



**SUMMARY OF THE APPLICATION FOR THE
AMENDMENT OF THE GLOBAL AUTHORIZATION
CERTIFICATE OF DECEMBER 2013**

BLACKROCK MINING PROJECT, CHIBOUGAMAU



1 CONTEXTUAL SETTING

In December 2017, BlackRock Metals Inc. (hereinafter BRM) submitted to the Ministry of Sustainable Development, Environment and the Fight against Climate Change (MDDELCC) a request for modification of the global certificate of authorization (hereinafter global CA) obtained in December 2013. In October 2014, BRM had requested to change the wording of certain conditions of the global CA obtained. BRM submitted this application to change the overall sales following the decision to build a processing plant for magnetite, vanadium and titanium concentrate in pig iron and ferrovanadium in Saguenay. The modifications to the project were mainly planned so that the rate of production of the mine could correspond to the anticipated needs of the secondary processing plant.

Following their analysis of the December 2017 global CA request, the MDDELCC submitted questions and comments to BRM. For the MDDELCC, several important elements related to the modifications made to the authorized project were not presented, updated or sufficiently detailed. As a result, the ministry has asked BRM to file a consolidated version of the December 2013 global CA, which considers the prior commitments that are part of the global CA, in addition to responding to all 156 questions and comments.

In order to clearly demonstrate the differences between the project authorized in 2013 and the modified one, the document distinguishes the following three parts:

- the presentation of the modifications made to the project having obtained the global CA and the analysis of the impacts;
- responses to questions and comments on the terms and conditions of the overall BOD;
- responses to questions and comments on topics other than project changes.

Note that the natural and human environments have not changed since obtaining global sales.

1.1 RATIONALE OF THE PROJECT

UPDATE OF THE RATIONALE OF THE PROJECT

BRM wishes to exploit the vanadium-titanium-magnetite (VTM) deposit that it owns, which is located in the Lac aux Dorés geological complex and in the municipality of Chibougamau as well as in the Eeyou Istchee territory. The deposit is about 30 km southeast of Chibougamau and about 6 km east of Lac Chibougamau.

BRM obtained its global CA from the Ministry of Sustainable Development, Environment, Wildlife and Parks (MDDEFP) on December 6, 2013. This licence was awarded following the COMEX's environmental analysis for the exploitation of an iron ore deposit for the production of a concentrate of iron vanadium ore.

With the various prices in the metals markets, BRM had to adjust its business plan and chose to make a second transformation in Quebec, in order to better protect itself from market fluctuations and enhance the value of the metals contained in its deposit (iron, vanadium and titanium).

In doing so, the mining project had to be adjusted to reflect the change in the rate of production that could be achieved by incorporating a secondary processing plant into the project. This change of strategy results in a significant decrease in mine activities. In order to meet the need of the secondary processing plant, several modifications have been made to the project such as:

- increased mine lifetime;
- decreased production rate;

- abolition of the construction camp;
- fine and coarse tailings pond together;
- use of Denis Lac;
- transportation of the concentrate by truck to a transshipment or trucking station directly at the Saguenay plant.

The purpose of this application to change the global CA is to obtain approval for the significant modifications to the project, due to both the change in the project caused by the integration of the secondary processing plant and the federal constraints added to the mining project in 2014 (refusal to use Lake Denis as a process water tank).

It should be noted that BRM submitted an impact study for the Saguenay plant project to the MDDELCC in June 2017 and that the report of the Bureau d'audiences publiques sur l'environnement (BAPE) on the project is expected on October 17, 2018.

ENVIRONMENTAL AND SOCIOECONOMIC CONTEXT

BRM plans to send its VTM concentrate containing approximately 62% iron, 2% vanadium and 8% titanium to its secondary processing plant in Saguenay to produce and sell the following products: iron product (high purity pig iron), titanium product, in slag form, and the vanadium product (FeV80). For all these products, global demand is growing. Below is a summary of the expert's analysis of the market outlook for these metals/products.

Prospects for the Pig Iron and Steel Market

The latest series of statistical publications confirmed that growth in global steel demand is now showing signs of slowing. In the United States, the government's irregular policy has begun to stifle the domestic market, particularly the automobile sector. Unresolved NAFTA negotiations, CAFE standards, high steel prices, and now, Auto Trade Inquiry 232 has contributed to increase uncertainty and defer investment decisions in the sector. Similarly, in Europe, signs of deceleration are emerging as motor vehicle registrations were declining in the first quarter. In China, experts continue to forecast a moderate growth in steel demand.

Pig iron can be used for steel production and as an input into the recycling industry to increase the number of recycling cycles by "diluting" the impurities found in recycled metals. Factors such as the increase of the urban population, rapid industrialization, the growing concerns about depletion of natural resources, and laws and regulations have propelled growth in the global metals recycling industry.

Vanadium Market Outlook

The growth of the vanadium market is mainly based on steel and more particularly on high-strength steels, which are mainly used in the construction, energy and transport industries (automotive, military and commercial planes).

Since 2013, the steel market has experienced significant difficulties. The slowdown in China's construction sector and the economic boom has created a significant surplus of production. Chinese steel mills are left with overcapacity.

Since vanadium is mainly used as an alloy in the steel sector, growth prospects remain strongly linked to the demand for steel, particularly in China.

Despite the issues surrounding the Chinese steel market, analysts expect the demand for vanadium to continue to increase given its growing importance in the steel sector. In addition, other markets are emerging for

vanadium. Although these new niche markets remain marginal compared to steel, energy accumulators and vanadium batteries offer great prospects for the use of vanadium. An upward trend is anticipated for the price of vanadium over the next few years.

Vanadium is also widely used in green technology applications and more specifically battery technology for energy storage (Redox battery).

Perspectives of the Titanium Market

The paint industry remains the most important market for TiO₂ pigment, accounting for 55% of consumption in 2015. At the same time, the paper industry remains a major consumer of TiO₂ whose consumption has shifted to specific sectors such as foldable flat cardboard and decorative paper for decorative laminates.

For the 2025 horizon, there are plans to expand existing producers and new projects are being prepared. Chinese producers are actively studying overseas resources to supplement supply and it is likely that exports to China will increase again in the medium term.

There has also been a significant number of mergers and acquisitions in the TiO₂ pigments industry, as well as capacity increases in China, and recent rationalization in the form of factory closures, which are reshaping the industry. Few players are in the titanium market and having another producer in North America is an opportunity for BRM.

DEVELOPMENT OF OTHER MINING PROJECTS

On a more regional scale, the project will not only allow the emergence of the iron titanium vanadium (Fe-Ti-V) potential of each flank of the Lac aux Dorés geological complex (Chibougamau), but will perhaps make it emerge the Fe-Ti-V potential of the Opawica anorthosite complexes (Desmaraisville) and the Bell River (Matagami). Already, three other mining companies in the Chibougamau sector are working, at various levels of progress, to develop their titanium vanadium project: VanadiumCorp Resource Inc., Vanadium One Energy Corporation and Spearmint Resources Inc.

1.2 HISTORY

In 2011, an environmental impact study was submitted to the Ministry of Sustainable Development, Environment and Parks (MDDEP) and the Canadian Environmental Assessment Agency (CEAA) for the exploitation of a pit to extract an iron vanadium titanium ore for the purpose of producing a concentrate of iron and titanium. Subsequently, the project is the subject of several series of questions and answers at the provincial and federal levels.

After the environmental review of the Review Committee (COMEX), after answering the questions of MDDELCC and COMEX and having held numerous information and consultation sessions, BRM obtained its MDDEFP global CA in 2013.

The federal licence was obtained in 2014 as a result of other changes to the project since the federal government did not approve the project in the same form as in 2013. The changes requested by the federal government were mainly at the Lake Denis level.

In 2015, falling of iron prices and global demand pushed BRM to rethink its business model. A request to modify the global sales has been filed. It introduced the production of a titanium concentrate. This request for modification was subsequently withdrawn because of the fall of the titanium price.

Following this other setback, BRM did not abandon its project and developed another business plan, this time focusing on the second metal processing in Quebec. Through this business plan, which took nearly two years to develop, BRM has arrived at a cost-effective feasibility study for its integrated mine project, which is the subject of the application to modify the current global CA; the secondary processing plant is subject to a separate authorization.

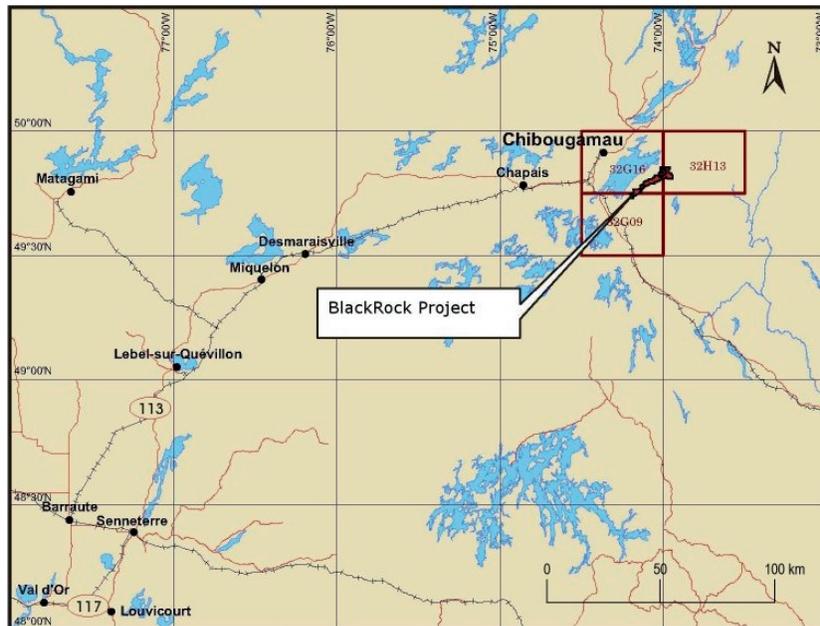
The changes required by the 2014 federal licence and the adjustment to mine production are necessary to make the project profitable. Including a second transformation helps to achieve this goal.

1.3 LOCATION AND SUMMARY DESCRIPTION OF THE MODIFIED PROJECT

1.3.1 LOCATION

BRM owns the iron deposit which is located near Lac aux Dorés, in Chibougamau and on lands where the community of Oujé-Bougoumou has ancestral hunting, fishing and trapping rights.

By road, the mining project is about 60 km southeast of Chibougamau, about 80 km east of Chapais and about 100 km from Oujé Bougoumou community. To get there, we have to take the provincial road 167, southbound, then, north, the forest road 210. All the infrastructure of the mine is located within the limits of the Ville de Chibougamau (Canton of Lemoine). The majority of the project's support infrastructures, the access road and the power line, will straddle the municipality of James Bay and Chibougamau (part of Queylus and Dollier townships).



1.3.2 MAIN CHANGES TO THE INITIAL MINING PROJECT IN CHIBOUGAMAU

The motive initiating the modifications to the BRM mine project in Chibougamau is the development of the iron concentrate processing plant project, which will be produced at the mine site, in pig iron and in ferrovanadium. This addition results in a significant reduction of the mine activities, to allow the two projects to be tied together. Moreover, since obtaining the global CA in 2013, the advancement of engineering has led to improvements in the project. The main changes are as follows:

- The mine's originally planned mine life of 13 years will be extended to 42.5 years.
- The expected average daily extraction rate of 32,000 tonnes of ore will be reduced to 8,400 tonnes.
- The total amount of material originally planned for extraction from the pit was 423.6 million tonnes (Mt), 152 Mt of ore, 264 Mt of waste rock and 7.6 Mt of overburden, for an annual production 3 Mt of concentrate. As a result of the modifications made to the project, the total volume expected to be extracted from the pit is 361.1 Mt, 130 Mt of ore, 226 Mt of waste rock and 5.1 Mt of overburden for the mine, an annual production of 830,000 tonnes (0.83 Mt) of concentrate.
- Fine and coarse tailings will be disposed of in the same tailings pond instead of being placed in separate tailings ponds.
- The containment and raising of the water level of Lake Denis will no longer be realized. Lake Denis will no longer be used as a process water basin. These waters will instead be transported directly from the polishing pond to the treatment plant.
- The 26.6 km rail line connecting the mining industrial complex to the railway linking Chibougamau/Chapais and Lac Saint-Jean will not be built until funding is available. Between the mine site and the existing railway of the Canadian National Railway Company (CN) or the Saguenay plant, the concentrate will be transported by truck first.
- The development and operation of the 500-person construction camp will no longer be carried out.

1.4 PROGRESS OF THE MINE PROJECT IN CHIBOUGAMAU

The impact study and the answers to the questions and comments of the governmental authorities were completed in 2013. The global sales were issued in December 2013 and it contains 29 conditions to be respected by BRM. Following the company's request, the timelines for four conditions have been modified and are subject to a CA amendment issued in February 2015. The responses from the MDDELCC questions regarding the changes in terms of the global CA are presented in chapter 7.

Following the development of the smelter project (secondary processing plant) at Grande-Anse in Saguenay, the feasibility study for the BlackRock mine project was updated in August 2017. No field work was undertaken. The mine plans to begin construction in the spring of 2019, prior to the construction of the secondary processing plant, which is expected to be cleared by the end of 2018.

It should be noted that BRM recently obtained its first turnover for deforestation, soil stripping and shallow rock excavation.

1.4.1 RELATED PROJECT: FOUNDRY ASSOCIATED WITH CONCENTRATE

Based on VTM concentrate that will be produced at the Chibougamau mine site, BRM is targeting the construction and operation of a secondary processing plant on the industrial-port site of Grande-Anse in Saguenay. On an annual basis, the mill will receive 830,000 tonnes of concentrate from which approximately 500,000 tonnes of pig iron and 5,200 tonnes of ferrovanadium will be produced, as well as 135,000 tonnes of titanium slag.

This plant was subject to an impact study separate from that of the mine. It was declared admissible in April 2018 and a BAPE commission was initiated on June 18, 2018. It is this secondary processing plant project, coupled with the update of the feasibility study of the mine project, which resulted in the request to modify the global CA.

Each of these sites had advantages and disadvantages. The following table presents the criteria used and the evaluation for the four potential sites for the establishment of the plant. The evaluation considers the best score as 5 (excellent) and the worst as 1 (unsatisfactory).

The Chibougamau site was particularly interesting for the potential integration of mining and secondary processing operations. The biggest disadvantage was the lack of natural gas. BRM estimated the costs of having liquefied natural gas or pipeline compressed gas from its operations, but the quantities required were too large and the costs associated with transportation were very unfavourable to the project.

The Chambord and Hébertville sites offered natural gas, but the equipment was handled twice, which increased production costs.

The Port of Saguenay site (Grande-Anse), meanwhile, had the presence of a natural gas pipeline, a favourable situation for the handling of materials, and an advantage for construction, the presence of the nearby port, which will allow modularization of the infrastructures and will thus be able to reduce construction costs. The chosen site was therefore that of Grande-Anse in Saguenay.

Construction of both projects is scheduled to begin in spring 2019.

Assessment of potential sites for the establishment of the secondary processing plant

Criteria	Evaluation			
	Chibougamau	Chambord	Hébertville	Saguenay
Environmental aspects	Good	Correct	Satisfactory	Good
Social acceptability	Excellent	Correct	Correct	Satisfactory
Constructions costs	Unsatisfactory	Satisfactory	Satisfactory	Good
Operation costs	Unsatisfactory	Satisfactory	Satisfactory	Satisfactory
Prescription of activities	Good	Unsatisfactory	Satisfactory	Good
Local suppliers' availability	Satisfactory	Excellent	Excellent	Excellent
Logistics	Good	Correct	Correct	Satisfactory
Multiuser electrical transport line	Unsatisfactory	Good	Correct	Satisfactory
Powerhouse	Excellent	Correct	Correct	Excellent
Natural gas availability	Unsatisfactory	Good	Good	Good

2 DESCRIPTION OF CHANGES TO THE PROJECT

2.1 OBJECTIVES AND JUSTIFICATION FOR MODIFICATIONS

As explained in Section 1.2, a feasibility study demonstrated to BRM the profitability of its integrated mine project, which includes the secondary processing plant at Grande-Anse in Saguenay. In addition to modifying the lifetime of the mine and the rate of ore extraction and concentrate production, the improvement in engineering made some modifications to the basic infrastructure of the mine site.

The modifications to the project are explained below and the resulting apprehended impacts are presented in section 4.

2.2 UNCHANGED ACTIVITIES AND INFRASTRUCTURE

Certain activities and infrastructures were not or very little modified by the modifications and improvements to the project authorized in 2013:

- the pit;
- the water treatment plant;
- the concentration process;
- the polishing basin;
- the total area of the project;
- service infrastructures.

It should be noted that several service infrastructures have only moved on-site, such as the telecommunication antenna, the explosives storage area, the garage, the primary crusher, etc.

PIT

The mining plan for the project has been updated to consider the economic values of the metals and grades present in the deposit. However, this update does not bring any significant changes to the final configuration of the pit, on the surface or in depth. In 2013, the pit covered an area of 1.03 km², whereas it is now 0.96 km².

WATER TREATMENT PLANT

The production rate at the mill has decreased, but the industrial water flow entering the treatment plant remains at 30,000 m³ / day, following further validation in engineering. Having two basins gives the opportunity to control the transfer between the two basins, as well as to control the discharge to the environment that does not exceed 30,000 m³ / day. Expected effluent concentrations have not changed since the project authorized in 2013.

PROCESS

The tailings filtration option was considered with the new processing capacity at the concentrator. This option was not retained, however, since the tailings pond is the central element of the project's water management. The tailings pond, in its current design, which is the same as that presented in the 2013 global CA, recycles process water, captures the contact water of the watershed in which the operations are located, and takes into account possible expansion.

POLISHING BASIN

The design of the polishing pond remains the same as in the project authorized in 2013. Since then, the polishing pond has undergone only minor changes. No changes are expected in the future for the polishing pond. Process water and mine water will be directed to the tailings pond, which will act as a tailings storage and decantation pond. Water is pumped from the tailings pond to the polishing pond. From there, the water is either returned to the plant (and will be used as process water and clean water) where it flows to the monitoring pond and treatment. If the water in the treatment pond does not meet the standards, it will be treated to meet the standards before being released to the environment.

In addition, the design criteria for retention ponds have not changed since the 2013 project.

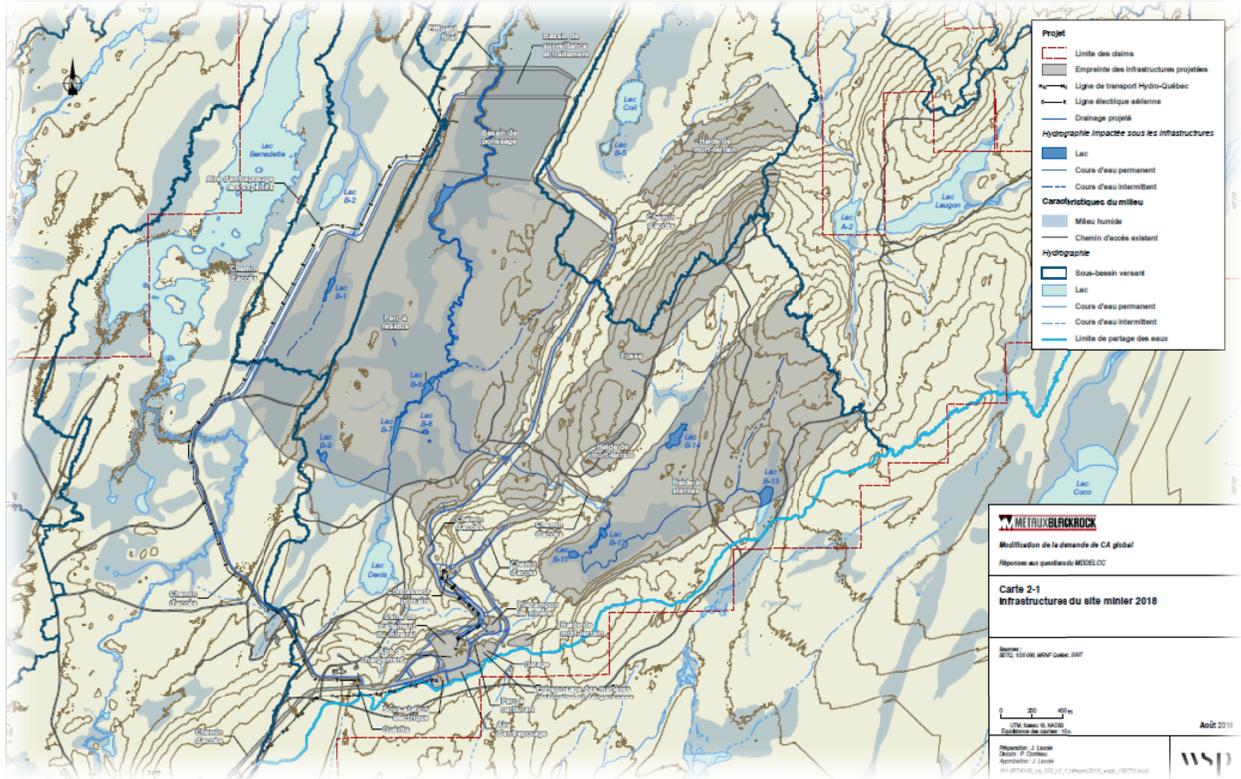
TOTAL AREA AFFECTED BY THE PROJECT

The total area of the new project presented is virtually unchanged from the authorized project. The footprint of the previous project occupied an area of 7.09 km² (7.57 km² including the railway), while the new project will use 7.10 km². The differences were subject to an environmental impact assessment. The new footprint remains within the archaeological potential area and the completed inventories have not revealed any vestige of historical or prehistoric value.

SERVICE INFRASTRUCTURE

The service infrastructure remains the same, with sometimes a new relocation within the mine site footprint. These infrastructures are also smaller, considering the decline in production.

Map 2-1. Infrastructure of the 2018 mine site



2.3 MAIN CHANGES TO THE PROJECT

Main changes between the 2013 global sales and the change request

Activity	CA (December 2013)	Change request to global CA
Higher lifetime	13 years	42.5 years
Lower production	32,000 tonnes/day	8,400 tonnes/day
Tailings pond with fine and coarse tailings	Pond with fine tailings Pile with coarse tailings	Pond with fine and coarse tailings
Overburden accumulation	An accumulation area of overburden located at the western end of the waste rock pile	Three accumulation areas of overburden: 1 - north of the pit; 2- between the pit and the waste rock pile; 3- East of the concentrator
Lake Denis use	Use as a process water basin, containment and water level enhancement	Will not be used as a process water basin, lake drying Process water will be transported from the polishing pond to the factory
Postponement of the construction of the railway	Train (railway)	Trucks (existing roads) to the current railway or factory in Saguenay. There is the possibility of eventually building the railway to the mine.
Abolition of the construction camp	Development and operation of a construction camp for 500 workers	The construction camp is no longer necessary

Maps 2-1 and 2-2 provide a clear understanding and differentiation between the initial authorized project and that of the resulting global change request.

Map 2-1 presents only the current project, including all infrastructure, topography, hydrographic network and the presence of wetlands or other valued components of the natural or human environment. It also makes it possible to visualize the backfilling provided in lakes and rivers and the complete drainage network of the site including the points of arrival and exit of the intermediate effluents. Finally, the watersheds in the study area are mapped to allow them to be located in relation to the main mining infrastructures.

Map 2-2 compares the projected infrastructure in 2013 (authorized) with that of 2018 (modified). It presents the main elements of the mining complex, with pit, tailings pond, waste rock pile, overburden, water management infrastructure (basins, reservoirs, effluent, water treatment plant), ore processing plant, etc. The comparative map is complemented by the topography, the hydrographic network and the presence of wetlands or other valued components of the natural or human environment.

Despite a reworking of some infrastructure, the overall footprint is virtually identical. Project modifications and the new footprint will have potential effects on the natural and human environments.

2.3.1 LIFETIME

With the secondary processing plant project in Saguenay, the rate of production of the mill at the Chibougamau mine decreased from 32,000 to 8,400 tonnes/day. The objective of the mine is to produce the concentrate at the same rate as the feed requirements of the smelter. Since the smelter will have special feed requirements, the mine must decrease the production rate of the concentrate at the mine. Given these changes, the life of the project was extended to 42.5 years.

2.3.1.1 DRILLING AND SLAUGHTERING

The amount of explosives used per tonne of rock is similar to that used in the 2013 approved project. However, since the annual tonnage was reduced to about 1/3 of the tonnage projected in the 2013 approved project, the amount of explosives used on an annual basis is about 1/3 compared to 2013. In order to optimize the use of existing roads and to reduce travel, the place of storage of explosives has been modified. In the project approved in 2013, it was located at the end of a small road west of the mine project site. The explosives storage is now located north of the industrial site, a little to the west of the tailings facility (Map 2-1).

As the scope of the project decreased, it was decided to use diesel powered drills. Indeed, the electrical infrastructures required to supply energy to electric-type drillers are difficult to justify in the case of a project operating only one (years 1 to 15 and 26 to 42) or two drills (16 to 25 years). A comparative study has not been conducted since it is unlikely that the “electric” scenario will have a positive economic impact compared to the “diesel” scenario. The trucks used were 220 metric tons while now the trucks are 90 metric tons. Air emissions will be reduced on an annual basis, but will be generated over a longer period of time.

2.3.1.2 DRYING THE PITCH

If we consider the final pit, we expect the same flow of mine water as in the project authorized in 2013. The flow of mine water is normally minimal at the beginning of operation and gradually increase until reaching the maximum flow rate at the end of the operation. The mine water will come mainly from precipitation, melting snow and groundwater. Since the final pit is similar to that of 2013, but the life of the mine has increased significantly, it is expected that flows will increase proportionally to those predicted in the 2013 approved project from the beginning, the operation and reaching the bottom of the pit.

2.3.2 PRODUCTION OF CONCENTRATE

The objective of the mine is to produce the concentrate at the same rate as the feed requirements of the smelter. Since the smelter will have special feed requirements, the mine must decrease the production rate of the concentrate at the mine.

With the secondary processing plant project in Saguenay, the rate of production at the mill at the Chibougamau mine decreased from 32,000 to 8,400 tonnes/day. BRM now expects to produce 830,000 tonnes of concentrate per year, while the initial project planned an annual production of 3 Mt of concentrate.

2.3.2.1 OVERVIEW OF THE PROCESS

In the July 2011 impact study, the process was defined as: primary crushing, grinding, magnetic separation (including regrinding), flotation, dewatering and heating the concentrate. Since that time, the flotation and heating steps of the concentrate have been removed from the process scheme.

Compared to the initial project, the sulphide flotation stage to remove them from the concentrate is no longer necessary, following the process retained at the secondary processing plant. The low concentration in the ore and therefore in the concentrate is not detrimental to the process or the quality of the effluents and emissions at the secondary processing plant, as can be seen from the study of impacts submitted to MDDELCC and available for consultation on the BAPE website¹.

¹ http://www.bape.gouv.qc.ca/sections/mandats/Usine_Blackrock/documents/liste_documents.htm#PR

2.3.3 ACCESS TO THE MINING SITE

RAILWAY

The construction of the railway going to the mine site from the transshipment station envisaged at the site of the former Scierie Gagnon is no longer required, which is mainly due to:

- The estimated cost of constructing the railway was \$67 million. Since the mine now forecast to produce 0.83 Mt/yr and the sales prediction is \$75/ton, a full year of production does not allow for the refund of the rail line.
- The trucks will only have to travel about 28 km on existing roads to transport the concentrate to the CN railroad (site of the former Scierie Gagnon) or 80 km to the potential site envisaged by the Ville de Chibougamau. At the railroad, they will transfer the concentrate to the cars and the concentrate can be shipped.
- The roads to transport the concentrate by truck from the mine are already built. An update is envisaged and about 2 km must be rebuilt.

Current CA estimates that access to the mine site between Provincial Highway 167 and the mine will be 26.6 km by rail at an estimated cost of \$65 million. The tonnage reduction envisaged in the current project does not justify such an investment for the time being. In addition, BRM has not yet made a choice between road transport and rail transport for its concentrate. This choice will depend, among other things, on an agreement to be found with the railway companies.

In the event that BRM opted for the railway scenario, governmental subsidy programs could reduce the cost of the section connecting the mine to the CN system. BRM wants to work with municipal, provincial and federal authorities to find a solution that will make this project possible. Also, BRM asks the MDDELCC to maintain the railway in its turnover, but conditionally that an acceptable mode of financing is found.

TRUCK TRANSPORT

In the meantime, road transport will have to be used. Provincial Highway 167 and Forest Road 210 will serve as access roads to the mine site. With the exception of the last two kilometres that will be rebuilt, Road 210 will be upgraded during the construction phase. Eventually, a safety gate will be set up along the forest road to ensure that access to the site by the road is limited to staff. Map 2–3 shows the route to the BRM mine site with the position of the safety barrier.

To access the site during the construction and operation phases, the workers will be transported by a shuttle service provided by BRM (bus), starting from the following drop-off points: Oujé-Bougoumou, Chibougamau and Chapais. There would be 12 (round-trips) bus trips per day.

2.3.4 TRANSPORT OF THE CONCENTRATE OUTSIDE THE MINE

The concentrate will be sent to the secondary processing plant in Saguenay. Both modes of transport (truck or rail) are still under study. When a decision is made on the mode of transport of the concentrate, BRM will submit to the COMEX and MDDELCC the details of the chosen option for transporting the concentrate.

TRANSPORT / ROUTE OPTIONS

There are four possible scenarios for transporting the concentrate. All use the trucking plant from the mill at the Chibougamau mine, either to a transshipment station to use the train or to reach the secondary processing plant directly in Saguenay.

1. Transportation by train from the Gagnon sawmill (junction 167), with 25 trucks of 100 tonnes/day (50 passages/day), 24 hours/day and 7 days/week.
2. Transportation by train from the transfer dock of the City of Chibougamau, with 25 trucks of 100 tons/day (50 passages/day), 24 hours/day and 7 days/week.
3. Transport by truck to the smelter in Saguenay, with 67 trucks of 40 tonnes/day (134 passes/day), 24 hours/day and 7 days/week. This option is the subject of a traffic study.
4. Transport by train from the mine to the smelter in Saguenay in the event that the 26.6 km stretch of railway between the mine and the CN system was built.

Map 2-1. Transport Scenarios Considered from the Mine



2.3.5 FINE AND COARSE TAILINGS POND

The tailings are produced by the same process, magnetic separation. The coarse tailings are derived from the first magnetic separation (roughing), while the fine tailings are produced by a second magnetic separation following secondary grinding (cleaning). The combination of the two types of tailings in the same tailings pond is not problematic since all the analysis performed on coarse and fine tailings have shown that the composition is similar and that the geochemical behavior of the tailings will be the same for both types of tailings.

Coarse and fine tailings will be combined and thickened at the concentrator to be pumped to the tailings pond. The amount of tailings that will be produced is estimated at 94.7 Mt. The tailings pond will be located west of the pit and will have a total capacity of 54 Mm³. During the update of the feasibility study, the tailings pond design was also revised to ensure compliance. The final design is yet to come (engineering details), but the park being a little bigger, the height will be decreased by about 5 m.

The licensed project consisted of two coarse tailings ponds and one tailings pond. The project now has only one park, which includes fine and coarse tailings, in the same area as the old licensed parks. Initially, the tailings ponds covered an area of 2.82 km² and the new combined park will have an area of 3.05 km² (Map 2-2).

The volume of the tailings pond (which includes the footprint of the former fine and coarse tailings ponds) will have a volume of 54 Mm³. The dikes will have a maximum height of 30 m (elevation of 437 m).

TAILINGS MANAGEMENT

The review of the tailings management plan is progressing to a detailed engineering stage, including a focus on liquid management, and a consolidation of tailings management and accumulation areas. A risk analysis will be produced during project development to ensure risk management including mitigation plans. Currently, the overall management plan includes internal and external dikes for years 8 to 42, as well as water management outside the park (polishing basin and treatment pond), thus minimizing the risks of a break.

2.3.6 WASTE ROCK STORAGE

The initial project consisted of two waste rock piles, covering an area of 1.52 km² while the modified project will have only one dump, covering an area of 1.54 km² (Map 2-2). The height of the waste rock pile and the management method do not change with respect to the authorized project.

2.3.7 OVERBURDEN STORAGE AREAS

An estimated 5.1 Mt of overburden is expected from deforestation and stripping of the mineralized zone. Compared to the original project, this represents a decrease of 2.12 Mt of overburden.

Overburden and topsoil will be deposited at three locations (Map 2-1). The main overburden pile is now located north of the pit and the two smaller ones are positioned between the pit and the waste rock pile and east of the concentrator area. The overburden pile has a total design capacity of approximately 5.2 Mm³; the original project had a capacity of about 7.4 Mm³.

The authorized project was located in the highest portion of the tailings pond, at its northern end (approximately 0.270 km²), while the three overburden piles of the new project is 0.40 km².

The nature and mode of storage of the overburden (including topsoil) of the project remains unchanged from the project authorized in 2013. The nature of the overburden to be moved is essentially till (undifferentiated and undifferentiated thin).

2.3.8 WATER MANAGEMENT

2.3.8.1 SURFACE WATER

There is little change in the surface water drainage system, which has nevertheless adapted to the changes made to the project; drainage ditches are located on the site plan (Map 2-1). The captured water is found in the same places as originally planned, to be treated before being released to the environment. The hydrological study is currently progressing in detail engineering.

2.3.8.2 DRINKING WATER

The drinking water supply is intended to cover the needs of employees operating on the mine site. At the beginning of the construction period, contractors will have to provide their own drinking water supply systems. In operation, the water will come from at least two artesian wells (one originally planned), located on or near the hub platform.

There will be a supply of 15.8 m³ / day, with a peak of 23.4 m³ / day; the original project estimated a supply of 323 m³ / day.

2.3.8.3 WATER TREATMENT

INDUSTRIAL WATER

No chemicals will be added to the process water tank . This tank will be closed and located near the concentrator. All runoff from the mine site is either naturally directed to the tailings pond (and the polishing pond), or captured by one of the site's perimeter ditches. Therefore, process water that could be released to the ground in the event of an accidental break would inevitably return to the tailings pond and then to the polishing pond.

The industrial water and mine water entry point will be at the southern end of the tailings pond and the treated water will exit the metering station at the north end of the site. The treated water will then flow to the outfall, in the tributary of Lac Jean, as for the authorized project.

At the tailings pond, water will be composed of a mixture of process water, mine water and rainwater falling on the tailings pond. In addition, all contact water from the mine site will be transported to this tailings facility. Thus, the water, laden with tailings, will undergo a first settling in the tailings pond. Then this surface water from the tailings pond will be transferred to the polishing pond for a second settling. The water from the polishing pond will be used to feed the concentrator. Otherwise, it will be sent to the treatment pond and measured for possible release to the environment, when it meets the applicable standards.

The only treatment considered for industrial water and mine water is the removal of suspended solids (SS), although an additional adjustment of alkalinity may be required.

The treatment sludge will be stored in the polishing pond and discharged periodically (approximately once every 2 years) by dredging the pond. An annual volume of 9,050 m³ of sludge is estimated.

DOMESTIC WASTEWATER

As there is no more construction camp for the project, there is no associated water treatment. The supply of drinking water and the treatment of domestic wastewater are planned to cover the needs of employees operating on the mine site. During the first construction period, contractors will have to provide their own drinking water supply systems and chemical toilets will be put in place on the site. The permanent systems will cover the needs of BRM employees during the second phase of the construction work, when the number of workers on the site justifies the installation of these treatment systems. These systems will be linked to the concentrator, the garage and the administrative offices.

A prefabricated plant for the treatment of domestic wastewater will be installed between the concentrator and the mine garage (Map 2-1). The plant will produce an effluent of a quality that meets the standards dictated by the MDDELCC. An underground insulated pipe will discharge the effluent into a ditch leading the water to the tailings pond. The sludge created in the plant will be collected in a tank that will be emptied by a specialized contractor.

2.3.8.4 WATER BALANCE

The thickener is used to reuse the process water in the concentration circuit. The thickened tailings are pumped to the tailings pond where they are captured to allow sedimentation. Runoff and mine water are also captured in the tailings pond. The tailings pond water is transferred to the polishing pond where a portion of the water is reused at the concentrator. The excess water captured in the polishing pond is sent to a monitoring and treatment basin. If necessary, the water is treated before being emitted to the environment. As described, process water and clean water are supplied from the polishing pond; the clean water is filtered for its use as sealing water and for the preparation of the flocculant.

In order to have enough water to start the plant, it is necessary to capture runoff from the site during a thaw season. During the life of the mine, process discharge water and runoff water will be used to supply the mill's treatment processes.

2.3.8.5 FINAL EFFLUENT

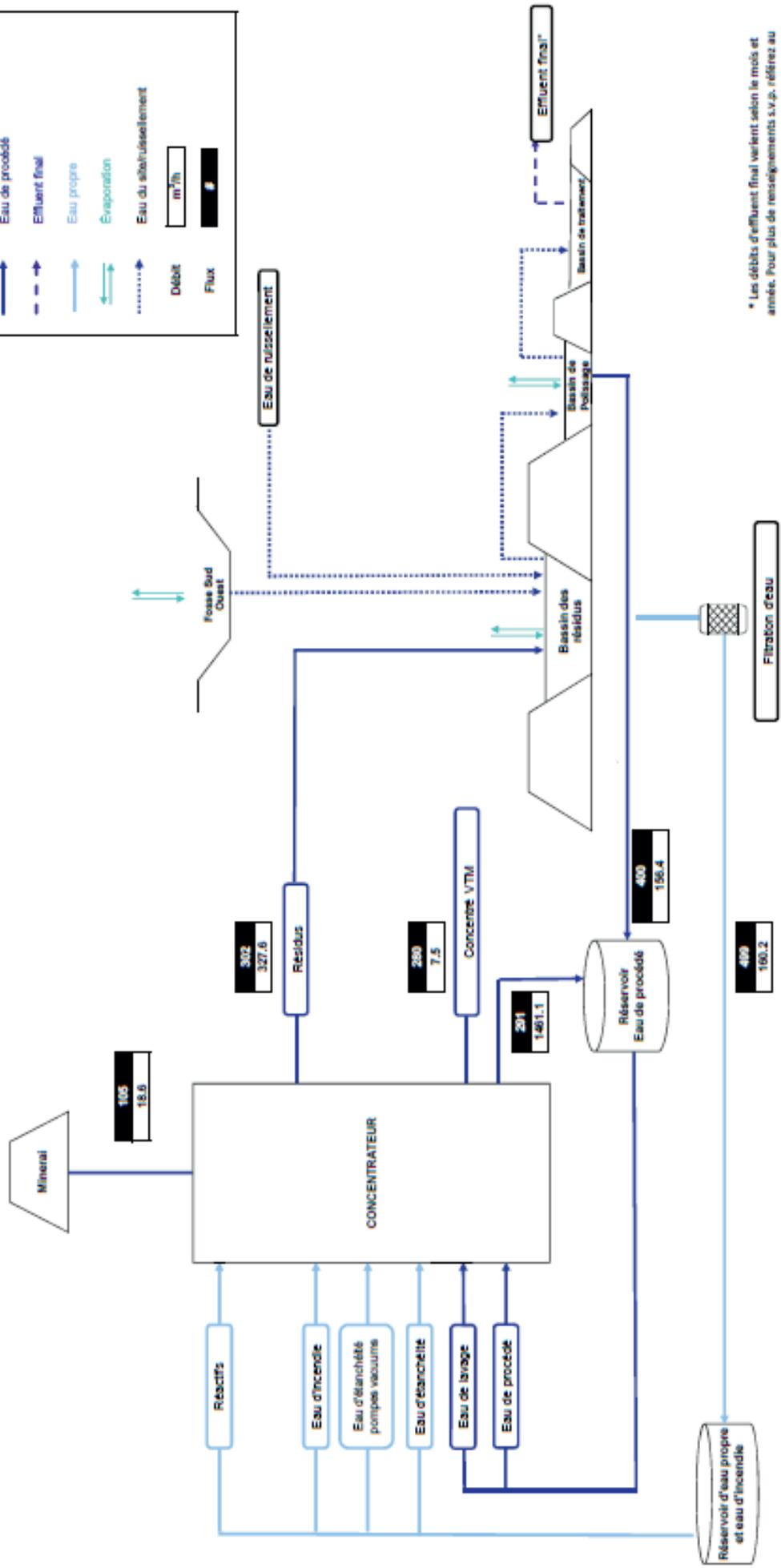
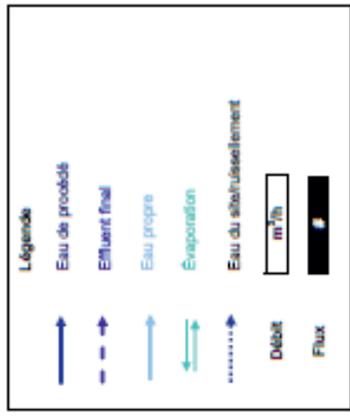
The final effluent is still at the outlet of the monitoring and treatment basin (maps 2-1 and 2-2), ending in Lac Jean.

However, due to the increased longevity of the mine, the water balance is no longer the same. However, the expected concentrations at the effluent have not changed since the project authorized in 2013.

The management of the final effluent during the operation will be done in order to reconcile the following needs:

- ensure the safety and integrity of the dikes;
- Make sure you have the required amount of water in the tailings pond for the concentrator to function properly, taking into account winter ice cover;
- minimize the impacts in the receiving environment by the following measures:
 - follow as much as possible natural fluctuations in the quantities of water arriving in the receiving environment (floods, low water, etc.);
 - have a water level in Lac Jean as close as possible to the initial state;
 - adjust to perceived climate change.

Adjustments following operational and environmental monitoring may be made during the operation, as prescribed by conditions 8 and 9 of the global CA.



* Les débits d'effluent final varient selon le mois et année. Pour plus de renseignements s.v.p. référez au tableau sommaire des volumes d'effluent.

2.3.9 SERVICE INFRASTRUCTURES

The service infrastructures (garage, administrative buildings, etc.) will have essentially the same characteristics as what was authorized (global CA of 2013), except for their location and their reduced size because of the lower production rate of the mine.

The amount of diesel stored at the site was reduced to 87,000 litres, compared to the amount planned for the authorized project in 2013 (550,000 litres). On the other hand, the quantity of gas stored on the site remains the same as that provided for in the project authorized in 2013 (20,000 litres). Delivery of diesel fuel will still be by tank truck. The location of the tanks has been changed. The mining garage site is now south of the mine site, east of the concentrator. Fuel will be stored just north of the mine garage as shown on the General Development Plan (Map 2-1).

Some of the inert and competent waste rock (as well as a small amount of overburden) will be used in pre-production for the development of the mine site infrastructure, including dikes, dams, roads and work platforms.

2.3.10 WORKERS CAMP FOR CONSTRUCTION

Since the filing of the impact study, the project has been redesigned with respect to housing workers during the construction of mining facilities in Chibougamau. Due to the proximity of Chibougamau, it was decided that the construction camp to accommodate 500 workers was no longer needed. In addition, the project focuses on the use of local labour. For non-local workers, accommodation will be provided in the available housing in the area, which will have sufficient capacity to house the maximum planned quantity of 165 workers during construction.

Transportation for Cree communities will be by bus from Oujé-Bougoumou, Chapais and Chibougamau. These are the places where housing is available.

2.3.11 LAKE DENIS

In the 2013 authorization, Lake Denis was used as a process water tank. BRM had made the assessment that a lake in the middle of an industrial site, because of traffic, interceptor ditches and industrial activities nearby, could not maintain its integrity and should be considered a loss.

After going through the federal process of alternatives to listing water bodies, including Lake Denis, in Appendix 2 of the MMER, Environment Canada and DFO considered it inappropriate to put process water into Lake Denis, because this water will be considered harmful, although tests have shown that it is not acutely toxic to rainbow trout and *Daphnia Magna*.

The process water will now be pumped directly from the polishing pond to the plant. There is sufficient process water for the operation of the concentrator.

BRM no longer considers Lake Denis to be a natural receiving environment, as the field experience for several projects has shown us that a lake in an industrial setting will not be able to keep its properties as it was in the initial state. Examples observed at the Lac Bloom mine site (uncontrolled spills of MES [Steve Simard, P. Eng.]) suggest that despite good intentions and mitigation measures put in place, it is difficult to keep use of the lake when near the facilities. In addition, the mitigation measures required to conserve the entire Lake Denis (including interceptor ditches) will significantly reduce the inflow of water into the water body, leading to its degradation by wanting to protect it. Lake Denis will lose its connection with the water of the tributaries it receives upstream and the water downstream. It will therefore be considered a loss and will be adequately compensated.

It is mentioned that Lake Denis will be drained, but in reality it is that its tributaries will be diverted. Ditches will be developed on each side of Lake Denis to prevent potentially contaminated runoff from the mine site from reaching the lake. These waters, which will be intercepted by the ditches surrounding Lake Denis, will be transported to the tailings pond. Federal agencies accepted the loss of Lake Denis due to the reasons mentioned above.

In the authorized project, the combined area of Lac Denis and its basin for process water occupied an area of 0.25 km² while Lake Denis was only 0.05 km².

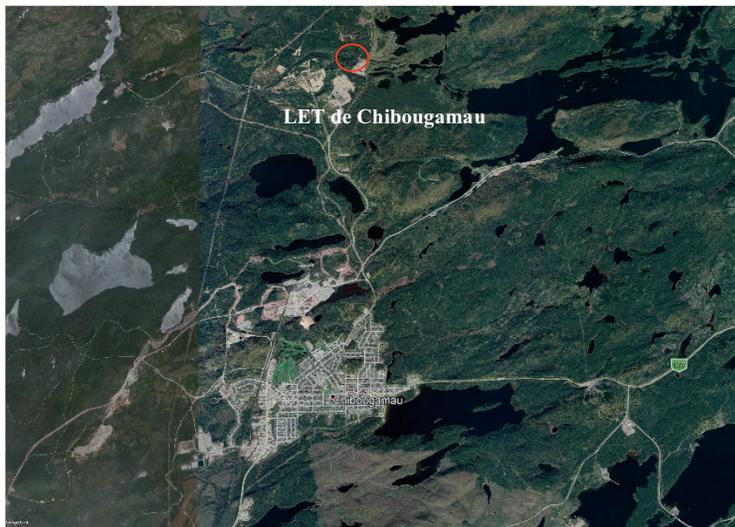
2.3.12 ELECTRICAL NEEDS

The decrease in production compared to the initial project, with a daily extraction of ore from 32,000 tonnes/day to 8,400 tonnes/day, causes a reduction in the power required for the concentration of the ore as well as for all auxiliary systems/services on the site. Equipment and service costs were re-estimated as part of the new project parameters; it estimates that the electricity demand is 23.9 MW. The licensed project required an electricity demand of 49 MW. Despite the modifications made to the project, BRM confirms that the Hydro-Québec power line will not be modified.

2.3.13 RECYCLING

First, let's remember that the project authorized in 2013 included an annual production of 3 Mt of concentrate per year, with a construction camp, while the 2018 project does not include a construction camp and with a lower production of concentrate (830,000 tonnes/year).

The technical landfill is located a few kilometres from the city of Chibougamau.



2.3.14 JOBS AND LOCAL WORKFORCE

The number of jobs at the mine will fluctuate somewhat as the project progresses. In preproduction, there will be 160 employees and the number will increase to 203 in the tenth year to reach up to 229 employees (years 30 to 33). This will also result in indirect jobs that will stimulate all local and regional activities. Initially, labour requirements were estimated at 156 jobs at the peak of production, with 86 pre-production jobs.

During construction, an average of approximately 165 direct workers will be required; moreover there would be indirect workers during the construction period. Initially, there were about a hundred direct jobs during construction.

The local workforce will be favoured, notably by the absence of commuting (fly-in/fly-out), by the establishment of schedules favourable to the establishment in the region: 4–5/5-4/5-5 for hourly workers and 4/3 for managers. Also, the agreements signed with the Jamesians and the Crees provide for processes to maximize the employment of workers in the regions, including training programs, the preferential posting of positions in the regions, etc.

2.3.15 PROJECT COST

The following table presents the capital costs required for the construction of the ore processing, initial crushing, storage, tailings facility and service facilities and administrative offices related to the mine site. Off-site logistics facilities, as well as any road or rail development necessary for the transportation of the concentrate to the secondary processing plant located at the industrial-port site of Grande-Anse in Saguenay, are excluded.

Expected capital costs for the construction of the mine and ore processing plant in Chibougamau

Capital costs	M\$ (CAD)
Mine, grinding, storage and conveyors	47.5
Hub and loading infrastructure	125.8
Tailings and water treatment	16.0
Infrastructure, Administration and Services	17.7
Indirect costs and contingencies	80.7
Total	287.7

The cost of mining, processing and infrastructure equipment was calculated from estimates prepared by an engineering firm, the cost of materials, suppliers quotes and contractors, as well as on the previous project basis. Capital costs, sales taxes, replacement capital cost of equipment, or any other capital costs subsequent to the start of operations are excluded.

The following table presents the annual cost of the activity related to the operation of the Chibougamau mine site as well as the operating costs of the project over the expected 42.5-year operating period.

Annual operating cost and expected duration of operation of the mine site and concentrator in Chibougamau

Operating costs	M\$/year (CAD)	M\$ operating life (CAD)
Mine, grinding, storage and conveyors	27.0	1,147.1
Concentrator and loading of trains to trucks	22.7	978.3
General and administrative expenses	9.6	405.7
Mining and mobile equipment rental fees	1.2	48.9
Transport and logistics	15.9	675.5
Other costs (dikes and environmental monitoring)	1.2	50.1
Total	77.6	3,305.6

Operating costs are based on certain assumptions about the cost of fuel, consumables, such as emulsifiers, hydro costs, labour costs, maintenance and part replacement costs, administrative, environmental and other operating expenses. It does not include logistics costs to transport the concentrate to the secondary processing plant in Ville Saguenay, processing costs at this secondary processing plant, marketing expenses and corporate expenses.

2.4 CALENDAR OF ACHIEVEMENT

The new construction schedule is to receive in December 2018 the authorization for the modification of the global turnover and to start the construction of the mine in spring 2019. The start of operations is scheduled for the third quarter of 2020.

3 CONSULTATIONS

Various discussions and consultations have been initiated by BRM since the summer of 2010, with the Cree First Nations of the region, the population of Chibougamau and the other municipalities in the region. Recently, BRM continued its consultations, this time to present the modifications to the project, with the addition of the secondary processing plant in Saguenay.

3.1 CONSULTATIONS CARRIED OUT

As part of the impact study of the BlackRock project and the modification of the overall turnover, meetings were held with various stakeholders in the community. Since July 2010, BRM and its representatives have conducted exchanges with stakeholders and the First Nations present in the Chibougamau region. The exchanges were with land tallyman 059, the Department of Energy and Natural Resources (MERN), the MDDELCC, the CEAA, the DFO, Environment and Climate Change Canada, the municipal authorities, including Chibougamau and the municipality of James Bay, local and regional organizations as well as the populations of Chapais and Chibougamau. These meetings concerned the mining project and its components, as well as later, its update.

Communication and consultation sessions were held. This involved the continuity of meetings of the exchange committees, interviews for the documentation of Cree traditional knowledge and the holding of open house days.

FOLLOW-UP COMMITTEE

The follow-up committee is a global exchange committee that includes representatives of the four communities directly affected by the BRM mining project (Chibougamau, Oujé-Bougoumou, Chapais and Mistissini).

The committee sits as needed and has a mandate: to exchange information, identify problems and concerns, find common solutions and reach out to the public about modifying or adding a project in the framework for BRM activities in the region. The mandate of the representatives is to inquire about the citizens' questions, to identify the issues, concerns and suggestions of the community they represent and to transmit them to the committee.

REGIONAL COMMITTEE

The regional committee is made up of elected or appointed representatives of the cities of Chibougamau and Chapais and the James Bay Regional Government.

It is essentially a place of strategic exchange where members discuss common issues of BRM and regional actors, some decisions to be made on the project and throughout the life of the mine as well as projects, current or future. In summary, the members see this committee as maximizing the economic benefits generated by BRM in neighbouring communities. Partners have agreed to meet quarterly or as needed, depending on the progress of the project.

IBA IMPLEMENTATION COMMITTEE

This committee, already in place, was put on hold during the downsizing of BRM activities and during the redesign of its business plan.

3.1.1 OPEN HOUSE DAYS 2012 (MINE PROJECT)

Open houses were held in Chapais, Ujé-Bougoumou, Chibougamau and Mistissini at the end of 2012. All the people who spoke and who made comments during the open days were in favour of the project. However, despite the positive aspects people see, some had mentioned some concerns and expectations. The main concerns were:

- Job creation and economic benefits;
- Training and hiring conditions;
- Slight change in activities practised by the users of the territory;
- Practice of traditional Cree activities on the territory;
- Movement of local labour to the mine;
- Risks of contamination of the environment;
- Potential increase in the price of residences;
- Other more detailed information about the project.

3.1.2 FOLLOW-UP COMMITTEE

The Regional Monitoring Committee held two formal meetings:

- On 15 November 2013, the BRM team held a meeting to determine the basis of the future follow-up committee. The committee's mandate is to exchange information, identify issues and concerns, find common solutions and reach out to the public about modifying or adding a project.
- A meeting of the committee was held on December 8, 2016, to inform the BRM mine monitoring committee of the progress of the mining project in Chibougamau and of the company's choice for the location of the secondary processing plant and to explain the reasons.

Participants expressed their disappointment with the choice of the Saguenay site and expressed the wish that this decision would be reviewed if there were an expansion or changes in transportation. They were also concerned about the decline in the rate of production that would result in fewer jobs available for the local population. However, they were happy that the life of the mine was lengthened, allowing greater sustainability for the regional economy.

3.1.3 CONSULTATIONS WITH FIRST NATIONS COMMUNITIES AND THE IMPACTED FAMILY

A meeting was held in February 2017 with the Ujé-Bougoumou Band Council to present the new mine project now linked to the smelter. Impacted family members regularly come to the BRM office to keep in touch and hear about the project.

An official meeting with the Wapachee family took place on October 29, 2017, at the BRM office in Chibougamau. The elders of the family, Matthew and Maggie Wapachee, were present along with several of their children, spouses and grandchildren. In total, 11 adults and 3 children were present. Mr. Adario Masty (Local Environment Officer) and Mr. William Paddy Mailleux (Economic Development Director) of Ujé-Bougoumou, were also invited to the meeting.

The main concerns and questions raised by the participants were:

- Accessibility of jobs for the family;
- Progress of the family facility in Chibou-Chibi;

- Involvement of young people;
- Possibility of including the railway later in the project;
- Reasons for the decrease in the tonnage of the mine;
- Maximum maintenance of traditional activities.

3.1.3.1 RABBIT CAMP

In previous consultations, the possibility of relocating the Rabbit camp was mentioned. However, the family has moved into their thoughts and wants more to be fully settled Chibou-Chibi. The family would therefore like help and support in developing permanent housing in Chibou-Chibi rather than relocating the Rabbit camp. BRM is in discussion with the family to make these changes to their commitment by participating in the development of Chibou-Chibi. The Oujé-Bougoumou Band Council is kept informed of the discussions.

3.2 AGREEMENT ON IMPACTS AND BENEFITS

An Impact Benefit Agreement (IBA) was signed in 2013 with the Grand Council of the Cree Nation and the community of Oujé-Bougoumou. This agreement was updated in 2016 when the BRM business plan was changed to reflect the secondary processing plant. Cree commitments on jobs, business opportunities and communications in general remained the same as the agreement signed in 2013.

3.3 CONSULTATIONS INITIATED FOR THE AMENDMENT OF GLOBAL CA

As part of the modification of the global turnover, meetings were held with the local population of the James Bay communities concerned by the BRM mine project. These meetings took place on June 11, 2018, in Chibougamau and on June 12, 2018, in Chapais and generated the participation of nearly a hundred citizens (77 in Chibougamau and 17 in Chapais). They lasted a little over an hour.

The objective of the meetings was to present to the participants the progress of the iron, vanadium and titanium mine and secondary processing plant projects, as well as the modifications made to this project recently. A background and a brief presentation of the mining project, its life, the transportation scenarios under study, the components of the secondary processing plant, the environmental requirements and the next steps are the main topics that have been discussed.

A period of questions and exchanges followed the presentation. The questions, concerns and expectations of the participants focused on the elements presented in the following table.

Citizens also took advantage of the meetings to express their satisfaction with the project, notably because of the potential improvements it could bring to the maintenance of the road, the fact that the second transformation was carried out in Quebec, or that following its update, the estimated life of the project is longer.

Questions, Concerns and Expectations from June 11 and 12 by BlackRock Metals and Responses to the Participants

Questions, concerns and expectation	Responses of BRM
<p>Are the possibilities of using an alternative to natural gas (electricity or building a natural gas pipeline) been assessed by BlackRock Metals?</p>	<p>Natural gas will not be used as an energy source, but as an input, since the process must use a carbon source. The use of coal and the truck transport of liquefied gas or compressed gas are alternatives that have been evaluated. The construction of a pipeline would delay the project too much and would not be profitable; it is important to start the project quickly because the market is currently favourable.</p>
<p>What are the reasons that led to the decision not to build a section of railway connecting the mine to the Canadian National network?</p>	<p>The three scenarios (trucking, rail transportation via Scierie Gagnon/Chibougamau transshipment centre) are currently under study (environmental and economic criteria). No decision has yet been taken on the scenario that will be retained.</p>
<p>What is the impact of the variability of economic cycles on the estimated life of the project at 40 years?</p>	<p>It is important to start such a project in an upward cycle in order to repay the initial investment as soon as possible. The prices of processed products would also be less affected by these cycles than the prices of raw concentrates.</p>
<p>Fear that the project is draining staff already employed in other mines located further north of the region.</p>	<p>Comment noted</p>
<p>Concerns about the truck transport scenario due to the current condition of Highway 167 and its potential deterioration.</p>	<p>According to the Ministry of Transport, Sustainable Mobility and Transportation Electrification, the current road is able to withstand the increase in traffic anticipated. BlackRock Metals says it is ready to support citizens in their demand for road improvements, especially if the gross concentrate transportation scenario is retained.</p>
<p>Importance of prioritizing local and regional businesses for transportation, should the truck transport scenario be retained.</p>	<p>Comment noted</p>
<p>Disappointment that the option to build the secondary processing plant in the region of Chapais-Chibougamau was not retained.</p>	<p>Comment noted</p>

4 EFFECTS CAUSED BY PROJECT CHANGES

Following the inclusion of a secondary processing plant in the Saguenay, modifications were made to the project, notably by changing the life of the mine and the rate of ore extraction and concentrate production. As the BRM project has not yet started, it is constantly evolving through engineering improvements, which has also brought some minor modifications to the basic infrastructure of the mine site.

Impacts apprehended during the construction phase remain the same for the mine site; the different impacts caused by the modification of the initial project will therefore be the only ones discussed and analyzed.

4.1 LIFE AND PRODUCTION RATES

The life of the mine will be extended from 13 years to 42.5 years, as a result of reduced production of the concentrate (from 32,000 tonnes/day to 8,400 tonnes/day) which will be used to supply the plant secondary processing in Saguenay. The decrease in production also leads to a decrease in the extraction rate as well as a reduction in the amount of equipment.

Although the 42.5-year operation has effects similar to the original project, but for a longer period, some long-term uncertainties may remain. Follow-up programs will help to adjust to offset any negative impact on the environment. The longer duration of the mine will also provide an opportunity to obtain better technologies whose effectiveness will reduce the effects on the environment.

GREENHOUSE GAS

With the change in mine and machinery life associated with reduced production capacity, greenhouse gas (GHG) emissions differ from those originally calculated. For the initial project, during mine operation, estimated GHG emissions averaged about 52.8 kt CO₂eq/yr. For the modified project, during mine operation, (direct) GHG emissions would average about 44.9 kt CO₂eq/yr.

4.2 CHANGES AND IMPROVEMENTS TO THE MINING SITE

The project and the main components have the same overall footprint, although the mining equipment is smaller and smaller. Some equipment has also been moved inside the mine site, with no impact on the environment.

The apprehended impacts on the mine site during the exploitation period remain low, considering the plans of emergency measures and the constant and monitored surveillance of equipment and infrastructures. The final restoration to restore the natural environment will be realized some 30 years later compared to the initial project.

4.2.1 FINE AND COARSE TAILINGS TOGETHER

The authorized project consisted of two coarse tailings ponds and a tailings pond, covering an area of 2.82 km². The project now has only one tailings pond, which includes fine and coarse tailings, in the same area as the previous authorized pond, on a similar area (3.05 km²). The gradual restoration of the tailings pond remains the primary mitigation measure. The apprehended impact is thus similar between the initial project and the modified project.

4.2.2 OVERBURDEN PILES

In the initial project, the overburden was within the tailings pond, while the new project has three locations, but mostly in an overburden pile north of the pit. There will be less overburden storage capacity with the new project, but there will be an additional footprint as the new project will no longer be inside the tailings facility. Nevertheless, the new overburden piles do not affect any watercourse or wetland. The additional footprint does not, however, have an additional impact, considering the global footprint, which remains very similar.

4.2.3 GLOBAL FOOTPRINT OF THE MINING SITE

The total area of the new project is virtually unchanged from the authorized project. The previous project occupied an area of 7.09 km², while the new project will use 7.10 km². Considering the abandonment of the railway, the previous project occupied an area of 7.57 km²; the overall assessment is positive for the components of the natural environment (vegetation and wetlands in particular). The following sections present details of the various components of the natural and human environments.

4.2.3.1 VEGETATION

At the level of vegetation, the new configuration of the mine site, although very similar to the previous one, makes the loss of vegetation or the encroachment of 4.97 km² to 5.11 km². The apprehended impact thus remains the same, and recent research on status species does not mention any potential new species at the mine site that will be developed. There will be continuous revegetation on the waste rock pile and tailings pond, but the final restoration of the site will be completed some 30 years later than originally planned.

4.2.3.2 WETLANDS

Impacted wetlands will be reduced with the new project, initially from 1.99 km² in 2013 to 1.92 km² in 2018. The impacts are therefore the same, including planned mitigation and compensation measures.

4.2.3.3 WILDLIFE

The overall footprint of the modified project being similar to the authorized project, or slightly less considering the withdrawal of the railway, the potential wildlife habitats will be impacted in a similar way. No new special status species are to be reported on the mine site. However, the extended duration of the operation could have an impact on wildlife, particularly with transportation activities on forest roads that provide access to the mine. The traffic generated on a daily basis is, however, much lower compared to the initial project, given the lower production rate.

The intensive use of the mine site road will be an obstacle to the passage of some terrestrial species or to increase the risk of collision with wildlife. There will also be noise and dust disturbances, depending on the final scenario. To this end, the following mitigation measures will reduce the apprehended impacts:

- indicate and report areas of highest risk of collision with large wildlife through adequate signage;
- provide tarpaulins for trucks on the public network to prevent the emission of dust during transport;
- ensure that the exhaust systems of the vehicles and machinery are in good condition in order to minimize the emission of contaminants into the air and ensure that the same applies to dust collection systems for equipment and machinery;
- limit the speed of vehicles for mine operations and forest roads.

4.2.3.4 WATER BODIES

LAKE DENIS

Lake Denis will no longer receive the process water as in the authorized project. However, BRM no longer considers it a natural receiving environment, as the experience of similar mining projects concludes that a lake in an industrial setting cannot keep its properties as in the initial state.

The mitigation measures required to conserve the entirety of Lake Denis (including interceptor ditches) will significantly reduce its water supply, leading to its degradation by wanting to protect it. Ditches will be created on each side of Lake Denis to prevent potentially contaminated runoff from the mine site from reaching the lake.

PONDS AND STREAMS AFFECTED

The slight redevelopment of the infrastructure has altered the directly encroached surfaces, as well as the surface on which water flows.

Whether 13 years or 42.5 years, plans and rivers under major infrastructure (tailings, waste rock dump) will remain losses that will be offset. It should be noted that Lake Denis, if it disappears due to lack of water supply, will be appropriately compensated.

The mine site will occupy a significant portion of the Lac Jean watershed. The expected effects are similar to what was calculated in 2012, with, however, a slight shift in the spring freshet.

BRM will have to carry out a follow-up study of the effects on the environment which will make it possible in particular to evaluate the impact of the effluent on the receiving aquatic environment and particularly on the fish and its habitat.

Despite the extended duration of the mine site, the quality of surface and groundwater will not have an impact different from the original project. Indeed, the many follow-ups will preserve the integrity of these resources. It should be noted that management in construction and operation is not different and that the concentrations expected for the effluent have not changed since the project authorized in 2013.

4.2.3.5 FISH

Considering the water quality and hydrology that will be similar, the apprehended impacts remain the same. However, there will be the eventual loss of Lake Denis which will be appropriately compensated.

IMPACTS BY DIRECT AND INDIRECT LOSSES

The new project decreases by 1.24 km in length of similar streams and 0.05 km² of lakes and ponds. These are the same plans and streams that will be affected and there are no new ones affected. In addition, Lac Denis will be replenished after mine operations and connectivity with its downstream will be restored.

A regular environmental monitoring program to identify impacts and verify the effectiveness of mitigation measures will be put in place at the beginning of mining operations. Monitoring will quickly identify problems and provide solutions throughout the course of operations.

IMPACTS BY TRUCKING ON FOREST ROADS

Potential impacts have already been assessed as part of the impact study, with impacts anticipated from dust emissions into streams and disturbance of fish habitat along Highway 210 (creeks).

The forest road will be maintained all year long, with the use of dust suppressants and fondants for authorized use. The impact study presented a number of common and specific mitigation measures to reduce the apprehended impacts.

4.2.3.6 AIR QUALITY

The air quality will respect the standards in force, but over a longer period. The footprint and location of the infrastructure is very similar, although the tailings pond may be a bit lower.

An atmospheric dispersion study of contaminants emitted during site preparation and operation shows that, based on available data and production forecasts, the project site will meet the particulate matter emission standard based on the rate of emissions supply of the process. All other modelled parameters are less than 100% of the standard.

The mitigation measures already specified in the impact study remain adequate, to which is added an air emissions management plan.

4.2.3.7 SOUND

The operation of the mine will be extended from 13 years to 42.5 years. However, the amount of equipment will be reduced compared to the initial 13-year operating scenario. The expected noise emissions will be less than the initial operating scenario. Note that there is no sensitive area within a radius of 10 km around the mine. Consequently, the noise emitted by the mine's activities will respect the standards in force, but over a longer period.

4.3 TRANSPORT

The postponement of the railway from the mine site to the CN railroad means that the transportation of the concentrate that will be produced will necessarily have to use forest roads for a minimum distance of nearly 30 km. Remember that the final scenario is not yet determined to access the mine nor to ship the concentrate.

4.3.1 REPORT OF THE RAILWAY

The postponement of the construction of the railway can be considered globally positive for the physical and biological environments. However, this has implications for truck transportation from the mine.

Because of this postponement of the railway, the apprehended impacts on the natural and human environments for its construction and exploitation will be non-existent. This represents 47 hectares of forestland and 17 of wetlands that will be preserved, but could also be impacted if the railway is eventually built.

4.3.2 TRANSPORT OF THE CONCENTRATE OUTSIDE THE MINING SITE

Prior to the addition of a rail line from the mine site to the project, the initial impact study considered trucking from the mine to a transshipment site about 30 km from the mine to unload the concentrate into wagons. However, transport was much more important considering a much higher daily production rate.

Studies are currently underway to determine the best scenario for shipping concentrate from the mine to the BRM secondary processing plant in Saguenay.

TRUCK TRANSPORT

The concentrate will be sent to the secondary processing plant in Saguenay. Both modes of transport (truck or rail) are still under study. When a decision is made on the mode of transport of the concentrate, BRM will submit to the COMEX and MDDELCC the details of the chosen option for transporting the concentrate.

The transport of the concentrate will not create any congestion since, according to the scenario selected, there will be only 25 or 67 trucks a day (50 or 134 round trips). Moreover, the expected impacts on forest roads between Highway 167 and the mine site are of minor importance, as this road is already being used by heavy trucks, either wood or gravel. However, the number of users varies according to the month and the year. The impacts expected on Route 167 also are of minor importance, since this road is already used by heavy trucks for deliveries of all kinds for industries and businesses in the Nord-du-Québec region. This represents an addition of 67 trucks per day, on an estimated daily traffic of 700 vehicles.

All roads used to transport the concentrate will be subject to mitigation measures (information and awareness, watering, etc.), monitoring programs and environmental monitoring. On the forest roads, the speed of the trucks envisaged will be about 50 km/h. Truckers will also be encouraged to use the radio to signal their presence.

SOUND IMPACTS

In the initial impact study, it was expected that the ore would be trucked between the mine and the transshipment site near the CN rail line. However, with the new mine operating scenario (final scenario not retained), the number of trucks per day going and going will increase to 25 trucks of 100 tonnes/day (50 passages/day) or 67 trucks of 40 tons (134 passages).

An assessment of the noise impact on the road network was made from the mine and with a simulation for sensitive areas nearby, for 11 residential areas along the way to the plant in Saguenay. The projected soundscape (with the project) was evaluated by adding the project vehicles to the current traffic flows. Thus, the number of transport truck passes between the mine and the plant has been added in all areas crossed. The results of the simulations show an increase in road noise of less than 1 dB in the majority of the sectors studied. An increase ranging from 1 to 3 dB in 3 of the 11 study areas was calculated. The sound impact of ore transport is null to low depending on the sector.

4.4 SOCIAL ENVIRONMENT

The insertion environment does not change, but given the duration of the project, uncertainties remain as to the future of the social and economic climate of the region.

4.4.1 ABOLITION OF THE CONSTRUCTION CAMP

There will be no construction camp due to reduced labour requirements for construction. Workers required for construction who cannot be found in the region will then be housed in the communities of Chibougamau, Chapais and Oujé-Bougoumou.

Since BRM cancelled the construction of the camp for 500 workers, its impacts on the physical and biological environment will also be cancelled. Moreover, the mine being located on the territory of Chibougamau, the studies revealed that the populations entirely decline the erection of permanent camps during the production, or the establishment of “fly in-fly out”. Thus, the cancellation of the construction camp is an element well received by the local population.

For the authorized project of a construction camp near the site, the impacts were relatively small given the short construction period and the remoteness of the site. The positive impacts of having a construction camp, however, brought some regional economic benefits, such as jobs (room maintenance, cooking, etc.).

With the modified project, the positive impacts are economic benefits for the region and the negative impacts are a possible increase in social unrest.

4.4.2 LAND USE

The land use and areas of interest of the Cree communities are always the same and the project having substantially the same footprint within a study area that has not changed, the modifications to the project will have the same impacts as initially defined, including trapline users 057.

The mine site will be restored, but some 30 years later than the initial project, notwithstanding the ongoing restoration of the tailings pond and waste rock dump. Full use of the entire territory will therefore be delayed. However, there is an agreement with the First Nations, as well as with the users of trapline 057.

The users of the territory, both Cree and Jamesian, are aware of the upcoming changes and BRM intends to circulate information, particularly on the increase in traffic on this road when the activities begin at the mine site.

HISTORICAL VALUE

The new footprint remains within the archaeological potential area and the completed inventories have not revealed any vestige of historical or prehistoric value.

Given that the modified project will have the same footprint on the ground and at altitude, with a few minor changes, there will be no different impacts on the quality of the landscapes.

4.4.3 EMPLOYMENT AND ECONOMY

There will be a number of jobs of the same size as the initial project, but all these jobs will be maintained over a longer period, which has a positive impact.

BRM will hire people from the region for the construction, operations and restoration of the mine. The benefits are that the infrastructure and services already in place will be used to their potential, thereby consolidating companies already well established in the region. Thus, the local economy will be greatly enhanced.

4.4.4 IMPACT OF WORKERS IN CITY

In this regard, BRM has already established links with various health and public safety bodies (Sûreté du Québec, Eeyou Eenu Police, CRSSS, hospital) and intends to continue communicating with these bodies to prepare the arrival of additional workers and to prevent any risk associated with their coming.

In addition, there may be an increase in wait times at the restaurant, pharmacy and hospital due to the increased use of these services. Nevertheless, the expected number of workers from outside the region is likely to be a small proportion of the existing population.

4.5 CLIMATE CHANGE

In order to consider climate change as part of the BRM mine project in Chibougamau, a simplified multi-risk resilience analysis was conducted. This analysis was guided by the new Infrastructure Canada general guidelines on Climate Change Optics (2018), section on project climate resiliency assessment, which is based on ISO 31,000—Management of Climate Change risks.

5 CUMULATIVE EFFECTS

5.1 GENERAL

Consideration of cumulative environmental impacts is an essential component of any environmental assessment. This approach considers the impact of project-related effects that are the subject of the environmental study, in combination with the effects of past, ongoing, or reasonably foreseeable projects. It is necessary to identify and put in place, from the initial phase of the project, all mitigation measures to limit and avoid any potential impact on the environment.

Cumulative environmental effects can be defined as changes to the environment as a result of combined action with other past, present and future human actions.

5.2 METHODOLOGICAL APPROACH

5.2.1 COMPONENTS VALORIZED BY THE ENVIRONMENT

Seven VECs were selected for the cumulative effects' assessment, namely:

- lakes and streams;
- vegetation, wetlands and special status plant species;
- birdlife and species with special status;
- traditional use of the territory;
- the use of the environment for the exploitation of other resources;
- the economy and employment;
- transport of workers and concentrate.

5.2.2 SPACE AND TIME LIMITS

SPACE LIMITS

For the selected VECs, given the distribution of potential projects, it was determined that the spatial boundaries approximately correspond to the Lac Chibougamau area, within a radius of approximately 150 km around Chibougamau.

TIME LIMITS

For the lower limit, the beginning of industrial use (wood and mines) in the Chibougamau region was considered, around 1950. Of course, the region was already used by the First Nations for millennia. For the upper limit, the BRM project was considered, a (modified) lifetime of 42.5 years, in addition to the restoration and monitoring of the site; it is thus established in the year 2070 approximately. This duration is longer than the average life of a mining project.

5.2.3 PROJECTS, ACTIONS OR EVENTS

Past, current or future projects, actions or events that may have an influence on the VECs retained have been identified for the purposes of the cumulative effects' assessment of the project. Only the most relevant for each VEC are then presented.

Where applicable, laws and regulations implemented from past time limits, and even before, concerning selected VECs were also considered for the cumulative effects assessment of the project, as some contributed to the protection of CVE selected.

To assess the cumulative effects of the project, the following activities were considered to be additional to those at the BRM project site:

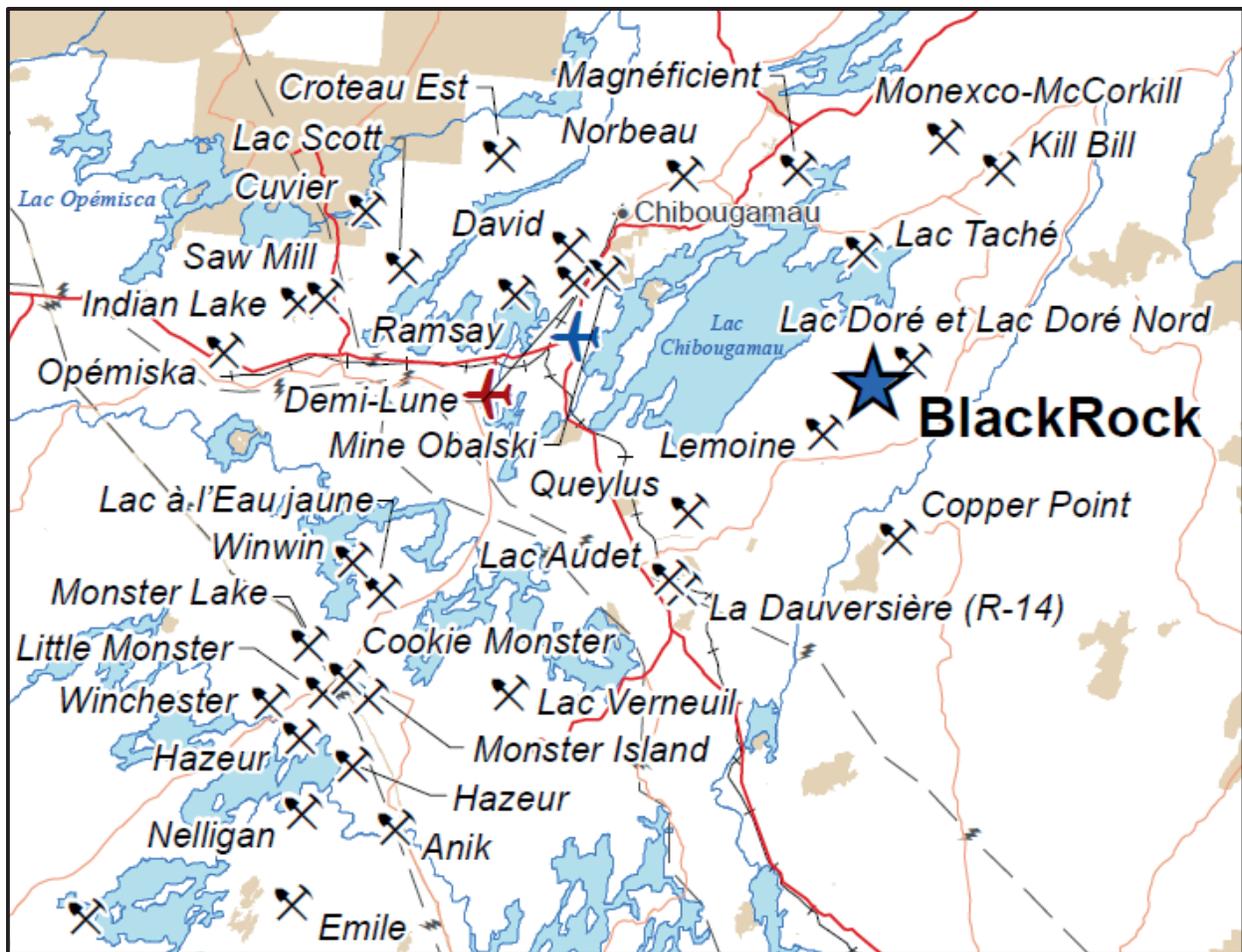
- mining activities;
- forestry activities;
- other important projects.

5.2.3.1 MINES

The mining industry occupies a central place in the development of the Chibougamau region. About 30 mines have been exploited for more than 60 years and the oldest mining operations in the region date back to the mid-1950s. The Campbell and Opemiska mines were the first mines to become operational respectively in 1955 and 1956.

The best-known projects that have been active in the region or are still active (exploration) are mainly located near Lac Doré, which is adjacent to the west side of Lac Chibougamau. The Troilus mine is the last to have ceased operations. This mine has been in operation for about fifteen years. The other previous mines, which are no longer in operation, left five tailings ponds in the Chibougamau area.

Currently, there are several exploration or development projects, either from former mine sites, or potential new deposits. Figure 5-1 shows the various mineral exploration projects in the Chibougamau region. Three potential projects are located in the immediate vicinity of the future BRM mine. Although there are several mining claims and exploration projects under way in and around the Chibougamau area, there is currently no indication of any serious evidence of a possible exploitation in the medium or long term.



Source : MERN 2017 — *Activité minière au Québec*

Figure 5 1. Mineral Exploration Activities in the Chibougamau Region

5.2.3.2 FORESTRY ACTIVITIES

Since the beginning of the 1950s, forest activity has contributed to modifying the entire biophysical environment of the Chibougamau region. In 1952, more than twenty mills were operating in the Chibougamau region. Chantiers Chibougamau Inc. currently operates the forest resources north of Lac Chibougamau. To the east and south, large-scale logging is almost complete.

In the vicinity of the future BRM mine there were commercial cuts about 30 years ago. The affected areas are now in the immature forest state. The integrated forest management plan presents few amenities around Lac Chibougamau and the surrounding area. There is, however, a potential area of intervention for regeneration cut west of Lac Armitage, near the future mine site.

5.2.3.3 OTHER PROJECTS

The region has been home to three Hydro-Québec transformer stations since the start of Phase 1 of the La Grande Complex in the early 1980s, namely the Chibougamau, Obalski and Obatogamau substations. A new 27 km-long power line will connect the future BRM substation to an existing line, currently linking the Chibougamau substation to the Chapais and Obatogamau substations.

In the region, various wind farm projects are potentially feasible. However, no official opinion in this respect allows to affirm a possible realization in the short or medium term, nor of their potential localization. Potential promoters include: Eeyou Power (potential project unknown), Oujé-Bougoumou Shakeegun LP (Chibougamau wind project, with directives received from MDDELCC in 2015) and CPV Canada Energy LP (Mistissini wind farm, with directives received from MDDELCC in 2013).

Various low impact projects are announced in the immediate vicinity of Chibougamau, an intermodal transshipment centre (Développement Chibougamau) and the development of 17 industrial sites (Gouvernement of Québec).

Finally, we should mention the restoration of the main mine in Chibougamau (Lac aux Dorés), which should begin in 2018 and last for about 6 years. The site consists of the former operating area, three tailings ponds, a polishing pond and two areas in Lac aux Dorés.

5.3 ANALYSIS OF POTENTIAL CUMULATIVE EFFECTS

5.3.1 LAKES AND WATERCOURSES

Several natural waterways and plans will be affected in whole or in part by the project. The new project involves fewer streams and the loss of water bodies will be the same. It should be remembered that the principles of compensation for fish habitat losses have been accepted by government authorities. In the region, the lakes and rivers affected by the completed mining activities, in progress or in the process of becoming (often potential updating of previous projects) are combined with the present project.

Lakes and streams are highly valued by the local and regional population because of the wildlife resources they contain. In addition, the quality of water as a support for wildlife habitats is linked to water quality and the maintenance of its quality.

Several types of mines have been put into production in the Chibougamau region and some of the exploited sites have not been restored. Fortunately, mining activities have been subject to significant regulations ever since. In addition, the restoration of the Principal mine will have positive effects on lakes and rivers and their habitats. About 5 km from the BRM project, the Lemoine Mine has been well restored.

However, the BRM project will cause fish habitat loss through the loss of lakes and streams. A compensation program started in 2015.

The cumulative effect for lakes and rivers is not considered significant since other past, current or potential projects are distant from each other, both spatially and temporally.

5.3.2 VEGETATION, WETLANDS AND FLORISTIC SPECIES WITH SPECIAL STATUS

The modified project touches practically the same environments as the original project. Losses of forest vegetation and wetlands are comparable, and removal of the railway from the mine site results in less environmental footprint with the modified project.

All projects in the region, mainly mining, completed or in the process of development, may affect wetlands and various plant species with special status. As with lakes and streams, newer or future projects are optimized from the outset to avoid and minimize effects on identified wetlands and flora and fauna. Also, it must be considered that all these projects have or will develop over a long period in addition to being dispersed in the region.

No additional mitigation measures, other than those that will be put forward for the BRM project or for potential projects, are needed. The potential cumulative effect expected on the vegetation and wetlands of the region is therefore considered not significant.

FLORISTIC SPECIES WITH SPECIAL STATUS

In the region surrounding Lac Chibougamau, 35 plant species have a special status. The project remains remote from biological refuges excluded from forest production, as well as designated biological refuges.

In the study area of the BRM project, only two special-status vascular plants have a probability of occurrence within 100 km of the study area, the bulbous arethusa (*Arethusa bulbosa*) and the utricular inverted flower (*Utricularia resupinata*). In addition, depending on the Quebec distribution of ostrich fern (*Matteucia struthiopteris*), it is possible that the plant is found in or near the study area. However, none of its three species was observed during the surveys conducted in the study area in 2011 and 2012.

All the mining projects in the region can affect various plant species with special status. On the other hand, in view of the legislation in force, the redevelopment and restoration of mining sites, in addition to compensation projects, restore the possibility for floristic species to recover some of the potential lost habitats.

No additional mitigation measures, other than those that will be put forward for the BRM project or for potential projects, are needed. The potential cumulative effect expected on the floristic species with status of the region is thus considered not significant.

5.3.3 AVIFAUNA AND SPECIES WITH SPECIFIC STATUS

The deforestation required for the BRM project, combined with other potential resource harvesting activities in the region, could impact nesting of birds and their habitats.

According to the various sources consulted and the inventories carried out, the study area and the region are likely to be visited annually by 145 bird species. From the various inventories and habitats encountered in the study area, the expected losses for the future mine site were evaluated:

- a breeding couple for waterfowl;
- 190 breeding pairs of land birds;
- a breeding pairs in shorebirds.

If they develop, potential projects will be optimized to limit the impacts on the various habitats harbouring avian species, not to mention the restoration, revegetation and reforestation programs.

No additional mitigation measures, other than those that will be put forward for the BRM project or for potential projects, are needed. The potential cumulative effect expected on the birdlife of the region is considered as not significant.

SPECIES WITH SPECIFIC STATUS—AVIAN FAUNA

In the region around Lac Chibougamau, some fifteen species of birds have a special status. In the BRM study area, four bird species are likely to be present: Common Nighthawk, Olive-sided Flycatcher, Canadian Warbler and Rusty Blackbird.

Considering the BRM project and the previous mines in the region, the main elements that could or could have an impact on the evolution of populations of special-status species are habitat loss and modification.

There are few accurate data available to perform a baseline state status of status species at the regional level. The Chibougamau area is part of the Bird Conservation Region 8, the Canadian Shield softwood forest. This region is the vast boreal forest.

No additional mitigation measures, other than those that will be put forward for the BRM project or for potential projects, are needed. The potential cumulative effect expected on the bird with special status of the region is thus considered not important.

5.3.4 TRADITIONAL USE OF THE TERRITORY

Traditional hunting, fishing, trapping and gathering activities have important cultural significance for First Nations communities in the area. They are practised over vast areas and on a seasonal basis. In addition, the territory is used to erect camps and there are sites of cultural, historical or archaeological interest.

The presence of the BRM project infrastructure will cover an area of approximately 7 km²; the total area of the new project presented is slightly less than the authorized project. This presence will change the use of the O-59 trapping site. Although this territory is vast (over 1,000 km²), it is largely occupied by Lac Chibougamau. Thus, there is not much land left. Also, the city of Chibougamau, the main mine and the development of the resorts make that the territory usable for the traditional activities is more restricted than in the past. Since the 1950s, previous mining projects have had an impact on traditional activities. The same goes for forest clearcutting activities and their impact on wildlife (especially moose).

All mining and forest activities in the region, whether past, present or potential, may affect the traditional activities of First Nations using the land, although the effect is spaced over time and space. In addition, several forestry or mining projects have or will benefit from restoration or reforestation plans that will allow revegetation of sites that will then be used by wildlife.

Although the elements of the fauna or flora affected by the infrastructure are common in the region, moose habitats potentially used for hunting by the tallyman and his family will be lost. However, the future power line to supply the BRM mine site, due to the small area affected, will have a minor impact on traditional activities in the region.

The cumulative effect for traditional activities practised in the region will be significant, given the limited territory and the presence of several other types of activities. To mitigate the effects of its project on the traditional activities of the First Nations, BRM has had many meetings with the users of the territory to make sure to reduce or even compensate for the disadvantages. In addition, a monitoring committee has been set up. BRM is committed to moving and replacing a currently used hunting camp.

Additional mitigation measures will be put forward, notably through the ERA with the Grand Council of the Cree Nation and the community of Oujé-Bougoumou, for the BRM project. The potential cumulative effect expected on traditional land use by First Nations in the region is thus significant but mitigated.

5.3.5 USE OF THE ENVIRONMENT FOR THE EXPLOITATION OF OTHER RESOURCES

Exploitation of other resources (mining, forestry, fishing and hunting) could be affected by the current mine project and other potential activities. The region is rich in minerals and some abandoned sites are currently undergoing new characterizations for the purpose of possible exploitation.

The areas affected by the deforestation necessary for the power line that will feed the future BRM mine will have a few hundred hectares. According to the 2013–2018 Tactical Integrated Forest Management Plan, for the 026-64 management unit, which includes the entire region surrounding Lac Chibougamau, the harvest potential

is 311,500 m³ / year. Thus, the deforestation caused by the project will not change the forest activities of the region, considering the small areas affected compared to the immense territory covered by forests.

Considering that forestry is a renewable resource, that mines are exploited over many decades and over a very vast territory, that the mining potential is very high and that companies are considering re-using former sectors that have become economically profitable. The cumulative effect of these various projects thus remains low value.

The L210 forest road is used by the Chantiers Chibougamau logging company when there is exploitation in this sector and the hunters also use it during the hunting season. First Nations also use it to visit their territory. The use of trucks by BRM on the L210 road to transport its concentrate to the railway or its plant in Saguenay will increase the traffic (approximately on average between 2.8 and 5.6 trucks/hour), but this road is designed for this and it will easily absorb extra traffic.

No additional mitigation measures, other than those proposed for the BRM project or for potential projects, will be required. The potential cumulative effect expected on the environment for the exploitation of the other resources of the region is considered as not significant.

5.3.6 ECONOMY AND EMPLOYMENT

The various activities in the study area, mining or otherwise, are mostly independent of one another, with no impact on the economics of other projects. If forestry activities are eventually envisaged in the area of the study area, good planning will coordinate the whole and avoid any negative repercussions.

The BRM project will have a direct positive impact on employment and local and regional economic benefits. New projects in the Chibougamau region would also have an impact on the quality of life of the citizens of the region and First Nations communities. This will result in improved living standards for many families, promote job security, and lead to economic and social stability at the local and regional levels.

No additional bonus measures, other than those that will be put forward for the BRM project or for potential projects, are needed. It is estimated that the cumulative effect expected will be of a positive (average) nature and that it will be the same for all projects in the regional area, whether they are already realized, in progress or will be eventually.

5.3.7 TRANSPORT OF WORKERS AND CONCENTRATE

The transport of the concentrate is not yet determined since various options are still possible and are still being analyzed. Trucking, however, is still needed from the mine, unless the railway is built. If the concentrate was transported by train, either from a transshipment station at Scierie Gagnon or the hypothetical one of Ville de Chibougamau, the concentrate would be transported using 100-ton trucks. This option represents 25 return journeys of 100 tons of trucks per day on Forest Road 210, thus 50 passages per day on the road, that is to say about two trucks per hour (considering the return trip). If the concentrate was transported directly from the mine to the plant in Saguenay, there would be 67 truck return trips of 40 tonnes (134 passages per day). This represents five truck passages of 40 tonnes per hour on average.

For the transport of workers, most will arrive at the mine site. As the work schedule is on two hours (7 am to 7 pm and 7 pm to 7 am), there would be 12 trips (round trip) of bus workers per day.

For operations-related trips (operational phase), an average of 12 return trips per day (approximately 80 per week) are estimated on the road (people travelling by truck [delivery parts, courier, equipment, explosives and pellets, fuel oil, garbage collection, etc.]), in addition to bus workers.

The transport of workers will be on forest roads that have been upgraded and whose traffic is variable depending on the season (hunting and fishing activities, traditional activities such as picking berries and medicinal plants) and years (logging, mining industry). The paths will be adequate for their use for BRM trucks (depending on which option has been chosen) and also for all users. Transporting some 30 km of logging roads could generate, for the scenario with the most trucks, up to 134 passages, which is relatively short over this distance and considering a 24-hour transport. These multi-user paths will be safe and maintained and transportation will be done by professional truckers. Transportation on standardized roads will have little effect on traffic, as demonstrated by the study submitted by BRM for its Saguenay plant project.

Compared to the initial project, the big difference is in the longest period of use of roads and roads (42.5 years instead of 13 years). However, considering the traffic, even with the worst-case scenario envisaged, the effects apprehended by the traffic remain low, considering the capacity of the infrastructures and their maintenance.

No additional mitigation measures, other than those proposed for the BRM project or for potential projects, will be required. The potential cumulative effect expected on the environment by the transport of workers and concentrate is therefore deemed not significant.

5.3.8 SUMMARY OF CUMULATIVE EFFECTS

Table 5-1 summarizes the cumulative effects on the VECs selected for the BRM project.

Table 5 1. Summary of cumulative effects

Valued component of the environment	Global effect
Lakes and streams	Not significant
Vegetation, wetlands and plant species with special status	Not significant
Avifauna and special status species	Not significant
Traditional use of the territory	Significant, but mitigated
Use of the environment for the exploitation of other resources	Not significant
Economy and employment	Positive
Transportation of workers and concentrate	Not significant

Considering that the project will not result in significant cumulative effects, no additional mitigation measures are deemed necessary to reduce cumulative effects.

6 SUMMARY OF CHANGES TO THE PROJECT

The BRM mine project in Chibougamau pays particular attention to the environment, to First Nations and to the local and regional population, while wanting to develop the field of economy and employment. Thus, with the objective of obtaining the global turnover, BRM presents to the COMEX the modifications and the update of its mine project.

The changes made to the 2013 authorized project are essentially of two kinds. First, the production of the concentrate has been greatly modified, in order to supply a secondary processing plant in Saguenay, put forward by BRM following a feasibility study to better protect itself from market fluctuations and to enhance the value of its products the metals contained in its deposit (iron vanadium titanium). This decrease in production has resulted in a change in the life of the operating period from 13 to 42.5 years. Secondly, the federal authorities refused in 2014 that Lake Denis would be used as a process water basin and detailed engineering has also advanced. Some infrastructure has been upgraded or relocated, but overall the project has a very similar footprint and does not touch new plans or watercourses. In addition, most of the activities and infrastructure remain unchanged, including the pit, the water treatment plant, the concentration process and the polishing pond. Finally, the postponement of the planned railway line between the mine and the CN railroad forces the return to trucking from the mine. The transportation of concentrate from the mine to the secondary processing plant in Saguenay is also an issue. However, the final scenario for transport is not yet established.

The apprehended impacts on the mine site during the exploitation period remain low, considering the plans of emergency measures and the constant and monitored surveillance of equipment and infrastructures. The final restoration to restore the natural environment will, however, be realized some 30 years later compared to the initial project.

Table 6-1 summarizes most of the differences from 2013 overall sales for the main activities and facilities authorized.

The Amended Project will not result in significant cumulative effects and no additional mitigation is deemed necessary to reduce cumulative effects. However, the traditional use of the territory by the First Nations has a significant effect, due to the new duration of the project, but mitigated by the agreements made.

BRM keeps its commitments to the Crees and Jamesians regarding jobs, business opportunities and communications in general, which remain the same as those taken in 2013 with the communities.

Table 6 1. Summary of Differences from 2013 Global Revenue on Major Infrastructure and Licensed Activities

Infrastructure and activity	Differences from the authorized project
Overall footprint used	<p>The total area of the new project (and thus the potential wildlife habitat) is virtually unchanged from the authorized project of 7.10 km - (7.57 km - considering abandonment of the railway) compared to 7.09 km². Vegetation loss or encroachment of 4.97 km - to 5.11 km². Impacted wetlands will be less with the new project, initially from 1.99 km—in 2013 to 1.92 km—in 2018. The new project decreases by 1.24 km in length of similar streams and by 0.05 km - of lakes and ponds. Directly impacted fish habitats will be less affected by the modified project. However, there will be the potential loss of Denis Lake (0.05 km²), which will be appropriately compensated. The mine site will be restored, but some 30 years later than the original project, notwithstanding the restoration of continuous operation of the tailings pond and the waste rock dump. Full use of the entire territory will therefore be delayed. However, there is an agreement with the First Nations.</p>
Ore extraction	<p>Compared to the initial project, there is a decrease of about 22.14 Mt of ore. Smaller mining equipment and in smaller size. The quality of the air and the sound environment will not change with the slightly modified footprint, but the duration increases.</p>
Concentrate Production	<p>Production decreases from 32,000 to 8,400 tonnes/day. BRM now expects to produce 830,000 tonnes of concentrate annually, while the initial project forecast annual production of 3 Mt of concentrate.</p>
Concentrate Transportation Out of the Mine	<p>Return of trucking between the mine and a transfer site for unloading in cars (30 or 60 km) or directly to BRM's secondary processing plant in Saguenay (450 km). Forest roads are used sporadically by seasons and years. Road transport will not have any significant effects considering current traffic.</p>
Tailings Pond With Fine and Coarse Tailings	<p>The project now has only one tailings pond, which includes fine and coarse tailings, in the same area as the old licensed pond. The area is 3.05 km—compared to 2.82 km—for the initial project. The tailings area will be slightly lower.</p>
Waste Pile	<p>Compared to the initial project, there is a slight decrease in capacity, but the management remains the same.</p>
Overburden accumulation areas	<p>The new project involves three overburden dumps while the initial project was to use the tailings pond. The overburden storage capacity will be lower with the new project (5.2 Mm vs 7.4 Mm³). Each overburden pile remains within its subwatershed.</p>
Water Management	<p>The slight redevelopment of the infrastructure has altered the directly encroached surfaces, as well as the surface water flow. The discharge to the final effluent will not have very different effects than those envisaged for the project authorized in 2013.</p>
Service infrastructure on the mine site	<p>Slight changes in location without environmental impact since within the mine site already occupying a surface.</p>
Removal of workers camp for construction	<p>With the modified project, the positive impacts are economic benefits for the region and the negative impacts are a possible increase in social unrest.</p>
Change of use of Denis Lake as a process water tank	<p>In the authorized project, the combined area of Lake Denis and its basin for process water was 0.25 km - while Lake Denis is only 0.05 km². Drying after a few years. The loss will be offset and included in the fish habitat compensation plan.</p>
Electricity requirements	<p>The electricity demand is 23.9 MW whereas for the authorized project it was 49 MW.</p>
Jobs and local labour	<p>There will be a number of jobs of the same size as the initial project, but all these jobs will be maintained over a longer period, which has a positive impact.</p>

7 ANSWERS TO QUESTIONS

Main issues of interest are present in this summary.

- *Question: Condition 16 of the overall BOD states: “The proponent must submit to the Administrator for approval, four (4) months after the project authorization, a program for complete characterization of the receiving environment, consistent with the proposed follow-up program, condition 17, particularly for the tributary of Lac Jean, Lac Jean, Lake Denis and Villefagnan Creek and control environments. The characterization of the environment must be carried out before the aquatic environment is affected by construction work and the results will be submitted to the Administrator one (1) year after the authorization of the project. The elements to be included in this program are, minimally: the quality of surface water and groundwater, the quality of sediments and the state of benthic invertebrate communities.”*

In Table 2.2, the proponent indicates that the characterization program was completed in June 2013. In fact, the proponent sent its responses to condition 16 on June 27, 2014, to the JBNQA Administrator and completed his mailing. July 9, 2014, in a document titled “Responses to Global Sales Conditions 3, 4, 10, 16 and 29”².

A letter was sent to the Proponent on October 24, 2014, advising that COMEX was continuing the analysis of condition 16. On December 17, 2014, the Administrator submitted a series of 34 questions and comments.³

This document specified in particular the missing elements to the characterization of the receiving environment which must be integrated into the characterization program. Since, since December 2014, the MDDELCC has not received any program to characterize the receiving environment and no new information on this subject, the questions and comments addressed to the proponent remain relevant. However, the proponent did not indicate how it would be taken into account. In order to meet Condition 16, the proponent must submit a comprehensive characterization program that considers:

- *Questions and comments sent on 17 December 2014;*
- *Changes to the project presented in the third amendment to the certificate of authorization and the questions and comments presented in this document.*

Finally, as required under condition 16, the proponent must complete and submit to the Administrator the results of the inventories provided for in the characterization program prior to construction.

Reply

- *A full characterization program for the receiving environment was submitted in August 2018 for approval. This program includes surface quality, groundwater, sediment and the state of benthic invertebrate communities. This program takes into account the questions and comments made in December 2014 regarding the 2013 characterization, as well as the questions and comments issued by COMEX in response to the request to modify the 2013 global sales (BlackRock Metals 2017).*

Question: As per Condition 6 “Chemical Details” of the overall BOD, the proponent indicated that the requested information (Material Safety Data Sheets, Aquatic Toxicity, Concentration Used, etc.) for the chemicals used in the cooling system and Purge neutralization, in the iron concentrate production process and in the final effluent treatment unit, would be provided at the CA request. However, to date, this

² MÉTAUX BLACKROCK. *Réponses aux conditions 3, 4, 10, 16 et 29 du CA global — Projet minier BlackRock*. Juin 2014. 9 p. et 2 annexes.

³ MDDELCC. *Questions et commentaires — Projet d’exploitation du gisement de fer au complexe géologique du lac Doré par Métaux BlackRock inc. — Réponses à la condition 16 – Dossier 3214-14-050*. Décembre 2014. 13 p.

information has still not been provided as it is needed to assess the impact of the proposed changes. The promoter must provide this information.

Reply

Industrial water will first be decanted once in the tailings pond. Then, they will be transferred to the polishing pond for a second settling where they will either be recycled for the process or sent to the treatment plant in the months during which there must be an effluent to the environment.

At the treatment unit, the process is as follows: addition of flocculants, decantation and pH adjustment if necessary. The sludge is returned to the tailings pond.

The only chemicals in the concentrator and the treatment plant are a flocculant for sedimentation of the tailings as well as ferric sulfate and sodium hydroxide for the treatment of the final effluent. In the concentrator, the flocculant will be prepared at a concentration of 0.5% and will be diluted in-line to the thickener at a concentration of 0.05%. At the final effluent treatment unit, the flocculant will have a concentration of 0.2%. Ferric sulfate and sodium hydroxide will be at concentrations of 60% (12% Fe³⁺) and 50% respectively.

Estimated quantities used annually at the final effluent treatment plant are 8,760 kg of dry flocculants, 876,000 kg of ferric sulfate (60% w/w solution) and 449,000 kg of sodium hydroxide (50% w/w solution). Typical Material Safety Data Sheets are in Appendix F.

- **Deposit and mineralization.**
- *Question: What about the project to mine the second pit (Armitage Zone)? In the case where the Armitage zone is exploited, will the dimensions of the tailings pond and the waste rock pile still allow the possible operation of this second pit?*

Reply

The tailings pond, which combines fine and coarse tailings, has the expansion capacity required to accommodate tailings if the Armitage pit were to be mined. For waste rock, a second pile should, however, be considered. For the moment, the current pit will allow exploitation over 42.5 years.

Geochemistry of Tailings and Waste Rock

- *Question: Regarding the characterization of tailings and waste rock, the proponent mentions that they are considered to be low risk, that they are not leachable and will not generate acid. Few results are available to confirm that the management mode for the 226 Mt of waste rock and 94.7 Mt of tailings generated by the ore treatment process is appropriate. A complete characterization study (total metal content, acid generating potential, leaching tests [TCLP, SPLP, CTEU-9] and kinetic assays) with a sufficient number of results should be performed. This study must present all the results obtained as well as the conclusions regarding the classification of tailings according to anticipated environmental risks. Although the project has already been approved, this issue remains a concern.*

Reply

The global turnover issued imposes conditions that are particularly relevant to the characterization of tailings and their management method:

- Condition 2: Percentage flow study under the tailings accumulation area.
- Condition 3: Geochemical Characteristics Monitoring Program for Tailings.

In this context, the information required under conditions 2 and 3 should make it possible to respond to the concerns raised by QC-29 concerning the characterization of tailings and how they are managed:

- Condition 2: The required percolation flow study will ensure that the tailings management process is appropriate and meets the requirements of Directive 019.
- Condition 3: In the modification request, the proponent mentions that a program for monitoring the geochemical characteristics of mine tailings has been deposited (this program has not been evaluated by the DEU). In the context of this program for monitoring the geochemical characteristics of mine tailings, a complete characterization should also be carried out at the beginning of the project (or depending on the availability of tailings), which would meet the concerns of the DEU. Such characterization should include the following elements:
 - summary of the characterization report;
 - introduction;
 - geological context of the project and characterized materials;
 - sampling program (representative samples of the various geological units and in sufficient number);
 - methods of analysis and test protocols;
 - total content of metals;
 - acidogenic potential;
 - leaching tests (TCLP, SPLP, CTEU-9);
 - kinetic tests, if necessary;
 - results of analyzes and tests;
 - interpretations of the results;
 - conclusions.

Thus, the answer to this question will be obtained when BRM provides the information required under conditions 2 and 3 of the CA issued in 2013.

- *Question: The proponent must complete, according to Condition 2 of the overall CA, hydrogeological studies to demonstrate that the maximum daily percolation rate of 3.3 L/m² will be met under tailings ponds and the waste rock pile. It should be mentioned to the proponent that the hydrogeological study must also demonstrate that the sealing measures put in place make it possible to avoid a significant degradation of the quality of the groundwater according to the objectives of protection of the quality of groundwater of the Directive 019.*

Reply

A geotechnical study is underway for the planned location of the tailings pond (fine and coarse assembly) and the waste rock dump. Fieldwork commenced in February 2018 and is expected to be completed in August 2018. The modelling study will then be completed with the results of the geotechnical study. The results of these geotechnical studies and modelling studies will be forwarded to the Administrator upon receipt, scheduled for December 2018.

Domestic Wastewater

- *Question: The CA change request states, “Domestic wastewater treatment units will be installed in the concentrator as needed”. The proponent must explain how the treatment of domestic water generated at the concentrator is considered optional.*

Reply

The request was made prior to an adequate definition of the exact locations of the sanitary infrastructure (washrooms, lunch rooms, etc.), after the December 2017 global sales change request document. The assertion noted in the document: Domestic sewage treatment units will be installed in the concentrator as required “did not mean that the treatment would be optional, but that the treatment units would be installed at the places that will have been determined later according to the locations determined during detailed concentrator engineering. A treatment system will be installed near the concentrator.

Polishing pond water treatment unit

- *Question: As required by Condition 9 of the Bylaw, the proponent must indicate whether it still plans to drain uncontaminated runoff directly into the tributary of Lac Jean, after treatment for suspended solids (SS).*

Reply

The non-contact runoff, which will be intercepted by the ditch along the road upstream of the tailings pond, will be treated for SS and then drained directly into the tributary of Lac Jean. They will be checked regularly.

Surface Materials

- *Question: On page 22 in the 3rd and 4th paragraphs of the 2013 FaunENord report, it states: “The analyzes revealed some variation in the mercury content of the soil, which tends to be greater east of the transect to the west, with concentrations above the normal background of 0.3 mg/kg (Criterion A, MNR, 2002) for soils in the Superior Geological Province in which the area is located is studied. 10 stations have a content equal to or greater than 0.3 mg/kg, with station S which stands out with 37.8 mg/kg, i.e. 126 times the content of criteria A.”*

The report states that “stations with above-standard metal concentrations are located in the eastern part of the transect”. Can we make a link between these grades and the rock in place in the eastern part of the site? If applicable, the proponent must justify its response.

Reply

No link can be made between the grades obtained and the rock in place in the eastern part of the site.

- *Question: On page 22 of the FaunENord report, it is stated that the result for zinc is 426 mg/kg at the “S-28” station while the criterion for zinc is 120 mg/kg. At Station “S-32”, the result for mercury is 37.8 mg/kg, which is 189 times higher than Criterion A in the Response Guide. According to J. Choinière and M. Beaumier (1997) in their book entitled “Geochemical background noise for different geological environments in Quebec”, the geometric mean for mercury in soils and sediments in the Chibougamau sector is 0.1 mg/kg.*

First, the certificates of analysis of these samples must be verified to verify that it is not a transcription error. Secondly, a check with the laboratory is required to confirm the validity of this result. If both of these elements are in compliance, and in view of the exceeding of criterion “C” in the intervention guide, additional characterization of the area where this sample was taken is required.

Reply

The certificates of analysis presenting the results of these samples have been verified and a validation has been carried out by the laboratory. This is not a transcription error. The representative of the laboratory

confirmed that the results appearing on the certificates are valid, but that it is impossible to repeat the analyzes, since the soil samples in question have been discarded. Additional characterization will be performed in the area where these samples were taken.

Quality of Surface Water and Sediments

- *Question: In the tributary of Lac Jean, five samples (exposed sites) were taken downstream of the future mine effluent discharge point. The proponent must specify if the stations have been established in accumulation zones. Field observations make it possible to identify areas of accumulation (meanders, troughs, fine sediments); at least one station must be established in such an area.*

Reply

For the 2013 stations, two of them (SA-1 and SA-2) are at points where the river has a curve. Although the curvature is not as pronounced as in a meander, one of the banks must nevertheless be subject to erosion and the other to sedimentation. In this sense, we consider that the SA-1 and SA-2 stations are in the accumulation zone. Attention may be paid during sampling work to concentrate sampling near the sediment-prone shore at each of these stations. The other stations are located in a straight section of the tributary and of variable depth. Based on the results of the 2013 study, the addition of a station in the 30–80 m area of the discharge point appears relevant, since at this point the stream reaches its maximum depth, in the section downstream of the effluent discharge point.

- *Question: Five samples (controls) were collected from Neveu Lake and five samples were also collected from the outfall. Considering, in particular, that its bathymetry is not presented, the proponent must verify whether the sampled control stations are comparable to the exposed sites on Lac Jean.*

Reply

With respect to the bathymetry of Lac Neveu, this has never been done. The stations sampled during the 2013 work had an average depth of about 2 m. Lac Jean, whose bathymetry was published in the impact study (Entraco 2011) is of a slightly lower depth (of the order of one metre) in the area where the lake will receive the water coming from the effluent of the mine via its tributary. The particle size of the substrate of the two lakes at sampled stations is comparable.

- *Question: In the Neveu Lake outfall, it must also be determined if the stations were established in accumulation zones; at least one station must be established in such an area.*

Reply

In the Neveu Lake outfall, stations ERC-4, ERC-2 and ERC-1 are located in curvatures of the creek. As in QC-69, we consider these stations to be accumulation zones.

Hydrogeology

- *Question: The initial characterization of the Lac Jean and Neveu sediments must be completed by the physicochemical analysis of five samples taken from the deepest part of the lake. In addition, new sediment sampling stations must be established in the Lac Jean outfall and Villefagnan Creek, if these streams have accumulation zones.*

Reply

The update of the receiving environment characterization program includes sediment sampling stations in the Lac Jean outfall and in Villefagnan Creek. During field trips, the search for accumulation zones in these rivers will be carried out in order to collect sediment samples.

Five additional sediment samples will be collected from the deepest zone of Jean and Neveu lakes and analyzed to complete the initial characterization.

- *Question: No information regarding the hydrogeological context or initial groundwater quality is available in the documents provided by the proponent. However, as required under conditions 16 and 17 of the global CA and in compliance with article 2.3.2 of Directive 019, the proponent must submit a characterization program and a groundwater monitoring program.*

The characterization program should include collecting the information necessary to describe the hydrogeological conditions of the study area (e.g. hydraulic conductivity, groundwater velocity and direction of the flow) including the direction of groundwater flow.

As part of the characterization program, the proponent must provide a piezometric survey and the collection of groundwater samples prior to the commencement of excavation work (construction phase). This initial piezometric survey must make it possible to determine the flow direction as well as the hydraulic gradient of the groundwater and to determine the sectors to be favoured in the framework of the monitoring of the quality of the groundwater, namely the sectors situated downstream hydraulic of the hazardous facilities (Article 2.3.2.1—Directive 019). In addition to determining hydrogeological conditions, groundwater samples must be collected to determine reference values for the physicochemical conditions of groundwater.

The results of the groundwater surveys and their interpretation must be compiled and interpreted in a follow-up report. Section 4.3 of the “Guide to Sampling for Environmental Analyzes” of the “Centre for Environmental Analysis Expertise”, February 2012, provides the minimum information that should be included in this report.

The proponent must also provide for the implementation of groundwater monitoring in accordance with Directive 019, including a piezometric monitoring of the aquifer’s behaviour over time. A follow-up of the impact of the drying up of Lake Denis and the pit being excavated on the local aquifer must be planned.

Reply

Much information on the hydrogeology and groundwater quality of the site is presented in Section 10 of Volume II of the Environmental Impact Statement (Entraco 2011). Data presented in this report include piezometric surveys, variable load permeability tests, and physicochemical groundwater analyzes.

The update of the receiving environment characterization program includes all additional analyzes required to establish reference values for the physicochemical conditions of groundwater.

Biological environment

- *Question: For each component of the biological environment, following consultations with Cree users in the territory, the proponent must integrate the species of interest for these users into each of the sections concerned.*

Reply

Since the impact study and during the requests for changes to the terms and conditions of the overall turnover obtained in 2013, consultations with Cree users have continued. The use of the territory remains the same.

For example, the project area is used for blueberries harvesting, partridge, waterfowl, bears and moose hunting. Fishing is mainly done in Lac Chibougamau (especially walleye, northern pike, lake trout and brook trout) and more marginally in Lac Armitage. The main users of the wildlife resources in the study area are the Wapachee family. Their moose hunting area is located east of Lac Armitage near Laugon Lake. They trap several fur-bearing animals and hunt Canada geese and several species of ducks along the Armitage River and Villefagnan Creek.

Birdlife

- *Question: In the second paragraph of Section 5.2.3, the proponent indicates twice the species “Red-tailed Hawk”. The proponent must specify if one of them would be rather the small nozzle.*

Reply

It is a mistake. The sentence should have been:

“On the other hand, the birds of prey that frequent the study area are: osprey, American kestrel, red-tailed hawk, bald eagles, harrier Saint-Martin, brown hawk and the Great Horned Owl.”

- *Question: Several figures are presented in section 8.2.5 without indicating their source. The proponent estimates, among other things, the extent of losses to avian wildlife. In addition, for species with a precarious status, it is mentioned that there will be losses, but no estimates are presented. The proponent must indicate where these estimates come from.*

Reply

These estimates come from the following document:

GENIVAR. 2013. BlackRock Metals Mining Project—Exploitation of the iron ore deposit at the Lac Doré geological complex. Responses to COMEX Questions and Comments, 2nd Series, Volume 2. Appendix 11, Complementary Study of the Biological Environment (GENIVAR September 2012).

For species at risk, between one and three breeding pairs of Canadian Warbler and Rusty Blackbird may be affected by the project. In the case of Olive-sided Flycatcher, the loss is estimated at about two breeding pairs (section 5.2.2.5, page 5–20 In GENIVAR September 2012).

Terrestrial Fauna

- *Question: Species designated as threatened or vulnerable or likely to be identified by the proponent as potentially present in its study area. The proponent must update the list of these species by consulting the list of species designated as threatened or vulnerable or likely to be4 and make a new request for information to the MFFP. It must also document their potential for presence from existing data and their preferred habitats and, if necessary, carry out the required inventories. It must also evaluate the impact of the modification of the project on these species and plan measures to minimize the impacts of the project on them.*

Reply

The modified project has essentially the same footprint and does not touch new media types.

A new request for information was sent to the Ministry of Forests, Wildlife and Parks (MFFP) on June 15, 2018. The responses to the MFFP to this request are available in Appendix R. According to the MFFP, the Vole Rocks (*Microtus chrotorrhinus*), a micromammal species likely to be designated threatened or vulnerable in Quebec, has been identified in the study area. The various occurrences reported by the MFFP are all outside the project area, including several spawning grounds, including four yellow walleye (*Sander vitreus*) spawning grounds recognized as wildlife sites of interest. In addition, according to the MFFP, no mapped wildlife habitat is found within the study area. The apprehended impacts do not differ from the authorized project.

⁴ <http://www3.mffp.gouv.qc.ca/faune/especes/menaces/liste.asp#susceptibles>

The impact study (Entraco 2011) reported that the rock vole has a high potential to be in the study area. As set out in Condition 16 of the global CA, a complete characterization program of the receiving environment will have to be carried out.

Consultations

- *Question: The proponent mentions that meetings have been held with various community stakeholders since July 2010. The proponent must indicate whether the concerns expressed in this section were expressed before or after the modifications that are the subject of this application to amend the regulation..*

Reply

BRM has modified its project in recent years, particularly because of the fall in the price of iron in 2013. Convinced of the quality of its deposit, BRM reviewed its business plan and decided to integrate a second plant transformation to its mining project. The port of Saguenay was chosen as the site of reception of the factory.

Despite regular communication, BRM recognizes that stakeholders may have had difficulty keeping up with project developments. Information mechanisms have been put in place, together with the elected representatives of the neighbouring communities, for example the monitoring committee and the regional committee.

Stakeholders were therefore clearly informed of the changes to the project before the modification request to the MDDELCC. However, we are far from convinced that they had a real understanding of the different processes to which the new BRM business plan was subject. In view of this, BRM continued its information campaign with stakeholders, including information sessions, buying advertising space in the local weekly, radio, formal and informal meetings with elected officials. and various organizations that are following with interest the development of the BlackRock mining project.

- *Question: In section 4.2.2, the proponent refers to an agreement (PLA) signed in 2013 and that this agreement was updated in 2016. The proponent must provide the elements of this agreement that are relevant to the analysis of this project with respect to measures related in particular to employment, training, communications, monitoring committees and the results of the implementation of these measures.*

Reply

The relevant elements of the ERA between BRM, the Oujé-Bougoumou Cree Nation, the Grand Council of the Crees (Eeyou Istchee) and the Cree Regional Authority (hereinafter collectively the “GCC [EI]/ARC”), are the following:

- to ensure the establishment of a long-term relationship between the parties based on mutual trust and respect during all phases of the project, through a sustainable development approach;
- to establish a framework through which communication and cooperation between the parties can be achieved in the performance of their respective obligations under ERA;
- to provide training, employment and contract opportunities for the Cree and particularly the Cree of Oujé-Bougoumou to the project, through joint efforts of the parties;
- to provide for cooperation and involvement of Cree parties with BRM in environmental monitoring during all phases of the project;
- To maintain a respectful relationship with the Oujé-Bougoumou trapline 059 family and to provide for specific measures to give certain benefits to Oujé-Bougoumou trapping ground, including through training, employment and contracts opportunities; participation in environmental monitoring;

- to provide for the social acceptability of the project by the Crees and to confirm their support for the development and operation of the project;
- facilitate the development and operation of the project in an efficient, profitable, safe and environmentally sustainable manner;
- to provide a non-punitive, solution-oriented and mutually beneficial approach for the proper implementation of ERA, through an Implementation Committee and other joint mechanisms.

A short summary of the chapters of the ERA is presented below.

TRAINING AND EMPLOYMENT

The purpose of the chapter on training and employment is to develop a skilled workforce and promote the employment, integration, advancement and retention of the Cree in all business units of the mining project.

For the purposes of this chapter, the parties have agreed to establish long-term, non-enforceable short-term employment goals to achieve a workforce that reflects the proportion of the Cree population over the long term. on the entire population of the Eeyou Istchee James Bay region.

The parties also agreed to cooperate in their respective programs and training measures to facilitate the hiring of the Cree, their advancement and progression in all business units of the mining project.

BRM will develop and implement its internal policies to reflect and respect the ERA.

Finally, BRM and Oujé-Bougoumou will jointly contribute annual amounts to a training fund intended to support training programs and particularly programs related to the mining industry in general and the mining project.

WORKING CONDITIONS AND POLICIES

The purpose of the chapter on working conditions and policies is to provide for the adaptation of certain working conditions for Cree BRM employees, in order to facilitate their integration and to set up certain policies applicable to the entire workforce.—working of the mining project.

BUSINESS OPPORTUNITIES

The purpose of the chapter on business opportunities is to provide business opportunities for Cree companies, particularly the Cree enterprises of Oujé-Bougoumou, and to encourage and facilitate the development of Cree enterprises in the context of the project. mining.

SOCIAL AND CULTURAL ASPECTS

The purpose of the chapter on social and cultural aspects is to provide for cooperative measures between the parties in a manner that respects and promulgates Cree society and culture, particularly traditional activities in the territory.

ENVIRONMENTAL ASPECTS

The purpose of the chapter on environmental aspects is to provide for the cooperation of the parties in the development and implementation of the BRM environmental management system and the environmental monitoring of the mining project.

FINANCIAL ASPECTS

The purpose of the chapter on financial aspects and to establish the terms under which BRM payments to the Cree parties will be established and made. It should be noted that the chapter on financial aspects, as well as the amounts of the various funds provided for in the ERA, are confidential.

IMPLEMENTATION COMMITTEE

The purpose of the chapter on the Implementation Committee is to provide a framework for the parties to implement IBA cooperatively and effectively.

RESOLUTION OF DISPUTES

The purpose of the Dispute Resolution Chapter is to provide dispute resolution procedures that are amicable, cooperative and effective.

GENERAL TOPICS

The purpose of this chapter is to provide for general topics that are frequently found in similar agreements. Among the topics, we find in particular:

- the representations of the parties and the approval process;
- the application of the James Bay and Northern Quebec Agreement and the consent and support of the Cree parties;
- transfer and change of control;
- amendments and future agreements;
- the confidentiality of the information exchanged between the parties;
- the opinions;
- cases of force majeure, temporary closure, the term of the agreement;
- the cases of default, the end of the agreement and the survival of the bonds.

Risks of environmental contamination

- *Question: The proponent states that “the train option was well received by several participants. Some visitors asked for information on the methods used to ensure that dust would not be scattered during rail transport. The proponent must indicate whether these comments were made in connection with the construction of the railway, which has been delayed until further notice. In general, the proponent must present the measures it intends to take to limit the dispersion of dust related to transportation.*

Reply

BRM favors rail transport of concentrate produced at the mine. However, currently the final choice for the transport of the concentrate is not done.

Dust mitigation measures can be found in the mine impact study (Entraco 2011), in sections 4.2.3.3 and 4.2.3.5 of this document and also in Appendix M, which presents the plan for management of atmospheric emissions.

Technological risks

- *Equipment failure, impacts of a malfunctioning water treatment plant, and water supply to plant facilities should be included in Table 6.1.*

Reply

Table 8-1 presents the update of Table 6-1 discussed on the technological risks of the project.

Table 8 1. Technological risks of the project

Risque	
Petroleum Products	Oil spill during road construction
	Spill during the transportation of petroleum products
	Major spill of petroleum products tanks
	Leakage of petroleum product tanks and related equipment
	Oil spills in the garage or other workshops
	Spilling of petroleum products in the pit, rolling roads and dumps
	Uncontrolled leachate during storage of contaminated soil
Reagents	Spill during transport of reagents
	Spill at the plant during reagent handling
	Emission to the factory of uncontrolled explosive dusts
	Fire or explosion in the factory or reagent warehouse
	Leakage of a reagent tank
Dangerous waste	Spill at hazardous waste storage site
	Fire or explosion at the hazardous waste storage site
Explosives	Abandonment of badly burned explosives in the pit
	Spillage of raw materials for the manufacture of the explosive
Dikes	Liquid discharge due to breakage of dike
Concentrate transport by truck	Spill of concentrate
	Spill of gasoline / diesel
	collisions
	Human error
	Lack of road signs
	Extreme weather conditions
Equipment break up	Spill of petroleum products or dangerous in the environment
	Injuries to workers
	Fires or explosions at the site of the defective equipment
Water treatment Unit	Discharge of untreated water into the environment
	Discharge of treatment products into the environment
Water for concentrator	Stopping operations

- *Question: The proponent must submit two preliminary emergency plans, one for the construction phase and one for the operation phase.*

Coordination must be ensured between the municipal civil protection plan of the City of Chibougamau and the proponent's emergency measures plan. It is important to note that joint emergency preparedness programs need to be updated regularly to ensure their effectiveness.

These plans will have to be sent to the emergency responders concerned who could provide support in the event of a disaster, particularly the City of Chibougamau. They will also be sent to departments and agencies whose mandate includes emergency measures, including the Department of Public Safety, the Department of Health and Social Services and the Cree Board of Health and Social Services of the Bay. James (CCSSSBJ).

These final and updated plans must be submitted to the MDDELCC before the mine is put into operation.

Reply

Preliminary emergency plans for the construction and operation phases are presented in Appendix Q.

In addition to the emergency plans, BRM will present an evacuation protocol for the wounded. All these plans will be in harmony with the municipal civil security plan of the City of Chibougamau. To do this, BRM will send its plans to the relevant stakeholders who can provide support in the event of a disaster. In addition, BRM will regularly update joint emergency preparedness programs to ensure their effectiveness.

Here is the list of stakeholders to whom it will be useful to send emergency plans:

MANDATORY

The City of Chibougamau:

Jean-Sébastien Gagnon
General Director of the city of Chibougamau
Such. +1 418-748-2688 ext. 2241
Email: jeansebastieng@ville.chibougamau.qc.ca

Upon receipt of the preliminary plans, the Director General will be responsible for forwarding the emergency plan for BRM to the appropriate stakeholders. A peer review will modify the deficiencies if necessary to harmonize the plans with that of the civil security of the city of Chibougamau.

Department of Health and Social Services (CRSSS):

Michel Leblanc
ambulance
Such. +1 418-748-3575 ext. 75,001
Email: michel_leblanc@ssss.gouv.qc.ca

Upon receipt of the casualty evacuation protocol, Mr. Leblanc (or his colleague Mr. Mathieu Thibault) will evaluate the latter to make a modification request if necessary.

OPTIONAL

According to Ms. Annie Groleau (personal communication) of the Ministry of Public Security, it has no legal obligation to transmit the emergency measures plan to the latter. It is up to BRM to decide who to send emergency response plans to, i.e., local stakeholders.

Directorate and regional offices of the Abitibi-Témiscamingue Civil Security, Nord-du-Québec:

Gaétan Lessard
Director, Civil Security
Such. +1 819-763-3636 ext. 42,701
Email: securite.civile08@mss.gouv.qc.ca

Mr. Lessard also argues that the transmission of the emergency measures plan can be transmitted on a voluntary basis to civil security. On the other hand, BRM must ensure that its emergency measures plans are in harmony with the municipal civil security plan of the city of Chibougamau. It is therefore on a voluntary basis that BRM will forward its preliminary plans of emergency measures in the event of a disaster.

Cree Board of Health and Social Services of James Bay (CBHSSJB):

Jason Coonishish
Coordinator of pre-hospital emergency measures
Such. +1 418-923-3355
Cell. +1 418-770-6516
Email: jason.coonishish@ssss.gouv.qc.ca

Still on a voluntary basis, Mr Coonishish wants BRM to send him the emergency plans and the casualty evacuation protocol in order to be able to intervene in case of need for additional help.

- *Question: The proponent must set up a consultation and emergency planning committee in close collaboration with the City of Chibougamau to ensure the safety and well-being of the population. Also on this committee will be departments and agencies related to emergency measures including, at their request, the CBHSSJB.*

Reply

BRM is committed to setting up a consultation and emergency planning committee with the City of Chibougamau and, at their request, with the CBHSSJB in the fall of 2018.

- *Question: The facilities and the mine could pose a physical hazard to the users of the territory. They could venture into dangerous areas on foot or by snowmobile. The proponent must indicate the security measures (e.g. barriers), agreements or communications that will be put in place to minimize potential risks due to physical risks (from falls, traffic, etc.).*

Reply

The security measures and communication agreements that will be put in place to ensure the safety of users of the territory remain the same as those provided for in the project authorized in 2013.

A safety barrier will be put in place on the access road to the mine, about 1 km before the mine site. A gatehouse (security post) will also be present at the entrance of the site to manage the entrances and exits of the site and to ensure that people entering the mine site are escorted by BRM staff to ensure their security.

Warning signs will be posted at other places that could be used to access the site (e.g. previous forest roads). The sections of the previous paths that could make access to the site possible will be destroyed or decommissioned. Security cameras will also be set up on the site.

Regular communication with the Wapachee family (family impacted by the project) is planned, to inform them of work in progress on the mine site or on the access road and any potential or unusual danger that may be connected to it. In the event of unusual or exceptional activities planned on the access road to the mine, press releases will be presented to the public by the radio and the local newspaper.

Global report

- *Question: In section 7.2.3, the introduction of invasive alien species should be taken into account and mitigation measures should be considered to prevent their spread.*

Reply

The following mitigation measures are proposed to prevent the introduction and spread of invasive alien species (IAS):

- Be sure to clean the construction machinery that will be used before arriving at the work site so that it is free from mud, animals or plant fragments that could contribute to the introduction or spread of EEA.
- Ensure that the topsoil and materials that will be used during the work do not come from areas affected by IAS.
- At the end of the work, reprofile the disturbed areas and seed the work areas with an EEE-free seed mixture containing seeds of native species appropriate to the hardiness zone, thus avoiding the establishment of EEE and accelerating the revegetation process.
- Avoid circulating, if it is not necessary, in places where there are IAS in order to avoid dispersing them on the territory.

Assessment of the impacts of the project on the human environment

- *Question: The proponent must provide details on how it intends to “encourage the hiring of local workers, as long as they have the skills required at the time of hiring” and the results of their engagement. To this end, the proponent must inform and solicit the collaboration of the Cree Human Resources Development⁵ to facilitate the hiring of Cree staff and potentially to develop training programs to meet the skills required by the project.*

Reply

BRM plans to hire local Cree, Cree from other communities, and Jamesian workers. To achieve this, information on the positions to be filled is already available. BRM will work with Cree government agencies such as CHRD (Cree Human Resources Development) and the Oujé-Bougoumou Band Council, and on the James Bay side, the Ministry of Labor, Employment and Social Solidarity as well as than the James Bay School Board.

- *Question: During the construction phase, it is estimated that 165 workers may need to be temporarily housed in Chibougamau, Chapais and Oujé Bougoumou. Initially, the promoter planned the construction of a camp of workers able to accommodate 500 people, at the height of the construction work. Thus, the proponent must specify whether the project must effectively allow the hiring of 500 workers at the peak of construction activities and that, thus, 335 of them would be local residents. It must also recall the number of jobs that would be created for the mining phase of the mine.*

Reply

The number of employees required for the construction and operation phases is detailed in the tables and charts presented in Appendix H. At the peak of construction activities, up to approximately 165 direct workers will be required.

- *Question: One of the CBHSSJ's concerns is the possible increase in social problems related to alcohol and drug use among workers, as well as excessive debt. During workers' holidays, an increase in cases of intoxication could have an impact on the functioning of local clinics. This problem is recognized in*

⁵ <https://www.cngov.ca/fr/governance-structure/departments/service-des-ressources-humaines-cries/>

Section 7.4.4: Impacts of Workers in the City. Details must be provided on how prevention and support measures will be implemented and the collaboration of the CBHSSJB should be sought when developing these measures.

Reply

BRM has planned to offer training to prevent these social problems. Indeed, BRM considers that prevention is better than reaction once problems are installed. The CBHSSJB will be consulted for the implementation of prevention and awareness programs. If, despite ongoing prevention efforts by employees, an Employee Assistance Program will be put in place to address the issues most humanely and effectively.

- *Question: Programs must be in place to facilitate the cultural integration of Cree and non-Aboriginal workers into mine operations. This is mentioned in Section 5.3.3: “Mr. Wapachee indicated that it would be desirable for efforts to be made to raise awareness of Cree way of life culture and practices [...] to future workers of the community. mine”. The proponent must indicate the measures he intends to put in place to achieve this.*

Reply

First of all, it seems essential that to promote the sound integration of all our employees who will include Cree workers, it was necessary to write, put in place and respect human resource management policies (BRM) regarding recruitment, selection and acquisition of the workforce—regular and temporary positions. Thus, a policy already in place explains our legal selection process which focuses on the guiding principles and pillars of BRM. The selection criteria are objective and directly related to the position to be filled. They are multiple: well-being, motivation, competence experience, diplomas or qualifications. In addition, in order to outlaw the erection of artificial barriers to the hiring and integration of the Crees and Jamesians, at no time will the company or its representatives require criteria that do not exactly reflect the needs of position to be filled.

Also, aware that the quality of the welcome directly influences the retention capacity of new employees, the duration of employment, the employee’s involvement in the company, as well as the new employee’s support for the pillars and guiding principles of the company, BRM provides a welcome process that facilitates the mobilization of new employees and allows them to develop a sense of belonging. Reception and integration are processes that ensure that all the necessary tools and information are provided to the new employee. The probation period provides an opportunity for both the new employee and BRM to determine if the initial hiring is the best for both parties. The purpose of this period is to give orientation, advice, practical training and support (by a colleague “buddy”) to the newbent. He has the opportunity to evaluate and adapt to his new role and work environment to determine whether he is living up to expectations and assessing whether he is doing well with the company. This important period is also the final phase of the selection process; supervisors having the opportunity to validate the hiring decision. It is the responsibility of the company’s management to regularly monitor, measure and evaluate the performance and attitude of the new employee during his probationary period.

Note that coaching by a colleague is an approach of at least one week—depending on the needs of the new employee, which strengthens the professional integration devices and which aims to facilitate the new employee’s access to his new environment. It aims to comfort the new employee in its insertion and reassure the company on its sound introduction to the different mechanisms and structures of BRM.

Impacts of the construction camp

- *Question: It was reported that the planned location for the construction camp would have already been impacted (cleaned and prepared for construction). The proponent must clarify this situation and, if necessary, specify the plans for the restoration of the site, or if it will be used for other purposes.*

Reply

Indeed, the site has already been prepared for construction, but no structure or building has been set up on the site. BRM undertakes to restore the site to vegetation.

Impact of workers in the city

Question: Consideration of similar large-scale projects carried out in James Bay and elsewhere in northern Québec has shown that the economic boom brought about by rising wages and the influx of new workers has a particularly significant impact on housing and housing. employment. Section 7.4.4 needs to be better documented and address the issue of potential socio-economic impacts such as, but not limited to:

- *The speculation on the cost of rent, namely the increase in the cost of rent generated by the increase in demand caused by the arrival of workers from outside the region;*
- *speculation on the cost of houses, i.e. the increase in the cost of renting and building houses;*
- *Increased costs of miscellaneous services;*
- *The pressure on public services;*
- *The shortage of labour currently affecting the region;*
- *The social and economic inequities engendered by the foregoing.*

Reply

BRM is aware of these socio-economic issues and has planned to address them with regional partners: municipal authorities, health service centers, including the CBHSSJB, and the ministries involved. For example, recent discussions have been held with regional contractors regarding the availability of labour and the possible escalation of wages, a situation that BRM and entrepreneurs want to avoid.

In these situations, the impacts are very dependent on the general situation of the region with related projects: hydroelectric projects (as we have seen in the past), other mining projects, and situations can also change rapidly as it has been possible to note this during the last drop in the price of metals.

Impact mitigation measures then involve consultation and exchange between stakeholders. There are no ready-made measures to implement and BRM intends to work with its partners to find solutions to these concerns and address them in the light of regional interests.

- *Question: The proponent illustrates the housing offer currently available in the area. This information does not allow us to conclude that the needs generated in this area by the project can be met. The proponent must repeat this assessment by integrating, among other things, taking into account the current and future needs of other users (e.g. business and leisure tourism, accommodation needs of other natural resource projects and mineral exploration, truckers in transit, etc.) as well as the fluctuation of demand according to the seasons (e.g. tourist season, hunting season).*

Reply

It is known, the city of Chibougamau is in shortage of housing. However, the municipality is in the process of building housing buildings. The mayor, Mrs. Manon Cyr, hopes that the project will be realized for the next year. It would be interesting for BRM to track the progress of this housing project to find out the situation for potential newcomers to the area. Ideally, it would be better to have local workers in order not to have

accommodation problems. On the other hand, in order to face any eventuality, BRM appealed to all the hotels, motels, inns, rentals to rent in the short, medium and long term of the region in order to survey the goodwill of the latter. In Table 8-2 we find the different accommodations in the area with the number of rooms as well as whether they are full in the summer season or not. After discussing with the staff at each of these locations, BRM can say that there will be room for their workers, as each of the accommodation sites mentions that it is “first come, first served”. Especially since most occupants are already mostly workers. Hotel managers mention that workers are present weekdays and tourists are present on weekends.

In addition, BRM met with Mr. René Savage, owner of the Harricana Resort, to use the vacant space in recent years. Mr. Savage suggests to BRM to renovate the Harricana and to rent them as long as they need it provided it is restored to its original state. This would use the 64 rooms, of which 70 to 80% of the rooms contain two beds. Renting the entire building would also allow the use of the conference rooms as well as the kitchen on site. A lease would be the most appropriate solution and would conclude that the needs generated by the project can be met. Thus, other users (e.g. business and leisure tourism, accommodation needs of other natural resource development and mineral exploration projects, truckers in transit, etc.) will not be disturbed by the project, as well as the fluctuation of the demand according to the seasons (e.g. tourist season, season of the hunt).

Table 8 2. Existing accommodations in and around the Chibougamau region

Ville	Location	Phone number	Number of rooms	Summer season : all occupied (Yes or No)
Chibougamau	Auberge chez Nancy	418-748-2485	12	Yes
	Auberge Boréale	418-748-3988	14	Yes
	Auberge Beauséjour	418-748-3244	11	Yes
	Hôtel Chibougamau	418-748-2669	100	No
	Hôtel-Motel Nordic	418-748-7686	54	Yes
	Relai Lac caché	418-748-6432	22	No
	Gîte de la Mine d'Or	418-748-1212	5	No
	Marc Leduc	418-748-4790	3	Yes
	Naomi Bergeron	418-748-5047	8	Yes
Chapais	Motel Routier	418-745-2564	19	Yes
	Motel Clossi	418-745-3633	9	Yes
	Hôtel Opémiska	418-745-2828	13	Yes
Oujé	Hôtel Capississit	418-745-3944	24	No
	Total rooms		294	

Transport impacts

- *Question: For each of the alternatives considered, the proponent must ensure that it includes a description of the exchanges it has had with community users regarding the use of Route 167 and R1004 and the mitigation measures contemplated in response to issues raised.*

Reply

The users of the road are mainly: the impacted family, the forest companies as well as the vacationers, hunters and fishermen. BRM is in regular contact with the impacted family and with representatives of the forest companies. Cottagers, hunters and fishermen are informed via the information meetings of BRM. The mitigation measures foreseen are: warning of the beginning of the transport activities to the stakeholders, reduction of the dust if necessary and setting up of adequate signaling. The impacts are the same for the R1004 road regardless of the mode of transportation chosen, including the choice of the transshipment site; only the intensity of the impact will vary according to the choice of trucks (100 tonnes if the train is retained

vs. 40 tonnes if truck transportation to the Saguenay plant is retained). The information was disseminated during the information meetings with the impacted family and with the Jamesians at public meetings in June.

Environmental monitoring program

- *Question: Section 9.2 of the Application to Change Overall Sales does not refer to the monitoring provided for in Condition 3 on the geochemical characteristics of fine and coarse tailings in the follow-up program. This follow-up must be planned by the promoter.*

Reply

The program for monitoring the geochemical characteristics of mine tailings is presented in the response of QC-14 in this section, dealing with the monitoring of GC conditions. As previously mentioned, geochemical characteristics will be monitored four times a year for the first two years of operation and annually for subsequent years of operation.

- *Question: The environmental monitoring program proposed in request for Modification in Section 9.2 does not specifically refer to OER monitoring for final effluent and sediment effluent. The proponent must specify whether the environmental monitoring provided for in conditions 17 and 18 of its December 6, 2013 sales volume is maintained and specify the desired modifications, if applicable. In this regard, the monitoring of the surface water quality of Lac Jean and Villefagnan Creek must be prioritized.*

In particular, sediment monitoring should be carried out in Lac Jean and its tributary (exposed sites) and Lac Neveu and its outfall (control stations) at the same stations as those used for the initial characterization. It is recommended that sediment monitoring be also carried out in the Lac Jean outfall (1 station) and in Villefagnan creek (1 station), if these rivers have accumulation zones (meanders, fine sediments).

Reply

The environmental monitoring provided for in conditions 17 and 18 of the 2013 global CA will be maintained, with the exception of monitoring of Lake Denis (surface water, sediments and groundwater) mentioned in condition 17. Ditches will be set up around the Lake Denis, to prevent potentially contaminated runoff from the mine site to the lake. Lake Denis will then be progressively dried up, since its water supply will be diverted to the tailings pond.

The monitoring of the parameters for which an environmental release target has been calculated is planned as part of the final effluent monitoring program, as mentioned in condition 18 of the 2013 global CA.

In response to condition 16 of the 2013 global BOD, an update of the Receiving Environment Characterization Program (Preliminary Draft) was presented to the Administrator during the month of August. The regular follow-up program required under condition 17 of the 2013 global CA will be based on the program developed in connection with condition 16. It will include, among other things, the surface water of the tributary of Lac Jean, the surface water of the lake. Lac Jean and the surface water of Villefagnan Creek. Sediment monitoring will be carried out, among others, in Lac Jean and its tributary, as well as in Lac Neveu and its outfall at the same sites as during the initial characterization. Parameters for which an environmental release target has been calculated will be included in sediment quality monitoring. A sediment quality monitoring station is planned in the Lac Jean outfall and in Villefagnan Creek if accumulation zones are identified.

This program must be submitted to the Administrator for approval 1 year before the start of the operation, i.e. in the summer of 2019.

Environmental monitoring program

Question: On page 9-2 of the application to modify the overall BOD, it is mentioned that monitoring the population is one of the main components that will be subject to environmental monitoring. The proponent must specify the elements that will be retained in the monitoring and by what means. Without limiting it, the proponent must commit to follow the impacts of truck transport of the concentrate and the impacts of worker displacements (accidents, feeling of insecurity, effectiveness of the information and awareness mechanisms, etc.) as well as the social impacts (negative and positive) associated with the presence of several temporary workers housed in the Chibougamau, Chapais and Oujé-Bougoumou localities, as well as the other socio-economic impacts raised in question 114. Any question related to the health of the population should be discussed with the CBHSSJB, which, if necessary, can collaborate in the development of the mitigation measures envisaged by the proponent.

Reply

BRM is committed to include, in its follow-up program with the intended population, the follow-up of the impacts of truck transport of the concentrate and the impacts of worker travel. Also, monitoring the social impacts associated with the presence of several temporary workers housed in the Chibougamau, Chapais and Oujé-Bougoumou localities will be included in the follow-up program. The socio-economic impacts on housing, raised in question 114, will also be part of the follow-up program. The response to condition 19 of the 2013 global CA, which was submitted and accepted by the COMEX in 2014, presented all the elements selected for the monitoring program of impacts on the human environment.

Environmental assessment and physico-chemical characterization plan before implementation of an industrial project

- *Question: In section 2.2.8 of the “Guide to the Physicochemical Characterization of the Initial State of Soils Prior to the Implementation of an Industrial Project”, it is indicated that it is recommended for a project likely to produce cuttings or sludge potentially radioactive drilling to perform a verification of the initial radioactivity of soils or rock. The proponent must justify the lack of consideration of radionuclide analysis in soil samples.*

Reply

Radionuclide analysis is not planned in the soil samples for the characterization of the initial state before the implementation of an industrial project since the nature of the VTM deposit of BRM is very unlikely to contain radioactive elements.

Modeling atmospheric dispersion

- *The proponent states that brook trout are found in some lakes and streams. The proponent must therefore consider the period of sensitivity of this species that breeds in the fall and whose incubation takes place under the ice during the winter during work in water (crossings of rivers, relocation, etc.). The proponent must therefore modify the restriction period in order to respect the presence of this species.*

Reply

Given the sensitivity period for brook trout, the water works will only be carried out between June 1 and September 15, where this species is present.

- *Question: The proponent plans to implement a dust emission management plan for the entire site during the various phases of the project. This plan must be included with this application to change the overall sales.*

The air emissions management plan must describe in detail all the mitigation measures that it undertakes to apply to limit the emission of particulate matter and metals from the various activities associated with the operation of the mine (transportation on site [routing], wind erosion, transport of concentrate, etc.). The plan must provide for the keeping of a register which will record, on the one hand, all the actions undertaken by the proponent (maintenance, application of dust suppressants, etc.) in relation to the mitigation measures provided for in the plan. management of atmospheric emissions and, on the other hand, all observations on the ground that could explain the uncontrolled emission of dust (breakage of equipment, high winds, etc.). This document must remain evolving and be updated based on the data collected and the experience gained.

Reply

Annex M presents the air emissions management plan. This plan is upgradeable and may be updated based on the data collected and the experience gained during the operational phase.

- *As specified in Condition 26 of the GC, to ensure that the mitigation measures proposed by the proponent are effective, an ambient air quality monitoring program must also be filed with this application. of modification.*

The general terms and conditions of this monitoring program will have to be presented, including the contaminants that will be monitored, the sampling frequency, the sampling methods and the location of the station.

Reply

BRM, made a commitment in its impact study to set up an air quality monitoring station south of the property. The follow-up will be found in the Air Emissions Management Plan (Appendix M).

Other subjects

- *Question: In the event that the proponent does not have access to atmospheric weather station data located near the mine site, in order to initiate monitoring of the meteorological conditions at the mine site, the proponent must provide installation of an atmospheric measurement station on its site. These data will be used to adapt the measures initially planned to respond to the effects of climate change on the project.*

Reply

If atmospheric weather station data (s) near the mine site are not available, BRM undertakes to provide for the installation of an atmospheric measurement station on its site. This is part of the Air Emissions Management Plan (Appendix M).