious metals. This work led to the discovery of several copper, gold, and silver deposits.

In 1997, Virginia Gold Mines Inc. acquired a large property that overlaps PMET's current property. Until the 2000s, it acquired various data (through geophysical and mapping surveys) and carried out prospecting. Numerous indications of base metals and precious metals were discovered during this period, including gold, copper, and zinc. From 2001 to 2013, this company carried out drilling on its property.

In 2016, PMET (then known as 92 Resources Inc.) acquired its first exclusive exploration rights in the region due to the presence of spodumene crystals in the pegmatite, which had been noted during an exploration program conducted by Virginia Gold Mines Inc. in 2006. More specifically, the description of the mineral indicated a lithium pegmatite. Since the acquisition, PMET has carried out various surface exploration programs (focused on lithium pegmatite, with secondary interest in base and precious metals) that have resulted in the discovery of multiple copper, gold, silver, lithium, tantalum, and cesium showings across the property. Drilling by PMET commenced in 2021, targeting the main lithium pegmatite showings. This work has identified significant and promising deposits of CV5 and CV13 pegmatites, thereby enabling the mine to begin operations.

2.1.4 Mining rights and land ownership

The Shaakichiuwaanaan property contains 463 exclusive exploration rights (EERs) held by PMET covering an area of approximately 23,710 ha. Most of them form an almost continuous group stretching approximately 51 km from east to west. The other EERs are located near the Trans-Taiga Road. The CV5 pegmatite deposit is located in the centre of the property, approximately 13 km south of KM 270 on the Trans-Taiga Road (Map 2-1).

PMET also holds a lease from the Ministère des Ressources Naturelles et Forêts (MRNF) on an area south of KM 270 of the Trans-Taiga Road, where its exploration camp and core library are located.

2.2 Regulatory context

The project is located within the James Bay Agreement territory and, as such, is subject to the impact assessment and review regime provided for in the JBNQA. It will also require authorizations from provincial and federal authorities, in accordance with applicable laws and regulations. The following sections provide an overview of the main legislative and regulatory frameworks applicable to the project.

2.2.1 Quebec

2.2.1.1 Environmental Quality Act (R.S.Q. c. Q-2.

In accordance with Chapter XXII of the JBNQA, incorporated into Title II of the Environment Quality Act (EQA), the procedure for assessing and reviewing environmental and social impacts applicable in the James Bay region - James region is governed by sections 133 to 167 of the EQA and regulated by the Regulation respecting environmental and social impact assessment and review in the James Bay and Northern Québec territory (Q-2, r. 25). The purpose of this regime is to minimize the adverse effects of development on the Indigenous population and wildlife resources in the territory, as provided for in paragraph 22.2.2(b) of the JBNQA.

Under Schedule A of the Environment Quality Act (EQA), any mining project — including the expansion, processing, or modification of an existing mining operation — is mandatorily subject to this impact assessment and review procedure.

The environmental and social assessment of projects under Quebec jurisdiction located in the James Bay region is the responsibility of the Environmental and Social Impact Evaluating Committee (Evaluating Committee or COMEV) and the Environmental and Social Impact Review Committee (Review Committee or COMEX). COMEV first considers the scope and obligation of a project's impact assessment. COMEX then takes over upon receipt of the impact assessment until the end of the process, including changes to the project authorized during construction or operations and follow-up reports produced by the initiators.

At the end of the COMEX assessment process, the authorization certificate provided for in section 154 of the EQA is issued by the Minister of the Environment, Climate Change, Wildlife, and Parks (MELCCFP). Any activity arising from the project is subject to ministerial authorization under section 22 of the EQA, or a declaration of compliance, or exemption, as provided for in the Regulation of activities based on their impact on the environment (Q-2, r. 17.1) (REAFIE).

2.2.1.2 Directive 019 on the Mining Industry

Directive 019 (D019) is the analytical framework used by the MELCCFP when receiving applications for ministerial authorizations of mining projects. It presents the environmental guidelines and basic requirements for the different types of mining activities so that environmental deterioration can be prevented. It also provided PMET with the information required to prepare the impact assessment. D019 is therefore a guideline that specifies MELCCFP's expectations regarding main mining activities.

Its update in 2025 aims to ensure alignment with:

- the Regulation applying to activities on the basis of their environmental impact (REAFIE), which sets out the activities requiring ministerial authorization and the information and documents required to submit such an application;
- the Ministère's expectations regarding the characterization of tailings, as defined in the *Guide de caractérisation des résidus miniers et du minerai* [Tailings and ore characterization guide];

- the Government of Canada's *Metal and Diamond Mine Effluent Regulations* (MDMER) with respect to final effluent discharge standards.

In addition, the latest version of Directive 019 clarifies elements already present in the previous version and adds or modifies certain requirements relating, in particular, to:

- factoring in the expected effects of climate change in the design of mining infrastructure;
- monitoring at the final effluent discharge point;
- groundwater protection;
- the environmental management of explosives;
- management of tailings and stability of mining infrastructure;
- technical information to be provided in an authorization request.

2.2.1.3 Mining Act (R.S.Q., c. M-13.1)

Quebec's *Mining Act* and *Mining Regulation* (CQLR, c. M-13.1, r. 2) determines how mines are to be developed, operated, and closed. They define the conditions for obtaining a mining lease issued by the Ministère des Ressources naturelles et des Forêts (MRNF)[1], which is required for the operation of a mine. This lease has an initial term of 20 years and is renewable up to three times for periods of 10 years. To obtain a mining lease, companies must develop a site restoration and redevelopment plan to be submitted to the MRNF for approval. This plan will then have to be reviewed every five years, or when there are changes in the mining activities that justify the amendment. In the two years following the approval of the site restoration plan, a financial guarantee covering all anticipated costs must be paid to the MRNF.

The *Mining Act* also provides a framework for the granting of exclusive leases for the mining of surface mineral substances (EML), which may be issued for the extraction of sand, gravel, or other surface mineral substances (peat, stone, etc.) for the operation of quarries and sandpits, as well as for the granting of mining claims for mineral exploration.

2.2.1.4 Act respecting occupational health and safety (R.S.Q., c. S-2.1)

The main health and safety legislation in Quebec is the *Act respecting occupational health and safety*, with which the Project must comply. Several regulations, such as the *Regulation respecting occupational health and safety in mines* (R.R.Q., c. S-2.1, r. 14) and the *Regulation respecting occupational health and safety* (R.R.Q., c. S-2.1, r. 13), also apply.

1 Formerly the Ministère de l'Énergie et des Ressources naturelles (MERN) and the Ministère des Forêts, de la Faune et des Parcs (MFFP). The acronym MRNF will be used to refer to this department throughout the report, regardless of when the documents are published.

2.2.1.5 Guidelines for the management of environmental noise

These guidelines establish the requirements applicable to any person who may emit noise pollution into the environment in excess of the present criteria and who is subject to the Environmental Quality Act (EQA). They replace Instruction Note 98-01 entitled “Handling Noise Complaints and Requirements for Businesses that Generate Noise” (IN 98-01) while maintaining its objective.

2.2.1.6 Other applicable regulations

In addition, the following regulations will apply:

- *Sustainable Forest Development Act* (CQLR, c. A-18-1):
  - *Regulation respecting the sustainable development of forests in the domain of the State* (CQLR, c. A-18.1, r. 0.01);
- *Act respecting the lands in the domain of the State* (CQLR, c. T-8.1);
- *Watercourses Act* (CQLR, c. R-13):
  - *Regulation respecting the water property in the domain of the State* (CQLR, c. R-13, r. 1);
- *Dam Safety Act* (CQLR, c. S-3.1.01):
  - *Dam Safety Regulation* (CQLR, c. S-3.1.01, r. 1);
- *Act respecting threatened or vulnerable species* (CQLR. c. E-12.01):
  - *Regulation respecting threatened or vulnerable wildlife species and their habitats* (CQLR, c. E-12.01, r. 2);
  - *Regulation respecting threatened or vulnerable plant species and their habitats* (CQLR, c. E-12.01, r. 3);
- *Act respecting the conservation and development of wildlife* (CQLR, c. C-61.1):
  - *Regulation respecting wildlife habitats (*CQLR, c. C-61.1, r. 18);
- *Cultural Heritage Act* (CQLR, c. P-9.002);
- *Building Act* (CQLR, c. B-1.1):
  - *Construction Code* (CQLR, c. B-1.1, r. 2);
  - *Safety Code* (CQLR, c. B-1.1, r. 3);
- *Act respecting explosives* (CQLR, c. E-22):
  - Regulation under the *Act respecting explosives* (CQLR, c. E-22. r. 1);
- *Highway Safety Code* (CQLR, c. C-24.2):
  - *Transportation of Dangerous Substances Regulation* (CQLR, c. C-24.2, r. 43);
- Regulations under the *Environment Quality Act*:
  - *Regulation respecting activities in wetlands, bodies of water and sensitive areas* (CQLR, c. Q-2, r. 0.1);
  - *Clean Air Regulation* (CQLR, c. Q-2, r. 4.1);
  - *Regulation respecting pits and quarries* (CQLR, c. Q-2, r. 7.1);
  - *Regulation respecting compensation for adverse effects on wetlands and bodies of water* (CQLR, c. Q-2, r. 9.1);

- *Regulation respecting biomedical waste* (CQLR, c. Q-2, r. 12);
- *Regulation respecting the declaration of water withdrawals* (CQLR, c. Q-2, r. 14);
- *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere* (CQLR, Q-2, r. 15);
- *Regulation respecting the regulatory scheme applying to activities on the basis of their environmental impact* (CQLR, c. Q-2, r. 17.1);
- *Regulation respecting the burial of contaminated soil* (CQLR, c. Q-2, r. 18);
- *Regulation respecting the landfilling and incineration of residual materials* (CQLR, c. Q-2, r. 19);
- *Regulation respecting waste water disposal systems for isolated dwellings* (CQLR, c. Q-2, r. 22);
- *Regulation respecting the operation of industrial establishments* (CQLR, c.Q-2, r. 26.1);
- *Snow, road salt and abrasives management Regulation* (CQLR, c. Q-2, r. 28.2);
- *Regulation respecting halocarbons* (CQLR, c. Q-2, r. 29);
- *Regulation respecting hazardous materials* (CQLR, c. Q-2, r. 32);
- *Water Withdrawal and Protection Regulation* (CQLR, c. Q-2, r. 35.2);
- *Land Protection and Rehabilitation Regulation* (CQLR, c. Q-2, r. 37);
- *Regulation respecting the quality of the atmosphere* (CQLR, c. Q-2, r. 38);
- *Regulation respecting the quality of drinking water* (CQLR, c. Q-2, r. 40);
- *Regulation respecting the charges payable for the use of water* (CQLR, c. Q-2, r. 42.1);
- *Regulation respecting the traceability of excavated contaminated soil* (CQLR, c. Q-2, r. 47.01);

— *Lignes directrices relatives à la valorisation des résidus miniers* [Tailings reclamation guidelines] (MDDELCC, 2015);

— *Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec* [Guidelines for preparing mine closure plans in Quebec] (MRNF, 2024);

— *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés* [Intervention guide – Soil protection and rehabilitation of contaminated sites] (MELCC, 2021);

— *Guide de caractérisation des résidus miniers et du minerai* [Tailings and ore characterization guide] (MELCC, 2020).

2.2.1.7 Procedure

As indicated in section 2.2.1.1, since the project is subject to the environmental and social impact assessment and review procedure set out in Title II of the EQA, its progress follows the steps established by this regime. The following summarizes the main steps already completed or to come for this project.

The Quebec environmental assessment procedure that applies to the project is a five-step process, some of which has already been completed, namely:

1. Project initiator's statement:

- Notice of intent including preliminary project information submitted on November 27, 2025.

2. Evaluation:

- COMEV forwarded its recommendation for a directive, specifying the scope of the impact assessment, to the Administrator, who then forwarded it to the initiator.
- The directive for the PMET project (file 3214-14-072) was received in March 2024.

3. Preparation of the impact assessment by the project initiator.
4. Review:
    - Submission of the impact assessment to the Administrator, who forwards it to COMEX.
    - Indigenous governments and the public may make representations to COMEX, which may also hold public hearings or other forms of consultation.
5. Decision:
    - After considering the COMEX recommendation, the Administrator decides whether or not to authorize the project. If the Administrator cannot accept the COMEX recommendation, the Administrator must consult with COMEX before making a final decision and informing the project initiator. The final decision is also forwarded to the relevant First Nations administrations. In addition, sectoral authorizations (e.g., for quarries and sand pits, water and sewer networks, and campsites) must be issued under the various provisions of Chapter I of the EQA.
    - The EQA provides for different timeframes, ranging from 30 to 90 days, for each step of the process. However, the duration of these steps may be extended, if necessary, by the Administrator.

2.2.2 Canada

The *Impact Assessment Act* (IAA) (S.C., 2019, c. 28, s. 1) and its regulations provide the legislative basis for federal environmental assessment practice in most parts of Canada.

The IAA (2019) applies to projects designated by the *Physical Activities Regulations*. It also provides for the Minister of the Environment to designate a project when the Minister considers that its implementation could cause adverse environmental effects or give rise to public concern.

On June 20, 2024, the *Budget Implementation Act* (2024) received Royal Assent, bringing the amendments to the IAA into force. These amendments were made in response to the Supreme Court of Canada's decision on the constitutionality of the IAA. Transitional provision 305 of the Budget Implementation Act, 2024, No. 1 describes the steps by which the Impact Assessment Agency of Canada (IAAC) or the Minister will bring designated projects under the amended IAA.

According to section 18(c) of the Physical Activities Regulations, the construction and operation of a new metal mill, other than a uranium mill, with an ore input capacity of 5,000 t/day or more are subject to the federal impact assessment process.

Section 18(d) of the same regulations provides a similar provision for any new metal mine other than a rare earth element mine, placer mine or uranium mine, with an ore production capacity of 5,000 t/day or more.

The project exceeds this threshold and is therefore subject to this procedure.

On May 22, 2025, PMET received notice from the IAAC determining that an impact assessment was required for the project.

A *Fisheries Act* authorization will be required from Fisheries and Oceans Canada (DFO) for the indirect effects of the project on fish habitat.

Also, the *Canadian Navigable Waters Act* will apply as navigable water bodies within the meaning of the Act will be indirectly affected by the construction of the mining infrastructure.

Lastly, various laws and regulations may need to be applied to the project, including:

- *Canadian Environmental Protection Act* (S.C. 1999, c. 33):
  - *Environmental Emergency Regulations (*SOR/2019-51);
  - *PCB Regulations (*SOR/2008-273);
  - *Federal Halocarbon Regulations (*SOR/2022-110);
- *Species at Risk Act* (S.C. 2002, c. 29);
- *Canada Wildlife Act* (R.S.C. 1985, c. W-9);
- *Explosives Act* (R.S.C., c. E-17);
- *Hazardous Products Act* (R.S.C. 1985, c. H-3);
- *Transportation of Dangerous Goods Act, 1992* (S.C. 1992, c. 34):
  - *Transportation of Dangerous Goods Regulations (*SOR/2001-286);
- *Nuclear Safety and Control Act* (S.C. 1997, c. 9):
  - *General Nuclear Safety and Control Regulations* (SOR/2000-202);
  - *Nuclear Substances and Radiation Devices Regulations* (SOR/2000-207);
- *Metal Mining and Diamond Mining Effluent Regulations* (SOR/2002-222);
- *Migratory Birds Regulations (*SOR/2022-105).

2.2.3 James Bay and Northern Quebec Agreement

The James Bay and Northern Quebec Agreement (JBNQA), signed in 1975 between the governments of Quebec and Canada, the Grand Council of the Crees, and the Association of Inuit of New Quebec, establishes the territorial, political, and administrative framework applicable to the territory of Eeyou Istchee James Bay. It divides the territory into Category I, II, and III lands, each with specific rights regarding use, hunting, fishing, and resource management. The project is located on Category III lands, where mining rights belong to the Government of Quebec.

Chapter 22 of the JBNQA establishes the environmental and social protection regime applicable to development projects located in this territory. It provides for the creation of committees responsible for the impact assessment and review process: the Assessment Committee (COMEV), the Review Committee (COMEX) and, when federal jurisdiction is involved, the Federal Review Committee (COFEX). These bodies operate in accordance with Title II of the EQA and Regulation Q 2, r. 25.

The Eeyou Istchee James Bay Regional Government (EIJBRG) and the James Bay Development Corporation (JBDC) also play a role in land management and development, particularly with regard to the issuance of certain sectoral authorizations under the James Bay Development Act.

Table 2-1 Specific rights according to land category

Category	Specific rights
Category I lands	For Cree use only. They may be used for residential, community, commercial, industrial, or other purposes. In addition, the Cree have exclusive hunting, fishing, and trapping rights on these lands.
Category II lands	Contiguous to Category I lands. They are part of the Quebec public domain. These are lands where the Cree have exclusive hunting, fishing, and trapping rights.
Category III lands	Represent all treaty lands not included in Category I and II lands. On these lands, the Cree have exclusive rights to trap fur-bearing animals. In addition, certain wildlife species are reserved for their hunting and fishing activities. On these lands, hunting and fishing are permitted for both First Nations and non-First Nations people who may, subject to the principle of conservation, pursue their traditional activities throughout the year. On Category III lands, the mineral rights belong to the provincial government. **The Project is located north of the 49th parallel in the Nord-du-Québec administrative region, on Category III lands in the Eeyou Istchee James Bay Territory.**

2.2.4 Municipal

The project must also comply with the regulations applicable in the James Bay region, particularly the *Act respecting land use planning and development* (chapter A-19.1). On Category III lands in the Eeyou Istchee James Bay territory, the Eeyou Istchee James Bay Regional Government (EIJBRG) exercises municipal responsibilities and may adopt urban planning and nuisance regulations applicable to the project, including:

- *Zoning By-law* (No. 213);
- *Nuisance By-law* (No. 149);
- *By-law relating to peace and order in public and private places* (No. 148).

PMET will file applications for authorizations and permits for the construction and operation of the project with the Eeyou Istchee James Bay Regional Government, in accordance with applicable regional regulations.

2.2.5 Permits and authorizations

The permits and authorizations required from the Eeyou Istchee James Bay Regional Government are:

- Permit - Construction - Main building
- Permit - Construction - Additional building
- Certificate of authorization for soil excavation, cutting/filling, and topsoil removal
- Certificate of authorization for tree planting and cutting for non-commercial purposes
- Certificate of authorization for work and structures on the banks and shores of lakes and watercourses

2.3 Project rationale

2.3.1 Purpose of the project

2.3.1.1 Project objective

According to the feasibility study conducted by a team of qualified professionals and managed by G Mining, hereafter referenced as G Mining Services (2025), the project's deposit is the largest lithium pegmatite resource in the Americas and ranks among the top ten globally. Spodumene, a lithium and aluminum silicate, is the main lithium mineral found in pegmatites.

The project's objective is to mine this deposit to produce a spodumene concentrate, an essential component of lithium-ion batteries. These batteries are indispensable to the energy transition, particularly for electric vehicles (EVs) and energy storage systems, as well as for various clean technologies.

The project's probable reserves are estimated at 84.3 Mt with an average grade of 1.26% Li_2O, representing approximately 2.62 Mt of lithium carbonate equivalent. The mine will be in production for 19 years, with a estimated production rate of 5,500 tonnes per day, totalling approximately 2 Mt per year (G Mining Services, 2025).

2.3.1.2 Critical minerals and lithium market

In October 2020, the Government of Quebec launched the Quebec Plan for the Development of Critical and Strategic Minerals 2020–2025 (Government of Quebec, 2020), which stems from the government's desire to promote prosperity in Quebec's regions and the transition to a low-carbon economy. Similarly, in March 2024, Natural Resources Canada published an update to Canada's Critical Minerals List (NRCan, 2024). This list identifies 34 minerals deemed essential to the sustainable economic success of Canada and its allies—minerals that can be produced in Canada, are essential to domestic industry and security, and have the potential to support secure and resilient supply chains to meet global demand. Both lists identify lithium as essential to technologies that reduce greenhouse gas emissions.

According to G Mining Services (2025), electric vehicle production will account for nearly a quarter of total sales in 2025 and reach 42% by 2030. The market for battery energy storage systems is also growing rapidly. By 2040, global demand for lithium is expected to increase from 1.1 Mt to 5.6 Mt of lithium carbonate equivalent (LCE). Global supply is expected to keep pace with demand until 2030, but annual deficits are anticipated thereafter, leading to higher prices.

Given the size of the deposit, its high grade, and the strong demand forecast, the project is well positioned to contribute to the global market needs and become a strategic partner in the development of Quebec's battery industry.

2.3.1.3 Economic impacts

The mining industry is a major economic player in Quebec. In 2022, the mining industry accounted for 15,594 direct jobs in Quebec, according to the Quebec Mining Association (QMA). If indirect and induced jobs are included, the total reaches 51,334 jobs.

The Quebec mining ecosystem includes 3,847 supplier companies with head offices in Quebec, including several SMEs (QMA). In its 2020 update of the economic impact of the mining industry in Quebec, the QMA estimated that the turnover of Quebec mining companies totalled $12.5 billion including investments (EcoTec Consultants, 2024). The mining industry generates an estimated 55,570 person-years of employment in Canada, the vast majority of which is in Quebec (76.5%). The gross domestic product (GDP) generated in Quebec by this industry is estimated at $12 billion. More specifically in Nord-du-Québec, the $1.1 billion GDP generated by the mining industry corresponds to 18.1% of the region's total GDP. That represents 1,287 person-years of employment in the mining industry in Nord-du-Québec in 2022. In terms of tax and quasi-tax revenues, mining companies have contributed $1.9 billion to the Government of Quebec and $735.5 million to the Government of Canada through taxes, mining duties, and quasi-taxes in 2022 alone.

According to the feasibility study conducted by G Mining Services (2025), the total capital required to construct the project is estimated at $1,978 million, operating costs total approximately $9,664 million, and reclamation and closure costs are estimated at approximately $248.4 million.

The project is part of the government's commitment to responsibly develop Quebec's mineral resources to stimulate employment and support economic prosperity. It will generate significant benefits for local communities, particularly in Cree and Jamesian communities, as well as for the region, by promoting job creation and economic activity. On a larger scale, the project will contribute to the sustainable development of northern Quebec and generate significant economic benefits for the entire province. The detailed economic benefits can be found in the economic impact study presented in Appendix 5-13.

During the construction and operations phases, positive impacts will be created for local communities through business opportunities and direct and indirect jobs.

Economic, technical, social, and environmental opportunities and constraints

The project benefits from a favourable economic climate, marked by strong global demand for lithium, which is essential to the energy transition and the battery industry. This situation significantly reduces the risk of the project being abandoned, as the current market offers prospects for sustained growth in the medium and long term.

From a technical standpoint, the confirmed presence of high-grade resources and the integration of combined pit and underground mining operations are major advantages. However, certain constraints remain, particularly the northern climate and the availability of skilled labour. From a social perspective, the project offers significant opportunities to the Cree and Jamesian communities, with commitments to employment and training, but it requires ongoing dialogue to address cultural and territorial concerns. Finally, from an environmental perspective, the sensitivity of ecosystems requires rigorous measures for managing water, waste rock, and tailings, which are integrated into the project design.

Compared to other lithium projects that have been approved in the region but have yet to be developed, this project stands out due to the advanced stage of its work, the well-defined geological continuity of the CV zone, and the robustness of its resources, which are characterized by several high-grade pegmatites.

In addition, PMET's ongoing engagement with the Cree Nation of Chisasibi and the Jamesian communities is a key factor in promoting social acceptability and limiting the risk of delays or interruptions, an issue that has affected other regional projects.

In summary, the combination of production volume, mineral grade, a simple DMS ore processing method, the ore's crystal size, and the support of a major financial partner gives the project a significantly higher probability of successful completion.

Events that may cause a slowdown or temporary halt in operations

External factors that could cause a slowdown or temporary halt in operations include significant decreases in the price of lithium, major technical problems, or extreme weather events. The availability of the required energy block from Hydro-Québec remains a critical factor; without the necessary power supply, the project design will need to be revised. Delays in obtaining regulatory approvals or issues related to social acceptability could also influence the work schedule, although consultation and compliance measures are planned to reduce the likelihood of this occurring.

2.3.2 Alignment with policies, government guidelines, and local agreements

2.3.2.1 Section 22 of the James Bay and Northern Quebec Agreement (JBNQA)

The James Bay and Northern Quebec Agreement (JBNQA) is an agreement signed in 1975 by the Grand Council of the Crees of Quebec, the Northern Quebec Inuit Association, the Government of Quebec, the Government of Canada, Hydro-Québec, and the James Bay Energy Corporation. Section 22 of this agreement, which applies to the Eeyou Istchee James Bay Territory south of the 55th parallel, establishes an environmental and social protection regime. It is aimed at reducing the impact of development on the territory and protects Cree hunting, fishing, and trapping rights. Among the measures introduced by the JBNQA are the division of lands into Categories I, II, and III; a hunting, fishing, and trapping regime; two separate environmental protection regimes (Cree and Inuit); a regime for the control and operation of outfitters; wildlife protection measures; measures to support traditional activities; and, economic and social development measures.

Table 2-2 shows the alignment between key subsections of Section 22 of the JBNQA and the information presented in the project's environmental impact statement.

Table 2-2 Alignment between the elements of Section 22 of the JBNQA and the environmental impact assessment

Subsections of Section 22 of the JBNQA	Corresponding chapter or section in the EIA
22.2 General Provisions	
22.2.2 a) To minimize the negative impact of development on the First Nations people and wildlife resources of the Territory.	Chapter 6 – Description of the Receiving Environment – Physical, biological, and social environments Chapter 7 – Identification of Issues – No. 1 – Preservation of aquatic habitat quality – No. 3 – Preservation of wetlands and habitats of interest to terrestrial fauna and flora – No. 5 – Preservation of the health, safety, and socioeconomic conditions of the regional population – No. 6 – Preservation of the traditional activities and practices of Indigenous peoples and the activities and practices of non-Indigenous peoples Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of issues 1, 4, 5, and 6 Chapter 9 – Cumulative Impact Assessment – Cumulative impact assessment Chapter 13 – Preliminary Monitoring and Follow-up Program – Environmental follow-up Chapter 14 – Preliminary Offsetting Program – Plan to offset the loss of fish habitat
22.2.2 c) A special status and involvement for the Cree people over and above that provided for in procedures involving the general public through consultation or representative mechanisms.	Chapter 3 – Relationships with the Community – Cree communities of Eeyou Istchee and Indigenous organizations
22.2.2 d) Protection of the rights and guarantees of the Cree people established by and in accordance with Section 24: – Hunting, fishing, and trapping – Maintaining traditional First Nations activities	Chapter 3 – Relationships with the Community – Cree communities of Eeyou Istchee and Indigenous organizations Chapter 6 – Description of the receiving environment – Social environment Chapter 7 – Identification of Issues – No. 5 – Preservation of the health, safety, and socioeconomic conditions of the regional population – No. 6 – Preservation of the traditional activities and practices of Indigenous peoples and the activities and practices of non-Indigenous peoples Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of Issues 5 and 6 Chapter 9 – Cumulative Impact Assessment – Analysis of cumulative impacts Chapter 13 – Preliminary Monitoring and Follow-up Program – Environmental follow-up Chapter 14 – Preliminary Offsetting Program – Plan to offset the loss of fish habitat

Subsections of Section 22 of the JBNQA	Corresponding chapter or section in the EIA
22.2.2 e) The protection of the Cree people, their economies, and the wildlife resources upon which they depend.	Chapter 6 – Description of the Receiving Environment – Biological and social environments Chapter 7 – Identification of Issues – No. 1 – Preservation of aquatic habitat quality – No. 3 – Preservation of wetlands and habitats of interest to terrestrial fauna and flora – No. 5 – Preservation of the health, safety, and socioeconomic conditions of the regional population – No. 6 – Preservation of the traditional activities and practices of Indigenous peoples and the activities and practices of non-Indigenous peoples Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of Issues 1, 3, 5, and 6 Chapter 9 – Cumulative Impact Assessment – Analysis of cumulative impacts Chapter 13 – Preliminary Monitoring and Follow-up Program – Environmental follow-up Chapter 14 – Preliminary Offsetting Program – Plan to offset the loss of fish habitat
22.2.4 a) The protection of the hunting, fishing, and trapping rights of First Nations people in the Territory. 22.2.4 c) The protection of First Nations people, societies, communities, and economies with respect to developmental activity affecting the Territory.	Chapter 3 - Relationships with the Community – Cree communities of Eeyou Istchee and Indigenous organizations Chapter 6 – Description of the Receiving Environment – Biological and social environments Chapter 7 – Identification of Issues – No. 1 – Preservation of aquatic habitat quality – No. 3 – Preservation of wetlands and habitats of interest to terrestrial fauna and flora – No. 5 – Preservation of the health, safety, and socioeconomic conditions of the regional population – No. 6 – Preservation of the traditional activities and practices of Indigenous peoples and the activities and practices of non-Indigenous peoples Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of Issues 1, 3, 5, and 6 Chapter 9 – Cumulative Impact Assessment – Analysis of cumulative impacts Chapter 13 – Preliminary Monitoring and Follow-up Program – Environmental monitoring Chapter 14 – Preliminary Offsetting Program – Plan to offset the loss of fish habitat
22.2.4 d) The protection of wildlife resources, physical and biotic environment, and ecological systems in the Territory with respect to developmental activity affecting the Territory.	Chapter 6 – Description of the Receiving Environment – Physical and biological environments Chapter 7 – Identification of Issues – No. 1 – Preservation of aquatic habitat quality – No. 2 – Preservation of soil and groundwater quality

Subsections of Section 22 of the JBNQA	Corresponding chapter or section in the EIA
	– No. 3 – Preservation of wetlands and habitats of interest to terrestrial fauna and flora – No. 6 – Preservation of the traditional activities and practices of Indigenous peoples and the activities and practices of non-Indigenous peoples Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of Issues 1, 2, 3, and 6 Chapter 9 – Cumulative Impact Assessment – Analysis of cumulative impacts Chapter 13 – Preliminary Monitoring and Follow-up Program – Environmental follow-up Chapter 14 – Preliminary Offsetting Program – Plan to offset the loss of fish habitat
22.5 Requirements for Impact Assessment and Review	
22.5.11 a-i) Purpose of the project.	Chapter 2 – Background and Rationale for the Project – Project rationale
22.5.11 a-ii) The nature and extent of the proposed development.	Chapter 2 – Background and Rationale for the Project – Context of project integration – Project rationale
22.5.11 a-iii) Intention to study alternative sites for development where appropriate.	Chapter 4 – Location and Technology Alternatives
22.5.11 a-iv) If applicable, the reasons why no site alternatives are possible.	Chapter 4 – Location and Technology Alternatives
22.7 Final Provisions	
22.7.1 The proponent shall, before proceeding with the work, obtain where applicable, the necessary authorization or permits from the responsible government departments and services.	Chapter 2 – Background and Rationale for the Project – Regulatory context

2.3.2.2 The Cree Nation Mining Policy

The Cree Nation Mining Policy (CNMP) establishes the guidelines for the development of natural resources, mainly mining activities, on the Eeyou Istchee territory. It aims to ensure Cree participation in the various stages of mining projects. The CNMP values the integration of sustainable development, as well as the respect of Cree rights and way of life.

In January 2023, PMET launched an information and consultation process with several regional communities and organizations, including the Cree Nation Government and the Cree Nations of Chisasibi, Wemindji, and Mistissini. The main objective of this approach was to consider traditional interests, concerns, and knowledge throughout the development of the project.

Table 2-3 shows the alignment between the major pillars of the CNMP and various aspects addressed in the project's environmental impact assessment.

Table 2-3 Alignment between the Cree Nation Mining Policy and the environmental impact assessment

Sections of the CNMP	Corresponding chapter or section in the EIA
Pillar 1 – Promotion and Support of Mining Activities	
Cree Contribution	
Incorporation of Cree guidance based on their traditional, technical, and scientific expertise on land and mineral resources.	Chapter 3 - Relationships with the Community – Cree communities of Eeyou Istchee and Indigenous organizations
Consideration of the interests of all Cree people and their institutions.	
Pillar 2 – Mineral Exploration and Sustainable Practices	
Sustainable Development Policy	
Conservation of biological diversity, soils, water and watercourses, flora, fauna, scenic diversity, and recreational values.	Chapter 6 – Description of the Receiving Environment – Physical, biological, and social environments Chapter 7 – Identification of Issues – No. 1 - Preservation of aquatic habitat quality – No. 2 – Preservation of soil and groundwater quality – No. 3 – Preservation of wetlands and habitats of interest to terrestrial fauna and flora – No. 6 – Preservation of traditional activities and practices of Indigenous peoples and activities and practices of non-Indigenous peoples Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of Issues 1, 2, 3, and 6 Chapter 9 – Cumulative Impact Assessment – Analysis of cumulative impacts Chapter 13 – Preliminary Monitoring and Follow-up Program – Environmental monitoring Chapter 14 – Preliminary Offsetting Program – Plan to offset the loss of fish habitat
Restoration of damaged ecosystems.	Chapter 7 – Identification of Issues – No. 1 – Preservation of aquatic habitat quality – No. 3 – Preservation of wetlands and habitats of interest to terrestrial fauna and flora Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of Issues 1 and 3 Chapter 9 - Cumulative Impact Assessment – Analysis of cumulative impacts Chapter 13 – Preliminary Monitoring and Follow-up Program – Environmental follow-up Chapter 14 – Preliminary Offsetting Program – Plan to offset the loss of fish habitat

Sections of the CNMP	Corresponding chapter or section in the EIA
Pillar 3 – Transparency and Collaboration	
Transparency	
Establishing direct and close relationships with Cree communities and other entities.	Chapter 3 – Relationships with the Community – Cree communities of Eeyou Istchee and Indigenous organizations
Collaboration	
Involvement of the Cree in the project to ensure that their rights, interests, and benefits are well protected and enhanced.	Chapter 3 – Relationships with the Community – Cree communities of Eeyou Istchee and Indigenous organizations
Support for the Mining Community	
Working with affected communities and local Cree families, including Cree tallymen and contractors.	Chapter 3 – Relationships with the Community – Cree communities of Eeyou Istchee and Indigenous organizations

2.3.2.3 Existing agreements in the Eeyou Istchee James Bay Territory

On July 24, 2012, the Cree of Eeyou Istchee and the Government of Quebec signed the Agreement on Governance in the Eeyou Istchee James Bay Territory (Governance Agreement). This Governance Agreement grants the Cree expanded jurisdiction over the management of natural resources and lands in the Eeyou Istchee James Bay Territory. On Category III lands, municipal land management is done in collaboration with the Jamesians. The purpose of the Governance Agreement is to pursue the development of the territory, to integrate a governance model based on sustainable development, and to take into account the traditional way of life.

The Project is part of the Governance Agreement's vision of "continuing the development of Northern Quebec." It was developed by considering the three pillars of sustainable development: environmental, social, and economic. Various project alternatives were considered in light of the environmental impacts (Chapter 2). The anticipated impacts on the physical, biological, and social environments have been assessed and mitigation measures are proposed to minimize the effects (Chapters 9 and 10).

On the other hand, the project will generate significant economic benefits for the Eeyou Istchee region. In fact, PMET is committed to ensuring meaningful participation by Cree communities, with a target of 15% of jobs during construction and 20% of jobs during operations. This commitment is part of a responsible and inclusive development approach that promotes the integration of local communities.

2.3.2.4 Strategic vision of mining development in Quebec

In 2020, Quebec adopted the Quebec Plan for the Development of Critical and Strategic Minerals (QPDCSM), which is part of the 2030 Plan for a Green Economy. This plan aims to make Quebec a leader in the production, processing, and recycling of CSM, which are essential to the energy transition and decarbonization of the economy. Critical minerals, such as lithium, graphite, nickel, and cobalt, are essential for the manufacture of batteries for electric vehicles and energy storage systems, as well as for several clean technologies. (Québec.ca)

The QPDCSM consists of four main areas of focus:

- enhance knowledge and build expertise on CSM;
- set up integrated supply chains, in partnership with the producing regions;
- contribute to the transition to a sustainable economy, in particular through the circular economy and the recycling of tailings;
- raise awareness and promote the importance of CSM for Quebec's energy future.

An update to the action plan for 2023-2025 reinforces these objectives by adding the following key measures:

- support for workforce training and the digital transformation of mines;
- optimization of environmental management and promotion of social acceptability;
- development of the battery industry, including lithium, to meet growing global demand.

The project is fully aligned with this strategic vision by contributing to the development of lithium, a critical mineral that is a priority for Quebec.

It should also be noted that demand for lithium will exceed supply in the coming years, making any mining project essential to the marketing of products using lithium.

Table 2-4 shows the alignment between the Quebec Plan for the Development of Critical and Strategic Minerals and the environmental impact assessment.

Table 2-4 Alignment between the Quebec Plan for the Development of Critical and Strategic Minerals and the project

Purpose	Corresponding chapter or section in the EIA or corresponding project element
Establishment of integrated supply chains (The QPDCSM aims to develop complete value chains for CSM, including production, processing, and recycling.)	The project contributes to the battery supply chain by providing spodumene concentrate (lithium), which is essential for lithium hydroxide conversion plants.
Support for training and employment (The plan includes measures to train the workforce and promote the integration of local and Indigenous communities.)	Targets of 15% Cree employment in construction and 20% in operations. – Section 1.2.3 – Community Relations Policy: ▪ Promote local job creation. – Section 3.11 – Employment and training: ▪ Hiring policy favouring the hiring of women, local candidates, and First Nations people.
Contribution to the energy transition (The QPDCSM aims to ensure the supply of CSM for the manufacture of batteries and clean technologies.)	The project involves the development of a lithium mine, a mineral that is critical for the battery industry and the high-tech sector.

2.3.2.5 Plan d'action nordique (Plan Nord)

The first version of the Plan Nord [Northern Action Plan] was unveiled by the Quebec government in 2011. The primary focus of the Plan Nord was the development and enhancement of resources in the north of the province. The second version of this action plan, entitled "The Plan Nord toward 2035, 2015-2020 Action Plan," was published in 2015. The three key policy directions of this action plan were to:

- "develop the diversified economic potential of northern Quebec in a responsible way and for the benefit of the population living there and Quebec as a whole";
- "support the development of all communities in the area covered by the Plan Nord, by helping them realize their full potential and enhancing their living conditions"; and,
- "protect the environment and preserve the distinctive biodiversity of northern Quebec by ensuring that mechanisms are put in place to dedicate 50% of the area covered by the Plan Nord, by 2035, to non-industrial purposes, protection of the environment, and the safeguarding of biodiversity" (Secrétariat du Plan Nord, 2015).

In 2023, the Société du Plan Nord developed "Le Plan d'action nordique 2023-2028" [The Northern Action Plan 2023-2028] which is a continuation of the Plan Nord toward 2035 and its long-term objectives (Société du Plan Nord, 2023). Four key areas of focus were adopted:

- increasing connectivity to the territory;
- capitalizing on the economic strengths of the North;
- stimulating the vitality of communities;
- preserving a unique environment.

The project is well aligned with the objectives and priorities of the Plan Nord, which aims to address economic, social, and environmental development issues while contributing to the vitality and prosperity of the host communities. Table 2-5 presents the various aspects of the project's environmental impact assessment that align with the focus areas of the Plan d'action nordique 2023-2028.

Table 2-5 Alignment between the Plan d'action nordique 2023–2028 and the environmental impact assessment

Section of the Plan d'action nordique	Corresponding chapter or section in the EIA
Focus area 2 – Capitalizing on the economic strengths of the North	
2.1.4 Supporting Indigenous entrepreneurship	Chapter 1 – Introduction – Responsible Procurement Policy
2.2.1 Supporting the implementation of projects for the training, international recruitment, retention, and qualification of the workforce	Chapter 7 – Issues – No. 5 – Preservation of the health, safety, and socioeconomic conditions of the regional population – No. 6 – Preservation of the traditional activities and practices of Indigenous peoples and the activities and practices of non-Indigenous peoples Chapter 8 – Identification and Assessment of Impacts – Impact assessment for the VECs of Issues 5 and 6

Section of the Plan d'action nordique	Corresponding chapter or section in the EIA
	Chapter 9 – Cumulative Impact Assessment – Analysis of cumulative impacts
Focus area 4 – Preserving a unique environment	
4.3.2 Facilitate the detection and anticipation of climate change impacts on northern biodiversity	Chapter 11 – Climate Change Resilience

2.3.2.6 Integration of sustainable development principles

The concept of sustainable development was articulated in 1987 in the Report of the World Commission on Environment and Development: Our Common Future (the Brundtland Report).

According to the project directive (MELCCFP, 2025),"Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet their own needs." The three objectives of sustainable development are maintaining the integrity and characteristics of the environment, improving social equity, and improving economic efficiency. A project designed with this in mind must aim to integrate and balance these three objectives.

The directive requires the proponent to take sustainable development objectives into account when developing its project and to determine how the actions to be implemented should be adapted to the specific environmental and social context of the James Bay region. It requires that the impact assessment summarize the sustainable development approach followed by the proponent and explain how the project design takes this into account.

The impact assessment of a project must be carried out with the participation of citizens in the planning and decision-making process. The project must be based on a rational and integrated planning approach that takes into account the links between project components and implementation choices. For the impact assessment to be an effective tool in support of sustainable development, it must integrate the social, environmental, and economic dimensions in a way that meets the needs of the local population (in the vicinity of the work) and those who will be served by the project. Table 2-6 shows how PMET takes the principles into account through its actions, commitments, and the way it has adapted its project.

Table 2-6 Sustainable development principles integrated into the project

Sustainable development principles	Examples of implementation in the project
1–Health and quality of life	PMET's commitment to creating and maintaining a safe and healthy work environment. – Existing policies to meet these health and quality of life commitments. – System in place to report incidents and implement corrective actions or follow-ups to improve practices. – Nursing services are available on site; employees are offered prevention and follow-up care to better guide them in matters of health and quality of life. – Human resources team members on site at the camp. – Strict water management, dust and emissions control, and measures to protect aquatic and terrestrial environments.
2–Social equity and solidarity	– Contribution to economic prosperity during the exploration phase and even more so during the operations phase by promoting the hiring of personnel from Indigenous communities.

Sustainable development principles	Examples of implementation in the project
3–Environmental protection	– Employee training and procedures in place in the event of accidental spills. – Mitigation measures implemented to minimize the project's impact on various environmental components. – Monitoring and follow-up program implemented during the project.
4–Economic efficiency	– Contribution to economic prosperity during the exploration phase and even more so during the operations phase through the hiring of several employees. – Lithium production for the battery industry, contributing to energy transition and decarbonization
5–Participation and engagement	– PMET held numerous meetings with various stakeholders during the project preparation phase so that it could share all information about its project with the host communities and gather comments, concerns, and suggestions. – PMET's willingness to sign agreements with non-Indigenous and Indigenous stakeholders.
6–Access to knowledge	– Involvement of Cree community members in inventories to obtain opinions on land use (fishing, hunting, gathering, or other activities) and on the wildlife species found in the study area (Chapters 3 and 6).
7–Subsidiarity	Not applicable.
8–International partnerships and cooperation	– Alignment with the QPDCSM and the Plan d'action nordique 2023-2028.
9–Prevention 10–Precautions	– Incident procedures in place and used by employees. – Spill kits and first aid kits available on site. – On-site emergency response plan. – Continuous environmental monitoring.
11–Protection of cultural heritage	– Keeping mining infrastructure concentrated within a certain area to limit how much it encroaches on the tallyman's land and to protect the landscapes and sensitive areas for the tallyman and other users as much as possible. Change made: combination of pit and underground mine, rather than exclusively open-pit mining, to reduce the footprint and visual impact. – Maintaining respectful and ongoing dialogue with host communities and local authorities through documenting and sharing information, mutual understanding, and collaboration to address concerns, particularly those related to cultural aspects. – Archaeological excavations carried out around the camp area on sites of medium potential identified by a specialized archaeological consultant. – Inclusion of traditional knowledge in the EIA through interviews with land users and the participation of many members of the Chisasibi community in field surveys.
12–Biodiversity preservation 13–Respect for ecosystem support capacity	– Project design developed to reduce encroachment or negative impacts on various components of the environment; incorporation of mitigation measures.
14–Responsible production and consumption	Ongoing optimization of the mine will be carried out to reduce environmental impacts.
15–Polluter pays	Budget dedicated to the environmental management of the project from construction to closure.
16–Internalization of costs	– Guaranteed amount for site restoration following the end of operations.

2.3.3 Constraints and issues identified

Based on the information available regarding the project, its receiving environment, and the comments and concerns raised by government authorities, stakeholders, and Indigenous groups, the main issues identified for the project are:

- increased risk of accidents, wildlife collisions, and wildlife disturbance on the Trans-Taiga Road and the Billy-Diamond Highway due to increased heavy vehicle traffic transporting concentrate;
- increased traffic on the Billy-Diamond Highway due to the project and numerous other potential projects in the area (cumulative effects);
- project encroachment on fish habitat;
- protection of water quality and fish resources;
- potential disruption to the traditional activities of land users;
- protection of the well-being and quality of life of local communities.

PMET wishes to address these issues with the relevant authorities, stakeholders, and Indigenous groups to develop strategies aimed at mitigating the project's potential impacts and increasing its social acceptability among users.

2.4 Analysis of project alternatives

2.4.1 Consequences of non-completion or postponement of the project

If the project is not carried out, Quebec will miss out on a strategic opportunity to develop the critical and strategic minerals sector, particularly lithium, which is essential to the energy transition and to achieving the objectives of the 2030 Plan for a Green Economy. It would limit the province's ability to meet growing demand for battery materials, thereby reducing its role in the North American and global value chain. Postponing the project would have similar effects, delaying the market entry of spodumene and compromising Quebec's competitiveness relative to other jurisdictions that are accelerating their mining projects to meet the needs of battery manufacturers and automakers.

2.4.2 Solutions proposed during consultations

The consultations identified concerns related to the ecological footprint and environmental impacts of exclusively open-pit mining. In response, PMET modified the initial design to adopt a hybrid approach combining open pit and underground mining, thereby reducing the disturbed area and impacts on the landscape. This solution is in addition to other planned measures, such as the creation of a waste rock stockpile equipped with a sealed membrane for PAG waste rock, and the safe co-disposal of tailings and waste rock.

2.4.3 Line of reasoning and criteria leading to the decision

The decision to carry out the project was based on several criteria:

- Strategic relevance: alignment with Quebec's critical and strategic minerals policy and direct contribution to the establishment of a robust Quebec-based battery industry.
- Characteristics of the deposit: high spodumene content and sufficient volumes to support long-term production at a competitive global price.
- Economic context: strong global demand for lithium, expected to grow significantly by 2040, with risks of shortages after 2030.
- Socioeconomic benefits: job creation, contribution to regional and provincial GDP, and substantial tax revenues for the governments.
- Social acceptability: incorporation of recommendations from consultations, particularly the reduction of territorial impacts through the adoption of a hybrid mine.

2.5 Similar projects

In the study area and more broadly in Quebec, several mining projects focused on critical and strategic minerals are currently being evaluated or implemented and are likely to influence the design or impacts of the proposed project. Major projects include:

- Rose Lithium-Tantalum Mining Project (Critical Elements Lithium Corporation) in Eeyou Istchee James Bay, currently in the permit and authorization phase.
- Moblan Project (Sayona Nord Inc.), feasibility study for a lithium mine in Nord-du-Québec.
- James Bay Lithium Mine Project (Galaxy Lithium Canada Inc.), in the authorization phase.
- Whabouchi Mining Project (Nemaska Lithium), commissioning suspended.

These projects, combined with existing infrastructure (roads, power lines, treatment facilities), may influence the planning and design of the proposed project, particularly in terms of logistics, access, and environmental impact management.

PMET also plans to conduct bulk sampling as part of the project, which is a preliminary step before production begins.

The presence of several mining projects in the region raises the issue of cumulative effects on the environment and communities. These effects may include:

- increased pressure on natural environments (habitat fragmentation, wildlife disturbance);
- increased air emissions and noise from mining activities and transportation;
- socioeconomic impacts (employment, infrastructure, coexistence with traditional activities).

3 Community Relations

PMET is committed to building and maintaining positive, mutually beneficial relationships with local stakeholders[1] and communities affected by its activities.

Since the beginning of the Shaakichiuwaanaan Project exploration phase in 2017, PMET has worked to identify, inform, and, where appropriate, consult local stakeholders and communities affected by its activities on the Shaakichiuwaanaan property, in a structured and culturally respectful manner.

This section addresses the requirements set out in the Tailored Impact Statement Guidelines issued by the Impact Assessment Agency of Canada (IAAC), as well as those outlined in the Directive of the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP). Although PMET's engagement activities began during the exploration phase, this chapter focuses primarily on engagement carried out during the environmental impact assessment phase, specifically following the filing of the project notice to the MELCCFP in November 2023.

Engagement with the Cree communities of Eeyou Istchee James Bay, the Inuit living in Chisasibi and Indigenous organizations is presented in a separate section from engagement with non-Indigenous stakeholders and government authorities. Each section summarizes the key comments, perspectives, and concerns raised during consultations, and explains how this input has informed the development of the Shaakichiuwaanaan Project.

Engagement activities with both Indigenous and non-Indigenous stakeholders were led by PMET, with support from WSP. Recognizing that meaningful engagement is an ongoing process, PMET will continue consultation and dialogue following submission of the EIA.

3.1 Engagement Process

In addition to the government requirements outlined above, PMET's engagement process, as described in the company's Stakeholder Engagement Protocol, is guided by the ECOLOGO® UL 2723 Certification for Mineral Exploration companies. This certification, which involves a formal audit of the certified exploration company and its suppliers, is designed to ensure the application of best economic, environmental, and social practices in mineral exploration.

3.1.1 Approach

The approach set out in PMET's Stakeholder Engagement Protocol is structured around six key steps:

- identifying project parameters and the company's responsibilities with respect to its duty to inform;

1 According to the MELCCFP, the term *stakeholders* refers to "individuals, groups, organizations, or local or Indigenous communities that are directly affected (or likely to be affected) by a given project and its impacts (both positive and negative), but may also include stakeholders (at the local, regional, or provincial level) who are interested in the project without being directly affected by its potential benefits and impacts" (MELCCFP, 2023. p. 3 [translated from the French original]). In keeping with this definition, the term *non-Indigenous stakeholders* is used in this chapter.

- identifying stakeholders and assessing the social environment;
- planning and initiating contact with key stakeholders;
- reporting;
- information sharing.

Through this approach, PMET ensures that it:

- engages local stakeholders and communities early in order to gather concerns in a timely manner;
- includes all stakeholders potentially affected by the project;
- promotes participation by providing advance notice of upcoming consultation activities;
- adapts engagement activities to the local culture by:
  - taking into account other traditional events or activities;
  - presenting meaningful and accessible information (e.g., in the local language);
  - using culturally appropriate consultation methods implemented with respect for local customs and traditions;
- encourages feedback to support ongoing dialogue with stakeholders;
- properly documents engagement activities; and
- maintains communication channels throughout the project lifecycle.

3.1.2 Objectives

PMET's engagement process with local stakeholders and communities aims to achieve the following objectives:

- Promote transparent dialogue and proactive, effective communication between PMET, host communities, and stakeholders involved in the company's activities and the Shaakichiuwaanaan Mining Project.
- Enhance the dissemination of information regarding the company's activities and the Shaakichiuwaanaan Project to ensure accountability.
- Gather information on land use, as well as the culture and traditions of Indigenous and local communities affected by the company’s activities.
- Gather stakeholder concerns and identify potential challenges associated with the implementation of the Shaakichiuwaanaan Project and the company’s other activities.
- Address concerns raised, correct misperceptions where appropriate, and make the necessary commitments to respond to questions, comments, and issues raised.
- Develop and maintain a lasting relationship of trust with stakeholders affected by the Shaakichiuwaanaan Project and the company's activities.

Through this process, PMET ensures that stakeholders and local communities affected by its activities are provided with meaningful opportunities to participate proactively in project planning and design.

3.1.3 Engagement tools

Certain tools have been designed specifically for Indigenous communities to support their engagement. PMET places particular importance on its relationships with Cree communities that may be affected by the project, especially the Cree Nation of Chisasibi. In July 2024, PMET renamed the Corvette Project following a recommendation from Chisasibi elders and the family of the tallyman responsible for trapline CH39. Shaakichiuwaanaan refers to the four Shaakichiuwaanaan hills located near the CV5 pegmatite. A new logo was also designed in collaboration with the family of the tallyman responsible for trapline CH39. It incorporates several Cree symbols, including a goose, a teepee, syllabic script, mountains, elements representing team spirit, and Lake Shaakichiuwaanaan. This name change reflects PMET's commitment to the Cree Nation of Chisasibi and its respect for traditional Cree land. Integrating the Cree language into the project name also helps promote and share Cree culture with all stakeholders.

PMET has developed various tools as part of its engagement process. These are presented below.

3.1.3.1 Communications log

As early as the exploration phase, PMET maintained a communications log to identify local stakeholders and other project participants, document the engagement activities in which they participated, and record their concerns. The log also enables the company to track commitments made to interested parties and local stakeholders.

The communications log serves as a stakeholder register and includes the following information: the name and contact details of the person met, the organization represented, their role, the engagement activities in which they participated (where applicable), their level of interest in and influence with regard to the project, archived emails, and follow-up actions required by PMET in relation to that stakeholder.

The communications register also serves as a tool for monitoring engagement activities and records: the type of activity carried out, the stakeholder consulted, the date of the activity, the names of participants, the materials used, the purpose of the activity, a summary of discussions, actions to be undertaken by the company following the activity, and the associated timelines.

Comments are categorized by theme to facilitate the identification of key concerns raised by local stakeholders and communities.

3.1.3.2 Community liaison office in Chisasibi

In 2024, PMET hired a community liaison coordinator and opened a liaison office in the Chisasibi shopping centre. The community liaison coordinator enables PMET to maintain ongoing relationships with various local stakeholders (elected officials, tallymen, community organizations, entrepreneurs, and community members). This role informs these stakeholders about activities conducted by PMET on the Shaakichiuwaanaan property and serves as an interpreter when the Cree language is required to adequately address community concerns. The coordinator also contributes to the development of PMET’s engagement strategy, supports awareness and understanding of exploration and mining activities, and coordinates information sessions, site visits, and public events.

3.1.3.3 Regional Working Group on the Transportation of Spodumene Concentrate

PMET established a working group on the transportation of spodumene concentrate (hereafter referred to as the "working group"). Representatives from the Cree Nations of Chisasibi and Wemindji, the City of Matagami, the Town of Radisson, and the Eeyou Istchee James Bay Regional Government participated in the working group's first meeting on January 17, 2025. At this initial meeting, PMET presented the purpose of the working group, namely to integrate the perspectives of local stakeholders into the development of a transportation plan for spodumene concentrate from the Shaakichiuwaanaan mine site. Participants were invited to share their experiences with other mining projects, particularly lithium projects, as well as their perspectives on the transportation of raw materials in the region. Participants also had the opportunity to express their comments and concerns regarding traffic on the Transtaïga Road and Billy-Diamond Highway. The meeting concluded with clarification of the working group's operating procedures, including the agenda and frequency of meetings, document sharing, and preparation of meeting minutes.

3.1.3.4 Communication Tools

To engage local stakeholders and communities affected by the project, PMET deployed a range of communication tools. As noted above, some of these tools were developed in collaboration with local communities, particularly the community of Chisasibi, in order to culturally tailor the company's communications and reach as many stakeholders as possible. These tools were used to inform local populations about the Shaakichiuwaanaan Project and to promote the information and consultation activities carried out by PMET. The following communication tools were used:

- meetings and interviews (in person or virtual);
- public presentations and events;
- phone calls and emails;
- community newsletters, fact sheets, *project update bulletins*, letters;
- company website and social media;
- informational videos;
- radio broadcasts;
- digital billboards.

3.2 Regional Context

The Crown has a legal duty to consult Indigenous Peoples and, where appropriate, accommodate them when considering actions that may adversely affect an established or potential Indigenous or treaty right.

The Shaakichiuwaanaan Project is located within the territory of the Eeyou Istchee James Bay Regional Government (EIJBRG), which replaced the municipality of James Bay in 2014. This territory, situated between the 49th and 55th parallels, corresponds to Category III lands under the James Bay and Northern Quebec Agreement (JBNQA), where the Cree hold exclusive rights to trap fur-bearing animals and fish certain species. The environmental protection regime established under the JBNQA guarantees the Cree a distinct and meaningful role in the environmental assessment process. This participation is carried out through consultation and representation mechanisms in which the Cree play a central role.

3.3 Cree Communities of Eeyou Istchee and Indigenous Organizations

The Crown has delegated certain procedural aspects of its legal duty to consult Indigenous peoples and, where appropriate, accommodate them in relation to the Shaakichiuwaanaan Project to PMET, through the requirements set out in the Tailored Impact Statement Guidelines.

3.3.1 Eeyou Istchee Cree communities and engaged Indigenous organizations

To carry out the impact assessment process, the IAAC and the Cree Nation Government (CNG) signed, in 2025, the Agreement concerning the Shaakichiuwaanaan External Federal Assessment Process Under the James Bay and Northern Quebec Agreement (JBNQA) and the *Impact Assessment Act* (IAA). The agreement delegates to a Joint Assessment Committee, composed of representatives appointed by the CNG and the IAAC, the responsibility for carrying out the activities required under the Act, including the implementation of an Indigenous Engagement and Partnership Plan (IEPP). This document is intended to ensure that meaningful consultations are conducted with Indigenous Peoples who may be affected by the Shaakichiuwaanaan Project.

As part of the IEPP, the Joint Assessment Committee established a list of Indigenous groups that could be affected by the project and must, therefore, be consulted and informed during the impact assessment. This list includes Indigenous groups potentially subject to adverse project impacts, particularly with respect to the exercise of their Aboriginal rights, whether recognized, asserted, or treaty-based. It also includes Indigenous groups whose Aboriginal rights are recognized and affirmed under section 35 of the *Constitution Act, 1982*, as well as Indigenous Peoples with asserted rights requiring an assessment of factors pursuant to section 22 of the IAA. The First Nations and Cree and Inuit organizations identified for engagement are as follows:

- Cree Nation of Chisasibi
- Cree Nation of Wemindji
- Cree Nation of Mistissini
- Makivik Corporation
- Cree Nation Government

PMET quickly identified the Cree Nation of Chisasibi as a priority stakeholder, given that the project is located on trapline CH39, which is associated with its traditional land. The company met with Chisasibi's elected officials to determine the concerned trapline tallyman and to agree on appropriate communication protocols.

Given the project's proximity to the Mistissini (M02A) and Wemindji (VC26) traplines, PMET also contacted elected officials from those communities to inform them of the project's key milestones, even though no drilling activities are planned within their respective territories.

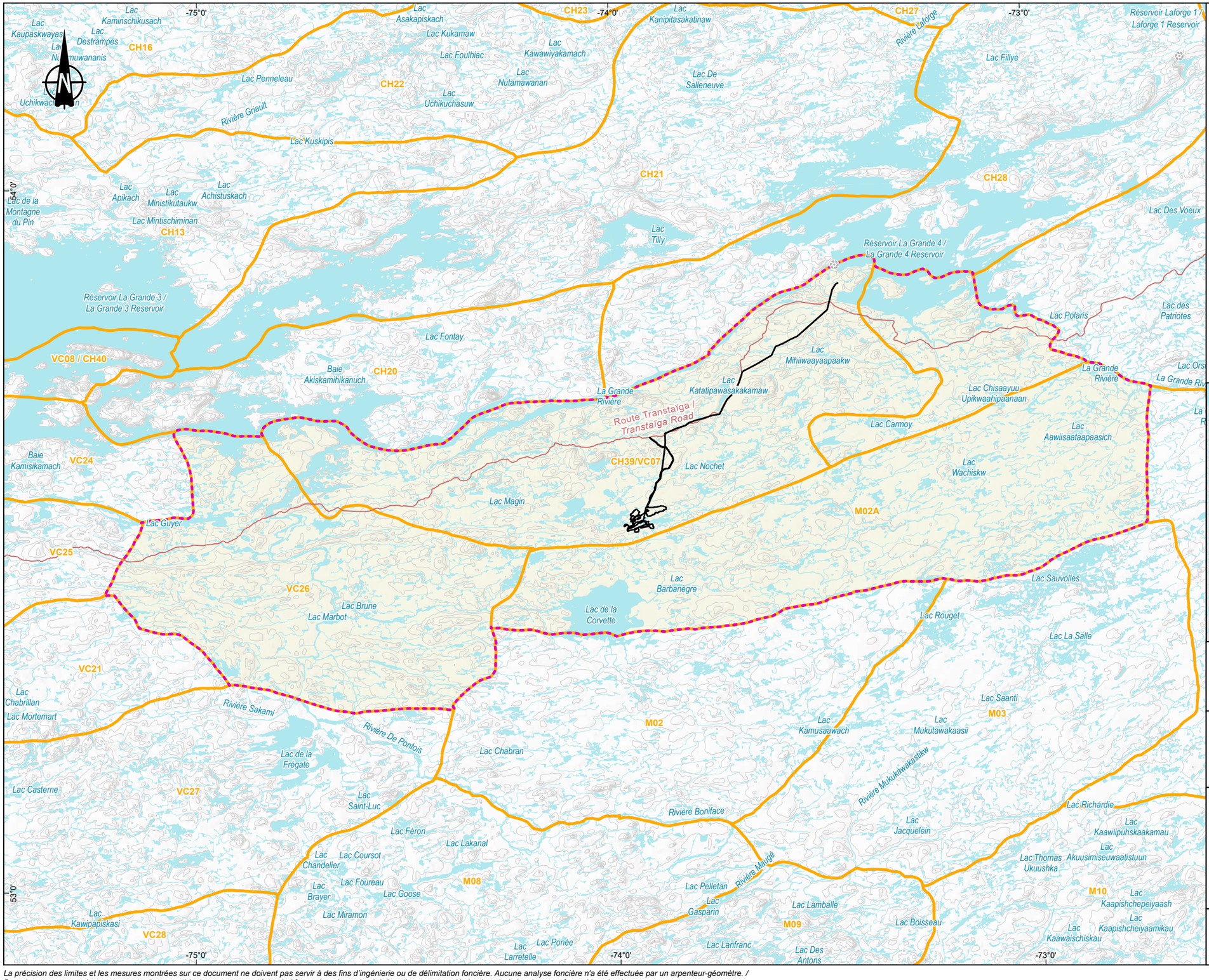
PMET attempted to contact the Makivik Corporation but did not receive a response[2]. In addition, given the role of the Cree Nation Government in the environmental and social impact assessment process established under Section 22 of the JBNQA, PMET ensured that it was included in its information-sharing and engagement activities.

Engagement efforts are therefore focused on the Cree communities of Eeyou Istchee and the Indigenous organizations listed in Table 3-1. These efforts include outreach to local stakeholders, the respective community governments, as well as the tallymen and primary users of the traplines affected by the project. Businesses and organizations within the Cree Nation of Chisasibi were also specifically targeted. Map 3-1 illustrates the traplines and Cree communities in the region.

Table 3-1 List of Indigenous stakeholders

Category	Stakeholders engaged
Regional Indigenous government	Cree Nation Government
Indigenous communities	Cree Nation of Chisasibi (CNC)
	Cree Nation of Wemindji (CNW)
	Cree Nation of Mistissini (CNM)
Land users	Tallyman and land users (CH39 – Chisasibi)
	Tallyman and land users (M02A – Mistissini)
	Tallymen and land users (VC26 – Wemindji)
Entrepreneurs and organizations of the Cree Nation of Chisasibi	Cree Trappers' Association (CTA – Chisasibi)
	Chisasibi Business Development Group (CBDG)
	Chisasibi Business Service Centre (CBSC)
	Saskounan Construction (construction company)
	Niigaan (environmental consultant)
	Chisasibi Eeyou Resource and Research Institute
	Cree Board of Health
	Cree School Board
	Youth Council
	Chisasibi Cree Women Association
	Chisasibi Cree Men's Association
Inuit organizations	Makivvik Corporation
	Kigaluk Landholding Corporation
	Anguvigaq of Chisasibi

[2] Members of the Makivik Corporation were contacted on three occasions by PMET via email (between September 2025 and February 2026) to invite them to various information and public consultation sessions, as well as to virtual or in-person meetings.



Zones d'étude / *Study Areas*

- Projet / *Project*
- Régionale - Humain / *Regional - Human*
- Locale - Humain / *Local - Human*

Occupation du territoire cri / *Cree Territory*

- Terrain de trappage / *Trapline*

Repères géographiques / *Geographical Landmarks*

- Communauté crie / *Cree community*
- Village inuit / *Inuit village*
- Municipalité / *Municipality*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*
- Cours d'eau / *Watercourse*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 3-1/ *Map 3-1*
Terrains de trappe et communautés cries de la région / *Traplines And Cree Communities in the Region*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02 / CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017 / BDGA, 1/1 000 000, MRN Québec, 2014
AQréseau+, réseau routier, MERN, 2024-03-01
Cree Trappers Association, 2018 / Le Groupe Nippour, 2013-05

2026-03-23

Préparation / Prepared by : M-H. Brisson
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Approbation / Approved by : M-H. Brisson
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3.3.2 Engagement Activities During the Exploration Phase

PMET initiated an information and consultation process prior to EIA. Initial discussions with the Cree Nation of Chisasibi began in 2017 during the preliminary exploration phase. In June 2022, PMET met with Chisasibi's elected officials for the first time to introduce the company and present its ongoing exploration activities. Throughout 2022, PMET representatives met on several occasions with elected officials and Band Council staff, while continuing to communicate by letter, email, and telephone.

In 2018, PMET notified the Cree Mineral Exploration Board (CMEB) by mail of its intention to carry out exploration activities at the Shaakichiuwaanaan site.

The tallyman of trapline CH39 and members of his family were first met in September 2022 at the Mirage site, a lithium exploration project led by Brunswick Exploration. They were given a tour of the core shack, which allowed them to familiarize themselves with the exploration activities conducted by PMET.

PMET first contacted the Cree Nation of Mistissini in 2019 to inform the community of the company's intentions regarding the Shaakichiuwaanaan property. In 2022, PMET provided information, by both email and mail, to the tallyman of trapline M02A as well as to community elected officials about the various exploration and construction activities underway on the Shaakichiuwaanaan property.

In December 2022, in accordance with the company's established process, PMET contacted the Chief of the Cree Nation of Wemindji and the tallyman of trapline VC29 by mail to inform them of the exploration activities being carried out on the Shaakichiuwaanaan property.

In February 2023, PMET, the Council of the Cree Nation of Chisasibi, and the Cree Nation Government jointly began developing a communication protocol specific to the exploration activities associated with the Shaakichiuwaanaan Project. This protocol establishes the framework for collaboration and defines the relationship between the company and its Cree partners. It includes mutual commitments regarding communication, environmental monitoring, employment and training, negotiation of impact and benefit agreements, and business opportunities. Discussions with Chisasibi concerning the communication protocol continued during the environmental impact assessment phase.

3.3.3 Engagement Activities During the Environmental Impact Assessment Phase

Since November 2023, when the project's impact assessment process began, PMET has organized more than 85 in-person and virtual working meetings with various stakeholders from the Cree community of Chisasibi. These meetings were held primarily with elected officials of the Chisasibi Band Council, the tallyman of trapline CH39, and members of his family. In addition, several dozen emails, letters, and phone calls were exchanged with various members of the First Nation.

In addition to these working meetings, PMET has visited the community of Chisasibi approximately every six weeks since January 2023 to hold engagement activities with community members. These activities included community information sessions, site visits, and Shaakichiuwaanaan Day. This annual cultural event took place at the exploration camp in June 2024 and again in September 2025.

Elected officials and tallymen from the Mistissini and Wemindji traplines, located near the project, have been met with five and three times, respectively, since November 2023.

Finally, PMET met with Cree stakeholders working in the health and education sectors, as well as in the private sector, in order to better understand the host community and its various social and economic issues, and to discuss potential business opportunities.

3.3.3.1 Meetings with Band Councils and representatives of the Cree Nation Government

Between November 2023 and décembre 2025, PMET met 32 times with elected officials of the Cree Nation of Chisasibi. The meetings referenced in this section were held exclusively with elected representatives, including the Chief, Deputy Chief, Councillors, and Band Council staff, notably the Executive Director, Acting Economic Development Officer and Tourism Coordinator, Natural Resources Relations Officer and the Finance Coordinator of the community. Some of these meetings were also attended by representatives of the Cree Nation Government.

These working meetings addressed, among other matters, project updates, the development of a communications protocol, the planning of community engagement activities, and the consultation and impact assessment process. PMET also maintained regular communication with elected officials by telephone, videoconference, text message, and email.

All interviews and other communications held in person or by videoconference since November 2023 are compiled in Table 3-2.

Table 3-2 Meetings with elected officials from the Chisasibi Band Council and representatives of the Cree Nation Government

Date	Participants[3]	Topics discussed
November 14, 2023	– CNC Chief – CNC Deputy Chief – Representatives of the Cree Nation Government	– Description of the project and ongoing activities – Strategies to attract Cree workers – Development of a communication protocol – Name of camp
December 8, 2023		

3 It should be noted that the participants mentioned did not attend all the meetings.

Date	Participants[3]	Topics discussed
January 19, 2024 February 8 and 23, 2024 March 8, 18, 27, 2024 April 8, 2024 May 31, 2024 June 13, 2024 July 29, 2024 August 27, 2024 October 3, 10, 17, 25, 2024 November 1, 6, 21, 2024	– CNC Chief – CNC Deputy Chief – Representatives of the Cree Nation Government	– Recent project developments – Planning of engagement activities – Development of a communication protocol – Planning of Shaakichiuwaanaan Day (2024) – Meeting with Wemindji elected officials and the concerned tallyman – Planning of field visits – Review of community information sessions – Exploration program – EIA process
January 22, 2025 March 10, 2025 April 29, 2025 May 28, 2025 June 17, 2025 July 7, 2025 July 14, 2025 August 14, 2025 September 8, 2025 September 9, 2025 October 22, 2025 November 12, 2025	– CNC Deputy Chief – CNC Chief – CNC Councillors – Executive Director – Representative of the Cree Nation Government	– Review of 2024 achievements – Development of a communication protocol – Visit to the Eleonore mine – Recent developments in project design – Relations with Hydro-Québec – Band Council election – Regional group on the transportation of spodumene concentrate – Boat washing station – Issues related to traplines – Infrastructure for training in the community – Chisasibi Business Development Group (CBDG) – Shaakichiuwaanaan Day (2025) – Follow-up on the meeting with the CH39 tallyman’s family – Compensation projects for fish habitat and fishing – Community relations and consultation as part of the EIA – Mineral Resource Estimates update – Bulk sampling – Government relations

Meetings were held during the EIA phase with the Deputy Chief, the Regional Development Officer, and the Environmental Administrator of the Cree community of Mistissini to present the Shaakichiuwaanaan Project and outline the consultation and collaboration approach planned for the environmental and social impact assessment (EIA) process.

An initial virtual meeting with the Chief and Deputy Chief of Wemindji was held in 2024. The purpose of this meeting was to present the Shaakichiuwaanaan Project, provide information on the EIA process, and invite them to participate in the regional group on the transportation of spodumene concentrate.

All of these meetings are listed in Table 3-3. PMET also met with staff from various Band Councils, including the Regional Development Officer for Mistissini. In addition, elected officials were kept informed of project developments by email and telephone.

Table 3-3 Meetings with elected officials of the Mistissini and Wemindji Band Councils

Date and location	Participants	Topics discussed
June 26, 2024 Online (Mistissini)	– CNM Regional Development Officer – CNM Environmental Administrator	– Presentation of project background and preliminary project fact sheet
December 11, 2024 Online (Wemindji)	– CNW Chief – CNW Deputy Chief	– Presentation of the Shaakichiuwaanaan Project – Regional group on the transportation of spodumene concentrate
December 12, 2024 Online (Mistissini)	– CNM Deputy Chief – CNM Environmental Administrator	– Presentation of the Shaakichiuwaanaan Project – Consultation and collaboration approach

The Cree Nation Government plays an important role in the project impact assessment process, given its status as a member of COMEX/COMEV and pursuant to the agreement established with the IAAC. It is therefore directly involved in the project authorization process. In 2024, the Cree Nation Government organized a training workshop to help PMET managers and executives better understand the cultural, political, and economic context of the Cree Nation. It also met with PMET to discuss the EIA process and Indigenous consultation expectations specific to the treaty territory.

Table 3-4 Meetings with representatives of the Cree Nation Government

Date	Participants[4]	Topics discussed
November 22, 2023	– 2 representatives of the Cree Nation Government	– Introduction to and overview of the Shaakichiuwaanaan Project – Cumulative effects related to traffic on Billy-Diamond Highway – JBNQA – Mining activities in Eeyou Istchee – COMEX Process – Consultation framework in Eeyou Istchee – Permitting schedule and federal review process – Bulk sampling – Development of a communication protocol – Community relations – Preliminary economic assessment – Working group on the transportation of spodumene concentrate
February 20, 2024	– 1 representative of the Cree Nation Government	
October 1, 2024	– 1 representative of the Cree Nation Government	
March 10, 2025	– 1 representative of the Cree Nation Government	

4 It should be noted that the participants mentioned did not attend all the meetings.

3.3.3.2 Meetings with tallymen and their families

Between November 2023 and December 2025, 27 meetings were held with the tallyman of trapline CH39 and members of his family. Most of these meetings took place in Chisasibi. Up to 17 family members attended certain meetings. Approximately ten of the meetings were also held in the presence of elected officials from the Band Council or representatives of community businesses.

These meetings provided an opportunity to better understand the family's use of the land and to gather their questions and concerns regarding the Shaakichiuwaanaan Project. PMET ensured that it met with the family of the tallyman responsible for trapline CH39 prior to holding public information sessions, in order to share information specific to their family trapline in advance. All meetings and the main topics discussed are listed in Table 3-5. Only in-person and virtual meetings have been included.

Table 3-5 Meetings with the tallyman of trapline CH39 from Chisasibi and his family

Date	Participants[5]	Topics discussed
January 17, 2024 (2 meetings)	– Tallyman – 28 family members in total	– Presentation of the project – New authorization process for impact-causing exploration work (ATI) – Project benefits and opportunities – Planning of Shaakichiuwaanaan Day (2024) – Development of a communication protocol – Preliminary economic assessment – Update on mineral resource estimates – Baseline data collection for natural and human environments – Land use – Study on the mining potential of the Shaakichiuwaanaan property – Field studies for the impact assessment – 2024 year-end review
March 12, 2024	– Tallyman – 10 family members	
March 25, 2024	– Tallyman – 16 family members	
March 27, 2024	– Tallyman – 4 family members	
May 1, 2024	– Tallyman – 4 family members	
May 21, 2024	– Tallyman – 4 family members	
July 19, 2024	– Tallyman – 2 family members	
July 30, 2024	– Tallyman – 10 family members	
August 13, 2024	– Tallyman – 12 family members	
September 9, 2024	– Tallyman – 17 family members	
November 18, 2024	– Tallyman – 2 family members	
December 10, 2024	– Tallyman – 12 family members	
January 21, 2025	– 9 family members	

5 Some of these meetings were also attended by elected officials or Band Council staff such as the Chief, Deputy Chief, Youth Council Chief, councillors, Acting Chief Executive Officer, Corporate Secretary, Treasurer, the Finance Coordinator, the Executive Assistant, the Natural Resources Relations Officer, the Acting Economic Development Officer and Tourism Coordinator, and a representative of the Cree Nation Government.

Date	Participants[5]	Topics discussed
March 17, 2025	– Tallyman – 6 family members	– Transportation of spodumene concentrate – Employment and business opportunities – Tour of the Eleonore mine – Study of fish and fish habitat compensation program – Land use – Field surveys (archeology, water and sediment, fish habitat compensation, vegetation, wetlands) – Preliminary closure plan – Shaakichiuwaanaan Day (2025) – Communication protocol – Mineral resource estimate and new minerals of interest (cesium, tantalum) – Bulk sampling – Environmental impact assessment process (methodology, validation of valued components) – Archaeological study – Caribou study – Vegetation and wetland study – Bird, amphibian and reptile study – Update on exploration activities – Year-end celebrations
March 27, 2025	– Tallyman	
April 28, 2025	– Tallyman – 10 family members	
May 26, 2025	– Tallyman – 6 family members	
July 3, 2025	– Tallyman	
July 7, 2025	– Tallyman – 10 family members	
July 14, 2025	– Tallyman – 1 family member	
August 11, 2025	– Tallyman – 1 family member	
September 2, 2025	– Tallyman – 1 family member	
September 9, 2025	– Tallyman – 10 family members	
September 11, 2025	– Tallyman – 1 family member	
October 23, 2025	– Tallyman – 1 family member	
November 12, 2025	– Tallyman – 1 family member	
December 1, 2025	– Tallyman – 1 family member	

An interview was conducted in February 2025 in Nemaska with the tallyman responsible for trapline M02A and four members of his family. The purpose of this meeting was to document the use of trapline M02A and to gather comments, concerns, and suggestions from the tallyman and his family members. A virtual meeting was subsequently held with elected officials of the Mistissini Band Council and other members of the tallymen's families to inform them of the concerns raised during the meeting.

PMET also met with the two tallymen of trapline VC26 to better understand how they use their trapline. This meeting also provided an opportunity to gather their concerns, comments, and suggestions.

Table 3-6 Meetings with the tallymen of Mistissini and Wemindji and their families

Date and location	Participants	Topics discussed
February 19, 2025 Nemaska	– Tallyman of trapline M02A – 4 family members	– Presentation of the project – Data collection on land use
February 20, 2025 Wemindji	– Two tallymen of trapline VC26	– Presentation of the project – Data collection on land use
March 13, 2025 Online	– 3 users of the trapline M02A – CNM Deputy Chief – CNM Environmental Administrator – CNM Regional Development Officer	– Follow-up on the meeting with the tallyman of trapline M02A

3.3.3.3 *Community information sessions*

PMET organized seven community information sessions in Chisasibi between October 2023 and September 2025. These sessions addressed a range of topics. Up to 78 community members participated, including elected officials and members of the family of the tallyman responsible for trapline CH39. The sessions provided an opportunity to share information about the project, respond to questions, and gather concerns from the community. At the suggestion of the Community Chief, three of the sessions were held in a World Café format, allowing participants to discuss the topics presented by PMET in small groups and in plenary sessions.

Invitations to participate in the public sessions were shared through community radio, social media, and email. Some sessions were also broadcast on community radio, enabling outreach to a broader audience. Simultaneous interpretation into Cree was provided to ensure accessibility for the entire population. The following topics were discussed during the public information sessions:

- the mining industry and mineral exploration;
- ongoing activities on the Shaakichiuwaanaan property;
- the implementation of a communication protocol;
- environmental baseline data collection and the impact assessment process;
- impacts on fish habitat and fish habitat compensation projects;
- land use;
- the project schedule;
- employment, training, and business opportunities;
- mitigation and compensation measures; and closure planning.

Three exhibitions featuring 22 informational posters were also organized by PMET in various public locations in Chisasibi (April and July 2025). Approximately 80 visitors attended the July and September 2025 exhibition. Public information and engagement sessions held in Chisasibi are detailed in Table 3-7.

Table 3-7 Public information and engagement sessions in Chisasibi

Date and location	Activities	Participants	Topics discussed
October 11, 2023 Chisasibi	World Café	– Tallyman of trapline CH39 – 7 family members of trapline CH39 – 12 community members – CNC Finance Coordinator	– Recent project developments – Survey of winter birds and large wildlife – Employment, training, and business opportunities
January 16, 2024 Chisasibi	Information session	– CNC Chief – Representative of the Cree Nation Government – CNC Natural Resources Liaison Officer – CNC Acting Economic Development Officer and Tourism Coordinator – Administrator, CTA – 46 community members – Family members of trapline CH39	– EIA process – Project schedule – Relationship with tallyman of trapline CH39
March 26, 2024 Chisasibi	Information session	– 78 community members	– Communication protocol
April 15, 2024 Chisasibi	World Café	– 30 community members	– Presentation of the project (video screening) – Recent developments
August 12, 2024 Chisasibi	Information session	– 46 community members	– Communication protocol – Consultation schedule
September 10, 2024 Chisasibi	World Café	– Tallyman of trapline CH39 – 10 family members of trapline CH39 – 3 community members	– Recent project developments – Community liaison coordinator – Shaskichiuwaanaan Day – Site infrastructure – Muskw (partnership) – Update on mineral resource estimates – Preliminary economic assessment
January 22, 2025 Chisasibi	Information session	– Tallyman of trapline CH39 – 7 family members of trapline CH39 – 2 community members – CNC Natural Resources Relations Officer	– Recent project developments – Project schedule – Environmental impact assessment – Presentation by the tallyman of trapline CH39

3.3.3.4 Targeted meetings with other Cree authorities

Between April 2024 and December 2025, eight meetings were conducted with various Cree organizations in Chisasibi to gain a better understanding of community dynamics. These meetings also provided an opportunity to document participants' concerns and to gather their comments and suggestions related to the project. Stakeholders from the following organizations were consulted:

– Cree School Board – Adult Education Services;

- Cree Trappers' Association;
- Cree Board of Health and Social Services of James Bay;
- Chisasibi Eeyou Resource and Research Institute (CERRI);
- Niskamoon Corporation.

In March 2025, additional discussions were held with members of CERRI and Niskamoon Corporation regarding fish habitat compensation measures. Similar discussions were also held multiple times with members of the family of the tallyman responsible for trapline CH39 as well as with land users of the Cree Nation of Wemindji in October 2025.

Representatives of the Chisasibi Business Development Group (CBDG), as well as several local businesses, including Saskounan Construction, Niigaan, Cree Construction and Development Company and Kuikuhaacheu, were also invited to meet with PMET to learn more about the project and the related business opportunities.

During the period, meetings were also held with various organizations in the community to inform them about the Project and discuss potential joint initiatives related to education and training, including the Chisasibi secondary and vocational schools, as well as the Eeyou Istchee College of Science and Technology.

PMET intends to continue engaging with these authorities to support ongoing project planning. Activities carried out to date are presented in Table 3-8.

Table 3-8 Meetings with other Cree authorities

Date and location	Participants	Topics discussed
April 15, 2024 Chisasibi	– 2 representatives from CERRI	– Presentation of the project – Fish habitat compensation program – Exploration program – EIA process – Worker' training – Community and workers' health
May 31, 2024 Chisasibi	– 1 representative from CERRI	
January 22, 2025 Chisasibi	– 1 representative from CERRI	
January 23, 2025 Online	– 1 representative from the Cree School Board	
January 23, 2025 Online	– 1 local representative from the Cree Trappers' Association	
February 4, 2025 Online	– 1 representative from the Cree Health Board	
March 17, 2025 Chisasibi	– 1 representative from CERRI	
March 17, 2025 Chisasibi	– 1 representative from the CNC Niskamoon Corporation	
April 1, 2025 Online	– 2 representatives from the Cree Health Board	

Date and location	Participants	Topics discussed
July 8, 2025 Chisasibi	– 1 representative from the CNC Niskamoon Corporation	
October 23, 2025 Chisasibi	– 1 representative from CERRI	

3.3.3.5 Other outreach activities

Public events and community cultural activities organized by PMET or in which it participated are listed in Table 3-9.

Cree cultural events

On June 1, 2024, PMET organized the first Shaakichiuwaanaan Day, bringing together members of the Cree community of Chisasibi, workers from the mine site, and members of PMET's management team. The purpose of the event was to build relationships with the community and celebrate Cree culture. For the occasion, a *sabtuan* (tent) was erected, and participants shared traditional foods. A tour of the workers' camp was also organized for community members. Some participants also travelled to the CV5 extraction site and to the core shack at the Mirage Lodge site, a lithium exploration project led by Brunswick Exploration. PMET intends to make this an annual event. The second edition of Shaakichiuwaanaan Day was held on September 7, 2025.

The company also marked National Truth and Reconciliation Day and Orange Shirt Day in 2023, 2024, and 2025. In 2024, to mark this commemorative day in honour of survivors of residential schools, a camp was set up on trapline CH39 together with the tallyman and his family.

Site Visits

In February 2025, at the request of the tallyman of trapline CH39, he and his family, along with the Deputy Chief of Chisasibi, visited the surface facilities of the Eleonore Mine, an operating gold mine located on the territory of the Cree community of Wemindji. In August 2025, PMET also organized a visit to the Whabouchi Mine, owned by Nemaska Lithium. The tallyman of trapline CH39, five members of his family, the Deputy Chief of Chisasibi, and a council employee toured various mine facilities, including the camp, the open pit, the ponds, and the ore processing plant.

Table 3-9 Other engagement activities (cultural events, site visits, etc.)

Date and location	Activity	Participants
June 1, 2024 Shaakichiuwaanaan Property	Public Event – Shaakichiuwaanaan Day	– 34 members of the Cree community of Chisasibi
February 22, 2025 Eeyou Istchee James Bay	Site visit – Eleéonore Mine	– Tallyman of trapline CH39 – 8 family members of trapline CH39 – CNC Assistant Chief – CNC Natural Resources Relations Officer
August 2, 2025 Eeyou Istchee James Bay	Site visit – Whabouchi Mine	– Tallyman of trapline CH39 – 5 family members of trapline CH39 – CNC Assistant Chief – CNC Natural Resources Relations Officer
September 7, 2025 Shaakichiuwaanaan Property	Public Event – Shaakichiuwaanaan Day	– 61 members of the Cree community of Chisasibi

3.3.4 Results of engagement activities and PMET responses

The main comments raised by Indigenous stakeholders are presented in this section. These comments have been compiled into three separate tables: one for Chisasibi, one for Mistissini and Wemindji, and one for the Cree Nation Government and other Cree stakeholders. The tables below summarize the concerns, questions, and suggestions expressed by stakeholders. These are organized by issue and linked to the relevant valued ecosystem component (VEC). Comments that do not relate directly to the VECs identified in the EIA have also been included, such as concerns or questions regarding the assessment or consultation process.

The comments are drawn from PMET's communications log (see Section 3.1.3) and from selected meeting transcripts. The "Reference in the EIA" column identifies certain commitments, measures, or approaches considered by PMET and refers to the sections of the impact assessment that address the concern.

A summary of the key concerns is presented following the tables in Section 3.3.4.4.

3.3.4.1 Chisasibi

Table 3-10 Concerns identified during engagement activities with the Cree Nation of Chisasibi

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures or related documents)
Preservation of health, safety, and socioeconomic conditions of the regional population		
Physical, psychological, and social health	Cultural safety – Ensure a culturally safe environment on site and at the workers' camp (e.g., cultural safety program)	PMET works closely with the community liaison coordinator to develop a cultural safety program for its Indigenous employees. PMET has a workplace harassment policy and a process for handling harassment complaints.
	Workers' lifestyles – Concerns regarding nutrition, substance use, and physical exercise at the workers' camp	PMET plans to develop a workers' camp designed to provide a restful and healthy environment. The camp will include: – a gym; – an indoor and outdoor common areas for resting; – a cafeteria offering healthy meal options. All concerns regarding health impacts and proposed mitigation measures are addressed in the health sectoral report (Appendix 6-24).
	Physical health of workers – Concerns regarding the impacts of working on-site (e.g., exposure to contaminants or dust)	PMET has implemented an occupational health and safety prevention program. Health risks were evaluated as part of the human health risk assessment (HHRA) (Appendix 6-24). The anticipated impacts and proposed control measures for air emissions are described in section 8.2.4 of Chapter 8. Ambient air quality monitoring will be initiated at the start of construction (section 13.2.2 of Chapter 13).
	Mental health of workers – Concerns regarding the impact of work schedules and commuting on workers' mental health and work-life balance	PMET plans to offer 7/7 and 14/14 work rotations. PMET also intends to implement workplace support measures to help mitigate the potential negative effects of fly-in/fly-out (FIFO) arrangements, including: – Training mental health leaders; – Providing access to consultations with a mental health professional; – Providing access to a 24/7 telephone hotline or chat service.

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures or related documents)
	Social cohesion – Concerns regarding the project's impact on community relations (e.g., equitable sharing of benefits)	PMET recognizes that the project may exacerbate tensions within families and the community and is committed to considering all concerns and to delivering meaningful benefits to the community as a whole.
	Vulnerable populations – Concerns regarding the health and safety of vulnerable populations (e.g., individuals with chronic illnesses, women, etc.)	The health and safety of vulnerable populations are addressed in section 8.2.5 of Chapter 8 and in Appendix 6-24. PMET remains open to discussions regarding additional measures that could be implemented to ensure their health and safety.
	Spiritual well-being – Concerns regarding the project's impact on the spiritual well-being of local stakeholders	Concerns regarding spiritual well-being are addressed in the chapter about health (Appendix 6-24).
	Access to health services – Concerns regarding pressure on health services if mine employees use them	24-hour on-site nursing services will be available. If necessary, workers will be airlifted (Appendix 8-2).
Economic activities	Employment opportunities – Expectations regarding competitive employment opportunities for members of Cree communities	PMET plans to develop and implement a local workforce recruitment and training strategy (see sections 5.10 of Chapter 5, Appendix 5-12 and section 8.2.5.2 of Chapter 8). A full-time community liaison coordinator was hired in January 2024, and an office was opened in Chisasibi in August 2024 (see section 3.1.1.3). The coordinator supports PMET's communications regarding employment opportunities and facilitates connections between community businesses and project-related business opportunities. Employment-related matters are addressed in section 8.2.5 of Chapter 8.
	Economic benefits and business opportunities – Expectations regarding economic benefits and business opportunities for Cree businesses	Since 2023, discussions have been held with Chisasibi regarding partnerships and business opportunities (section 3.3.3.1, Table 3.2). An Impact and Benefit Agreement (IBA) will be discussed with Chisasibi and the Cree Nation Government. A monitoring committee will be established to ensure that the agreement's objectives are achieved throughout the life of the project (section 3.3.6.1).
	Training – Provision of training tailored to members of Cree communities to support employment at the mine	PMET is committed to working with the Cree School Board and the community of Chisasibi to implement tailored training programs to ensure that the local labour force can access available positions (Appendix 8-2). A prior learning assessment and recognition program may also be implemented, as needed.

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures or related documents)
Road safety	Traffic – Concerns regarding increased traffic attributable to the project, particularly the transport of concentrate and workers	PMET is committed to identifying opportunities to reduce traffic-related impacts. To this end, the company has established a working group on the transportation of spodumene concentrate to optimize transport between the Shaakichiuwaanaan site and the transshipment centre in Matagami (see Section 3.1.1.3). Measures to ensure road safety are also in place, including radio communications, mandatory training, and escort vehicles for oversized loads (Appendix 8-2).
Preservation of traditional and non-Indigenous activities and land uses		
Well-being on the land	Preservation of the Cree way of life – Concerns regarding the project's impact on ecosystems necessary to sustain the Cree way of life on the land	PMET recognizes that time spent on the land is integral to many aspects of Cree culture and well-being, including the transmission of Cree values and language, mental health, healing, and collective memory. The company is aware that cumulative impacts on the land may affect the preservation of the Cree way of life. Actions implemented by PMET to celebrate and support Cree culture are presented in section 3.3.3.5.
	Cumulative impacts – Concerns regarding cumulative impacts attributable to mining, hydroelectric, and infrastructure projects on access to the land and climate-related hazards	Cumulative impacts on Cree culture are addressed in Chapter 10. This analysis considers, in particular, hydroelectric projects, forest fires, and climate change (Section 9.3 of Chapter 9).
	Practising activities on the land – Implement measures to promote activities on the land, including: ▪ halting work during the hunting season ▪ programs to encourage youth participation in traditional activities ▪ providing space at the workers' camp for preparing traditional foods ▪ participation in the CTA fund	An IBA will be discussed with Chisasibi and the Cree Nation Government. A fund for land use and the preservation of the Cree Way of Life will be discussed as part of this agreement.
	Preservation of sites valued for traditional activities – Concerns regarding the protection of sites valued for traditional activities	PMET maintains regular communication with the primary users of the trapline. Interviews were conducted with land users to ensure that valued locations and sites would not be affected by the project (Section 3.3.3.2 of Chapter 3, Table 3-5 and 3-6).

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures or related documents)
Hunting and trapping of terrestrial wildlife and waterfowl	Maintenance of large wildlife – Conduct inventories and monitoring of large wildlife species populations	A large wildlife inventory was conducted in January 2023. A very low moose density (0.2 moose/10 km²) was recorded in the local assessment area. The results of this inventory are presented in Section 6.3.5. The company is working with the tallyman of trapline CH39 on wildlife habitat improvement. Monitoring of large wildlife will be defined in collaboration with the tallyman. It is anticipated that the tallyman and his family will be able to harvest large wildlife species on the Shaakichiuwaanaan property.
Harvesting of valuable plant species	Plant species – Concerns regarding the project's impact on plant species	Discussions with the main users of trapline CH39 identified certain species for analysis, including blueberries and Labrador tea. PMET presented the results of the ecotoxicological studies in Chisasibi at a public meeting.
Fishing	Fish habitat: – Concerns regarding anticipated impacts on fish habitat and efforts to avoid or minimize impacts on fish habitat and promote fishing practices.	Certain species were identified with the assistance of the tallyman of trapline CH39, and these species were the subject of an ecotoxicological study. The planned fish monitoring program is presented in Section 13.2.3 and 13.2.4 of Chapter 13. PMET is developing a compensation plan for the loss of wetlands or water bodies, as well as for the loss of fish habitat (Section 14.3 of Chapter 14 and Appendix 14-3). Measures will be implemented to avoid, minimize and, where necessary, compensate for the loss of fish habitat. The development of a fishing program for Cree youth is under discussion with the tallyman of trapline CH39.
Preservation of aquatic habitat quality		
Hydrodynamic and hydro-sedimentary conditions	Water balance – Concerns regarding lake drainage and water flow from the site within the watershed and toward valued locations	Following comments and concerns raised by members of the Chisasibi community, PMET revised its plans by opting for a hybrid operation (underground and open pit), thereby reducing the area of affected lakes from 173 ha to 67 ha. The water balance is presented in Section 5.4.1 and in Appendix 5-10, and the description of the dikes and watercourse diversion in Section 5.4.3. Effluent dilution modelling was carried out to determine how far downstream from the discharge point concentrations of metals or other potential contaminants could be detected. The results of this modelling will be verified through monitoring of surface water and sediment quality downstream of the discharge point. A water treatment plant will be constructed to ensure that mine effluent discharge complies with applicable standards and regulatory requirements. Monitoring of mine effluent includes effluent characterization and toxicity testing using collected samples (Section 13.2.2 of Chapter 13). The scenarios analyzed for water management are presented in Section 4.1.3. The northern option is preferred in order to remain within the same watershed. The diverted water will flow into Lake Shaakichiuwaanaan (L27) within the same watershed.

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures or related documents)
Surface water quality	Surface water use – Concerns regarding the project's impact on the water quality of lakes and waterways, particularly drinking water quality and its effects on traditional foods, human health, and wildlife	The impact on surface water quality is analyzed in Section 8.2.1 of Chapter 8. An HHRA was conducted as part of the project (Appendix 6-24). Various water monitoring programs are planned (sections 13.2.2 of Chapter 13), and the analyses take into account all metals that could potentially be deposited in surface water as a result of airborne dust dispersion.
Preservation of soil and groundwater quality		
Soil quality	Spill management – Concerns regarding spill management	The communication framework and procedures to be followed in the event of spills in terrestrial or aquatic environments are set out in the Emergency Response Plan (ERP). The importance of considering freeze/thaw periods has been incorporated into the ERP (Chapter 12, Appendix 12-3).
	Waste management – Concerns regarding waste management at the site and at the workers' camp	The technical aspects of waste management and the 3R-V approach (reduce, reuse, recycle and recovery) are presented in Section 5.6 of Chapter 5. An environmental officer will ensure compliance with the hazardous materials management plan. Monitoring of waste and hazardous materials will be carried out, along with follow-up with employees, to ensure that sorting and recovery practices are properly implemented (Section 13.2.1 of Chapter 13).
Groundwater quality	Water management – Concerns regarding water management at the mining site	Impacts on water quality are addressed in Section 8.2.1 of Chapter 8 Monitoring of surface water and groundwater is described in Section 13.2.2 of Chapter 13. Compliance of sanitary wastewater will also be monitored (Section 13.2.2), as will the biological environment (fish, benthos and sediments) (Section 13.2.3 and 13.2.4).
Preservation of wetlands and habitats of interest to terrestrial fauna and flora		
Terrestrial fauna (large wildlife, small wildlife, avifauna, herpetofauna)	Caribou migration routes – Concerns regarding the project's impacts on caribou migration routes	Impacts on caribou are addressed in Section 8.2.3 of Chapter 8.
	Moose habitat – Concerns regarding the project's impacts on moose habitat, particularly disturbances related to traffic, drilling, and helicopter flights	Impacts on moose are addressed in Section 8.2.3 of Chapter 8.

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures or related documents)
	Bird and small wildlife habitats – Concerns regarding the project's impacts on bird and small wildlife habitats	The impact on geese and their migration route is addressed in Section 8.2.3 of Chapter 8.
Preserving the quality of life of the local population		
Air quality	Air emissions – Concerns regarding the project's impact on air quality and the health of workers and land users	Impacts on air quality and the planned air emission control measures are described in Section 8.2.4 of Chapter 8. Ambient air quality monitoring will be implemented at the start of the project construction phase (Section 13.2.2 of Chapter 13). Health risks were assessed as part of the HHRA (Appendix 6-24). PMET remains in regular contact with families in the area to address their concerns (Section 3.3.3.2).
Noise and vibration	Monitoring of noise and vibration levels – Questions regarding the location of sound measurement stations and the noise level associated with blasting	Seven sound measurement stations have been established, including three at camps located less than 15 km from the project site. Appendix 6-2 presents the results of the noise modelling. A noise and vibration monitoring program will be implemented during the project construction phase (Section 13.2.2).
Landscape	Landscape – Concerns regarding the potential impacts of infrastructure on the natural landscape	Two visual observation points were suggested by stakeholders from the Chisasibi community and were incorporated into the landscape impact assessment (Appendix 6-28). Visual simulations were presented to the Chisasibi community during a community information session. To the extent possible, PMET will preserve important viewpoints that serve as landmarks within the territory. Spoil piles and the pit will be shaped to reflect the surrounding relief in order to integrate them into the local topography. PMET will restore and revegetate the various site components at the end of operations. Restoration activities will be subject to a monitoring and follow-up program (Section 13.1 and 13.2)
Social acceptability, consultation process, and impact assessment process		
Social acceptability	Questions and comments regarding the negotiation of an IBA	An IBA will be negotiated between Chisasibi, the Cree Nation Government, and PMET when the stakeholders deem it appropriate.
	Concerns regarding limited knowledge of the project and its impacts	Several consultation and information activities (including presentations of the project, studies and results) were carried out within the community (Section 3.3.3 of Chapter 3).
	Comments and concerns regarding the importance of consent and building trusting relationships with various Cree stakeholders	PMET's regular presence in Chisasibi and the employment of a local coordinator are intended to foster open and trusting dialogue among community members, PMET and companies involved in the project. PMET maintains regular communication with trapline users who wish to discuss the project, as well as their concerns and suggestions (Sections 3.3.3 and 3.3.6 of Chapter 3).

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures or related documents)
	Change of the project name to the Cree name of "Shaakichiuwaanaan"	In July 2024, at the suggestion of certain members of the Chisasibi community, PMET renamed the Corvette Project, which is now called Shaakichiuwaanaan (Section 3.1.3).
	Questions regarding the schedule and technical aspects (including drilling, the workers' camp, road construction, market conditions, and the use and transportation of lithium) as well as site closure	PMET answered technical questions during consultation activities when the relevant information was available. The technical aspects of construction and operation are presented in Chapter 5. Certain elements of the project schedule are described in Sections 5.5 and 5.9. The rehabilitation and closure plan will be developed in partnership with the tallyman to ensure that future land use is respected (Appendix 8-2). Restoration activities will be subject to a monitoring and follow-up program (Sections 13.1 and 13.2 of Chapter 13).
Consultation process	Questions and concerns regarding the participation of the CH39 tallyman's family and project benefits for the community	Since 2022, discussions have taken place between PMET and the Chisasibi First Nation regarding consultation, opportunities for collaboration and potential business opportunities (Sections 3.3.2 and 3.3.3 of Chapter 3). PMET's regular presence in Chisasibi, as well as the employment of a local coordinator, is intended to promote open and trusting dialogue with community members. An IBA will be negotiated between Chisasibi, the Cree Nation Government, and PMET when the stakeholders deem it appropriate.
	Suggestions regarding preferred means of communication and best practices	Various communication tools were developed based on recommendations from Cree stakeholders (see Section 3.1.3). PMET also developed a communication protocol in collaboration Chisasibi (Section 3.3.2 of Chapter 3).
	Concerns regarding community participation and requests for additional information and consultation activities	Various communication and engagement measures were implemented in collaboration with the local coordinator and in accordance with the communication protocol established with Chisasibi and the Cree Nation Government (Section 3.1.3 of Chapter 3). Seven community information sessions were held in Chisasibi between October 2023 and December 2025, including three conducted in a World Café format as well as three informational poster displays at various locations within the community (Section 3.3.3.3 of Chapter 3). Site visits to operating mines were organized in 2025 with elected officials and family members of trapline CH39 (Section 3.1.1.5 of Chapter 3).
Impact assessment process	Questions about the impact assessment process (schedules, environmental studies, required authorizations)	Various questions were raised and PMET responded to these questions during meetings when the relevant information was available. The regulatory context and authorizations required for the project are described in Section 2.2. With respect to environmental studies, members of the Chisasibi Cree participated in the studies conducted by Niigaan for the project (Section 3.3.5 of Chapter 3).

3.3.4.2 Mistissini and Wemindji

Table 3-11 Main results of engagement activities with the Cree Nations of Mistissini and Wemindji

Valued ecosystem components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures, or related documents)
Preservation of the health, safety, and socioeconomic conditions of the regional population		
Economic activities	Jobs and business opportunities – Provide business opportunities for Mistissini companies and hire workers from the community	Beginning in 2023, discussions were initiated between PMET and the Cree Nations of Mistissini and Wemindji regarding consultation and collaboration with these communities (Section 3.3.3.1 of Chapter 3).
Preservation of aquatic habitat quality		
Hydrodynamic and hydro-sedimentary conditions	Hydrology – Concerns regarding impacts on hydrology, particularly on trapline M02A	The impact on hydrology is addressed in Section 8.2.1. No impact is anticipated on the hydrology of trapline M02A.

3.3.4.3 Cree Nation Government and Cree organizations

Table 3-12 Key results of engagement activities with regional Indigenous stakeholders (Cree Nation Government, CHB, CSB)

Valued components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures, or related documents)
Preservation of the health, safety, and socioeconomic conditions of the regional population		
Physical, psychological, and social health	Workers' lifestyles – Concerns regarding diet, drug use, and physical activity at the workers' camp	PMET intends to develop a workers' camp that offers a healthy and restful environment. For example, the camp will include: – a gym; – indoor and outdoor common areas for resting; – a cafeteria offering healthy meal options. All concerns regarding health impacts and proposed mitigation measures are addressed in the health sectoral report (Appendix 6-24).
	Workers' mental health – Concerns regarding the impacts of work schedules and commuting on workers' mental health and work-life balance	PMET plans to offer 7/7 and 14/14 work rotations. PMET intends to implement workplace support measures to help mitigate the potential negative effects of FIFO arrangements, including: – Training mental health leaders; – Providing access to consultations with a mental health professional; – Providing access to a 24/7 telephone hotline or chat service.
	Vulnerable populations – Concerns regarding the health and safety of vulnerable populations (e.g., individuals with chronic illnesses, women, etc.)	The health and safety of vulnerable populations are addressed in Section 8.2.5 of Chapter 8. PMET remains open to discussions regarding additional measures that could be implemented to ensure their health and safety.
	Access to health services – Establishment of a Medevac system	24-hour on-site nursing services will be available. If necessary, workers will be airlifted (Appendix 8-2).
	Emergency Disaster Relief Department – Request for donations to fund the Emergency Disaster Relief Department, which aims to manage crisis situations locally	Discussions will continue with the community to identify potential partnerships that respond to its needs.

Valued components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures, or related documents)
Economic activities	Training – Provide training tailored to members of Cree communities to support employment at the mine.	PMET is committed to working with the Cree School Board and the community of Chisasibi to implement tailored training programs to ensure that the local labour force can access available positions (Appendix 8-2). The programs will be offered in the community whenever possible.
	Recruitment – Suggestions on ways to communicate with and recruit Cree workers (e.g., internships, job fairs, benefits related to proximity to the territory)	A full-time community liaison coordinator was hired in January 2024 and a liaison office opened in Chisasibi in August 2024 (Section 3.1.3.2 of Chapter 3). The liaison coordinator supports PMET's communications regarding employment opportunities and facilitates connections between community businesses and various business opportunities. As part of the feasibility study, a list of mining sector positions was developed, including the associated training requirements for each position. PMET plans to organize a day dedicated to employment and training in Chisasibi.
Preservation of traditional Indigenous activities and non-Indigenous land uses		
Well-being on the land	Practice of traditional activities – Implement measures to facilitate the practice of activities on the land, including traditional activities and healing workshops at the site.	Discussions will be planned regarding an IBA with Chisasibi and the Cree Nation Government. A land use and Cree Way of Life preservation fund will be discussed as part of this agreement. Compensation measures have been established in partnership with the CH39 tallyman's family. Details are presented in section 3.3.5.3. A *cultural site* to be installed near the workers' camp would enable Cree community members to prepare traditional foods and participate in cultural renewal activities.
	Cumulative impacts – Concerns regarding cumulative impacts on the land and climate-related hazards	The cumulative impacts on Cree culture are addressed in Chapter 10. The assessment considers, among other factors, forest fires and climate change (see Section 10.2). Climate change resilience is addressed in Chapter 12.
Hunting and trapping of terrestrial wildlife and waterfowl	Trapping – Concerns regarding impacts on traplines near the project	PMET maintains regular communication with the tallyman of trapline CH39 and his family in order to avoid, mitigate, or compensate for potential impacts of the project on their activities. Discussions have also taken place with tallymen and other users of adjacent lands (VC26 and M02A) (Section 3.3.3.2, Section 8.2.6 of Chapter 8 and Appendix 8-2).

Valued components	Concerns, suggestions, requests, questions	Reference in the EIA (chapters, sections, mitigation measures, or related documents)
Preservation of soil and groundwater quality		
Soil quality	Waste management – Concerns regarding waste management at the site	The technical aspects of waste management and the 3R-V approach are presented in Section 5.6. An environmental officer will ensure compliance with the hazardous materials management plan. Monitoring of waste and hazardous materials will be carried out, along with follow-up with employees, to ensure that sorting and recovery practices are properly implemented (Section 13.2.1.4). PMET is committed to leaving no waste behind where work has been carried out.
Preservation of wetlands and habitats of interest to terrestrial fauna and flora		
Wetlands and water environments	Aquatic environments – Concerns regarding potential impacts of the project on nearby lakes and watercourses, particularly with respect to health risks associated with water consumption	Potential impacts on surface water quality is analyzed in Section 8.2.2 of Chapter 8. Various water monitoring measures are planned (Sections 13.2.2 of Chapter 13). The analyses consider all metals that could potentially be deposited in water bodies as a result of airborne dust dispersion.
Terrestrial fauna (large wildlife, small wildlife, avifauna, herpetofauna)	Terrestrial fauna – Concerns regarding the project's impacts on terrestrial fauna	Potential impacts on terrestrial fauna and wetlands are addressed in Section 8.2.3 of Chapter 8.

3.3.5 Contributions and participation of the Cree

Reflecting the Cree people's unique understanding of the land, the data collected from PMET's Cree partners has enhanced the company's understanding of both the biophysical and human environment.

3.3.5.1 Design and monitoring of the Shaakichiuwaanaan Project

Between November 1, 2023, and December 2025, PMET carried out close to 290 engagement activities. Of these, more than 200 were conducted with the Cree communities of Eeyou Istchee James Bay, including the Cree community of Chisasibi, as well as various Indigenous organizations. Based on the concerns and comments raised during these activities, PMET revised the design of the Shaakichiuwaanaan Project and selected a hybrid operating scenario, thereby reducing the area of impacted lakes from 173 ha to 67 ha. The rehabilitation and closure plan is being developed in partnership with the tallyman of trapline CH39 in order to promote the future use of the site.

Environmental data collection at the Shaakichiuwaanaan Project site is being carried out by WSP and Niigaan (a Cree joint venture). Members of the Cree community of Chisasibi, including the primary users of trapline CH39, are assisting the biologists working on site. Through this collaboration, several valued plant species, including blueberries and Labrador tea, were identified. These species have undergone ecotoxicological analysis and will be monitored during subsequent phases of the project. The same approach applies to fish species. Certain species identified with the assistance of the tallyman of trapline CH39 have undergone ecotoxicological studies and will be subject to ongoing monitoring. Large wildlife species will also be monitored in collaboration with the tallyman of trapline CH39. PMET is also working with the tallyman of trapline CH39 to implement a wildlife habitat enhancement program, as well as the rehabilitation and closure plan, in order to support the future use of the site.

3.3.5.2 Employment and business opportunities

As noted previously, PMET values the economic success of local communities and is committed to ensuring that its activities and value chain generate mutual and sustainable benefits. Accordingly, the company prioritizes business relationships with contractors that employ and procure locally, particularly within the community of Chisasibi. Between January 2023 and September 2025, PMET spent more than $55 million with Indigenous businesses or joint ventures.

In 2023, 48 Indigenous workers were employed on the Shaakichiuwaanaan property, representing a total of 2,650 workdays. Between January 1, 2024, and March 31, 2025, the number of Indigenous workers increased to 123. The majority were from the CNC, and they worked more than 8,416 days on site. During this period, Indigenous employees represented an average of 16% of the on-site workforce. Between April and December 2025, the average was established at 23%. Indigenous workers contributed to core logging work led by Dahrouge Geological Consulting, heavy equipment operations required for the construction and maintenance of the multi-user road, carried out by Saskounan Construction, drilling operations led by Forage Fusion, environmental surveys conducted by Niigaan (Desfor/Synergis Group), and camp operations in collaboration with Domco/Meeyobin Iywaashtin Savard. Saskounan and Niigaan are Cree companies based in Chisasibi. In 2024, Forage Fusion and Saskounan Construction formed a joint venture called Muskw, registered with CNC. Muskw provides construction and drilling support services.

PMET is committed to working with the Cree School Board and the community of Chisasibi to develop and implement tailored programs and training initiatives to ensure that community members have access to employment opportunities available at the site.

3.3.5.3 Cultural integration and capacity building

Since 2023, PMET has contributed more than $170 000 in donations and sponsorships, including $136 000 within Eeyou Istchee James Bay. PMET contributed to the 2023 Reconstruction Initiative Forest Fires Fund (RIFFF), which aims to rebuild Cree trapper camps damaged by forest fires, as well as to the Fonds Restor-Action Cri, which supports the cleanup of abandoned mineral exploration sites on the land in Eeyou Istchee.

PMET has supported various initiatives within the community of Chisasibi. Donations and sponsorships have contributed to the construction of a sweat lodge; the organization of the 36th Chisasibi Community Gathering, led by the Mamouweedow Minshtuk Committee; the hosting of the first symposium on economic and mining development; and end-of-year community celebrations as well as supporting different cultural and sporting events.

PMET is committed to collaborating with the tallyman of trapline CH39 to develop a fishing program for Cree youth.

3.3.6 Upcoming information and consultation activities

The Company intends to maintain ongoing and transparent communication with stakeholders and communities potentially affected by the Project throughout key stages of project development, including the release of the feasibility study and the present environmental impact assessment.

Once the impact assessment has been submitted, PMET will continue its information and consultation activities with local and regional Indigenous entities. The approach adopted by PMET will remain consistent with that described above, namely to:

- continue to visit the community of Chisasibi on a regular basis;
- maintain the Chisasibi liaison office operated by the Community Liaison Officer;
- engage with community representatives at each key stage of the Project;
- continue the work of the Spodumene Concentrate Transportation Working Group;
- publish community newsletters on a quarterly basis;
- distribute plain-language documentation to inform the community of recent developments;
- regularly issue press releases; and frequently update the content of the Company’s website.

The Company also intends to engage with the newly elected Chief and Council of Chisasibi and to co-develop with them various working committees—such as education and training, environment, business opportunities, social and cultural matters, and transportation, among others. PMET also plans to organize discussion groups with Elders, women, and youth, and to collaborate with the schools of Chisasibi. The Company will regularly organize information and consultation activities on the various topics addressed in this impact assessment. Additional engagement initiatives may be implemented based on the needs expressed by Indigenous stakeholders.

3.3.6.1 Impact and Benefit Agreement

An Impact and Benefit Agreement (IBA) is expected to be negotiated between Chisasibi, the Cree Nation Government, and PMET prior to the commencement of construction work on the project. Once the IBA is signed, the company will adapt its engagement approach in accordance with the provisions of the agreement.

3.4 Non-Indigenous Stakeholders and Government Authorities

3.4.1 Identified non-Indigenous stakeholders and government authorities

PMET has conducted a preliminary identification of stakeholders in the territory who are affected or potentially affected by the Shaakichiuwaanaan Mining Project. This analysis, based on publicly available information, focused on various government authorities as well as citizen, community, economic, social, and tourism organizations in the James Bay region. The preliminary list was expanded following receipt of the provincial Impact Assessment directive and was further refined throughout the development of the mining project, particularly as exploration activities progressed and the project design became more defined. The non-Indigenous stakeholders and government authorities presented in Table 3-13 were identified as part of the consultation process.

Table 3-13 Identified non-Indigenous stakeholders and government authorities

Category	Consulted stakeholders
Federal government	Impact Assessment Agency of Canada (IAAC)
	Fisheries and Oceans Canada
	Transport Canada
	Health Canada
	Natural Resources Canada
	Environment and Climate Change Canada
	Indigenous Services Canada

Category	Consulted stakeholders
Provincial government / Crown Corporations	Ministère des Ressources naturelles et des Forêts (MRNF)
	Ministère de l'Économie, de l'Innovation et de l'Énergie (MELCCFP)
	Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs
	Environmental and Social Impact Evaluating Committee (COMEV) / Environmental and Social Impact Review Committee (COMEX)
	Hydro-Québec
	Société du Plan Nord (SPN)
	Société de développement de la Baie-James (SDBJ)
Regional and municipal governments	Eeyou Istchee James Bay Regional Government (EIJBRG)
	Administration régionale Baie-James (ARBJ)
	Town of Radisson
	City of Matagami
Regional economic organizations	Attraction Nord (James Bay)
	Northern Entrepreneurship Centre
	Centre d'études collégiales à Chibougamau – Business and Community Services (BCS)
	Matagami Community Futures Development Corporation (CFDC)
Citizen and community organizations	Sûreté du Québec
	Jamésie Youth Employment Centre
	Uni-Vers-Elles Women's Center
	Centre d'études collégiales à Chibougamau
	Centraide Abitibi-Témiscamingue and Nord-du-Québec
	James Bay Vocational Training Centre
	James Bay Regional Health and Social Services Centre
	Radisson Health Centre
	Solidarité alimentaire Matagami
Recreational and tourism activities	Radisson Campground
	Mirage Adventure
	Vacation and basic shelter leaseholders
	Radisson Snowmobile Club
	James Bay Tourism

The local stakeholders and interested parties involved were listed and detailed in the communications register developed by PMET as part of the consultation process.

3.4.2 Engagement Activities

3.4.2.1 Federal and provincial governments

In early 2023, PMET initiated communications with government departments and Crown corporations to inform them of the planned exploration activities on the Shaakichiuwaanaan property and to discuss the development of the project.

Since the launch of the EIA phase, discussions have focused primarily on establishing the timeline for the EIA process and ensuring that the content of the EIA enables analysts from the various ministries, within their respective areas of expertise, to conduct a comprehensive assessment of the Shaakichiuwaanaan Mining Project. In this regard, at both the provincial and federal levels, the company is collaborating with an interdepartmental working group responsible for overseeing the EIA process for the Shaakichiuwaanaan Mining Project.

The main engagement activities conducted with federal and provincial government authorities are outlined below.

Table 3-14 Main engagement activities conducted with federal and provincial government authorities

Date Activity	Participants	Topics discussed
November 21, 2023 *Meeting with MRNF*	– Minister of Natural Resources and Forestry – Associate Deputy Minister of Mines	– Presentation of the Shaakichiuwaanaan Mining Project – Access to the land (roads) – Establishment of an interdepartmental working group regarding the authorization process for the Shaakichiuwaanaan Project
November 21, 2023 *Meeting with SPN*	– President and CEO	– Cumulative effects related to transportation on the Billy-Diamond Highway
November 21, 2023 *Meeting with SDBJ*	– President and CEO	– Use of LG-4 airport for fly-in/fly-out service for workers
February 27, 2024 *Meeting with Secrétariat aux relations avec les Premières Nations et les Inuit (SRPNI)*	– Director, Negotiations and Consultation Branch – Team lead, Centre of Expertise on Northern Governance – Indigenous affairs advisor, Centre of Expertise on Northern Governance	– Relations with the Cree Nation Government and the Cree Nations of Chisasibi, Wemindji, and Mistissini – Development of essential transportation infrastructure in Eeyou Istchee (La Grande Alliance initiative)
May 14, 2024 *Meeting with SPN*	– Economic impact maximization coordinator, Marketing office – Economic advisor – Stakeholder, Mining Policy Branch – Mining tax advisor – Engineer, Mining Industry Development Branch	– Tax measures and financial assistance programs available to the mining sector – Action 2.2.2 of the Quebec Plan for the Development of Critical and Strategic Minerals 2020-2025
May 22, 2024 *Meeting with MRNF*	– Regional director, Nord-du-Québec Regional Office – Territorial affairs advisor (Geomatics) – Territorial affairs advisor (Environment)	– Planned decontamination work at km 277 of the Transtaïga Road – Establishment of an interdepartmental working group regarding the authorization process for the Shaakichiuwaanaan Project
June 4, 2024 *Meeting with MELCCFP*	– Coordinator/Acting team lead, Mining Projects – Project Manager, Mining Projects	– Mining strategy and planning – Data collection required to describe the receiving (biophysical) environment – Studies required as part of the EIA – Hydrological studies (methods, baseline conditions, modelling)

Date Activity	Participants	Topics discussed
June 18, 2024 *Meeting with IAAC*	– Team lead – Senior Indigenous consultation analyst	– Mining planning – EIA Process – Data collection required to describe the receiving environment
July 11, 2024 *Interdepartmental working group meeting*	– Various representatives from MRNF and MELCCFP	– Data collection required to describe the receiving environment – Timeline for obtaining the necessary authorizations
August 27, 2024 *Meeting with MELCCFP*	– Coordinator/Acting team lead, Mining Projects – Project Manager, Mining Projects – Analyst, Impact Studies and Wildlife Habitats	– Baseline conditions for fish habitat (preliminary results, methodologies) – Proposed compensation projects
September 3, 2024 *Meeting with MELCCFP*	– Coordinator/Acting team lead, Mining Projects – Project Manager, Mining Projects – Engineer, Atmospheric remediation – Analyst, Climatology	– Characterization and assessment of the atmospheric environment (methodology, baseline conditions, modelling scenarios)
September 10, 2024 Meeting with various ministerial representatives	– Coordinator for Maximizing Economic Benefits, Marketing Office (SPN) – Economic Advisor (SPN) – Speaker, Mining Policy Branch (MRNF) – Advisor, Mining Taxation (MRNF) – Engineer, Mining Industry Development Branch (MRNF) – Representative, Corporate Tax Policy Branch (Ministry of Finance of Quebec) – Representative, Services Québec Branch, Nord-du-Québec (Ministry of Employment and Social Solidarity of Quebec)	– Tax measures and financial support programs in place for the mining sector
September 20, 2024 *Meeting with SPN*	– Economic impact Maximization Coordinator, Marketing Office (SPN)	– Transportation of spodumene concentrate – Extension of Route 167 North planned under the La Grande Alliance initiative

Date Activity	Participants	Topics discussed
September 25 *Provincial interdepartmental working group meeting*	– MRNF ▪ Territorial Affairs Advisor, Head of Geomatics ▪ Representative, Mining Project Development and Oversight – MELCCFP ▪ Municipal Coordinator, Water and Natural Environment ▪ Analyst, Impact Studies and Wildlife Habitats ▪ Analyst, Industrial Infrastructure ▪ Analyst, Hydrology and Wetlands	– Timeline for obtaining the necessary authorizations
November 13, 2024 *Meeting with SPN*	– Director, Infrastructure Projects Division – Infrastructure Advisor, Infrastructure Projects Department – Investment Advisor	– Infrastructure projects planned under the La Grande Alliance initiative ▪ Route 167 North extension project ▪ Railway along Billy-Diamond Highway ▪ Deepwater port ▪ Use of LG-4 airport
November 14, 2024 *Meeting with IAAC*	– Project manager (interim), Quebec Regional Office – Team lead – Indigenous consultation analysts – Impact assessment officer	– EIA Process ▪ Memorandum of Understanding with the Cree Nation ▪ Timeline ▪ Project proponent portal ▪ Submission of Initial Project Description ▪ Geospatial data ▪ Preliminary consultations ▪ Engagement of Indigenous communities
November 26, 2024 *First meeting of the Federal Interdepartmental Committee*	– Various representatives from IAAC, Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada, Health Canada, Indigenous Services Canada, Transport Canada, Women and Gender Equality Canada, and the Cree Nation Government	– Timelines for the EIA process – Consultations planned as part of the EIA process – Collaboration with the Cree Nation Government
December 9, 2024 *Meeting with SRPNI*	– Director, Negotiations and Consultation Branch – Aboriginal Affairs Advisor, Centre of Expertise on Northern Governance	– Relationship with the Cree Nation Government and the Cree nations of Chisasibi, Wemindji, and Mistissini

Date Activity	Participants	Topics discussed
January 16, 2025 Meeting with Fisheries and Oceans Canada	– Various representatives from Fisheries and Oceans Canada	– Fish inventories – Compensation projects to be implemented
January 31, 2025 *Meeting with IAAC*	– Various representatives from IAAC	– Submission of Initial Project Description
February 12, 2025 *Meeting with SPN*	– Economic Impact Maximization Coordinator, Marketing Office (SPN) – Engineer, Mining Industry Development Branch (MRNF) – Director, Marketing Office (SPN)	– Battery component supply chain
February 12, 2025 *Meeting with Hydro-Québec*	– Large-Power sales representative	– Project energy requirements – Technical requirements
February 26–27, 2025 Online consultation activities organized by IAAC	– IAAC – MRNF – Cree Nation Government – Cree Nation of Chisasibi – Cree Nation of Mistissini – Mining Working Group of the James Bay region – Town of Radisson – EIJBRG – SPN – Mining Watch Canada	– EIA Process – Participation mechanisms available to the public
February 27, 2025 *Meeting with SDBJ*	– Director, Airport Services Department	– Participation in the working group on the transportation of spodumene concentrate – Baseline scenario for traffic on the Billy-Diamond Highway and Transtaïga Road – Use of LG-4 airport for fly-in/fly-out service for workers

Date Activity	Participants	Topics discussed
March 20, 2025 *Public event (Oujé-Bougoumou) organized by SPN*	– Various representatives of the Quebec government and SPN – Local and regional entrepreneurs	– Business meetings with local and regional entrepreneurs – Panel discussions *Eeyou Istchee James Bay, a land of opportunity: strategic preparation to leverage internal policies, best practices, and major projects*
March 27, 2025 Meeting with IAAC	– Various representatives from IAAC	– Summary of questions regarding the Initial Project Description
April 7, 2025 *Meeting with SDBJ*	– Project director – Director of Airport Services and Acting Director of Road Maintenance Services	– Feasibility study – Available traffic data for the Billy-Diamond Highway and Transtaïga Road – Preliminary parameters for spodumene concentrate transport
April 11, 2025 Meeting with Fisheries and Oceans Canada	– Various representatives from Fisheries and Oceans Canada	– Inventories – Results of fish habitat characterization – Fish habitat compensation plan
April 15, 2025 *Meeting with MELCCFP*	– Coordinator/Acting team leader, Mining Projects – Project Manager, Mining Projects	– Impact assessment approach – Community consultations – Geochemistry
May 23, 2025 *Meeting with MRNF*	– Head of the Abandoned Mine Site Restoration Department, Mining Legacy Liabilities Team (state-owned mine sites)	– Compensation projects and orphaned mining sites
June 11, 2025 *Meeting with IAAC and Environment Canada*	– Various representatives from IAAC and Environment Canada	– Project schedule – Authorizations required from Environment Canada – Species at risk within the study area – Analysis of alternatives for mining waste storage – Baseline conditions for fish habitat – Infrastructure plan
June 18, 2025 Meeting with SPN and MRNF	– Economic Impact Maximization Coordinator, Marketing Office (SPN) – Executive Assistant/Acting Director General, Mining Industry Development Branch (MRNF) – Mining Policy Development Advisor(MRNF)	– Quebec Government Financing and R&D plans and programs – Calcination project – Rules governing bulk sampling

Date Activity	Participants	Topics discussed
July 8, 2025 *Meeting with IAAC*	– Project Manager – Senior Consultation Analyst	– Planification des consultations publiques
July 16, 2025 Meeting with IAAC, Environment Canada, and Fisheries and Oceans Canada	– Various representatives from IAAC, Transport Canada, Environment Canada, and Fisheries and Oceans Canada	– Permitting plan – Navigation – Fish habitat compensation projects – Mining waste management
July 18, 2025 *Meeting with MELCCFP at their office in Québec City*	– Acting Director, Industrial and Mining Projects Environmental Assessment Department	– Impact assessment process – Key project issues
July 23, 2025 *Meeting with IAAC and CNG*	– Director, Quebec Region (IAAC) – Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Associate Director (IAAC) – Environmental Analyst (CNG)	– Publication of the impact assessment guidelines – Permitting plan and impact assessment proces
August 28, 2025 *Meeting with MRNF*	– Economic Impact Maximization Coordinator, Marketing Office	– Northern Business Network – Extension of Route 167 North planned under the La Grande Alliance initiative – Calcination project – Mining Working Group of the James Bay region – Use of LG-4 airport for fly-in/fly-out service for workers
September 9, 2025 *Meeting with IAAC and CNG*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Environmental Analyst (CNG)	– Project update – Planning of public consultations
October 14, 2025 *Meeting with IAAC and CNG*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Environmental Analyst (CNG)	– Preliminary review of report

Date Activity	Participants	Topics discussed
October 28, 2025 *Meeting with IAAC and CNG*	– Director General, Regional Operations (East) (IAAC) – Director, Quebec Region (IAAC) – Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Environmental Analyst (CNG)	– Schedule for obtaining the required authorizations
October 28, 2025 *Meeting with DFO, IAAC and CNG*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Senior Biologist, Fish and Fish Habitat Protection, Regulatory Reviews (DFO) – Environmental Analyst (CNG)	– Permitting plan – Fish and fish habitat compensation projectst
November 6, 2025 *Meeting with IAAC and CNG*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Environmental Analyst (CNG)	– Planning of public consultations and approach regarding key community concerns
November 18, 2025 *Meeting with MELCCFP*	– Acting Director – Project Officer – Industrial and Mining Projects Environmental Assessment Department	– Project update – Air dispersion modelling – Preliminary assessment of socioeconomic impacts
November 27, 2025 *Meeting with Transport Canada*	– Officer, Navigation Protection Program (Transport Canada) – Project Manager, Permitting Coordination (IAAC)	– Project update – Navigation – Schedule for obtaining the required authorizations
December 11, 2025 *Meeting with DFO, IAAC and CNG*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Senior Biologist, Fish and Fish Habitat Protection, Regulatory Reviews (DFO) – Environmental Analyst (CNG)	– Preliminary review and comments on the fish and fish habitat compensation plan
January 21, 2026 *Meeting with MELCCFP at their office in Québec City*	– Acting Director – Project Officer – Industrial and Mining Projects Environmental Assessment Department	– Air dispersion modelling – Schedule for obtaining the required authorizations

Date Activity	Participants	Topics discussed
January 22, 2026 *Meeting with IAAC and CNG*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Environmental Analyst (CNG) – Environmental Analyst (CNG)	– Impact assessment process
January 29, 2026 Provincial interdepartmental working group meeting MRNF, MELCCFP, SPN, Economy; approx. 17 analysts in person in Chibougamau and via Teams	– Regional Director, Nord-du-Québec and Environmental Liabilities Expertise Hub, Public Lands Branch, MRNF – Land Affairs Advisor – Geomatics Lead, MRNF – Officer – Mining Project Development and Oversight, MRNF – Active Sites Restoration Coordinator, Mining Sites Restoration Branch, MRNF – Project Officer, Industrial and Mining Projects Environmental Assessment Department, MELCCFP – Analyst, Regional Directorate of Analysis and Expertise for Abitibi-Témiscamingue and Nord-du-Québec, MELCCFP – Municipal Coordinator – Water and Natural Environments, MELCCFP – Analyst – Impact Assessments and Wildlife Habitats, MELCCFP – Analyst – Industrial Infrastructure, MELCCFP – Analyst – Hydrology and Wetlands, MELCCFP – Coordinator, Maximizing Economic Benefits, SPN – Advisor, Maximizing Economic Benefits, SPN	– Schedule for obtaining the required authorizations
February 25, 2026 *Meeting with ECCC, IAAC and GNC*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Environmental Analyst (CNG)	– Caribou – Sectoral report
February 27, 2026 *Meeting with IAAC and CNG*	– Project Manager (IAAC) – Senior Consultation Analyst (IAAC) – Environmental Analyst (CNG)	– Consultations regarding human health
March 4, 2026 *Meeting with IAAC*	– Director General, Regional Operations (East) – Director, Quebec Region	– Échéancier pour l’obtention des autorisations nécessaires

3.4.2.2 Local and regional government authorities and stakeholders in the territory

Since 2017, PMET has kept the Eeyou Istchee James Bay Regional Government (EIJBRG) informed by email of developments related to exploration activities on the Shaakichiuwaanaan property. Each year, the company submits its exploration plan for the Shaakichiuwaanaan property to the EIJBRG.

During the exploration phase, PMET met in person with senior officials from the Town of Radisson and the City of Matagami, as well as representatives of the EIJBRG. The purpose of these meetings was to introduce PMET, present the Shaakichiuwaanaan Mining Project, and initiate dialogue among the parties. Subsequent meetings were held to present the project's Preliminary Economic Assessment and to invite Radisson and Matagami to be part of the regional working group on the transportation of spodumene concentrate.

As part of the EIA process, targeted meetings were conducted with representatives of the Town of Radisson and the City of Matagami. Additional targeted interviews were also carried out with representatives of the James Bay Regional Administration, as well as stakeholders from citizens, community, and tourism organizations in the region. These meetings, held by videoconference, took the form of structured interviews aimed at gaining a better understanding of the organization or entity represented, documenting the observed effects of other mining projects in Eeyou Istchee James Bay, and considering the potential positive and negative impacts of the Shaakichiuwaanaan Project. These meetings also helped identify cumulative effects to be considered and gather mitigation measures proposed by stakeholders.

The following table presents the various engagement activities conducted with communities of the James Bay region, as well as other regional authorities.

Table 3-15 Main engagement activities carried out with communities of the James Bay region and other regional authorities

Date – Activity	Participants	Topics covered
December 10, 2023 *Introductory meeting with the Town of Radisson*	– Mayor, Town of Radisson – Councilor, Town of Radisson – Director General, Town of Radisson – Public Works Foreman	– Introduction of PMET – Presentation of the Shaakichiuwaanaan Mining Project – Local perspectives on project development – Planned exploration activities and drilling work
March 13, 2024 *Introductory meeting with EIJBRG*	– Director of Natural Resources and Territory, EIJBRG	
June 13, 2024 *Introductory meeting with the City of Matagami*	– Director General, City of Matagami	
December 5, 2024 *Follow-up meeting with the City of Matagami*	– Director General, City of Matagami	– Preliminary economic assessment of the project – Regional working group on the transportation of spodumene concentrate – EIA process
December 10, 2024 *Follow-up meeting with the Town of Radisson*	– Mayor, Town of Radisson – Director General, Town of Radisson	
January 17, 2025 *First meeting of the regional working group on the transportation of spodumene concentrate*	– Representatives from the Cree Nations of Chisasibi and Wemindji, the City of Matagami, the Town of Radisson, and the EIJBRG	– Experience with other mining projects – Traffic on the Transtaïga Road and Billy Diamond Highway (comments and concerns)
February 13, 2025 *Targeted meeting*	– Director General, City of Matagami	– Land use, planning, and development – Economy and services – Social fabric and health – Land use
March 4, 2025 *Targeted meeting*	– Director of Development and Partnerships, Centraide Abitibi-Témiscamingue and Nord-du-Québec	

Date – Activity	Participants	Topics covered
March 19, 2025 *Targeted meeting*	– Assistant to the President and Director General, Media Relations, Communications, and Legal Affairs, James Bay Regional Health and Social Services Centre (CRSSSBJ) – Program Manager and Site Manager, Radisson Health Centre	– Issues identified – Mitigation measures – Other activities and cumulative effects
April 17, 2025 *Targeted meeting*	– Executive Director, James Bay Regional Administration	
April 17, 2025 *Targeted meeting*	– Director General, Town of Radisson – Coordinator of Sports, Recreation, Culture, Tourism, and Community Life – Director of Fire Safety Services	
April 22, 2025 *Targeted meeting*	– Executive Director, James Bay Tourism	
April 22,2025 *Targeted meeting*	– Programming, Planning, and Research Officer, CRSSSBJ – Public Health Department	
June 26, 2025 *Meeting with a recreational leaseholder*	– Owner of a recreational lease on the shores of Corvette Lake	– History and use of the recreational lease – Use of the multi-user road – Activities carried out by PMET on Shaakichiuwaanaan property – Environmental assessment process
July 2, 2025 *Follow-up meeting with EIJBRG*	– Land use planning coordinator, EIJBRG – Partnerships and Major Projects Coordinator	– ATI request for a bulk sample of erratic blocks
July 17, 2025 *Targeted meeting*	– Owner of a recreational lease on the shores of Corvette Lake	– Land use – Issues identified – Mitigation measures – Other activities and cumulative effects
December 17, 2025 Meeting with EIJBRG	– Partnerships and Major Projects Coordinator – Land Use Planning Coordinator	– Feasibility study of the project

3.4.3 Results of Engagement Activities and PMET Responses

This section summarizes the main comments expressed by non-Indigenous stakeholders and various government authorities. Organized by stakeholders, these comments address anticipated impacts, key issues and concerns raised, as well as suggestions and expectations. The comments are drawn from PMET's communications log (Section 3.1.1.3) and from selected meeting summaries. The company's responses, along with the measures and approaches it is considering, are also presented.

Table 3-16 Key results of engagement activities with of the James Bay region and municipalities and other regional authorities

Topics	Requests, concerns, questions, and suggestions	Responses, commitments, and actions
Preservation of aquatic habitat quality		
Surface water quality	Water management – Question regarding the location of the mine effluent discharge	The water management scenarios analyzed are presented in Section 4.1.3. The northern option is preferred in order to remain within the same watershed. Diverted water will flow into Lake Shaakichiuwaanaan (L27) within that same watershed. A water treatment plant will be constructed to ensure that mine effluent discharges comply with applicable standards and regulatory requirements. Effluent dilution modelling was conducted to determine how far downstream of the discharge point concentrations of metals or other potential contaminants could occur. The results of this modelling will be verified through monitoring of surface water and sediment quality downstream of the discharge point (Section 13.2.2 of Chapter 13).
Aquatic fauna and habitats	Fish habitat: – Questions regarding anticipated impacts on Corvette Lake and efforts to avoid or minimize impacts on the lake and fish habitat	Water from the mine site will not discharge into the Corvette Lake watershed. Measures to avoid or minimize impacts on fish habitat are discussed in section 8.2.1 of Chapter 8.
Preservation of wetlands and habitats of interest to terrestrial fauna and flora		
Wetlands and water environments	Wetlands and biodiversity: – Concerns regarding potential impacts on wetlands and biodiversity Compensation: – Questions regarding the proposed compensation projects, given the large number of wetlands in the region	PMET will ensure that a 10- to 15-metre riparian buffer strip is maintained around wetlands, watercourses, and water bodies, depending on slope conditions. Issues related to wetlands and biodiversity are addressed in Section 8.2.3 of Chapter 8. PMET is developing a compensation plan for the loss of wetlands and other water environments, as well as for the loss of fish habitat (Section 14.3 of Chapter 14).
Preserving the quality of life of the local population		
Air quality	Ambient air quality: – Concerns regarding potential impacts on air quality	PMET will implement an ambient air quality monitoring program during the construction and operation phases of the project (Section 13.2.2 of Chapter 13).

Topics	Requests, concerns, questions, and suggestions	Responses, commitments, and actions
Preservation of the health, safety, and socioeconomic conditions of the regional population		
Physical, psychological, and social health	Fly-in/fly-out service: – Questions regarding the use of fly-in/fly-out service during the operational phase, including the choice of airport for worker transit – Concerns regarding the use of fly-in/fly-out service, particularly its impacts on the vitality of communities of the James Bay region, community health, and the maintenance of regional services – Expectations and interests from communities of the James Bay region regarding fly-in/fly-out service Community health and social services: – Contact the Public Health Department in the event of health issues at the mining site that may require care by regional health centres Substance use issues: – Concern that the Town of Radisson will become a place of substance use for workers at the mine site – Concerns regarding violence against women at the mine site Housing: – Concerns regarding access to housing Accommodation capacity: – Concerns regarding the capacity of the James Bay region to accommodate workers who choose to settle in the region – Collaborate with communities of the James Bay region to develop structuring projects aimed at strengthening their capacity to accommodate new residents Social investment: – Establish structuring projects, in conjunction with local partners, rather than providing donations and sponsorships Social restoration: – Develop a social restoration plan for when the mine closes to provide psychological support and employment assistance to Jamésie residents who need it	PMET plans to use fly-in/fly-out service for workers during the operational phase of the Shaakichiuwaanaan Project. Workers will transit through LG4 airport. PMET is committed to seeking opportunities to generate or enhance positive impacts, such as contributing to the social and economic growth of communities by prioritizing local and regional procurement and employment, and by investing in sustainable community and educational initiatives (Appendix 8-2). PMET has an occupational health and safety prevention program that includes coordination with the emergency infrastructure of the Jamesian communities concerned (Appendix 8-2). The sectoral report on health determinants takes into account social and well-being issues affecting workers' families. Issues related to substance use and health are addressed in Section 8.2.5 of Chapter 8. PMET develops and implements measures to encourage and increase women's participation in the mining industry, including workplace policies to prevent sexual harassment and violence. PMET will communicate with local and municipal authorities, as well as regional housing organizations, to inform them of anticipated workforce needs for each phase of the project in order to better anticipate potential housing requirements (Appendix 8-2). PMET will communicate and collaborate with local and municipal authorities to coordinate and promote the permanent settlement of newcomers in alignment with local strategies and planned residential development projects (Appendix 8-2). PMET is committed to implementing an employee assistance program to support employees during the transition to the end of operations.

Topics	Requests, concerns, questions, and suggestions	Responses, commitments, and actions
Economic activities	Socioeconomic benefits for local communities: – Concerns regarding economic benefits at the local and municipal levels in the region – Concerns regarding economic benefits at the level of cities and towns in the region – Hope that the Shaakichiuwaanaan Project will contribute to the socioeconomic development of communities of the James Bay region – Adapt tendering processes to the capacity of regional businesses, particularly to meet the project's transportation needs Employment, training, and economic development: – Question regarding the number of employees and subcontractors working on the Shaakichiuwaanaan property during the exploration phase – Question regarding the company's business model – Provide training opportunities for residents of the James Bay region seeking employment at the mine – Concern regarding the hiring of the required number of drivers – Concern regarding the potential impacts on the job market in Matagami – Interest in establishing local businesses that meet the needs of the project	PMET places importance on the economic success of local communities and is committed to ensuring that its activities and value chain generate sustainable and mutually beneficial outcomes. To this end, PMET relies on a local and regional procurement strategy (Section 5.10 of Chapter 5, Appendix 5-12 and Section 8.2.5 of Chapter 8). The number of employees and subcontractors in the exploration phase is specified in Section 5.10 of Chapter 5. PMET's presentation, project justification, and analysis of alternatives are discussed in Sections 1.1, 2.3, and 2.4, respectively. PMET plans to develop and implement a strategy for recruiting and training local and regional workers (see section 5.10 of Chapter 5).
Road safety	Impact of heavy traffic on Billy-Diamond Highway and Transtaïga Road: – Concerns regarding increased traffic on the Billy-Diamond Highway and Transtaïga Road, including negative effects on road safety (increased risk of collisions, run-off-road accidents, etc.). Ore transportation: – Question regarding the methods of transporting spodumene concentrate, including the extension of Highway 167 as a scenario under consideration – Contribute to initiatives aimed at ensuring the safety of users of the Billy-Diamond Highway and Transtaïga Road	PMET is committed to identifying opportunities to reduce the impact on traffic. To achieve this, PMET has set up a working group on the transportation of spodumene concentrate to optimize transportation between the Shaakichiuwaanaan site and the transshipment centre in Matagami (see section 3.1.1.3 of Chapter 3). PMET has conducted a pre-feasibility study on transportation to determine potential transportation routes. It is planned that spodumene concentrate will be transported via the Transtaïga Road and Billy-Diamond Highway to the transshipment centre in Matagami (Section 5.2.4 of Chapter 5). Transportation arrangements will be discussed within the working group on the transportation of spodumene concentrate. PMET is committed to collaborating on initiatives to ensure the safety of users of the Billy-Diamond Highway and Transtaïga Road.

Topics	Requests, concerns, questions, and suggestions	Responses, commitments, and actions
Preservation of traditional Indigenous activities and uses and non-Indigenous activities and uses		
Hunting and trapping of terrestrial wildlife and waterfowl	Poaching and non-compliance with quotas: – Concerns regarding an increase in poaching, particularly of moose populations frequenting the territories along the Transtaïga Road	Measures will be put in place to prohibit hunting and trapping activities by workers.
Fishing	Poaching and non-compliance with quotas: – Concerns regarding excessive fishing by mine employees	Measures will be put in place to prohibit hunting and trapping activities by workers.
Well-being on the land	Land use: – Plan land use based on anticipated impacts in order to avoid cumulative effects between the project and other projects already operating on the land. Landscape: – Concerns regarding potential impacts of infrastructure on the natural landscape. Soundscape: – Concerns regarding potential impacts on the soundscape – Use of the multi-use road – Request regarding the use of the multi-use trail connecting to the Shaakichiuwaanaan property from the Transtaïga Road	Consultations were carried out in 2024–2025 as part of this project to document land use (see Section 3.4.2.2, Table 3-15). PMET plans to implement a complaint management mechanism at the start of construction in order to anticipate potential conflicts related to interactions between project activities and those of third parties. The cumulative effects analysis is presented in Section 9.3 of Chapter 9. PMET will, to the extent possible, maintain important viewpoints that serve as landmarks in the area and will model the shape of the waste rock piles and pit to follow the surrounding terrain in order to integrate them into the local topography. PMET will restore and revegetate the various facilities at the end of operations. Impacts on the landscape are discussed in Appendix 6-28. Various mitigation measures will be implemented, and motorized equipment (trucks, loaders, bulldozers, backhoes, etc.) will be equipped with high-performance mufflers in good condition (Appendix 8-2). PMET will implement a program to monitor ground vibration velocities and air overpressure near permanent camps during the construction and operation phases of the mine (Section 13.2.2 of Chapter 13). Under certain conditions, it is possible to use the multi-user road.
Consideration of climate change		
Climate change mitigation (GHG emissions)	Energy: – Question regarding the project's anticipated energy needs	PMET conducted an energy options study to detail its electricity requirements and evaluate potential transmission line routes. A transmission line connecting Hydro-Québec's Tilly Substation to the Shaakichiuwaanaan property is planned (Section 5.3.2 of Chapter 5).

3.4.4 Upcoming Engagement Activities

Once the impact study has been submitted, PMET will continue its information and consultation activities with various government authorities, as well as with towns and municipalities in the James Bay region and other regional organizations. PMET's approach will remain consistent with that described above, namely:

- engaging with representatives of the federal, provincial, regional, and municipal governments at each key stage of the project;
- continuing the work of the working group on the transportation of spodumene concentrate;
- regularly issuing press releases; and
- frequently updating the content of the company's website.

Additional engagement initiatives may be implemented based on the needs expressed by the non-Indigenous community and government authorities.

4 Site location and technology alternatives

The following section provides an overview of technology and site location alternatives that were considered during the project planning process. Alternatives were considered with consideration for economic, social, technological and social criteria. The result of the alternatives assessment is a proposed project that reduces environmental impacts and maximizes benefits while accomplishing its objective.

4.1 Technology alternatives

4.1.1 Ore processing

Primero (2025) analyzed three main options for processing the raw ore generated by the Shaakichiuwaanaan mining project (the "project") on behalf of PMET (Appendix 4-1). These options include the basic treatment already considered, namely dense media separation (DMS), and two hybrid plant options including a flotation process to intercept what the DMS process has not retained (fines and ultrafines).

The DMS process involves crushing the ore to a size of less than 10 mm to enable gravity separation. In more detail, the steps include:

- Crushing aimed at generating three groups of particle size fractions: -9.5 mm to 3.3 mm, -3.3 mm to 1.5 mm, and -1.5 mm to 0.65 mm.
- The crushed material is introduced into a suspension of water mixed with ferrosilicon or magnetite (called a dense medium), which is adjusted to achieve a density of 2.6 g/cm³ to 2.8 g/cm³.
- The result is fed into a DMS cyclone, which separates the heavy particles containing the concentrated spodumene, which sink to the bottom of the cyclone, from the light particles of gangue, which float to the surface and are discharged (reject).
- The recovered concentrate is washed to remove the dense suspension and then dried for transport to a lithium transformation plant. The dense medium can be recovered by magnetic separation and reused in the process.

This process is primarily physical and avoids the introduction of chemical reagents. It has proven to be very effective for coarse fractions, enabling pre-concentration prior to flotation of up to 70%. However, the fine and ultrafine fractions of the ore, as well as the residues from re-crushing, must be treated by flotation.

Two hybrid plant options which add a flotation treatment section to the DMS process were considered to:

- intercept particles not intercepted by the DMS process (Option 1);
- intercept these same particles, as well as the re-crushing residues and the fine and ultrafine particles generated at various stages of the DMS process (Option 2).

In general, the flotation process works based on the difference in hydrophobic properties between mineral surfaces. Spodumene ore is rendered hydrophobic by adding reagents to an aqueous solution, while the gangue remains hydrophilic. The separation then takes place in a flotation cell where air bubbles capture the hydrophobic particles, which rise to the surface as froth. This froth is collected by skimming, dehydrated by filtration, and drying to recover the concentrate. Highly effective for fine particles, it is normally used in conjunction with a coarse particle treatment process such as the DMS process described above. However, it requires large quantities of chemical reagents and more complex water and sludge management. Furthermore, if this process were to be used to treat all the ore, it would have to be reduced to fine dust (<0.85 mm), which would require greater energy consumption.

The DMS process was ultimately chosen for the following reasons:

- The process is less sensitive to variations in ore quality and allows for good ore recovery (up to 70%).
- The process has little environmental impact (moderate water consumption for recycling the dense medium and discharge of generally inert solid matter).
- Consultations with Cree communities indicated that there would be greater resistance to the choice of a flotation process due to the higher risk of introducing chemical contaminants into the environment.
- The favorable geology of the deposit makes it possible to obtain a satisfactory concentrate quality without resorting to the flotation process, which has a greater environmental impact.
- Finally, considering the current price of spodumene, the recovery gains offered by the two hybrid plant options do not justify the required additional investment, since a return on this investment would only be achieved after 13.3 years (hybrid option 1) or 9 years (hybrid option 2), respectively.

4.1.2 Tailings and waste rock management

The management options considered for tailings and waste rock differ and are therefore presented separately. However, it should be noted that some of the waste rock will be managed at the same site as the tailings, as it is metal leaching, under certain conditions.

4.1.2.1 Tailings

Some of the tailings will be stored in an outdoor stockpile, while others will be used to make paste backfill for sections of the underground mine where operations have ended. The options under consideration mainly relate to the form in which the tailings will be stored in the stockpile. Three main alternatives were considered, namely:

- Pumping them, in the form of sludge, directly from the stockpile. This option eliminates the need to set up a process at the concentration plant to dry the tailings and limits the number of truck trips between the plant and the stockpile. However, this approach requires special modifications to the stockpile to ensure that the water contained in this sludge is recovered. This alternative will also direct an additional volume of water to be treated by the industrial water treatment plant. Lastly, this approach would require the establishment of a unique stockpile for tailings, as the sludge would make it difficult to manage on the same site as the metal leaching waste rock.
- Transforming them into thickened tailings, which generates a viscous material that can be pumped to the designated storage area. This option presents the same issues as the sludge management option, although the water content is lower.

- Dewatering the tailings at the concentration plant using DMS process units and transporting them by truck to the stockpile. This option allows surplus water to be recovered at the concentration plant and thus be reused in during the concentration process, reducing the volume of water to be treated at the industrial water treatment plant. In addition, their low water content allows them to be managed as solids, simplifying the design of the stockpile and allowing the creation of a joint space for dewatered tailings and waste rock that is metal leaching. However, this approach will require many truck trips to transport the tailings to the stockpile, as well as machinery for consolidation of the tailings in the stockpile. This issue can be mitigated by positioning the stockpile as close as possible to the plant, which was in fact one of the selection criteria for the installation of all storage sites. The advantage of this option also lies in the geotechnical stability of the structure (no liquefaction potential).

The option chosen is dewatering the tailings at the concentration plant and storing them in dewatered form at the stockpile that will be provided for this purpose. It should be noted that some of the tailings will be used to produce a paste for backfilling sections of the underground mine where operations have been completed.

4.1.2.2 Waste rock

There will be two main types of waste rock: those that are metal leaching and those that are considered low-risk. The alternative approaches considered for their storage mainly involve either placing them all in a single stockpile or separating them into separate stockpiles.

The option of storing them in a single stockpile avoids the creation of multiple stockpiles, but will result in significant volumes of water having to be treated due to the potential of a portion of the stored materials to be metal leaching. However, separating the two types of waste rock reduces the volume of water that needs to be treated, while also requiring the creation of two separate stockpiles. It should be noted that it is possible to mitigate the effects of an additional stockpile by combining the tailings discussed in the previous section with the metal leaching waste rock stockpile.

The option of separating the two types of waste rock into individual stockpiles was chosen, in combination with storing metal leaching waste rock with tailings in the same stockpile. Additional geochemical testing in the laboratory and in the field will be conducted to confirm the leachability of waste rock, as outlined in Chapter 5.

4.1.3 Water treatment

The water to be treated comes from various sources related to the project, including:

- sanitary facilities throughout the mine site;
- industrial water from the concentration plant and other activities related to mine operations;
- dewatering of the open pit and the underground galleries of the mine;
- rainwater from the site in general, but more specifically from various storage sites for tailings, waste rock, and organic soils.

The various water sources are managed using techniques specific to the anticipated contaminants. Each of the techniques selected is the result of a comparison between various alternatives, which are presented below.

4.1.3.1 Sewage water treatment

The process selected is a modular biological treatment plant combining a screen, an equalization tank, MBBR (Moving bed biofilm reactor) biological treatment, and a dissolved air flotation system. A phosphorus removal stage is also implemented to limit eutrophication of the effluent water.

A membrane bioreactor (MBR) biological treatment process was evaluated for water treatment. However, this option was rejected due to the operational constraints associated with this technology, particularly those related to membrane cleaning.

Furthermore, given the available space and the fact that sanitary effluent is then pumped to the polishing basin, the organic load from sewage becomes negligible. This limits the relevance of using an MBR, whose main advantage lies in its ability to achieve superior processing performance for TSS.

4.1.3.2 Contact water treatment

Two types of contact water must be managed separately: contaminated and non-contaminated contact water. The options considered for these are presented below.

Uncontaminated contact water

The uncontaminated contact water comes from waste rock stockpile 01 and runoff from the industrial area. This water contains only suspended solids as contaminants. Sedimentation ponds, as well as a polishing pond, have been designed to remove suspended solids before discharge into the environment.

The only option under consideration is a physico-chemical treatment system that has been proposed to remove total suspended solids. However, this option requires the addition of chemicals and additional operations. In addition to the capital and operating costs associated with a treatment plant, this approach also introduces increased operational risk.

Decantation was therefore preferred. However, since all effluent is pumped, it remains possible, in the event of exceedances of TSS criteria or the presence of another contaminant, to install a specific water treatment plant in the space already reserved for the contingency treatment system.

Contaminated contact water

The contaminated contact water includes runoff from stockpile 02, which contains both mine tailings and waste rock that may leach metals. In addition, the water from the concentrator is also included.

The treatment process for this water is based on physico-chemical principles, in particular successive precipitation. The formation of goethite, achieved by adjusting the pH and using coagulants, generates stable precipitates that are large enough to be effectively separated. The use of chelating agents promotes the complexing of certain metals. The sludge recirculation system facilitates the return of goethite to the process, which improves metal complexing and, consequently, treatment efficiency.

Alternatives to the overall water treatment process and its components that have been considered include:

- The use of sulphur-based chelating agents for the treatment of dissolved metals:

  This option was ruled out because the sludge produced is less stable, which complicates its disposal on site. In addition, the particles produced are generally finer, making them more difficult to manage and separate.

- The integration of ultrafiltration (UF) treatment:

  Although this technology offers high performance, it generates a significant amount of brine, which is complex to manage. Furthermore, its implementation is economically difficult to justify when the targeted contaminants or discharge requirements do not require the performance offered by UF.

4.1.3.3 Dewatering water treatment

Two options for managing dewatering water from the open pit mine were considered. They are related to the anticipated quality of this water. The first option consists of direct pumping into the natural environment, provided that the quality of this water met the discharge criteria of the MELCCFP and Directive 019. The second option involves pumping the water into a sedimentation pond before redirecting it to the mine site's polishing pond, where some of it can be reused in processes and some discharged into the environment (Watercourse CE11).

Given the presence of an underground mine, it is anticipated that the dewatering water will contain a significant amount of TSS. In addition, certain metals and ammonia, resulting from the use of explosives, can contribute to environmental contamination. For these reasons, the option chosen is to direct this water to the sedimentation pond, then to the mine's main pond.

This path not only guarantees the treatment of TSS, but also allows existing infrastructure to be used to redirect water to an active treatment system if necessary. In fact, depending on the quality of the dewatering water, additional treatment may be necessary.

To respond to this possibility, a treatment system has been designed based on the principles of coagulation and flocculation, and space has been reserved for its potential installation if the situation requires it.

4.1.3.4 Rainwater management and treatment

Rainwater management and treatment apply to the mining site in general (production and concentration facilities), waste rock stockpile 01, waste rock and tailings stockpile 02, overburden stockpiles 04 and 05, and organic soil deposits. The options for managing overburden and organic soils, which are not potential sources of contaminants other than suspended solids, were considered together when choosing the treatment option.

Rainwater treatment at the mining site

This refers to rainwater collected around ore production and concentration facilities, as well as around facilities related to maintenance and staff presence on site (camp). Only TSS is expected to be present in these waters. No alternatives were considered, as they will be captured by the system of ditches surrounding the facilities and directed to the polishing pond, where part of it can be reused in the processes and part discharged into the environment (watercourse CE11).

Treatment of rainwater from overburden stockpiles and organic soil deposits

Three options were considered for managing rainwater that had come into contact with these piles of materials, namely:

- Option 1: The installation of peripheral ditches around each pile that would drain into a collection pond, with the effluent directed to the mining site's sedimentation pond.
- Option 2: The installation of peripheral ditches as mentioned above, but with a discharge point into the open pit of the mine for management of this water together with the dewatering water.
- Option 3: Installation of catchment paddocks around the edges of the piles of materials. These plots, surrounded by dikes, would retain runoff water and allow sedimentation of suspended matter as the water percolates into the underlying soil.

Option 3, installation of peripheral catchment paddocks, was ultimately chosen. In fact, for option 1, the costs of providing an electrical connection to the overburden stockpiles located more than 2 km from the sedimentation ponds and the energy required to pump the collected water are significantly high. A similar problem leads to the rejection of option 2, since the water from the two overburden stockpiles cannot be directed by gravity toward the pit due to the local topography.

The option chosen is a passive system that requires little maintenance and no pumping of water.

Treatment of rainwater from waste rock stockpile 01

Due to the absence of acid leaching potential, but considering the presence of TSS associated with the presence of fine particles in the tailings, the water does not need to be treated, but the system must allow for sedimentation time. Thus, no alternative was considered, and this water will be intercepted by ditches that will direct it to two unlined ponds (001 and 001a), and their effluents will be discharged into the polishing pond at the mine site, where part of it can be reused in the processes and part discharged into the environment (watercourse CE11).

Treatment of rainwater from waste rock and tailings stockpile 02

The potential for metal leaching from the materials stored in this stockpile requires that rainwater percolating through it be treated at the industrial wastewater treatment plant. No alternatives were considered for this treatment, and the water is therefore captured by ditches and directed to two lined ponds (002 and 003), which direct the accumulated water to the industrial wastewater treatment plant. See Section 4.1.3.2 for the options considered for this treatment plant.

4.1.4 Mode of transport for the spodumene concentrate

Transporting the spodumene concentrate is a strategic element of the project, both in terms of economic performance and reducing environmental and social impacts. The chosen solution must enable the transport of an annual volume of approximately 800,000 tonnes of spodumene (or 2,300 tonnes per day including an additional 5% margin to account for weather conditions and other contingencies) from the mine site in northern Quebec to processing or shipping points, while complying with the logistical and regulatory constraints specific to the North. This section is based on the memo from G Mining Services (2025) *Note on transporting spodumene concentrate*, provided in Appendix 4-2 of this assessment.

4.1.4.1 Approach and analysis criteria

The assessment of transport alternatives is based on several criteria: user and worker safety, logistical reliability, investment and operating costs, reduction of GHG emissions, and social and environmental impacts. Significant distances, harsh climatic conditions, and limited infrastructure require rigorous planning and robust solutions. Three main scenarios were considered:

- **Scenario 1:** Transport by truck to Matagami, then by rail to an industrial facility in Bécancour, without handling by ship.
- **Scenario 2:** Transport by truck to Matagami, then by rail to the Port of Quebec (Beauport sector), including port operations.
- **Scenario 3:** Transport by truck to Matagami, then by rail to the port of Grande-Anse, with port handling prior to maritime shipment.

These scenarios are based on a combined road-rail network, limiting long-distance trucking and its impacts. The road section covers approximately 844 km (Billy-Diamond Highway and Trans-Taiga Road) to Matagami, where the rail transfer takes place. Loads per truck are estimated at 45–47 net tonnes (AGVW 68,750 kg), which can be optimized to 75 tonnes subject to specific permits.

4.1.4.2 Results of the economic analysis

Table 4-1 presents the breakdown of unit costs ($/t) and annual costs ($/year) for each scenario, based on a volume of 800,000 t/year and excluding fuel surcharges (not specified in the available data).

Table 4-1 Costs per segment and annual totals (Millette road transport company)

Transport segment	Bécancour (facility) $/t	Annual $	Grande-Anse (POL) $/t	Annual $	Québec-Beauport (POL) $/t	Annual $
Truck – Site → Matagami	95.00	76,000,000	95.00	76,000,000	95.00	76,000,000
Yard (sorting) – Matagami	2.00	1,600,000	2.00	1,600,000	2.00	1,600,000
Transshipment + storage	15.00	12,000,000	15.00	12,000,000	15.00	12,000,000
Rail – Wagon rental	11.30	9,040,000	11.30	9,040,000	12.56	10,048,000
Rail – Transportation	55.83	44,664,000	53.35	42,680,000	63.82	51,056,000
Subtotal delivered	179.13	143,304,000	176.65	141,320,000	188.38	150,704,000
POL Operations – Stacking	—	—	26.00	20,800,000	15.95	12,760,000
POL Operations – Ship loading	—	—	5.50	4,400,000	11.70	9,360,000
Total	**179.13**	**143,304,000**	**208.15**	**166,520,000**	**216.03**	**172,824,000**

These results show that the Bécancour alternative has the lowest unit cost ($179.13/t), followed by Grande-Anse ($208.15/t) and Québec-Beauport ($216.03/t). The differences are mainly due to port charges and rail distances.

4.1.4.3 Costs per transport company for each destination

Table 4-2 shows the variation in total costs according to the road transport company selected for each destination.

Table 4-2 Costs per tonne and annual costs based on destination and transport company

Destination	Road transport company	Costs/tonne ($/t)	Annual costs ($)
Bécancour	Transporter A	179.13	143,304,000
	Transporter B	229.46	183,568,000
	Transporter C	313.46	250,768,000
Québec–Beauport	Transporter A	216.03	172,824,000
	Transporter B	266.36	213,088,000
	Transporter C	350.36	280,288,000
Grande-Anse	Transporter A	208.15	166,520,000
	Transporter B	258.15	206,520,000
	Transporter C	342.48	273,984,000

These differences confirm the importance of the choice of transport company in the overall cost structure.

4.1.4.4 Preferred alternatives

The three options studied meet the project's logistical and environmental requirements. However, the combined road + rail solution is emerging as the best practice for reducing long-distance trucking and its impacts. Scenario 1 (Matagami–Bécancour) offers the most competitive cost and significant flexibility for land deliveries, while scenario 3 (Matagami–Grande-Anse) is the preferred solution for marine shipments, in line with the recommendations of the logistics memo (G Mining Services, 2025). The project favors Scenario 3, as the availability of an industrial processing facility in Bécancour cannot be guaranteed at that time.

4.1.5 Energy supply sources

4.1.5.1 Background and energy needs

The project is located in a remote area in the heart of the James Bay region, where climatic conditions are particularly harsh and winters are long. This reality imposes significant and continuous energy requirements, particularly for heating buildings, maintaining critical infrastructure, and ventilating underground tunnels. Heating requirements are particularly high during the winter months, with peaks in consumption to heat buildings and mining facilities. Energy supply must therefore meet several requirements: ensuring reliability and continuity of service, limiting investment and operating costs, reducing greenhouse gas (GHG) emissions, and minimizing the environmental and social footprint of the facilities.

Two technical and economic analyses were carried out (Appendices 4-3 and 4-4) to identify the most suitable energy solutions, both for the site's general energy supply and more specifically for heating, taking into account the following criteria:

- Reliability and continuity of supply in an isolated location.
- Capital expenditures (CAPEX) and operating expenditures (OPEX) over the project life cycle.
- Reduction of greenhouse gas (GHG) emissions.
- Potential integration of renewable energies.
- Logistical complexity and environmental footprint.

These criteria guided the assessment of various energy options, taking into account the logistical constraints specific to a remote site and the economic and environmental performance objectives.

4.1.5.2 Comparative analysis of electrical power supply options for the mining site

The mining site is expected to require, excluding heating, an average load of 34.55 MW per year during regular operations, from 2032 to 2048. To meet these electricity needs, a total of seven different scenarios were evaluated according to technical and economic criteria. They are briefly presented in Table 4-3.

Table 4-3 Description of the scenarios considered

Scenario	Description
1	Connection to Hydro-Québec's (HQ) grid: interconnection to HQ's grid from the Tilly substation, near the LG-4 hydroelectric power plant, via a 53-km, 120 kV line
2A	Stand-alone diesel power plant
2B	Hybrid diesel-powered stand-alone power plant integrated with renewable energy and a battery energy storage system (BESS)
3A	Stand-alone LNG power plant
3B	Stand-alone hybrid LNG power plant integrated with renewable energy and BESS
4A	Stand-alone CNG power plant
4B	Stand-alone hybrid CNG power plant integrated with renewable energy and BESS

Scenario 1 – Connection with Hydro-Québec

This scenario involves connecting to the Tilly substation located near the LG-4 power plant. This connection begins with the construction of a new 315-120 kV substation located near the Tilly substation and connected to it by a maximum 2 km 315 kV line. A 120 kV power line must then be built over a distance of 53 km between the new 315-120 kV substation and another substation installed at the mine site, which would operate at 120-13.8 kV.

GHG emissions associated with this scenario represent an annual maximum of 200 T CO_2eq per year, or 3,800 tons over the 23 years of operations considered in the comparative study.

The anticipated capital expenditures for this scenario are $195,000,000, while the projected operating costs (i.e., the cost of purchasing electricity) amount to $8,834,000 per year, for a total over the life of the mine of $203,176,000 per year, or $0.153/kWh.

Scenario 2A– Stand-alone diesel power plant

The aim here is to generate all of the mine site's electricity needs using stand-alone power plant consisting of diesel-fuelled generators.

GHG emissions associated with this scenario represent an annual maximum of 181,000 T CO_2eq per year, or 3,692,000 over the 23 years of operations considered in the comparative study.

The anticipated capital expenditures for this scenario are $174,315,000, while the projected operating costs (i.e., the cost of electricity production) amount to $38,367,000 per year, for a total over the life of the mine of $882,448,000 per year, or $0.405/kWh.

It should be noted that this scenario would allow the heat generated by the plant to be recovered and used to heat process and auxiliary buildings, thereby reducing the gas requirements currently planned for their heating (see Section 4.1.5.3).

Scenario 2B – Stand-alone diesel power plant integrated with renewable energies

The plan is to install the same diesel power plant as in scenario 2A, combining it with four wind turbines of 6,200 kW each (total 24,800 kW) and a 12,400 kW BESS with one hour of spinning reserve. The objective is to reduce diesel fuel consumption, in addition to saving on gas for heating process and auxiliary buildings.

GHG emissions associated with this scenario represent an annual maximum of 136,200 T CO_2eq per year, or 2,703,000 over the 23 years of operations considered in the comparative study.

The anticipated capital expenditures for this scenario are $269,322,000, while the projected operating costs (i.e., the cost of electricity production) amount to $27,638,000 per year, for a total over the life of the mine of $635,668,000 per year, or $0.347/kWh.

Scenario 3A – Stand-alone liquefied natural gas power plant

This scenario proposes the construction of a stand-alone power plant whose generators would run entirely on natural gas, which would be transported to the site in liquefied form. This power plant would also bring about savings in heating costs, as presented in Section 4.1.5.3.

GHG emissions associated with this scenario represent an annual maximum of 128,000 T CO_2eq per year, or 2,594,000 over the 23 years of operations considered in the comparative study.

The anticipated capital expenditures for this scenario are $196,683,000, while the projected operating costs (i.e., the cost of electricity production) amount to $27,620,000 per year, for a total over the life of the mine of $635,253,000 per year, or $0.319/kWh.

Scenario 3B – Stand-alone liquefied natural gas power plant integrated with renewable energies

The plan is to install the same liquefied gas power plant as in scenario 3A, combining it with four wind turbines of 6,200 kW each (total 24,800 kW) and a 12,400 kW BESS with one hour of spinning reserve.

GHG emissions associated with this scenario represent an annual maximum of 95,000 T CO_2eq per year, or 1,886,000 over the 23 years of operations considered in the comparative study.

The anticipated capital expenditures for this scenario are $291,690,000, while the projected operating costs (i.e., the cost of electricity production) amount to $19,625,000 per year, for a total over the life of the mine of $451,381,000 per year, or $0.285/kWh.

Scenario 4A – Stand-alone compressed natural gas power plant

This involves installing a power plant that produces all the electricity needed for the mine site using generators powered by compressed natural gas.

GHG emissions associated with this scenario represent an annual maximum of 128,000 T CO_2eq per year, or 2,592,000 over the 23 years of operations considered in the comparative study.

The anticipated capital expenditures for this scenario are $175,575,000, while the projected operating costs (i.e., the cost of electricity production) amount to $38,349,000 per year, for a total over the life of the mine of $882,022,000 per year, or $0.406/kWh.

Scenario 4B – Stand-alone compressed natural gas power plant integrated with renewable energies

The plan is to install the same compressed natural gas power plant as in scenario 4A, combining it with four wind turbines of 6,200 kW each (total 24,800 kW) and a 12,400 kW BESS with one hour of spinning reserve.

GHG emissions associated with this scenario represent an annual maximum of 96,200 T CO_2eq per year, or 1,880,000 over the 23 years of operations considered in the comparative study.

The anticipated capital expenditures for this scenario are $270,581,000, while the projected operating costs (i.e., the cost of electricity production) amount to $27,270,000 per year, for a total over the life of the mine of $627,208,000 per year, or $0.344/kWh.

Selected scenario

The scenarios were analyzed based on a weighting that compared economic, environmental, social, and technical criteria. This analysis showed a clear advantage for the scenario of connecting to Hydro-Québec's grid, with a marked advantage in terms of economic and social criteria, a median score for environmental criteria (mainly due to its footprint on the land, water bodies, and wetlands), and a high score similar to two other scenarios (2A and 3A). The total score for this scenario was 80, while the next two closest options had a score of 62 (scenarios 2A and 4A).

The scenario of connecting to Hydro-Québec's grid was therefore selected and will be implemented.

4.1.5.3 Comparative analysis of options to heat the facilities

The analysis focused on three main scenarios: liquefied natural gas (LNG), liquefied propane gas (LPG), and compressed natural gas (CNG).

Scenario 1 – Liquefied natural gas (LNG)

LNG is a commonly adopted solution in remote industrial projects due to its high energy density and relatively low carbon footprint compared to other fossil fuels. It is obtained by cooling natural gas to -162 °C, which allows it to be transported in bulk by cryogenic tank trucks. Once delivered to the site, it must be regasified before being distributed to the facilities.

From an environmental standpoint, LNG offers a significant advantage as it generates fewer GHGs than propane, making it an option that aligns with emission reduction goals. From a technical standpoint, it provides a stable power supply and enables heat recovery for building heating, which improves overall energy efficiency. However, this solution requires significant initial investments. The installation of cryogenic tanks, regasification systems, and an internal distribution network represents an estimated CAPEX of $17.9 million for the first two years. On the other hand, the unit cost of LNG is the most competitive among the three scenarios, at $14.29/GJ, which reduces long-term operating expenses. This combination of high investment but low energy costs makes LNG an attractive option for the mature phase of the project, but less suitable for the start-up phase, when financial flexibility is crucial.

Scenario 2 – Liquefied propane gas (LPG)

LPG is a proven solution for remote sites, particularly due to its logistical simplicity. Unlike LNG, it does not require cryogenic storage, which reduces the complexity of facilities and commissioning times. Pressurized tanks used for LPG are easy to deploy and widely available in Quebec, ensuring a reliable supply.

However, LPG has two major drawbacks. From an environmental perspective, it has a higher carbon intensity than LNG, which increases the project's climate footprint. From an economic standpoint, its unit cost is significantly higher, at $33.77/GJ, which translates into significant operating expenses. Initial CAPEX, estimated at $4.0 million, remains lower than that of LNG, but this initial saving is quickly offset by higher operating costs.

In summary, LPG may be a fallback solution in the event of technical or logistical constraints, but it does not optimally meet the project's economic and environmental performance objectives.

Scenario 3 – Compressed natural gas (CNG)

CNG stands out for its delivery method. It is transported in compressed form at high pressure (250 to 300 bar) in specialized trailers, eliminating the need for cryogenic infrastructure. This feature gives CNG a strategic advantage in the initial phase of the project, as it significantly reduces the required investment. The required CAPEX is estimated at only $34,000, which is negligible compared to the other scenarios.

This solution also offers great logistical flexibility, thanks to a modular system that can be adapted to changing needs. However, this simplicity comes at a cost—CNG is the most expensive option when it comes to operating costs, with a unit price of $38.17/GJ and requiring frequent deliveries (10 to 15 trucks per week). From an environmental perspective, its emissions profile is comparable to that of LNG, but without any significant advantages.

Consequently, CNG appears to be an ideal transitional solution for the start-up phase of the project, preserving financial liquidity and allowing operations to begin quickly, while awaiting the implementation of a more sustainable infrastructure such as LNG.

Comparative analysis of scenarios

The comparative study quantified the differences between the three scenarios in terms of capital expenditures, unit costs, and cumulative expenditures over 20 years. These results are presented in Table 4-4.

Table 4-4 Comparison of energy supply scenarios

Option	CAPEX (CAD)	Unit cost ($/GJ)	Annual OPEX (CAD)	Total cost over 20 years (CAD)
LNG	17,911,572	14.29	4,970,720	117,325,972
CNG	34,000	38.17	7,099,620	142,026,400
LPG	4,011,334	33.77	7,832,595	160,663,234

Preferred alternative

Based on the assessment, CNG is selected for the initial phase of the project due to its low initial investment and rapid implementation, despite higher operating costs.

4.2 Site location alternatives

The site location alternatives for the main infrastructure were analyzed as part of the project's EIA. In accordance with the requirements of *Directive 019 on the Mining Industry* (MELCCFP, 2025) and the guides on the management of tailings and waste rock (MELCC, 2020; MRNF, 2024), the analysis focuses on describing the proposed sites, their geographic location, and comparing their biophysical, social, technical, and economic advantages and disadvantages. The goal is to demonstrate that the project takes into account local constraints, reduces its environmental footprint, and incorporates concerns expressed during consultations with stakeholders, particularly Cree communities and land users.

The alternatives presented consider the needs to be met, sustainable development objectives, greenhouse gas emission potential, and anticipated impacts of climate change. Where relevant, Cree place names are specified for the locations or bodies of water concerned. Finally, the justification for the final site selection is based on a multicriteria analysis that incorporates land-use planning criteria, biological and physical constraints, environmental vulnerability, and technical, operational, financial, and social considerations.

It should be noted that the site location scenarios analyzed in this section are based on technical studies conducted specifically for the project, including BBA's technical report entitled *Site Selection Alternatives for Storage of Mine Waste* (BBA, 2025a), which presents the preselection process, conceptual modelling, and multicriteria assessment of potential sites for tailings and waste rock stockpiles (Appendix 4-5). This assessment was conducted in accordance with the requirements of Section 20 of National Instrument 43-101, which includes the development of a preliminary project design and layout to assess the potential location of the project's main components. The criteria and results of this analysis, validated during workshops with stakeholders, form the basis for comparing the alternatives selected in this chapter.

4.2.1 Alternative locations for main infrastructure

4.2.1.1 Open pit versus underground mining

Various operations scenarios were analyzed to identify the most appropriate option for extracting the main spodumene deposit. The scenarios assessed include open pit mining only, underground mining only, and a hybrid alternative combining both methods. The hybrid alternative is the scenario chosen for the location of the mine's main infrastructure.

Scenario 1 – Open pit mining only

In this scenario, the entire deposit would be mined using a single open pit. This option maximizes ore accessibility and simplifies the organization of mining operations, particularly with regard to planning, extraction, and internal logistics. Solely using a pit also allows for more direct management of the mining sequence and optimization of extraction equipment. Furthermore, even when considering the need for fish habitat compensation, this alternative is the least expensive of the options assessed, due to the simpler design of the associated hydraulic works. It is also the least expensive because the unit operating costs (per tonne mined) are much lower in open pit mining than in underground mining.

However, it requires a large footprint, produces large amounts of waste rock and tailings, and has a significant impact on water and terrestrial environments. In terms of water management, the creation of the pit would require the installation of water control infrastructure, including cut-off dikes to maintain the natural levels of neighbouring lakes, as well as diversion channels to divert runoff away from the excavation area. These measures aim to limit the impact on local water systems, but involve a significant change to the natural flow regime.

Scenario 2 – Underground mining only

This scenario involves mining the deposit solely through underground tunnels. It reduces the footprint, limits waste rock production, and better preserves sensitive natural environments. However, it involves technical challenges related to ore access, ventilation, safety, and tailings management. Some of the processing by-products can be used as backfill in the tunnels, which contributes to the stability of the structures and reduces the volumes to be managed on the surface. Furthermore, among the alternatives assessed, this is the most expensive scenario, mainly due to the technical and operational requirements associated with fully underground operations. This scenario also results in a significant loss of resource in the surface pillar.

Scenario 3 – Hybrid alternative

The hybrid option combines open-pit mining with underground mining. This scenario was selected following multicriteria analysis, as it optimizes resource recovery while limiting environmental and social impacts. Open pit mining is planned in two phases: the first (2030–2047) for initial extraction, the second (2031–2049) for pit expansion. Underground mining will begin in 2032 and continue until 2048. The hybrid alternative offers several advantages:

- reduced footprint and volumes of waste rock generated;
- greater operational flexibility and better control over the plant feed grade. This helps reduce the need for storage areas for feed management, thereby lowering the costs and GHG emissions associated with ore re-handling, as well as the surface footprint of stockpiles.
- use of tailings as underground backfill (approximately 32.5 Mt), contributing to stability and sustainable waste management;
- adaptation of water and waste management infrastructure according to the phases of operation;
- compliance with regulatory requirements and industry best practices.

The hybrid scenario chosen for the project involves close interaction with several bodies of water, mainly Lakes L01 to L05. Lake L01, located at the centre of the project, is directly affected by the development of the open pit mine. To enable ore extraction while maintaining the lake's water level, cut-off dikes will be constructed in two successive phases. These dikes isolate the excavation area and control water infiltration into the pit. To maintain natural water flow and protect the surrounding lakes (i.e., Lakes L02, L03, and L04), a diversion channel will be constructed to divert water from Lake L01 to Lake L05, bypassing the open pit (see Section 4.2.1.3).

Reasons for the choice

The proposed mining method has been updated to address Cree concerns about the project's impact on fish and water. The integration of an underground mining method combined with an open-pit method has significantly reduced direct impacts on fish while still allowing access to the ore.

The hybrid scenario is a reasonable approach that meets the project objectives while respecting the environmental concerns raised by stakeholders. The hybrid scenario is preferable to the underground-only option for resource recovery.

The hybrid scenario also reduces the surface footprint required for waste rock and tailings management compared to the open-pit-only scenario. This approach is further supported by the results of consultation workshops and technical assessments, which highlighted the flexibility and robustness of the hybrid option given the site constraints and stakeholder expectations.

4.2.1.2 Dikes

As part of the project's development, the construction of dikes is an essential component of water management and water environment protection. Dikes are mainly required to:

- isolate the open pit of Lake L01 and maintain the water level of this body of water in its current conditions during the operations phases;
- control runoff and infiltration into the pit to limit the risk of flooding and contamination;
- ensure water diversion to downstream lakes (Lake L07), preserving the hydraulic and ecological connectivity of the watershed.

Various scenarios for the location and design of the dikes were analyzed to meet the technical, environmental, and regulatory constraints of the site. Some scenarios proposed the construction of a single large dike that would isolate the western end of Lake L01 from the main body of water from the outset, replacing the lake's natural outlet with a channel built east of the original location. Other scenarios suggested a more gradual approach, with the successive installation of dikes aligned with the development of the pit, allowing for more flexible water management and a reduction in environmental impacts.

The precise location of the dikes, their dimensions, the nature of the materials used, and the protective measures against erosion and infiltration were analyzed in detail. Hydrological and seismic safety criteria, as well as regulatory requirements, guided these choices throughout the process. Following this analysis, the chosen solution was to build **two dikes in Lake L01**, each corresponding to a phase of expansion of the open pit. The first dike would be constructed before excavation work begins, isolating the western portion of the lake and maintaining its water level east of the dike. The second dike, built during the expansion of the pit, would complete the isolation and adapts water management to the new operating conditions.

These levees are designed with a minimum crest width of 6.0 m and slopes of 3H:1V, and include 6 m wide berm upstream and downstream to account for local geotechnical conditions. Erosion protection measures consisting of riprap laid on geotextile, and seepage management systems, such as sheet piles and geomembranes, are integrated into the structure of the work. These structures have been classified as "Extreme" in accordance with Quebec regulations and the guidelines of the Canadian Dam Association (CDA), which impose very high safety requirements, particularly with regard to earthquakes and extreme flooding.

This choice makes it possible to combine technical robustness, adaptation to the evolving needs of the project, and respect for the natural environment. It also meets the requirements of *Directive 019 on the mining industry*, the *Dam Safety Act* (chapter S-3.1.01) and the *Dam Safety Regulation* (chapter S-3.1.01, r. 1), while drawing on recognized best practices in the mining sector.

4.2.1.3 Water diversion

Water diversion, a practice that involves deliberately redirecting water flow to specially designed channels, is an essential measure in the development of the open pit mine while preserving the water balance of water bodies located near the project. Before excavation work begins, a diversion channel will be constructed to redirect water from Lake L01 to Lake L05, bypassing the pit and maintaining the water level of Lake L01 at its natural elevation.

Five scenarios for the route and design of the diversion channel were analyzed, as presented in Table 4-5, Map 4-1, and Appendix 4-6. The alternatives assessed differ in terms of their length (from 726 m to 793 m), side slopes (from 2.5H:1V to 1H:1V), and compliance with safety distances from bodies of water and the pit (buffer zones of 10 to 60 m). The options were compared based on their hydraulic capacity, ease of construction, impact on water environments, and ability to limit intrusions into Lakes L02, L03, L04, and L05.

Table 4-5 Water diversion scenarios considered for the project

Scenario	Channel length (m)	Side slope	Main impacts	Advantages	Disadvantages
A	793	2.5H:1V	Intrusion into buffer zones, proximity to Lake L04	Good hydraulic capacity	Intrusion into water environments, not selected
B	738	2.5H:1V	Impact on the natural channel of Lake L02, intrusion into buffer zones	Shorter channel	Impacts on water environments, not selected
C1	726	2.5H:1V	Minor intrusion into buffer zones, impact on Lake L04	Shorter channel, good hydraulic capacity	Construction difficulty in Lake L04
C2	726	1.5H:1V	Steeper slopes, impact on Lake L04	Less excavation	Slopes too steep for the soils, reduced hydraulic capacity
D1	774	2.5H:1V	Minor intrusion into buffer zones, preservation of natural waterways	Good hydraulic capacity, environmentally friendly	Longer ditch, some minor intrusions
D2	774	1H:1V	Slopes very steep, no intrusion into lakes	Less excavation, total respect for the environment	Slopes too steep, reduced hydraulic capacity

Following a multicriteria analysis, the chosen solution corresponds to an alternative to scenarios D1 and D2, which complies with the safety distances from the pit wall (45 m) and surrounding lakes, while minimizing the impact on water environments. The side slope of the solution selected for the diversion channel is mainly 2.5H:1V (option D1), with possible adjustments to 1.5H:1V or 1H:1V in certain sections where the depth of the cover material allows, to ensure slope stability and comply with local geotechnical constraints.

This channel is designed to preserve ecological connectivity between bodies of water, in particular through the installation of drops and boulders that replicate hydraulic conditions favourable to fish migration. The channel will be built in two phases, in line with the gradual development of the open pit. In addition, the design of the diversion channel takes into account current regulatory requirements, including D019 and hydrological and environmental safety standards. The diversion work will thus help maintain the quality and quantity of surface water, protect aquatic habitats, and limit the risks of contamination associated with mining activities.

Zone d'étude / *Study Area*

Projet / *Project*

Composante du projet / *Project Component*

Projetée / *Projected*

Canal de dérivation / *Diversion Channel*

Option A

Option B

Option C

Option D

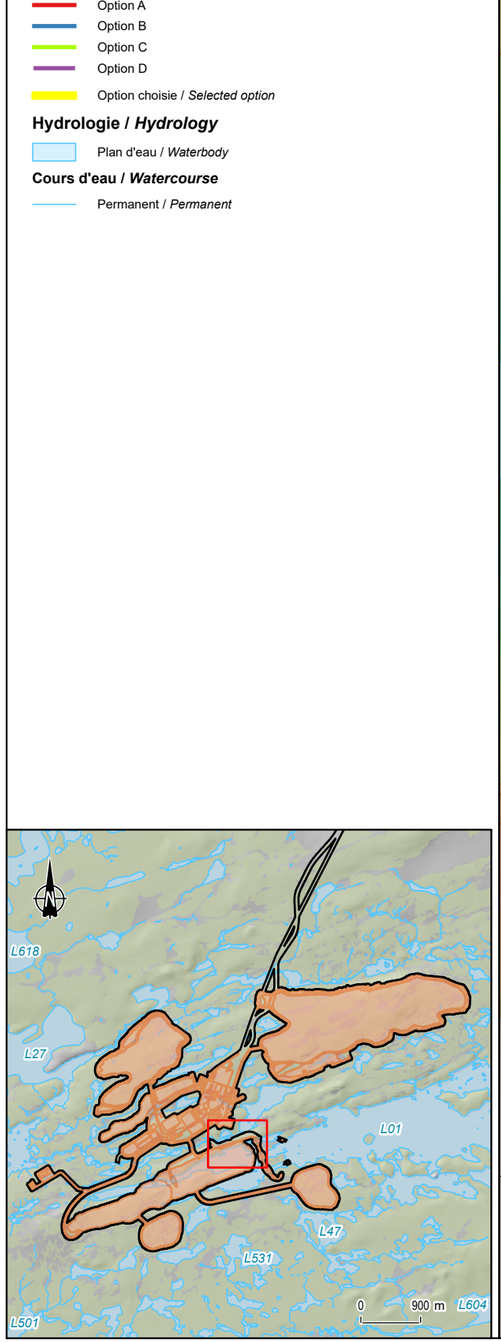
Option choisie / *Selected option*

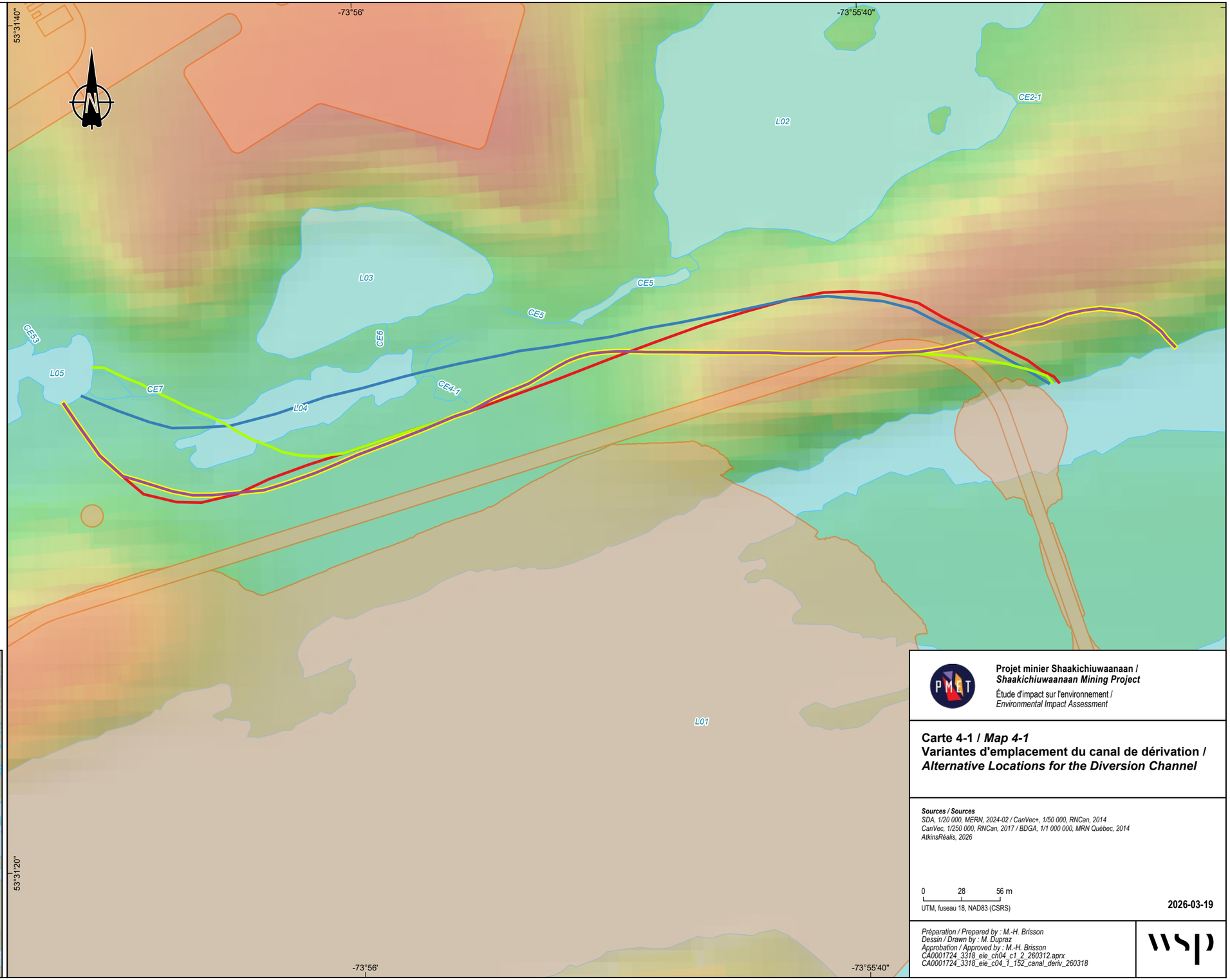
Hydrologie / *Hydrology*

Plan d'eau / *Waterbody*

Cours d'eau / *Watercourse*

Permanent / *Permanent*





Projet minier Shaakichiuwaanaan /
Shaakichiuwaanaan Mining Project

Étude d'impact sur l'environnement /
Environmental Impact Assessment

Carte 4-1 / *Map 4-1*
Variantes d'emplacement du canal de dérivation / *Alternative Locations for the Diversion Channel*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02 / CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017 / BDGA, 1/1 000 000, MRN Québec, 2014
AtkinsRéalis, 2026

0 28 56 m

UTM, fuseau 18, NAD83 (CSRS)

2026-03-19

Préparation / Prepared by : M.-H. Brisson
Dessin / Drawn by : M. Dupraz
Approbation / Approved by : M.-H. Brisson
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Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.

4.2.1.4 Waste rock and tailings storage and management areas

As with any mining project, waste rock and tailings storage facilities will be required as part of the project's development. According to recent technical data, the project will generate approximately 155.2 million tonnes (Mt) of waste rock (including 81 Mt of metal leaching waste rock and 74.2 Mt of low-risk material) and 71.1 Mt of tailings, in addition to 14 Mt of overburden. These volumes correspond to a total estimate of approximately 145 million cubic metres to be managed on the surface, excluding underground backfill.

Site selection process for accumulation area

An initial survey of 31 potential sites, located within a 10 km radius of the open pit mine, was conducted based on photo interpretation and constraint analysis. Several criteria guided the preselection process: the absence of bodies of water and watercourses frequented by fish, the search for relatively flat areas to facilitate construction and stability of the structures, proximity to the pit, and the planned access road route (north side of the pit, connecting to the Trans-Taiga Road), as well as the exclusion of areas with mineral potential, protected areas, and land outside the claims held by the proponent. The aim of this approach was to limit the impact on sensitive environments, reduce transport distances, and optimize the integration of infrastructure into the main logistics corridor.

At the end of this stage, five implementation scenarios were selected for in-depth comparative analysis (Map 4-2 and Appendix 4-5). Each scenario proposes a different configuration of the accumulation areas, depending on their location, capacity, accessibility, and integration with other site infrastructure.

Comparative assessment of scenarios and surface areas covered

The comparative assessment of the scenarios was carried out using a multicriteria matrix (POETS), incorporating environmental, technical, social, economic, and operational criteria. To ensure consistency and traceability in the environmental assessment, the criteria used in the multicriteria analysis of accumulation area scenarios were defined to overlap with the project's main environmental and social risk areas. The criteria analyzed include the area of wetlands affected, distance from water bodies, geotechnical stability, contact water management, proximity to sensitive receptors, capacity for expansion, and capital and operating expenditures.

-74°3'
-74°0'
-73°57'
-73°54'
-73°51'
53°36'
53°33'
53°30'

L823
L706
L417
L617
L618
L27
L27
L325
L02
L01
CE11_CE11
L47
L531
L604
L501
L600

Variantes proposées / *Proposed Variants*

Infrastructures proposées / *Proposed Infrastructure*

- Halde à stériles et/ou résidus / *Waste rock and/or tailings stockpile*
- Bassin / *Basin*

Variantes d'emplacement / *Alternatives Location*

- Scénario 1 / *Scenario 1*
- Scénario 2 / *Scenario 2*
- Scénario 3 / *Scenario 3*
- Scénario 4 / *Scenario 4*
- Scénario 5 / *Scenario 5*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*

Infrastructure / *Infrastructure*

- Chemin d'accès / *Access road*

Projet minier Shaakichiuwaanaan /
Shaakichiuwaanaan Mining Project

Étude d'impact sur l'environnement /
Environmental Impact Assessment

Carte 4-2 / *Map 4-2*
Variantes d'emplacement des aires d'entreposage et de gestion des stériles et des résidus miniers /
Alternative Locations for Waste Rock and Mine Tailings Storage and Management Areas

Sources / Sources
SDA, 1/20 000, MERN, 2024-02 / CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017 / BDGA, 1/1 000 000, MRN Québec, 2014
AtkinsRéalis, 2026

0 560 1 120 m
UTM, fuseau 18, NAD83 (CSRS)

2026-03-27

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CA0001724_3318_eie_c04_2_153_aires_entrepo_260327

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Table 4-6 shows the correspondence between the risk assessment criteria selected for the comparative analysis and the POETS matrix criteria used in the multicriteria analysis.

Table 4-6 Correspondence between risk assessment criteria and POETS matrix criteria

POETS criterion	Corresponding risk assessment criteria	Examples of sub-criteria or indicators used
P (Project costs)	Not applicable (economic criterion, non-environmental or social)	Capital expenditures, operating expenditures, phasing, habitat compensation
O (Operational)	GHG emissions, logistics optimization, operational safety	Transport distances, GHG emissions, operational safety
E (Environmental)	Preservation of sensitive environments and biodiversity, water management, GHG emissions	Impact on wetlands, proximity to habitats, water management, containment measures, GHG emissions
T (Technical)	Stability and safety of structures, water management	Geotechnical stability, pile height, seismic risk management, technical measures for water management
S (Social)	Land use and social acceptability, preservation of traditional practices, limiting negative impacts on communities	Proximity to sensitive receptors, impacts on traditional uses, hunting/fishing areas, social acceptability

To illustrate the challenges and trade-offs associated with each option, the following sections describe the scenarios analyzed, specifying their layout, total surface area, and advantages and disadvantages in relation to the multi-criteria selected[1].

Scenario 1 – Base

This scenario proposes storage facilities located close to the plant, minimizing transport distances and, consequently, the associated greenhouse gas emissions. The total surface area occupied by waste rock and tailings stockpiles in this scenario is approximately 289 hectares (ha) (176 ha for the low-risk waste rock stockpile, 109 ha for the metal leaching waste rock stockpile, and 85 ha for the tailings stockpile). However, this layout requires encroachment on some wetlands and a high tailings stockpile (up to 95 m).

Scenario 2 – Avoidance of water environments

This scenario seeks to avoid wetlands and water environments, but requires a much larger storage area, namely 256 ha (97 ha for the metal leaching waste rock stockpile and 159 ha for the combined tailings and low-risk waste rock stockpile). This option increases development costs and footprint, but reduces certain environmental risks.

[1] The BBA report presenting site selection alternatives for storage of mine waste was prepared in June 2025. At that time, the available data on the geochemistry of tailings and waste rock preliminarily identified several lithologies as potentially acid-generating. A validation and update of the interpretation of the geochemical data were carried out in March 2026 based on additional data collected. In light of this update, all mining materials in the project are now considered non-acidogenic. The description of the scenarios in Section 4.2.1.4 reflects this update, namely that the waste rock identified as potentially acid-generating in the BBA report is considered herein as metal leaching waste rock. Further details on this matter are provided in Section 5.2.5 of the environmental impact assessment report.

Scenario 3 – Storage cost optimization

The expansion of the base sites optimizes storage costs, but the height of the stockpile can reach 125 m. The total area occupied is approximately 252 ha (110 ha for the low-risk waste rock stockpile and 142 ha for the combined tailings and metal leaching waste rock stockpile).

Scenario 4 – Alternative sites E, O, J

This scenario proposes remoter areas, limiting certain environmental impacts but increasing transport distances and costs. The total surface area occupied is approximately 290 ha (120 ha for the low-risk waste rock stockpile, 107 ha for the metal leaching waste rock stockpile, and 63 ha for the tailings stockpile).

Scenario 5 – Alternative sites U, V, W

Lastly, this scenario covers the largest area, namely 330 ha (128 ha for the low-risk waste rock stockpile, 114 ha for the metal leaching waste rock stockpile, and 88 ha for the tailings stockpile). It presents major challenges in terms of costs, wear and tear on road infrastructure, and social acceptability.

Table 4-7 presents a summary of the various scenarios evaluated.

Table 4-7 Scenarios for waste rock and tailings storage areas

Scenario	Summary description	Total area occupied (ha)	Main advantages	Main disadvantages
1	Areas near the plant (base)	289	Minimal transport distances, optimized logistics	Impact on wetlands, high pile height
2	Avoidance of water environments, combined area	256	Reduction of impacts on water environments	Large surface area, higher development costs
3	Expansion of base sites, cost optimization	252	Reduced surface area, optimized costs	Pile height up to 125 m
4	More distant alternative sites (E, O, J)	290	Reduction of some environmental impacts	Increased transport distances, logistics costs
5	More spread out alternative sites (U, V, W)	330	Less impact on some sensitive environments	Maximum surface area, lower costs and social acceptability

Environmental risk and impact assessment

For each scenario, a detailed assessment of the risks and environmental impacts was carried out according to the following criteria:

- **Preservation of sensitive environments and biodiversity**: The scenarios nearest to the plant (1 and 3) minimize transport distances and the project's carbon footprint, but they result in a greater impact on wetlands and some natural habitats. Conversely, the most distant scenarios (4 and 5) reduce the direct impact on sensitive environments and contribute to the preservation of local biodiversity, but they increase the amount of land cleared and the impacts associated with internal transport.

- **Water management:** All scenarios include water management measures such as perimeter ditches, collection ponds and, for hazardous materials, lined membranes and containment systems. The design aims to limit the risk of contamination of water environments, in particular by maintaining a minimum distance of 60 m from water bodies, managing runoff water, and having retention ponds.
- **Stability and safety of structure**s: The stability of the piles is ensured by geotechnical analysis that complies with current standards, including consideration of seismic risks. The maximum heights vary depending on the scenario, reaching up to 125 m for scenario 3.
- **Land use and social acceptability:** The assessment of the scenarios also focused on limiting impacts on wildlife habitats, hunting and fishing areas, and traditional land uses. Where possible, distances to sensitive receptors were maximized to reduce potential nuisance to local communities.
- **Greenhouse gas (GHG) emissions:** The most compact scenarios (1 and 3) generate fewer GHG emissions due to internal transportation, while the more expansive scenarios increase the project's energy consumption and carbon footprint.

The main issues identified relate to land use, the preservation of wetlands and water environments, runoff and contact water management, and the long-term stability of structures. Scenarios favouring a compact, centralized storage area help to limit the project's carbon footprint.

Multicriteria analysis and selected scenario

A multicriteria analysis was used to assess the relative performance of each scenario for the site selection of the waste rock and tailings storage facilities according to all of the criteria assessed. The results of the multicriteria analysis of the scenarios assessed are presented in Table 4-8.

Table 4-8 Relative performance of scenarios for the location of waste rock and tailings storage facilities

Scenario	Overall score (%)[1]	Project cost (P)	Operations (O)	Environment (E)	Technical (T)	Social (S)
1	61	62	65	54	63	65
2	44	20	20	52	80	60
3	68	84	71	56	51	65
4	53	38	29	70	65	60
5	49	27	20	52	58	80

Note: 1 The higher the score, the more favourable the scenario is considered to be according to all the criteria selected.

The multicriteria analysis shows that scenario 3 achieves the best overall score, mainly due to its economic and operational advantages, while maintaining environmental impacts that are considered acceptable. Scenario 1 comes in second place, with a balance between the criteria, but a more limited capacity for expansion. Scenarios 4 and 5, although effective in terms of certain environmental criteria, are less competitive due to costs, distances, and technical constraints.

Scenario 3 was recommended following the multicriteria analysis, as it offers the best balance between economic, operational, environmental, technical, and social criteria. This scenario consists of a storage area located near the process plant, optimizing internal logistics, reducing GHG emissions, and facilitating environmental monitoring.

4.2.1.5 Industrial area

An industrial area of approximately 40 hectares will be required to accommodate the following infrastructure:

- concentration plant;
- ore storage area;
- maintenance workshop and warehouse;
- fuel storage facilities;
- workers' camp;
- administrative and operations buildings.

The main criteria for the industrial area's location depend on the position and dimensions of the open pit. In fact, the industrial area must be close enough to the pit to reduce travel distances, but sufficiently far away not to interfere with any unexpected expansion of the pit. Three pit sizing scenarios were considered (see Section 4.2.1.1), each associated with a different layout of the industrial area.

Pit sizing scenario 1 is relatively limited around lake L01, allowing the industrial area to be positioned between water bodies L02 to L08 to the south and lake L12 to the north. The industrial area would occupy most of the land between these water bodies.

Pit sizing scenario 2, still centred on the same portion of lake L01, also includes, to the north, part of lake L02 and water bodies L03 to L08. The industrial area would still be located in the same place as in the previous scenario, but with slightly different dimensions (narrower but longer).

Pit sizing scenario 3 covers a much larger area encompassing most of the land previously proposed for the industrial area. The industrial area is therefore repositioned north of lake L12, south of lake L15, and west of lakes L61 and L62.

Lastly, as pit sizing scenario 1 was selected, the associated positioning of the industrial area was chosen.

4.2.1.6 Main access road to the Trans-Taiga Road

A main access road connecting the project site to the Trans-Taiga Road was built during the summer of 2024. To avoid additional encroachment caused by the development of new roads, it was decided to retain the current road, making modifications to ensure that spodumene could be transported by trucks carrying two bins totalling 75 tonnes. These modifications mainly include smoothing out some curves and improving the road foundation so that it can withstand repeated heavy truck traffic.

4.2.1.7 Secondary access roads

A road network will be required to connect the open pit mine to the industrial area and the waste rock and tailings storage facilities. Two main options were considered for the development of these local roads: a single network for all light and heavy vehicles, or separate networks for light and heavy vehicles. For safety and efficiency reasons, the option of separate networks was selected.

The routes for these networks were largely determined by two main criteria: reducing transport distances for heavy vehicles and minimizing the number of watercourse crossings.

4.2.2 Other infrastructure

4.2.2.1 Transmission line

The power supply for the Shaakichiuwaanaan project requires the construction of a new 120 kV transmission line to connect the mine site to Hydro-Québec's grid. A pre-feasibility study identified, analyzed, and compared two line routing options, taking into account the technical, environmental, and social constraints of the land. The *Technical Report – 120 kV Transmission Line Study* (BBA, 2025b), on which this section is based, is provided in Appendix 4-7.

Scenario 1 – Route along the Trans-Taiga Road

This routing scenario favours running along the Trans-Taiga Road and existing mining access roads for nearly 70% of its length. This route minimizes the construction of new access roads, which will facilitate logistics during construction and maintenance work. It has a total length of 52.9 km and is divided into three sections:

- **Section 1**: The route runs alongside the existing 735 kV lines for approximately 3.5 km to the Trans-Taiga Road. It then crosses a natural area, consisting of forests, hills, and wetlands, for approximately 18 km.
- **Section 2**: The route runs alongside the Trans-Taiga Road for approximately 17 km.
- **Section 3**: This section of the route runs alongside existing mine access roads for approximately 18 km to the projected substation located near the mine.

The main challenges identified for this routing option are:

- the construction of access roads (section 1) involving impacts on the natural environment and additional construction work;
- the crossing of natural environments, including wetlands and water environments, and soils that are unfavourable for the construction of the line's infrastructure;
- the proximity of LG-4 Airport (approximately 1.2 km away) and the hydroplane base (300 m away) in section 1;
- the proximity (300 m) of sensitive sites such as cabins, old cemeteries, and other places of cultural significance to the tallyman's family.

However, this routing option has the advantage of limiting the length of access roads to be built and reducing the impact on sensitive environments and wildlife.

Scenario 2 – Direct route connecting the existing substation to the mine

The second scenario proposes a shorter route, with a total length of 50.5 km, between a starting point (near Hydro-Québec's Tilly substation, which has yet to be named) and the planned substation (yet to be named) located near the mine. This scenario involves a greater distance from the Trans-Taiga Road, which means building additional access roads and crossing a larger area of wetlands and water environments, old-growth forests, and soil that is unsuitable for building infrastructure for the line. The route is also divided into three sections:

- **Section 1:** With an initial transmission line route very similar to that of scenario 1, the route of scenario 2 diverges from it approximately 11.5 km after the road crossing, then rejoins it approximately 13.5 km further on, near the Trans-Taiga Road.

- **Section 2**: Running alongside the Trans-Taiga Road for 2.5 km, the line then heads toward the mine for approximately 12 km, crossing natural areas with no roads or access paths.
- **Section 3**: The line follows existing mine access roads for approximately 7 km to the planned substation located near the mine.

The main challenges identified for this routing option are:

- the construction of access roads (sections 1 and 2) involving impacts on the natural environment and additional construction work;
- the crossing of natural environments, including wetlands and water environments, and unfavourable soils (organic soils associated with wetlands) for the construction of the proposed line;
- the proximity (200 m) of sensitive sites such as cabins, old cemeteries, and other places of cultural significance to the tallyman's family.

Comparative analysis of options

The comparative analysis of the options took into account the main environmental constraints of the land, including the presence of wetlands, old-growth forests, and sites with wildlife or archaeological potential (Table 4-9). The alternatives were compared taking into account the minimization of impacts on these environments, in accordance with MELCCFP requirements. The assessment criteria also include the total length of the routes, access road requirements, the presence of unfavourable soils, the presence of old-growth forests, proximity to sensitive sites, and technical and logistical feasibility.

Table 4-9 Comparative analysis of two routing options for the proposed 120 kV line

Criteria	Option 1	Option 2
Total length	52.9 km	50.5 km
Access road construction	Less	More
Bodies of water crossed	Comparable (no major crossings)	
Wetlands crossed	Comparable	
Unfavourable soils	32% of the route	29% of the route
Length of old-growth forest area crossed	8.9 km	11.6 km
Proximity to sensitive sites	≥ 300 m	≥ 200 m
Proximity to LG-4 Airport	1.2 km	
Proximity to the hydroplane base	300 m	
Technical and logistical feasibility	Favourable	Less favourable

Selected option

Following the comparative analysis, scenario 1 was selected to continue data acquisition and project planning. This route was chosen for the following reasons:

- reduction of the access constraints thanks to the proximity of the Trans-Taiga Road and mine access roads;
- reduction of impacts on sensitive environments;
- better technical and logistical feasibility;
- increased flexibility for potential adjustments in later phases.

It should be noted that the selected scenario will be subject to further field studies and stakeholder consultations to adjust the final route based on the results of ecological surveys, concerns raised, and regulatory requirements.

4.2.2.2 Runway

A runway may be necessary to support the work team rotation schedule and supplies by air. The length of the runway may vary depending on the size of the aircraft expected, which will also depend on the size of the crew and the transport of supplies. In addition, the location of the runway will depend on prevailing winds and terrain and should be close to the main access road and the mine site to minimize transport time. A weather station has been in operation approximately 31 km northeast of the project site at the La Grande 4 dam since 1985. The data collected at this station includes wind speed and direction and may be useful in determining the choice of the future runway site. Other technical considerations may be necessary, such as vegetation cover (the presence of rock outcrops may require blasting).

It should also be noted that discussions are underway with the SDBJ and Hydro-Québec regarding the possibility of opening LG4 Airport to the public, which could call into question the nature of the runway required and even its necessity. As for the Mirage site runway (southeast of LG4), it can only accommodate aircraft of limited size (no Boeing 737s) and would not be able to handle the number of flights required for PMET activities.

No additional heliports, apart from the one already existing at the exploration camp, are planned for the mine site. In the event that a helicopter needs to land there, the heavy vehicle parking area is to be used.

4.2.2.3 Borrow pits and quarries

The project will also require construction materials to build mine roads, industrial areas, etc. This infrastructure may require a significant volume of construction materials. Therefore, the extraction of materials located close to the mine site would be ideal.

Options for granular material supply include:

- use only excavated material from the pit;
- use only materials sourced from a quarry (for coarser granular materials) and from borrow pits (for potential unconsolidated deposits located on either side of the site access road);
- use materials from these potential quarries and borrow pits until the pit is able to generate sufficient granular materials to meet construction needs.

The option of relying exclusively on materials generated from the pit is not feasible, as various site developments must be completed before excavation activities can begin in the pit. Conversely, the option of relying solely on potential quarries and borrow pits is technically feasible; however, their distance from the mine site would result in higher transportation costs, making this option less advantageous once usable materials begin to be generated from the pit. For this reason, the preferred option consists of opening quarries and borrow pits and using them on a temporary basis until materials from the pit become available. Quarries and borrow pits may subsequently serve as an alternative source of materials for the mine site, particularly for works to be carried out in close proximity to these areas (road segments, base camp located near the Trans-Taiga Road, etc.).

With respect to quarries more specifically, a study conducted by BBA in March 2026 identified 14 potential sites (Map 4-3). An analysis of the available material volumes and their anticipated geochemical characteristics led to the selection of five sites considered suitable to meet material requirements for construction activities, up to the commencement of pit operations. These quarries are located on either side of the mine access road between kilometre markers 13 and 16.

For borrow pits, the areas of interest are more limited and are all located between kilometre markers 8.5 and 9.5. A total of six sites were identified (Map 4-3).

4.2.2.4 Overburden stockpiles

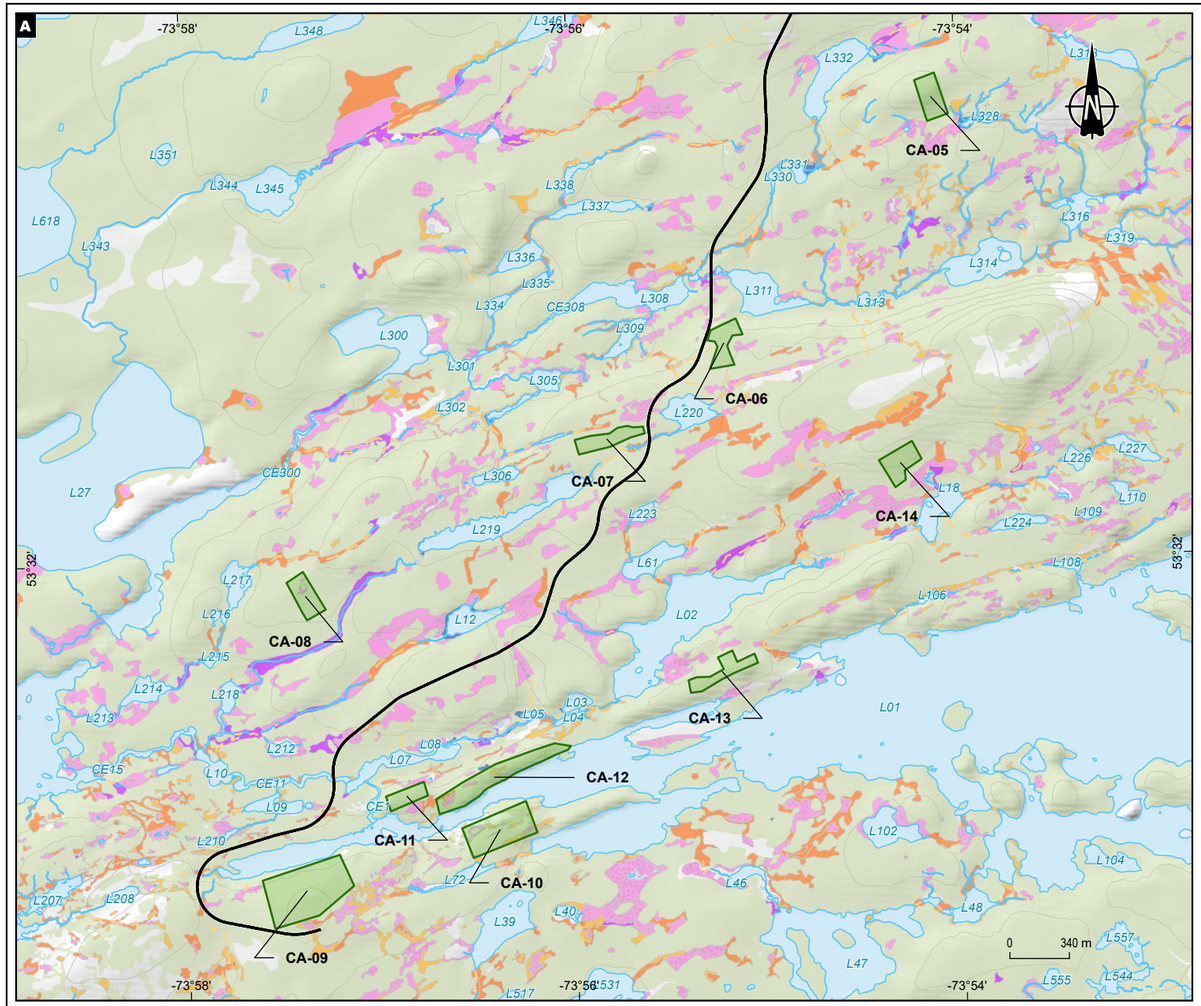
Overburden, including topsoil, sand, gravel, and other unconsolidated materials, will be removed during the stripping of the various project development areas, including the open pit and main infrastructure. These materials will be removed in two phases corresponding to the opening of the two sections (west and east) of the open pit.

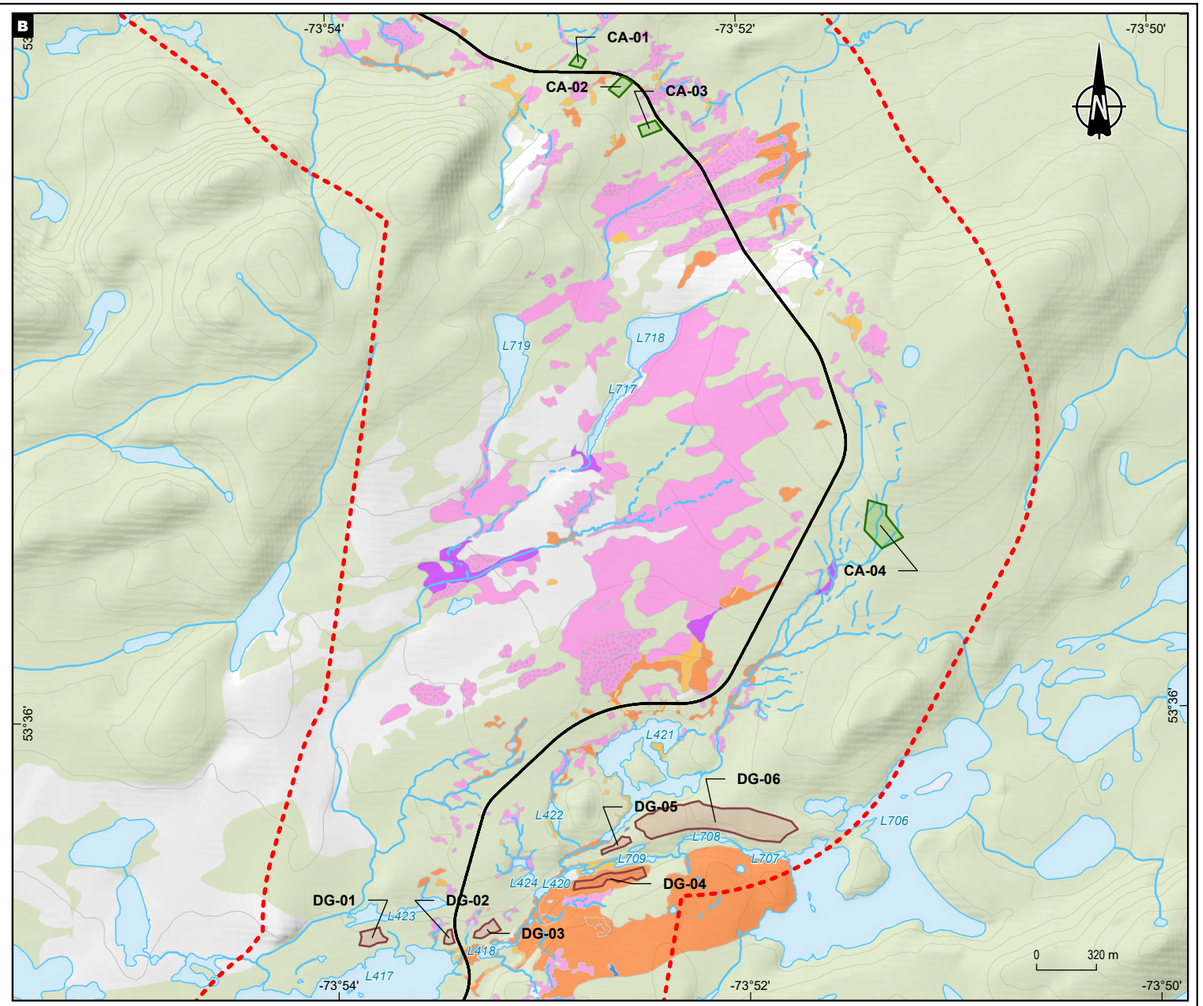
The only alternatives for managing these materials were to create a single stockpile where everything could be stored, or two stockpiles to distribute the overburden, in line with the two removal phases and so as not to interfere with the mine's activities. The main disadvantage of the single stockpile option was finding a site that offers sufficient space, has little impact on wetlands and the water system, and is located close to the areas where the materials originate.

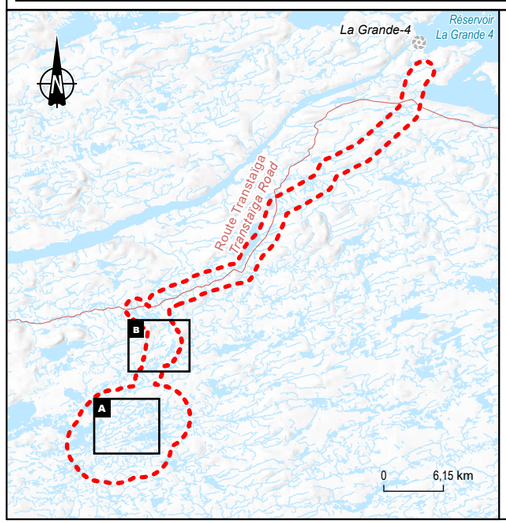
It was therefore decided to plan the development of two smaller stockpiles, which would be much easier to integrate near the site while minimizing environmental impact and transportation distances.

4.2.2.5 Organics stockpiles

The alternatives considered for the management of organics are similar to those for overburden, i.e., the installation of one or two temporary stockpiles. The chosen solution is to set up two stockpiles to facilitate placing them near the surfaces to be stripped and to avoid/minimize encroachment on sensitive natural components.







Zone d'étude / *Study Area*

Locale - Biophysique / *Local - Biophysical*

Bancs d'emprunt / *Borrow Pits*

Carrières potentielles / *Potential quarries*

Dépôts meubles potentiels / *Potential unconsolidated deposits*

Composantes de l'écosystème / *Ecosystem Components*

Milieux humides et hydriques / *Wetlands and Hydrous Environments*

Marécage arborescent / *Treed swamp*

Marécage arbustif / *Shrubby swamp*

Tourbière minérotrophe boisée / *Treed fen*

Tourbière ombrotrophe boisée / *Treed bog*

Tourbière ombrotrophe ouverte / *Open bog*

Marais / *Marsh*

Eau peu profonde / *Shallow water*

Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

Intermittent / *Intermitent*

Permanent / *Permanent*

Souterrain / *Underground*

Infrastructure / *Infrastructure*

Chemin d'accès / *Acces Road*

Réseau routier / *Road Network*

Route d'accès aux ressources / *Resource access route*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 4-3 / *Map 4-3*
Options de carrières et de bancs d'emprunt pour construction des infrastructures / *Quarry and Borrow Pit Options for Infrastructure Construction*

Sources / Sources

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4.3 Cost-benefit analysis

Lithium is recognized by the Government of Québec as a critical and strategic mineral due to its economic importance, its role in several technological and energy-related sectors, and the high level of risk associated with its global supply. In this context, lithium mining projects located in Québec contribute to strengthening the security of supply for this resource by reducing reliance on imports and supporting the resilience of North American supply chains. This contribution aligns with government orientations aimed at ensuring stable and predictable access to the minerals required for Québec's economic and technological development. [quebec.ca], [gq.mines.gouv.qc.ca]

Lithium is an essential input in the manufacture of lithium-ion batteries, which are used notably in electric and plug-in hybrid vehicles, energy storage systems associated with renewable energy sources, and various technological applications. As such, lithium supply is closely linked to the energy transition and economic decarbonization objectives pursued by the Government of Québec. Lithium mining projects therefore support the deployment of technologies related to electrification and energy storage by providing a raw material recognized as necessary for these uses, in accordance with provincial strategies related to critical and strategic minerals.

A cost-benefit analysis was undertaken for the Project to compare the advantages of the status quo with the advantages of developing the project. The analysis was undertaken following key potential benefits by theme as outlined in the table below.

Table 4-10 Cost-benefit analysis

Themes	Benefits if the project goes ahead	Benefits if the project does not go ahead (status quo)
Socio-economic benefits	• Creation of local and Indigenous jobs • Strengthening skills and training for Indigenous communities • Economic revitalisation of a northern region • Development of a strategic sector for the energy transition • Increased tax revenue and infrastructure investment	• Preservation of the current local way of life • Preservation of traditional activities without industrial pressure • No influx of workers and no pressure on local services and infrastructure
Technical and operational choices	• Optimisation of mineral resource recovery from the territory • Reduced impacts of hybrid mining compared to 100% open-pit mining	• No need to build mining infrastructure • Full preservation of the landscape, soil and local water bodies
Environmental impacts and planned mitigation measures	• Enhanced environmental oversight through monitoring measures • Potential to restore and compensate for certain habitats • Application of strict standards to minimise long-term effects	• Full preservation of ecological and hydrological functions • No disturbance to wildlife, flora and sensitive habitats
Social issues and consultation	• Incorporation of community concerns • Development of collaborative relationships and community opportunities	• Full preservation of current land uses (trapping, hunting, Cree culture) • Lack of industrial pressure

The project involves the development of a lithium deposit that is considered strategic in light of the energy transition. It is therefore likely to generate positive socioeconomic benefits, particularly through the creation of direct and indirect jobs, the development of specialized expertise, and its contribution to regional and provincial economic activity. These benefits are particularly significant in a northern context where opportunities for structural economic development remain limited.

From a technical and operational standpoint, the choices made for mining operations, tailings and waste rock management, transport of concentrate, and energy supply are designed to ensure the project's feasibility while limiting the constraints associated with the site's isolation and climatic conditions. The hybrid mining option, combining open pit and underground mining, optimizes resource recovery while reducing the footprint and certain impacts associated with exclusively open pit mining or exclusively underground operation. Similarly, the preferred infrastructure solutions were selected to facilitate gradual implementation that could be adapted to the different phases of the project.

However, the project will impose constraints and generate impacts on the biophysical and social environment, particularly in terms of land cover, local changes to hydrology, temporary disturbances to wetlands and aquatic environments, and land use. These effects were taken into account when selecting site location and technology options, with a view to reducing the project's footprint. Mitigation, compensation, and monitoring measures are planned to limit these impacts and ensure their long-term management, as presented in the subsequent chapters of this assessment.

Social issues and land use were also taken into consideration. Consultations with Cree communities and land users have helped to incorporate some concerns into the project design, particularly with regard to the location of infrastructure and the protection of sensitive sites. These elements help to improve the integration of the project into its host environment and reduce the risk of conflicts of use. In fact, consultations with land users led to the decision to adopt a hybrid extraction method, as this approach reduces the environmental impact compared to using only open pit mining.

The "do nothing" approach, i.e., not carrying out the project, would avoid the impacts associated with mining activities, but would also mean missing out on the socioeconomic and strategic benefits associated with developing the deposit. In light of the information presented, the project, as designed and with the planned mitigation and monitoring measures, presents an acceptable balance between the expected benefits and the identified constraints.

5 Project description

5.1 Project summary

The Shaakichiuwaanaan (CV5 Pegmatite) mining project (hereinafter the "project") is aimed at developing a large LCT pegmatite (lithium-cesium-tantalum) spodumene deposit located in the James Bay region of northern Quebec. The project is being developed by PMET Resources (PMET) through its subsidiary Lithium Innova Inc., which holds all 463 Exclusive Exploration Rights ("EERs") – formerly referred to as 'CDC claims' – totalling 23,710 ha.

The objective is to extract and process the ore to produce a spodumene concentrate ("SC") grading 5.5% Li_2O, destined for the international lithium market. The project is adopting a hybrid mining approach combining open pit and underground extraction to reduce the land footprint and visual impacts, in line with the concerns expressed during consultations. It is fully aligned with the *Quebec Strategy for the Development of Critical and Strategic Minerals* and the *2030 Plan for a Green Economy*, contributing to the creation of an integrated battery industry in Quebec and to the provincial and federal energy transition. This project is part of global efforts aimed at decarbonizing the economy.It responds to the growing global demand for lithium, which is expected to increase fivefold by 2040, and is a major driver for regional economic development.

The project includes:

- open pit mining of the CV5 pegmatite (Phase 1), followed by underground expansion (Phase 2);
- a two-stage process plant with a maximum nominal processing rate of 5.1 million tonnes of ore per year, producing approximately 800,000 tonnes of SC 5.5% Li_2O concentrate;
- storage areas for waste rock and tailings, designed to allow for gradual rehabilitation;
- an internal road network, an electrical connection to the Hydro-Québec grid, and support infrastructure (camp, mechanical workshop, administrative buildings, water management ponds, treatment plant, and fuel depot).

The total lifespan of the project is estimated at approximately 19 years of mining operations (2030 to 2049), excluding the construction phase (2028 to 2030) and gradual closure. According to the economic impact analysis (Appendix 5-13), project expenditures are expected to support an average of approximately 3,200 direct, indirect, and induced jobs per year during construction and approximately 3,500 during operation (jobs expressed in person-years; direct, indirect, and induced effects).

The main phases of the project are as follows:

1. Construction phase: development of roads, platforms, and main infrastructure.
2. Mining and transportation phase: extraction, crushing and concentration, road transport to a regional transshipment centre.
3. Closure and rehabilitation: dismantling of facilities, revegetation, and post-closure environmental monitoring.

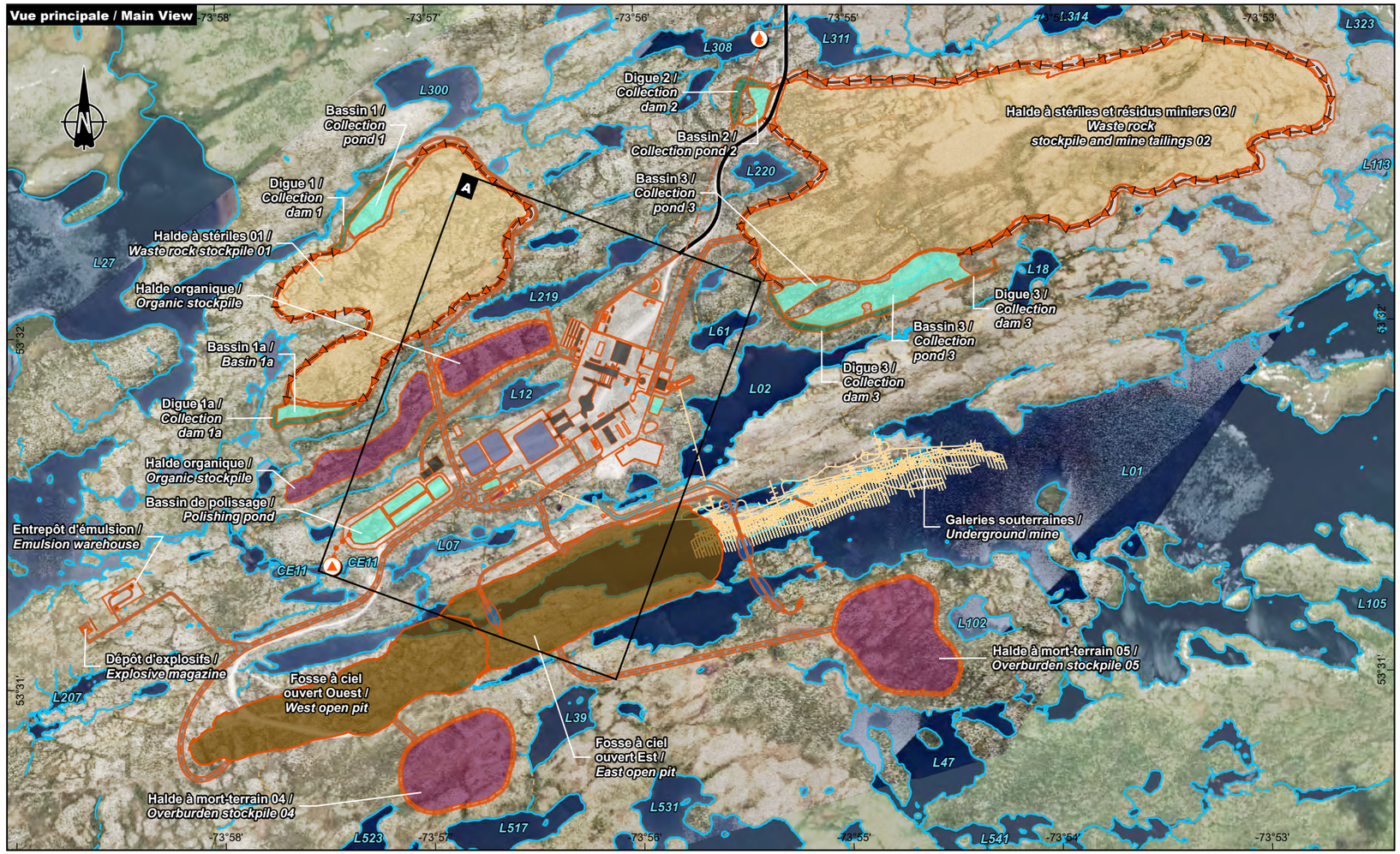
5.2 Description of the mine and operations

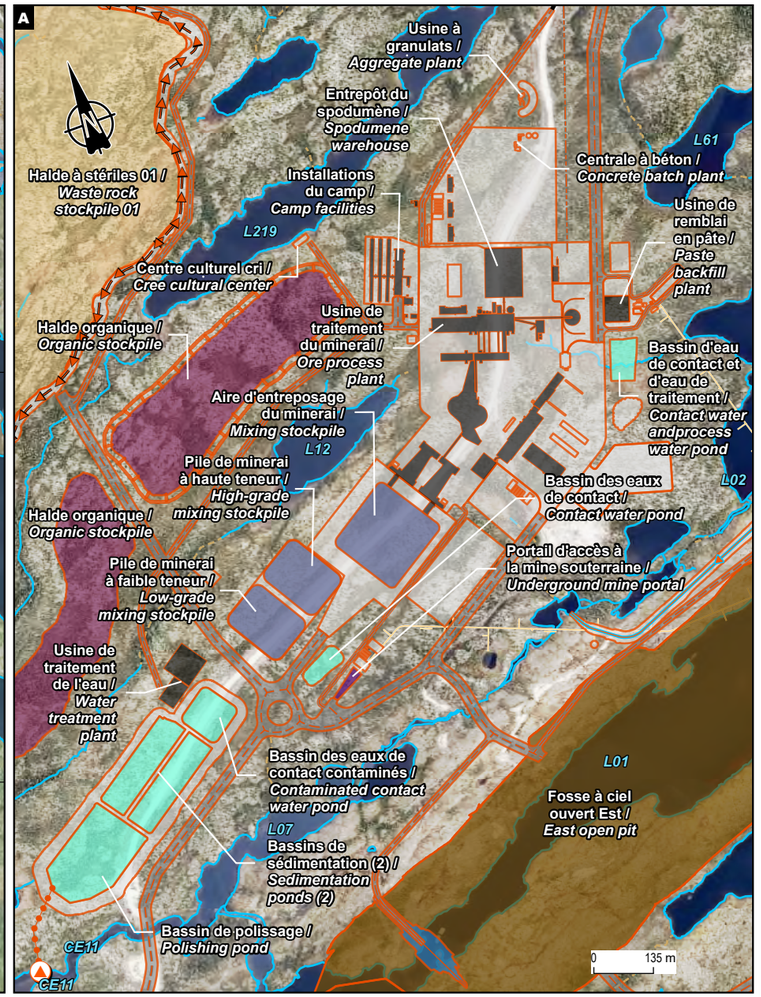
The mining complex will consist of various facilities described in more detail in the following subsections, including:

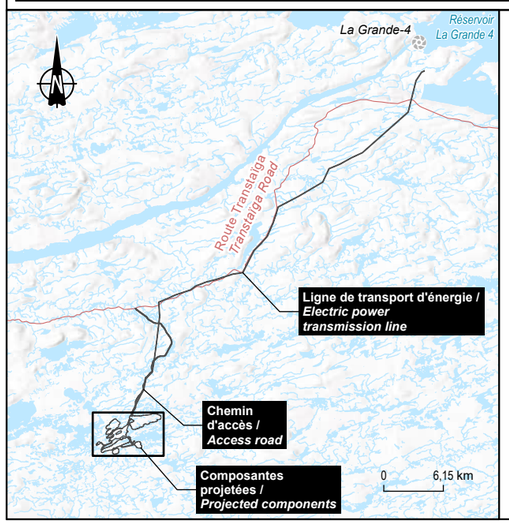
- an access road to the mine site from the Trans-Taiga Road;
- roads and culverts to enable the movement of mining equipment during mine operations;
- a workers' camp during the construction and operations phases of the mine;
- a hybrid mine for mining the CV5[1] deposit (partly open pit and partly underground);
- storage areas for waste rock and tailings;
- an ore storage area;
- dikes to isolate the CV5 deposit mining pit from Lake L01, which partially covers it;
- a power supply line;
- an electrical substation and an electrical distribution network;
- an ore processing plant;
- a paste backfill plant;
- a water treatment plant;
- an emulsion explosives storage area;
- a garage and other auxiliary buildings;
- a fuel storage area and a refuelling station.

Several components of the project are illustrated in Map 5-1.

1 Other spodumene pegmatite clusters show potential for additional resources, notably CV13 and CV9, located west of CV5, respectively.







Zone d'étude / *Study Area*

- Projet / *Project*

Composantes du projet / *Project Components*

Existante / *Existing*

- Chemin d'accès / *Access road*

Projetées / *Projected*

- Effluent minier / *Mining effluent*
- Prise d'eau / *Water intake*
- Barrage / *Dam*
- Canal / *Channel*
- Canal de dérivation / *Diversion Channel*
- Chemin secondaire / *Secondary road*
- Fossé / *Ditch*
- Galerie souterraine / *Underground mine*
- Ligne de transport d'énergie / *Power transmission line*
- Aire d'entreposage du minerai mixte / *Mixed ore stockpile*
- Autre / *Other*
- Bâtiment ou équipement / *Building or equipment*
- Digue / *Dam*
- Bassin / *Basin*
- Digue des bassins / *Basins dam*
- Fosse / *Pit*
- Halde à mort-terrain et organique / *Overburden stockpile*
- Halde à stériles et/ou résidus / *Waste rock and/or tailings stockpile*
- Portail d'accès à la mine souterraine / *Underground mine portal*
- Voie de circulation / *Roadway*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Souterrain / *Underground*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-1 / *Map 5-1*
Composantes du projet minier / *Mining Project Components*

Sources / Sources

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UTM, fuseau 18, NAD83 (CSRS)

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5.2.1 Mineral deposits, resources, and reserves

The main deposit of the project is the CV5 Pegmatite, a near-vertical body of the LCT pegmatite type, located within the La Grande Greenstone Belt, an Archean geological sequence composed of metasedimentary and volcanic rocks.

At the time of inclusion into the 2025 Feasibility Study (includes drilling through 2024), the CV5 Pegmatite had been delineated to approximately 4.6 km in length (has since been extended to approximately 5.0 km at the end of 2025) and remains open laterally and at depth (Figure 5-1). Diamond drilling at the Property carried out between 2021 and 2024 totals approximately 235,000 m, spread over approximately 800 holes, with the vast majority focused on delineation and development of the CV5 Pegmatite.

The Mineral Resource Estimate for the CV5 pegmatite, prepared in accordance with NI 43-101, totals 101.8 Mt at 1.38% Li_2O, 0.09% Cs_2O, 164 ppm Ta_2O_5, and 66 ppm Ga (Indicated), and 13.9 Mt at 1.21% Li_2O, 0.08% Cs_2O, 147 ppm Ta_2O_5, and 60 ppm Ga (Inferred). The cut-off grade is 0.40% Li_2O (open-pit) and 0.60% Li_2O (underground), with an Effective Date of June 20, 2025 (through drill hole CV24-787). Mineral resources are not mineral reserves as they have not demonstrated economic viability. Mineral resources include mineral reserves. The Mineral Reserve Estimate for the CV5 Pegmatite, prepared in accordance with NI 43-101, totals 84.3 Mt at 1.26% Li_2O (Probable). The cut-off grade is 0.40% Li_2O (open-pit) and 0.70% Li_2O (underground), with an Effective Date of September 11, 2025.

The Shaakichiuwaanaan Property is situated within the Archean Superior Province of the Canadian Shield, which extends from Manitoba to Quebec and covers approximately 750,000 km^2 of Quebec. Within the region, the Superior Province is divided into four distinct sub-provinces based on their lithological, metamorphic, geophysical, and structural characteristics: Opatica, Nemiscau, Opinaca, and La Grande (Map 5-2). The Property is situated within the central portions of the volcano-plutonic, La Grande sub-province, proximal to the Opinaca sub-province to the south. The region is considered to have strong exploration potential for a variety of commodities, including base and precious metals, and lithium (LCT pegmatite).

The Property covers part of the Lac Guyer Greenstone Belt, considered part of the larger La Grande River Greenstone Belt. The Property is dominated by volcanic and sedimentary rocks metamorphosed up to amphibolite facies. The Property's principal claim group is dominantly host to rocks of the Guyer Group (amphibolite, iron formation, intermediate to mafic volcanics, peridotite, pyroxenite, komatiite, as well as felsic volcanic tuffs). The amphibolite and metasedimentary rocks that trend east-west through this region are bordered to the north by the Magin Formation and to the south by an assemblage of tonalite, granodiorite, and diorite, in addition to metasediments of the Marbot Group (conglomerate, wacke). Several regional-scale Proterozoic gabbroic dykes also cut through portions of the Property (Lac Spirt Dykes, Senneterre Dykes). The KCG claim block, located to the north of the principal claim group, is situated within the Bezier Suite (monzodiorite and granodiorite), and outside the Guyer Group.

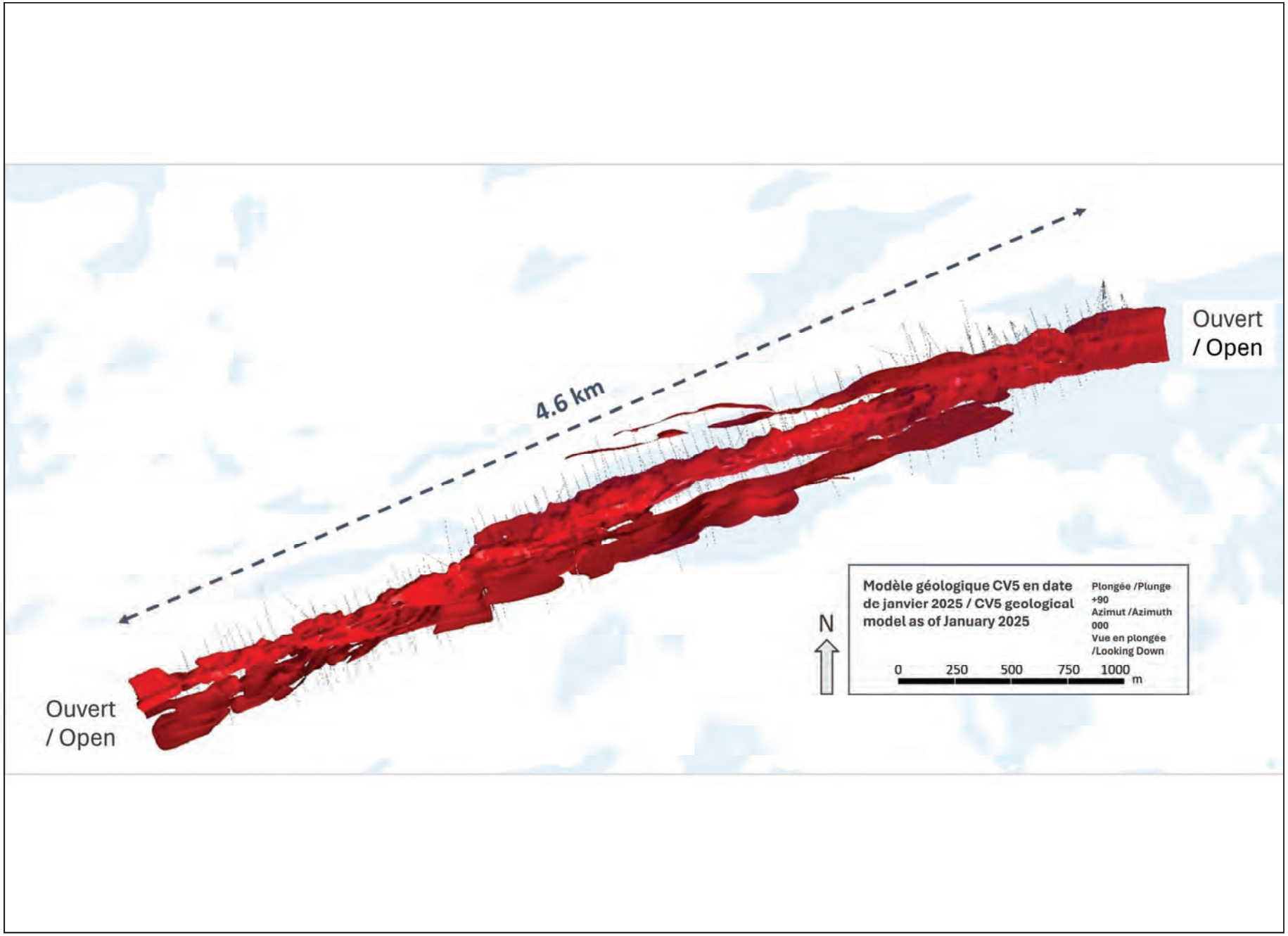
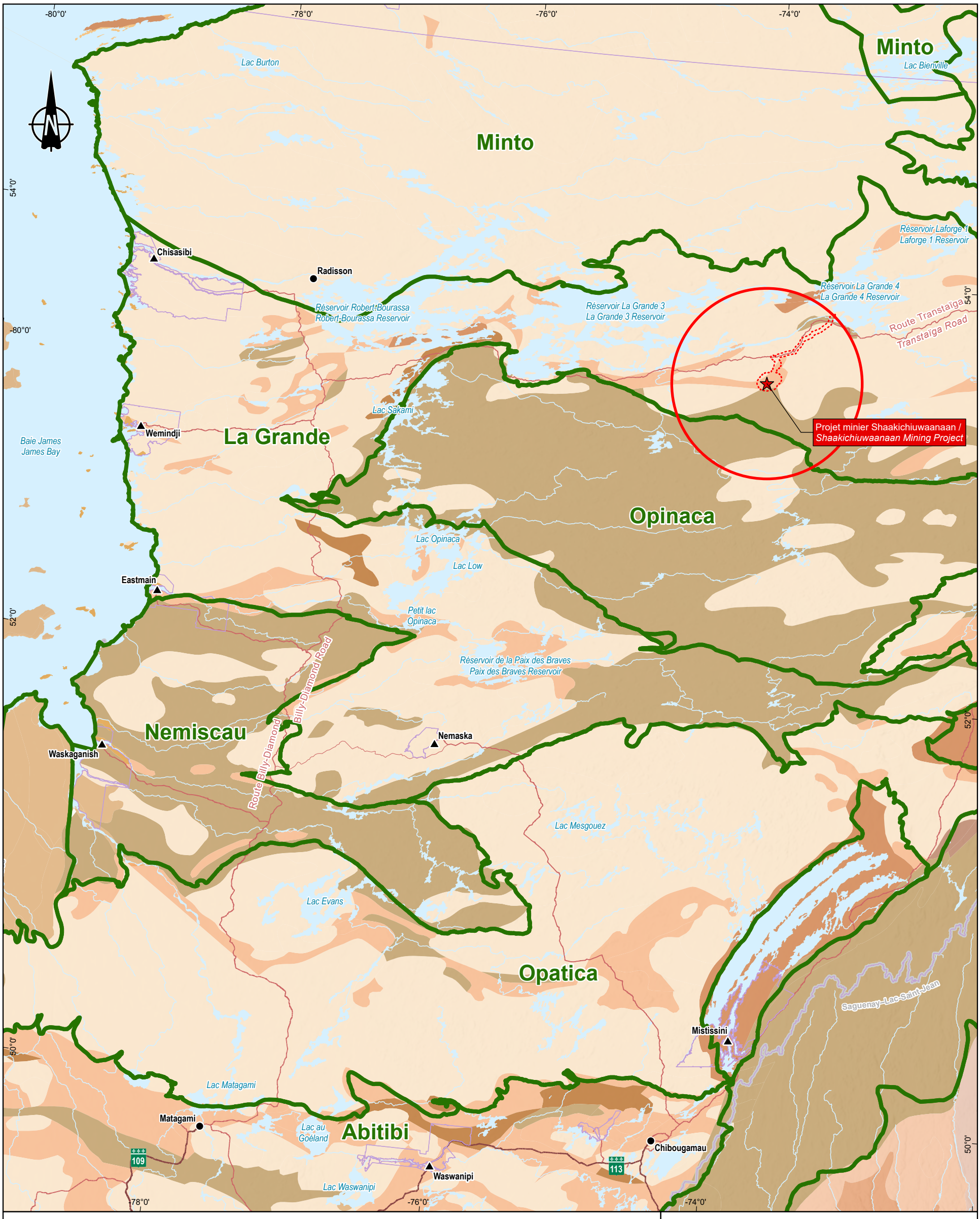


Figure 5-1 **Vue du modèle de blocs pour la fosse à ciel ouvert et la mine souterraine /** *View of the block model for the open pit and the underground mine*



Zones d'étude / *Study Areas*

- Locale - Biophysique / *Local - Biophysical*
- Régionale - Biophysique / *Regional - Biophysical*

Repères géographiques / *Geographical Landmarks*

- ▲ Communauté crie (zone d'étude régionale) / *Cree community (regional study area)*
- ● Municipalité / *Municipality*

Limites / *Boundaries*

- Région administrative / *Administrative Region*
- Municipalité régionale de comté (MRC) et Territoires autochtones / *Regional County Municipality (RCM) and First Nations Territories*

Réseau routier / *Road Network*

- Route nationale ou régionale / *National or regional road*
- Autre / *Other*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*
- Cours d'eau / *Watercourse*

Géologie / *Geology*

- Sous-province ou sous-division géologique / *Geological subprovince or subdivision*

Géologie générale du socle / *General Bedrock Geology*

- Roches intrusives de l'Archéen / *Archean intrusive rocks*
- Roches intrusives de l'Archéen-Paléoprotérozoïque / *Archean-Paleoproterozoic intrusive rocks*
- Roches intrusives du Paléoprotérozoïque-Mésoprotérozoïque / *Paleoproterozoic-Mesoproterozoic intrusive rocks*
- Roches métamorphiques de l'Archéen / *Archean metamorphic rocks*
- Roches métamorphiques du Paléoprotérozoïque / *Paleoproterozoic metamorphic rocks*
- Roches métamorphiques du Paléoprotérozoïque-Mésoprotérozoïque / *Paleoproterozoic-Mesoproterozoic metamorphic rocks*
- Roches sédimentaires de l'Archéen / *Archean sedimentary rocks*
- Roches sédimentaires de l'Archéen-Protérozoïque / *Archean-Proterozoic sedimentary rocks*
- Roches sédimentaires du Paléoprotérozoïque / *Paleoproterozoic sedimentary rocks*
- Roches sédimentaires du Paléozoïque / *Paleozoic sedimentary rocks*
- Roches sédimentaires et roches volcaniques de l'Archéen / *Archean sedimentary and volcanic rocks*
- Roches sédimentaires et roches volcaniques du Paléoprotérozoïque / *Paleoproterozoic sedimentary and volcanic rocks*
- Roches volcaniques de l'Archéen / *Archean volcanic rocks*

Projet minier Shaakichiuwaanaan /
Shaakichiuwaanaan Mining Project

Étude d'impact sur l'environnement /
Environmental Impact Assessment

Carte 5-2 / *Map 5-2*
Contexte géologique / *Geological Context*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/1 000 000, MRN Québec, 2002
AQréseau+, réseau routier, MERN, 2024-03-01
SIGEOM, Divisions géologiques, 2025
Ressources naturelles Canada, Géologie du socle rocheux, 2025

0 20 40 km
UTM, fuseau 18, NAD83 (CSRS)

2026-03-20

Préparation / Prepared by : M-H. Brisson
Dessin / Drawn by : J. Roy
Approbation / Approved by : M-H. Brisson
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The lithium pegmatites on the Property, including those at CV5, are hosted predominantly within amphibolites, metasediments, and minor ultramafic rocks of the Guyer Group within the principal claim group.

The geological setting is primarily prospective for gold, silver, base metals, platinum group elements, and lithium, over several different deposit styles including orogenic gold (Au), volcanogenic massive sulphide (Cu, Au, Ag), komatiite-ultramafic (Au, Ag, PGE, Ni, Cu, Co), and Li-Cs-Ta (LCT) pegmatite.

Exploration of the Property has outlined three (3) primary mineral exploration trends (Figure 5-2), crossing dominantly east-west over large portions of the Property's principal claim group – Golden Trend (gold), Maven Trend (copper, gold, silver), and CV Trend (Li-Cs-Ta Pegmatite). The Golden Trend is focused on the northern areas of the Property, the Maven Trend in the southern areas, and the CV Trend "sandwiched" between. Historically, the Golden Trend has received the exploration focus followed by the Maven Trend. However, the identification of the CV Trend and the numerous lithium-tantalum pegmatites discovered to date represents a previously unknown lithium pegmatite district that was first recognized in 2016/2017 by Dahrouge Geological Consulting Ltd. and PMET.

The CV LCT Pegmatite Trend is currently recognized as an approximate 1-km wide and 25+ km long corridor, which is host to numerous distinct LCT pegmatite occurrences, and extends in a general east-west direction across the west-central portions of the Property. The trend is interpreted to extend across the majority of the principal claim group of the Property (~50 km); however, large areas remain to be explored for lithium pegmatite. The LCT pegmatites along this trend may outcrop as isolated high-relief "whale-back" landforms or relatively low-relief to flat landforms (Figure 5-2).

To date, nine distinct lithium pegmatite clusters have been discovered along this trend at the Property: CV4, CV5, CV8, CV9, CV10, CV12, CV13, CV14 and CV15. Each of these clusters includes multiple lithium pegmatite outcrops in close proximity and oriented along the same local trend.

To date, the lithium mineralization discovered on the Property has been confined to the CV Trend. The principal area of the trend includes the CV5 spodumene pegmatite with a strike length at the end of 2025 of approximately 5.0 km and the CV13 spodumene pegmatite with a strike length of approximately 3.2 km, as defined by drilling.

5.2.2 Ore extraction

The project will involve a hybrid mining method that combines open-pit and underground extraction. Mineral reserves extracted over the life of the mine (19 years) will total 84.3 Mt. To access the mineralization, 155.2 Mt of waste rock, 14 Mt of overburden and et 3.2 Mt of organic materials. will need to be excavated.

The following sections provide more information on the specific extraction methods used in both types of mines.

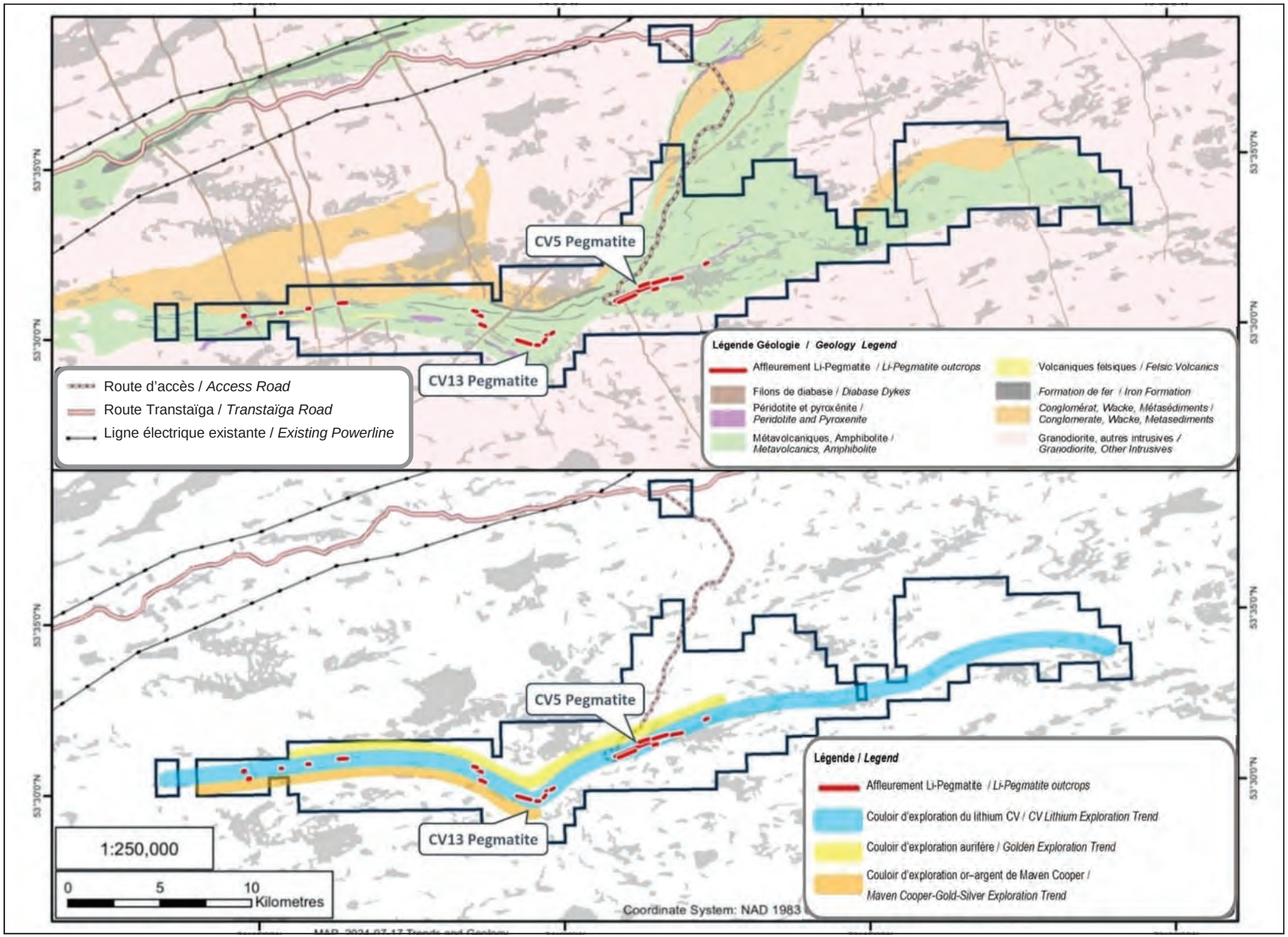


Figure 5-2 **Géologie de la propriété et tendances en matière d'exploration /** *Property Geology and Exploration Trends*

5.2.2.1 Open pit

Surface mining will be carried out using conventional production and pre-split drilling methods, as well as blasting, followed by loading and transport of ore and waste rock.

The design of the open pit takes into account the physical constraints of the site, in particular the location of the dikes. A long-term stability study of the final walls of the pit is presented in Appendix 5-1. It proposes a single pit divided into two main phases, each mined using sub pits, for a total of six sub pits (Figure 5-3):

- West Pit: Prioritizing the mining of the West Pit allows early access to ore content while limiting the impact on the adjacent body of water (Lake L01) by postponing certain operations.
- East Pit: The East Pit, which represents the second phase of open-pit mining, is also physically constrained by the dam located northeast of the ultimate pit shell. This sequence aims to optimize resource recovery while respecting the site's water and geotechnical constraints.

The planned peak mining rate is 23 Mt per year with a life-of-mine of 19 years, including a two-year pre-production period. A total of 49.2 Mt at 1.12% Li_2O of ore will come from the open pit. All operations will require the movement of approximately 216.7 Mt of material, including ore, waste rock, and overburden.

The equipment will include drills, hydraulic excavators, wheel loaders, and 140-tonnes haul trucks, operating on successive steps for the pit. The list of main equipment is presented in Table 5-1.

Table 5-1 Main equipment planned for open pit mining operations

Main equipment	Number
Production Drill (4.5″-8)	3
Auxiliary Pre-split Drill (4.5″-8)	1
Diesel Hydraulic Shovel (15 m^3)	2
Wheel Loader (23 m^3)	2
Mining Haul Truck (140 t)	13
Track Dozer (600 HP)	3
Motor Grader (18 ft)	2
Water Truck	1
Wheel Dozer (530 hp)	1

5.2.2.2 Underground mine

The underground mine will provide access to the CV5 Deposit located beneath Lake L01. Underground mining will use the long-hole open stoping (LHOS) method, mainly in a transverse configuration.

The underground mine will enable the extraction of 40.3 Mt of material, including 35.1 Mt of ore grading 1.45% Li_2O, and will reach a maximum production rate after an estimated development period of two years. A stability study of surface pillars is presented in Appendix 5-1.

Underground operations will be carried out using battery-electric mining equipment (BEV), including 50-tonnes trucks to transport ore to the surface, with a view to reducing emissions and improving environmental performance. The list of main equipment is presented in Table 5-2

Table 5-2 Main equipment planned for underground mining operations

Main equipment	Number	Main equipment	Number
Jumbo – 2 Boom	2	Water Truck	1
Bolter	6	Block Holer	1
Production Drill	4	Grader	1
Cable Bolter	1	Light Vehicle	23
Front-end loader– 18 T BEV	5	Tractor – Electricians	2
Front-end loader – 10 T	2	Telehandler	2
Truck – 50 T BEV	9	Mobile Air Compressor	1
Explosive Truck	3	Backhoe Loader	2
Scissor Lift	5	Raise Bore (include head 1.2 m head reamer)	1
Truck Crane	2	Giant Bolter	1
Fuel & Lube Truck	1		

5.2.3 Ore processing

Spodumene will be concentrated at the mine site, where an ore processing plant will be built north of the CV5 pit and will be continuously fed by trucks from the open pit and underground mines (Map 5-1). The average lithium recovery rate is estimated at 69%, with an annual production of approximately 800,000 tons of dry SC grading 5.5% Li_2O. The concentrate generated will be stored under cover prior to shipment. The concentrate will be transported by 75-tonnes truck to the Matagami rail transfer point, for onward shipment to a deep-water port and international markets.

The following sections describe the main components of the processing plant site, the process used, and the main products used in the process.

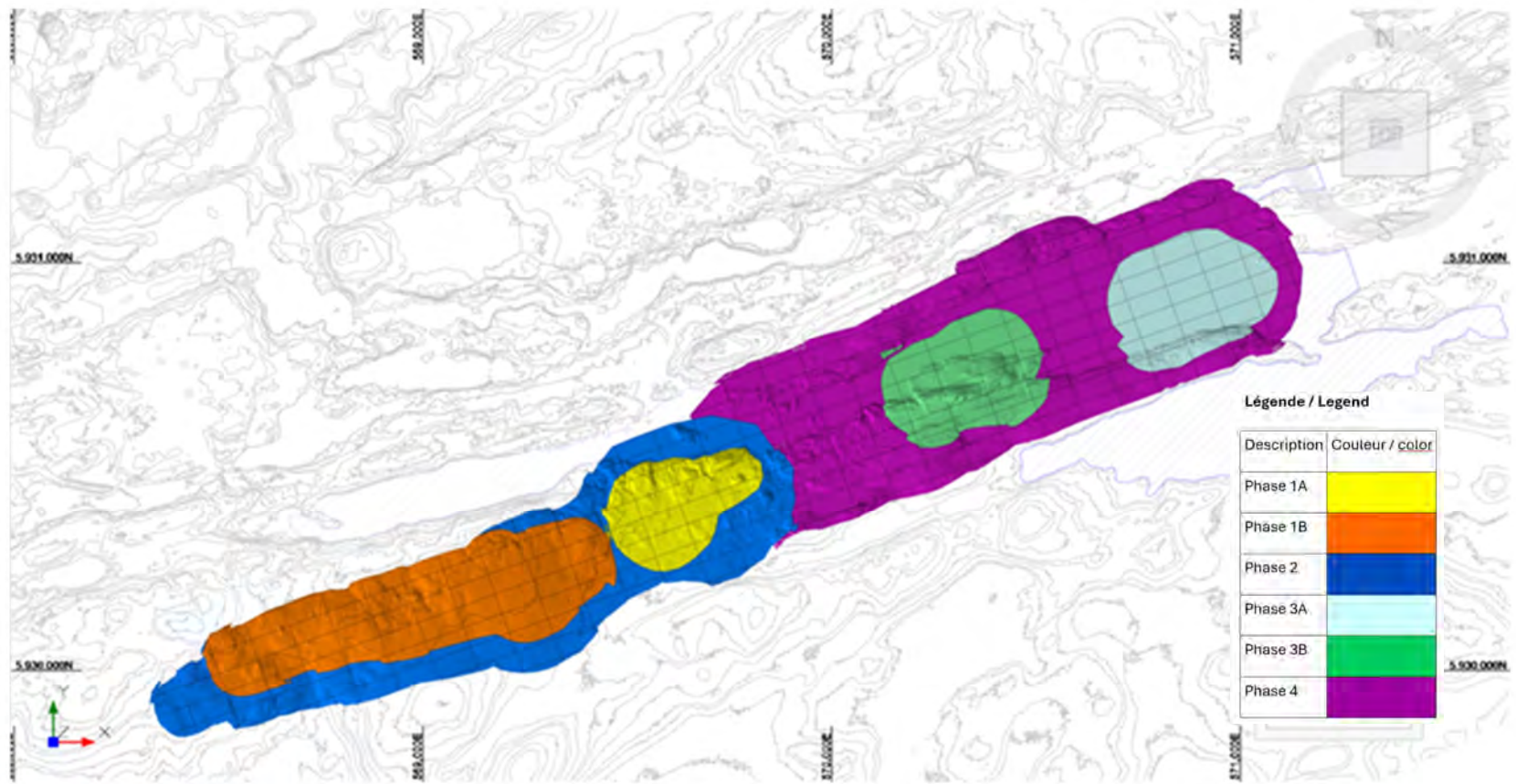
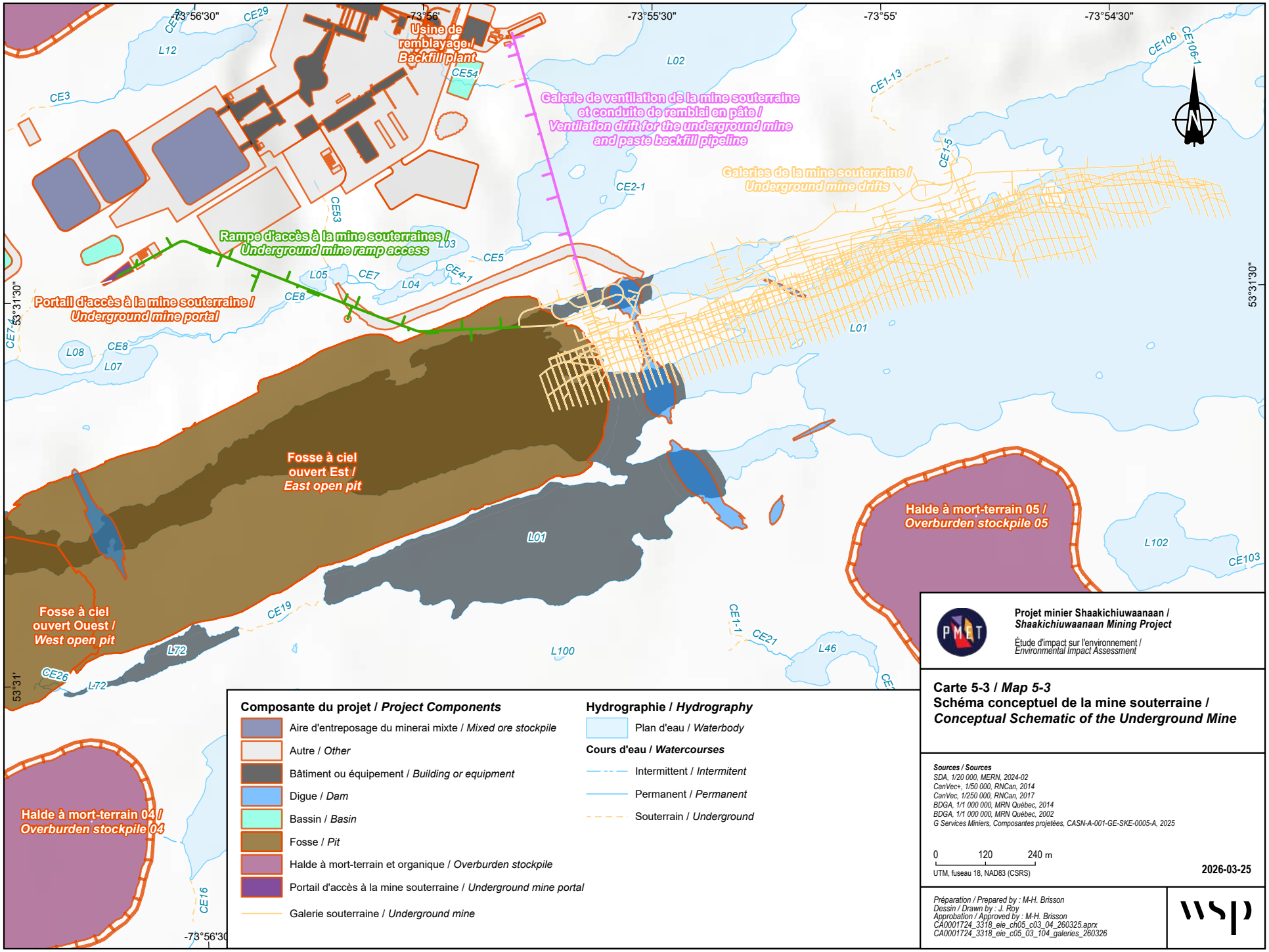


Figure 5-3 ***Schéma conceptuel de la fosse par phase*** */ Conceptual diagram of the Open–pit by phase*



Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-3 / *Map 5-3*
Schéma conceptuel de la mine souterraine / *Conceptual Schematic of the Underground Mine*

Sources / Sources
SDA, 1/20 000, MERN, 2024-02
CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/1 000 000, MRN Québec, 2002
G Services Miniers, Composantes projetées, CASN-A-001-GE-SKE-0005-A, 2025

0 120 240 m
UTM, fuseau 18, NAD83 (CSRS)

2026-03-25

Préparation / Prepared by : M-H. Brisson
Dessin / Drawn by : J. Roy
Approbation / Approved by : M-H. Brisson
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CA0001724_3318_eie_c05_03_104_galeries_260326

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5.2.3.1 Infrastructure

The processing plant will include areas dedicated to ore storage, crushing and grinding, concentration, drying, and loading for shipment.

The main components and activities at the processing plant site include:

- run-of-mine (ROM) stockpiles;
- crushing circuit (with primary, secondary, and tertiary crushing);
- crushed feed stockpile;
- coarse dense media separation (DMS) circuit;
- fine DMS circuit;
- ultrafine DMS circuit;
- recrush DMS circuit;
- magnetic separation and final product handling;
- dewatering and management of fines and middlings;
- tailings management.

5.2.3.2 Process

The concentration process at the processing plant is designed to produce spodumene concentrate that meets quality specifications from the raw ore extracted from the mine. This process will be based on a gravity circuit using a three-stage DMS and a crushing circuit, applicable to coarse and fine fractions. The facility will be equipped with two parallel processing lines, capable of operating independently, each representing 50% of the crushing, concentration, and dewatering capacity.

The main processing steps, also shown in Figure 5-4, will be as follows:

- crushing circuit (primary, secondary, and tertiary crushing);
- silo storage for crushed material supply;
- dense media separation (coarse, fine, and re-crushed);
- magnetic separation and handling of the final product;
- fines bypass, middling dewatering, and handling.
- final waste handling (tailings).

The raw ore from the pit and underground mine (mixed raw material) will be transported by mining trucks to the processing plant. At the site, trucks will either dump the raw ore directly into the dump pocket of the primary crusher (known as a jaw crusher) or direct it to a nearby temporary storage area where wheel loaders can continue to feed the primary crusher dump pocket.

The crushed ore will then be transported to be crushing screen. At this stage, coarse ore will be sent to the secondary crusher, while sufficiently fine ore will be sent directly to the final screen before being stored for processing via the DMS process. Any material that does not pass through the final screen is sent to a tertiary crusher, while materials that meet the desired particle size are transported to a silo to feed the DMS system, thus serving as a buffer between the crushing circuit and the processing plant. Subsequently, two apron feeders located in a reclaim tunnel beneath the silo will reclaim the crushed material and move it to a conveyor that will transport it to the processing plant.

At this stage of separation, there are three DMS circuits:

- Coarse DMS (CDM);
- Fine DMS (FDM);
- Ultrafine DMS (UFDM);
- Recrush DMS (RDM).

The dense medium separation process is essentially a gravity separation process in which crushed ore is introduced into a solution of water densified with added ferrosilicon (called dense medium) that is adjusted to achieve a density of 2.6 g/cm³ to 2.8 g/cm³. The ore particles, which are denser than the medium, report to the cyclone underflow, while the lighter gangue materials (quartz, feldspar, etc.) report to the overflow.

Following the dense medium separation circuits, the magnetic separation circuit will be fed by a fraction of the products from the FDM, UF-DMS separation circuit and part of the products from the RDM separation circuit. These materials will be exposed to a high-intensity magnetic field that will separate materials with higher proportions of iron in their mineral composition from the concentrate (final product). This magnetic circuit ensures that the final concentrate specification does not exceed the final iron impurity. The magnetic fraction will be sent to the processing plant's rejects (tailings). The non-magnetic fraction will be combined with part of the products from the CDM separation circuit to obtain a final concentrate, which will be loaded by a front-end loader into trucks for transporting the spodumene concentrate.

Residual fractions that are too fine will be directed to the fines bypass and middling dewatering circuit, where they will be conveyed to dewatering cyclones whose underflow will go to a thickener, and whose overflow will join the process water. The rest of the material from the dewatering cyclones as well as the thickener will be transported by conveyor to the dense medium separation middling stockpile. This product will then be transported by a wheel loader to a mining truck, which will store it in a designated location.

The final rejects of the process (tailings) come from the CDM, FDM, UF-DMS and RDM separation circuits, as well as the magnetic separation circuit. These rejects are accumulated on a stockpile and then transported by truck to the tailings storage facility.

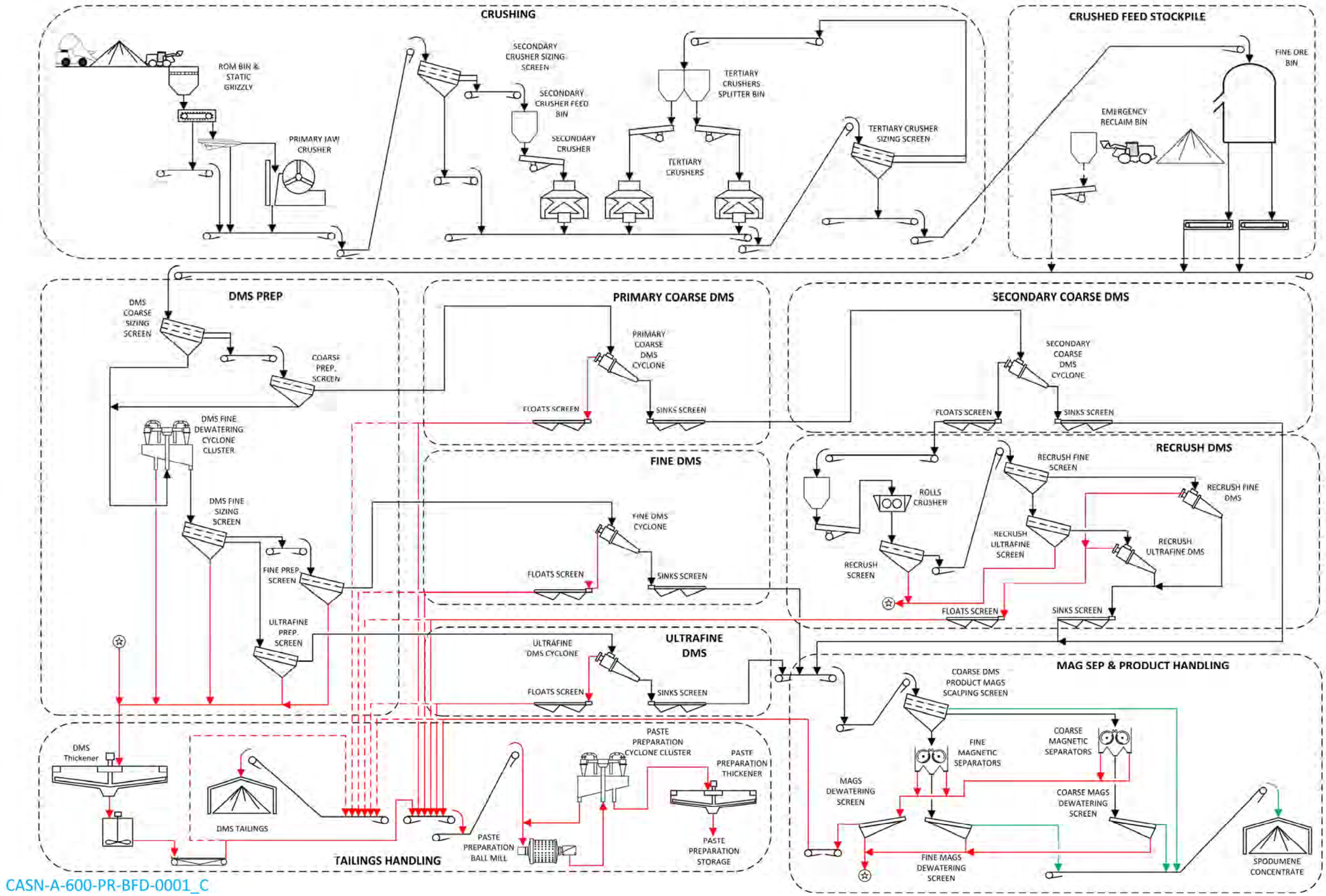


Figure 5-4 Mineral Processing Facility Simplified Process Flow Diagram

5.2.3.3 Reagents used in the process

The processing plant will mainly use two types of reagents:

- Ferrosilicon (FeSi) for dense media separation (DMS), delivered in bulk bags and prepared in a mixing tank before being pumped to the DMS circuits.
- Anionic flocculant (Magnafloc 10) for thickening and dewatering waste, delivered in 25 kg bags and diluted with raw and process water.

The mixing of reagents will be carried out in dedicated areas within the plant, with spill recovery systems.

5.2.4 Shipping of spodumene concentrate

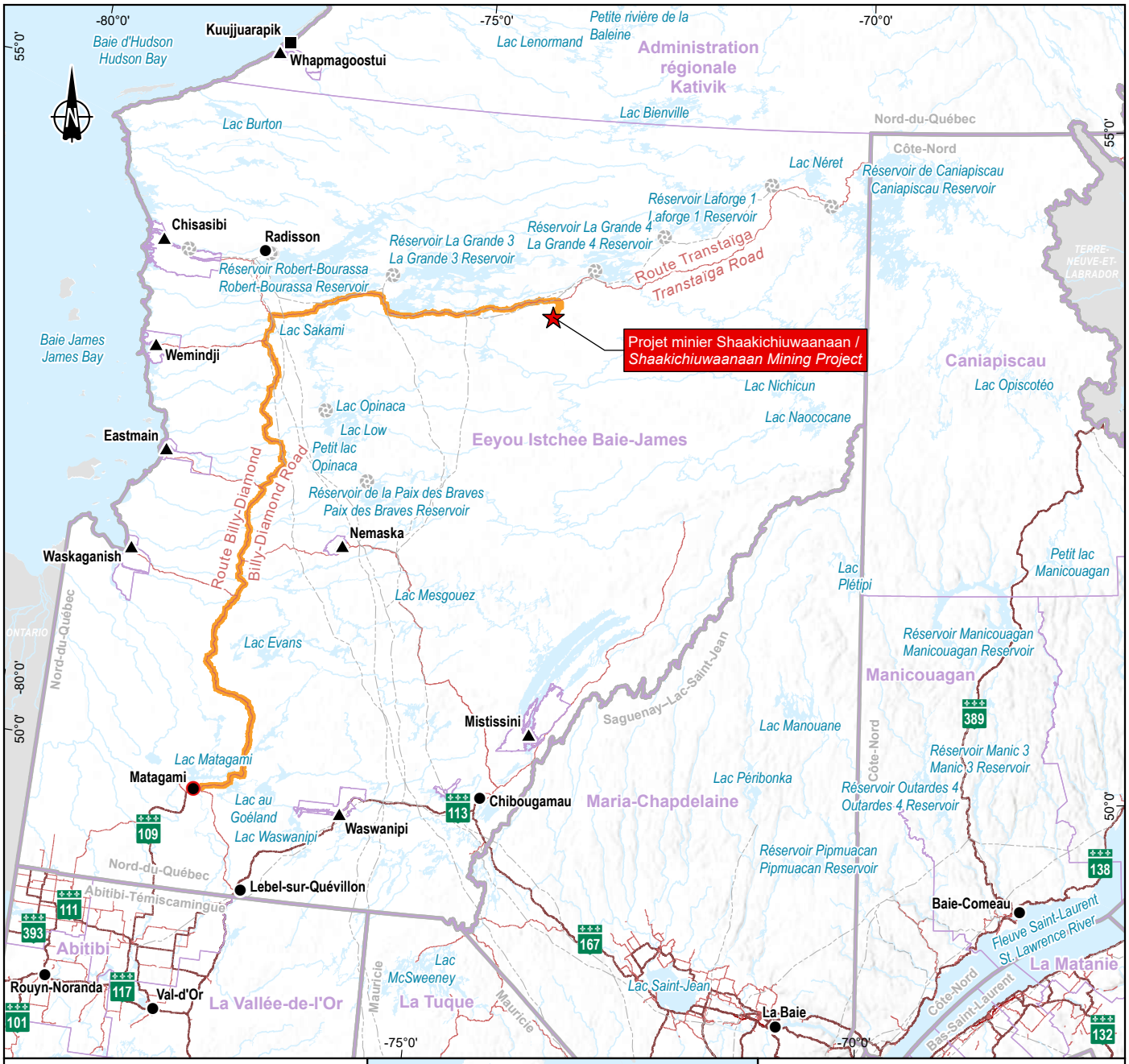
The project will produce an average of 800,000 tonnes of spodumene concentrate per year. A fleet of trucks will transport the concentrate from the mine site to the Matagami railway station, where a transshipment yard will be built (Map 5-4). The concentrate will be transported by trucks carrying two bins in a road train totalling 75 tonnes. The total road distance between the mine and Matagami will be over 800 km.

Upon arrival at the Matagami transfer yard, the trucks will be unloaded into a building that will protect the concentrate from the elements. From this point, the concentrate will be shipped by rail to the Grande-Anse/La Baie port, where it will be transported to conversion facilities located outside Quebec. Should a local market develop, conversion of the concentrate inside Quebec will be prioritized (at equal costs).

5.2.5 Geochemistry of tailings and waste rock

The geochemical studies conducted for the project include acid-base accounting (ABA), kinetic tests (HCT and columns), and predictive modelling by Vision Geochemistry (Appendix 5-4-1).

Atkins-Realis conducted a review of the available geochemical data (Appendix 5-4-2) to update the classification of the mining materials that will be produced during the operation of the Shaakichiuwaanaan project, in accordance with the criteria set forth in the Quebec Guide to the Characterization of Mine Tailings and Ore. The data examined include results from static tests conducted on 350 samples of waste rock, ore, and mine tailings, as well as results from kinetic tests in wet cells and columns. Some of these results were previously presented in the Vision Geochemistry report (2025). This report aims to validate and update the interpretation presented in the 2025 report based on the additional data collected.



Repères géographiques / *Geographical Landmarks*

- Communauté crie (zone d'étude régionale) / *Cree community (regional study area)*
- Village inuit / *Inuit village*
- Municipalité / *Municipality*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Transport du minerai / *Ore Transportation*

- Route pour le transport du spodumène / *Spodumene transportation route*

Réseau routier / *Road Network*

- Autoroute / *Highway*
- Route nationale ou régionale / *National or regional road*
- Autre / *Other*

Limites / *Boundaries*

- Région administrative / *Administrative Region*
- Municipalité régionale de comté (MRC) et Territoires autochtones / *Regional County Municipality (RCM) and First Nations Territories*



Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-4 / *Map 5-4*
Gestion du transport routier en dehors du site / *Off-site Road Transportation Management*

Sources :

SDA, 1/20 000, MRNF, 2024-02
Canvec, 1/250 000, 1/5 000 000 et 1/15 000 000, RNCan, 2019
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/5 000 000, MRNF Québec, 2010
AQréseau+, réseau routier, MERN, 2024-03-01
RNCan, Frontières géopolitiques, 2002

0 50 100 km

NAD 1983 Quebec Lambert

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Table 5-3 presents a summary of the classification of the various lithologies evaluated as part of this review. This overview forms the basis for the interpretation of risks associated with the geochemical behavior of the project's materials and will be used to develop the mine waste management program for the site. The classification is based on information available as of the date of this review, assuming that the properties of the samples analyzed for a given lithology are representative of the properties of that lithology as a whole. Laboratory tests will begin in March 2026 to apply these segregation criteria to the various mining materials in the project and to verify the feasibility of producing low-risk material based on these criteria.

Table 5-3 Summary of geochemical classification of mine lithologies

Lithology	Acid generating	Metal leaching	High risk	Radioactivity (preliminary evaluation)
Amphibolite	No	Leachable (**As, Cd, Sb**)	No	No
Metasediment	No	Leachable (As)	No	No
Ultramafic	No	Leachable (**As, Cd**)	No	No
Sterile pegmatite	No	Leachable (As, Cd, Cu)	No	No
Spodumene Pegmatite	No	Potentially leachable (As, Li),	No	No
Tailings	No	Leachable (**As**, Li, U)	No	No

Note: Elements shown **in bold** are more likely to be leached over the long term, based on the results of column testing. Some materials from each lithology may be considered non-leachable when segregated according to their arsenic content and sulfide content.

It should be noted that in the Vision Geochemistry report (2025), several lithologies were preliminarily identified as potentially acid-generating. In light of the additional information reviewed in this study, this potential has not been confirmed. All mining materials in the project are therefore considered non-acidogenic. However, it is recommended that testing continue under conditions more representative of actual mining conditions to validate this information.

Although all lithologies have been classified as non-acidogenic, the metasedimentary lithology is likely to be the most sensitive to heterogeneity in the distribution of sulfides or neutralizing minerals. Indeed, this unit has the highest sulfur grades and some of the lowest carbonate grades. The environmental risk that this unit could pose must be assessed in greater detail.

No mining material from the project was classified as "high-risk" in this review. However, column tests on ultramafic rock show leached concentrations of over 5 mg/L for arsenic. Larger-scale tests must be conducted to verify leached concentrations under field conditions.

Based on available analysis results, all mining materials exhibit some potential for leaching in the short term (metasediments, pegmatite) or in the longer term (amphibolite, ultramafic rock, and mine tailings). Vision Geochemistry (2025) proposes implementing a segregation process to separate the waste rock into two groups: one consisting of low-risk material, and the other comprising leachable material. As previously mentioned, laboratory tests will begin in March 2026 to apply these segregation criteria to the various mining materials in the project and to verify the feasibility of producing low-risk material based on these criteria.

The project calls for segregation of potentially metal leaching materials, specifically the complete separation of ultramafic lithology and the removal of all materials with arsenic concentrations greater than 30 ppm. This method should prevent arsenic leaching at Stockpile 01, thereby maintaining arsenic concentrations below the CVAA and REMMMD/D019 criteria.

Conversely, leaching conditions were identified in Stockpile 02, with arsenic concentrations that could exceed REMMMD/D019 criteria by up to two orders of magnitude, mainly due to the presence of tailings. Similarly, antimony and, to a lesser extent, lithium could be leached from Stockpile 02.

Among the measures planned to limit environmental impacts, the project includes the installation of a geomembrane-lined foundation beneath Stockpile 02, as well as a drainage system and collection ponds to intercept contact water. This water will be sent to a treatment plant to remove contaminants before being discharged into the natural environment.

A geochemical monitoring program will be implemented during operations to track the evolution of oxidation conditions and to confirm that metal leaching rates—expected to be higher during the initial exposure of materials and to decrease over time as a result of a natural wash-off process—remain consistent with predictions. This program will allow, if necessary, for adjustments to be made to the management of waste rock piles and retention ponds.

5.2.6 Stockpile management

The stockpile management areas relate to five major groups of materials: tailings, waste rock, overburden, organics, and ore. The project design includes the development of two waste rock stockpiles, two overburden storage facilities, and two organics storage facilities. The condemnation report for mineral resources under stockpiles is provided in Appendix 5-6. The construction and gradual elevation of these stockpiles will take place continuously throughout the mine's lifetime.

Materials stored in waste rock stockpiles and organics piles will be reused, where appropriate, during the site closure phase, particularly for covering and restoring mining components. The following sections describe how these different types of materials are managed.

5.2.6.1 Waste rock and tailings management

Project operations will produce 155.2 Mt of waste rock, including 74.2 Mt of low-risk waste rock and 81 Mt of waste rock that can potentially leach metals. Low-risk waste rock will be stored in Stockpile 01 (Map 5-1) located north of the mining facilities and covering a ground area of approximately 802,400 m². As for potentially metal-leaching waste rock, it will be stored on part of Stockpile 02 located east of the mining facilities (Map 5-1), covering an estimated area of approximately 1,296,000 m².

A total of 71.1 Mt of tailings will be generated. A portion of these tailings (54 Mt), containing low levels of lithium and tantalum, will be stored in a separate section of Stockpile 02 with the potentially metal leaching waste rock, covering an area estimated at approximately 1,022,000 m^2. The remaining 17.1 Mt of tailings will be used to produce paste backfill, which will be deposited in underground stopes where extraction has been completed.

As for Stockpiles 01 and 02 mentioned above, they will have a footprint of 80 ha and 218 ha, respectively, and will reach heights of 95 m and 120 m. For Stockpile 02, 92 ha are earmarked for tailings and 126 ha for potentially metal leaching waste rock. These stockpiles will comply with the minimum setback of 60 m from water bodies and identified fish habitats. In accordance with the requirements of Directive 019 on the mining industry, the footprint of Stockpile 02 will be lined with an impermeable geomembrane (Figure 5-5).

All tailings destined for surface storage will be transported by truck, then spread by a dozer and compacted using a vibratory soil compactor to ensure the stability of the deposits. The stockpiles were designed in such a way as to ensure long-term geotechnical stability of the deposits by ensuring a stepped elevation with final slopes ranging from 26 to 30 degrees (Figure 5-6). The report on the geotechnical laboratory analysis of tailings and the technical analysis of the stability of Stockpiles 01 and 02 are presented in Appendices 5-7 and 5-8, respectively.

5.2.6.2 Overburden and organics management

A total of 14 Mt of overburden will be moved as part of the mining operations and stored on two separate stockpiles, namely Stockpiles 04 and 05, located south and southeast of the open pit, respectively. A surface area of approximately 225,000 m² (Stockpile 04) and 271,000 m² (Stockpile 05) is planned for these two stockpiles.

A total of 3.2 Mt of organics will be removed from the mining facility operating area and stored in two storage areas located between Stockpile 01 and the mining facilities. These storage areas will have a footprint of approximately 98,400 m² and 134,200 m² respectively.

These two types of materials will be temporarily stored, as they will eventually be reused in the site closure works.

5.2.6.3 Ore management

The ore extracted from CV5 and transported out of the pit by truck will be stored in ore stockpiles adjacent to the process plant. As for the ROM pad, its storage capacity covers the 1 Mt required for the entire life of the mine (LOM). These storage areas are temporary and designed to receive ore before it is transferred to the processing plant. These areas will have a total footprint of approximately 65,000 m², about half of which is planned for the ROM pad. Geochemical characterization of the ore is underway and will help identify risks of leaching and acid generation. Depending on the results obtained, the design of the ore stockpile foundation and the ROM pad will take into account the sealing measures to be applied for groundwater protection as presented in D019.

5.3 Planned infrastructure and related developments

The project will include a coherent set of infrastructure facilities designed to support the project's extraction, processing, and environmental management operations. This infrastructure will be designed in accordance with Quebec standards for safety, environmental performance, and integration into the local landscape. The site infrastructure plan is shown on Map 5-1.

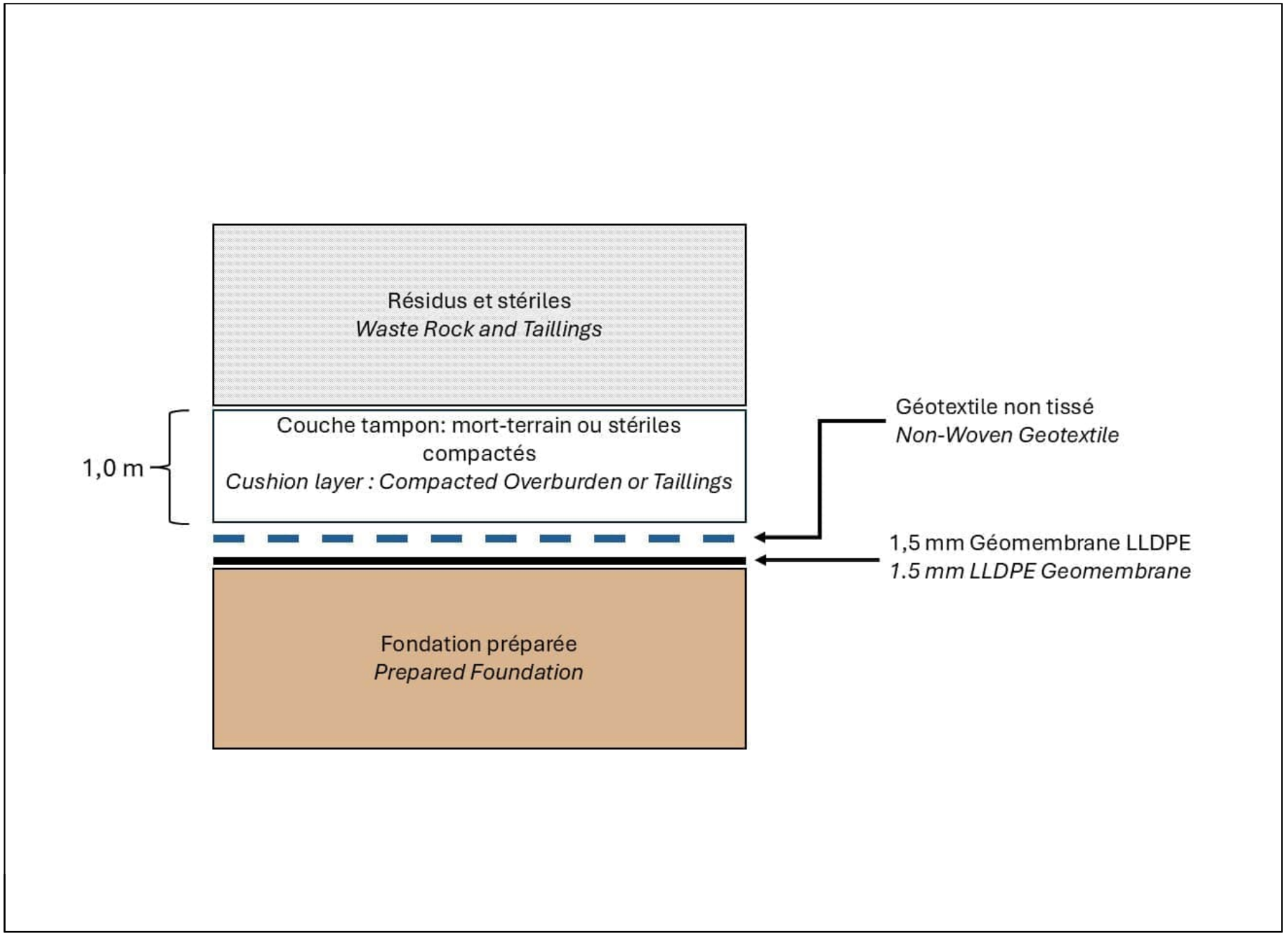


Figure 5-5 **Schéma conceptuel d'une fondation muni d'une membrane pour la halde 02 /** Conceptual diagram of a foundation equipped with a membrane for Stockpile 02

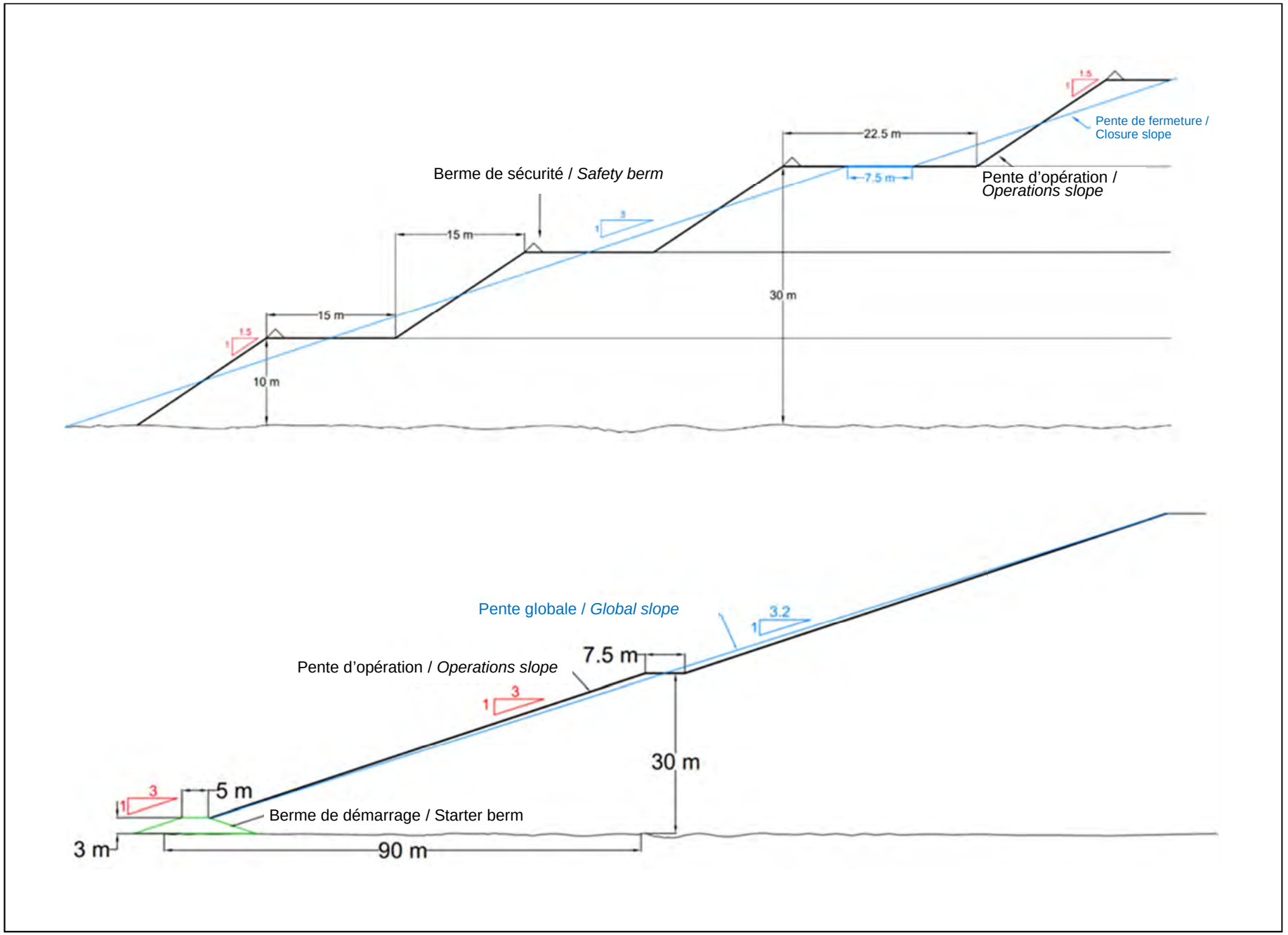


Figure 5-6 **Schéma conceptuel des pentes proposées pour les diverses zones d'empilement /** *Conceptual diagram of the proposed* slopes for the various stacking areas.

Some infrastructure has been developed, and other infrastructure is planned to be developed before the work and activities described in this document are carried out. These facilities and their construction have been or will be subject to prior authorizations and are necessary for the development of the project, but are not part of the scope of its environmental impact assessment. This infrastructure includes:

- the construction of an exploration camp at kilometre 270 of the Trans-Taiga Road;
- the construction of an all-season road from the Trans-Taiga Road to the project site.

5.3.1 Road access to the mine site and internal road network

The main access to the site will be via an existing all-season road approximately 20 km long connecting the Trans-Taiga Road (km 270) to the project's industrial zone (Map 5-5). This road will allow heavy and light vehicle traffic, with an average right-of-way of 30 m. Note that the Trans-Taiga Road, which runs east-west, connects to the Billy-Diamond Highway, which links Matagami to the south, the final destination for road transport of the concentrate (Map 5-5).

Within the boundaries of the mine site, a planned network of approximately 17 km of gravel roads will be constructed to allow the movement of light vehicles and heavy mobile equipment (Map 5-1). These internal roads will connect the main surface infrastructure, including the processing plant, workshops, fuel storage areas, material storage areas, explosives facilities, and waste rock management areas. Some of these routes will be dedicated to heavy trucks to facilitate the transport of ore and minimize interactions between these trucks and light vehicles.

Haul roads will be designed to accommodate 140-tonnes rigid-frame trucks, ensuring the movement of ore and waste rock between open pit mining areas and key surface infrastructure (primary crusher, maintenance workshop, refuelling station, tailings management facility, waste rock and overburden storage areas).

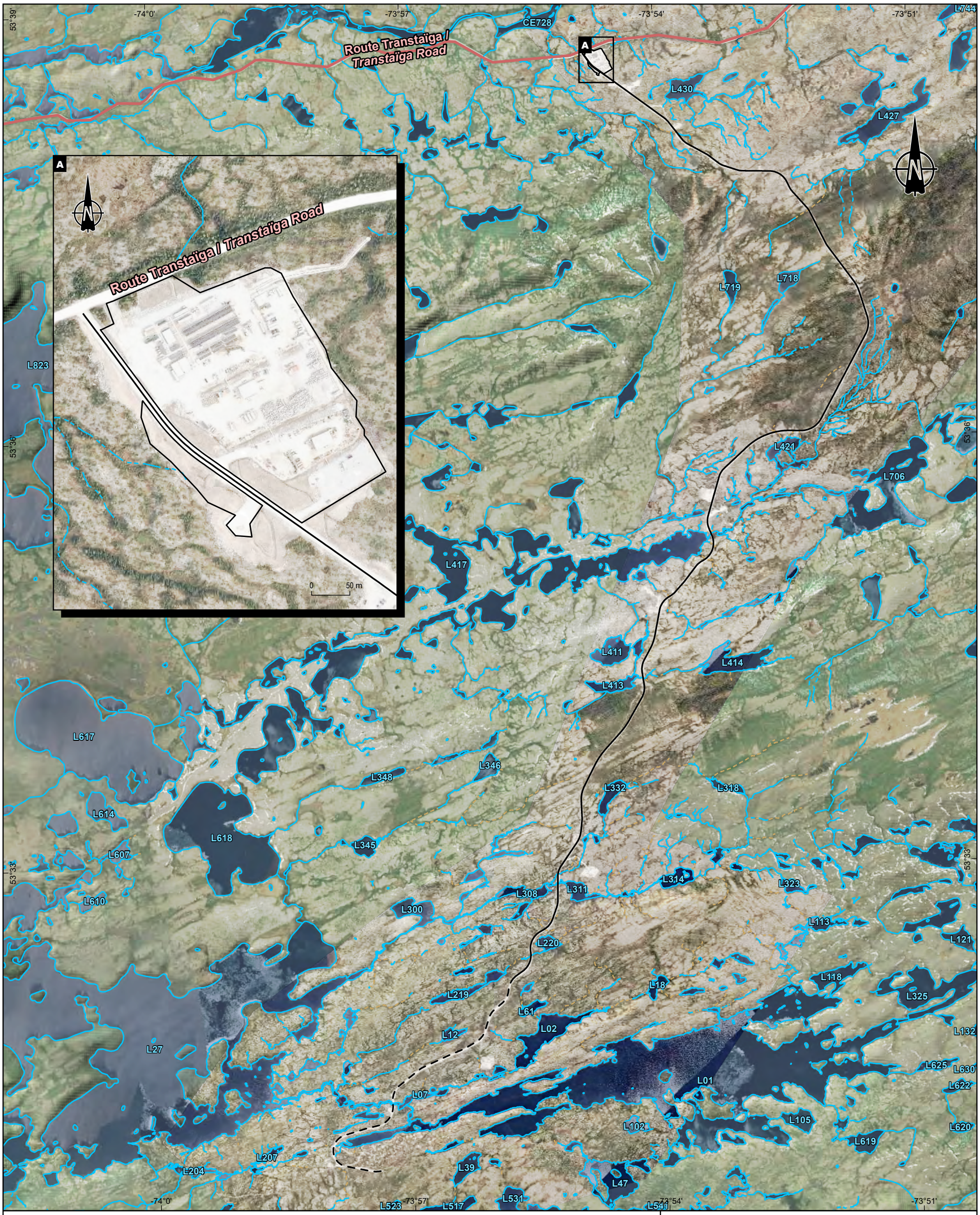
The entire road network includes ditch systems as well as culverts and bridges where necessary to ensure the free flow of surface water.

5.3.2 Power supply

Electricity will be supplied via a connection to the Hydro-Québec grid from the existing 315 kV Tilly substation located near the La Grande-4 complex. A dedicated transformer station (315 kV/120 kV) will be built near the Tilly substation to step down to the required power level of 120 kV. At the mine site, another step-down transformer is needed to reduce the voltage to a distribution level (Map 5-6).

The total power requirement is estimated at 35 MW for the combined operations of the open pit mine, underground mine, processing plant, and various on-site facilities. Hydroelectric power will ensure a favourable carbon footprint and limit the use of fossil fuels.

In the event of a grid power failure, a load-shedding scheme will be implemented to maintain power to essential systems. These critical loads will be supplied by two standby diesel generators rated at 2 MW each, operating at 13.8 kV. To further improve reliability, a third 2 MW backup generator will also be installed, providing additional redundancy. This standby generation system ensures that all essential systems remain energized during an outage.



Composantes du projet / *Project Components*

Existante / *Existing*

- Campement d'exploration / *Exploration camp*
- Chemin d'accès / *Access road*
- Chemin d'accès à démanteler / *Access road to be dismantled*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Permanent partiellement souterrain / *Partially underground permanent*
- Souterrain / *Underground*

Infrastructures / *Infrastructure*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-5 / *Map 5-5*
Composantes existantes du projet / *Existing Project Components*

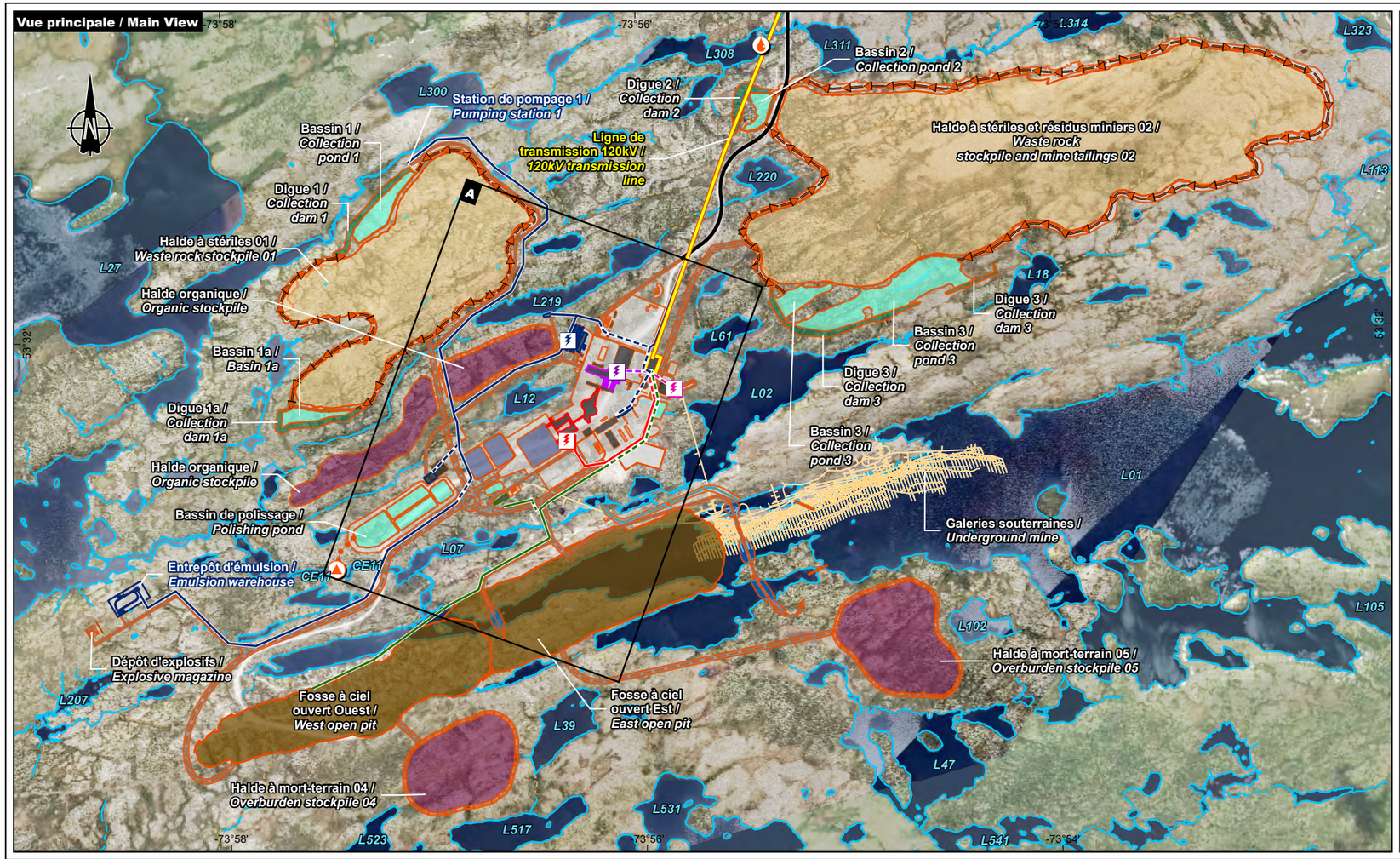
Sources / Sources
AQréseau+, réseau routier, MERN, 2024-03-01
G Services Miniers, Composantes actuelles, CASN-A-001-GE-GA-0002-CAD_RevB5, 2025
MERN, Ombrage MNT 50k, 2023
ESRI, World Imagery

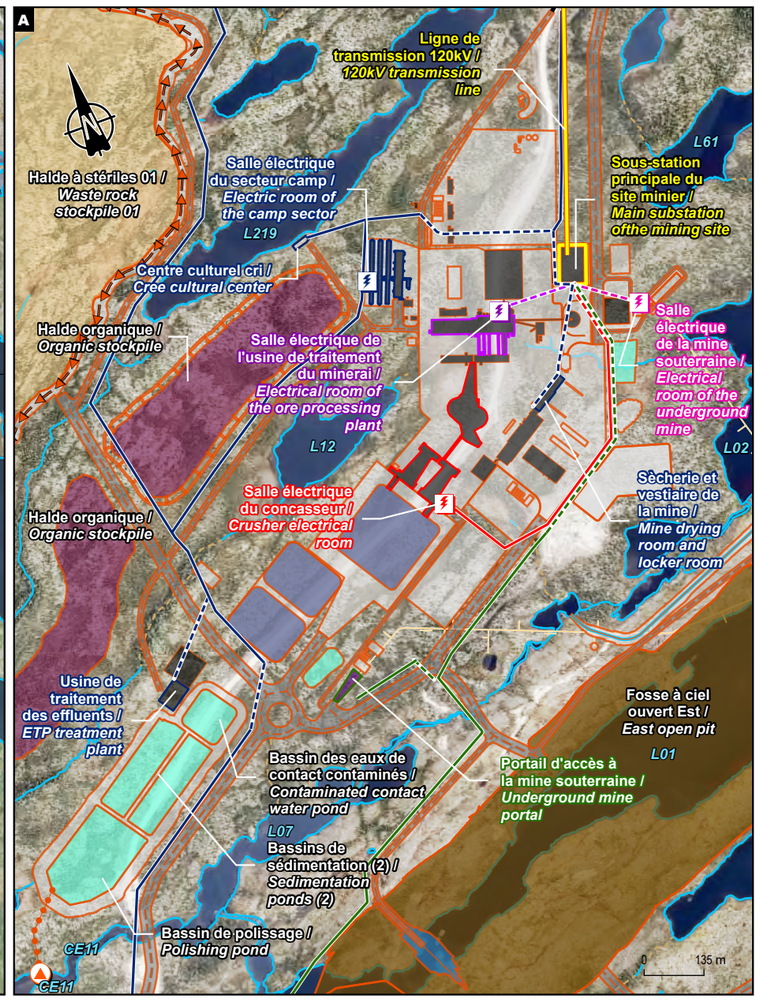
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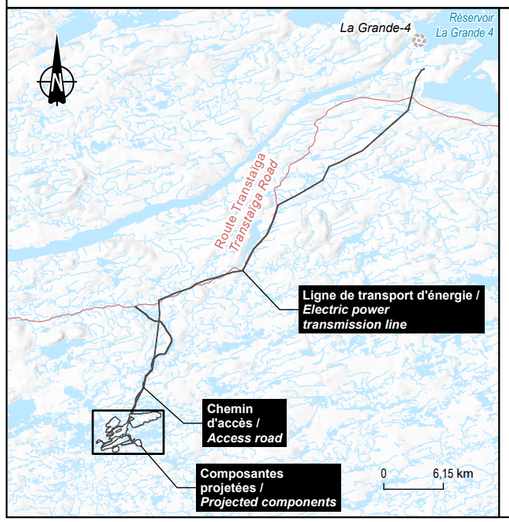
2026-03-25

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Dessin / Drawn by : J. Roy
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Composantes du projet / *Project Components*

Existante / *Existing*

- Chemin d'accès / *Access road*

Projetées / *Projected*

- Effluent minier / *Mining effluent*
- Prise d'eau / *Water intake*
- Barrage / *Dam*
- Canal / *Channel*
- Canal de dérivation / *Diversion Channel*
- Chemin secondaire / *Secondary road*
- Fossé / *Ditch*
- Aire d'entreposage du minerai mixte / *Mixed ore stockpile*
- Autre / *Other*
- Bâtiment ou équipement / *Building or equipment*
- Digue / *Dam*
- Bassin / *Basin*
- Digue des bassins / *Basins dam*
- Fosse / *Pit*
- Halde à mort-terrain et organique / *Overburden stockpile*
- Halde à stériles et/ou résidus / *Waste rock and/or tailings stockpile*
- Portail d'accès à la mine souterraine / *Underground mine portal*
- Voie de circulation / *Roadway*

Réseau électrique projetée / *Projected Electric Network*

- Ligne de transmission 120kV / *120kV transmission line*
- Ligne électrique aérienne (couleur) / *Overhead power line (color)*
- Ligne de distribution souterraine (couleur) / *Underground distribution line (color)*
- Salle électrique (couleur) / *Electrical room (color)*

Subdivision du réseau électrique sur le site minier (couleur) / *Subdivision of the Electric Network on the Mining Site (Color)*

- Concasseur / *Crusher*
- Mine à ciel ouvert / *Open-pit mine*
- Infrastructures / *Infrastructure*
- Mine souterraine / *Underground mine*
- Usine de traitement du minerai / *Ore processing plant*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Souterrain / *Underground*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-6 / *Map 5-6*

Localisation des postes, de la ligne de transmission projetée et des connexion électrique sur le site minier / *Location of the Stations, of the Projected Transmission Line, and of the Electrical Connection on the Mining Site*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02 / CanVec+, 1/50 000, RNCan, 2014 / CanVec, 1/250 000, RNCan, 2017
BDGA, 1/1 000 000, MRN Québec, 2014 / BDGA, 1/1 000 000, MRN Québec, 2002
AQréseau+, réseau routier, MERN, 2024-03-01
G Services Miniers, Composantes projetées, CASN-A-001-GE-SKE-0005-A, 2025

0 260 520 m

UTM, fuseau 18, NAD83 (CSRS)

2026-03-26

Préparation / Prepared by : M-H. Brisson
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5.3.3 Surface buildings and infrastructure

The industrial area will include:

- the ore processing plant, including crushing and screening circuits, crushed ore silos, DMS circuits, magnetic separation, and a loading area for concentrate and tailings;
- administrative buildings: offices, control centre, clinic, changing rooms, and other small auxiliary buildings for the concentrator and mine areas;
- a permanent camp with 672 beds for operational personnel, designed in accordance with CNESST standards;
- mechanical workshops and warehouses for equipment maintenance;
- a fuel depot (capacity of 320,000 litres) for vehicles and generators, equipped with a refuelling station;
- a secure storage area for hazardous materials (oils, solvents, batteries, reagents);
- an emulsion storage facility and explosive storage magazines;
- a First Nations cultural centre;
- storage areas, particularly for mining equipment.

Map 5-1 shows all planned infrastructure, and Figure 5-7 shows a 3D model of the main planned surface infrastructure.

All buildings will be thermally insulated and connected to a compressed natural gas (CNG) central heating system. Domestic wastewater will be treated on site by a modular system that complies with the *Wastewater Systems Effluent Regulations* (Section 5.4.7). The following sections provide more detailed information about some of these buildings.

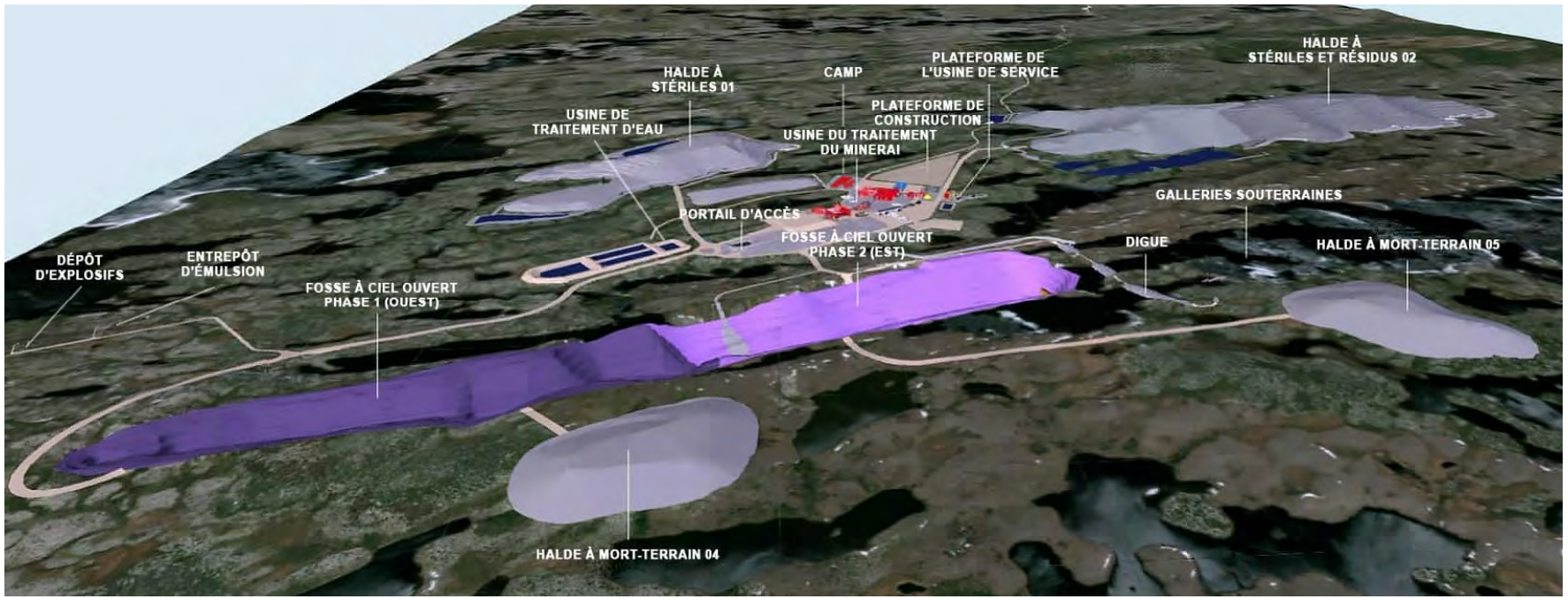


Figure 5-7 **Infrastructure principale du site – Vue en perspective**

5.3.3.1 Administrative and laboratory building

The administrative and laboratory building will be designed to combine office, meeting, and technical analysis functions under one roof. The administrative section will include ten closed offices, a work area with 30 workstations, two meeting rooms, a dining room, and support areas (printing, storage).

The laboratory section will be equipped for a range of analytical and preparation activities, including a wet laboratory, a sample preparation room, a chiller room, a press room, storage for instrumentation and chemicals, and a dedicated acid cabinet. In addition to these components, the laboratory will include equipment such as a jaw crusher, a rotary splitter, multi-head pulverizers, a sample drying oven, fume hoods, dust collectors, and other analytical apparatus.

Support areas will include a mechanical room, a chemist's office, and a training room. Acoustic insulation measures will be incorporated in certain spaces to enhance safety and comfort.

5.3.3.2 Process buildings

The secondary and tertiary crushing, screening, DMS sizing, and DMS buildings will be constructed with a concrete structure, insulated, and heated to prevent freezing. Most of the process plant equipment will be installed indoors with the exception of large water storage tanks and thickeners, which will be located outdoors but equipped for winter conditions. The primary crusher will remain outdoors without heating.

Crushed ore will be stored in an insulated silo capped with an insulated concrete dome. It will be erected on site with a steel frame and shotcrete construction. A reclaim tunnel will be built underneath the silo, with one doorway allowing access for a front-end loader in case of emergency.

All conveyors downstream of the DMS sizing building will be enclosed, insulated, made of structural steel, and heated to prevent freezing. For Phase 2, the secondary and tertiary crushing, screening, and crushed ore storage buildings will be duplicated, while the DMS buildings will be extended to accommodate the additional equipment.

5.3.3.3 Staff administrative building

The building will be multifunctional and will occupy an area of approximately 750 m². It will combine staff preparation areas and administrative spaces to optimize safety and operational efficiency.

It will include, in particular:

- men's and women's changing rooms with lockers, washing areas, and sanitary facilities;
- a boot washing area near the entrances to maintain cleanliness;
- administrative areas including offices for supervisors, meeting room, server room, truck dispatch area, and office for remote operations;
- additional amenities: cafeteria, electrical room, and laundry room for work clothes.

The layout will facilitate traffic flow during shift changes and will be located near the truck workshop, ensuring separate traffic flows for safety reasons.

5.3.3.4 Permanent campsites and related buildings

The permanent camp will be designed to accommodate up to 480 workers on site during Phase 1. In Phase 2, 192 additional beds will be added to meet the anticipated increase in workforce needs. In addition, the existing 150-bed camp located along the Trans-Taiga Road can be used during the construction phase when the total workforce exceeds the capacity of the operating camp.

Workers will be accommodated in Type B buildings, which are collective accommodation units spread over two levels. Each Type B dormitory is designed to accommodate up to 96 beds and includes rooms arranged along corridors, with shared sanitary facilities at a ratio of one bathroom for every two rooms, as well as technical and maintenance rooms.

The kitchen and lunchroom facilities will be designed to accommodate approximately 150 individuals at a time. They will include cooking zones, serving areas, and hygienic processing sections that comply with health standards, as well as storage spaces and cold rooms to ensure food safety.

The office is a single-story structure with an approximate area of 750 m², situated adjacent to the laundry facility and the recreational room.

5.3.3.5 First Nations Cultural Centre

The First Nations Cultural Centre will be in front of Lake L219, with spaces reserved for meetings and areas for traditional activities. This facility includes restrooms, a cold kitchen and wood stove, and a library.

Installed adjacent to this building, a traditional house will be positioned, covered in a waterproof canvas, with a combination of traditional and modern materials.

5.3.3.6 Temporary truck shop

A temporary shop will be installed to support mining activities during the construction phase. It will include multiple service bays for light vehicle maintenance, supported by specialized work areas such as a welding bay, tire shop, oil room, and battery storage. A wash bay will be integrated with appropriate drainage and water management systems. The facility will also include three heavy-duty vehicle bays and two tracked equipment bays.

The structure will consist of an insulated dome and will incorporate safety features such as eye wash stations, hose reels, and water gun stations.

5.3.3.7 Warehouse

The warehouse will be a thermally insulated steel structure, with thermoacoustic panel cladding and a fibre-insulated dome, covering an area of approximately 1,390 m². It will be designed for storage, reception, and distribution operations, with an internal layout that promotes smooth movement and safety.

5.3.3.8 Explosives storage facility

This infrastructure will be designed to meet all blasting requirements during operations.

Two mobile manufacturing units (MMUs) will be dedicated to the site, with the second being added as a backup unit for maintenance and contingencies. The explosive requirement will be 63,000 kg of 100% emulsion per week. The bulk depot will include two 25-ton ANE iso-containers, a garage/wash bay for one MMU, and containers for mixing gasser products, a water evaporator for contaminated water treatment, and other supplies.

Moreover, a 12 m explosives magazine and a 3.6 m detonator magazine will be included. The bulk depot sizing will provide 5.5 days of capacity without delivery. No additional infrastructure will be required for the underground operations, other than underground magazines. Emulsion will be delivered in 1,500 kg bins from the emulsion plant, and 65 bins total may be required cumulatively for the initial underground development work planned at the start of the production phase. This estimate represents a total volume over a limited period and does not correspond to a quantity stored simultaneously in underground magazines. The explosive storage area will be enclosed within a secured and fenced perimeter, with controlled access gates and regular security patrols.

5.3.4 Communication and security systems

The site will be equipped with a fibre-optic and satellite telecommunications network enabling real-time monitoring of operations and security systems.

The security measures will include the following:

- 24-hour surveillance system at strategic checkpoints;
- computerized access control;
- emergency plan and corrective measures integrated into the project's Health and Safety Management System (HSMS).

Joint emergency exercises will be conducted periodically with local services and the Cree authorities concerned.

5.3.5 Fuel storage and distribution

The fuel depot will include two separate sections (Map 5-1): one for light-duty vehicles and one for heavy-duty vehicles, with separate circulation paths to ensure safety and efficiency. It will be equipped with:

- three (3) horizontal steel diesel tanks, each with a capacity of 50,000 litres, as well as a 20,000-litre tank for clear diesel for Phase 1;
- an additional three (3) tanks of 50,000 litres to be added in Year 3 of operations.

This storage is designed to ensure five days of autonomy at peak consumption without requiring delivery.

The work will also include safety access walkways, grounding systems for lightning protection, and perimeter fencing for access control. The fuel distribution network will consist of two independent circuits:

- heavy vehicles: complete piping network with high-flow pumps and dispensing nozzles;
- light vehicles: similar, lower-flow network, compatible with both gasoline and clear diesel.

A dedicated loading/unloading area will be set up with:

- a heated 20-ft insulated container for transfer equipment;
- safety mechanisms such as emergency shut-off, spill protection, and overfill alarms.

A hydrocarbon separator unit will be installed downstream to treat accidental spills before discharge into the drainage system. The management system will include radio frequency identification (RFID) card access, real-time tracking, and a leak detection unit with automatic shutdown in the event of an incident.

5.3.6 Compressed natural gas (CNG)

The heating of the plant, underground mine, and auxiliary buildings will use 100% compressed natural gas (CNG). This will be delivered by a supplier via a high-pressure (up to 4,300 psi) trailer system, serving as both delivery and mobile storage units. The system will be designed with enough capacity to ensure four days of peak heating autonomy, with trailer rotation managed by the supplier to ensure continuous supply.

5.3.7 Quarries and borrow pits for construction

A report detailing the locations of quarries and borrow pits, as well as their capacities, is provided in Appendix 5-9. According to this report completed by BBA in March 2026, the material requirements (all particle sizes combined) for the construction of the entire mining site amount to 1.3 Mm^3. These requirements will be met by the opening of quarries and borrow pits, as well as by materials extracted from the pit once its excavation begins. Quarries and borrow pits will remain active after the pit is opened to meet the needs of work to be carried out in their vicinity (repair of the access road, in the exploration camp area, etc.).

A total of fourteen potential quarry sites (CA-1 to CA-14) have been identified on both sides of the access road to the mining site (Map 5-7). Of these, nine (CA-1 to CA-4 and CA-9 to CA-13) were excluded due to limited volumes of available material, unfavorable locations (conflict with project infrastructure), and the risk that a portion of the estimated volumes may be unusable due to the risk of leaching of metals, including arsenic. Priority for exploitation was therefore given to quarries CA-5 through CA-8 and CA-14, which are located between km 13 and 16 of the access road to the mining site. Table 5-4 presents the estimated potential volumes for the selected quarries.

Table 5-4 Estimated maximum volume for the selected quarries

Quarry	Estimated volume (000 m^3)
CA-5	800 to 1000
CA-6	200
CA-7	125
CA-8	4509
CA-14	750
Total	**2 325 to 2 525**

Source : Poly-Géo, 2026

Regarding borrow pits, the six identified sites (DG-01 to DG-06) are all located between km 8.5 and 9.5 of the access road to the mining site. The estimated potential volumes are presented in Table 5-5.

Table 5-5 Estimated maximum volume from borrow pits

Sand/gravel deposit	Estimated volume (000 m^3)
DG-01	15
DG-02	5
DG-03	8
DG-04	20
DG-05	10
DG-06	500
Total	**558**

Source : Poly-Géo, 2026

Note that geochemical characterizations for these various borrow pits and quarries are currently underway to confirm all construction material will be low risk.

5.4 Water management

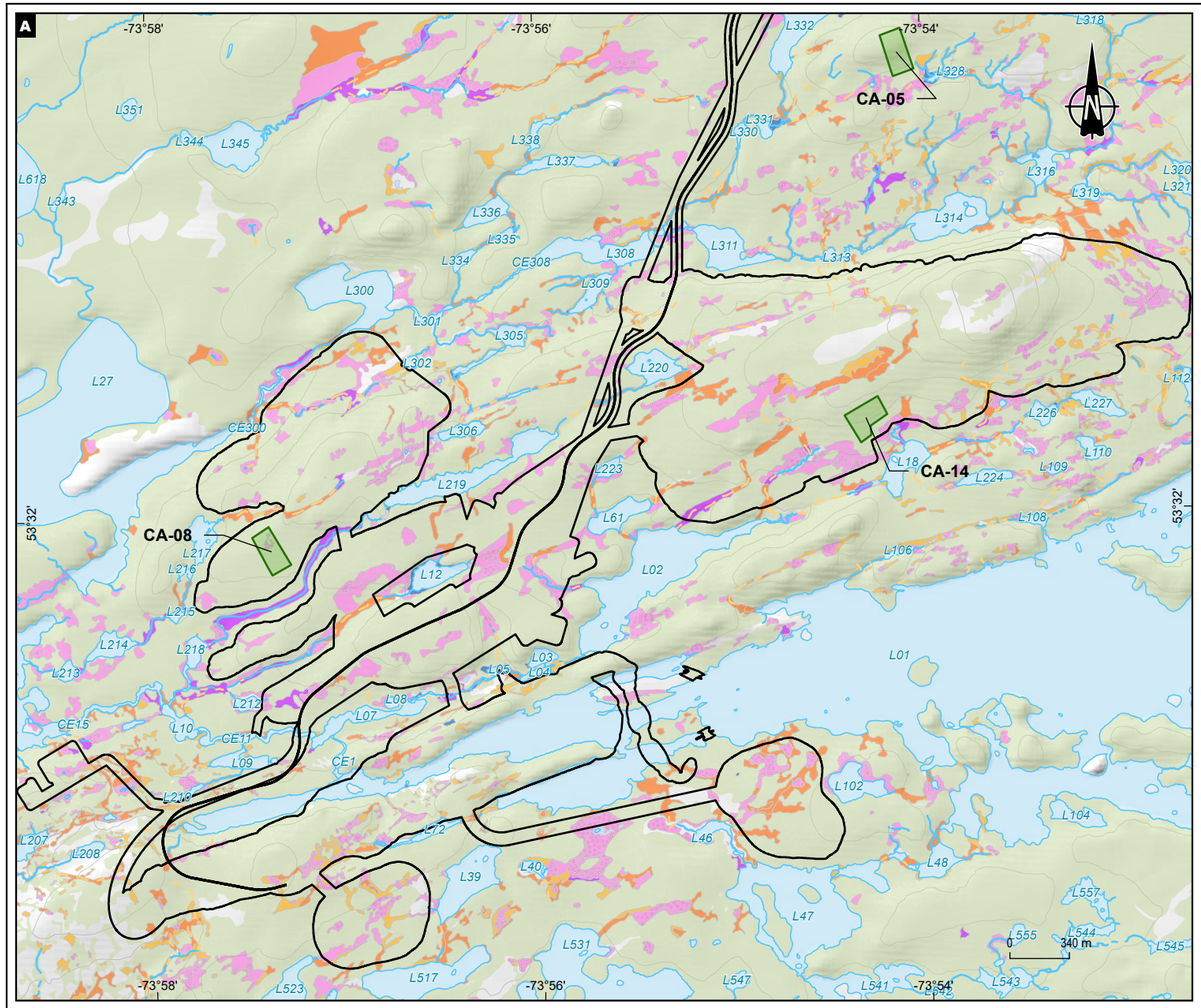
The project's water management aims to prevent any contamination of the water environment, optimize the reuse of process water, and ensure regulatory compliance of discharges. The system is designed according to an integrated water balance approach, combining collection, storage, treatment, and recirculation.

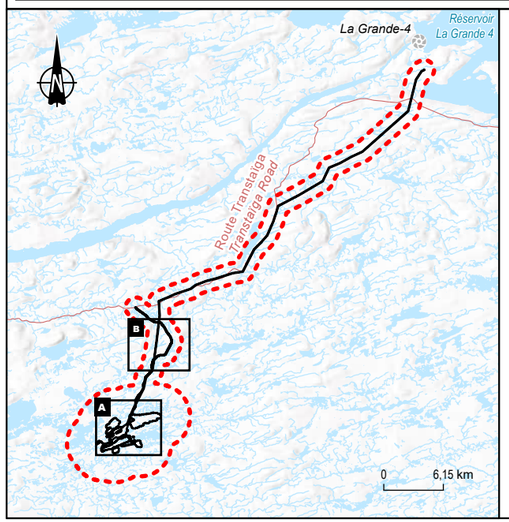
5.4.1 Water balance

A water balance model was developed for the entire mining complex to assess inflows and outflows (Appendix 5-10): precipitation, runoff, infiltration, pumping, process consumption, and evaporation.

The main inflows considered are:

- runoff from the pit, stockpiles, and pads;
- dewatering water from the underground mine;
- process water from ore processing;
- mine drainage water (during operations);
- natural inputs (precipitation) and losses through evaporation.





Zone d'étude / *Study Area*

- Projet / *Project*
- Locale - Biophysique / *Local - Biophysical*

Bancs d'emprunt / *Borrow Pits*

- Carrières potentielles / *Potential quarries*
- Dépôts meubles potentiels / *Potential unconsolidated deposits*

Composantes de l'écosystème / *Ecosystem Components*

Milieux humides et hydriques / *Wetlands and Hydrous Environments*

- Marécage arborescent / *Treed swamp*
- Marécage arbustif / *Shrubby swamp*
- Tourbière minérotrophe boisée / *Treed fen*
- Tourbière ombrotrophe boisée / *Treed bog*
- Tourbière ombrotrophe ouverte / *Open bog*
- Marais / *Marsh*
- Eau peu profonde / *Shallow water*
- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Souterrain / *Underground*

Infrastructure / *Infrastructure*

- Chemin d'accès / *Acces Road*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-7 / *Map 5-7*
Carrières et bancs d'emprunt sélectionnés pour la construction des infrastructures / *Selected Quarries and Borrow Pits for Infrastructure Construction*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02
CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/1 000 000, MRN Québec, 2002
AQréseau+, réseau routier, MERN, 2024-03-01
G Services Miniers, Composantes projetées, CASN-A-001-GE-SKE-0005-A, 2025

0 340 680 m
UTM, fuseau 18, NAD83 (CSRS)

2026-03-26

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Approbation / Approved by : M-H. Brisson
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Key findings from the water balance analysis include:

- The fresh water supply varies from 4,424 m^3/month to 4,898 m^3/month.
- Under average conditions, when the mine is fully developed, the volume of excess water discharged to the environment ranges from 286,000 m^3 (February) to 989,000 m^3 (May) per month.
- On an annual basis, the volume of excess water discharged to the environment is estimated at 4,950,000 m^3 in dry conditions, 7,030,000 m^3 in average conditions, and 8,410,000 m^3 in wet conditions.
- The treated water stored in the polishing pond will be sufficient to supply the processing plant and meet other operational needs throughout the life of the mine, under various climate scenarios.
- The runoff ponds located at the base of the stockpiles will be adequately sized to manage the meltwater.
- The pumping stations, designed to handle the Directive 019 snowmelt event, ensure efficient and reliable transfer of water to both passive and active treatment systems.
- The hydraulic retention time (HRT) in the passive treatment infrastructures consistently remains high enough to allow for effective particle settling.
- Under normal conditions, the ponds operate between the lowest operating water level (LOWL) and maximum operating water level (MOWL), utilizing only 40% of the pump capacity.

The model provides for internal recirculation of more than 75%, thereby minimizing fresh water requirements and discharge volumes. Excess volumes will be treated before their final discharge into the receiving environment. Figure 5-8 shows the flow diagram for mine site water management.

5.4.2 Contact water management infrastructure

The water management plan was designed to effectively separate contact water from uncontaminated water, in accordance with the requirements of Directive 019 on the mining industry. The main water management infrastructure is presented in the following subsections (Map 5-8). It will all be designed to withstand at least a 100-year rainfall event and equipped with automated control devices (see section 5.4.2.2).

5.4.2.1 Contact water collection ditches and pipelines

Ditches will be constructed to collect runoff from Stockpiles 01 and 02 and direct it to the contact water collection ponds (Map 5-8). All ditches will be constructed to allow for the installation of an adjacent service road, and those located around Stockpile 02 will be lined with a geomembrane, as shown in Figures 5-9 and 5-10. Pipes for drinking water, sewage water, and industrial water will also be installed on the site (Map 5-9).

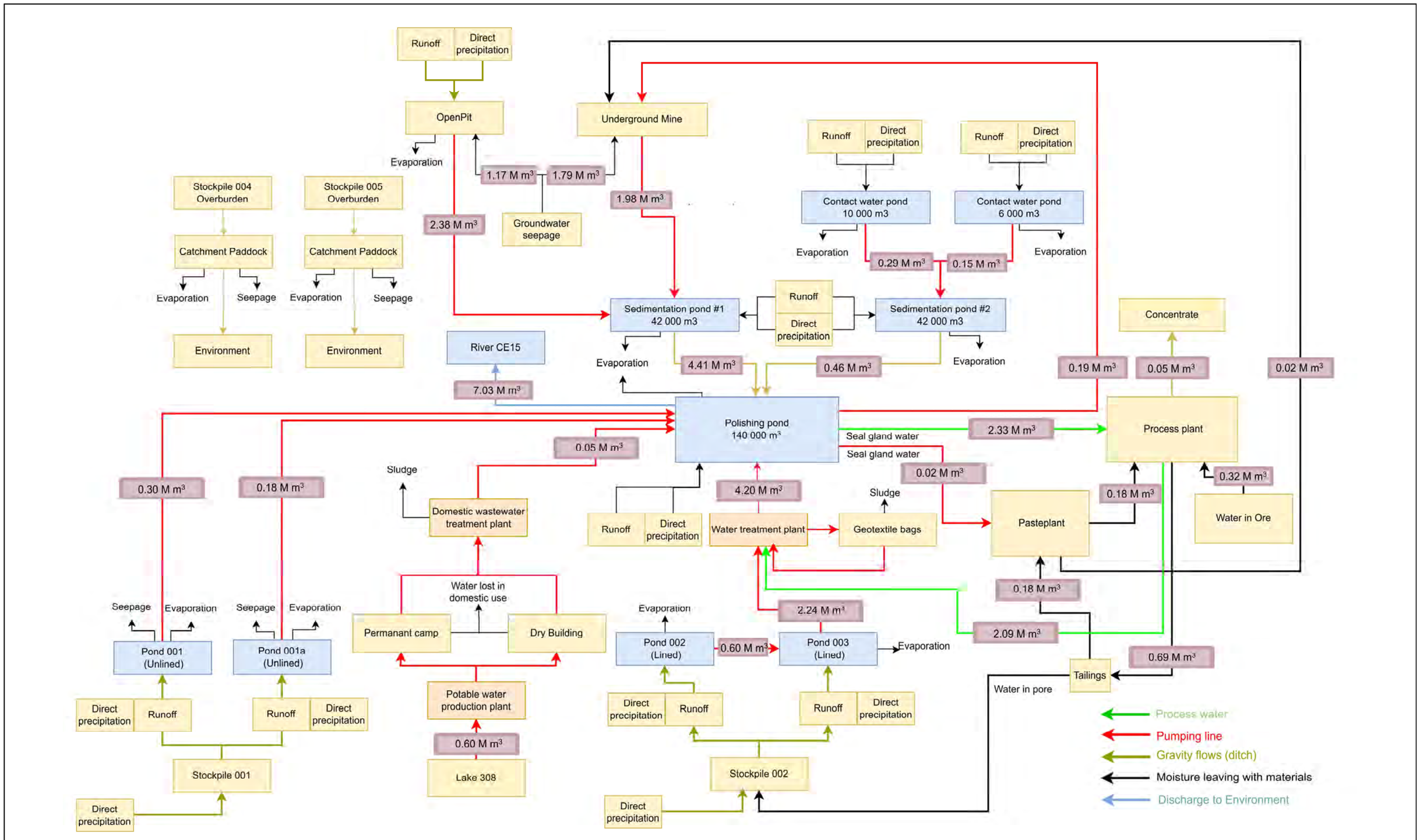


Figure 5-8 Mine site water balance

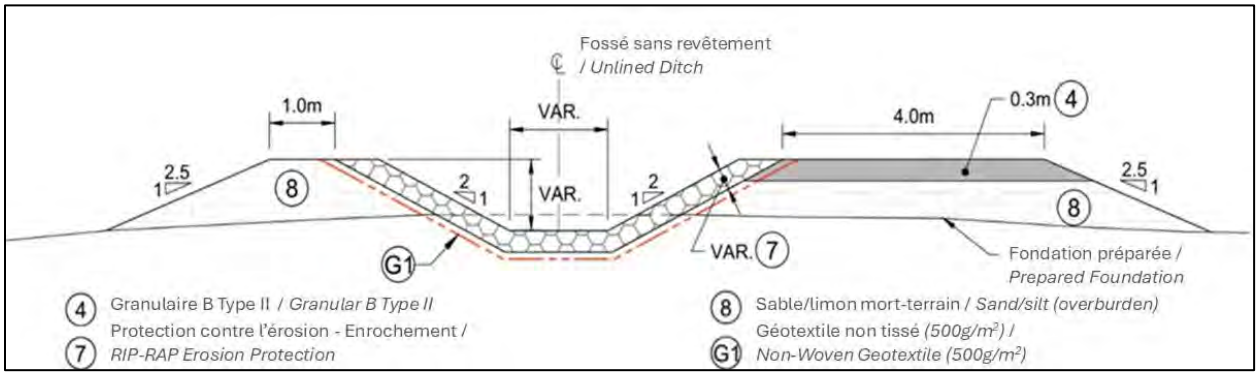


Figure 5-9 Typical section for Stockpile 01 water collection ditch

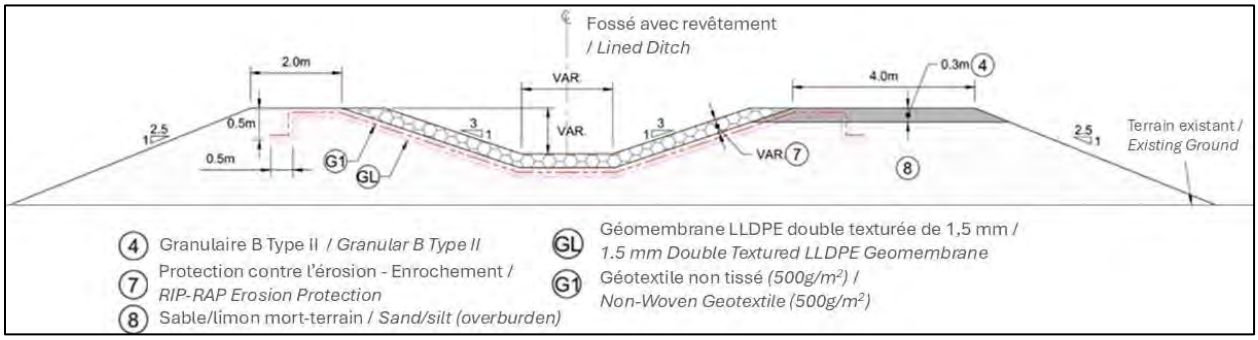


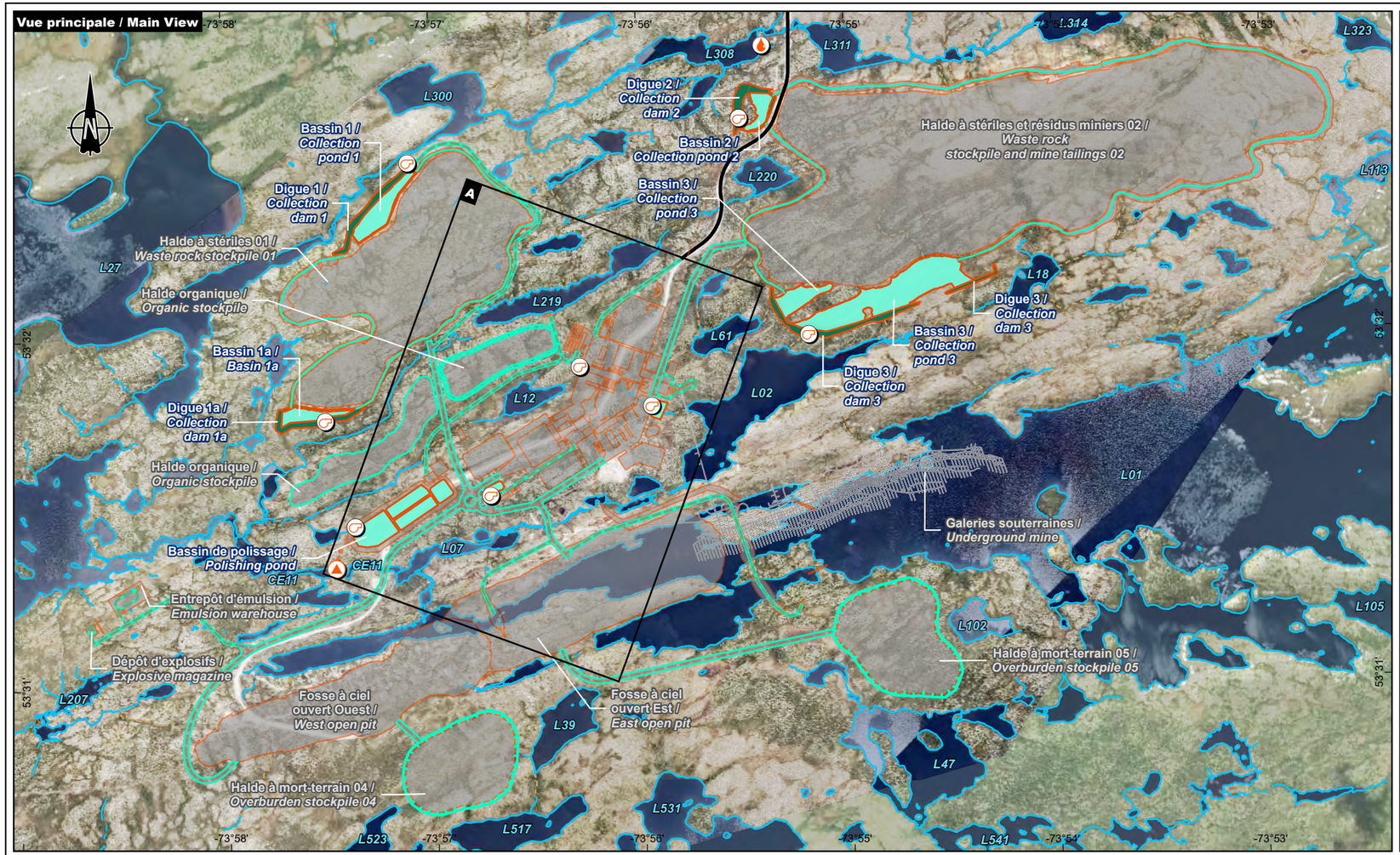
Figure 5-10 Typical section for Stockpile 02 lined water collection ditch

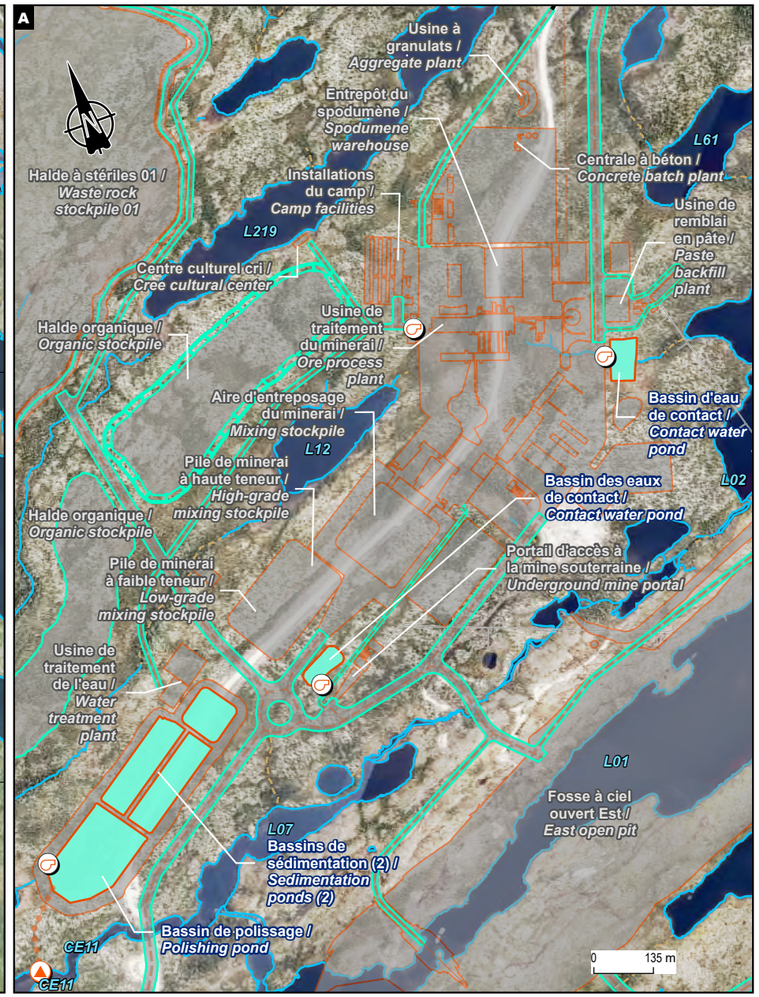
5.4.2.2 Contact water collection ponds

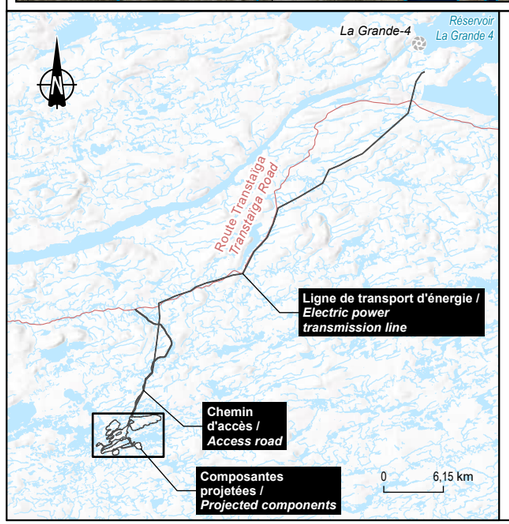
These ponds will serve as initial containment to collect runoff from Stockpiles 01 and 02 and the industrial area (Map 5-8). Once the contact water has been collected in these ponds, will be transferred by pumping systems to the treatment infrastructure for treatment (Section 5.4.4). In addition, emergency spillways will be incorporated into the design of all pond embankments to safely discharge inflows exceeding the EDF.

A total of six collection ponds are planned for the mine site, as detailed below and in Table 5-6. The ponds were designed with a capacity that takes into account the risk of failure in the event of severe weather conditions:

- Stockpile 01 (Pond 01 and Pond 01A): Combination of 24-hour freezing and 100-year snowmelt in 13 days, with a required freeboard of 1.0 m above the peak environmental design flood (EDF) water level.
- Stockpile 02 (Pond 02 and Pond 03): Combination of the 2,000-year rainfall event in 24 hours and the 100-year snowmelt in 13 days, with a required freeboard of 1.5 m above the peak EDF water level.
- Industrial area collection ponds (CP1 and CP2): Combination of the 100-year rainfall event in 24 hours and the 100-year snowmelt in 13 days.







Zone d'étude / *Study Area*

Projet / *Project*

Composantes du projet / *Project Components*

Existante / *Existing*

Chemin d'accès / *Access road*

Projetées / *Projected*

Effluent minier / *Mining effluent*

Prise d'eau / *Water intake*

Station de pompage / *Pumping station*

Barrage / *Dam*

Canal / *Channel*

Chemin secondaire / *Secondary road*

Galerie souterraine / *Underground mine*

Ligne de transport d'énergie / *Power transmission line*

Fossé / *Ditch*

Bassin / *Basin*

Digue des bassins / *Basins dam*

Autres infrastructures projetées / *Other projected infrastructures*

Hydrographie / *Hydrography*

Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

Intermittent / *Intermitent*

Permanent / *Permanent*

Souterrain / *Underground*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-8 / *Map 5-8*
Bassins et fossées collecteurs du site/ *Basins and Collector Ditches of the Site*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02
CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/1 000 000, MRN Québec, 2002
AQréseau+, réseau routier, MERN, 2024-03-01
G Services Miniers, Composantes projetées, CASN-A-001-GE-SKE-0005-A, 2025

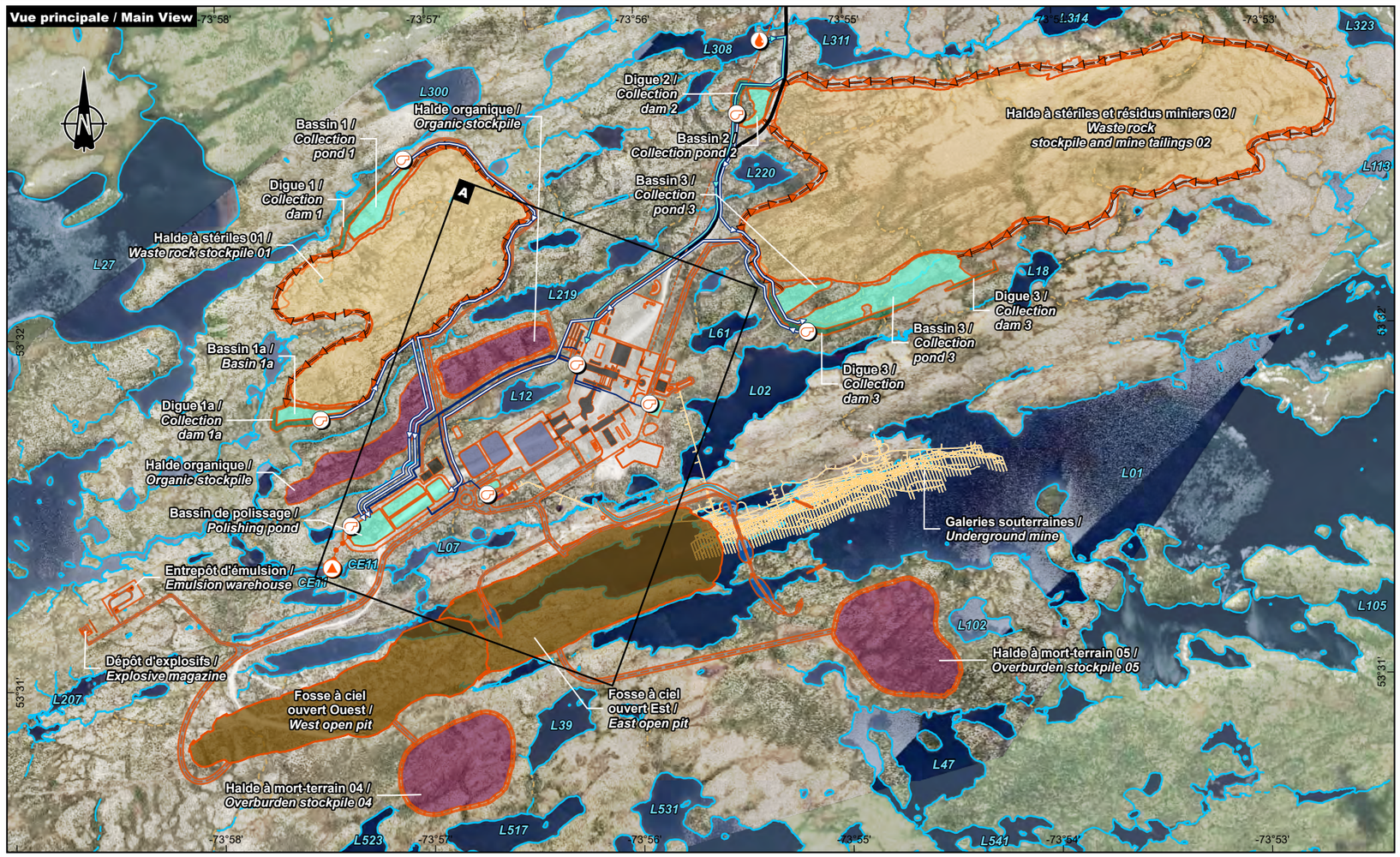
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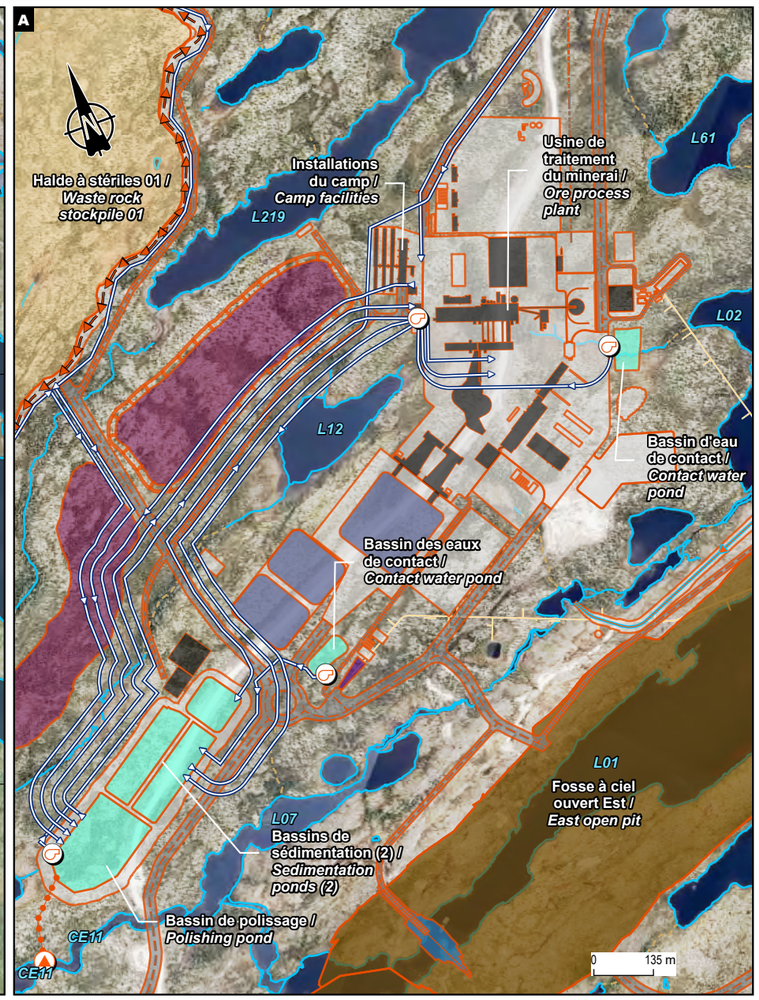
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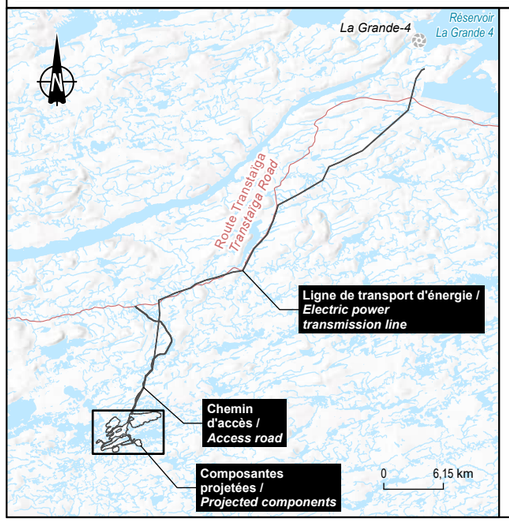
2026-03-26

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Dessin / Drawn by : J. Roy
Approbation / Approved by : M-H. Brisson
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Zone d'étude / *Study Area*

Projet / *Project*

Composantes du projet / *Project Components*

Existante / *Existing*

Chemin d'accès / *Access road*

Projetées / *Projected*

Effluent minier / *Mining effluent*

Prise d'eau / *Water intake*

Station de pompage / *Pumping station*

Barrage / *Dam*

Canal / *Channel*

Canal de dérivation / *Diversion Channel*

Chemin secondaire / *Secondary road*

Fossé / *Ditch*

Galerie souterraine / *Underground mine*

Ligne de transport d'énergie / *Power transmission line*

Canalisation projetée / *Projected Pipelines*

Conduite d'eau potable (représentation) / *Drinking water pipe (representation)**

Conduite d'eau non potable (représentation) / *Non-potable water pipe (representation)**

Autre conduite / *Other pipe*

Composantes du projet / *Project Components*

Aire d'entreposage du minerai mixte / *Mixed ore stockpile*

Autre / *Other*

Bâtiment ou équipement / *Building or equipment*

Digue / *Dam*

Bassin / *Basin*

Digue des bassins / *Basins dam*

Fosse / *Pit*

Halde à mort-terrain et organique / *Overburden stockpile*

Halde à stériles et/ou résidus / *Waste rock and/or tailings stockpile*

Portail d'accès à la mine souterraine / *Underground mine portal*

Voie de circulation / *Roadway*

Hydrographie / *Hydrography*

Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

Intermittent / *Intermitent*

Permanent / *Permanent*

Souterrain / *Underground*

* Affichage pour représentation seulement (ne correspond pas à l'emplacement réel) / *Display for representation only (does not correspond to the actual location)*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-9 / *Map 5-9*
Canalisations projetées pour les eaux potable, sanitaires et industrielles / *Pipelines Planned for Drinking Water, Sanitary, and Industrial Use*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02
CanVec+, 1/50 000, RNCan, 2014 / CanVec, 1/250 000, RNCan, 2017
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/1 000 000, MRN Québec, 2002
AQréseau+, réseau routier, MERN, 2024-03-01
G Services Miniers, Composantes projetées, CASN-A-001-GE-SKE-0005-A, 2025
AtkinsRéalis, Canalisation projetée, 2025

0 260 520 m

UTM, fuseau 18, NAD83 (CSRS)

2026-03-26

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Table 5-6 Summary of the design specifications of the proposed collection ponds

Pond	Description	Catchment Area (m^2)	Required Storage Capacity (m^3)	Associated Collection Ditches
Pond 01	Collect runoff from Stockpile 01	621,400	80,000	Ditches 01-01 and 01-02
Pond 01A	Collect runoff from Stockpile 01	378,500	52,000	Ditches 01A-01 and 01A-02
Pond 02	Collect runoff from Stockpile 02	935,300	137,000	Ditches 02-01 and 02-02
Pond 03	Collect runoff from Stockpile 02	1,933,200	293,000	Ditches 03-01 and 03-02
Pond CP1	Collect runoff from the industrial area infrastructure	435,000	10,000	N/A
Pond CP2	Receives runoff from the industrial infrastructure section	230,000	6,000	N/A

Ponds 01, 01A, 02, and 03 will require embankments made of waste rock, with a layer of stones and sand. All embankments will be lined with a 1.5 mm textured geomembrane and the collection ponds for Stockpile 02 will also be lined with a 1.5 mm textured LLDPE geomembrane. Figure 5-11 shows a typical section of the embankments of contact water collection ponds.

5.4.2.3 Pumping stations

These pumping stations are strategically distributed across the site and are used to transfer contact water between the collection system and the treatment facilities (Section 5.4.5). The pumping system was also designed to provide operational support to supply water for various mining activities.

5.4.3 Dikes and watercourse diversion

As presented in Section 5.2.2.1, the open pit mine will be developed in two (2) phases, the West Pit and the East Pit, which will incorporate a portion of Lake L01. The project therefore includes the construction of a series of diversion and cut-off dikes, as well as a diversion channel to keep the mine footprint dry while ensuring the natural flow of water from Lake L01 (Map 5-1). The diversion channel will be constructed in a single stage in Year 2.

The diversion and cut-off dikes will hydraulically isolate the mine area while diverting water from the lake away from the mine footprint. Lake L01 has a total surface area of 4,478,314 m^2, an estimated volume of 24,463,185 m^3, an average depth of 6.3 m, and a maximum depth of 18.0 m. These parameters were incorporated into the dewatering planning and the design of the diversion structures.

The total watershed area of Lake L01 is 106 km^2. The total drainage area affected by the diversion is approximately 1.9 km^2 or 1.7% of the entire Lake L01 watershed.

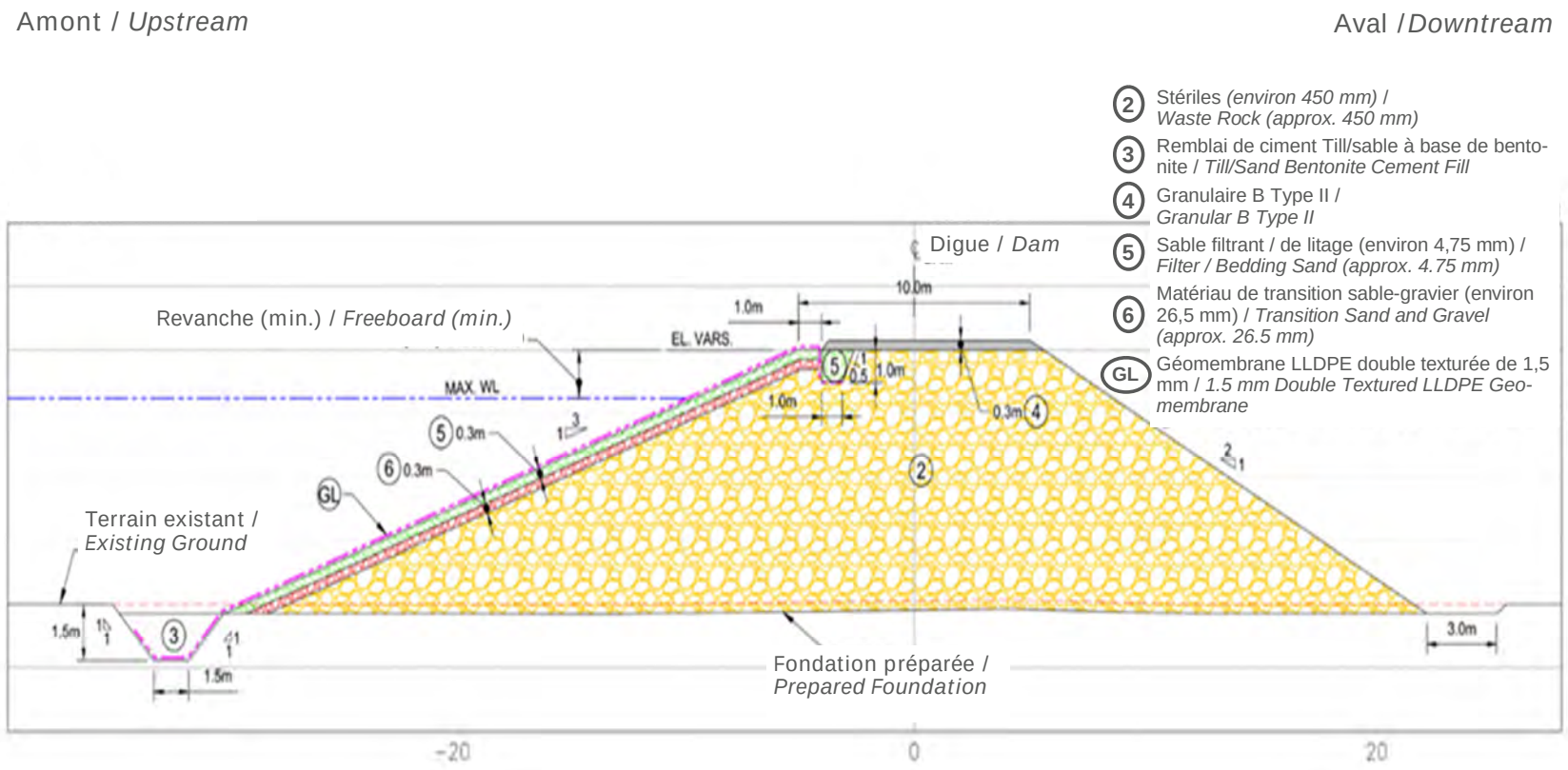


Figure 5-11 **Coupe type d'un remblai de rétention d'eau de contact conçu pour les bassins** / *Typical cross-section of a contact water retention embankment designed for the basins*

The diversion channel will redirect flow from Lake L01 to Lake L05. It will be approximately 870 m long with a 5 m base and an average gradient of approximately 0.3%. Most of the channel will be routed through bedrock with 1H:1V side slopes. The alignment of the channel was chosen to have a minimum offset of 45 m from the open pit mine, a minimum offset of 60 m from Lakes L02 and L03, and an offset of 10 m from Lake L04.

The diversion channel will replace the existing natural watercourse discharging from Lake L01 to Watercourse CE15. The design of the channel must therefore replicate the hydraulic conditions of the natural watercourse for fish habitat and fish passage. This will be achieved by providing a series of drops and pools along the channel bed to create varying hydraulic conditions. These hydraulic conditions will facilitate rapid flows and water depths, both upstream and downstream of the drops. Boulders will be placed between sections of the channel where high velocities are present to provide shelter for fish during their migration from downstream to upstream.

Figure 5-12 shows a schematic representation of the proposed fishway channel. Comparison between the results of the hydraulic modelling and field measurements showed that the velocities at the depths of the diversion channel are within a similar range of values to those measured in the natural watercourse.

Flow control structures, such as sluice gates or spillways, are not required for the diversion channel as designed. No additional control works are planned at this stage.

The cut-off dikes will be constructed on the east side of the open pit mine and will be developed in two (2) phases to match the pit development. For the West Pit, a single dikes is required, while four (4) dikes will be constructed during the development of the East Pit. These dikes will be located to the east of the West Pit dam.

The lake sediments present in the area where the dikes will be built will be removed by dredging to ensure a stable foundation for the structures.

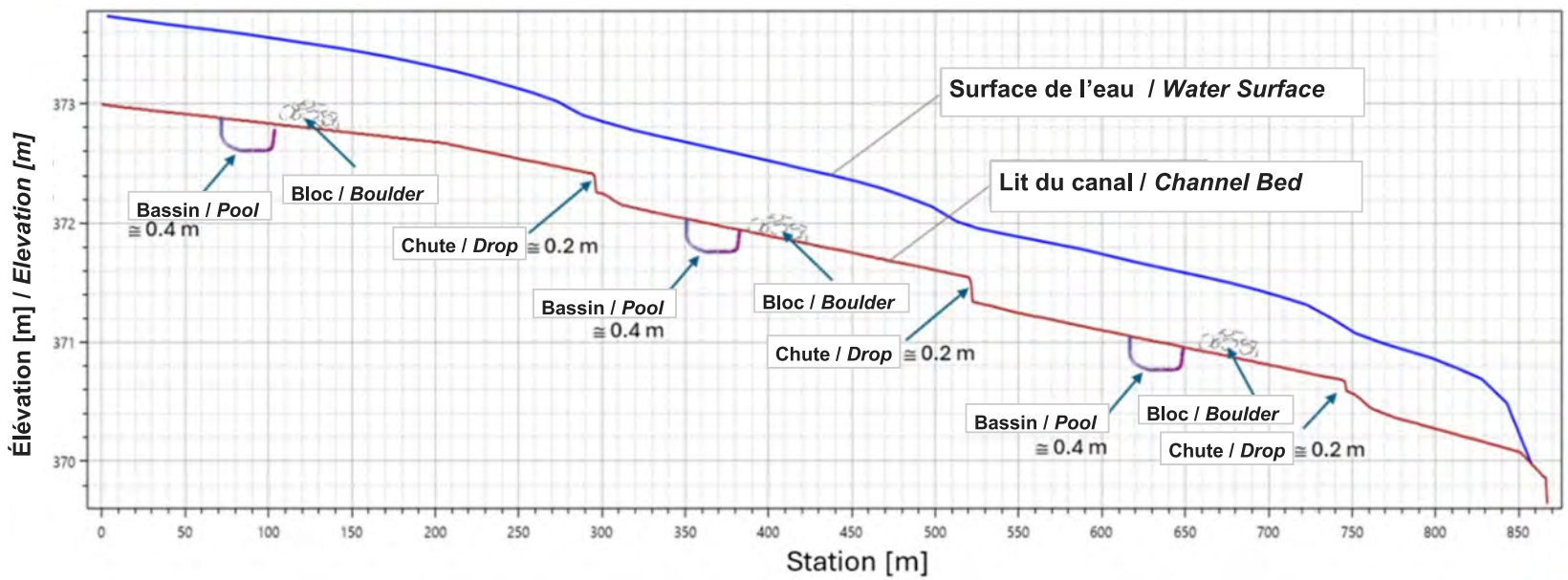
The dikes are classified as “Extreme” by the CDA and “Class C” by Quebec’s *Dam Safety Act*, with a P value of 58. The dam classification determines the return period for the seismic event and the Inflow Design Flood (IDF) used in the dike design.

For a dike classified as “Extreme,” a return period of 1 in 10,000 or the Maximum Credible Earthquake is required according to 2019 CDA guidelines and 2025 MELCCFP guidelines.

The following features are included in the Lake L01 cut-off dike design (Figure 5-13):

- Silt curtains will be required during construction to reduce sediment transport.
- Lake sediments will be removed from the dike foundation by dredging.
- The dikes will be constructed with geochemically inert rockfill.
- The berms will be constructed by dumping and dozing the rockfill, starting at the edge of the lake.

The berm crest elevation is designed to maintain a height of approximately 1 metre above the lake water level. The crest width of the dike has been designed to be 6.0 metres.



Source : AtkinsRéalis, Juillet 2025

Figure 5-12 **Profil du canal de dérivation avec habitat/passe à poissons proposé** / Cross-section of the diversion channel proposed with fish habitat/fish passage

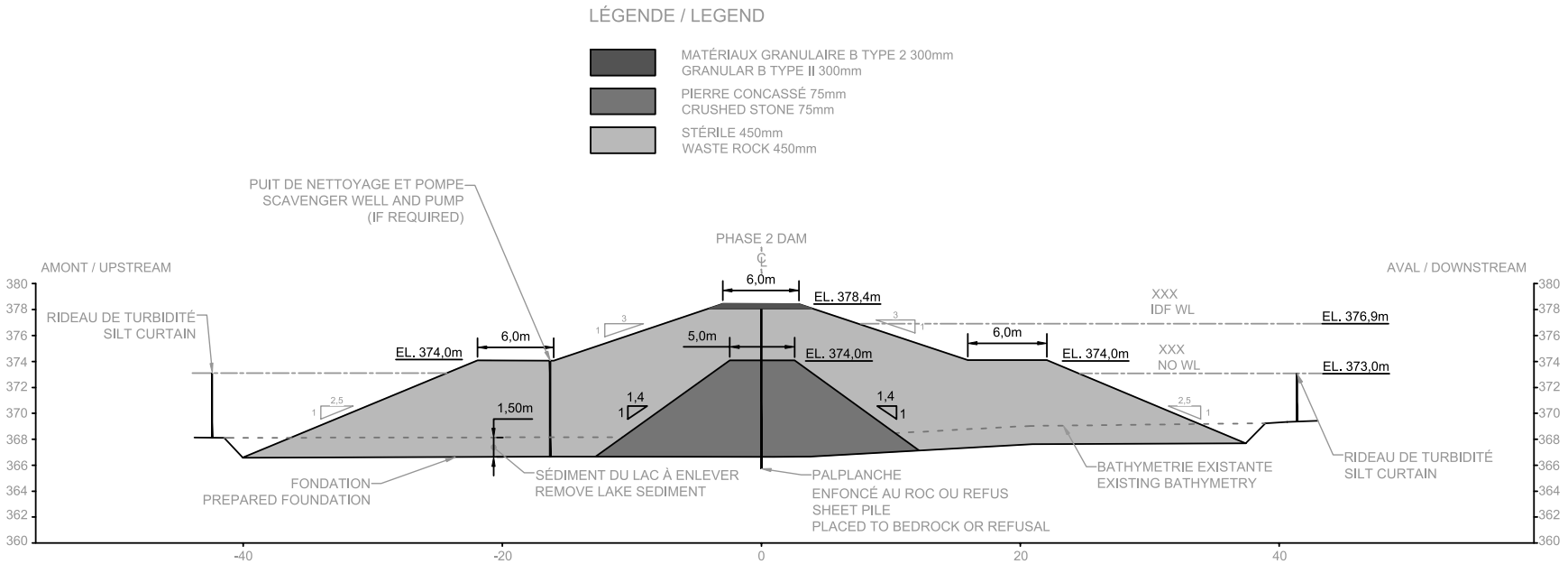


Figure 5-13 **Coupe transversale typique de la digue de coupure (section critique) /** ***Typical cross-section of the cut-off dam (critical section)***

5.4.4 Dewatering of Lake 01 – Sediment and water management

The dewatering of Lake 01 as part of the phased development of the open pit requires a staged sediment and water management strategy to mitigate environmental risks, ensure operational efficiency, and the long-term stability of the structures. Strategies have been developed for the West phase and the East phase of pit development based on the evolving footprint of the pit and the associated drainage area, as well as the topography/bathymetry of the area, according to the existing boundaries of the lake.

West Pit phase

For the West Pit phase, the western portion of Lake L01 is to be dewatered following the construction of the West Pit cut-off dams. The sediment and water management approach for the West Pit is based on dividing the dewatered area into two zones (West and East) by constructing a sediment control dam (Berm 1) at a narrow and shallow point within the former lakebed approximately 400 metres west of the mouth Watercourse CE1 (Figure 5-14).

In the East zone of the dewatered area, sediments are to be removed to prevent mobilization into the pit. The runoff will be directed to the open pit, where it will be classified as contact water and subsequently transferred to the industrial area ponds for treatment of TSS.

In the West zone of the dewatered area, sediments will be left in place. To prevent sediment from being carried into the pit, the permeable berm (mentioned above) along with a pumping system will be installed to manage runoff flows up to a 10-year flood. The water collected in this way will be pumped to a sedimentation pond in the industrial area before being discharged into the environment.

East Pit phase

For the East Pit phase, the open pit footprint will be extended further into the former lake, requiring additional sediment and water management measures across three zones of the dewatered area: North, Central, and South

In the North and Central zones, sediments will be removed to eliminate the risk of mobilization. Runoff water will be collected in the pit and then pumped to the industrial area for treatment (Figure 5-15).

The South zone will be separated by a sediment control dam (Berm 2) to prevent sediment from reaching the pit (Figure 5-15). This berm, located at the highest surface of the natural topography, was designed to contain flow volumes up to a 10-year flood. In the South zone, sediments will be left in place. A pumping system will direct runoff to a sedimentation pond to control TSS prior to discharge.

5.4.5 Mine and industrial water treatment plant

A water treatment plant (WTP) has been designed to treat the collected water, which may be acidic or contain metals. The plant operates using a physico-chemical process (Figure 5-16) that includes:

- metal precipitation through pH adjustment and the use of chelating agents;
- coagulation and ballast-assisted flocculation;
- high-rate clarification.

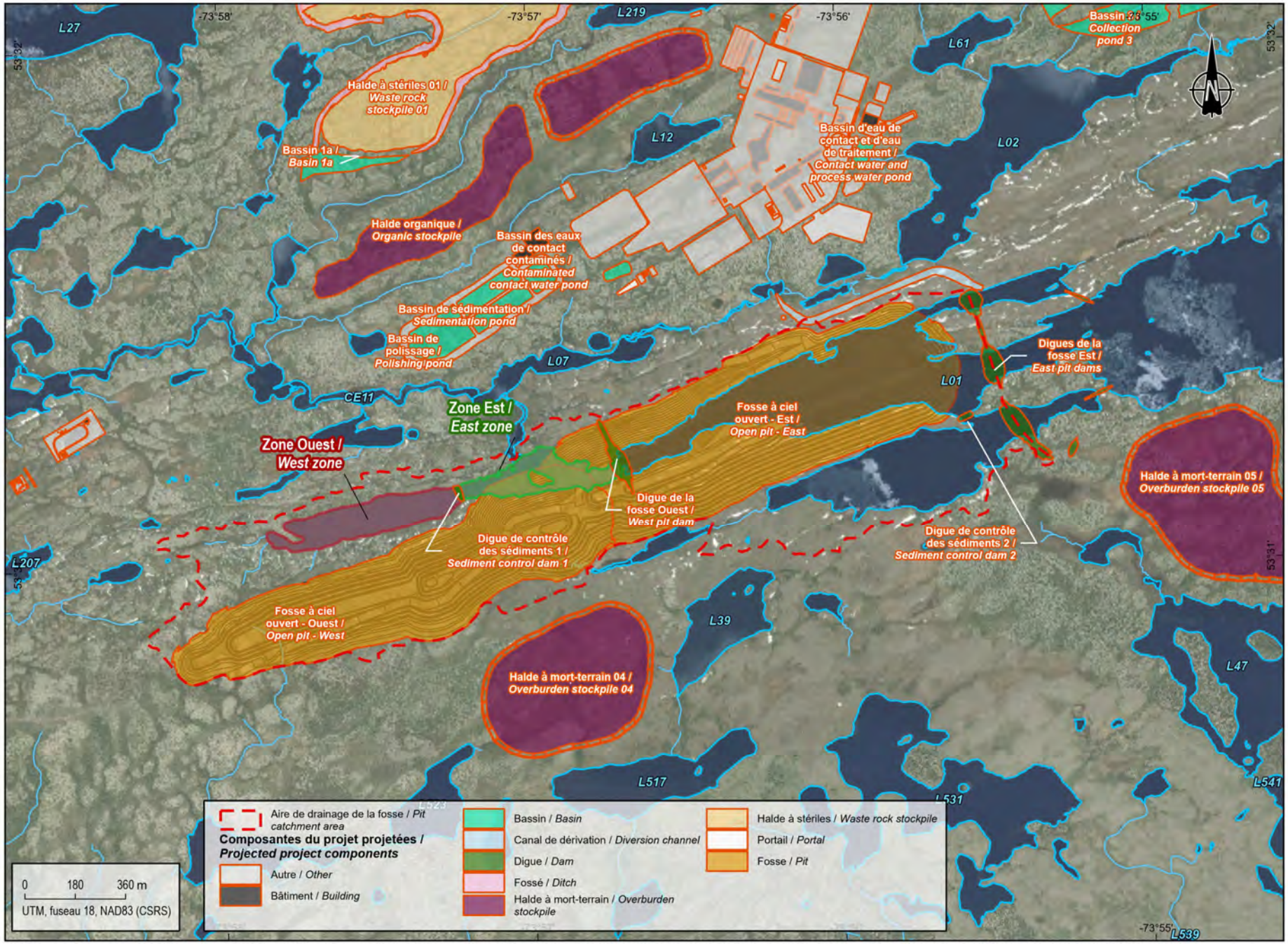


Figure 5-14 **Concept de gestion des sédiments et de l'eau au niveau de la fosse ouest de la mine à ciel ouvert - Fosse Ouest / *Sediment and Water Management Concept for the West Pit of the Open-pit Mine – West Pit***

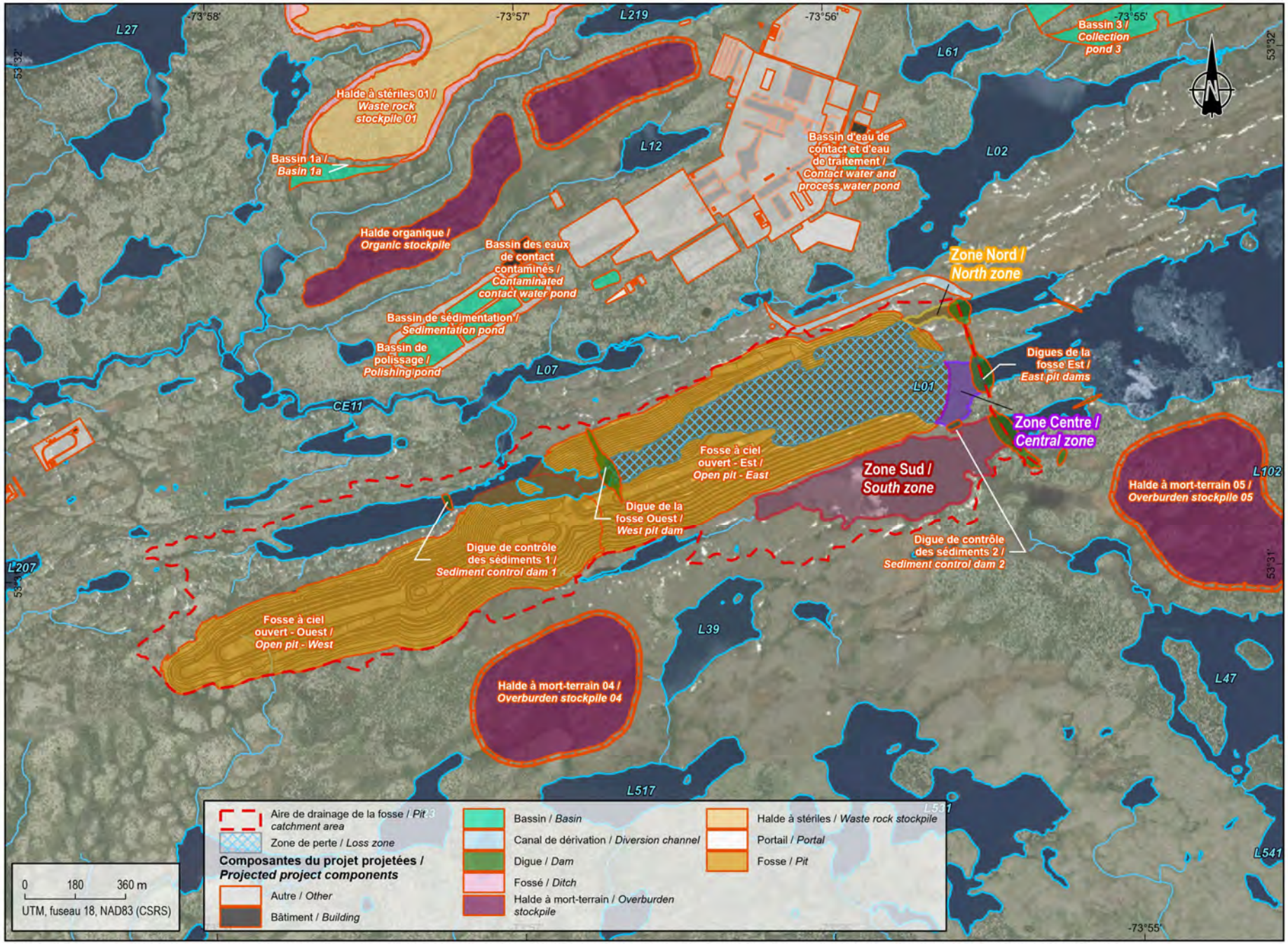


Figure 5-15 **Concept de gestion des sédiments et de l'eau au niveau de la fosse Est de la mine à ciel ouvert - Fosse Est / *Sediment and Water Management Concept for the East Pit of the Open-pit Mine – East Pit***

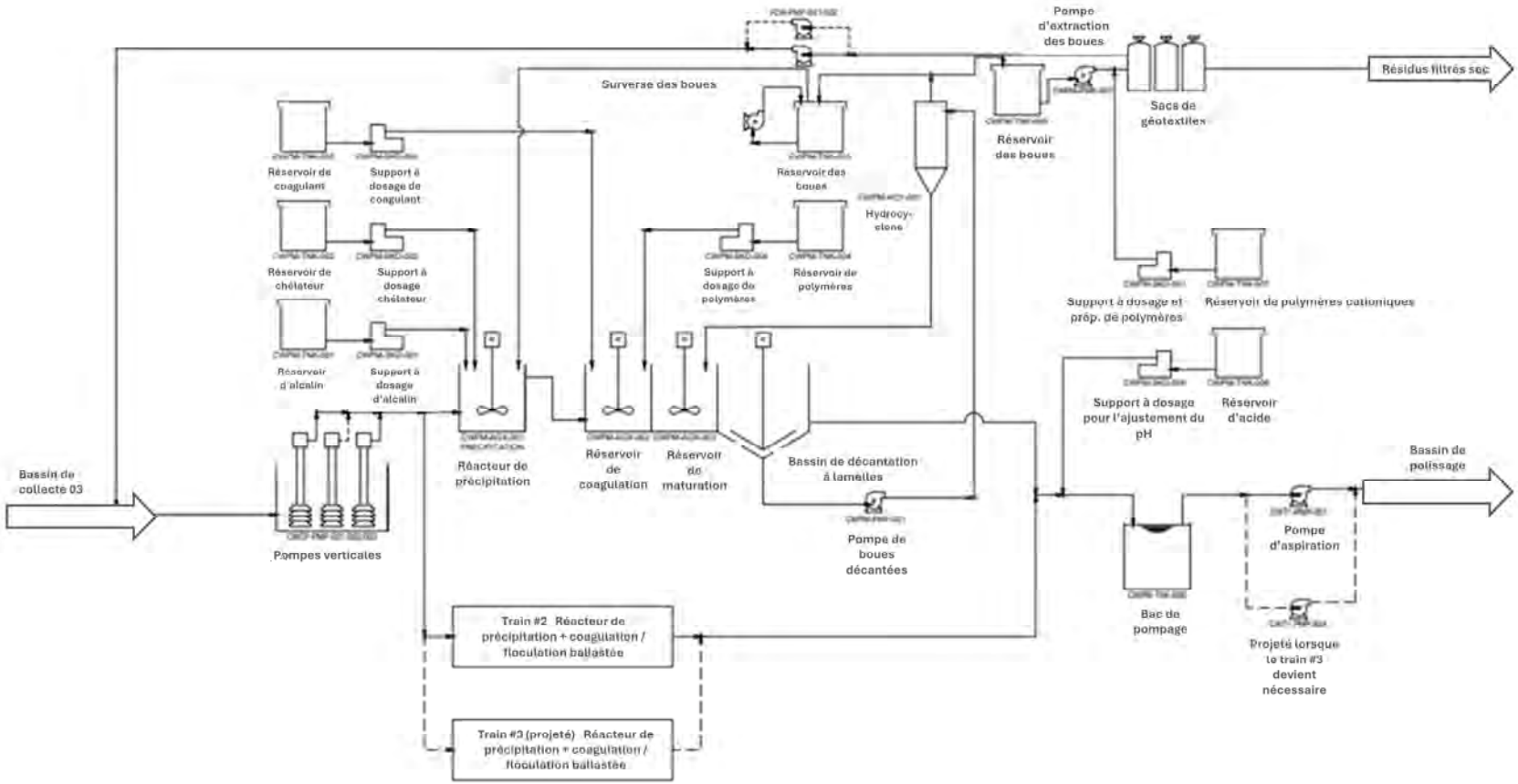


Figure 5-16 **Schéma simplifié de l'usine de traitement des eaux usées minières et industrielles /** *Simplified diagram of the mining and industrial wastewater treatment plant*

This process also includes a containerized lamellar clarifier using microsand to optimize settling, as well as a hydrocyclone for recovering the microsand for reuse. A distribution box allows part of the sludge to be recirculated upstream of the process to promote particle agglomeration.

The treated water is discharged to a pump-box, which then feeds the polishing pond to complete the treatment process and ensure compliance with effluent regulations. The filtrate from the dewatering bags is collected in a drainage ditch and returned to the treatment system by a sump pump, while the water from the polishing pond can be used to supply the process plant, cemented paste plant, or underground mine.

The sludge generated during treatment will be stored and dewatered using geosynthetic filtration bags. The consolidated sludge will then be removed from the bags and transferred to Stockpile 02 for final disposal. The water extracted from the bags will be pumped to the treatment.

The system will be pre-assembled in fully mounted containers and then shipped to the site. This modular configuration allows for flexible and gradual installation according to operational needs. The concrete pad housing the geosynthetic filtration bags will be divided into multiple bays, each containing one filtration bag. At any given time, one bay will remain on standby while the others are active. When the bags in the active bay are full, clarified water will be redirected to the standby bay. Three bays will be used during the initial phases of operations, and a fourth bay will be added when the mine reaches its full development level. The collected sludge will then be further dewatered, and the resulting dry sludge will be transferred to Stockpile 02.

The facility will ensure compliance with the discharge criteria set out in the *Metal and Diamond Mining Effluent Regulations* (C.R.C., c. 819), Directive 019, and the *Regulation respecting the quality of drinking water* (Q-2, r. 40). Additional environmental discharge objectives (EDOs) may be added to the above requirements. These EDOs will be defined as necessary by the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP) during the authorization process.

5.4.6 Mine effluent

The treated mine effluent will be discharged into Watercourse CE11, which flows into Lake L27 after passing through Lake L10 and Watercourse CE15 (Appendix 5-10). This receiving environment was selected on the basis of a hydrological and biological study. There will be only one discharge point for the entire mine complex. The final effluent discharge point is located at km 2.5 of the series of lakes and watercourses between the entrance to the diversion channel and Lake L27.

The polishing pond will collect all treated effluent from the water treatment plant to ensure final treatment and homogenization of the effluent. Given the proximity between the polishing pond and the Watercourse CE11, as well as favourable topography, the final treated effluent will be discharged by gravity. To establish the modelling conditions, the average flow rate of the upstream diversion channel was set at 3.1 m^3/s and the final effluent flow rate at 0.93 m^3/s.

To ensure adequate mixing of the final treated effluent in the receiving environment, a subsurface discharge diffuser system will be required. The discharge from the polishing pond consists of three (3) pipes with a diameter of 91 cm (36 in.), which gradually reduce to 61 cm (24 in.), 41 cm (16 in.), and 15 cm (6 in.) at the outlet into the watercourse. This configuration ensures sufficient flow velocity within the diffusion system. Each submerged pipe, 90 m long, is equipped with 14 15 cm (6 in.) diffusers fitted with check valves and held in place by 277 kg (610 lb) concrete blocks acting as ballast.

The longitudinal mixing zone extends approximately 200 m downstream from the discharge point, promoting gradual homogenization of the effluent before it reaches Lake L27 (Map 5-10, Appendix 5-10). According to the model, complete mixing occurs well upstream of the lake.

Monitoring stations at the mine effluent will continuously measure flow rate, pH, conductivity, dissolved metals, and turbidity.

5.4.7 Potable water

Fresh water for potable use will come from Lake L308 (Map 5-1). A study was conducted to estimate the hydrological capacity of Lake L308 using a water balance for the lake, which is attached in Appendix 5-11. There will be only one intake and one treatment plant for the entire site. Water will be pumped from a barge using two submersible pumps to ensure full redundancy. An above-ground, insulated, and heat-traced pipe will run between the pumps and the treatment plant.

The raw water will be treated using ultrafiltration and nanofiltration to remove total suspended solids (TSS) and total organic carbon (TOC) from the surface water year-round, in accordance with environmental requirements. Disinfection will be achieved through ultraviolet (UV) treatment and chlorination. Potable water storage tanks will ensure a continuous supply, even during peak demand periods such as shift changes.

5.4.8 Sewage water

Sewage generated from various buildings will be collected and directed to an equalization tank to buffer flow variations. The wastewater will then undergo biological treatment using a moving bed biofilm reactor (MBBR) system. To ensure compliance with effluent standards, phosphorus removal will be achieved through chemical coagulation, followed by disinfection using UV lamps.

All sludge produced during the domestic wastewater treatment process will be extracted, stored in a dedicated tank, and transported by a specialized contractor to an authorized disposal facility. The potential for sludge stabilization through liming and subsequent disposal on the overburden pile will be assessed in future studies.

The treated effluent will be discharged into a polishing pond via an above-ground pipe, ensuring a single discharge point during operations.

5.4.9 Other water treatment systems

Secondary systems will ensure the targeted treatment of specific effluents:

- equipment washing: recycling and cartridge filtration;
- oily water: API separators and coalescing filters;
- firewater: temporary containment ponds prior to treatment.

All these systems will be integrated into the overall water management plan and incorporated into the annual environmental monitoring program.

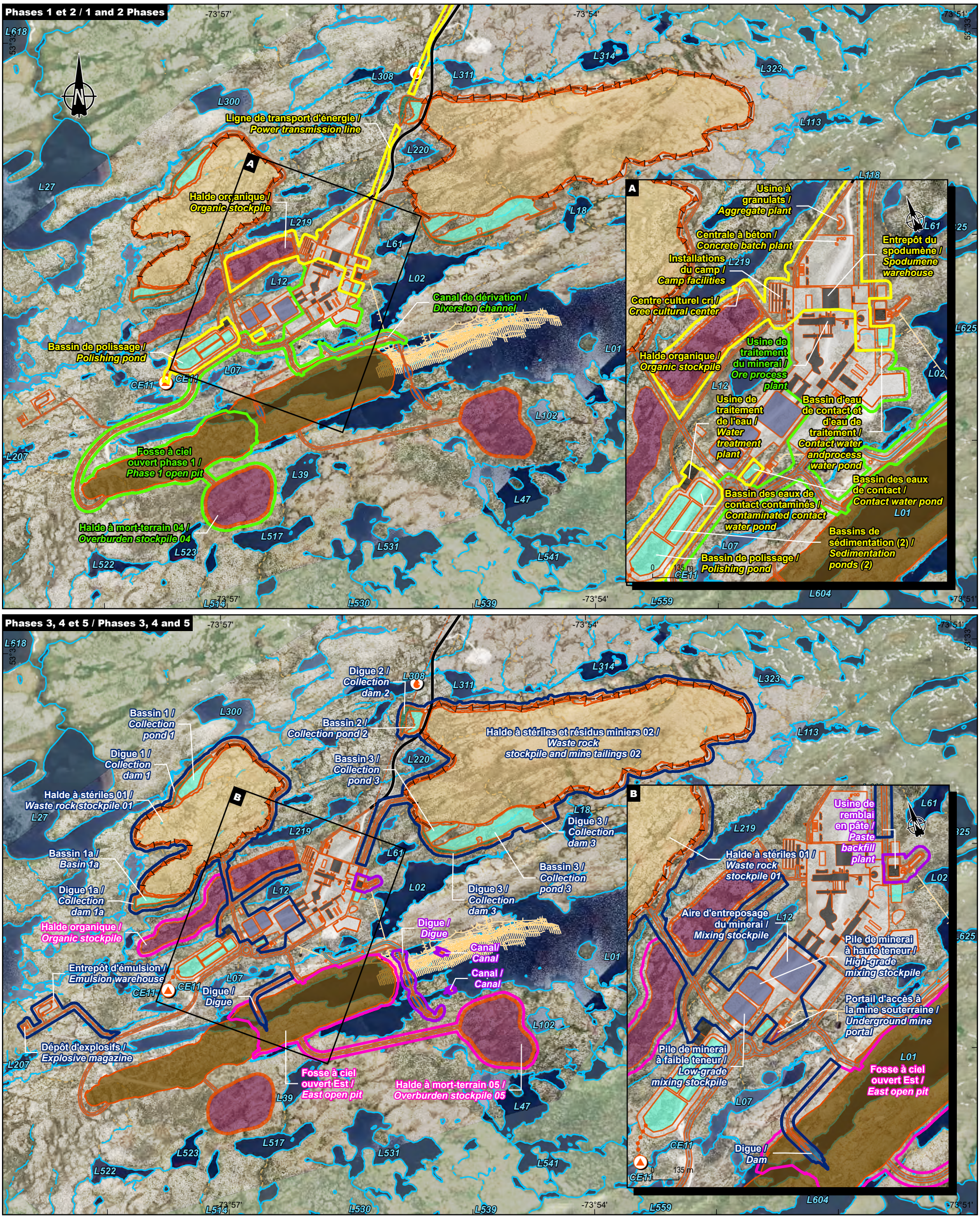
5.5 Activities planned during the construction, operations, and closure phases

The project will proceed in three main phases: construction, operations, and closure/restoration. Each includes planned activities aimed at ensuring the technical performance, safety, and environmental compliance of the mine site.

5.5.1 Construction activities

The construction phase will take place in several phases and span approximately 4 years, from February 2028 to March 2032, and will include the following activities:

- **Site preparation:** This activity includes selective tree clearing, stripping of organic soil and its storage in designated areas, and the installation of temporary fences and roads.
- **Earthwork and drainage:** This activity includes levelling the areas where the infrastructure will be built, removing overburden for the pit and storing it at Stockpiles 04 and 05, and preparing the waste rock stockpiles, ponds, and installation areas for the various buildings and the plant. Map 5-11 shows the water management during the construction period.
- **Construction of key infrastructure:** This activity includes:
  - bringing the 20 km access road up to standard (bridges and culverts);
  - the construction of the 120 kV power line and the planned transformer station at the mine site;
  - the construction of industrial, maintenance, and administrative buildings;
  - the installation of water management ponds and treatment plants (potable water and wastewater);
  - the installation of the permanent camp and telecommunications systems.
- **Installation of ore processing equipment:** This activity involves installing components related to the concentration plant, including crushers, DMS circuits, magnetic separators, and filter presses.
- **Installation of security and environmental systems:** This activity involves the installation of emergency ponds, monitoring stations, and weather stations.



Composantes du projet / *Project Components*

Existante / *Existing*

- Chemin d'accès / *Access road*

Projetées / *Projected*

- Effluent minier / *Mining effluent*
- Prise d'eau / *Water intake*
- Barrage / *Dam*
- Canal / *Channel*
- Canal de dérivation / *Diversion channel*
- Chemin secondaire / *Secondary road*
- Fossé / *Ditch*
- Galerie souterraine / *Underground mine*
- Ligne de transport d'énergie / *Power transmission line*
- Aire d'entreposage du minerai mixte / *Mixed ore stockpile*
- Autre / *Other*
- Bâtiment ou équipement / *Building or equipment*
- Digue / *Dam*
- Bassin / *Basin*
- Digue des bassins / *Basins dam*
- Fosse / *Pit*
- Halde à mort-terrain et organique / *Overburden stockpile*
- Halde à stériles et/ou résidus / *Waste rock and/or tailings stockpile*
- Portail d'accès à la mine souterraine / *Underground mine portal*
- Voie de circulation / *Roadway*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Souterrain / *Underground*

Étapes de construction des composantes projetées / *Construction Stages of the Projected Components*

- Étape 1 / *Stage 1*
- Étape 2 / *Stage 2*
- Étape 3 / *Stage 3*
- Étape 4 / *Stage 4*
- Étape 5 / *Stage 5*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 5-10 / *Map 5-10*
Gestion des eaux durant la période de construction / *Water Management During the Construction Period*

Sources / Sources

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La précision des limites et les mesures montrées sur ce document ne doivent pas servir à des fins d'ingénierie ou de délimitation foncière. Aucune analyse foncière n'a été effectuée par un arpenteur-géomètre. / Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.

Table 5-7 shows a summary schedule of the main stages of surface construction work only. It describes the sequence of five preparatory stages corresponding to the work carried out in the various areas of the mine site. These stages are illustrated in Map 5-11, which also shows the planned water management during this period.

Table 5-7 Summary schedule of key construction milestones (surface work only)

Milestone	Start date	End date
Preparation for pre-work and construction	**February 2028**	**March 2032**
Stage 1—Clearing and construction of ponds in the industrial area and their access roads, the workers' camp, the aggregate plant, the North industrial zone, the fuel storage area and the organics stockpile. Clearing along the power line and associated access roads.	February 2028 (tree clearing)	March 2028 (tree clearing)
Stage 2 – Clearing for the diversion channel, overburden stockpile 04, the ore processing plant area, and the land portion of phase 1 of the pit, stripping, and water management.	March 2028 (tree clearing)	April 2028 (tree clearing)
Stage 3 - Clearing and development of dike 1, the emulsion and explosives plant, the ore stockpile area, the underground mine portal, Stockpiles 01 and 02, and their associated ponds and roads.	April 2028 (tree clearing) July 2028 (work in water)	May 2028 (tree clearing) August 2028 (work in water)
Drainage of Lake L01- West pit	July 2028	February 2029
Construction of surface infrastructure – Part One (Steps 1 and 3).	February 2028	February 2030
Stage 4 – Clearing and development of dike 2, paste plant and construction of the second phase of the ore processing plant.	August 2031 (tree clearing) August 2031 (work in water)	September 2031 (tree clearing) November 2031 (work in water)
Stage 5 – Clearing and stripping of overburden stockpile 05, phase 2 of the pit and the second organics stockpile	September 2031 (tree clearing)	December 2031 (tree clearing)
Drainage of Lake L01 – East pit	November 2031	November 2032
Construction of surface infrastructure – Part Two (Stages 4 and 5).	August 2031	November 2032

Note : * This should be discussed with DFO to assess the possibility of conducting the work outside the low-risk period for salmonids.

All construction sites will be governed by an environmental management plan and a health and safety program that complies with CNESST regulations.

5.5.2 Mining operations

The operations phase will run from 2030 to 2049, corresponding to the estimated lifespan of the mine. The main activities include:

- The extraction of ore from the open pit and underground mines by drilling and blasting, as well as its loading and transport to the concentration plant.
- Management of waste rock through segregation of low risk (Stockpile 01) and potentially metal leaching (Stockpile 02) waste rock stockpiles and gradual rehabilitation of stabilized areas.

- Ore processing at the concentrator, which will operate continuously (5.1 Mt/year) with monitoring of recovery and concentrate quality parameters.
- Ongoing maintenance of infrastructure, including regular inspection of dikes, ponds, and roads.
- Environmental monitoring of the site, including monitoring of water quality, air quality, noise levels, and wildlife, in accordance with the environmental monitoring plan.
- Transportation of the concentrate by truck to the rail transshipment site in Matagami, including monitoring of transport-related logistics and emissions.

Operations will maintain a permanent workforce of approximately 1,100 employees, including operational, maintenance, laboratory, and administrative staff. A continuing education program will be offered in collaboration with Cree communities and regional institutions.

5.5.3 Mine site restoration

Closure and restoration activities will begin gradually in 2045, in parallel with the winding down of mining operations, and will continue until 2052. These activities will focus on restoring the site to a safe, stable, and ecologically functional state.

A redevelopment and restoration plan will be prepared in accordance with the *Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec* (Guide for the preparation of redevelopment and restoration plans for mine sites in Quebec) (MERN, 2022) and submitted to the Ministère des Ressources naturelles et des Forêts (MRNF) for approval. All mining infrastructure will be subject to redevelopment and restoration measures, including mining waste storage areas, open pits, various buildings, etc.

The main measures planned are:

- the dismantling of non-reusable infrastructure and the removal of equipment;
- profiling of waste rock piles and covering with inert materials to limit erosion and infiltration (Figure 5-17);
- pits flooding;
- soil rehabilitation and revegetation using local species;
- post-closure monitoring (water, stability, vegetation) for a minimum period of five years;
- monitoring of community engagement, including consultation on the final restoration of the site.

A budget of CAD 248,4 million is planned for the closure, including post-closure monitoring and a contingency margin of 20%. These costs will be covered by a financial bond with the MRNF, in accordance with Quebec regulatory requirements.

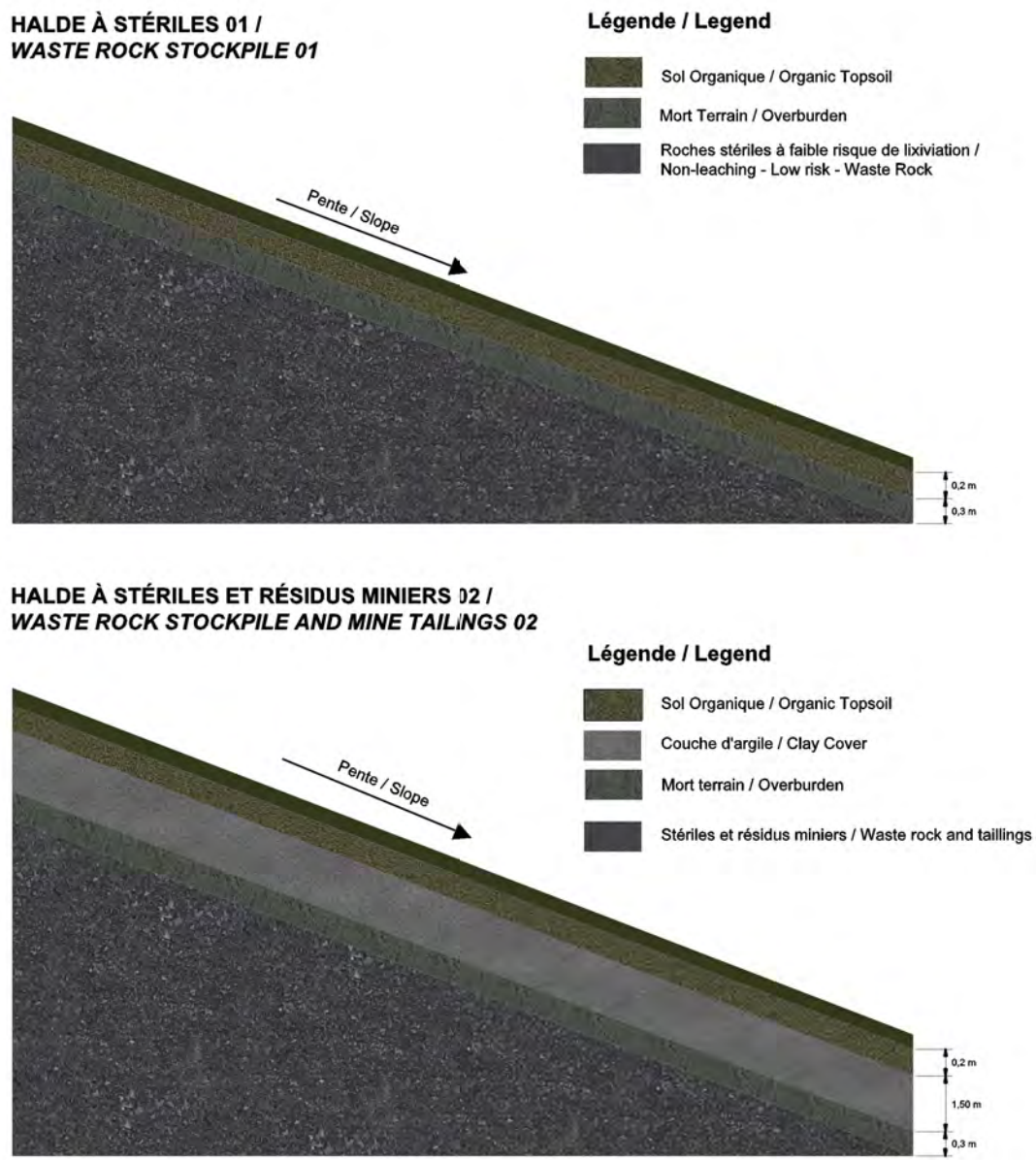


Figure 5-17 **Schéma conceptuel de la restauration des haldes 01 et 02 /** ***Conceptual Diagram of the Restoration of Waste Rock Stockpiles 01 and 02***

5.6 Waste management and the 4R approach

Waste management will promote the implementation of practices based on the 4 Rs, i.e., prioritizing reduction, reuse, recycling, and recovery of waste materials. Residual materials will be managed in accordance with applicable laws and regulations. A management plan will be established at a later stage of the project, including the monitoring of waste flows through the implementation of an environmental register.

As the management of hazardous waste is regulated, the disposal of these products will be carried out in accordance with applicable laws and regulations. A management plan will be established at a later stage of the project.

If any other category of waste were to be produced by the project, PMET would manage it in accordance with applicable laws and regulations.

5.6.1 Solid household waste

The domestic waste generated by the camp and administrative offices (approximately 120 tonnes/year) will mainly consist of organic matter, paper, plastic, and various types of non-recyclable waste.

The management approach envisaged for this waste includes the implementation of selective collection on site and a composting facility for organic matter (food waste). Final waste will be sent to the town of Radisson. Lastly, as part of the environmental management system, monthly monitoring will be implemented to track disposal volumes and recovery rates.

Awareness campaigns on selective sorting will be conducted among staff to maintain a recovery rate of over 60%.

5.6.2 Dry waste

Non-hazardous dry waste (wood, metals, concrete, rubble, cables, packaging materials, etc.) will mainly come from construction and infrastructure maintenance work.

The management approach envisaged for this waste includes sorting at source in designated areas of the site. Inert materials will be reused as much as possible for backfilling or maintaining access roads. A system for the recovery of ferrous and non-ferrous metals will be set up in association with one or more approved recovery companies. Anything that cannot be recovered will be periodically disposed of, as necessary, at authorized external sorting centres.

Special attention will be paid to reducing packaging and reusing form lumber and pallets. The target is to recover at least 70% of the dry materials generated.

5.6.3 Hazardous materials

Hazardous materials that may be generated at the mine site include used oils, filters, solvents, paints, laboratory reagents, batteries, and contaminated sludge.

The proposed management approach for this waste involves storing it in a dedicated, ventilated, and leakproof room with an impermeable floor and equipped with retention bins. Labelling in accordance with the *Transportation of Dangerous Substances Regulation* will be implemented and checked regularly. An agreement with an authorized carrier will be reached to ensure that this waste is disposed of at certified facilities (RECYC-QUÉBEC). The environmental management system to be implemented at the mine site will include the creation and maintenance of a tracking log that will record, among other things, the volumes recovered and shipped, the disposal methods chosen for each type of waste, and copies of transport and disposal manifests. The management system will also provide for annual staff training on emergency response procedures associated with hazardous materials used and generated as waste.

PMET is committed to recycling used oil with a target of over 90%. This recycling will be carried out by a specialized supplier. Similarly, all batteries shall be returned to manufacturers or approved collection points.

5.7 Energy consumption

The project will be powered primarily by hydroelectricity supplied by Hydro-Québec, ensuring a low-carbon energy footprint. Energy requirements are determined based on the mining plan and the size of industrial facilities.

5.7.1 Total requirements

The total energy consumption of the mining complex is estimated at 89,369 GJ/year, corresponding to an average installed capacity of approximately 75 MW for the combined operations of the mine, processing plant, and related infrastructure (Table 5-8).

Table 5-8 Estimated annual energy consumption

Energy source	Primary use	Estimated consumption	In GJ/year
Electricity (Hydro-Québec)	Processing plant, offices, underground mine	131.2 MWh/year	472
Compressed natural gas (CNG)	Heating of buildings, camp, and underground mine	87,691 GJ	87,691
Diesel	Mining vehicles, emergency generators, concentrate transport	31.5 M litre/yr*	1,206
		Total	**89,369**

Note: * GHG estimate, Appendix 5-12.

5.7.2 Energy optimization

The project's energy optimization effort involves a gradual approach, which will be defined in detail and implemented during operations. At this stage of the project, the main measures under consideration are:

- Exclusive use of renewable electricity for industrial processes and lighting to reduce GHG emissions.
- Use of high-efficiency motors (IE3/IE4) and variable speed drives to improve the energy efficiency of equipment.
- Heat recovery from compressed air and ventilation systems, contributing to reduced heating requirements.
- Implementation of an energy management program compliant with ISO 50001 during the operations phase to ensure monitoring and continuous improvement.
- Gradual replacement of light diesel vehicles with electric models, depending on their availability on the market.

5.7.3 Autonomy in emergencies

A standby power plant consisting of three diesel generators, each with a capacity of 2 MW, will ensure the continuity of critical operations in the event of a power failure. This equipment will operate for less than 100 hours per year and will be equipped with vapour recovery and spill containment systems.

5.8 Greenhouse gases

The project design places central importance on reducing greenhouse gas (GHG) emissions from the earliest stages of engineering. The project's energy profile, largely powered by hydroelectricity, minimizes direct and indirect CO_2 emissions. The sectoral report on GHG emissions is presented in Appendix 5-12.

5.8.1 Emission sources

GHG emissions come mainly from the following sources:

Source	Description	Annual estimate (t eq. CO_2)
Diesel (mining vehicles)	Trucks, drills, loaders, mobile equipment	54,127
Mining equipment	Generators and other fixed equipment	3,226
CNG heating	Heating of buildings and camp	8,035
Explosives	Explosives used in mining extraction areas	1,050
Concentrate transport (truck)	Transport by truck to rail transshipment	27,457
Concentrate transport (train)	Transport by train to the port facility by a third party	24,555
Electricity (Hydro-Québec)	Treatment plant and pumps	492

Estimated total emissions at the site (excluding electricity from Hydro-Québec): approximately 64 kt eq. CO_2 per year during the operations phase, representing an **average carbon intensity of 0.08 t eq. CO_2 per tonne of concentrate produced**, which is lower than the global average for lithium mines (~0.10 t eq. CO_2/t conc.).

Annual direct emissions related to site operations are estimated to range from a minimum of 24 kt CO2-eq during the first year of operations to a maximum of approximately 87 kt CO2-eq in 2036. The annual average over the entire operations period is 64 kt CO_2-eq.

5.8.2 Reduction and compensation measures

Mitigation measures will be applied at each stage of the project to minimize GHG emissions, namely:

- **Optimizing mining transport**: short routes, preventive vehicle maintenance, and low-resistance tires.
- **Gradual replacement** of light diesel vehicles with electric models.
- **Heat recovery** in the processing plant to heat buildings.
- **Training staff** in eco-driving and reducing fuel consumption.
- **Annual monitoring of GHG emissions** in accordance with ISO 14064-1 methodology and reporting to MELCCFP.
- **Voluntary participation** in carbon offset programs (reforestation, verified credits).

5.8.3 Climate performance target

The proponent's goal is to **reduce direct emissions** by 2035 compared to the baseline scenario, in particular through increased electrification of the fleet and energy efficiency in processes. Such a performance supports the government's target of **net-zero emissions by 2050** for the Quebec mining sector.

The project's greenhouse gas emissions were estimated based on preliminary engineering data available. At this stage of the project, emissions have been estimated for the construction and operations phases only.

Total emissions associated with construction are estimated at 95 kt of CO_2eq, mainly due to deforestation of the site. During this phase of the project, emissions are broken down as follows:

- diesel consumption by machinery: 4,439 t CO_2eq;
- deforestation: 88 kt CO_2eq;
- diesel consumption during logistics transport: 2.1 kt CO_2eq.

Annual emissions associated with operations are estimated at 101 kt CO_2eq. Machinery accounts for 59% of these emissions, with logistical transport and explosives accounting for 38% and 3% of emissions, respectively. It should be noted that these emissions are annual and vary from year to year during the operations phase. On average during the operations phase, emissions break down as follows:

- diesel consumption (mobile sources): 60 kt CO_2eq per year;
- use of explosives: 3 kt CO_2eq per year;

- logistical transport (truck): 25 kt CO_2eq per year;
- logistical transport (train): 13.6 kt CO_2eq per year.

5.9 Project timeline

The overall project will span approximately 19 years, including planning, construction, operation, and decommissioning of the site.

This timeline is based on the results of the feasibility study (NI 43-101, 2025) and will be updated as the detailed engineering phases progress. The construction and operations periods are expressed in quarters (Q).

Table 5-9 Timeline of the main phases of the project

Period	Key activities	Details and objectives
2025–2027	Environmental studies, permits, and detailed engineering	Completion of basic studies, submission of the ESIA, COMEX hearings, obtaining provincial and federal certificates of authorization, and detailed engineering.
Q1 2028–Q2 2030	Construction et mise en service	Development of road, electrical, and industrial infrastructure; construction of the camp and processing plant; no-load and load testing.
Q3 2030–2048	Mining operations (Phases 1 and 2)	Nominal production of 5.1 Mt/year of combined underground and open-pit ore.
2048–2052	Gradual closure and rehabilitation	Dismantling, reprofiling of stockpiles, revegetation, and post-closure environmental monitoring (≥ 10 years).

5.9.1 Key milestones

More specifically, the key milestones of the project include:

1. ESIA approval and obtaining permits – Q4 2027
2. Start of construction work – Q1 2028
3. Completion of electrical substation and access road – Q4 2029
4. Commissioning of the ore processing plant (concentration) – Phase 1 – Q2 2029
5. Attainment of nominal capacity (5.1 Mt/year) – Q1 2032
6. Start of underground mining operations - Phase 2 – Q1 2032
7. Start of gradual closure – Q1 2048
8. End of post-closure monitoring and release of bonds – 2052

This list of milestones incorporates the constraints associated with the northern climate: earthworks and concrete work mainly planned during the summer and seasonal logistical windows for oversized equipment.

Schedule-related risk management

Schedule management will be based on an integrated planning and monitoring system by the owner, with:

- monthly monitoring of physical and financial progress;
- measures to mitigate winter supply and transportation risks;
- ongoing coordination with Cree and government authorities;
- flexibility margins built into critical timeframes (± 3 months) to compensate for weather-related or logistical delays.

5.10 Workforce, economic spin-offs, and overall project costs

The project is a key initiative for Quebec's lithium industry in support of the global decarbonization of the economy and the socioeconomic development of the James Bay region. In addition to creating direct jobs, it will generate significant economic spin-offs in the construction, services, transportation, and mineral processing sectors.

5.10.1 Workforce and economic spin-offs

The project's labor requirements and economic impacts were assessed based on the expenditure flows associated with the construction, operation, capital maintenance, and decommissioning phases, as defined in the feasibility study (NI 43-101, 2025). The economic impacts were estimated using the Institut de la statistique du Québec's Quebec Inter-sectoral Model (MISQ), according to a methodology detailed in Appendix 5-13.

The results presented below correspond to the direct, indirect, and induced effects generated by project expenditures in the Quebec economy. Jobs are expressed in person-years, i.e., the equivalent of one full-time job sustained for one year. Table 5-10 presents a summary of labor requirements associated with the various phases of the project, expressed in person-years. It aims to provide an order of magnitude for the jobs supported by the project; a detailed analysis of the economic impacts is presented in Appendix 5-13. For clarity, the table also presents annual averages over the duration of each phase.

Table 5-10 Labour force requirements by project phase

Phase du projet	Period (months)	Jobs (total)	Jobs (average annual)
Construction			
Phase 1	41	7 545	2 208
Phase 2	43	3 629	1 013
Operations	19 ans	66 282	3 489
Closure and follow-up	30	1 537	615

Note : Total job numbers are for the duration of the entire project phase.

Construction Phase

The construction phase, which includes the construction of the open-pit mine (Phase 1) and the underground mine (Phase 2), represents a period of concentrated investment and generates significant economic benefits for Quebec. According to MISQ results, this phase supports approximately 11,200 person-years of employment province-wide, corresponding to an average of more than 3,200 jobs per year over the duration of the work. The associated value added is estimated at nearly $1.5 billion, including approximately $860 million in pre-tax wages and salaries.

At the regional level, the effects are more modest but remain significant. Preliminary results suggest that approximately 9% of the jobs and 8% of the value added generated during construction could materialize in the Nord-du-Québec region, reflecting both the anticipated share of regional labor and the geographic structure of supply chains.

Operational Phase and Maintenance Capital

Over the mine's entire lifespan (approximately 19 years), operating and maintenance capital expenditures constitute the primary source of economic benefits. MISQ simulations indicate that these activities support approximately 66,300 person-years of employment in Quebec, or an average of about 3,500 jobs per year. The total associated value added is estimated at approximately $8.8 billion, including over $5.2 billion in wages and salaries.

At the regional level, the share of economic impacts attributed to the operational phase is higher than that observed during construction, as illustrated by the regional results presented in Appendix 5-13. Preliminary results suggest that approximately 15% of the jobs and 10% of the value added generated during operations could benefit the Northern Quebec region. In addition, the feasibility study projects approximately $54.7 million in municipal and school taxes over the mine's lifespan, which constitute direct benefits for the host community.

Closure Phase

The closure and restoration phase, although shorter, also generates significant economic benefits. The associated expenditures support approximately 1,500 person-years of employment in Quebec and generate nearly $200 million in value added, primarily through decommissioning activities, civil works, and environmental restoration. The regional effects account for approximately 7% of the provincial impacts.

Summary of Economic Benefits

Combining all project phases, the total economic benefits are estimated at approximately 79,000 person-years of employment and $10.5 billion in value added across Quebec. At the regional level, cumulative impacts are estimated at approximately 10,400 person-years of employment and $1.3 billion in value added, representing 13% and 12% of the provincial results, respectively. These results should be interpreted as indicative orders of magnitude, as the regional impacts are not derived from a standalone regional intersectoral model, but rather from an allocation of provincial results based on conservative and documented assumptions.

The project will also contribute to **Quebec's 2030–2050 Energy and Mining Strategy**, positioning the province as a key supplier of critical materials for the global energy transition.

5.10.2 Total project costs

The cost estimates are based on the feasibility study (NI 43-101, 2025) and are expressed in 2025 Canadian dollars. The total cost of the Project is estimated at $2,914.7 million. It is important to note that this amount excludes pre-production revenue of $101.7 million during the construction of Phase 1, as well as restoration and closure costs, estimated at $248.4 million.

Table 5-11 Cost estimates for the mining project

Cost category	Amount (M CAD)	Comments
Initial capital	1,497.7	Construction of the pit, plant, infrastructure, road, and power line, and 23% of the underground mine.
Expansion capital	480.5	Underground development, camp expansion, the second train of the processing plant, as well as related indirect costs and contingencies.
Sustaining capital	936.4	All capital expenditures necessary to sustain operations throughout the LOM
Operating costs (OPEX, LOM)	6,785	Mining, processing, transportation, G&A, and environmental management.
Closure and rehabilitation	248.4	Dismantling, restoration, and post-closure monitoring.
Contingencies (CAPEX only)	Included	Approximately 11% by category; Class 3 estimate (AACE International).

The unit operating cost is estimated at CAD 729.1/t of concentrate, for an all-in sustaining cost (AISC) of CAD 799.8/t of concentrate.

The economic assumptions are based on:

- CAD/USD exchange rate = 1.34;
- average price of SC 5.5 concentrate = USD 1,221/t FOB;
- a combined open-pit and underground mine life of 19 years at nominal production.

These estimates illustrate the scale of the potential economic benefits associated with project expenditures.

6 Description of the receiving environment

6.1 Delineation of study areas

The Project is located north of the 53rd parallel in the Nord-du-Québec administrative region, on Category III lands in the Eeyou Istchee James Bay territory. It is located approximately 250 km east of the town of Radisson and lies within the traditional territory of three Cree communities: Chisasibi (village located 205 miles west), Wemindji (205 miles southwest), and Mistissini (215 miles south).

To identify and locate sensitive elements of the environment that could be affected by the mining project, five study areas were delineated: two regional areas for components located far from social and biophysical environments, two local areas for components close to these same environments, and a project area corresponding to the effects directly associated with the footprint of the planned infrastructure.

The consideration of these various areas is justified by the fact that some components are only affected in the immediate vicinity of the mining site, while others may be influenced over larger areas. The boundaries of these areas are shown on the maps presenting the initial state of the biophysical and social environments in sections 6.2 to 6.4 of this chapter, as well as those relating to the impacts on the valued components identified in chapter 8.

6.1.1 Regional study area of the social environment

The regional study area of the social environment (social RSA) situates the project in its socioeconomic and geographic context (Map 6-1). It provides the spatial framework to describe the components of the social environment, some elements of which are found outside the boundaries of the local study area of the social environment (social LSA). This area covers 346,997 km² and includes the boundaries of the Eeyou Istchee James Bay territory. It is delineated to document the demographic and economic characteristics of the non-Indigenous communities and First Nations members concerned, as well as the land's development trends and uses.

6.1.2 Regional study area of the biophysical environment

The regional study area of the biophysical environment (biophysical RSA)—defined by a 50-kilometre radius around the mining site (7,854 square kilometres)—situates the project in its environmental context (Map 6-1). It provides the spatial framework for describing biophysical components, some of which extend beyond the boundaries of the local study area of the biophysical environment (biophysical LSA).

6.1.3 Local study area of the social environment

The social LSA encompasses, in particular, the biophysical LSA and a portion of the Trans-Taiga Road. It is bounded by the official boundaries of trapline CH39 (formerly VC7), which is part of the traditional territory of Chisasibi, as well as traplines M02A (Mistissini) and VC26 (Wemindji) (Map 6-2). The area covers a total surface area of 6,521 km².

The social LSA is used to describe and assess impacts on components of the land that are perceptible beyond the boundaries of the biophysical LSA. The effects on land users (both Indigenous and non-Indigenous), vacation resort leaseholders, and the landscape (particularly visual effects) are analyzed. Certain components of the physical environment must also be assessed at this scale when sensitive receptors are located outside the biophysical LSA and the effects are more widespread.

6.1.4 Local study area of the biophysical environment

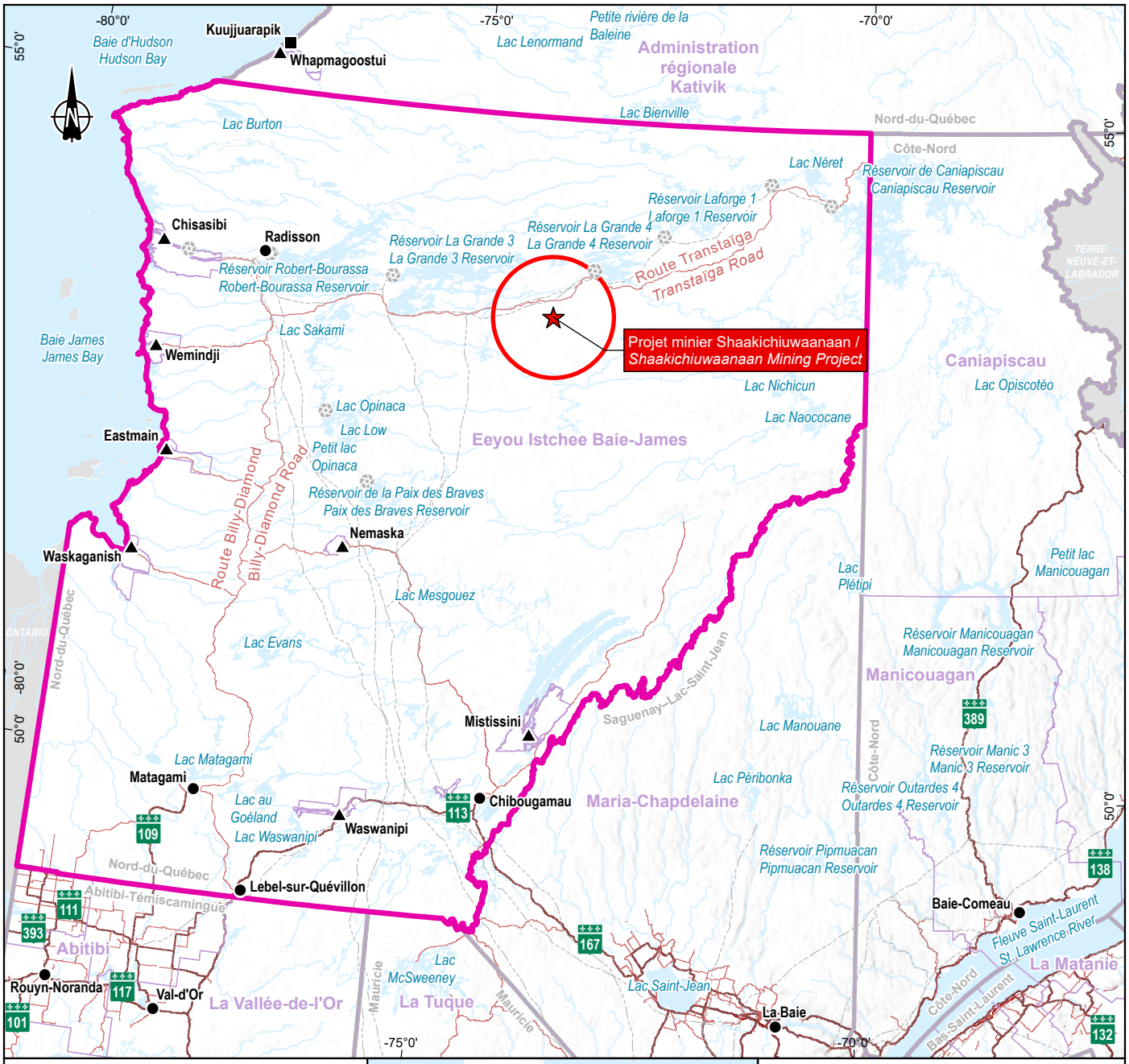
The biophysical LSA includes the physical and biological elements of the receiving environment most likely to be affected by project activities during the construction, operations, and closure phases (Map 6-2). It includes existing PMET facilities as well as key natural features located on the periphery of the site, including several lakes.

This area is the result of combining a 3 km buffer zone around the mining section of the project area and a 1 km buffer zone surrounding the project area for the access road and power line sections, for a total area of 207 km². The biophysical components were inventoried over representative surface areas, as described in the sectoral reports and in the sections on the current state of the environments.

For large wildlife, however, the biophysical RSA is preferred, as the potential effects may extend beyond the boundaries of the biophysical LSA.

6.1.5 Project area

The project area includes all existing and planned facilities, as well as a 25-metre buffer zone around them (Map 6-2), covering a total area of 12 km². In sections where the buffer zone cuts across bodies of water, its boundaries have been adjusted to avoid these areas, since the planned infrastructure will be built in such a way as to avoid any impact on them.



Zones d'étude / *Study Areas*

- Régionale - Biophysique / *Regional - Biophysical*
- Régionale - Humain / *Regional - Human*

Repères géographiques / *Geographical Landmarks*

- Communauté crie (zone d'étude régionale) / *Cree community (regional study area)*
- Village inuit / *Inuit village*
- Municipalité / *Municipality*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Autoroute / *Highway*
- Route nationale ou régionale / *National or regional road*
- Autre / *Other*

Limites / *Boundaries*

- Région administrative / *Administrative Region*
- Municipalité régionale de comté (MRC) et Territoires autochtones / *Regional County Municipality (RCM) and First Nations Territories*



Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 6-1 / *Map 6-1*
Zones d'étude régionales / *Regional Study Areas*

Sources :

SDA, 1/20 000, MRNF, 2024-02
Canvec, 1/250 000, 1/5 000 000 et 1/15 000 000, RNCan, 2019
BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/5 000 000, MRNF Québec, 2010
AQréseau+, réseau routier, MERN, 2024-03-01
RNCan, Frontières géopolitiques, 2002

0 50 100 km

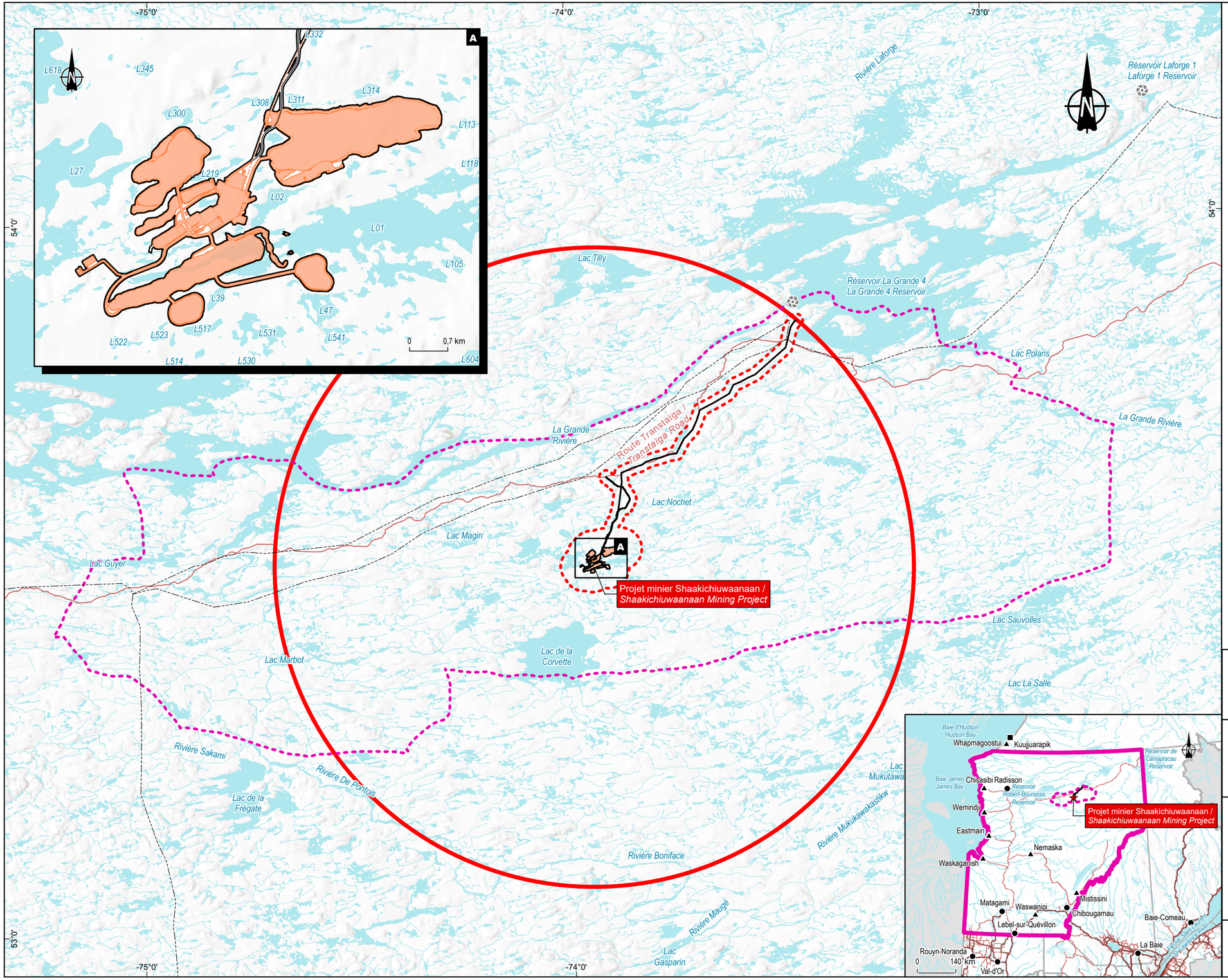
NAD 1983 Quebec Lambert

2026-03-25

Préparation / Preparation : M.-H. Brisson
Dessin / Drawing : J. Roy
Approbation / Approval : M.-H. Brisson
CA0001724_3318_eie_ch06_c01_02_260218.aprx
CA0001724_3318_eie_c06_01_085_ze_reg_260325

wsp

La précision des limites et les mesures montrées sur ce document ne doivent pas servir à des fins d'ingénierie ou de délimitation foncière. Aucune analyse foncière n'a été effectuée par un arpenteur-géomètre. / Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.



Projet / *Project*

- Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Zones d'étude / *Study Areas*

- Projet / *Project*
- Régionale - Biophysique / *Regional - Biophysical*
- Locale - Biophysique / *Local - Biophysical*
- Régionale - Humain / *Regional - Human*
- Locale - Humain / *Local - Human*

Repères géographiques / *Geographical Landmarks*

- Communauté crie / *Cree community*
- Village inuit / *Inuit village*
- Municipalité / *Municipality*

Composantes du projet / *Project Components*

Existante / *Existing*

- Chemin d'accès / *Access road*

Projeté / *Projected*

- Ligne de transport d'énergie / *Power transmission line*
- Limites des composantes de projet / *Limit of project components*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*
- Cours d'eau / *Watercourse*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 6-2 / *Map 6-2*
Zones d'étude locales et de projet / *Local and Project Study Areas*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02
CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017
BDGA, 1/1 000 000, MRN Québec, 2014
AQréseau+, réseau routier, MERN, 2024-03-01
MRNF, Ombrage MNT 50k, 2019
ESRI, World Imagery / ESRI, World Topographic

0 6 12 km

UTM, fuseau 18, NAD83 (CSRS)

2026-03-23

Préparation / Prepared by : M.-H. Brisson
Dessin / Drawn by : J. Roy
Approbation / Approved by : M.-H. Brisson
CA0001724_3318_ele_ch06_c01_02_260218.aprx
CA0001724_3318_ele_c06_02_086_ze_locales_260323

La précision des limites et les mesures montrées sur ce document ne doivent pas servir à des fins d'ingénierie ou de délimitation foncière. Aucune analyse foncière n'a été effectuée par un arpenteur-géomètre. /
Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.

6.2 Physical Environment

6.2.1 Climate

The study area has a subpolar continental climate, characterized by long cold winters and short cool summers.

Weather data on temperatures, extreme precipitation, and winds are from the station located at La Grande IV (ECCC, 2025a). This weather station is located in the biophysical RSA approximately 31 km northeast of the mine site. The temperature data are taken from climatological averages for the period from 1991 to 2020. Given the lack of data on average monthly precipitation at the La Grande IV station, the data used comes from the Nitchequon station and covers the period from 1961 to 1990 (ECCC, 2025b). The Nitchequon station is located approximately 200 km east of the mine site.

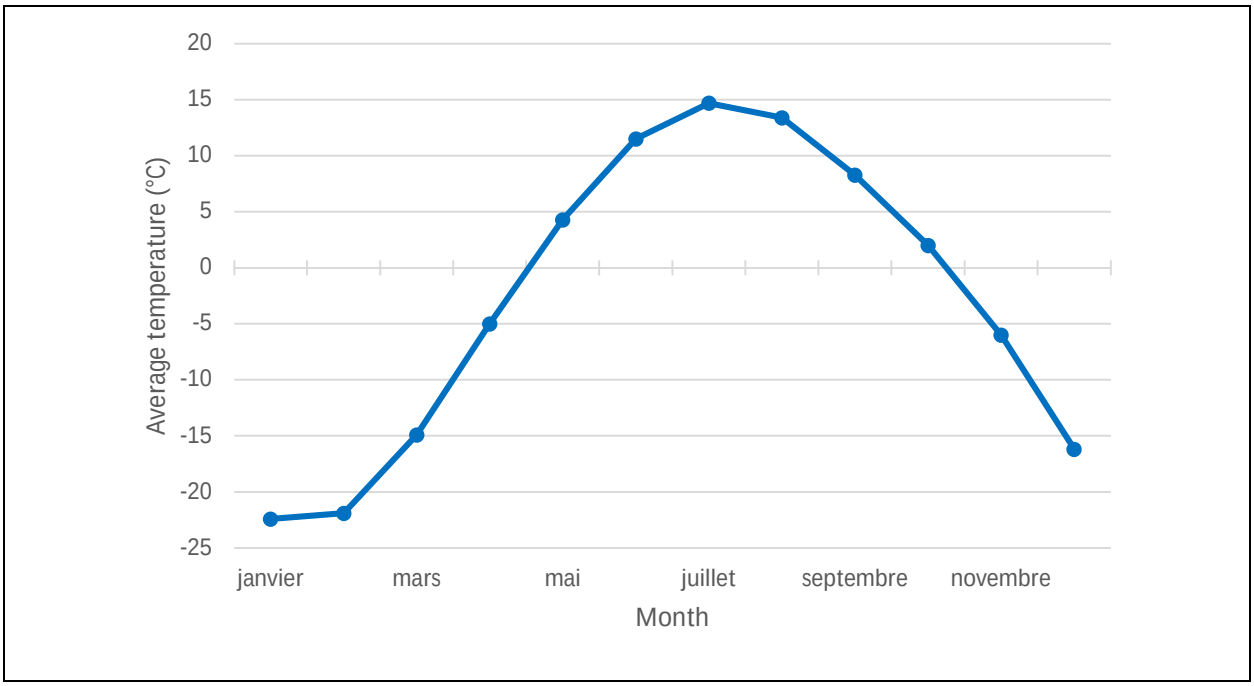
6.2.1.1 Temperature

Temperature is highly variable, with extremes ranging from -50.4 °C to 35.5 °C (Table 6-1). January is the coldest month with an average temperature of -22.4 °C, while July is the warmest month with an average temperature of 14.7 °C. Figure 6-1 shows the average temperature variation for the 1991 to 2020 period.

Table 6-1 Temperature normals at the Grande IV weather station (1991 to 2020 period)

Month	Daily average (ºC)	Daily maximum (ºC)	Daily minimum (ºC)
January	-22.4	-16.8	-27.9
February	-21.9	-15.4	-28.3
March	-14.9	-7.3	-22.3
April	-5.0	1.2	-11.1
May	4.3	10.3	-1.8
June	11.5	18.1	4.8
July	14.7	20.5	8.8
August	13.4	18.7	8.0
September	8.3	12.8	3.8
October	2	5.3	-1.2
November	-6	-2.6	-9.4
December	-16.2	-11.5	-21.0
Year	**-2.7**	**2.8**	**-8.1**

Source: Environment and Climate Change Canada (ECCC), 2025a.



Source: Environment and Climate Change Canada (ECCC), 2025a

Figure 6-1 Variation of average temperature (1991 to 2020 period)

6.2.1.2 Precipitation

Total annual precipitation averages 827.2 mm and is highest from June to October (Tables 6-2 and 6-3). Snowfall occurs from August to May and averages 328.2 cm annually. Figure 6-2 shows the monthly rainfall amounts and Figure 6-3 shows the monthly snowfall amounts.

Table 6-2 Average monthly precipitation norms at La Grande IV weather station (1991 to 2020 period)

Month	Rainfall (mm)	Snowfall (cm)	Total precipitation (mm)	Mean snow cover (cm)	Median snow cover (cm)	Snow cover, end of month (cm)
January	0.7	39.4	32.7	43	44	47
February	1.8	23.9	23.9	46	46	49
March	3.2	25.9	28.4	48	48	44
April	8.8	20.6	31.3	28	30	8
May	N/A	N/A	51.2	N/A	N/A	N/A
June	N/A	N/A	78.4	N/A	N/A	N/A
July	N/A	N/A	N/A	N/A	N/A	N/A
August	N/A	N/A	N/A	N/A	N/A	N/A
September	N/A	N/A	109.1	N/A	N/A	N/A
October	N/A	N/A	78.6	N/A	N/A	5

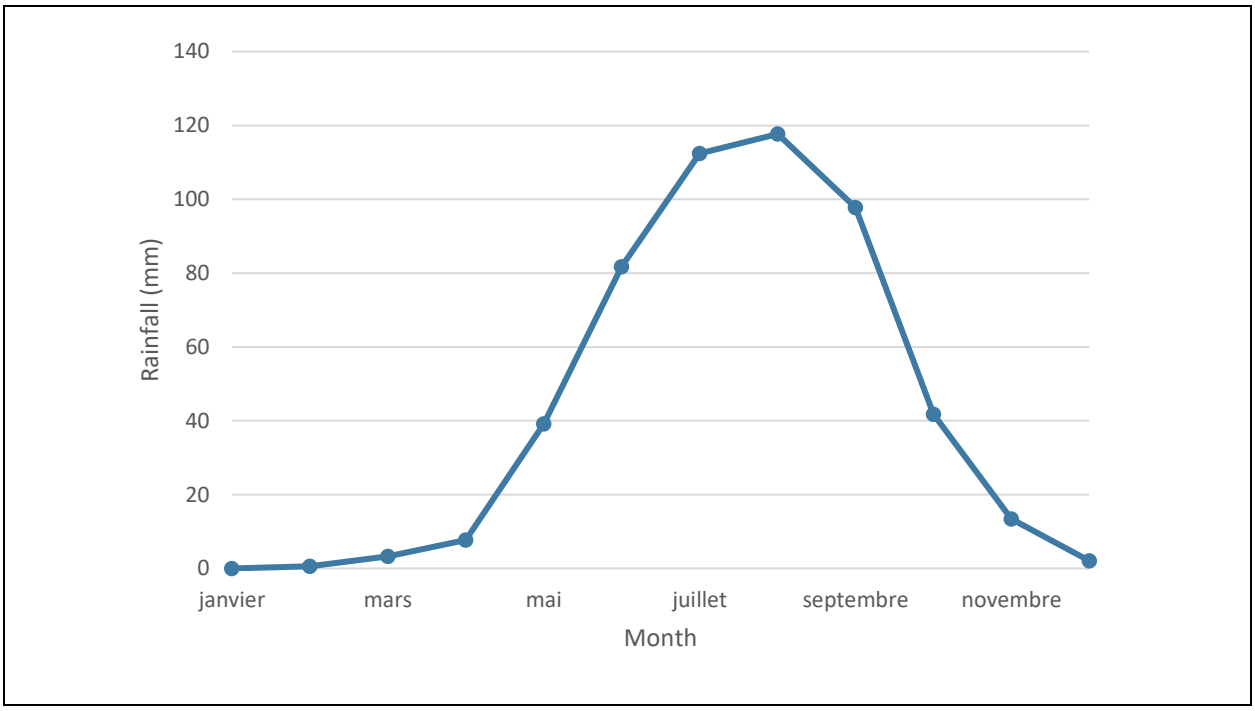
Month	Rainfall (mm)	Snowfall (cm)	Total precipitation (mm)	Mean snow cover (cm)	Median snow cover (cm)	Snow cover, end of month (cm)
November	18.3	53.4	59.7	11	10	19
December	4.9	42.8	N/A	26	26	34
Year	N/A	N/A	N/A	N/A	N/A	N/A

Source: Environment and Climate Change Canada (ECCC), 2025a.

Table 6-3 Average monthly precipitation normals at the Nitchequon weather station (1961 to 1990 period)

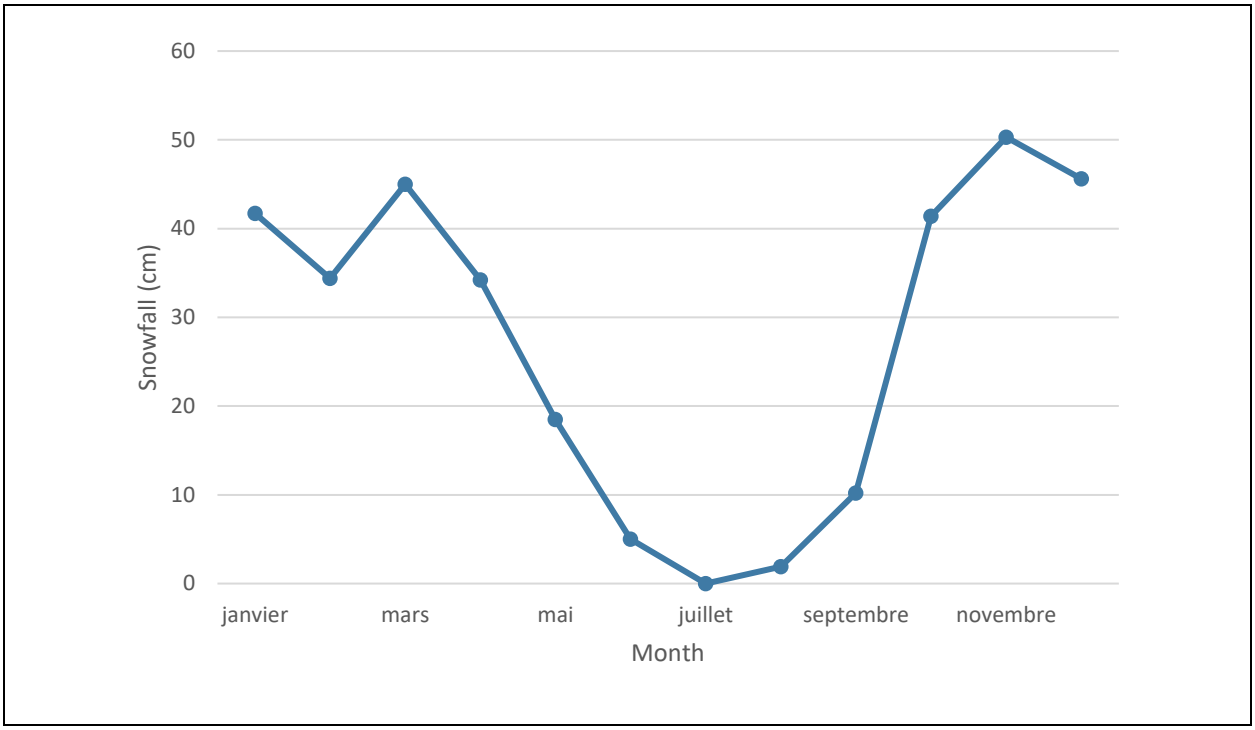
Month	Rainfall (mm)	Snowfall (cm)	Total precipitation (mm)	Mean snow cover (cm)	Median snow cover (cm)	Snow cover, end of month (cm)
January	0	41.7	38.5	N/A	N/A	70
February	0.6	34.4	30.9	N/A	N/A	78
March	3.3	45.0	44.9	N/A	N/A	84
April	7.7	34.2	40.8	N/A	N/A	51
May	39.2	18.5	57.5	N/A	N/A	3
June	81.7	5.0	87.7	N/A	N/A	0
July	112.4	0	112.4	N/A	N/A	0
August	117.7	1.9	119.6	N/A	N/A	0
September	97.8	10.2	107.7	N/A	N/A	0
October	41.8	41.4	82.1	N/A	N/A	0
November	13.4	50.3	60.6	N/A	N/A	9
December	2.1	45.6	44.4	N/A	N/A	29
Year	**517.6**	**328.2**	**827.2**	N/A	N/A	**56**

Source: Environment and Climate Change Canada (ECCC), 2025b.



Source: Environment and Climate Change Canada (ECCC), 2025b.

Figure 6-2 Monthly rainfall at the Nitchequon weather station (period from 1961 to 1990)



Source: Environment and Climate Change Canada (ECCC), 2025b.

Figure 6-3 Monthly snowfall at the Nitchequon weather station (period from 1961 to 1990)

The highest daily precipitation (Table 6-4) was approximately 60.7 mm of rain recorded on July 1, 2014, and 33 mm of snow water equivalent recorded on February 19, 1994. The snow cover on the ground reached a record of 99 cm in March 2015.

Table 6-4 Extreme precipitation (long-term) at La Grande IV weather station (1991 to 2020 period)

Month	Rain (mm)	Date (yyyy/dd)	Snow (cm)	Date (yyyy/dd)	Total precipitation (mm)	Date (yyyy/dd)	Extreme snow cover (cm)	Date (yyyy/dd)
January	13.2	2003/21	17.6	1989/08	16.0	2011/05	96	2015/30
February	5.4	2003/04	30.6	1994/19	33.0	1994/19	96	2015/01
March	14.0	2003/29	16.6	2007/21	20.5	2007/22	99	2015/05
April	12.6	1993/30	19.2	2013/19	21.0	2013/19	98	2015/03
May	25.6	1990/11	11.4	1986/02	54.9	2018/31	36	1990/01
June	45.6	2004/19	1.6	1992/03	45.6	2004/19	3	2002/02
July	33.2	1994/29	0	N/A	60.7	2014/01	0	N/A
August	49.8	1992/10	1.0	1986/30	58.2	2015/30	0	N/A
September	49.2	1989/08	13.8	1995/22	49.2	1989/08	9	1992/24
October	30.2	1994/08	30.2	1993/05	30.2	1994/08	29	1987/13
November	22.0	2015/06	31.0	2014/24	28.3	2014/24	52	2014/30
December	9.2	2010/01	24.8	2014/25	19.5	2012/22	91	2014/29

Source: Environment and Climate Change Canada (ECCC), 2025a.

6.2.1.3 *Winds*

The meteorological data used to determine the prevailing winds in the biophysical RSA are those compiled by Environment Canada, recorded by the La Grande IV weather station.

The data included temperature, relative humidity, barometric pressure, and wind direction and speed. These data were used to produce wind roses, which are shown in Figures 6-4 to 6-7 for each season: fall (September to November), winter (December to February), spring (March to May), and summer (June to August). They are based on data available from 2018, 2020, 2021, 2022, and 2024.

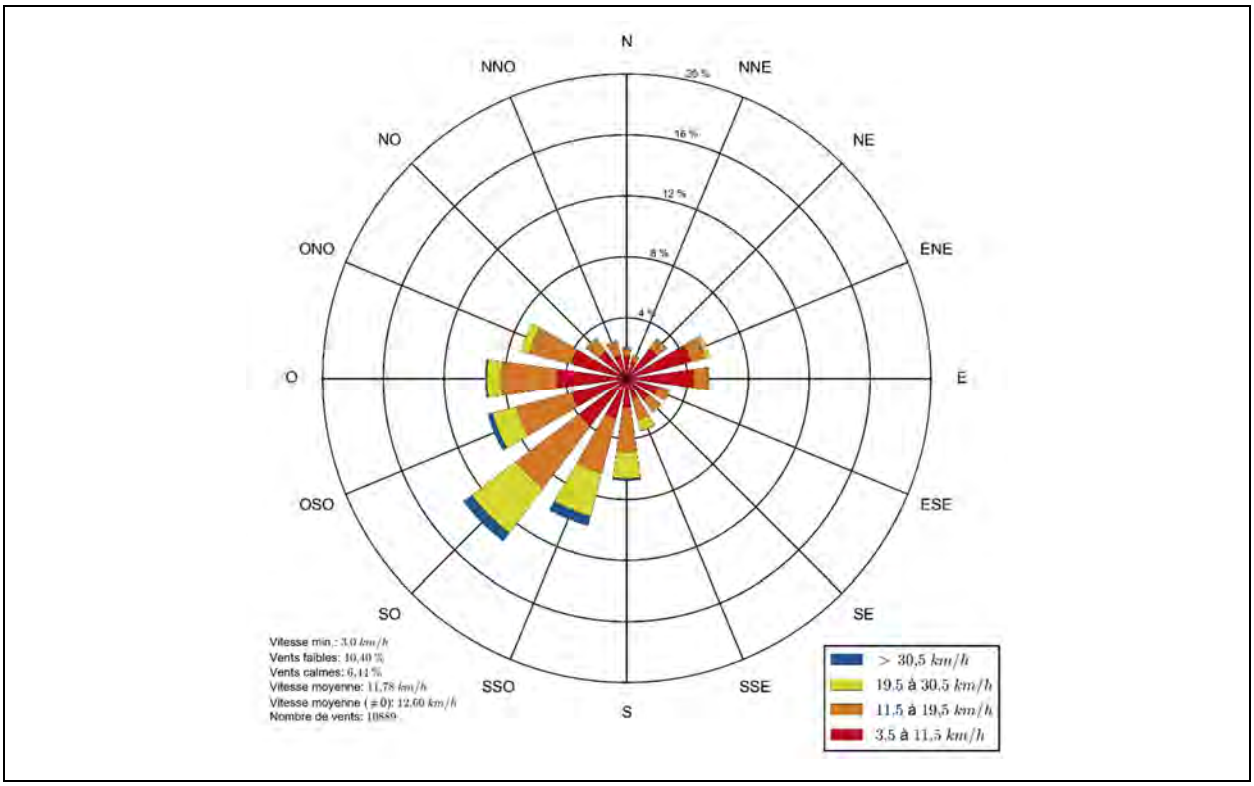


Figure 6-4 Wind rose illustrating the direction from which the winds originate – Fall

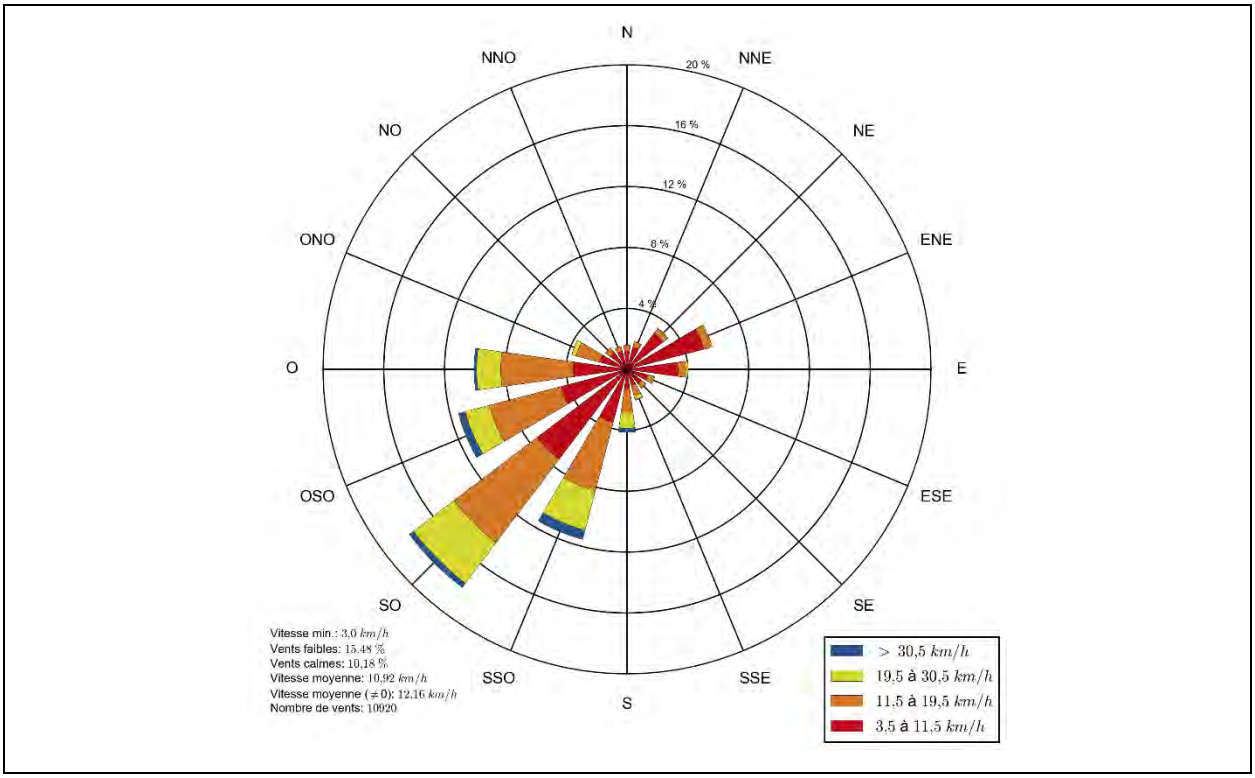


Figure 6-5 Wind rose illustrating the direction from which the winds originate - Winter

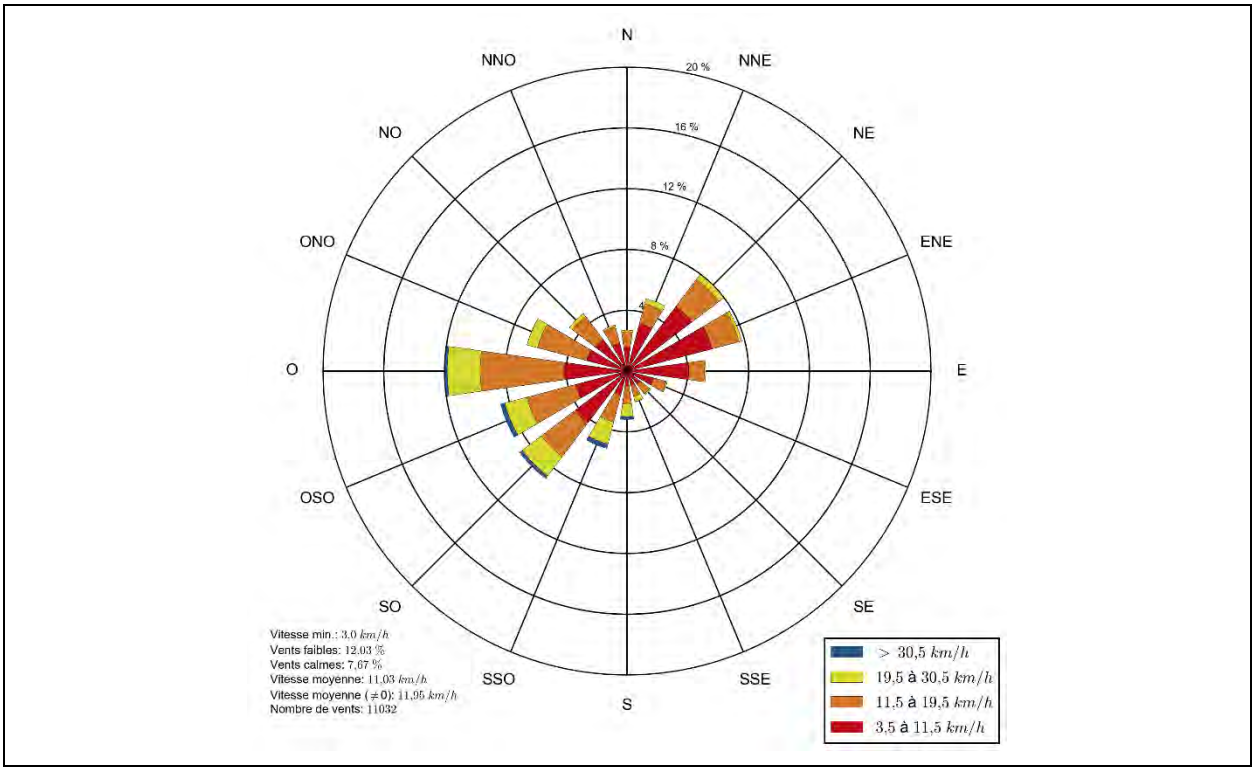


Figure 6-6 Wind rose illustrating the direction from which the winds originate - Spring

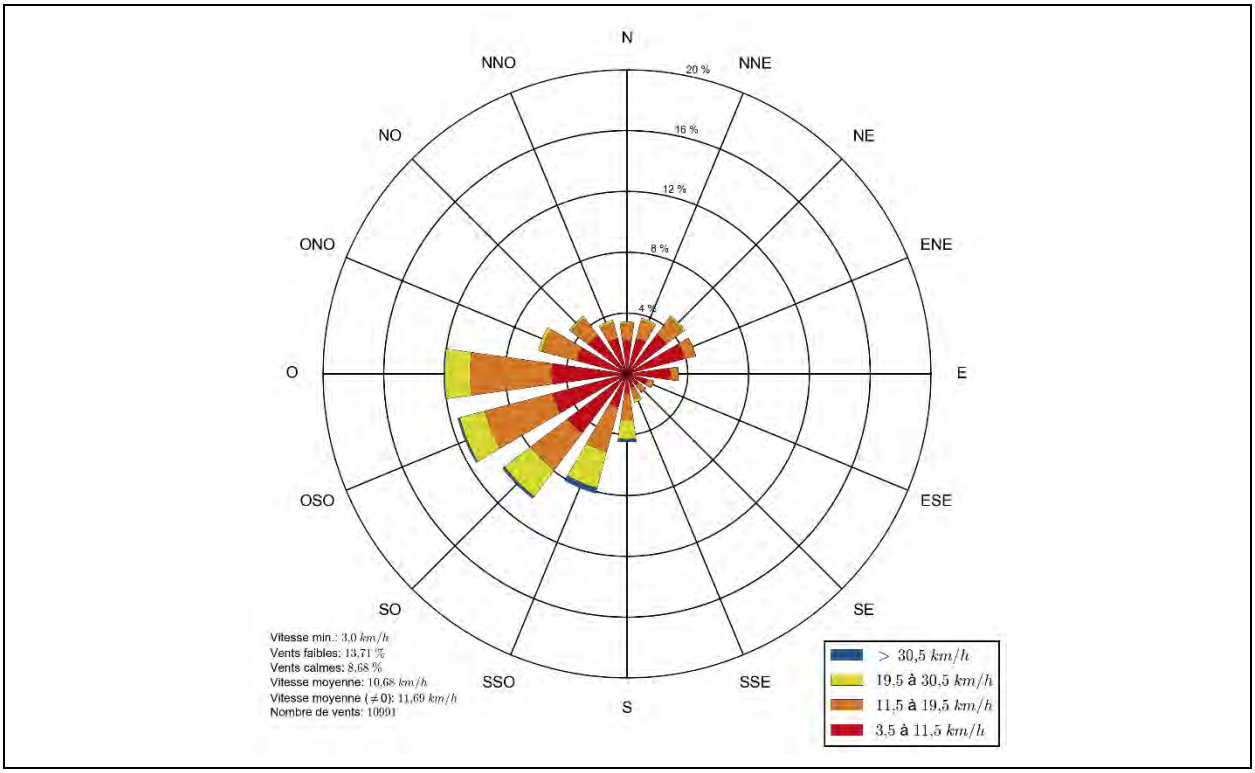


Figure 6-7 Wind rose illustrating the direction from which the winds originate - Summer

The prevailing winds remain largely the same throughout the year, blowing from the southwest. Winds from the west are also observed, but they are more frequent in spring and summer. Winds from the northeast are also common in spring. Every year, southwesterly winds are also capable of reaching the highest speeds, exceeding 30.5 km/h.

6.2.2 Ambient air

To determine the initial concentrations of contaminants in ambient air, different approaches may be considered. Initial concentrations can be established based on:

- Measurements taken on site to obtain actual values.
- Measurements taken by federal, provincial, or municipal monitoring networks, such as Environment and Climate Change Canada's (ECCC) National Air Pollution Surveillance (NAPS) or the MELCCFP's Quebec Air Quality Surveillance Network (RSQAQ).
- Initial generic concentrations defined by the MELCCFP.

In the case of this project, data from the Radisson National Air Pollution Surveillance (NAPS) station, located about 250 km west of the project site and at approximately the same latitude, were analyzed and taken into account (Appendix 6-1). This station samples total particulate matter, fine particulate matter (PM2.5), ozone, and certain metals in total particulate matter.

However, some of the pollutants that may be emitted by the project are not measured at this station. In this context, and in accordance with MELCCFP recommendations, the initial concentrations prescribed for northern projects (NP) in the document *Guide d'instructions – Préparation et réalisation d'une modélisation de la dispersion des émissions atmosphériques – Projets miniers* [Instruction guide – Preparation and implementation of air emission dispersion modelling – Mining projects] (MELCCFP, 2025a) were also considered. A comparison between concentrations for NP and data from the Radisson station was also performed.

Finally, for all other substances not available for northern projects, the initial concentrations used are generic initial concentrations taken from the document *Normes et critères de qualité de l'air du Québec [NCQQA v10]* (MELCCFP, 2025b).

For the specific case of NOx, a low exposure level was selected in accordance with the *Guide de la modélisation de la dispersion atmosphérique* [Guide to atmospheric dispersion modelling] (MELCCFP, 2025c).

Table 6-5 shows the initial concentrations selected for each of the modelled contaminants.

Table 6-5 Standards and criteria associated with the modelled components

Substance	CAS, Chem. Formula or Acronym	Gov. / Org.	Threshold Type	Averaging Period	Statistical	Limit (µg/m³)	Background Concentration reference	Background Concentration (µg/m³)
Total particulates	PMT	MELCCFP	Norme	24-hour	1st maximum	120	Radisson Station	26.09
Fine particulates	PM2.5	MELCCFP	Norme	24-hour	1st maximum	30	Radisson Station	10.42
Carbon monoxide	CO	MELCCFP	Norme	1-hour	1st maximum	34000	Northen Projects	600
Carbon monoxide	CO	MELCCFP	Norme	8-hour	1st maximum	12700	Northen Projects	400
Nitrogen dioxide [OLM;0.2;70]	NO2	MELCCFP	Norme	1-hour	1st maximum	414	MELCCFP, 2025, Low Level	43
Nitrogen dioxide [TC]	NO2	MELCCFP	Norme	24-hour	1st maximum	207	MELCCFP, 2025, Low Level	28
Nitrogen dioxide [TC]	NO2	MELCCFP	Norme	1-year	1st maximum	103	MELCCFP, 2025, Low Level	9
Sulfur dioxide	SO2	MELCCFP	Norme	4-minute	1st maximum	1310	Northen Projects	40
Sulfur dioxide	SO2	MELCCFP	Norme	4-minute	99.5th percentile	1050	Northen Projects	40
Sulfur dioxide	SO2	MELCCFP	Norme	24-hour	1st maximum	288	Northen Projects	10
Sulfur dioxide	SO2	MELCCFP	Norme	1-year	1st maximum	52	Northen Projects	2
Silver	Ag	MELCCFP	Norme	1-year	1st maximum	0.23	Radisson Station	0.001
Arsenic	As	MELCCFP	Norme	1-year	1st maximum	0.003	Radisson Station	0.001
Barium	Ba	MELCCFP	Norme	1-year	1st maximum	0.05	Radisson Station	0.00102
Beryllium	Be	MELCCFP	Norme	1-year	1st maximum	0.0004	Radisson Station	0.0002
Ethyl benzene	100-41-4	MELCCFP	Norme	4-minute	1st maximum	740	NCQQA v10	140
Ethyl benzene	100-41-4	MELCCFP	Norme	1-year	1st maximum	200	NCQQA v10	3
Styrene	100-42-5	MELCCFP	Norme	1-hour	1st maximum	1910	NCQQA v10	0

Substance	CAS, Chem. Formula or Acronym	Gov. / Org.	Threshold Type	Averaging Period	Statistical	Limit (µg/m³)	Background Concentration reference	Background Concentration (µg/m³)
Styrene	100-42-5	MELCCFP	Norme	1-hour	98th percentile	150	NCQQA v10	0
1,3-Butadiene	106-99-0	MELCCFP	Critère	4-minute	1st maximum	352	NCQQA v10	2
1,3-Butadiene	106-99-0	MELCCFP	Critère	1-year	1st maximum	0.5	NCQQA v10	0.14
Acrolein	107-02-8	MELCCFP	Critère	4-minute	99th percentile	8.3	-	-
Acrolein	107-02-8	MELCCFP	Critère	1-year	1st maximum	0.02	-	-
Toluene	108-88-3	MELCCFP	Norme	4-minute	1st maximum	600	NCQQA v10	260
Pentane	109-66-0	MELCCFP	Critère	4-minute	1st maximum	4120	NCQQA v10	76
Pentane	109-66-0	MELCCFP	Critère	1-year	1st maximum	240	NCQQA v10	8
Hexane	110-54-3	MELCCFP	Norme	4-minute	1st maximum	5300	NCQQA v10	140
Hexane	110-54-3	MELCCFP	Norme	1-year	1st maximum	140	NCQQA v10	3
Propionaldehyde	123-38-6	MELCCFP	Critère	4-minute	1st maximum	460	NCQQA v10	10
Propionaldehyde	123-38-6	MELCCFP	Critère	4-minute	99th percentile	20	NCQQA v10	10
Pyrene	129-00-0	MELCCFP	Critère	1-year	1st maximum	13	NCQQA v10	0
dimethylbenzene	1330-20-7	MELCCFP	Norme	4-minute	1st maximum	350	NCQQA v10	150
dimethylbenzene	1330-20-7	MELCCFP	Norme	1-year	1st maximum	20	NCQQA v10	8
Formaldehyde	50-00-0	MELCCFP	Norme	15-minute	1st maximum	37	NCQQA v10	3
Benzo[a]pyrene	50-32-8	MELCCFP	Norme	1-year	1st maximum	0.0009	NCQQA v10	0.0003
2,2,4-trimethylpentane	540-84-1	MELCCFP	Critère	1-hour	1st maximum	3500	NCQQA v10	0
2,2,4-trimethylpentane	540-84-1	MELCCFP	Critère	1-year	1st maximum	350	NCQQA v10	0
Benzene	71-43-2	MELCCFP	Norme	24-hour	1st maximum	10	NCQQA v10	3
Acetaldehyde	75-07-0	MELCCFP	Critère	4-minute	99th percentile	3	-	-

Substance	CAS, Chem. Formula or Acronym	Gov. / Org.	Threshold Type	Averaging Period	Statistical	Limit (µg/m³)	Background Concentration reference	Background Concentration (µg/m³)
Acetaldehyde	75-07-0	MELCCFP	Critère	1-year	1st maximum	0.5	-	-
Naphthalene	91-20-3	MELCCFP	Norme	4-minute	1st maximum	200	NCQQA v10	5
Naphthalene	91-20-3	MELCCFP	Norme	1-year	1st maximum	3	NCQQA v10	0
2-methylnaphthalene	91-57-6	MELCCFP	Critère	1-hour	1st maximum	30	NCQQA v10	0
2-methylnaphthalene	91-57-6	MELCCFP	Critère	1-year	1st maximum	4	NCQQA v10	0
Cadmium	Cd	MELCCFP	Norme	1-year	1st maximum	0.0036	Radisson Station	0.0002
Cobalt	Co	MELCCFP	Critère	1-year	1st maximum	0.1	Radisson Station	0.0002
Chromium(VI)	Cr(VI)	MELCCFP	Norme	1-year	1st maximum	0.004	Northen Projects	0.002
Chromium(III)	Cr(III)	MELCCFP	Norme	1-year	1st maximum	0.1	Radisson Station	0.003
Copper	Cu	MELCCFP	Norme	24-hour	1st maximum	2.5	Radisson Station	0.116
Polycyclic aromatic hydrocarbons	PAH	MELCCFP	Critère	1-year	1st maximum	0.0024	NCQQA v10	0.0014
Mercury	Hg	MELCCFP	Norme	1-year	1st maximum	0.005	Northen Projects	0.002
Lithium	Li	MELCCFP	Critère	1-hour	1st maximum	2	NCQQA v10	0
Magnesium	Mg	MELCCFP	Critère	1-hour	1st maximum	24	NCQQA v10	6
Manganese	Mn	MELCCFP	Critère	1-year	1st maximum	0.08	Radisson Station	0.00249
Nickel	Ni	MELCCFP	Norme	24-hour	1st maximum	0.07	Radisson Station	0.003
Nickel	Ni	MELCCFP	Norme	1-year	1st maximum	0.02	Radisson Station	0.003
Lead	Pb	MELCCFP	Norme	1-year	1st maximum	0.1	Radisson Station	0.002
Dioxins and Furans	PCDD/F	MELCCFP	Norme	1-year	1st maximum	0.00000006	NCQQA v10	0.00000004
Antimony	Sb	MELCCFP	Norme	1-year	1st maximum	0.17	Radisson Station	0.001
Selenium	Se	MELCCFP	Critère	1-hour	1st maximum	2	NCQQA v10	0.15

Substance	CAS, Chem. Formula or Acronym	Gov. / Org.	Threshold Type	Averaging Period	Statistical	Limit (µg/m³)	Background Concentration reference	Background Concentration (µg/m³)
Silica-crystalline, Quartz	SiO2	MELCCFP	Critère	1-hour	1st maximum	23	NCQQA v10	6
Silica-crystalline, Quartz	SiO2	MELCCFP	Critère	1-year	1st maximum	0.07	NCQQA v10	0
Tin	Sn	MELCCFP	Critère	4-minute	1st maximum	2	NCQQA v10	0
Tin	Sn	MELCCFP	Critère	1-year	1st maximum	0.1	Radisson Station	0.003
Titanium	Ti	MELCCFP	Critère	24-hour	1st maximum	2.5	Radisson Station	0.0064
Vanadium	V	MELCCFP	Norme	1-year	1st maximum	1	Radisson Station	0.007
Zinc	Zn	MELCCFP	Norme	24-hour	1st maximum	2.5	Radisson Station	0.06
Fine particulates	PM2.5	CCME	NCQAA	24-hour	98th percentile [3YA]	27	Radisson Station	10.42
Fine particulates	PM2.5	CCME	NCQAA	24-hour	98th percentile [3YA]	23	Radisson Station	10.42
Fine particulates	PM2.5	CCME	NCQAA	1-year	1st maximum [3YA]	8.8	Radisson Station	2.99
Fine particulates	PM2.5	CCME	NCQAA	1-year	1st maximum [3YA]	8	Radisson Station	2.99
Nitrogen dioxide [OLM;0.2;70]	NO2	CCME	NCQAA	1-hour	98th percentile [DM] [3YA]	79	MELCCFP, 2025, Low Level	43
Nitrogen dioxide [TC]	NO2	CCME	NCQAA	1-year	1st maximum	22.6	MELCCFP, 2025, Low Level	9
Sulfur dioxide	SO2	CCME	NCQAA	1-hour	99th percentile [DM] [3YA]	170.2	Northen Projects	20.9
Sulfur dioxide	SO2	CCME	NCQAA	1-year	1st maximum	10.5	Northen Projects	2

[MQ] Percentile calculated from the daily maxima of hourly average concentrations.
[MM] Moving average.
[M3A] Three-year average.

6.2.3 Greenhouse gases (Energy transition)

Greenhouse gas (GHG) emissions refer to the quantities in metric tonnes of GHG emissions, primarily carbon dioxide (CO_2), methane (CH_4), and nitrous oxides (N_2O).

6.2.3.1 In Canada

According to the National GHG Emissions Report 1990–2023 (ECCC, 2025), total GHG emissions in 2023 for Canada reached 694 Mt of CO_2eq.

According to the sectors of activity defined in the executive summary of the National Inventory Report 1990-2023, the mining activities other than exploitation of oil and gas are classified in the “Heavy Industry” category. This sector emitted 78 Mt of CO_2 eq in 2023.

6.2.3.2 In Quebec

In 2023, Quebec’s total GHG emissions were 78 Mt CO_2eq, or 8.8 t per capita, representing 11.3% of Canada’s total emissions of 694 Mt CO_2eq.

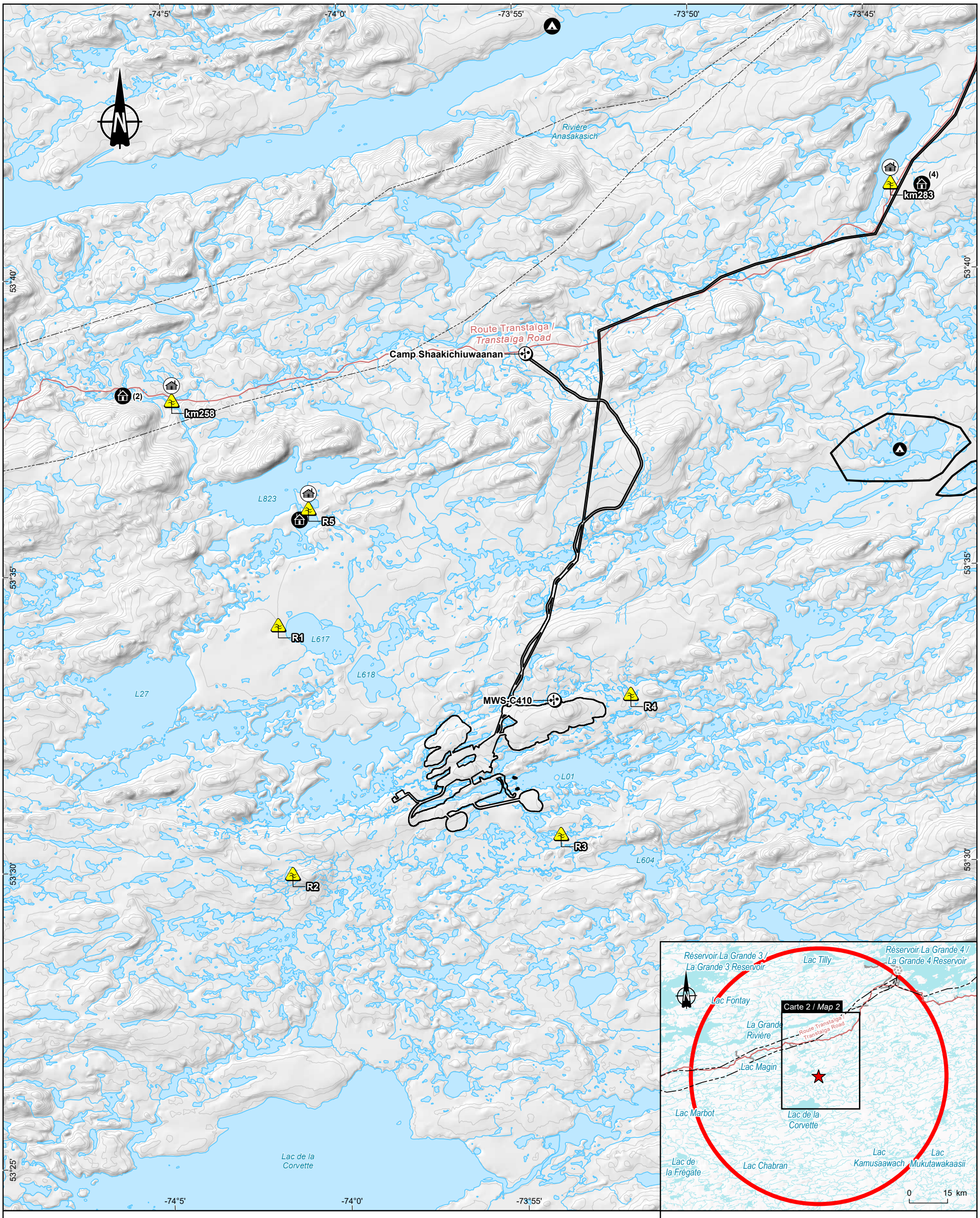
The sector that produced the most GHG emissions in Quebec in 2023 was transportation (road, air, sea, rail, and off-road). The industry sector ranked second, reaching 24.7 Mt CO2eq, or 31.7% of total emissions.

These emissions are distributed as follows: 47.4% from energy consumption, 51.5% from industrial processes, and 1.1% from fugitive emissions and the use of solvents and other products (MELCCFP, 2025b).

6.2.4 Acoustic environment

The study area is located within the territory of the Eeyou Istchee James Bay Regional Government in an area where regulations allow, among other things, single-family dwellings, outfitters, mining activities, and parks and green spaces. The applicable noise criteria are those set out in Directive 019 on the mining industry (D019; MELCCFP, 2025) and the guidelines on environmental noise management (MELCCFP, 2026). The prescribed noise limit for this area (hourly average) is 45 dBA at night and 50 dBA during the daytime, as the dwellings appear to be rudimentary shelters (not connected to a potable water supply or wastewater treatment system).

The acoustic environment (reference state) was determined by field measurements using sound level meters installed at sensitive receptors (Map 6-3). The methodology used is presented in Appendix 6-2. Identification of sensitive receptors, including consultations carried out by PMET, did not identify any permanent residences or resort areas near the project site or within the study area. The sensitive receptors were identified by land use research and confirmed by PMET during consultations with land users. They include three Cree campsites located within15 km of the project site, as shown in Table 6-6.



Zones d'étude / *Study Areas*

- Projet / *Project*
- Régionale - Biophysique / *Regional - Biophysical*

Ambiance sonore / *Sound Ambiance*

- Station de mesure du bruit / *Noise measurement station*

Utilisation du territoire / *Land Use*

- Camp cri permanent / *Cree permanent Camp*
- Campement cri temporaire / *Cree temporary camp or campsite*
- Camp de chasse / *Hunting camp*
- Aire de camps et de campements / *Camps and campsites area*

Climat / *Climate*

- Station météo / *Weather station*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 6-3 / *Map 6-3*
État initial de l'ambiance sonore / *Baseline Acoustic Environment*

Sources / Sources

AQréseau+, réseau routier, MERN, 2016
BDGA, 1M, MERN, 2014
CanVec, 250k,RNCan, 2017

0 1,2 2,4 km

UTM, fuseau 18, NAD83 (CSRS)

2026-03-23

Préparation / Prepared by : M. Deshais
Dessin / Drawn by : M. Dupraz
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CA0001724_3318_eie_ch06_c03_04_260303.aprx
CA0001724_3318_eie_c06_03_114_amb_sonore_260323

La précision des limites et les mesures montrées sur ce document ne doivent pas servir à des fins d'ingénierie ou de délimitation foncière. Aucune analyse foncière n'a été effectuée par un arpenteur-géomètre. / Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.

Table 6-6 Identified sensitive receptors

Sensitive receptors	Coordinates	
	NAD83, MTM zone 8 (dd,dddd)	WGS84 (dd,dddd)
KM258 – Campsite at km 258 on the Trans-Taiga Road	53.632602° N, -74.080211° E	53.6326° N, -74.0802° E
KM283 – Campsite at km 283 on the Trans-Taiga Road	53.691001° N, -73.738200° E	53.6910° N, -73.7382° E
R5 – Campsite approximately 4 km south of the Trans-Taiga Road, 6 km northwest of the project site	53.601696° N, -74.016095° E	53.6017° N, -74.0161° E

Four additional sound measurement stations were selected by PMET to characterize the acoustic environment (baseline) around the study area. The measurement stations and their coordinates are shown in Table 6-7.

Table 6-7 Sound measurement stations around the project site

Measurement station	Coordinates	
	NAD83, MTM zone 8 (dd,dddd)	WGS84 (dd,dddd)
R1 – northwest of the project site	53.569102° N, -74.031096° E	53.5691° N, -74.0311° E
R2 – southwest of the project site	53.499097° N, -74.025805° E	53.4991° N, -74.0258° E
R3 – southeast of the project site	53.590202° N, -73.898995° E	53.5092° N, -73.8990° E
R4 – northeast of the project site	53.548301° N, -73.865105° E	53.5483° N, -73.8651° E

Table 6-8 shows the equivalent noise levels (LAeq) at the seven measurement stations for two time periods: daytime (7 a.m. to 7 p.m.) and nighttime (7 p.m. to 7 a.m.), as well as for the 24-hour period. The equivalent noise level corresponds to the average noise level during the measurement period. To determine the noise criteria according to provincial regulations, residual noise measurements (ambient noise without the mine's activities) must be compared to the maximum sound levels permitted by the MELCCFP's environmental noise management guidelines. Should the measured residual noise be above the maximum noise levels permitted by the guidelines, the measured level becomes the standard. The measured noise levels were all below the criteria established by the applicable guidelines. The applicable noise criteria are therefore 45 dBA at night and 50 dBA during the daytime at all monitoring locations.

Table 6-8 Measured noise levels

Measurement site	$L_{eq, 24h}$ (dBA)[a]	$L_{eq, 7h-19h}$ (dBA)[1]	$L_{eq, 19h-7h}$ (dBA)[1]	Minimum hourly level, daytime (dBA)[1]	Minimum hourly level, nighttime (dBA)[1]
KM258	45	46	44	32	42
KM283	33	35	23	19	18
R1	20	21	19	17	17
R2	20	21	17	16	16
R3	31	31	32	30	31
R4	27	29	23	15	15
R5	27	28	25	16	17

Note: 1 Noise level rounded to 1 dBA, ref.: $2x10^{-5}$ Pa.

For comparison with federal standards, daytime noise levels Ld, nighttime noise levels Ln, and the Ldn indicator were used. These results are used to calculate the % HA (Highly Annoyed) and determine compliance with the Health Canada noise criterion. The Ld noise indicator represents the average noise measured between 7 a.m. and 10 p.m. The Ln noise indicator represents the average noise measured between 10 p.m. and 7 a.m. Finally, the Ldn indicator represents the average daily noise to which a weighting of 10 dBA is added for the nighttime period (10 p.m. to 7 a.m.). Table 6-9 presents the results of ambient noise surveys conducted prior to the project.

Table 6-9 Results of ambient noise surveys – federal criteria

Measurement site	L_d (7h-22h) (dBA)[1]	L_n (22h-7h) (dBA)[1]	L_{dn} (dBA)[1]	%HA
KM258	46	43	50	2.2
KM283	34	20	33	0.9[2]
R1	21	19	26	0.3[2]
R2	21	16	24	0.3[2]
R3	31	32	38	1.7[2]
R4	28	24	31	0.7[2]
R5	33	25	32	0.8[2]

Notes: 1 Noise level rounded to 1 dBA, ref.: $2x10^{-5}$ Pa;
2 An additional 10 dBA is applied to the day-night level for calculating the %HA at the receptor in a quiet area (L_d < 45 dBA and L_n < 35 dBA).

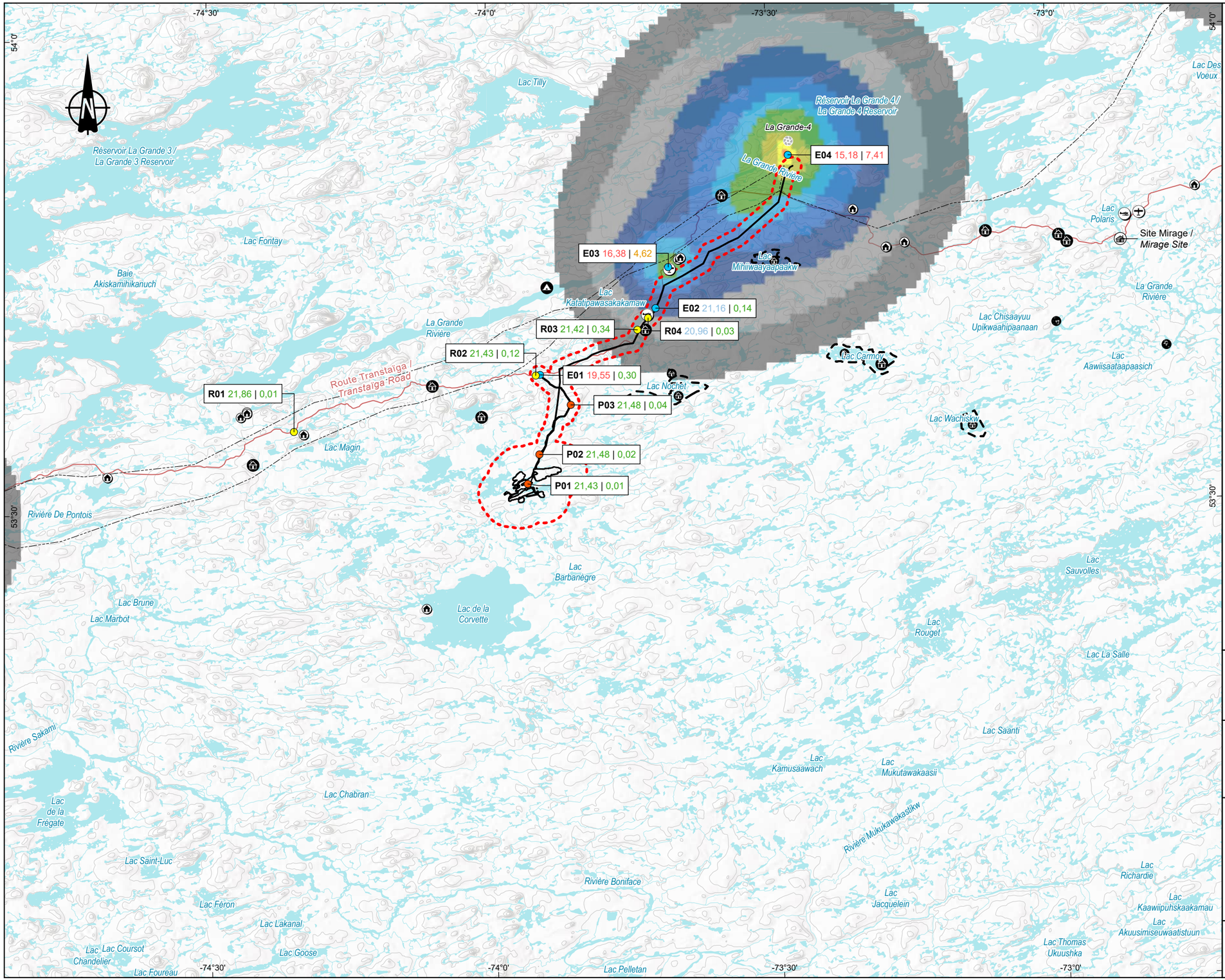
All ambient noise (e.g., road and air traffic, activities of users in the area) was taken into account in ambient noise measurements. However, the start time for each 24-hour measurement period was selected to minimize the influence of noise from the occasional helicopter flights that took place on site during the measurement campaign and that were used to transport the noise measurement instruments.

The main noise contribution at measurement site KM283 comes from traffic on the Trans-Taiga Road, with an average daytime noise level of 35.3 dBA. At measurement site KM258, a generator operating to power the campsite during the night of November 3 to 4 produced a relatively high noise level, with the minimum hourly noise level at night at 42.1 dBA.

When moving away from the Trans-Taiga Road, the noise level is relatively low, which corresponds to the levels typically measured at the beginning of winter in an environment far from human habitation and activity, when wind speeds are low. At locations far from the road, with the exception of measurement site R3, average noise levels ranged from 19.6 dBA to 26.9 dBA. At measurement site R3, the flow of water in a stream was audible, resulting in a higher noise level than that measured at other sites along the Trans-Taiga Road.

6.2.5 Ambient light

The analysis of current ambient light conditions in the biophysical LSA is based on a review of the literature and field surveys. The details of the information summarized below can be found in the luminosity report presented in Appendix 6-3. Measuring stations representative of the biophysical LSA were selected following an analysis of existing sources of artificial light present at nighttime in the study area. In total, four sensitive receptor stations (R), four stations corresponding to emitters (E), and three stations at the project site (P) were selected for light measurements. The location of each of these stations is shown on Map 6-4, and a brief description of each is provided in Table 6-10.



Zones d'étude / *Study Areas*

- Projet / *Project*
- Locale - Biophysique / *Local - Biophysical*

Ambiance lumineuse / *Luminous Environment*

- Projet / *Project*
- Récepteur / *Receiver*
- Émetteur / *Transmitter*

Numéro de la station / *Station number*
E = Émetteur / *Transmitter*
R = Récepteur / *Receiver*
P = Projet / *Project*

E13 19,71 | 0,02

Couleur : Zone de la CIE / *Color : CIE Zone*
Lumière intrusive (lux) / *Intrusive light (lux)*
Clarté du ciel / *Sky clarity* (mag/arcsec²)

Zone de la CIE pour chaque station / *CIE Area for Each Station*

- XXX Secteur peu influencé par la luminosité / *Sector little influenced by the luminosity*
- XXX Secteur de faible luminosité / *Area of low brightness*
- XXX Secteur de luminosité moyenne / *Area of medium brightness*
- XXX Secteur de forte luminosité / *Area of high brightness*

Résultat des mesures de clarté du ciel / *Sky Brightness Measurement Result* (mag/arcsec²)

>21,97	21,09-21,45
21,96-21,97	20,6-21,09
21,94-21,96	20,02-20,60
21,90-21,94	19,35-20,02
21,82-21,90	18,65-19,35
21,68-21,82	17,93-18,65
21,45-21,68	< 17,93

Infrastructures / *Infrastructure*

- Aérodrome / *Aerodrome*
- Hydroaérodrome / *Hydroaerodrome*
- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*

Utilisation du territoire / *Land Use*

- Bail de villégiature / *Resort purpose*
- Camp de chasse / *Hunting camp*

Campements cri / *Cree Camps*

- Camp permanent / *Permanent Camp*
- Campement temporaire / *Temporary camp or campsite*
- Aire de camps et de campements / *Camps and campsites area*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 6-4 / *Map 6-4*
Clarté du ciel et résultats d'échantillonnage de l'ambiance lumineuse / *Sky Brightness and Light-environment Sampling Results*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02 / CanVec+, 1/50 000, RNCan, 2014
CanVec, 1/250 000, RNCan, 2017 / BDGA, 1/1 000 000, MRN Québec, 2014
BDGA, 1/1 000 000, MRN Québec, 2002
AQréseau+, réseau routier, MERN, 2024-03-01 / MTMD, Aéroports 2024-05-28
Données du nouvel Atlas 2016 / Data from the new 2016 Atlas : Falchi et al. 2016

0 4,5 9 km
UTM, fuseau 18, NAD83 (CSRS)

2026-03-25

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CA0001724_3318_eie_c06_04_115_clarte_ciel_260325

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Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.

Table 6-10 Description of ambient light survey stations

Station	Type	Location in relation to the project	Description
R01	Sensitive receptor	Northwest	Trans-Taiga Road, resort lease
R02	Sensitive receptor	North	Trans-Taiga Road
R03	Sensitive receptor	Northeast	Trans-Taiga Road
R04	Sensitive receptor	Northeast	Camp Nouchimi
P01	Project	Project	Project site
P02	Project	North	Access road to the project site
P03	Project	Northeast	Access road to the project site
E01	Emitter	North	Exploration camp, inhabited section of the camp
E02	Emitter	Northeast	Communication tower
E03	Emitter	Northeast	Trans-Taiga street light, airfield
E04	Emitter	Northeast	LG-4 hydroelectric complex

Measurements were taken in the field during the nights of October 2 and 3, 2024. This field campaign enabled specific measurements to be taken of sky clarity and light pollution, and photographs to be taken of the surrounding nighttime landscapes. As the moon influences measurements, surveys were conducted during the new moon (less than 1% visible during the night of October 2). In addition, since cloud cover can also influence measurements, particular attention was paid to weather conditions to ensure that surveys were carried out under the best possible conditions. All measurements were taken after astronomical twilight, specifically between 8:00 p.m. and 1:15 a.m.

SKY CLARITY

Data on the quality of the night sky in the project area are presented in Map 6-4. These data are illustrated using a colour chart corresponding to the level of sky clarity, with orange representing the least clear sky and transparent representing the clearest sky for the area under study.

The study area is located between the town of Radisson (west of the boundaries of Map 6-4) and the LG-4 hydroelectric complex (clearly visible on Map 6-4). The project site (P stations) is located in a section where sky clarity is optimal, as it is in an area identified as having more than 21.97 mag/arcsec2 (transparent area on Map 6-4). The closer one gets to stations E02, E03, and E04, the greater the amount of nighttime artificial light can be detected. This high level of light is mainly due to the infrastructure of the exploration camp, the LG-4 hydroelectric complex, and its airfield.

INTRUSIVE LIGHT

The results show that there is currently very little intrusive light (at ground level) emitted toward the receptor stations (zone E1,[1] levels below 1 lux). Emitters E03 and E04 are the stations with the highest levels of intrusive light, with zone E3 having levels up to 2 lux and zone E4 having levels up to 5 lux. Hydro-Québec's facilities (airfield and LG-4 hydroelectric complex) are, once again, the main causes of intrusive light.

NIGHTTIME LANDSCAPE

The project site and selected receptor stations have a very dark nighttime landscape, with little or no visible artificial light emissions. Emitter stations offer a much brighter nighttime landscape, where existing infrastructure is the main source of light pollution.

6.2.6 Geology and geomorphology

6.2.6.1 Geology

The biophysical LSA and RSA are entirely located within the Superior geological province, which covers nearly half of Quebec's territory (Government of Quebec, 2026). It consists of very old geological formations, between 2.5 and 2.8 billion years old, and is subdivided into nine sub-provinces. More specifically, the biophysical LSA is entirely located within the La Grande subprovince, while the biophysical RSA encompasses a small portion of the Opinaca subprovince in its southern part. Within the biophysical RSA, the two sub-provinces meet at the Quentin Shear Zone (Map 6-5). The formations present are mainly from the Neoarchean era (2.8 to 2.5 billion years ago) and are granitoid and sedimentary in type. However, formations from the Mesoarchean era (3.2 to 2.8 billion years ago) are also present and include metavolcanic and metasedimentary rocks, as well as formations comprising a composite of tonalite, diorite, quartz diorite, and granodiorite.

The project facilities are located entirely within a Mesoarchean formation comprising metavolcanic and metasedimentary rocks (Map 6-5). This formation contains a wide variety of rock types, as shown in the legend for Map 6-5, some of which contain spodumene pegmatite intrusions that contain the mineral targeted by the project. The pegmatite intrusion targeted by the mining project is presented in detail in Section 5.2.1 of the chapter on the project description. It should be noted that this formation is bounded to the north by the Ponthois-Sud fault, which exhibits reverse shearing, and to the south by a zone of shearing with indeterminate movement, known as the Nochet zone.

6.2.6.2 Geomorphology

Physical geography

The topography within the biophysical RSA is generally uniform, with maximum elevations around 400 m. The average elevation tends to decrease toward the northwest, on the north side of the Ponthois-Sud fault, where the maximum elevations drop to 360 m and 320 m. With regard to the project area itself, the LiDAR survey indicates that the center of the site's elevation varies between 335 m and 340 m above mean sea level (Appendix 6-4). The site is relatively flat, with a slight slope to the north (Appendix 6-4).

[1] International Commission on Illumination classification system for artificial light at night (CIE, 2003)

Zones d'étude / *Study Areas*

- Projet / *Project*
- Régionale - Biophysique / *Regional - Biophysical*
- Locale - Biophysique / *Local - Biophysical*

Géologie du socle / *Bedrock Geology*

Failles régionales / *Regional Faults*

- Position déduite de levés géophysiques, mouvement indéterminé (FGID) / *Position deduced from geophysical surveys, undetermined movement (FGID)*

Cisaillements régionaux / *Regional Shears*

- Position certaine, mouvement indéterminé (CCID) / *Certain position, undetermined movement (CCID)*
- Position certaine, mouvement inverse (CCIV) / *Certain position, reverse movement (CCIV)*
- Position certaine, mouvement normal (CCNO) / *Certain position, normal movement (CCNO)*

Zones géologiques générales / *General Geological Areas*

- Arénite quartzitique, conglomérat et mudrock / *Quartz arenite, conglomerate and mudrock*
- Conglomérat, wacke et formation de fer / *Conglomerate, wacke and iron formation*
- Regroupement de roches quartzifères ou non telles que le granite, la granodiorite, la diorite, la monzonite et la monzodiorite. / *Grouping of quartz-bearing or non-quartz-bearing rocks such as granite, granodiorite, diorite, monzonite, and monzodiorite.*
- Regroupement de roches telle que la tonalite, le gneiss tonalitique la diorite, la diorite quartzifère et le granodiorite et le granite; parfois sous forme de brèche intrusive à fragments. / *Groupings of rocks such as tonalite, tonalitic gneiss, diorite, quartz diorite, granodiorite, and granite; sometimes in the form of intrusive breccia with fragments.*
- Regroupement de roches telles que la diorite, la granodiorite, la monzodiorite et la monzonite, quartzifères ou non. / *Grouping of rocks such as diorite, granodiorite, monzodiorite, and monzonite, whether quartz-bearing or not.*
- Regroupement de roches telles que la granodiorite, la tonalite, le granite, la granodiorite à niveaux de tonalite, la diorite et la tonalite, quartzifère ou non. / *Grouping of rocks such as granodiorite, tonalite, granite, granodiorite with tonalite layers, diorite, and tonalite, whether quartz-bearing or not.*
- Regroupement de roches telles que la tonalite, la diorites, le granodiorite et le gneiss tonalitique, quartzifères ou non. / *Grouping of rocks such as tonalite, diorite, granodiorite, and tonalitic gneiss, whether quartz-bearing or not.*
- Regroupements de diverse roches telle que l'amphibolite, le tuf felsique à intermédiaire, la formation de fer, le wacke, le mudrock, le basalte, le gneiss mafique et autres roches métavolcaniques et métasédimentaires. / *Groupings of various rocks such as amphibolite, felsic to intermediate tuff, iron formation, wacke, mudrock, basalt, mafic gneiss, and other metavolcanic and metasedimentary rocks.*
- Regroupements de paragneiss, de conglomérat, de formation de fer, de métatexite, de diatexite, d'amphibolite, d'arénite quartzitique et de mudrock. / *Assemblages of paragneiss, conglomerate, iron formation, metatexite, diatexite, amphibolite, quartzitic arenite, and mudrock.*

Hydrographie / *Hydrography*

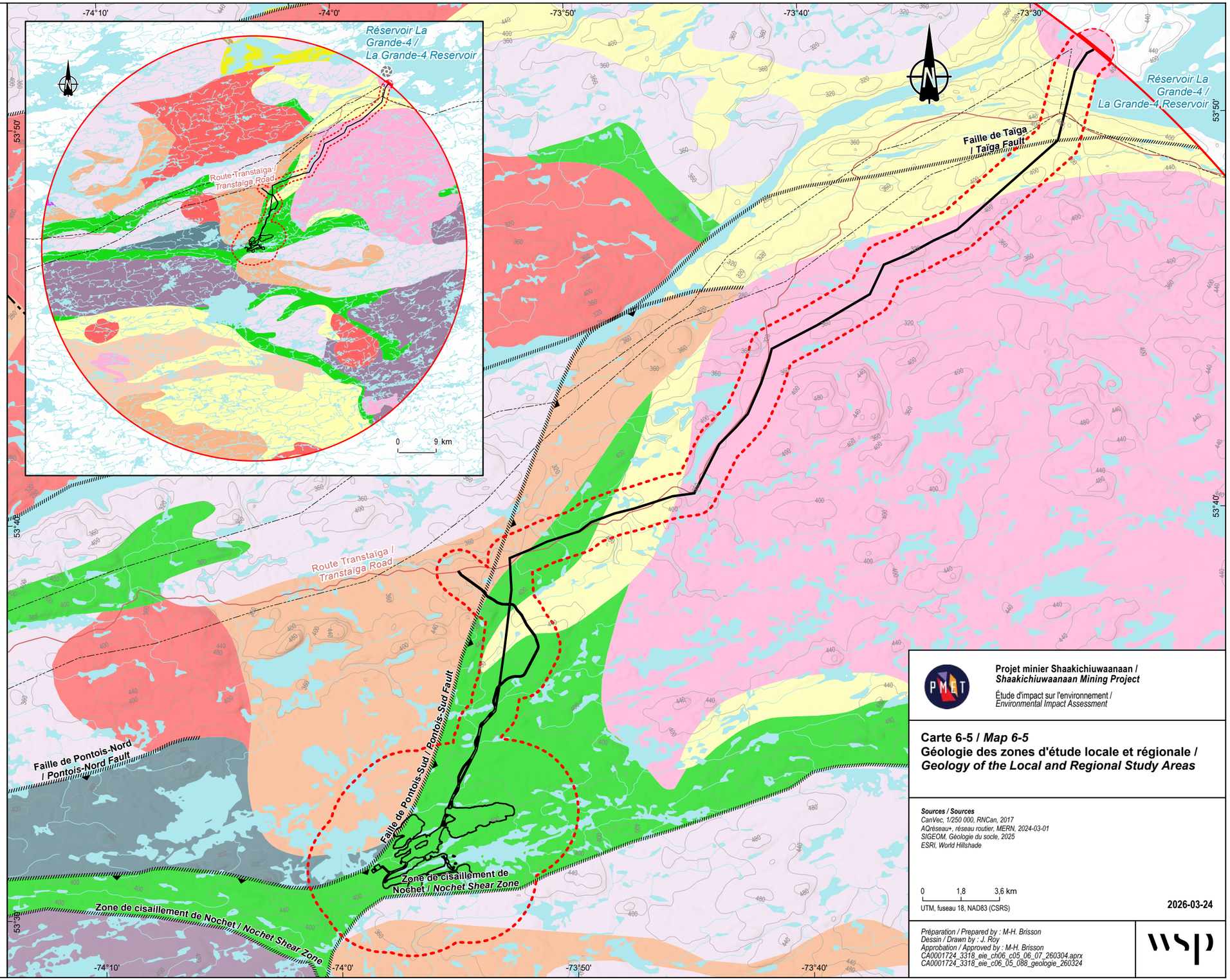
- Plan d'eau / *Waterbody*
- Cours d'eau / *Watercourse*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*



Projet minier Shaakichiuwaanaan /
Shaakichiuwaanaan Mining Project

Étude d'impact sur l'environnement /
Environmental Impact Assessment

Carte 6-5 / *Map 6-5*
Géologie des zones d'étude locale et régionale /
Geology of the Local and Regional Study Areas

Sources / Sources
CanVec, 1/250 000, RNCan, 2017
AQréseau+, réseau routier, MERN, 2024-03-01
SIGEOM, Géologie du socle, 2025
ESRI, World Hillshade

0 1,8 3,6 km
UTM, fuseau 18, NAD83 (CSRS)

2026-03-24

Préparation / Prepared by : M-H. Brisson
Dessin / Drawn by : J. Roy
Approbation / Approved by : M-H. Brisson
CA0001724_3318_eie_ch06_c05_06_07_260304.aprx
CA0001724_3318_eie_ch06_05_088_geologie_260324

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Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.

Superficial deposits

Superficial deposits, both in the biophysical RSA and biophysical LSA, consist mainly of undifferentiated till with numerous discontinuous areas of melt-out till or ablation till (Map 6-6). Undifferentiated till covers large continuous areas across both study areas, covering 71% of the territory in the RSA and 72% in the LSA. The materials generally found in this type of deposit are silty sand or sandy silt with the presence of gravel, pebbles, and boulders in varying proportions depending on the area. The melt-out or ablation till occupies 13% of the RSA and 15% of the LSA. Undifferentiated lacustrine sediments, juxta-glacial sediments, and outcrops of undifferentiated bedrock are also relatively abundant (14%) in the RSA. Finally, four other types of deposits are present in the RSA, but more sporadically (>1%). It should be noted that organic deposits occupy barely 1% of the biophysical RSA and are scattered sporadically across the territory in small cells.

With regards to the soils present in the project study area, the soil survey carried out by BBA (2025) as part of the baseline studies help to define the main horizons present. These are described below in the section presenting the results of this assessment.

Assessment of the existing soils

A study to assess the natural background level (NBL) in soils was conducted at the project site (Appendix 6-4). According to this study, the soils observed in the exploration trenches and boreholes showed some heterogeneity in their composition, grain granulometry, and stratigraphic sequence. However, in general, a layer of organic soil was found on the surface with a thickness varying from 0.05 m to 0.67 m. Beneath this layer, two main stratigraphic layers were observed. The first horizon consisted of sand and gravel with traces of gravel, varying in colour from grey to brown, and the second horizon observed consisted of sand and silt with traces of silt, varying in colour from beige to grey to dark brown. These last two horizons were used for the NBL calculations on the site (Appendix 6-4).

As part of the NBL assessment, 16 exploratory trenches and 3 boreholes were drilled in areas that had not been affected by human activities (Map 6-7). The selected samples, 19 samples for the sand and gravel horizon and 17 samples for the sand and silt horizon, were analyzed for metals,[2] total organic carbon (TOC), moisture content, and pH (BBA, 2025).

The NBL assessment conducted by BBA for the study site showed NBLs in the A-B range for silver (Ag) and arsenic (As) in both natural soil horizons studied. All other metals had NBLs below the generic criterion A suggested by the MELCCFP.

Soil quality

According to the Phase I Environmental Site Assessment (Appendix 6-5), based on the property inspection and the historical review conducted, one (1) potential contamination indicator was identified, suggesting that soil quality and/or groundwater quality at the site may have been affected.

[2] The metals analyzed were: Ag, Al, Sb, Cd, Ca, Cr, Co, Cu, Sn, Fe, Li, Mg, Mn, Hg, Mo, Ni, Pb, K, Se, Na, S, Ti,V, Zn.

The site inspection has not yet been carried out, as the site is inaccessible during the winter period according to information provided by the Client. A site visit will have to be conducted by a specialist as soon as conditions permit, in order to carry out a Phase II Environmental Site Assessment.

6.2.7 Hydrology

As part of the baseline hydrology study (Appendix 6-6), several field campaigns were carried out over a period of three years (2023 to 2025) to characterize the hydrological environment of the LSA. In particular, rain gauges and level sensors were installed, gauging was done, and profiles were surveyed along watercourses. This field data also helped establish rating curves[3] for key calculation points. Details of the data collected are available in the hydrology report (Appendix 6-6).

A total of 11 calculation points were selected in the biophysical LSA, and the characteristic watersheds and flows were assessed at each of these points.

Watersheds

Table 6-11 presents the 11 selected calculation points, the lake or watercourse in which they are located, the primary watershed to which they belong, and the watershed area. These calculation points and their associated watersheds are illustrated on Map 6-8.

Table 6-11 Watersheds at the 11 points of interest, under existing conditions

Name of calculation point	Lake or watercourse	Watershed tributary	Watershed area (km²)
LL01	Lake L01	La Grande River	108
LL12	Lake L27	La Grande River	219
L633	Lake L633	Lac de la Corvette	20.9
Corvette	Lac de la Corvette	Pontois River	3163
LL5	CE15	La Grande River	116
LL6	CE300	La Grande River	12.2
LL7	Watercourse, downstream of Lake L601	Lac de la Corvette	11.9
LL8-b	Lake L540	Lac de la Corvette	1.63
LL9	Lake L219	La Grande River	1.01
LL10	Lake L308	La Grande River	8.85
LL11	CE413, at the outlet of Lake L413	La Grande River	3.44

[3] Relationship between flow rate and water level for a given hydrometric station.

Zones d'étude / *Study Areas*

- Projet / *Project*
- Régionale - Biophysique / *Regional - Biophysical*
- Locale - Biophysique / *Local - Biophysical*

Géologie du Quaternaire / *Quaternary Geology*

Dépôts de surface / *Superficial Deposits*

- Dépôt anthropogénique (H) / *Anthropogenic deposit (H)*
- Roche en place non différenciée (R) / *Undifferentiated in-situ rock (R)*
- Sédiment juxtaglaciaire (Gx) / *Proglacial sediment (Gx)*
- Sédiment lacustre non différencié (L) / *Undifferentiated lake sediment (L)*
- Sédiment organique non différencié (O) / *Undifferentiated organic sediment (O)*
- Sédiment éolien (Ed) / *Aeolian sediment (Ed)*
- Till de fusion ou d'ablation (Tf) / *Fusion or ablation till (Tf)*
- Till non différencié (T) / *Undifferentiated till (T)*

Hydrographie / *Hydrography*

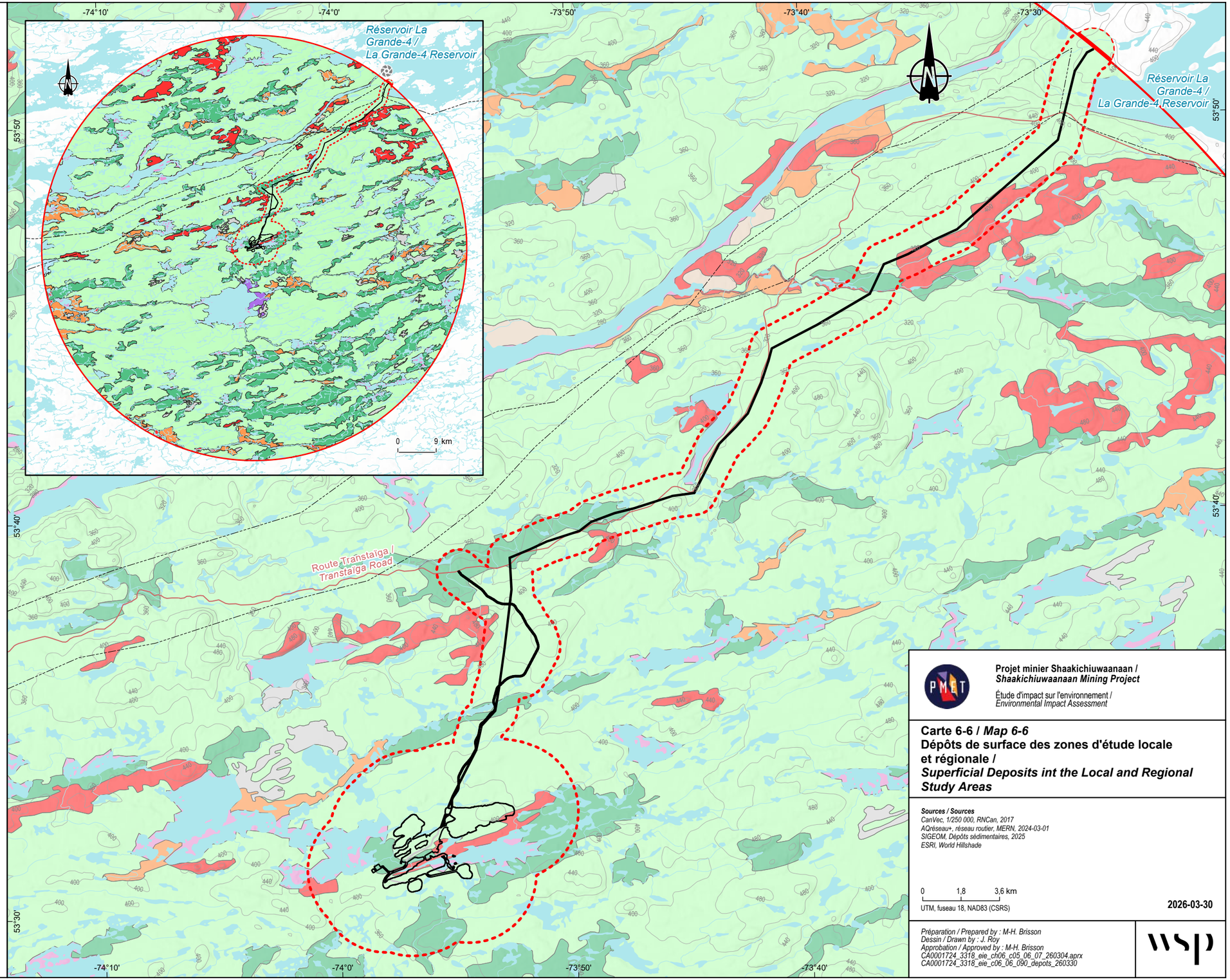
- Plan d'eau / *Waterbody*
- Cours d'eau / *Watercourse*

Infrastructures / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric generating station*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*



Projet minier Shaakichiuwaanaan /
Shaakichiuwaanaan Mining Project

Étude d'impact sur l'environnement /
Environmental Impact Assessment

Carte 6-6 / *Map 6-6*
Dépôts de surface des zones d'étude locale et régionale /
Superficial Deposits int the Local and Regional Study Areas

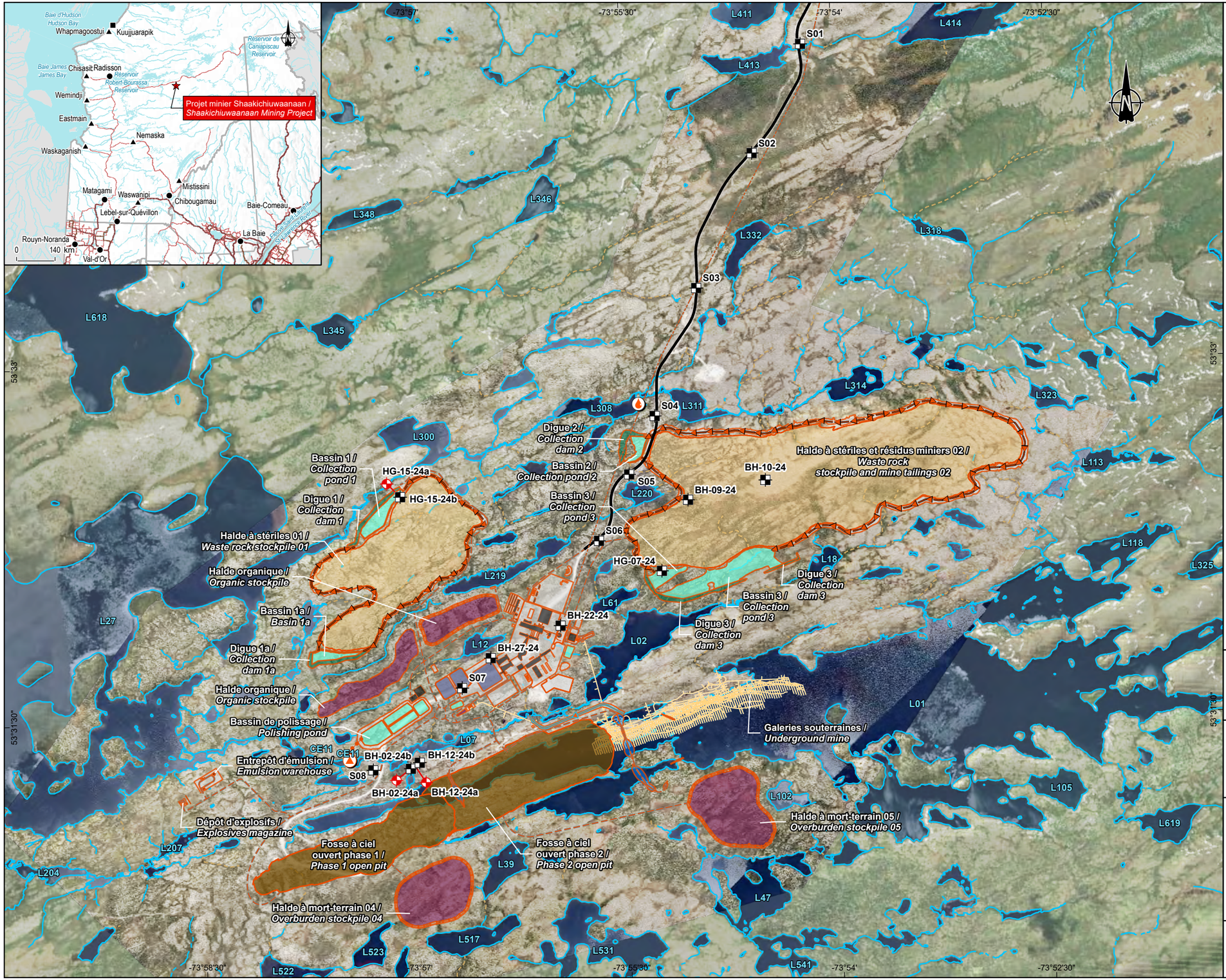
Sources / Sources
CanVec, 1/250 000, RNCan, 2017
AQréseau+, réseau routier, MERN, 2024-03-01
SIGEOM, Dépôts sédimentaires, 2025
ESRI, World Hillshade

UTM, fuseau 18, NAD83 (CSRS)

2026-03-30

Préparation / Prepared by : M-H. Brisson
Dessin / Drawn by : J. Roy
Approbation / Approved by : M-H. Brisson
CA0001724_3318_ele_ch06_c05_06_07_260304.aprx
CA0001724_3318_ele_c06_06_090_depots_260330

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Boundary accuracy and measurements shown on this document are not intended for engineering or land delineation purposes. No land analysis has been performed by a land surveyor.



Sondages / *Soil Samplings*

- Forage / *Borehole*
- Tranchée / *Test pit*

Composantes du projet / *Project Components*

Existante / *Existing*

- Chemin d'accès / *Access road*

Projetées / *Projected*

- Effluent minier / *Mining effluent*
- Prise d'eau / *Water intake*
- Barrage / *Dam*
- Canal / *Channel*
- Canal de dérivation / *Diversion Channel*
- Chemin secondaire / *Secondary road*
- Fossé / *Ditch*
- Galerie souterraine / *Underground mine*
- Ligne de transport d'énergie / *Power transmission line*
- Aire d'entreposage du minerai mixte / *Mixed ore stockpile*
- Autre / *Other*
- Bâtiment ou équipement / *Building or equipment*
- Digue / *Dike*
- Bassin / *Basin*
- Digue des bassins / *Basins dike*
- Fosse / *Pit*
- Halde à mort-terrain et organique / *Overburden stockpile*
- Halde à stériles et/ou résidus / *Waste rock and/or tailings stockpile*
- Portail d'accès à la mine souterraine / *Underground mine portal*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Souterrain / *Underground*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / *Environmental Impact Assessment*

Carte 6-7 / *Map 6-7*
Localisation des sites de sondages des sols / *Location of Soil Sampling Sites*

Sources / Sources

SDA, 1/20 000, MERN, 2024-02
CanVec+, 1/50 000, RNCan, 2014 / CanVec, 1/250 000, RNCan, 2017
BDGA, 1/1 000 000, MRN Québec, 2014 / BDGA, 1/1 000 000, MRN Québec, 2002
AQréseau+, réseau routier, MERN, 2024-03-01
G Services Miniers, Composantes projetées, CASN-A-001-GE-SKE-0005-A, 2025
BBA, Rapport d'évaluation de la teneur de fonds naturelle dans les sols, 2024-12-05

0 260 520 m
UTM, fuseau 18, NAD83 (CSRS)

2026-03-30

Préparation / Prepared by : S. St-Cyr
Dessin / Drawn by : J. Roy
Approbation / Approved by : M-H. Brisson
CA0001724_3318_eie_ch06_c05_06_07_260304.aprx
CA0001724_3318_eie_c06_07_111_sondages_260330

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-74°5'
-74°0'
-73°55'
-73°50'
53°35'
53°30'

L617 L614 L618 L607 L610 L27 L348 L346 L345 L332 L417 L421 L411 L413 L419 L308 L311 L314 L300 CE300 L219 L02 L01 CE15 L113 L121 L325 L118 L624 L627 L132 L629 L632 L625 L105 L619 L39 L47 L517 L531 L541 L522 L523 L514 L512 L530 L539 L603 L604 L501 L500 L600 L604 L633

Zones d'étude / *Study Areas*

- Projet / *Project*
- Locale - Biophysique / *Local - Biophysical*

Hydrologie / *Hydrology*

- Sens d'écoulement de l'eau / *Waterflow direction*
- Point de calcul / *Calculation point*

Bassins versants / *Watersheds*

- Principal / *Principal*
- Intermédiaire / *Intermediate*
- Sous-bassin versant / *Sub-watershed*

Composantes du projet projetées / *Projected Project Components*

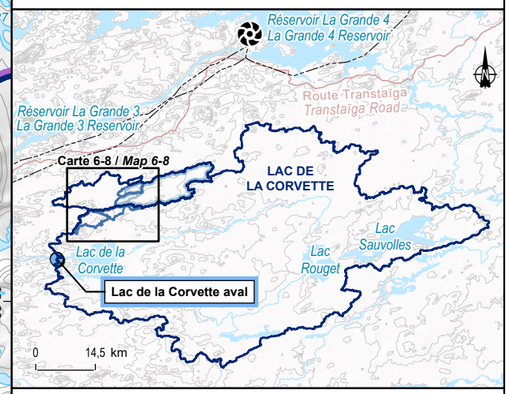
- Effluent minier / *Mining effluent*
- Prise d'eau / *Water intake*

Hydrographie / *Hydrography*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Souterrain / *Underground*



Projet minier Shaakichiuwaanaan /
Shaakichiuwaanaan Mining Project

Étude d'impact sur l'environnement /
Environmental Impact Assessment

Carte 6-8 / *Map 6-8*
Bassins versants aux conditions actuelles / *Existing Watersheds*

Sources :
CanVec, 1/250 000, RNCan, 2017
BDGA, 1M, MERN, 2014
Cartographie écologique de la végétation du Nord Québécois, MFFP, 2013

0 700 1 400 m
NAD 1983 CSRS UTM Zone 18N

2026-03-30

Préparation / Preparation : E. Sormain
Dessin / Drawing : V. Venne
Approbation / Approval : M.-H. Brisson
CA0001724_3318_eie_ch06_c06_08_09_10_14_260325.aprx
CA0001724_3318_eie_c06_08_107_hydrologie_260330

Characteristic flows

Various methods were used to estimate characteristic flows (average monthly flows, flood flows, and low water flows) at the various calculation points.

First, a frequency analysis of flood, average, and low water flows was carried out using data from 19 hydrometric stations (MELCCFP, 2024 and ECCC, 2024) and six sections of the Hydroclimatic Atlas (MELCCFP, 2022) deemed relevant. Two stations were then selected as they were considered to be the most representative of the watersheds in the biophysical LSA based on the area of the watersheds and their physical characteristics. These stations correspond, in one case, to watersheds smaller than 220 km² and, in the other case, to watersheds larger than 220 km². The other stations were used for comparison and sensitivity analysis purposes.

The average monthly flows at all calculation points were estimated by transposing the quantiles obtained by the frequency analysis. A comparison with the average flow observed during field campaigns (obtained by converting the water level recorded by the probes using the established discharge curves) was carried out, validating the order of magnitude obtained, which confirmed that the estimated water volumes for the study area's ungauged watercourses are relatively accurate.

Flood flows were estimated using the rational method for watersheds smaller than 25 km² and by transposing the quantiles obtained by frequency analysis for watersheds larger than 25 km². A comparison with the maximum flow observed during field campaigns (obtained by converting the water level recorded by the probes using the established discharge curves) was carried out and showed that the theoretical flood flows with a 2-year recurrence interval are significantly higher than the maximum flows observed in the field, which is to be expected. However, this comparison should be treated with caution, as the discharge curves are uncertain for the maximum levels recorded, and only one spring flood is available for most of the calculation points.

Low water flows were estimated using the linear regression method proposed by MELCCFP (2017) for watersheds smaller than 25 km² and by transposing the quantiles obtained by frequency analysis for watersheds larger than 25 km². A comparison with the maximum flow observed during field campaigns (obtained by converting the water level recorded by the probes using the established discharge curves) was carried out and showed that for most probes, the observed and estimated low water flows are of the same order of magnitude.

Tables 6-12 and 6-13 show the characteristic flow rates selected at each of the calculation points after this analysis.

Table 6-12 Flood and low water flows selected for calculation points in the study area

Watershed name	Low water levels (m^3/s)					Flood levels (m^3/s)				
	q_{2-7}	q_{10-7}	q_{5-30}	2 years	5 years	10 years	20 years	25 years	50 years	100 years
Lake L01 (LL1)	0.313	0.169	0.243	13.1	16.1	17.8	19.3	19.8	21.1	22.4
Lake L27 (LL12)	0.635	0.344	0.493	26.6	32.7	36.2	39.3	40.2	42.9	45.5
Lake L633	0.035	0.017	0.023	6.77	9.18	10.7	-	12.7	14.1	15.6
Lac de la Corvette	10.7	10.3	11.2	194	241	268	292	299	321	340
CE15 (LL5)	0.335	0.181	0.260	14	17.2	19.1	20.7	21.2	22.6	24.0
CE300 (LL6)	0.020	0.010	0.013	5.88	8.09	9.51	-	11.3	12.6	14.0
Downstream Lake L601 (LL7)	0.020	0.010	0.013	3.34	4.56	5.35	-	6.34	7.07	7.82
Lac L540 (LL8-b)	0.003	0.001	0.002	1.27	1.79	2.13	-	2.57	2.88	3.20
Lake L219 (LL9)	0.002	0.001	0.001	0.35	0.49	0.58	-	0.70	0.78	0.86
Lake L308 (LL10)	0.015	0.007	0.010	4.86	6.72	7.91	-	9.42	10.5	11.7
CE413 (LL11)	0.006	0.003	0.004	1.86	2.61	3.09	-	3.71	4.15	4.61

Table 6-13 Average monthly flows used for calculation points in the study area

Station name	Jan. (m^3/s)	Feb. (m^3/s)	Mar. (m^3/s)	Apr. (m^3/s)	May (m^3/s)	Jun. (m^3/s)	Jul. (m^3/s)	Aug. (m^3/s)	Sep. (m^3/s)	Oct. (m^3/s)	Nov. (m^3/s)	Dec. (m^3/s)
Lake L219 (LL9)	0.005	0.004	0.004	0.008	0.065	0.042	0.018	0.020	0.024	0.020	0.017	0.009
Lake L540 (LL8-b)	0.009	0.007	0.006	0.013	0.105	0.068	0.029	0.032	0.038	0.032	0.028	0.014
CE413 (LL11)	0.019	0.015	0.013	0.027	0.222	0.143	0.061	0.067	0.081	0.068	0.059	0.030
Lake L308 (LL10)	0.048	0.038	0.033	0.069	0.575	0.370	0.158	0.173	0.209	0.177	0.151	0.077
Downstream Lake L601 (LL7)	0.064	0.051	0.044	0.093	0.769	0.494	0.211	0.232	0.279	0.237	0.202	0.103
CE300 (LL6)	0.066	0.052	0.045	0.095	0.788	0.507	0.217	0.238	0.286	0.243	0.208	0.105
Lake L633	0.113	0.090	0.078	0.163	1.35	0.868	0.371	0.407	0.490	0.416	0.356	0.180
Lake L01 (LL1)	0.584	0.465	0.401	0.841	6.98	4.48	1.92	2.10	2.53	2.15	1.84	0.931
CE15 (LL5)	0.627	0.499	0.431	0.903	7.49	4.82	2.06	2.26	2.72	2.31	1.97	1.00
Lake L27 (LL12)	1.18	0.942	0.813	1.71	14.1	9.09	3.89	4.27	5.14	4.36	3.73	1.89
Lac de la Corvette	26.0	17.7	13.8	16.3	106	113	64.8	65.6	69.5	87.1	74.7	46.4

Ice regime

A summary analysis of the ice regime was carried out using Sentinel-2 satellite images from 2016 to 2024. It shows that the formation and melting of ice on small lakes and watercourses in the biophysical LSA precede those on Lac de la Corvette, as might be expected. Thus, the formation of the ice cover varies between mid- and late November for small lakes and watercourses, while it tends to occur between late November and early December for Lac de la Corvette. In contrast, the ice melts in mid- to late May for small lakes and watercourses, and in late May to early June for Lac de la Corvette.

6.2.8 Surface water

Sampling and analysis of surface water began in 2022, when seven stations were established. Subsequently, several additional stations were added each year as the planned mining infrastructure plan evolved. In total, surface water quality was analyzed at 29 sampling stations distributed throughout the biophysical LSA, including six stations in the area that could potentially be exposed to mine effluent and 23 stations in the reference area. Four stations are located in watercourses, while the other 25 are located in small waterbodies and lakes. The locations of surface water sampling stations established between 2022 and 2025 are shown on Map 6-9.

To obtain a minimum of six sampling efforts spread over the ice-free period, as recommended by the Ministère (MDDELCC, 2017), water quality sampling campaigns were spread over two years for some stations. These were designed to record distinct hydrological conditions, namely spring and fall floods, as well as low water levels in summer.

All information (results and certificates of analysis) concerning surface water quality can be found in the surface water and sediment quality report in Appendix 6-7. A summary of the key results obtained is presented in the following paragraphs.

The results of in situ surface water quality measurements and laboratory analyses were compared, where possible, with the following quality criteria:

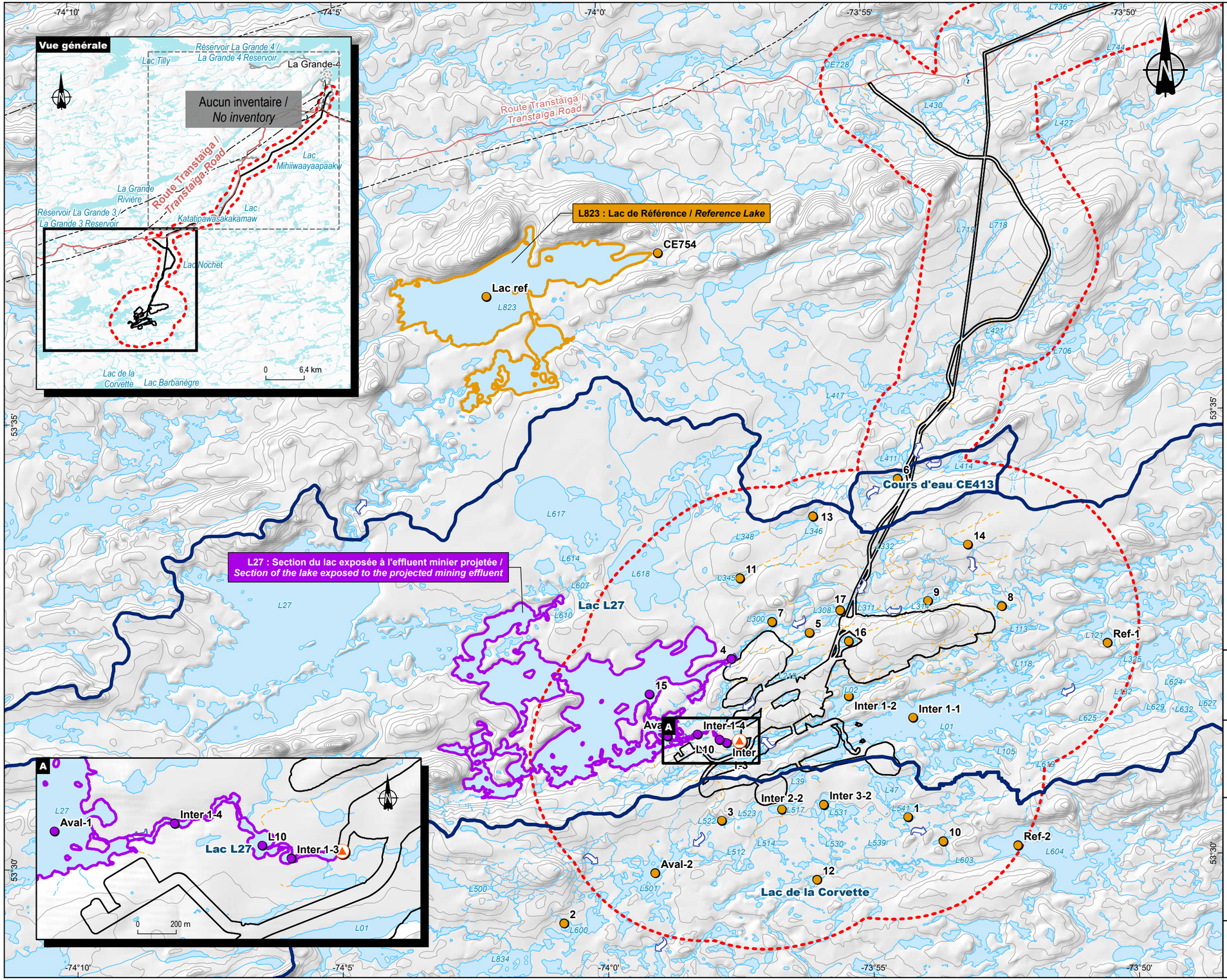
- MELCCFP's Protection of aquatic life (chronic effect): CVAC;
- MELCCFP's Prevention of contamination (water and aquatic organisms): CPC (EO);
- MELCCFP's Prevention of contamination (aquatic organisms only): CPC (O);
- MELCCFP's Protection of terrestrial fish-eating wildlife: CFTP;
- Canadian Water Quality Guidelines (Freshwater) – Protection of Aquatic Life – Long-term effect, of the Canadian Council of Ministers of the Environment (CCME): CWQG.

In general, the lakes studied shared the same characteristics: they were oligotrophic lakes with a slightly acidic pH (average 6–6.5), good surface oxygenation, clear waters, and low biological productivity.

Among the surface water samples collected at the 29 stations, guideline exceedances were observed mainly for pH, dissolved oxygen, and total extractable metals, particularly aluminum, iron, and mercury.

A few instances of exceedances of fluoride and zinc concentrations were also observed. All sampled stations exceeded the in situ pH level (below the optimal range of 6.5 to 9.5) and in situ dissolved oxygen level (CCME criterion of 9.5 mg/L) in at least one of the campaigns conducted. The acidity of the lakes is characteristic of the aquatic ecosystems of the Canadian Shield. With regard to dissolved oxygen, the criterion established by the CCME is a value that is often difficult to achieve in natural environments.

The metals with the highest exceedances were aluminum (CWQG) and mercury (CPC [EO], CPC [O], and CFTP). These exceedances are likely related to the geology and rock composition of the region.



Zones d'étude / *Study Areas*

- Projet / *Project*
- Locale - Biophysique / *Local - Biophysical*

Composantes du projet projetées / *Projected Project Components*

- Effluent / *Effluent*

Hydrologie / *Hydrology*

- Sens d'écoulement de l'eau / *Waterflow direction*
- Bassin versant principal / *Principal watershed*

Milieux hydriques / *Hydrous Environments*

- Plan d'eau / *Waterbody*

Cours d'eau / *Watercourses*

- Intermittent / *Intermitent*
- Permanent / *Permanent*
- Permanent partiellement souterrain / *Partially underground permanent*
- Intermittent partiellement souterrain / *Partially underground intermittent*
- Souterrain / *Underground*

Station d'échantillonnage / *Sampling Station*

Type d'échantillon / *Sample type*

- Eau de surface

Catégorie d'échantillon / *Sampling Category*

- Exposée à l'effluent minier projetée / *Exposed to the projected mining effluent*
- Référence / *Reference*

Infrastructure / *Infrastructure*

- Centrale hydroélectrique / *Hydroelectric power plant*
- Ligne de transport d'énergie / *Electric power transmission line*

Réseau routier / *Road Network*

- Route collectrice municipale / *Municipal collector road*

Projet minier Shaakichiuwaanaan / *Shaakichiuwaanaan Mining Project*

Étude d'impact sur l'environnement / Environmental Impact Assessment

Carte 6-9 / *Map 6-9*
Stations d'échantillonnage de l'eau de surface / *Surface Water Sampling Stations*

Sources :
CanVec, 1/250 000, RNCan, 2017
BDGA, 1M, MERN, 2014
Cartographie écologique de la végétation du Nord Québécois, MFFP, 2013
Synergis, État de référence du milieu aquatique pour le projet Shaakichiuwaanaan, 12-2025

0 800 1 600 m
NAD 1983 CSRS UTM Zone 18N

2026-03-25

Préparation / Preparation : I. Cartier
Dessin / Drawing : J. Roy
Approbation / Approval : M.-H. Brisson
CA0001724_3318_eie_ch06_c06_08_09_10_14_260325.aprx
CA0001724_3318_eie_c06_XX_116_XXXX_260324

A reference lake (Lake L823) was established to the northwest outside the biophysical LSA. The water quality samples in the reference lake exceeded quality criteria for pH, dissolved oxygen, and aluminum.

Table 6-14 shows all parameters for which a criterion exceedance was noted in surface water samples collected between 2022 and 2025.

Table 6-14 Summary of exceedances of water quality criteria

Zone type	Station	Exceedance of criteria
Reference	Inter 1-2, 6, 7, 9, 11, 14, 17	Al: value exceeding CWQG, CVAC, and CPC (EO) Fe: value exceeding CWQG and CPC (EO) Hg: value exceeding CPC (EO), CPC (O), and CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	13, 16	Al: value exceeding CWQG, CVAC, and CPC (EO) Hg: value exceeding CWQG, CPC (EO), CPC (O), and CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	Ref-1	Al: value exceeding CWQG Hg: value exceeding CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	Inter 1-1	Al: value exceeding CWQG Hg: value exceeding CPC (EO), CPC (O), and CFTP pH: value below the optimal range
	1	Al: value exceeding CWQG Fluorides: value exceeding CWQG Hg: value exceeding CPC (EO), CPC (O), and CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	5, 10, Inter 3-2	Al: value exceeding CWQG Hg: value exceeding CPC (EO), CPC (O), and CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	8	Al: value exceeding CWQG Fluorides: value exceeding CWQG pH: value below the optimal range
	2, 12, Ref-2, Inter 2-2	Al: value exceeding CWQG, CVAC, and CPC (EO) Hg: value exceeding CPC (EO), CPC (O), and CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	3	Al: value exceeding CWQG and CPC (EO) Hg: value exceeding CPC (EO), CPC (O), and CFTP Zn: value exceeding CWQG pH: value below the optimal range Dissolved O_2: value lower than CWQG

Zone type	Station	Exceedance of criteria
	Aval-2	Al: value exceeding CWQG, CVAC, and CPC (EO) Fe: value exceeding CWQG and CPC (EO) Hg: value exceeding CWQG, CPC (EO), CPC (O), and CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	Lac ref	Al: value exceeding CWQG pH: value below the optimal range Dissolved O_2: value lower than CWQG
Potentially exposed to future mine effluent	4	Al: value exceeding CWQG, CVAC, and CPC (EO) Fe: value exceeding CWQG and CPC (EO) Hg: value exceeding CPC (EO), CPC (O), and CFTP Zn: value exceeding CWQG pH: value below the optimal range Dissolved O_2: value lower than CWQG
	15	Al: value exceeding CWQG Cu: value exceeding CWQG pH: value below the optimal range Dissolved O_2: value lower than CWQG
	Aval-1	Al: value exceeding CWQG Hg: value exceeding CPC (EO), CPC (O), and CFTP pH: value below the optimal range Dissolved O_2: value lower than CWQG
	L-10	Al: value exceeding CWQG, CVAC, and CPC (EO) pH: value below the optimal range Dissolved O_2: value lower than CWQG
	Inter 1-3	Al: value exceeding CWQG Hg: value exceeding CPC (EO), CPC (O), and CFTP pH: value below the optimal range
	Inter 1-4	Al: value exceeding CWQG Fluorides: value exceeding CEQG Hg: value exceeding CPC (EO), CPC (O), and CFTP Zn: value exceeding CWQG pH: value below the optimal range