



## ANNEXE A : DOCUMENTS DE SOUTIEN PRÉLIMINAIRES

A-1 BATHYMÉTRIE ET HYDROLOGIE

A-2 CADRAGE ENVIRONNEMENTAL ET SOCIAL

A-3 MILIEU AQUATIQUE

**A-4 TRANSPORT**

A-5 MICROMAMMIFÈRES

A-6 GÉOCHIMIE

A-7 QUALITÉ DE L'AIR

A-8 POTENTIEL ARCHÉOLOGIQUE



## PATRIOT BATTERY METALS **CORVETTE PROJECT**

Pre-feasibility study for the transport of lithium spodumene concentrate between the Corvette mine site and the Matagami Transshipment Center (MTC) or to the Transshipment Center of Chibougamau (CTC), as well as final delivery by rail to Saguenay and Bécancour, QC

**JULY 2023**







PATRIOT BATTERY METALS

Attention: Mr Darren Smith,

We would like to thank you for choosing Craler to carry out a pre-feasibility study for the transport of lithium concentrate between the mining site (Corvette Project), located in the James Bay region, near LG4, to a railway transshipment center. The ore must then transit to a national or international processing plant.

We are pleased, in this document, to respond to your request.

Thus, as required, we have studied and analyzed various transport scenarios for the transport of your concentrate by truck according to various cycle times, between the Corvette mine site and two rail transshipment centers, then, in a second step, towards your customers in Québec.

Second, we carried out an exhaustive analysis of the purchase costs for the various types of trucks and trailers available on current and future markets.

Finally, we looked at some important aspects and points of reflection whose issues could influence the realization or the results of your project.

You will therefore, we hope, find answers to your questions as well as some ideas that can guide your thoughts on the final choices in this area.

In addition, rest assured that we remain at your entire disposal regarding the logistical issues of your project.

Please accept, Mr. Smith, the expression of our sincere greetings.

<original signed by>

Yves Pétrin, / Managing Director, Craler

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# GLOSSARY AND ACRONYMS

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## GLOSSARY

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- Annualized average of tonnage: Average tonnage over a year considering the reduction in tonnage imposed during the thaw period
- Circuit 1: From the mine site to the MTC (Matagami Transshipment Center)
- Circuit 2: From the mine site to the MTC in 2 steps: A= from the mine site to the HUB, or B= From the HUB to the MTC
- Circuit 3: From the mine site to the CTC (Chibougamau Transshipment Center)
- Circuit 4: From MTC to option 1: Bécancour, QC, or Option 2: Saguenay, QC
- Circuit 5: From CTC to option 1: Bécancour, QC, or Option 2: Saguenay, QC
- Company (The): Patriot Battery Metals (PBM)
- Miner (The): Patriot Battery Metals (PBM)
- Mining (The): Patriot Battery Metals (PBM)

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## ACRONYMS

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- TY: Transfer yard or Transshipment yard
- TC: Transfer or Transshipment Center
- CTC: Chibougamau Transshipment Center
- MTC: Matagami Transshipment Center
- HUB: Site identified at the junction of the Billy Diamond road, km 544
- PBM: Patriot Battery Metals

# IN CONTEXT

Patriot Battery Metals (PBM) aims, with this study, to validate potential solutions for the transport of its spodumene concentrate from its Corvette Project, located in the LG4 sector, in the James Bay region. The spodumene would be concentrated directly at the mine site using a strategically positioned concentrator. The product transported will be lithium spodumene concentrate (particle size from +0.85 mm to 9.5 mm).). Currently, the expected life of the project is 25 to 30 years.

PBM plans to produce, on its Corvette project, 400,000mt of spodumene concentrate in year 1, then approximately 800,000mt in subsequent years. The concentrate will be transported by truck to a rail transshipment center. Thereafter, it will be transported by train to a seaport for international customers and/or directly to a processing plant located in Quebec.

# SCOPE OF WORK

This pre-feasibility study aims to identify the possible cycle times for transporting the concentrate by truck between the Corvette site and two potential rail transshipment centers, namely those of the city of Matagami (existing) or that of the city of Chibougamau (non-existing). From these Transshipment Centers, rail transportation costs to Bécancour and Saguenay, QC, Canada, will be assessed. **Please refer to project 2 options Map 01.**

The best scenario(s) for transporting by truck the 400,000mt in year 1 and the 800,000mt in each subsequent year will be identified. The study may also target, if necessary, best practices for truck transshipment operations, storage and railcar loading for the next 25 to 30 years. In addition, it will focus more on comparing the scenarios for shipping the concentrate by rail to Saguenay and Bécancour, from Matagami and Chibougamau, QC.

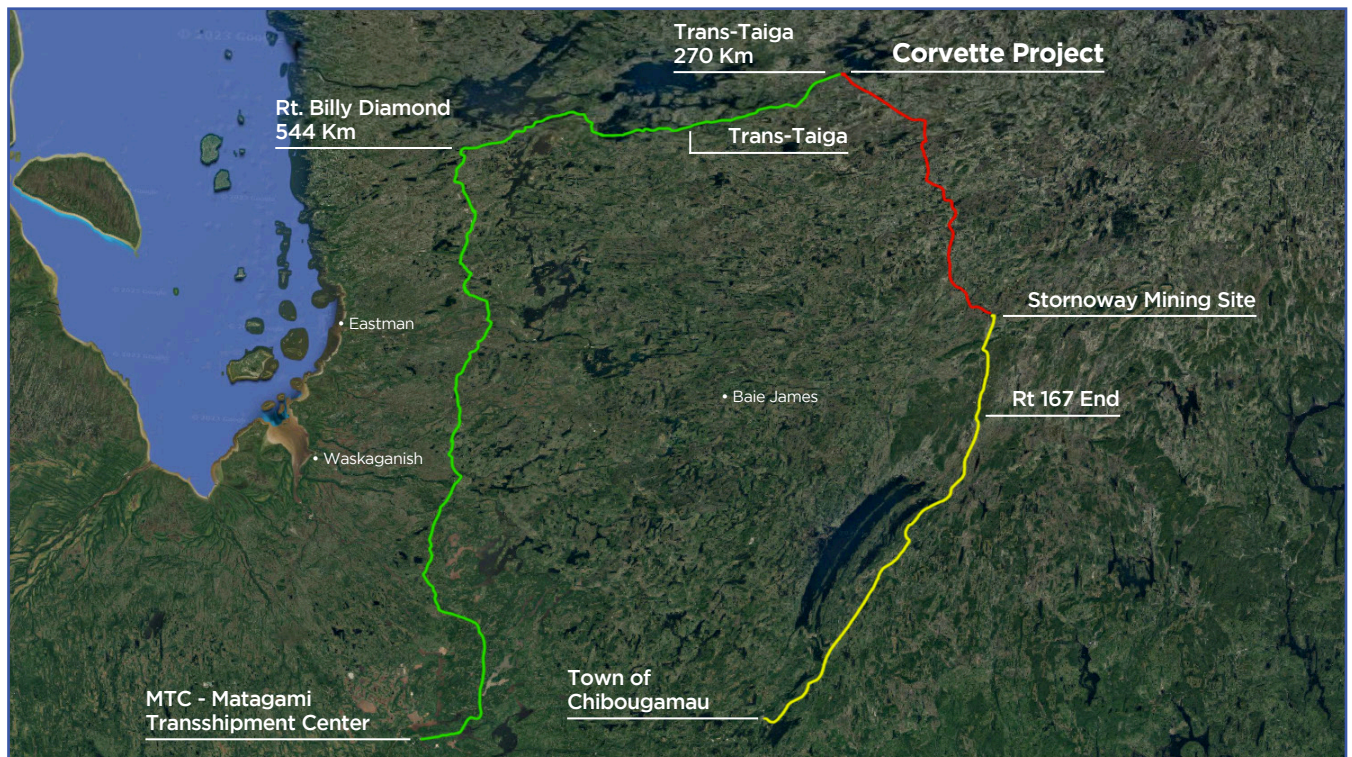
The study should also identify the various equipment (trucks and trailers) available on current and future markets, compare them and suggest the best possible combination, at the best possible cost, while considering the human factor (drivers) and relative costs.

In addition, certain points of reflection will be exposed regarding the quality of the circuits for the gravel and asphalted areas, the construction of the road as well as the improvements to be made to certain circuits.

Finally, the topics of required manpower, summer and winter road maintenance and other related topics will also be discussed.

## MAP 01

### GENERAL MAP FOR TRUCKING- ALL OPTIONS



# PROJECT CHARACTERISTICS

- Annual production of 400,000mt for year 1 (i.e., 1739mt/day (over 230 working days), 5/7 for 8695mt/week)
- Annual production of 800,000mt from year 2 (i.e., 3478tm/day (over 230 working days), 5/7 for 17390tm/week)
- Annual production of 400,000mt for year 1 (i.e., 1216tm/day (over 329 days), 7/7 for 8512tm/week)
- Annual production of 800,000mt for year 2 (i.e., 2,432mt/day (over 329 days), 7/7 for 17,024mt/week)
- Project life: 25 to 30 years
- Loading trailers with loaders
- Unloading on a pad, inside a dome, at the transshipment center
- Distance of the route: 844 km for the circuit from the Corvette mine site to the Matagami (MTC) Transshipment Center
- Distance of the route: 547 km for the circuit from the Corvette mine site to the Chibougamau transfer Center (CTC).
- Equipment maintenance and parking sites will be located at the mine and at the transfer site.

Note that for the option to Chibougamau, a class 1 forest road will have to be built between the mine site and the access road to the Stornoway mine. In addition, the road between Route 167 and the Stornoway mine being level 3, an upgrade of this segment will have to be undertaken to bring it to level 2.

## FOREWORD THOUGHTS ON CYCLE TIMES EQUIPMENT & OPERATIONS

First, several points of reflection challenged us as to the geographical location of the site, its isolation, the distances to be covered, namely and more precisely:

- The distance of 844 km (1688km round-trip) between the Corvette site and the Matagami Transshipment Center (MTC) and of 547km (1094 round-trip) between Corvette and Chibougamau.
- The use of a mixed road circuit (gravel and asphalt road)
- This northern territory is isolated, with rare places offering rest and food services.

This led us, in such a context, to focus on a few key points.

## SAFETY FOR ALL USERS

- For our truckers as well as for all other truckers, residents, Aborigines, and others as well as vacationers, all using the same circuit, everyone must be able to work in their occupations in the greatest safety. Thus, our reflection guided us towards models of operation, types of equipment, worker profiles and work schedules in this sense.
- To attract a permanent workforce for the transport project, we thought about the best operating scenarios and work schedules that we could offer them: cycle time to respect to allow a round trip, the best working hours. We have also considered the choice of equipment that they will have to operate in complete comfort, reliability, and safety, while considering the maintenance aspect of the equipment and the safe maintenance of the circuit.
- We also thought about the profile of the people (truckers) we would favor for this type of specialized work in this northern and isolated territory.

## EQUIPMENT AND OPERATION

- First, the Company will have to choose a business model, namely whether the equipment (trucks and trailers), in whole or in part, will belong to the Mining Company, or to a general contractor specializing in transport in isolated Nordic territory, or a group of independent owner-operators, or combinations of these options.
- Depending on the business model and operating scenarios chosen by the Mining Company and depending on the final specifications of the material to be transported (particle size, humidity, weight, abrasiveness), several models and types of equipment could do the job. They will have to be selected.
- The combined thoughts of our team members, our suppliers and strategic partners have made it possible to offer you transport scenarios, a few models and types of equipment that could do the job required.

# TRANSPORT OPERATION OPTIONS

We considered two possible operating options between the Corvette mine site and the Matagami Transshipment Center (MTC).

## CIRCUIT 1 - FROM THE MINE SITE DIRECTLY TO THE MTC

The trucks, equipped with a berth, operated by a single operator, will cover the 1688 km between the mining site and the MTC in an average of 27 hours for the round trip.

Each trucker must respect the daily driving hours. Thus, the trucks will all be equipped with electronic logging devices (Logbook).

For these operations, our team of truck drivers must be equipped with tridem trucks equipped with a heavy-Duty frame (HD) and a single side-dump trailer with a capacity of 45mt and suitable for this direct, long, and isolated circuit.

## CIRCUIT 2 - FROM THE MINE SITE IN 2 STAGES (A & B) TO THE MTC

For this circuit, two independent teams will be created to cover the two sectors (Steps A & B) to cover the 1688km round trips of the road circuit between the mine site and the MTC. For each transport unit, truckers will be equipped with tridem trucks equipped with sleeping berths, operated by a single solo driver. Drivers in both sectors must respect the electronic recording device (Logbook) for their driving hours and safety.

## DESCRIPTION OF THE TWO SECTORS (STEPS):

- Step A: From the Corvette mine site towards Km 0 of the Trans-Taiga Highway and/or Km 544 of the Billy Diamond Highway (580km round trip) with an average of approximately 12 hours to complete a trip.
- Step B: From Km 0 of the Trans-Taiga road and/or Km 544 of the Billy Diamond road to the Matagami MTC (1108Km round trip), with an average of about 16 hours to complete a trip.

For this Circuit 2, Step A, a transfer yard (TC) will have to be built at the intersection of the two roads. Truckers will have to leave their single, loaded trailers on site and pick up an empty trailer to return to the Corvette mine site to reload the trailer.

For this operation, our team of truck drivers must be equipped with trucks equipped with a robust frame (HD), with tridem traction and a simple side-dump model trailer (side-dump) with a capacity of 45mt and suitable for this direct, long, and isolated circuit.

For Step B, from the transfer yard (HUB), the loaded trailers left behind by the Step A group will be coupled into a type B road train and will be transported to the Matagami MTC.

Step B truckers will then have left their empty trailers assembled into a type B road train on site. They will be decoupled there and given back to the Step A team to be re-routed single-handedly to the mine site for the reloading.

The team of truck drivers in this step will be equipped with transportation equipment such as a heavy-duty frame (HD) model truck with tridem traction and two trailers coupled in a type B road train. This side dump model road train side-dump will have a total load capacity of 90tm (2 X 45mt) and will be suitable for a direct circuit between the transfer yard and the MTC.

## GENERAL NOTES TO REMEMBER

- The cost of C\$212 used in all scenarios below as the hourly rate (driver and equipment) is an average rate between the cost of a driver-equipment combination working on a paved route with a single trailer and the cost related to a driver combination -equipment working on a gravel course with a type B train.
- In our study, we assumed that the advertised moisture content of 2.65% of the concentrate would not pose a problem in terms of transport, either by truck or by train. Naturally, the harsh Quebec winters (sometimes colder than -30 degrees Celcius) suggest that the humidity level be as low as possible to prevent the ore from freezing as a block during transport.
- All prices and rates mentioned in this document are based on current costs and may vary over time.
- Distances in the CN Rail fuel surcharge calculation are in miles.
- This study highlighted the cost of C\$2.00 per metric ton for the use of MTC-Matagami. This price does not include the costs of handling, transshipment, storage structures (domes), garages, offices, scales, etc. These costs may be the subject of an addition or another study, if necessary.
- All prices and rates are subject to applicable taxes, to fuel surcharge of carriers and are in Canadian dollars.
- Distances are in kilometers and weights in metric tons.
- In this document, gravel road refers to forest-type gravel road.

# DESTINATION A: FROM MINE SITE TO MTC (MATAGAMI)

STUDY PART 1 - YEAR 1 -  
(400,000MT/YEAR)

## CIRCUIT 1

Option 1: Operation 5/7

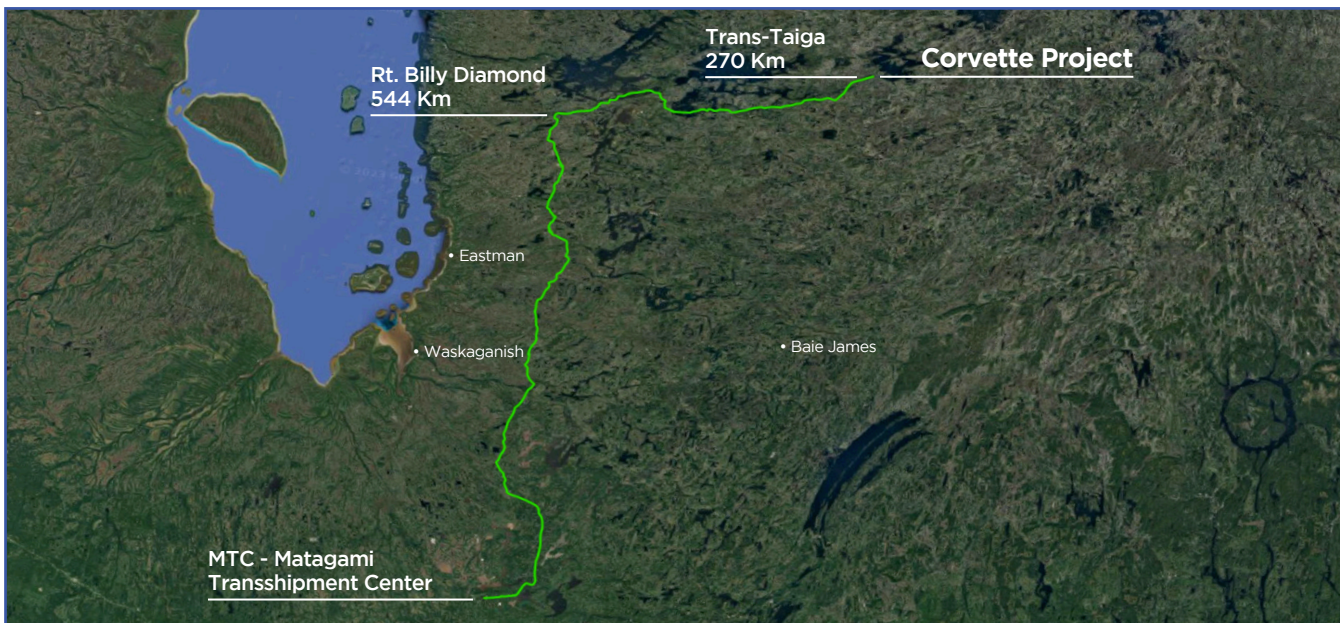
Day and night operation over 5-day weeks, from Monday morning to Friday at 24:00H, (5/7 - 24/24). Each tow truck operator with side-dump making the round trip from the Corvette mine site to the Matagami transfer Center (MTC)

- Will use the mining site access road to reach the Trans-Taïga at Km 270: +/- 20Km, then the Trans-Taïga from Km 270 to Km 0 to reach the Billy Diamond road at Km 544: +/- 270 Km, From there, the Billy Diamond road from Km 544 towards Km 0: +/- 544 Km to finally join the provincial road 109 to the MTC : +/- 10 Km.

**Total distance: 1688 km per roundtrip.**

### MAP 02

#### GENERAL MAP FOR TRUCKING - CORVETTE TO MTC



**TABLE A****CYCLE TIME: TRANSPORT FROM CORVETTE TO MTC**

SECTOR: CORVETTE TO MATAGAMI			Date:	2023-06-23	
Year : 2023			Volume:	400 000 mt/yr	
LOCALISATION	Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	Time (Min)	
Corvette Site - Rte Trans-Taïga km 270 ( <b>Gravel</b> )	30	20	20	60,0	
Trans -Taïga km 270 to km 0 = Rte Billy Diamond km 544 ( <b>Gravel</b> )	70	63	270	257,1	
Route Billy Diamond km 544 to Matagami km 0 ( <b>Paved</b> )	90	75	544	435,2	
Matagami km 0 to MTC Matagami ( <b>Paved</b> )	70	45	10	12,0	
<b>TOTAL</b>			844	764,3	
Time					
Outward	Round-trip	Unproductive	Total	Total	Nb. trips/24 hrs
Min	Min	Min	Min	Hours	24h
764,34	1528,69	120,00	1648,69	27,48	0,9
Rate					
\$/Hour	\$/Trip	TMV/Trip	\$/TMV		
212.00	5825.36	45.00	129.45		

In this [Table A](#) with option 1, here are the details that emerge from the cycle time calculations from Corvette to MTC

**NOTE ON OPERATION 7/7: Regarding cycle times, the results between 5/7 and 7/7 days of operation are the same**

- The cycle time per round trip of a total distance of 1688 km is 27.5 hours/trip.
- Each truck will be able to perform 0.9 cycles per 24 hours period
- At an hourly rate of 212\$ (Driver & equipment budget), we arrive at a cost of 5825.36\$ per load of 45mt, or a cost of 129.45\$ per metric ton

In this same scenario of Option 1 (5/7 days), the calculation of the Equipment and labor requirements, from Corvette to MTC are identified in [Table B](#) below.

**TABLE B**

**CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS TRANSPORT BY TRUCK FROM CORVETTE TO MTC**

Transport of 400 000 mt of spodumen of lithium concentrate - Load of 45 mt / Trip

SCENARIO (24/24 HRS IN 5 DAYS / WEEK & 7 DAYS / WEEK)	SCENARIO A: 5D/7	SCENARIO D: 7D/7
Metric Tons to handle / Year	400,000 mt/yr	400,000 mt/yr
Number of working Days / Year	230 work/days	329 work/days
Mt per day to transport	1,739 mt/day	1,216 mt/day
Truck loading Capacity in Mt on public highway	45 mt/loads	45 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	38,65 loads	27,02 loads
Number of trips per day	1.00 trip/unit	1.00 trip/unit
Number of trucks	39 units	27 units

In this [Table B](#), we have identified the following facts:

- The production of 400,000mt, spread over 230 working days, will be 1739mt per day.
- There will be 45 trips per day to transport, over a 24 H shift with a fleet of 39 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1 trip per 24 H period

**NOTE ON OPERATION 7/7: Naturally, in the 7D/7 scenario of 329 days of operation/year, the daily tonnage, the number of trips per day and the number of trucks are affected. The cycle times remain the same.**

In this scenario, the [Table B](#) shows:

- A production of 400,000mt spread over 329 working days will be 1216mt per day.
- There will be 27 trips per day to haul, over a 24 H shift with a fleet of 27 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1 trip per 24 H period

# CIRCUIT 2

From mine site to MTC in 2 steps, A & B

## Step A (From Mine site to HUB):

Each dump truck operator will make the return trip from the Corvette mine site to a transfer site (HUB) for change of trailer (loaded / empty) at KM 0 of the Trans-Taïga and / or on the Billy Diamond road at km 544.

It will use the access road to the Corvette mine site to reach the Trans-Taïga at Km 270: +/- 20Km. Then the Trans-Taïga from Km 270 to Km 0 to reach the Billy Diamond road at Km 544: +/- 270 Km, i.e. the HUB site.

**Total round trip distance for this stage: 580 km.**

## MAP 03

### GENERAL MAP FOR TRUCKING - CORVETTE TO HUB



## TABLE C

### CYCLE TIME FROM CORVETTE TO HUB ROUTE TRANS-TAÏGA WITH TANDEM TRUCK AND SINGLE DUMP TRAILER

SECTOR: CORVETTE TO MATAGAMI			Date:	2023-06-23
Year : 2023			Volume:	400 000 mt/yr
LOCALISATION	Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	Time (Min)
Corvette Site - Rte Trans-Taïga km 270 (Gravel)	30	20	20	60,0
Rte.Trans-Taïga km 270 to Rt Billy Diamond km 544 (Gravel)	70	63	270	257,1
<b>TOTAL</b>			290	317,1

Time					
Outward	Round-trip	Unproductive	Total	Total	Nb. trips/24 hrs
Min	Min	Min	Min	Hours	24h
317,14	634,29	120,00	754,29	12,57	1,9

**NOTE: The Fuel surcharge is not included in Rates**

Rate			
\$/Hour	\$/Trip	TMV/Trip	\$/TMV
212.00	2665.14	45.00	59.23

In this Table C, **Circuit 2, Step A**, here are the cycle time calculations for Transport from Corvette to HUB, Km 0 Trans-Taïga

#### NOTE ON OPERATION 7/7:

Regarding cycle times, the results between 5/7 and 7/7 days of operation are the same

- The cycle time per round trip of a total distance of 580 km is 12.57 Hours/trip.
- Each truck will be able to perform 1.9 cycles per 24 H period
- At an hourly rate of 212\$ (Driver & equipment budget), we arrive at a cost of \$2665.14 per load of 45mt, or a cost of \$59.23 per metric ton.

In this same scenario of **Circuit 2, Step A** (5/7 days), the calculation of the Equipment and labor requirements, from Corvette to HUB are identified in Table D next page.

**TABLE D**

**CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS  
TRANSPORT FROM CORVETTE TO HUB - ROUTE BILLY DIAMOND KM 544**

Transport of 400 000 mt of spodumen of lithium concentrate - Load of 45 mt / Trip

SCENARIO (24/24 HRS IN 5 DAYS / WEEK & 7 DAYS / WEEK)	SCENARIO A: 5D/7	SCENARIO D: 7D/7
Metric tons to handle / Year	400,000 mt/yr	400,000 mt/yr
Number of working days / Year	230 work/days	329 work/days
Mt per day to transport	1,739 mt/day	1,216 mt/day
Truck loading Capacity in Mt on public highway	45 mt/loads	45 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	38,65 loads	27,02 loads
Number of trips per day	1.90 trip/unit	1.90 trip/unit
Number of trucks	20 units	14 units

In this Table D, we have identified the following facts:

- Production of 400,000mt, spread over 230 working days, will be 1739mt per day.
- There will be 38.65 trips per day to be transported, over a 24-hour shift with a fleet of 20 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1.9 trips per 24 H period

**NOTE ON 7/7 OPERATION: Naturally, in the 7D/7 scenario, of 329 days of operation/year, the daily tonnage, the number of trips per day and the number of trucks are affected. The cycle times remain the same.**

In this Table D with the 7/7 days scenario, in the calculation of transport and labor needs, we have identified the following facts:

- Production of 400,000mt spread over 329 working days will be 1216mt per day.
- There will be 38.65 trips per day to be transported, over a 24-hour shift with a fleet of 14 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1.9 trips per 24 H period

**Step B (From HUB to MTC):**

Each trailer truck operator with dump body in type A road train mode will make the round trip from the Matagami transshipment Center (MTC) to the HUB\*, the site determined in the previous Step A for a change of trailer. The trailers will be pre-coupled in type A road train mode (empty/loaded) at the HUB. It will use the Billy Diamond road between the MTC in Matagami and the HUB.

\* Located at Km 0 of the Trans-Taïga and/or on the Billy Diamond road at Km 544

**Total for the round trip: 1108 Km**

**MAP 04**

**GENERAL MAP FOR TRUCKING - HUB TO MATAGAMI**



**TABLE E****CYCLE FROM HUB TO MTC MATAGAMI WITH TRIDEM TRUCK & 2 DUMP-SIDE TRAILERS ASSEMBLED IN B TRAIN**

SECTOR: CORVETTE TO MATAGAMI		2023-06-23		
Year : 2023		Volume: 400 000 mt/yr		
LOCALISATION	Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	
Route Billy Daimond km 544 to Matagami km 0 (Paved)	90	75	544	
Matagami km 0 to MTC Matagami (Paved)	70	45	10	
<b>TOTAL</b>			554	
<b>Time</b>				
Outward Min	Round-trip Min	Unproductive Min	Total Min	Total Hours
447,20	894,40	120,00	1014,40	16,91

**NOTE: The Fuel surcharge is not included in Rates**

Rate			
\$/Hour	\$/Trip	TMV/Trip	\$/TMV
212.00	3584,21	90.00	39,82

In this Table E, of **CIRCUIT 2 – Step B**, here are the calculations of the Transport cycle time, from the HUB to MTC, using road train B type.

- The cycle time per round trip of a total distance of 1108km is 16.91 hours/trip.
- Each truck will be able to perform 1.4 cycles per 24 H period
- At an hourly rate of \$212 (Driver & equipment budget), we arrive at a cost of \$3584.21 per load of 90mt, or a cost of \$39.82 per metric ton.

**NOTE ON OPERATION 7/7:**

**Regarding cycle times, the results between 5/7 and 7/7 days of operation are the same.**

Let's find the Calculation of Equipment and Labor requirements in Table F below.

**TABLE F****CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS TRANSPORT BY TRUCK FROM HUB TO MTC MATAGAMI**

Transport of 400000 mt of spodumen of lithium concentrate - Payload of 90 mt / Load

SCENARIO (24/24 HRS ON 5/7 AND 7/7 WEEK)	SCENARIO C: 5D/7	SCENARIO F: 7D/7
Mt to transport per year	400,000 mt/yr	400,000 mt/yr
Number of working days / Year	230 work/days	329 work/days
Mt per days to transport	1,739 mt/day	1,216 mt/day
Truck loading capacity in Mt on public highway	90 mt/loads	90 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	19,32 loads	13,51 loads
Number of trips per day	1.40 trip/unit	1.40 trip/day
Number of trucks	14 units	10 units

In this Table F, **Circuit 2, Step B**, scenario 5/7, from HUB to MTC, we have identified the following facts with regard to equipment needs and labor :

- Production of 400,000mt, spread over 230 working days, will be 1739mt per day.
- There will be 19.32 trips per day to be transported, over a 24 H shift with a fleet of 14 trucks, at an annualized average of 90mt per trip.
- Each truck will make 1.4 trips per 24 H period.

In this same Table F with the 7/7 days scenario, we have identified the following facts:

- The production of 400,000mt, spread over 329 working days, will be 1216mt per day.
- There will be 13.51 trips per day to be transported, over a 24 H shift with a fleet of 10 trucks, at an annualized average of 90mt per trip.
- Each truck will make 1.4 trips per 24 H period.

In [Table G](#) below, the details of the days of operation will be found, then in the following [Table H](#), the equipment and manpower requirements required by the different scenarios will be detailed.

**TABLE G**  
**DETAILS ON WORKING DAYS**

	5D/7	7D/7
Weekend and Holiday	109	10
Spring maintenance period	14	14
Fall maintenance period	7	7
Unexpected	5	5
Total days off	135	36
<b>Total Working Days / Year</b>	<b>230</b>	<b>329</b>

**TABLE H**  
**DETAILS ON LABOR - For 400 000 mt/Yr**

	SCENARIO*:	A	B	C	D	E	F
Number of trucks required		39	20	14	27	14	10
Drivers 24h/24		39	20	14	27	14	10
Permanent replacement drivers		1	1	1	1	1	1
Temporary replacement drivers - Holiday		1	1	1	1	1	1
During training and probationary period		0	0	0	0	0	0
<b>Total drivers 5 days / 7</b>		<b>41</b>	<b>22</b>	<b>16</b>	<b>29</b>	<b>16</b>	<b>12</b>
<b>Total drivers 7 days / 7 2 crews</b>					<b>58</b>	<b>32</b>	<b>24</b>

**JOBS NOT INCLUDED**

Road maintenance staff	0	0	0	0	0	0
Mechanical maintenance staff (Trucks & trailers)	0	0	0	0	0	0
Staff at loading and unloading sites.	1	1	1	1	1	1
Supply operation staff	0	0	0	0	0	0
Management, logistics, security, training, and human resources staff	1	1	1	1	1	1

- \*Scenario A: Operation 5/7 Corvette to MTC
- Scenario B: Operation 5/7 Corvette to HUB
- Scenario C: Operation 5/7 HUB to MTC
- Scenario D: Operation 7/7 Corvette to MTC
- Scenario E: Operation 7/7 Corvette to HUB
- Scenario F: Operation 7/7 HUB to MTC

## STUDY PART 2 - YEAR 2 & FOLLOWING - 800,000MT / YEAR.

### CIRCUIT 1

#### CORVETTE MINE SITE TO MTC

Option 1: Operation 5/7

Day and night operation over 5-day weeks, from Monday morning to Friday at 24:00H, (5/7 - 24/24)

Each truck operator with side-dump trailer making the round trip from the Corvette mine site to the MTC Matagami.

- Will use the mining site access road to reach the Trans-Taïga at Km 270: (20Km), then the Trans-Taïga from Km 270 to Km 0 to reach the Billy Diamond road at Km 544: (270 Km), From there, the Billy Diamond road from Km 544 towards Km 0: (544 Km) to finally join the provincial road 109 to the MTC: (10 Km).
- Total round-trip distance: 1688 km.

WE HAVE ANALYZED CYCLE TIMES AS FOLLOWS:

- Day and night operation over 5-day/weeks, from Monday morning to Friday at 24:00H, (5/7 - 24/24)
- Day and night operation on a 7-day week, from Monday morning to Monday morning (7/7 - 24/24)

**As far as cycle times are concerned, they remain the same for a volume to be transported of 800,000tm / year.**

**TABLE I**

#### CYCLE TIME: TRANSPORT FROM CORVETTE TO MTC

SECTOR: CORVETTE TO MATAGAMI		Date: 2023-06-26			
Year : 2023		Volume: 800 000 mt/yr			
LOCALISATION	Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	Time (Min)	
Corvette Site - Rte Trans-Taïga km 270 (Gravel)	30	20	20	60,0	
Trans -Taïga km 270 to km 0 = Rte Billy Diamond km 544 (Gravel)	70	63	270	257,1	
Route Billy Diamond km 544 to Matagami km 0 (Paved)	90	75	544	435,2	
Matagami km 0 to MTC Matagami (Paved)	70	45	10	13,3	
<b>TOTAL</b>			844	765,7	
Time					
Outward Min	Round-trip Min	Unproductive Min	Total Min	Total Hours	Nb. trips/24 hrs
765,68	1531,35	120,00	1651,35	27,52	0,9
Rate					
\$/Hour	\$/Trip	TMV/Trip	\$/TMV		
212,00	5834,78	45,00	129,66		

In this Table I with option 1, we found the details that emerge from the cycle time calculations from Corvette to MTC:

- The cycle time per round trip of a total distance of 1651 km is 27.5 hours/trip.
- Each truck will be able to perform 0.9 cycles per 24 H period
- At an hourly rate of \$212 (Driver & equipment budget), we arrive at a cost of \$5834.78 per load of 45mt, or a cost of \$129.66 per metric ton

#### NOTE ON OPERATION 7/7:

**Regarding cycle times, the results between 5/7 and 7/7 days of operation are the same**

In [Table J](#) below, you will find the calculations relating to the equipment and manpower requirements.

**TABLE J**

**CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS  
TRANSPORT BY TRUCK FROM CORVETTE TO MTC MATAGAMI**

Transport of 800 000 mt of spodumen of lithium concentrate

SCENARIO (24/24 HRS ON 5/7 AND 7/7 WEEK)	SCENARIO A: 5D/7	SCENARIO D: 7D/7
Mt to transport per year	800,000 mt/yr	800,000 mt/yr
Number of working days / Year	230 work/days	329 work/days
Mt per days to transport	3,478 mt/day	2,432 mt/day
Truck loading capacity in mt on public highway	45 mt/loads	45 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	77,29 loads	54,04 loads
Number of trips per day per truck	1.00 trip/unit	1.00 trip/day
Number of trucks	77 units	54 units

In this [Table J](#), with option 1 (5/7 option), we have identified the following facts:

- Production of 800,000mt, spread over 230 working days, will be 3478mt per day.
- There will be 77 trips per day to haul, over a 24 H shift with a fleet of 77 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1 trip per 24 hour period

**NOTE ON OPERATION 7/7:**

**Naturally, in the 7D/7 scenario of 329 days of operation/year, the daily tonnage, the number of trips per day and the number of trucks is affected. The cycle times remain the same.**

## CIRCUIT 2

### Step A (From Mine site to HUB):

Each dump truck operator will make the return trip from the Corvette mine site to a transfer site (HUB) for change of trailer (loaded / empty) at KM 0 of the Trans-Taïga and / or on the Billy Diamond road at km 544.

It will use the access road to the Corvette mine site to reach the Trans-Taïga at Km 270: +/- 20Km. Then the Trans-Taïga from Km 270 to Km 0 to reach the Billy Diamond road at Km 544: +/- 270 Km, i.e. the HUB site.

**Total round trip distance for this stage: 580 km.**

The Cycle Time for this section is detailed in the [Table K](#) below

**TABLE K**

**CYCLE TIME: TRANSPORT FROM CORVETTE TO MTC**

SECTOR: CORVETTE TO MATAGAMI			Date:	2023-06-26	
Year : 2023			Volume:	800 000 mt/yr	
LOCALISATION	Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	Time (Min)	
Corvette Site - Rte Trans-Taïga km 270 (Gravel)	30	20	20	60,0	
Trans -Taïga km 270 to Rte Billy Diamond km 544 (Gravel)	70	63	270	257,1	
<b>TOTAL</b>			290	317,1	
Time					
Outward	Round-trip	Unproductive	Total	Total	Nb. trips/24 hrs
Min	Min	Min	Min	Hours	24h
317,14	634,29	120,00	754,29	12,57	1,9
Rate					
\$/Hour	\$/Trip	TMV/Trip	\$/TMV		
212.00	2665.14	45.00	59.23		

In this [Table K](#), the details of the cycle time calculation tell us that:

- The cycle time per round trip of a total distance of 580 km, with a walking time of 12.57 hours/trip
- Each truck will be able to perform 1.9 cycles per 24 H period
- At an hourly rate of \$212 (Driver & equipment budget), we arrive at a cost of \$2665.14 per load of 45mt
- A cost of \$59.23 per metric ton

In [Table L](#) below, let's detail the calculation of Equipment and Labor required for this option from Corvette to HUB

**TABLE L**

**CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS  
TRANSPORT BY TRUCK FROM CORVETTE TO HUB (Rte Billy Diamond - km 544)**

Transport of 800 000 mt of spodumen of lithium concentrate

<b>SCENARIO (24/24 HRS ON 5 DAYS/WEEK AND 7 DAYS/WEEK)</b>	<b>SCENARIO B: 5D/7</b>	<b>SCENARIO E: 7D/7</b>
Mt to transport per year	800,000 mt/yr	800,000 mt/yr
Number of working Days / Year	230 work/days	329 work/days
Mt per days to transport	3,478 mt/day	2,432 mt/day
Truck loading capacity in mt on public highway	45 mt/loads	45 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	77,29 loads	54,04 loads
Number of trips per day per truck	1.90 trip/unit	1.90 trip/day
Number of trucks	41 units	28 units

In this [Table L](#) with option 1 (5/7 days) we have identified the following facts:

- Production of 800,000mt, spread over 230 working days, will be 3478mt per day.
- There will be 77.29 trips per day to be transported, over a 24 H shift with a fleet of 29 trucks, at an annualized average of 45mt per trip.
- Each truck will make 2.7 trips per 24 H period

In this same [Table L](#), with option 2 (7/7 days) we have identified the following facts:

- The production of 800,000mt, spread over 329 working days, will be 2432 mt per day.
- There will be 54.04 trips per day to be transported, over a 24 H shift with a fleet of 20 trucks, at an annualized average of 45mt per trip.
- Each truck will make 2.7 trips per 24 H period

## Step B (From HUB to MTC):

Each trailer truck operator with dump body in type B road train mode will make the round trip from the Matagami transshipment Center (MTC) to the transfer site (HUB) for a change of trailer. The trailers will be pre-coupled in type B road train mode (empty/loaded) at the HUB (at Km 0 of the Trans-Taïga and/or on the Billy Diamond road at Km 544). It will use the Billy Diamond route between the MTC and the transfer site (HUB).

**Total for the round trip: 1108 Km**

**TABLE M**

### CYCLE TIME: FROM HUB TO MTC MATAGAMI

SECTOR: CORVETTE TO MATAGAMI				Date:	2023-06-26
Year : 2023				Volume:	800 000 mt/yr
LOCALISATION		Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	Time (Min)
Rte Billy Diamond km 544 to Matagami km 0 (Paved)		90	75	544	435,2
Matagami km 0 to MTC (Paved)		70	45	10	13,3
<b>TOTAL</b>				554	448,5
<b>Time</b>					
Outward Min	Round-trip Min	Unproductive Min	Total Min	Total Hours	Nb. trips/24 hrs 24h
448,53	897,07	120,00	1017,07	16,95	1,4
<b>Rate</b>					
\$/Hour	\$/Trip	TMV/Trip	\$/TMV		
212.00	3593.64	90.00	39.93		

In Table M, we note the following results:

- The cycle time per round trip of a total distance of 1108 km with a walking time of 16.91 hours/trip.
- Each truck will be able to perform 1.4 cycles per 24 H period
- At an hourly rate of \$212 (Driver & equipment budget), we arrive at a cost of \$3593.64 per load of 90mt
- A cost of \$39.93 per metric ton

**Note that the result between 5/7 and 7/7 days of operation is the same.**

Regarding the equipment and manpower requirements for this scenario between the HUB and the MTC, they are expressed in Table N below.

**TABLE N**

### CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS TRANSPORT BY TRUCK FROM HUB TO MTC

Transport of 800 000 mt of spodumen of lithium concentrate - 90mt/load

SCENARIO (24/24 HRS ON 5 DAYS/WEEK AND 7 DAYS/WEEK)	SCENARIO B: 5D/7	SCENARIO E: 7D/7
Mt to transport per year	800,000 mt/yr	800,000 mt/yr
Number of working Days / Year	230 work/days	329 work/days
Mt per days to transport	3,478 mt/day	2,432 mt/day
Truck loading capacity in mt on public highway	90 mt/loads	90 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	38,65 loads	27,02 loads
Number of trips per day per truck	1.40 trip/unit	1.40 trip/day
Number of trucks	28 units	19 units

In this Table N, with the 5/7 days option, we have identified the following facts:

- Production of 800,000mt, spread over 230 working days, will be 3478mt per day.
- There will be 38.65 trips per day to be transported, over a 24 H shift with a fleet of 28 trucks, at an annualized average of 90mt per trip.
- Each truck will make 1.4 trips per 24 H period

In this same Table N, with the 7/7 days option, we have identified the following facts:

- Production of 800,000mt spread over 329 working days will be 2432mt per day.
- There will be 27 trips per day to transport, on a 24-hour shift with a fleet of 19 trucks, at an annualized average of 90mt per trip.
- Each truck will make 1.4 trips per 24 H period

In Table O below, details of the days of operation can be found. Then, in the following Table P will be detailed the equipment and manpower requirements according to the different scenarios

**TABLE O**  
**DETAILS OF DAYS OF OPERATION**

	<b>5D/7</b>	<b>7D/7</b>
Weekend and Holiday	109	10
Spring maintenance period	14	14
Fall maintenance period	7	7
Unexpected	5	5
Total days off	135	36
<b>Total Days of operation / Year</b>	<b>230</b>	<b>329</b>

**TABLE P**  
**DETAILS ON LABOR - For 800 000 mt/Yr**

	<b>SCENARIO*:</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
Number of trucks required		77	41	28	54	28	19
Drivers 24h/24		77	41	28	54	28	19
Permanent replacement drivers		1	1	1	1	1	1
Temporary replacement drivers - Holiday		1	1	1	1	1	1
During training and probationary period		0	0	0	0	0	0
<b>Total drivers 5 days / 7</b>		<b>79</b>	<b>43</b>	<b>30</b>	<b>56</b>	<b>30</b>	<b>21</b>
<b>Total drivers 7 days / 7 2 crews</b>				<b>112</b>	<b>60</b>	<b>42</b>	

**NON INCLUDED STAFF**

Road maintenance staff	0	0	0	0	0	0	0
Mechanical maintenance staff (Trucks & trailers)	0	0	0	0	0	0	0
Staff at loading and unloading sites.	1	1	1	1	1	1	1
Supply operation staff	0	0	0	0	0	0	0
Management, logistics, security, training, and human resources staff	1	1	1	1	1	1	1

\* Scenario A: Operation 5/7 Corvette to MTC  
 Scenario B: Operation 5/7 Corvette to HUB  
 Scenario C: Operation 5/7 HUB to MTC  
 Scenario D: Operation 7/7 Corvette to MTC  
 Scenario E: Operation 7/7 Corvette to HUB  
 Scenario F: Operation 7/7 HUB to MTC

# DESTINATION B: FROM MINE SITE TO CTC (CHIBOUGAMAU)

## STUDY PART 1 - YEAR 1 - (400,000MT/YEAR)

### CIRCUIT 3

Each truck operator with a side-dump trailer will make the round trip from the Corvette mine site to the CTC transshipment site in Chibougamau\*.

**\* This transshipment site is to be built, not existing to date.**

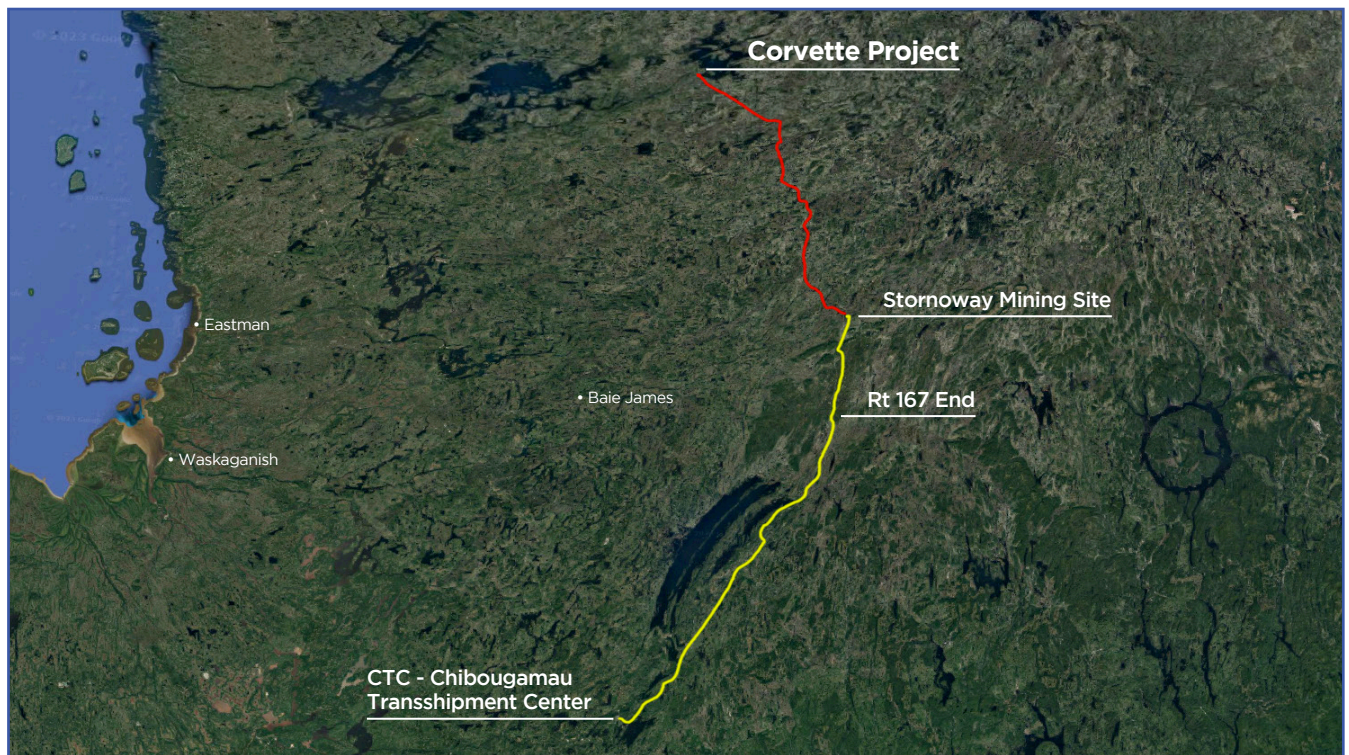
It will then be essential to:

- Construct a Class 1 access road between the Corvette mine site to join the Class 3 road from Stornoway at Km 648 (+/- 130Km.)
- Use Stornoway Road from Km 648 to join road 167 at Km 552 class 1 gravel road. (+/- 97 Km)
- Use Route 167 at Km 552 to reach the junction of Route 167 and Route of Mistissini Km 304 (+/- 245 Km)
- Finally use Route 167 from Mistissini (Km 304) towards Chibougamau at Km 232 (+/- 75 Km)

**Total round trip distance: 1094 Km.**

### MAP 05

#### GENERAL MAP FOR TRUCKING - CORVETTE TO CTC



**TABLE Q**

**CYCLE TIME: FROM CORVETTE TO CTC - CHIBOUGAMAU**

SECTOR: CORVETTE TO CHIBOUGAMAU			Date:	2023-06-26	
Year : 2023			Volume:	400 000 mt/yr	
LOCALISATION	Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	Time (Min)	
Corvette Site - Road to build to Stronoway on 130 km (Gravel)	70	63	130	123,8	
Rt Stronoway km 648 to Rt 167 km 552 (Gravel)	70	63	97	92,4	
Rt 167 km 552 to Rt 167 Mistissini km 304 (Gravel)	70	63	245	233,3	
Mistissini km 304 to CTC Chibougamau km 232 (Paved)	90	75	75	60,0	
<b>TOTAL</b>			547	509,5	
Time					
Outward	Round-trip	Unproductive	Total	Total	Nb. trips/24 hrs
Min	Min	Min	Min	Hours	24h
509,52	1019,05	120,00	1139,05	18,98	1,3

**NOTE: The Fuel surcharge is not included in Prices**

Prices			
\$/Hour	\$/Load	MT/Load	\$/MT
212.00	4024.63	45.00	89.44

In this [Table Q](#), the cycle time per round trip of a total distance of 1094 km corresponds to a traveling time of 18.98 hours/trip.

- Each truck will be able to perform 1.3 cycles per 24 H period
- At an hourly rate of \$212 (Driver & equipment budget), we arrive at a cost of \$4024.63 per load of 45 mt, or a cost of \$89.44 per metric ton.

**Note that, for the cycle time, the result between 5/7 and 7/7 days of operation is the same.**

Let us now see in [Table R](#) below the calculation of equipment and labor requirements.

**TABLE R**

**CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS TRANSPORT BY TRUCK FROM CORVETTE TO CTC - CHIBOUGAMAU**

Transport of 400 000 mt of spodumen of lithium concentrate - 45mt/load

SCENARIO (24/24 HRS ON 5 DAYS/WEEK AND 7 DAYS/WEEK)	SCENARIO A: 5D/7	SCENARIO B: 7D/7
Mt to transport per year	400,000 mt/yr	400,000 mt/yr
Number of working Days / Year	230 work/days	329 work/days
Mt per days to transport	1,739 mt/day	1,216 mt/day
Truck loading capacity in mt on public highway	45 mt/loads	45 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	38,65 loads	27,02 loads
Number of trips per day per truck	1.30 trip/unit	1.30 trip/day
Number of trucks	30 units	21 units

In this [Table R](#), Scenario A (5/7) above, we have identified the following facts:

- Production of 400,000mt, spread over 230 working days, will be 1739mt per day.
- There will be 38.65 trips per day to be transported, over a 24-hour shift with a fleet of 30 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1.3 trips per 24-hour period.

Then, in this same [Table R](#), for scenario B (7/7), we identified the following facts:

- Production of 400,000mt spread over 329 working days will be 1216mt per day.
- There will be 27.02 trips per day to be transported, over a 24-hour shift with a fleet of 21 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1.3 trips per 24-hour period.

Let's now see in the [Tables S and T](#) the Details of the days of operation (S) and the details of the labor (T) for the scenarios A & B mentioned above.

**TABLE S****DETAILS OF DAYS OF OPERATION**

	<b>5D/7</b>	<b>7D/7</b>
Weekend and Holiday	109	10
Spring maintenance period	14	14
Fall maintenance period	7	7
Unexpected	5	5
Total days off	135	36
<b>Total Days of operation / Year</b>	<b>230</b>	<b>329</b>

**TABLE T****DETAILS ON LABOR**

For 400 000 mt/Yr

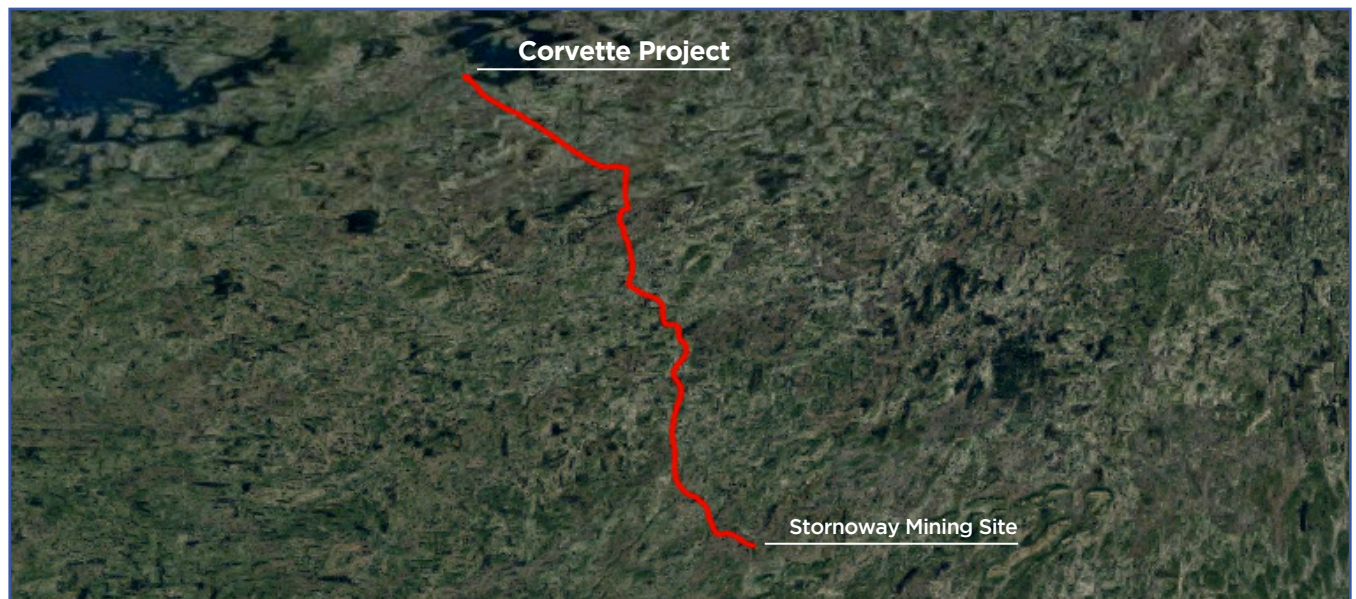
	<b>SCENARIO*:</b>	
	<b>A</b>	<b>B</b>
Number of trucks required	30	21
Drivers 12h/24	30	21
Permanent replacement drivers	1	1
Temporary replacement drivers - Holiday	1	1
During training and probationary period	0	0
<b>Total drivers 5 days / 7</b>	<b>32</b>	<b>23</b>
<b>Total drivers 7 days / 7 2 crews</b>		<b>46</b>

**NON INCLUDED STAFF**

Road maintenance staff	0	0
Mechanical maintenance staff (Trucks & trailers)	0	0
Staff at loading and unloading sites.	1	1
Supply operation staff	0	0
Management, logistics, security, training, and human resources staff	1	1

\*Scenario A: Operation 5/7 Corvette to CTC

Scenario B: Operation 7/7 Corvette to CTC

**MAP 06****GENERAL MAP FOR TRUCKING - CORVETTE TO STORNOWAY MINE**

## STUDY PART 2 - YEAR 2 & FOLLOWING - 800,000MT / YEAR.

### CIRCUIT 3

#### CORVETTE MINE SITE TO CTC

In the Table U below, we explore the Cycle Time from Corvette to CTC Chibougamau for the volume of 800,000mt / year.

**TABLE U**

#### CYCLE TIME: FROM CORVETTE TO CTC - CHIBOUGAMAU

SECTOR: CORVETTE TO CHIBOUGAMAU			Date:	2023-06-26	
Year : 2023			Volume:	800 000 mt/yr	
LOCALISATION	Speed Limit (Km/h)	Speed Limit (Km/h)	Distance (Km)	Time (Min)	
Corvette Site - Road to build to Stronoway on 130 km <b>(Gravel)</b>	70	63	130	123,8	
Rt Stronoway km 648 to Rt 167 km 552 <b>(Gravel)</b>	70	63	97	92,4	
Rt 167 km 552 to Rt 167 Mistissini km 304 <b>(Gravel)</b>	70	63	245	233,3	
Mistissini km 304 to CTC Chibougamau km 232 <b>(Paved)</b>	90	75	75	60,0	
<b>TOTAL</b>			547	509,5	
<b>Time</b>					
Outward Min	Round-trip Min	Unproductive Min	Total Min	Total Hours	Nb. trips/24 hrs
509,52	1019,05	120,00	1139,05	18,98	1,3

**NOTE: The Fuel surcharge is not included in Prices**

Prices			
\$/Hour	\$/Load	MT/Load	\$/MT
212.00	4024.63	45.00	89.44

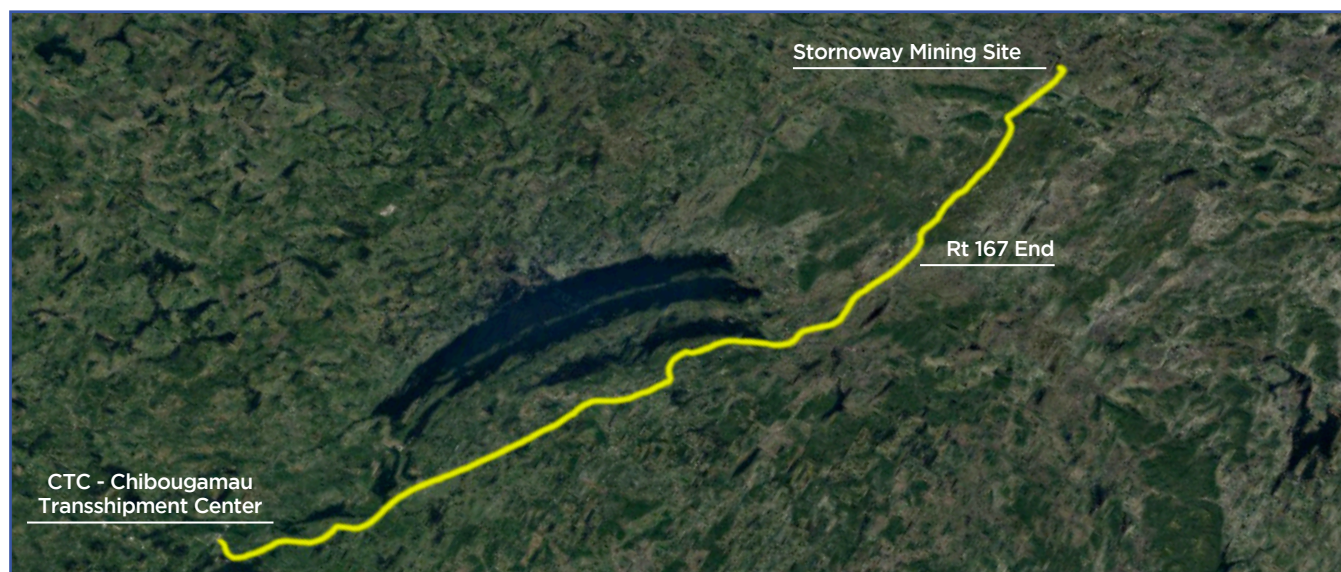
In the Table U, let us point out that:

- The cycle time per round-trip for the total distance of 1094km will be of 18.98 hrs./trip.
- Each truck will be able to perform 1.3 cycles per 24-hour period
- At an hourly rate of \$212 (Driver & equipment budget), we arrive at a cost of \$4024.63 per load of 45mt
- A cost of \$89.44 per metric ton

**Note that the result between 5/7 and 7/7 days of operation is the same**

#### MAP 07

#### GENERAL MAP FOR TRUCKING - STORNOWAY MINE TO CTC



Regarding the calculations of equipment and labor requirements for YEAR 2 & followings (800,000mt/yr.), see Table V next page.

**TABLE V****CALCULATION OF EQUIPMENT AND LABOR REQUIREMENTS  
TRANSPORT BY TRUCK FROM CORVETTE TO CTC - CHIBOUGAMAU**

Transport of 800 000 mt of spodumen of lithium concentrate - 45mt/load

<b>SCENARIO (24/24 HRS ON 5 DAYS/WEEK AND 7 DAYS/WEEK)</b>	<b>SCENARIO A: 5D/7</b>	<b>SCENARIO B: 7D/7</b>
Mt to transport per year	800,000 mt/yr	800,000 mt/yr
Number of working Days / Year	230 work/days	329 work/days
Mt per days to transport	3,478 mt/day	2,432 mt/day
Truck loading capacity in mt on public highway	45 mt/loads	45 mt/loads
Number of loads to transport per day 24/24h 5/7 days and 7/7 days	77,29 loads	54,04 loads
Number of trips per day per truck	1.30 trip/unit	1.30 trip/day
Number of trucks	59 units	42 units

In this [Table V](#), scenario A (5/7 days), we have identified the following facts:

- Production of 800,000mt spread over 230 working days will be 3478mt per day.
- There will be 77.29 trips per day to transport, over a 24-hour shift with a fleet of 59 trucks,
- Each truck will make 1.3 trips per 24-hour period

In this same [Table V](#), scenario B (7/7 days), we note the following facts:

- Production of 800,000mt spread over 329 working days will be 2432mt per day.
- There will be 50.04 trips per day to be transported, over a 24-hour shift with a fleet of 42 trucks, at an annualized average of 45mt per trip.
- Each truck will make 1.3 trips per 24-hour period

Following are [Tables W and X](#) which give us the Details of days of operation ([Table W](#)) and the Details of labor ([Table X](#))

**TABLE W****DETAILS OF DAYS OF OPERATION**

	<b>5D/7</b>	<b>7D/7</b>
Weekend and Holiday	109	10
Spring maintenance period	14	14
Fall maintenance period	7	7
Unexpected	5	5
Total days off	135	36
<b>Total Days of operation / Year</b>	<b>230</b>	<b>329</b>

**TABLE X****DETAILS ON LABOR - For 800 000 mt/Yr**

	<b>SCENARIO*: A B</b>	
Number of trucks required	59	42
Drivers 12h/24	59	42
Permanent replacement drivers	1	1
Temporary replacement drivers - Holiday	1	1
During training and probationary period	0	0
<b>Total drivers 5 days / 7</b>	<b>61</b>	<b>44</b>
<b>Total drivers 7 days / 7 2 crews</b>		<b>88</b>
<b>NON INCLUDED STAFF</b>		
Road maintenance staff	0	0
Mechanical maintenance staff (Trucks & trailers)	0	0
Staff at loading and unloading sites.	1	1
Supply operation staff	0	0
Management, logistics, security, training, and human resources staff	1	1

\*Scenario A: Operation 5/7 Corvette to CTC

Scenario B: Operation 7/7 Corvette to CTC

# DESTINATION C: DELIVERY IN QUEBEC

## CIRCUIT 4

From MTC (Matagami) to:

Option 1 – Bécancour

Option 2 – Saguenay

## CIRCUIT 5

From CTC (Chibougamau) to:

Option 1 – Bécancour

Option 2 – Saguenay

The Prices for the delivery of lithium spodumene concentrate by rail (CN Rail) are detailed in Table Y below.

### TABLE Y

#### **TRANSPORT RATES BY RAIL - CN RAIL**

Transport of spodumen of lithium concentrate in 52 FT Covered Gondolas

ORIGIN	DESTINATION	RAILCAR CAP. MT/KG	RATE/RAILCAR CAN\$	RATE/MT
<b>CIRCUIT 4</b>				
MTC Matagami	Saguenay, QC	80mt 80 000kg	\$3,900.00	\$48.75
MTC Matagami	Saguenay, QC	80mt 80 000kg	\$4,500.00	\$56.25
<b>CIRCUIT 5</b>				
CTC Chibougamau	Saguenay, QC	80mt 80 000kg	\$2,000.00	\$25.00
CTC Chibougamau	Becancour, QC	80mt 80 000kg	\$3,600.00	\$45.00

- NOTES:**
- These rates are subject to the CN Fuel Surcharge Tarif CN 7403
  - These rates do not include any fee for loading or unloading of railcars at Origin or Destination
  - These rates do not include the applicable taxes
  - CN will not be responsible for under weight or excess weight loaded into railcars
  - These rates are actual rates (June 2023) and can fluctuate anytime

# POINTS FOR REFLECTION

## EQUIPMENT - COSTS - OWNERSHIP - CIRCUITS

### EQUIPMENT - COSTS

Several options and combinations are possible regarding the ownership of trucks and trailers. It all depends on the volume of concentrate to be transported between year 1 of the project and subsequent years as well as the choice of rail transshipment site, Matagami or Chibougamau.

Based on the probable scenarios for transport to the MTC Matagami (**Destination A**), during year 1, from Corvette directly to the MTC, as well as for the 2-leg transport option, we considered the following equipment:

- Tridem truck adapted to the project, unit price: \$400,000.00\*
- Side-dump trailer adaptable to a road train: \$200,000.00

**\* Prices are always subject to applicable taxes.**

These trucks and trailers will be designed for robust work (HD) and functional for concentrate transport operations for your project. Note that the unit prices of trucks and trailers must be re-evaluated by tender, at least 2 years before the start of operations to complete the transport fleet on time (In fact, the high demand for equipment influences the delivery dates of the various manufacturers).

The transport operation of the concentrate between Corvette and the Matagami-MTC will require the use of a fleet that will vary between 24 and 27 trucks depending on the choice of circuit 1 or circuit 2 and will require 30 to 40 trailers depending on the option chosen. This calculation includes some spare trucks and trailers.

For the Circuit 1 option, the investment to be considered will be of the order of:

- **\$16,200,000 for the transport fleet for year 1 of the project (400,000mt)**
- **\$32,400,000 for the transport fleet for year 2 & following (800,000mt)**

For the Circuit 2 option, the investment to be considered will be of the order of:

- **\$18,600,000 for the transport fleet for year 1 (400,000mt)**
- **\$37,200,000 for the transport fleet for year 2 (800,000mt)**

About the delivery scenario at the CTC in Chibougamau (**Destination B**), we considered, for the purposes of this study, that the missing infrastructures would be existing and of usable levels (roads and transshipment yard).

For YEAR 1 (400,000mt), Circuit 3 (From Corvette to CTC Chibougamau), the concentrate transportation operation will require a fleet of approximately 21 trucks and trailers including some spare trucks and trailers.

The investment to be considered would be of the order of:

- \$12,600,000 for the transport fleet for YEAR 1 (400,000mt)
- \$25,200,000 for the transport fleet for year 2 (800,000mt)

**This scenario is also based on 7 days a week shifts.**

### FLEET OWNERSHIP

The Company promoting the project will have to carry out an important reflection to define its choices as to the ownership of the fleet for the transport operations (Opex/Capex). It will have to rule in relation to its involvement in the transport operations of the concentrate.

#### Option 1

We estimate that 100% ownership of the fleet by the mining company, Corvette option in Matagami, will require an investment of nearly \$37,000,000 for a complete fleet to support operations for the transport of 800,000 mt/year. The investment would be close to \$25,000,000 for the Corvette option in Chibougamau.

This option will oblige the mining company to take care of the maintenance of the equipment while enforcing safety standards.

Does this scenario suit the Mining's objectives? Does she want to create a major in-house transportation company?

#### Option 2

In this scenario, the Mining entrusts its Transport Business to a general subcontractor while retaining ownership of the trailers.

In the negotiations with the transport general contractor, the Miner will have to include a minimum annual amount in its Opex for the amortization of the fleet over a short period, for both the Matagami and Chibougamau options.

Guarantees of daily volumes transported and according to a precise schedule will have to be established, all understood in a transport contract of 3 to 5, or even 6 years. This period will serve as a guarantee for the transport company which will provide trucks, trailers, drivers, and dispatchers. As the latter own the equipment, it will be 100% responsible for the labor and maintenance of its fleet.

Under a similar contract with the Mining Company, the general subcontractor should easily obtain the support of a lender for its investments of \$600,000 per truck-trailer unit.

The supplier must also set up a supervision team (dispatcher, head of labor and safety, etc.).

The general subcontractor could also choose to work with subcontractors (second zone). He will then be responsible for negotiating and establishing service contracts with them.

The latter will also be responsible for enforcing the operating regulations required by the mining company, all standard and mandatory safety rules, including compliance with working hours.

The Mining could also acquire 2 or 3 standard trucks (trucks and trailers) thus obtaining a certain expertise of transport operations (statistics of volumes, costs, etc.), obtaining in turn a certain respect from the main contractor and subcontractors.

### Option 3

Eventually, the Mining Company could opt to retain ownership of the trailers, thereby retaining some control. It would entrust the general subcontractor with the mandate to maintain the trailers. This scenario makes it possible to secure operations in the event of a conflict with the subcontractor while sharing the costs and risks with the latter.

The general transport operations of the Mining Company, in addition to those of the transport of the concentrate, include another very important aspect that should not be neglected is that of the management of the transport of the supply intended for the mine site.

Consideration should be given to the supply operations of the mining complex, both about the construction phase of the complex and that of the day-to-day operations of the site. The life of the mine depends on a smooth, stable, and constant supply operation.

Having this in mind, a mining team will have to consider the security of supply of the mine and, by extension, to organize and provide the required transport service. The basic idea of transport being to use the trucks to their maximum round-trip capacities, we can therefore consider using the resources of bulk transport. One option would be to hitch a second trailer loaded with mine supplies to the front of the empty trailer headed for the Corvette site. Surely an idea to explore.

Above all, the mining supply needs and volumes will have to be established to know the type and number of transport equipment, the workforce as well as the storage and consolidation sites required by these operations.

## LABOR

Currently, in Quebec, the scarcity of labor is a major source of concern. It is unfortunately increased in the mining sectors as well as in the transport sector.

This will likely continue for years to come.

This labor shortage in the transportation industry is more serious than one might think, more specifically for truckers in remote northern areas. The same goes for all mechanical maintenance personnel and fleet managers. This will surely be one of the major challenges of the HR team that the Mining will have to face, such as for the eventual general subcontractor who would have the mandate of transport operations. This dynamic is identical for the Matagami option as well as for that of Chibougamau.

It will therefore be necessary to consider the best options. The choice of working hours will therefore be a major asset for the recruitment of the workforce.

Given the remoteness and the distances to be covered for the project, we consider that a schedule of 5 days out of 7 is not advisable.

In our opinion, a schedule of 7 days a week, with a full day off (At the mine site or at the rail transfer site) would be ideal. This buffer day could also prove to be a necessary period of equipment maintenance.

The hourly wage of \$35 to \$40 per hour should be competitive regarding the prerequisites, compared to the current requirements and salaries of related trades in the mining sector.

Beyond the salary, several important factors deserve to be highlighted to favor this scenario. Pride and the feeling of belonging to an organization concerned about the well-being of its employees is a significant one. In addition, having equipment assigned to each driver, having recent, high-performance equipment adapted to Nordic transport will be attractive factors.

The sense of belonging of employees undeniably creates fraternity within a group. From experience, in the Nordic region, we have found that the members of such a group will be concerned with each other. They thus undoubtedly contribute to reducing the risk of accidents at work and, what is more, to the possible positive results of the company. This phenomenon is documented.

For Circuit 2, from site to MTC in 2 Steps, our calculations indicate the need for 94 drivers, including additional drivers (spares) and a dispatcher on a 7-day shift.

For the Corvette operation to MTC Matagami, these scenarios imply the employment of 108 drivers for Circuit 1, for the volume of 800,000 mt/year. This calculation includes additional drivers (spares) and a dispatcher on a 7-day shift.

For Circuit 2, from site to MTC in 2 Steps, our calculations indicate the need for 94 drivers, including additional drivers (spares) and a dispatcher on a 7-day shift.

Regarding the Corvette operation in Chibougamau, this scenario involves the employment, with the same parameters, of 88 drivers, including additional drivers (spares) and a dispatcher on a work shift of 7 days on 7.

This information is detailed in the [J & V Tables](#).

## CIRCUITS - THE ACCESS ROADS TO THE MINE SITE

### MATAGAMI OPTION

For the transport of the lithium concentrate as well as for the supply of the mine, considering the 1688 km round trip circuit, the equipment chosen must have been designed for this robust work in the northern zone. It is essential for the safety of all users to have a very well-maintained road network year-round, making it possible to reduce the risk of accidents and damage to the transport fleet. Otherwise, given the remoteness of the project, we could be exposed to very costly equipment breakdowns and loss of time.

#### Circuit details and sections:

- From the Matagami Transshipment Center (MTC). Until km 544 and junction of the Trans-taïga.
- From km 0 of the Billy Diamond road, to km 544 and corner of the Trans-taïga km 0 of the Trans-taïga road.
- From km 0 of the Trans-taïga road, at the corner of the access road to the Corvette mine site km 270 of the Trans-taïga road.
- From km 270, direction Corvette mining complex by the access road.

#### Details about this option:

This existing circuit opens the door to the possibility of sharing road maintenance costs with other users such as:

- Hydro-Quebec.
- SDBJ (James Bay Energy Company)
- Indigenous communities.
- Local outfitters (Tourist, 4 seasons, hunting fishing, etc.)
- Other mining exploration companies.

#### For example, and details:

- The Billy Diamond road, a 544 km paved road with an exceptional capacity, is maintained year-round by SDBJ subcontractors.
- The Trans-taïga road is maintained year-round by Hydro-Québec subcontractors.

Note that from the junction of the Trans-Taïga road at KM 270 towards the Corvette mining complex, there will be:

- +/- 20km of road to upgrade, Class 2 at least
- +/- 20 km of road that the mine will have to maintain alone

#### Details of populated areas:

- Valleys and indigenous communities.
- Radisson, 75 km north of the junction of the Trans-taïga and the Billy Diamond road.
- 2 Aboriginal communities which are located west of the Billy Diamond road at more or less 80 km for Wemindji and nearly 100 km for Chisasibi.
- A restoration and rest site at Km 381 on the road to Billy Diamond
- Several other rests stops on the Billy Diamond road, such as the one at km 257 Rupert River, as well as other sites, existing safety rest stops on the Trans-taïga.

The 290 km (270 + 20) of gravel will require different increased maintenance over the seasons while the current very low traffic will be increased daily by all the passages of trucks with a total loaded mass of 62,500 kg.

In addition, the gravel area will require permanent maintenance teams (graders and sanders), who will be based at one or two satellite camps, equipped with dome-type garages. Domes set up for the repair of equipment and the storage of certain parts for their maintenance. These satellite camps will also be used as a year-round fuel site.

We believe that a minimum of four to five pieces of equipment (graders) should be considered for road maintenance for the summer period, while four sanders and a few additional graders should be mobilized for the winter period. In winter, the sandblasters must use crushed material of the MG-20 type (and not sand) to keep the quality of the road covering intact for the mild seasons. This operation is carried out at a higher cost than the use of sand, but it makes it possible to delay the resurfacing of the stone road by at least one year. Gravel roads to be replenished with MG-20 crushed material every five years, minimum.

In addition, it should be noted that the spreading of dust suppressant, 3 to 4 times per summer season, becomes mandatory for the safety factor of all circuit users.

Our consultations with a recognized contractor informed us about the maintenance costs of a gravel road. It costs a few million dollars annually for a road of 400 to 500 km. We believe that these costs should be shared by all users of this route.

**A table of these costs can be found on page 30.**

Transportation equipment significantly damages gravel roads by traveling during freeze-thaw periods. The costs of upgrading following these periods are very expensive. During these periods, the roads are waterlogged, creating wash-out and become minefields, damaging the vehicles circulating. The risk of accidents increases. For these reasons, transport operations should ideally be stopped for the thaw period. If the fall season was rainy, it might be wise to schedule certain downtimes to avoid losing control over the quality of the road.

It will be essential that the trucks and trailers dedicated to this project be equipped with tires adapted to such road conditions, different brake bands and equipped with additional protections for the air and electrical lines, etc. The combined acquisition and maintenance costs of this equipment would then be increased by 15 to 20%.

Arrived at their destination, at the MTC Matagami transshipment site, the trucks loaded with concentrate will have to be weighed and then transferred to a warehouse so that the ore is sheltered from the weather and the wind. Subsequently, a loading operation of the gondola type wagons with cover, will be carried out using loaders on wheels. This operation will be carried out by the organization operating on the MTC site. Subsequently, the assembly of the wagons will be done by the MTC operator so that the rail carrier (CN) can route the convoy to the final destination.

## CHIBOUGAMAU OPTION

The other option considered for the transport of the lithium concentrate as well as for the supply of the mine concerns the CTC site (Chibougamau Transfer Center). This non-existent site is located approximately 547 km (1094 km round-trip) from Corvette site. Transport must be carried out by trucks designed for this robust work in northern and remote areas.

It is essential, here too, for the safety of all users of the circuit to have a very well-maintained road network year-round, reducing the risk of accidents as well as damage to the transport fleet. Otherwise, given the remoteness of the project, we could be exposed to very costly equipment breakdowns and loss of time.

**Circuit details and sections (From Corvette to CTC):**

- A CTC railway transshipment yard (non-existent to date) around km 232, using route 167 to km 304, end of the paved road.
- From km 304 of route 167 class 1 gravel road, to km 552 end of route 167.
- From km 552 end of Route 167 at the Stornoway mine site to km 648 via a Class 3 access road.
- From the Stornoway mine site at km 648 towards the Corvette mining complex. Access road to be built on a wet area, unidentified route, with approximately 130 km.

**Details about this option:**

Partially existing circuit with the possibility of sharing road maintenance costs with other users such as

- MTQ (Ministry of Transport of Quebec)
- SDBJ
- Logging company if operation in the sector (Chantier Chibougamau and/or Barette Chapais)
- Other mines operating in the area, such as the Renard mine in Stornoway
- Indigenous communities.
- Outfitters. (Tourist, 4 seasons, hunting fishing, etc.)
- Other mining exploration companies.

### Details of this segment of the circuit:

- Class 3 access road to reach the Stornoway mine site, approximately 97 km.
- Plan to upgrade the road to at least Class 2 level.
- This section is maintained by a mining subcontractor on a year-round basis.
- Consider sharing road maintenance costs with Stornoway Mining.
- Access road to be built of at least class 2, to reach the Corvette mine site: Approximately 130 km.
- The mine will have to work with a subcontractor to maintain this segment year-round and will be the only one to cover the maintenance costs of this road.
- No restoration and rest site between the mine and the town of Chibougamau.- A few rest stops and existing safety stops between the mine site and the town of Chibougamau along the route.

### Indigenous communities:

- 2 Aboriginal communities located west of Route 167: Mistissini and Oujé-Bougoumou.

The 472 km of gravel will require different maintenance over the seasons, while the currently very low traffic will be increased daily by all the passages of trucks with an average total loaded mass of 62,500 kg.

In addition, the gravel area will require permanent maintenance teams (graders and sanders), who will be based at one or two satellite camps, equipped with dome-type garages. Domes set up for the repair of equipment and the storage of certain parts for their maintenance. These satellite camps will also be used as a year-round fuel site. These camps will also serve as a site of refuge during storms or fortuitous events.

We believe that a minimum of four to five pieces of equipment (graders) should be considered for road maintenance for the summer period, while four sanders and a few additional graders should be mobilized for the winter period. In winter, the sandblasters must use crushed material of the MG-20 type (and not sand) to keep the quality of the road covering intact for the mild seasons. This operation is carried out at a higher cost than the use of sand, but it makes it possible to delay the resurfacing of the gravel road by at least one year. Gravel roads to be replenished with MG-20 crushed material every five years, minimum.

In addition, it should be noted that the spreading of dust suppressant, 3 to 4 times per summer season, becomes mandatory for the safety factor of all circuit users.

According to our consultations, the annual maintenance cost of a gravel road is quite expensive, and these costs should be shared by all users of this road, except of course for the segment used by Corvette only.

Here, in a few figures, is the result of these consultations regarding the current maintenance costs of a gravel road (Forest type) in Quebec:

Scraping and shaping of the road with a grader in the summer	\$1,730 / km
Snow and ice removal with grader, in fall and winter	\$1,810 / km
Snow removal and sanding with sander truck	\$2,490 / km
<b>Total</b>	<b>\$6,030/km</b>

Which brings us, as an example, to a total annual maintenance cost of \$2,846,160, for the 472 km gravel road to be maintained between Corvette and Stornoway:

From Corvette towards Stornoway (Road to be built)	130km
From Stornoway, km 648 to Rte 167, km 552	97km
From Rte 167, km 552 to Mistissini, km 304	245km
<b>Total</b>	<b>472 km</b>

- NOTES:**
- This annual cost does not include the materials (sand, gravel, de-icing equipment, dust suppressant), nor their transport to the various sites, nor their loading in utility trucks.
  - This cost could of course be shared between several users, depending on the section concerned.

To this end, we must also ask ourselves whether the section of road to be built, at great expense, between the Otish Mountains and the Trans-taiga, is logical, desirable, and feasible.

Note that the cost of building a level gravel road required here would be \$750,000 to 1 million per km, not counting the cost of bridges and culverts which would be very numerous in this region. Indeed, some high-flow rivers meandering in this territory would require the erection of important bridges.

This road would be built in one of the largest wetlands in Quebec and one of the largest reserves of natural and drinking water. This region which is, moreover, an important source for several of the great rivers of northern Quebec. Building this road, with no environmental impact, would be a colossal engineering and social acceptability challenge for the Cree community and all other non-native users.

In addition, it would become important that these road sections as well as the culverts and the quality of the bottom of the road be reviewed and redesigned to provide them with sufficient width to allow two trucks to meet.

Note that it is unlikely that the MTQ will agree to contribute in part to the cost of maintaining this new road, considering the enormous maintenance costs, although it is not unthinkable.

To this end, and following discussions that led to an agreement between the Government of Quebec and the Cree community, a road could see the light of day between the Trans-Taïga and the Stornoway mine site within the next 25 years, possibly even as far as Kuujuaq in the Far North. Certainly, a long-term project but which would surely open new horizons for the indigenous peoples living there as well as for the Mining Industry. A file to follow for all concerned.

Again, we must repeat that transportation equipment significantly damages gravel roads by traveling during freeze-thaw periods. The costs of upgrading following these periods are very expensive. During these periods, the roads are waterlogged, creating wash-out and become minefields, damaging the vehicles that circulate there. The risk of accidents increases. For

these reasons, transport operations should ideally be stopped for the thaw period. If the fall season was rainy, it might be wise to schedule certain downtimes so as not to lose control over the quality of the road.

It will be essential that the trucks and trailers dedicated to this project be equipped with tires adapted to such rolling conditions, different brake bands and equipped with additional protections for the air and electrical lines, etc. The combined acquisition and maintenance costs of this equipment would then be increased by 15 to 20%.

Arrived at their destination, at the CTC Chibougamau transshipment site, the trucks loaded with concentrate will have to be weighed and then transferred to a warehouse so that the ore is sheltered from the weather and the wind. Subsequently, a loading operation of the gondola type wagons with cover will be carried out using wheeled bucket loaders. This operation will be carried out by the organization operating on the CTC site. Subsequently, the assembly of the wagons will be done by the CTC operator so that the rail carrier (CN) can route the convoy to the destination.

## SITE AND TRANSSHIPMENT YARD

Regardless of the transshipment site that will be chosen, Mata-gami or Chibougamau, the logistics services for the storage of the lithium concentrate as well as its transfer in the railcars, must respect the same safety criteria and environmental standards of federal, provincial, and municipal.

All without considering that a very good local social acceptability will always be required, regardless of the project.

The site of the municipality selected to host the Mining facilities for its transshipment operations must offer sufficient electrical installations as well as all the infrastructure and service for water with fire hydrant as well as sewers. The site must also be secure (fenced) with a gate and security camera. Not to mention that it must be equipped with a scale for weighing trucks as well as office spaces.

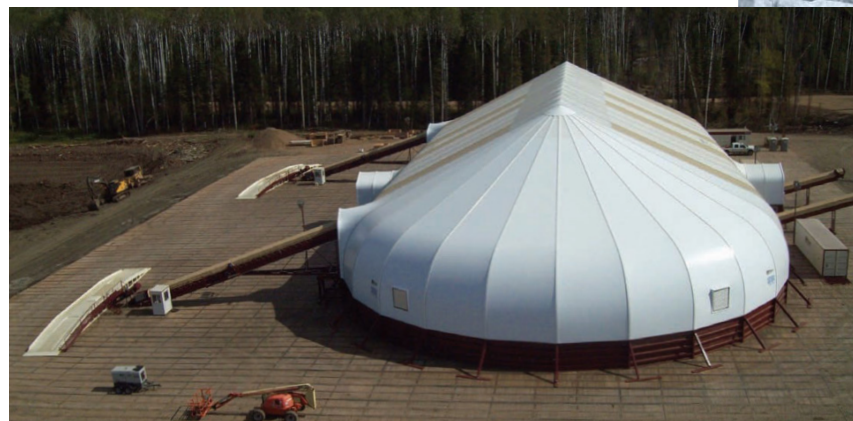
The municipality involved would also benefit from guaranteeing that the site will be operational with the space required for the Miner facilities while having the possibility of future expansions.

The Mining Company will have to obtain agreements with the selected municipality that owns the site as well as with the logistics organization operating on site so that it can proceed with the installation of storage domes for the concentrate, facilities for the management and consolidation of inventories and for the storage of parts in transit for the Mine operations.

The latter will also have to enter into agreements with a car lessor dedicated to transporting the concentrate by rail. Agreement that it could make alone with the landlord or in partnership with the organization operating the transshipment site.

The company that will be responsible for site operations must provide a service that complies with all laws and standards of the Railway Association of Canada ( Info can be viewed on <https://www.railcan.ca/>), as well as those imposed by the rail carrier, Canadian National (Info to be viewed on <https://www.cn.ca/en/>) and to have in his possession all the necessary certificates for the operation of a transshipment yard.

The Mining Company will have to negotiate with the company operating the site an agreement specifying and covering the duration of the said agreement, specifying the obligations of the two parties and the expected return.



It will be the responsibility of the operating company to provide the equipment necessary for unloading the trailer trucks, those dedicated to the management of the concentrate in the domes,

all the equipment used for loading the wagons as well as those used for their maintenance.

In conclusion, we must mention that only the municipality of Matagami can currently offer the full service of an operational, regulatory, and safe transshipment site with the possibility of expansion if necessary.

The Matagami MTC site can be visited at:

<https://matagami.com/wp-content/uploads/Documents/PDF/Cour-de-transbordement-Matagami.pdf>.

**The Chibougamau sector does not currently have a transshipment site, but the will is there.**



## DELIVERY IN QUEBEC VIA RAIL

We saw in [Table X](#), the costs of transport by CN rail from the MTC and CTC sites, to Saguenay or Bécancour, QC.

**It should be noted, however, that although CN Rail facilities exist in both Matagami and Chibougamau, there is currently no transshipment site in Chibougamau.**

# CONCLUSIONS

In this document, we have presented and analyzed different cycle times with two circuit options for transporting lithium concentrate between the Corvette site and a rail transshipment center.

We determined the circuit that, in our opinion, would provide PBM with the best elements of success given the general issues related to distance and transportation issues.

We also analyzed the various equipment available on the market in the short and long term while keeping in mind the costs, the ecological footprint and social acceptability.

We have presented the various issues, advantages, disadvantages, and findings for each of the options.

All the prices and tariffs mentioned in this document are budgetary and based on today's costs. They should, ideally, be confirmed in the context of a detailed study to come.

In addition, the transportation rates mentioned in this document are subject to the applicable fuel surcharge according to the Freight Carrier Association of Canada (FCA) weekly report, Heavy TL rate.

As part of this pre-feasibility study, our conclusions lead us to suggest the following cycle time, equipment, and suggestions:

## CYCLE TIME

Whether we prefer the Matagami or Chibougamau option, we suggest an operation with two teams 7/7, on a continuous day/night cycle time, over a period of 7 continuous days, including an installation period of 24 hours to respect the drivers driving hours (logbook). Naturally, this 24-hour break would be managed according to a schedule that pauses 1/7 of the workforce per day.

We have seen that there are several possible cycles of operation for the transport of the concentrate, however, we believe that the 7/7 with 24-hour pose is the one which, in our opinion, would be likely to obtain the highest percentage of social acceptability as well as providing the project with the required manpower.

## TRUCK AND TRAILER

We suggest, for both options, the same model of truck, i.e., a tridem traction truck, regardless of the brand.

Regarding trailers for the Matagami option, as well as for Chibougamau, we suggest a fleet of B-train type trailers (2 X trailers with a capacity of 45tm each)

- For the Matagami option: 37 diesel-powered 4-axle trucks (3 traction axles), regardless of brand (Western Star, Kenworth, Mack, etc.), with 42 trailers (side-dump) type B-train.
- For the Chibougamau option: The use of 13 X 4-axle trucks instead of 14 X 3-axle trucks would result in a reduction in GHG emissions of around 7% and a 12% reduction in trips through urban areas (43 vs. 49).
- In each case, 2 or 3 of these trucks could be the property of Patriot Battery Metals.

About electric and compressed natural gas (CNG) or renewable (RNG) trucks, we conclude that the current market will not allow technically level and profitable use for several years. However, the market is changing rapidly, which is why we will have to keep an eye on the development of these products. Who knows? The next generation of trucks assigned to this project (2029/2030) could see the emergence of a few natural gas or even electric trucks.

The trailers should be of the 4-axle type with side unloading and could be the property of the Mining Company or of a general contractor (see **Note**).

Operations could be entrusted to a contingent of 10 or 11 independent owners-operators, each owner of their own truck (1 or 2 maximum per permit)

**Note:** During various approaches and meetings with entrepreneurs, some of whom are major players working in this field for decades, they mentioned that it would be very difficult to convince them to invest only in trucks, without investing in the trailers. As previously suggested, the Mining could, in such a scenario, have 2 or 3 standard trucks and trailers for the obvious purpose of acquiring data and building expertise regarding the transportation project.



**Note:** Photo of equipment like what could be used for the Corvette Project.



## THE CIRCUITS

The first circuit (Corvette to MTC) of 844 km is complete and currently exists.

As for the second planned circuit (Corvette to CTC), it does not exist over a minimum distance of 130 km\* (From Corvette towards the Stornoway project), and will also require an upgrade (class 3 to 2) for 97 km.

**\* This distance could increase considerably during the design of the road.**

## LABOR

The current challenge and success in attracting qualified labor open to contributing to such a project is largely due to respect for the individual. The respected employee will develop a sense of belonging to his group and with the company that employs him.

We believe that a group of valet-tugs identified in the colors of the Mining Company, well paid, working 7/7/24 hour shifts would be proud to work on this project and to work on it for many years.

# FINAL CONCLUSION

## SUMMARY TABLE

### PBM-CORVETTE LITHIUM SPODUMEN CONCENTRATE SHIPPING

800 000mt/Year - 7/7 Operation

Origin	Destination	Distance/km	Scenario	Nbr trucks	Nbr drivers	Investment	C\$/mt by truck	C\$/mt by Rail
Corvette	MTC Matagami	844	Direct from Corvette	54	108	32,400,000	129.66	
Corvette	MTC Matagami	844	In 2 x Steps with Hub	47	94	37,200,000	99.16	
Corvette	CTC-Chibougamau	547	Direct	42	88	25,200,000	89.44	
MTC Matagami	Saguenay, QC							48.75C\$
MTC Matagami	Becancour, QC							56.25C\$
CTC Chibougamau	Saguenay, QC		Rail - 80mt/Railcar					25.00C\$
CTC Chibougamau	Becancour, QC		Rail - 80mt/Railcar					45.00C\$

In this [Summary Table](#), we note the following important elements:

- The difference in km between CTC and MTC of 297 km (594 km for the round-trip) would lead to a total reduction of more than 5 million km traveled over one year of production by the fleet (800,000 mt = 8,889 loads of 90 mt X 594 km), i.e., a significant saving in fuel, wear, and maintenance of equipment
- The number of trucks required for the CTC option is 5 to 12 units less than for the MTC option
- The number of drivers required for the CTC option is lower by 6 to 20 drivers than for the MTC option
- The investment in equipment is less for the CTC option of 7 to 12MC\$ than for the MTC option
- The transportation cost per metric ton of \$89.44 for the CTC option would provide savings of at least \$7.8MC\$ annually and up to \$32.2MC\$ depending on the chosen MTC option for comparison
- The cost of transportation by rail per metric ton from Chibougamau to Saguenay or Bécancour would provide the following significant savings:
  - From CTC to Saguenay VS MTC to Saguenay: Savings of 19,000,000C\$ / year (20MC\$ vs 39MC\$)
  - From CTC to Bécancour VS MTC to Bécancour: Savings of 9,000,000C\$ / year (36MC\$ vs 45MC\$)

Considering the information emanating from this summary table, we can only conclude that transporting from Corvette to Chibougamau by truck and then from Chibougamau by train to Saguenay would prove to be the most economical solution. A saving of at least \$25.8MC in transportation (rail of \$19MC and trucking of \$7.8MC), all without counting the savings in drivers, investment for the fleet, for fuel, maintenance, etc.

We can say, without being mistaken, that savings of around \$30MC per year would be achievable.

However, there is no road between Corvette and Stornoway and another section of the road to Chibougamau needs to be upgraded (Route of Stornoway Mining). In addition, there is no Transshipment Center in Chibougamau.

On the other hand, the realization of \$30 million in potential savings, annually and over a period of 25 to 30 years, could prove to be the trigger for a study project in this direction.

If this option via Chibougamau is not feasible in the short term for various reasons, there will always be the option of having the concentrate transit through Matagami for a certain time.

We believe and hope that the information and conclusions set forth in this document will help inform Patriot Battery Metals choices regarding this transportation project and help you make decisions in the best interests of your business.

It will be our pleasure, in a second step and at your request, to carry out a detailed and feasibility study on the challenges of your lithium spodumene concentrate transport project.

Sincerely,



Yves Fournier, General Manager

Craler

# ANNEX 1

From: Petrin, Yves <ypetrin@craler.com>

Sent: Monday, June 26, 2023 8:06 AM

To: Darren Smith <darren@patriotbatterymetals.com>; Latulippe, Hugo <Hugo.Latulippe@bba.ca>

Cc: Thomassin, Yves <Yves.Thomassin@bba.ca>; Gregory Barfoot <gbarfoot@patriotbatterymetals.com>

Subject: RE: Corvette transportation study

Good morning Darren,

Here is the information you've requested,

- Budgetary price per metric ton for the transport by truck of the lithium spodumene concentrate between Corvette and Matagami: **\$198.00/mt**
- ***Please note that the current fuel surcharge is included in the price.***
- ***Trucks should carry +/- 45tm per trip.***
- ***The type of trailer used is side dump trailers***
- Budgetary price per metric ton for concentrate transshipment operations at the warehouse and in the railcars, in Matagami : **\$27.00/mt**
- Note that the price for the warehousing of the product is not included in the transshipment operation rate (Dome type, property of the mine)
- Note that this price includes the current fee of \$2.00/mt billed by the city of Matagami for the use of their site.
- Budgetary price per metric ton for transportation of concentrate by rail between Matagami and Bécancour, QC: **\$62.00/mt**
- ***Please note that the current fuel surcharge is included in the price.***
- ***Note that the rail capacity in the Matagami sector allow a maximum of 263,000 lbs.***
- ***Note that the railcar used to transport the concentrate is a 52-foot covered gondola. These railcars should be able to carry +/- 80mt of net concentrate each. CN will not provide the railcars and the mine would be responsible to lease or purchase such equipment.***

Total cost for transporting each metric ton from Corvette site to Bécancour, QC: **\$287.00**

***Although these rates are accurate for today's reality, they remain budgetary rates that would change in time (fuel surcharge vary on a weekly basis)***

You will soon find, in our complete report, a lot of additional detailed information and various operating scenarios.

Best Regards,

Yves



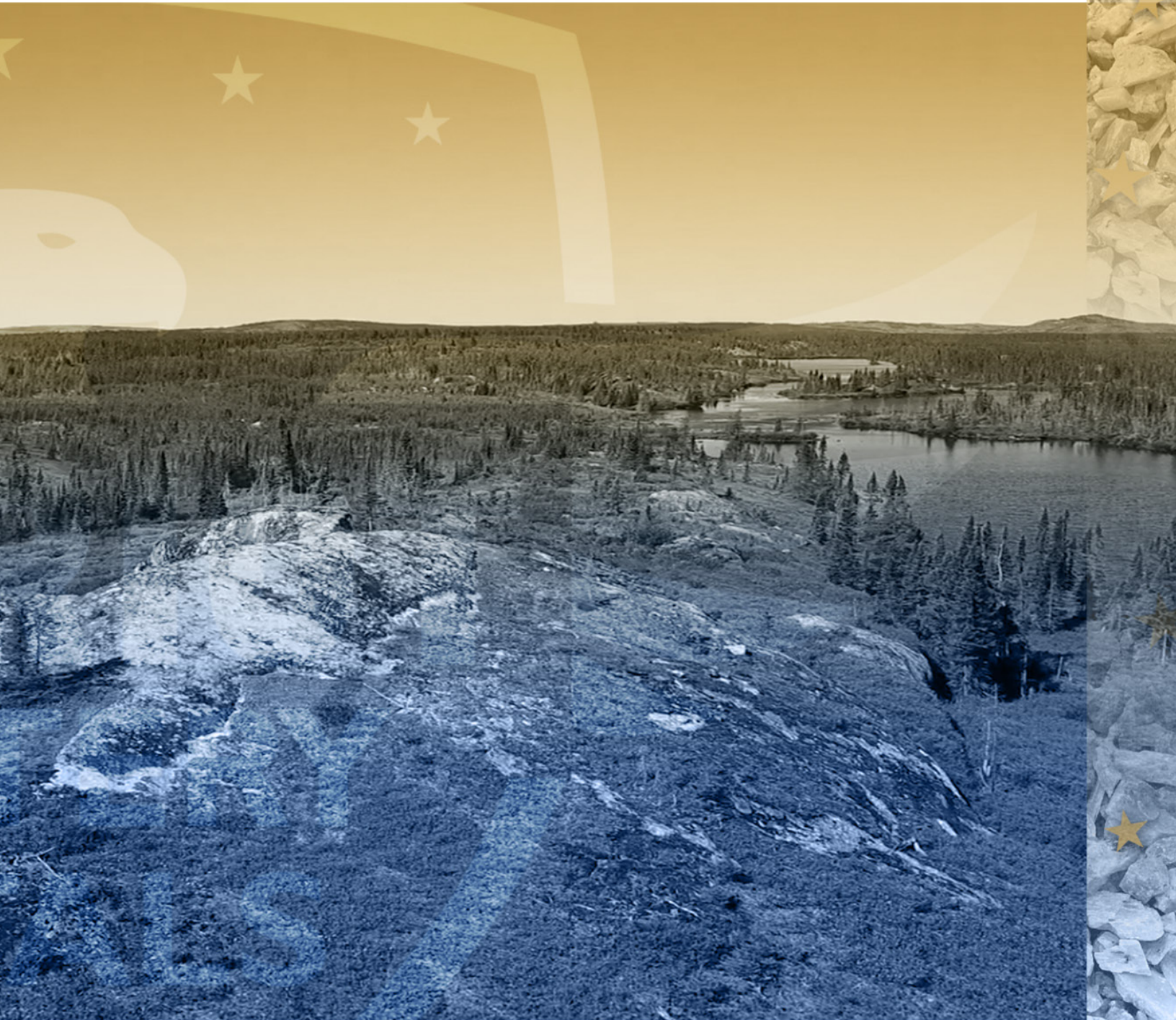
**Yves Petrin**  
General Manager  
Directeur Général

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