JAMES BAY LITHIUM MINE

ENVIRONMENTAL IMPACT ASSESSMENT

CHAPTER 1: INTRODUCTION

JULY 2021 (VERSION 2)

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1 INTRODUCTION

1.1 PROJECT PROPONENT

Galaxy Lithium (Canada) Inc. is a fully owned subsidiary of Galaxy Resources Limited (Galaxy Resources), a mid-tier mining company listed on the Australian Stock Exchange (ASX). The firm currently operates the Mt. Cattlin Spodumene Mine in Australia and is developing the Sal de Vida Potash and Lithium Brine Project in Argentina (in an area known as the "lithium triangle"). Thus, Galaxy Lithium (Canada) Inc. (hereinafter called GLCI) is acting as the proponent of the James Bay Lithium Mine project. The contact information of Galaxy in Canada is as follows:

Name of project proponent	GALAXY LITHIUM (CANADA) INC.
Project office	2000 Peel St., Suite 720 Montréal, QC H3A 2W5
Websites	**www.gxy.com** **www.gxy.com/james-bay/**
Project manager	Ms. Gail Amyot, Director EHS **gail.amyot@gxy.com**
Phone number	514-558-1855 **/ cell.: 514-346-0961**
Québec enterprise number (NEQ)	1167071928

1.2 MANDATE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

GLCI has retained the services of WSP for the preparation of the environmental impact assessment (EIA) for the James Bay Lithium Mine project. Contact information for their representative is as follows:

Name of consultant	WSP CANADA INC.
Project office	1135 Lebourgneuf Boulevard Québec, QC G2K 0M5
Website	www.wsp.com
Project director	Ms. Christine Martineau christine.martineau@wsp.com
Phone	418-623-2254
Fax	418-624-1857

1.3 PREAMBLE

An environmental impact assessment (EIA) was prepared by WSP (2018a) and presented to the Canadian Environmental Assessment Agency (CEAAg) and the Québec *Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques* (MDDELCC) in October 2018. While the federal and provincial authorities analyzed the EIA, the project design was also optimized. The results of this optimization are laid out in a preliminary economic study that meets NI 43-101 standards, prepared by G Mining Services (2021). This EIA is based on the updated project design, which was the result of the engineering optimization process. The main modifications made to the report from the 2018 EIA version are highlighted using a different font (Verdana) and presented in bold.

1.4 PRESENTATION OF THE REPORT

This study contains all of the relevant information and analysis components for meeting the directive of Québec's Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC, now known as the Ministère de l'Environnement et de la Lutte contre les changements climatiques or MELCC)[1] by way of the environmental and social protection regime applicable in the James Bay region, established under Chapter 22 of the James Bay and Northern Québec Agreement (JBNQA); for meeting the guidelines of the Canadian Environmental Assessment Agency (CEAAg)[2] and, by extension, for meeting the requirements of the *Environment Quality Act* (EQA) and the *Canadian Environmental Assessment Act* (CEAA).

In this report, Chapter 1 presents the project proponent and its main consultant, who is responsible for the various environmental approaches. Next, we find the main tenets of its environmental policy and an overview of the **2021** project **compared to the 2018 project.** The technical details are presented in Chapter 4.

Chapter 2 describes the project context and justification by highlighting the history of the mining operations and the components enabling its achievement. This chapter also provides the legal and regulatory framework for this project, outlining its legislative features.

Chapter 3 compares the different project alternatives which were analyzed for material deposit sites, such as the areas to stockpile tailings, waste rock and overburden. The alternatives are studied to target each one's advantages and disadvantages, on an environmental, technical, social and economical level.

Chapter 4 presents a detailed description of the project and its various components. This description includes (but is not limited to) mining infrastructure, activities to take place on-site, the deposition plan for waste rock and tailings, water treatment on the mine site, related equipment and infrastructure and the mine rehabilitation plan. Completion schedule and cost of work are also presented, along with project design plans.

Chapter 5 outlines the consultation activities which were conducted among the population from the very start of the project. A communications plan is also outlined. Finally, this chapter highlights the concerns and expectations of the various stakeholders to enhance the project and minimize the adverse effects on the environment and on the population.

Chapter 6 describes the receiving environment—or the various components from the physical, biological or human environments—in the study areas used in assessing the project's environmental and social effects.

The effects on the environment and on humans are identified and assessed in Chapter 7. This assessment considers proposed mitigation measures for each environmental component for the project's construction, operation, rehabilitation and post-rehabilitation phases. An assessment of the project's residual effects, following mitigation, concludes this section.

1 Provincial directive: https://www.ree.environnement.gouv.qc.ca/dossiers/3214-14-055/3214-14-055-3.pdf
2 Federal guidelines: https://aeic-iaac.gc.ca/050/documents/p80141/121718E.pdf

Chapter 8 deals with the project's cumulative effects for each of the valued components (VCs) of the ecosystem selected. Therefore, all projects, activities or events (past, current or future) which may result in project cumulative effects on these VCs are assessed.

Chapter 9 lists the general procedures for managing the main accidents that may occur during project construction and operation.

Chapter 10 presents an overview of the environmental follow-up and monitoring programs. Monitoring mainly concerns the construction phase and will be worked out at the planning and specifications phase. Among other things, follow-up aims at evaluating the effectiveness of the mitigation measures proposed, confirming whether certain negative effects do in fact occur, verifying compliance with standards and applying solutions, if necessary, to protect the environment or the population.

In addition to the main report presented in two volumes (volumes 1 and 2), this study also includes another volume, regrouping all the appendices (volume 3).

1.5 PROJECT LOCATION

The James Bay Lithium Mine project is located in the Nord-du-Québec administrative region, on the territory of the Eeyou Istchee James Bay Regional Government. It is located approximately 10 km south of the Eastmain River, **130** km east of James Bay and close to the Eastmain village (Map 1-1). The project is on Category III lands according to the JBNQA.

The geographical coordinates in UTM (zone 18, NAD83) of the site are presented below:

- X: 358,891
- Y: 5,789,180

The lands subject to the mining claim of the James Bay Lithium Mine project (Project Property) are easily accessed by the **Billy-Diamond highway (formerly the James Bay road)** that connects Matagami and Radisson. This road crosses the James Bay Property at kilometre 381 of the road, close to the truck stop (*relais routier)* managed by the *Société de développement de la Baie-James* (SDBJ) at that kilometre point.

A Phase I Environmental Site Assessment (ESA) was done **by WSP (2018b)** to determine the site's environmental history, i.e. to identify potential and real environmental risks associated with past and present activities carried out on the site and in the immediate area. **A Phase II ESA was then conducted to characterize the remote disposal site (WSP, 2018c).**

1.6 GENERAL PROJECT DESCRIPTION, 2021 VS 2018

The project title is: "James Bay Lithium Mine". The project site is identified on maps with its official title. Of noteworthy mention, there is currently no mine in existence.

The project underwent several changes after the 2018 EIA. The main changes applied to:

- **storage areas: four waste rock and tailings storage facilities instead of a single stockpile in 2018, the overburden and peat stockpile was moved from its 2018 location;**
- **the larger size and smaller number of trucks to transport concentrate and trucks used to carry ore to the crusher compared to 2018;**
- **haul roads to allow for shorter trips compared to what was planned in 2018;**
- **the location of the concentrator, the workers' camp and the service building, which are now closer to the Billy-Diamond highway than they were in the 2018 project;**
- **the location of the explosives warehouse, which was moved further northwest from its location in the 2018 project.**

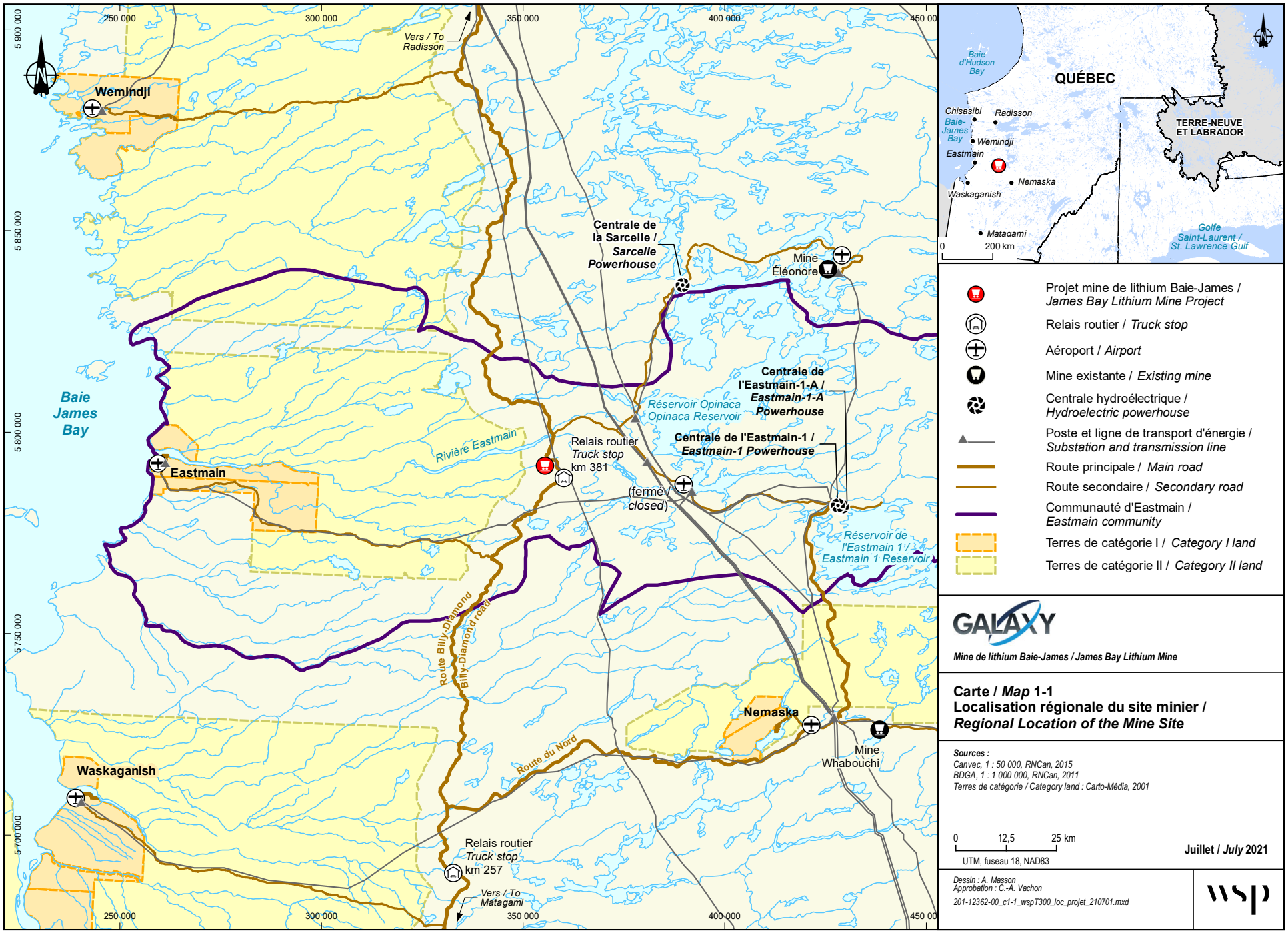
The project details are presented in Chapter 4.

1.6.1 MAIN INFRASTRUCTURE

The following surface infrastructure is planned for the James Bay Lithium Mine project. These are conventional facilities for an open pit mining operation. They include the following:

- a pit;
- a 2,000,000 t/yr spodumene concentrator;
- areas to store and stockpile overburden, topsoil, tailing/waste rock, ore and concentrate;
- raw and process water retention ponds;
- administrative and operations buildings;
- a workers' camp;
- **a location for a** water treatment plant (WTP), **if needed**;
- facilities for maintenance and repair of mechanical equipment, including spare part warehousing, laboratories and emergency services facilities;
- explosives warehouse.

The list of the main infrastructure considered in this EIA is similar to the list for the 2018 EIA. Map 1-2 shows the comparison.



- Projet mine de lithium Baie-James / *James Bay Lithium Mine Project*
- Relais routier / *Truck stop*
- Aéroport / *Airport*
- Mine existante / *Existing mine*
- Centrale hydroélectrique / *Hydroelectric powerhouse*
- Poste et ligne de transport d'énergie / *Substation and transmission line*
- Route principale / *Main road*
- Route secondaire / *Secondary road*
- Communauté d'Eastmain / *Eastmain community*
- Terres de catégorie I / *Category I land*
- Terres de catégorie II / *Category II land*

GALAXY

Mine de lithium Baie-James / James Bay Lithium Mine

Carte / *Map* 1-1
Localisation régionale du site minier /
Regional Location of the Mine Site

Sources :
Canvec, 1 : 50 000, RNCan, 2015
BDGA, 1 : 1 000 000, RNCan, 2011
Terres de catégorie / Category land : Carto-Média, 2001

0 12,5 25 km
UTM, fuseau 18, NAD83

Juillet / *July* 2021

Dessin : A. Masson
Approbation : C.-A. Vachon
201-12362-00_c1-1_wspT300_loc_projet_210701.mxd

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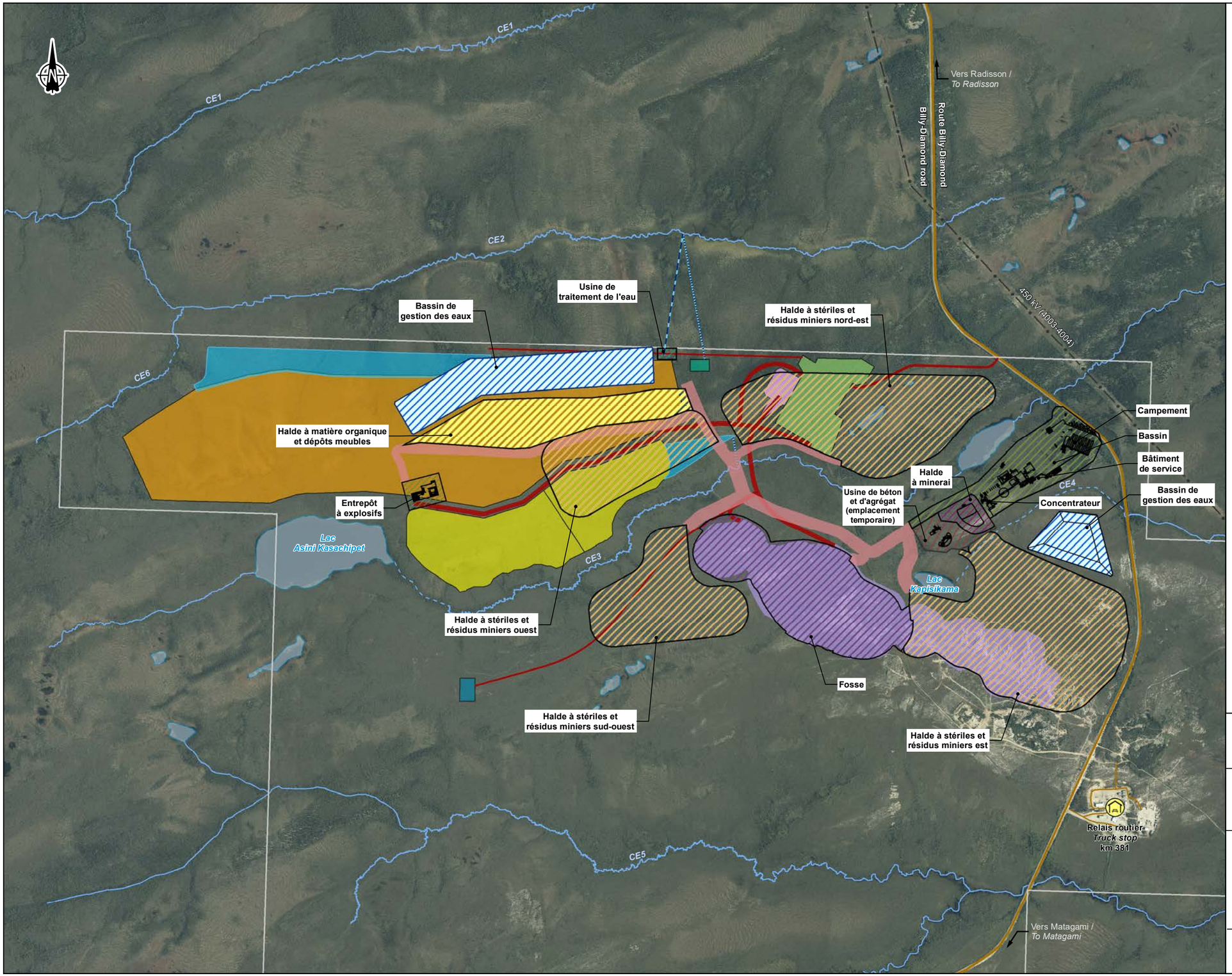

Limite de propriété / *Property limit*

Composantes du projet / *Project Component*

2018 2021

Route / *Road*

Effluent minier / *Mine effluent*

Usine de traitement de l'eau / *Water treatment plant*

Secteur administratif et industriel / *Administrative and industrial sector*

Fosse / *Pit*

Halde à minerai / *ROM pad*

Halde à stériles / *Waste rock stockpile*

Halde à matière organique / *Organic matter stockpile*

Entrepôt à explosifs / *Explosives magazine*

Bassin de rétention d'eau / *Water retention basin*

Câble de fibre optique / *Optical fiber cable*

Infrastructures / *Infrastructure*

Route principale / *Main road*

Route d'accès / *Access road*

Ligne de transport d'énergie / *Transmission line*

Relais routier / *Truck stop*

Hydrographie / *Hydrography*

CE3 Numéro de cours d'eau / *Stream number*

Cours d'eau permanent / *Permanent stream*

Cours d'eau à écoulement diffus ou intermittent / *Intermittent or diffused flow stream*

Plan d'eau / *Waterbody*

GALAXY

Mine de lithium Baie-James / James Bay Lithium Mine

Carte / *Map* 1-2
Comparaison générale de l'aménagement du site 2018 vs. 2021 / *General Mine Site Arrangement Comparison 2018 vs. 2021*

Sources :
Othoimage : Microsoft Bing (ESRI, 2017)
Gestim : MRNF Québec, 210315
Données du projet / Project data : Galaxy 2021

0 200 400 m
UTM, fuseau 18, NAD83

Juillet / *July* 2021

Dessin : A. Masson
Approbation : C. Martineau
201-12362-00_c1-2_wspT302_compar_GA_210701.mxd

wsp

1.6.2 MINING

The James Bay Lithium Mine project consists of setting up a mining operation. The material will be mined from a pit using conventional surface mining methods. Drill rigs and blasting will be used to extract ore and waste rock. Tracked power shovels will be used to load **100** t trucks that will **carry ore to the concentrator. In 2018, the project was planning for 61.5 t trucks.**

No changes were made to the quantity of ore to be mined or to the quantity of waste rock generated.

1.6.3 PROCESSING

The onsite **ore processing** will consist of a spodumene **concentration process**. The concentrator will allow the spodumene to be separated to obtain approximately 6.0% lithium oxide (Li_2O) concentrate. The selected process involves crushing of the **ore** followed by a dense media separation (DMS).

The project optimization did not include any ore processing changes. The process will remain the same as what was planned in the 2018 EIA.

1.6.4 STORAGE AREAS

Areas to stockpile and store ore, waste rock, dry tailings, spodumene concentrate, overburden and topsoil will be built on the site of the James Bay Lithium Mine project. **Four waste rock and tailings storage facilities (WRTSFs)** will be built to store the waste rock and tailings**, while a single stockpile was planned in 2018**. All storage areas will be set up in such a way as to limit environmental impacts. Surface drainage channels will be built to divert **runoff** from **areas for stockpiling ore, waste rock / tailings, spodumene concentrate, overburden and topsoil**. The same strategy will be used to control surface water around the infrastructure, namely, the concentrator, buildings and roads.

The stockpiling and storage areas were moved from their 2018 project locations. Their locations were chosen in order to minimize the project's footprint on the environment while reducing waste rock transportation distances.

1.6.5 WATER MANAGEMENT

Process water will be used in the plant. It will be recovered and recycled via the dewatering screens, tails thickener and tails filtration. Recirculation of the water will be facilitated by the fact that no chemical reagents are present in the tailings following processing. Raw water will, however, be used to top up the process water system as required. Raw water shall be directed to the concentrator from the main retention pond.

Surface water runoff will be directed to the raw water storage pond. Appropriate wastewater management will be applied on this project. Before being released into the receiving environment, if required, the effluent will be treated to meet the applicable effluent discharge standards, including those specified in *Directive 019 for the mining industry* (D019) of the MDDELCC (MDDEP, 2012) and the federal *Metal and Diamond Mining Effluent Regulations* (MDMER).

The approach selected for managing process water and runoff remains the same as the one planned in the 2018 EIA.

1.6.6 WASTE MANAGEMENT

The collection and sorting of reusable, recyclable and waste materials (whether harmless or hazardous) will be carried out on site. They will then be managed by specialized contractors and transported off-site to a certified disposal site or to appropriate services.

The selected approach for managing waste materials remains the same as the one planned in the 2018 EIA.

1.6.7 OTHER INFRASTRUCTURE

In addition to site-specific developments, a series of additional equipment and infrastructure projects are also planned to ensure proper management of the site, namely:

- an administrative and operations building;
- an autonomous workers' camp;
- a tank farm for the fuelling of the mining equipment, for heating purposes and for backup generators.

Furthermore, GLCI is planning to connect the mining site to Hydro-Québec's power distribution system by a 69-kV power line. This could require up to 11 km of additional power lines, **depending on** the route set by Hydro-Québec. The site will also be connected to the optic fiber or cellular data network.

The additional infrastructure and equipment needed for the project remain similar to what was planned in the 2018 EIA. The design was simply reviewed to reduce the size of the buildings and the free space between buildings.

1.6.8 SITE REHABILITATION

Following the end of mining operations, rehabilitation measures will be taken to bring the receiving environment back as close as possible to its original state. These measures will involve management of the mining complex, waste rock, tailings and water from the treatment ponds, as well as demolition of the infrastructure and of the administrative and ore processing facilities. A progressive rehabilitation approach will be deployed. A mine rehabilitation plan will be filed with the Ministère de l'Énergie et des Ressources naturelles (MERN) before the start of the mine operations, as provided for under Québec's *Mining Act* (RSQ, c. M-13.1).

The recommended site rehabilitation approach remains unchanged from the one presented in the 2018 EIA.

1.6.9 PROJECT SCHEDULE

In the 2018 EIA, construction work was planned to start in 2020 and the commissioning was planned for 2022. The lifespan of the mine was initially 15 to 20 years.

GLCI **now** plans to start construction work at the mine in **2022** for a commissioning in **2023**. According to the latest forecast, the mine will be in operation for **18,5 years**.

1.7 GLCI'S CORPORATE SUSTAINABLE DEVELOPMENT POLICY

GLCI is firmly committed to limiting environmental impacts resulting from the development of mineral resources, while building a successful business that fully assumes its responsibilities within the communities where it operates.

This commitment is put into practice daily by integrating the social, economic and environmental dimensions to the company's decision-making process and through the ongoing respect of the interests of its many stakeholders. GLCI's commitment toward sustainability is reflected in its environmental and social policies, which are set forth in this section.

1.7.1 ENVIRONMENTAL POLICY

In its environmental policy, GLCI plans to conduct its activities in a manner that respects the environment and all applicable regulations and to implement a management system that will ensure the application of the highest environmental standards possible to its products, services and processes. More specifically, GLCI undertakes to:

- include environmental considerations in all its planning decisions and in its overall business strategy;
- evaluate the potential impact on the environment of all services and processes, from the project design to delivery and disposal;
- develop products and services and operate the facilities in a manner that prevents pollution, improves efficiency, reduces energy consumption, uses renewable resources and minimizes waste by recycling wherever possible;
- promote a culture in which all employees, contractors, suppliers, customers and community members share its commitment;
- respect cultural heritage and the local communities in which it operates;
- aim to continuously improve its environmental management system and performance by taking into account technical developments, scientific understanding, consumer needs and community expectations;
- prevent environmental incidents and have effective emergency plans;
- provide adequate training at all levels, make resource people available and ensure that the policy is well understood and applied;
- comply with applicable legislative and sectoral requirements.

1.7.2 HEALTH AND SAFETY POLICY

In its health and safety policy, GLCI wants to take all possible and feasible measures to ensure the health and safety of its employees and other members of its personnel directly or indirectly involved in the project by eliminating all occupational injuries and diseases. GLCI guarantees that no business objectives will compromise safety. More specifically, GLCI undertakes to:

- make the health and safety of all employees, contractors and the public its top priority;
- promote a culture that obliges and authorizes all employees and contractors to stop work when they deem it to be hazardous;
- provide a work environment that allows each individual to be “able to work”, meaning in a physical, mental and emotional state that allows them to work efficiently, free of risks to their well-being or that of others;
- plan to consult with employees on safety initiatives and measures to prevent accidents;
- offer continuous integration training and instructions to ensure that all employees and contractors understand their responsibilities and GLCI’s expectations with regard to safety;
- provide and update safe work methods for which hazards and risks have been identified and reduced to the lowest level possible;
- ensure that safe work practices are developed, implemented and continuously reviewed;
- ensure that all mobile equipment and fixed facilities are safely operated and maintained;
- ensure that all new substances, activities and processes are assessed for potential risks to health and safety;
- investigate all accidents, incidents or hazards and take corrective measures;
- comply with all applicable legislative requirements and industry standards.

1.7.3 POLICY ON HARASSMENT AND EQUAL ACCESS TO EMPLOYMENT

The principles of equal access to employment are crucial for GLCI. These principles apply to all employees regardless of gender, sexual orientation, family situation, pregnancy, family responsibilities, race, disability, political or religious convictions and age.

Furthermore, GLCI wishes to create a work environment free of harassment and intimidation and to treat all people with dignity and respect. GLCI will not tolerate any discriminatory behaviour whatsoever by anyone on its property.