

# **Revised NI 43-101 Technical Report Preliminary Economic Assessment of the Crevier Niobium Project**



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### IMPORTANT NOTICE

This Report was prepared as a National Instrument 43-101 Technical Report for MDN Inc. (MDN) by Met-Chem Canada Inc. (Met-Chem). The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in Met-Chem's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this Report. This Report is intended for use by MDN subject to the terms and conditions of its contract with Met-Chem. This contract permits MDN to file this Report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to National Instrument 43-101, *Standards of Disclosure for Mineral Projects*. Except for the purposes legislated under Canadian securities laws, any other uses of this Report by any third party are at that party's sole risk.

The substantive information included in this Report is the same as the one issued in March 2010. Some descriptive wording has been revised in this Report to fulfill the requirements of the NI 43-101 regulation.

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## 1.0 EXECUTIVE SUMMARY

MDN Inc. (MDN) commissioned Met-Chem Canada Inc. (Met-Chem) to carry out the scoping study of the Crevier niobium and tantalum deposit, North of Lac Saint-Jean, Quebec. This technical report is prepared in accordance with the Standards of Disclosure for Mineral Projects as defined by NI 43-101.

The geology and exploration data are a summarization of the “Technical Report Niobium and Tantalum resource estimation of the Crevier deposit, North of the Lac-Saint-Jean, Quebec, Canada, effective date of resource estimates May 25, 2009”, prepared by SGS Geostat Ltd., now SGS Canada Inc.

The Crevier Property is located in the Crevier and Lagorce Townships in the MRC of Maria-Chapdelaine, Roberval County. The property is located North of Lac St-Jean area and the nearest city with all major services is Dolbeau-Mistassini about 85 km to the South.

The property is centered on latitude 49°30' North and longitude 72°49' West (SNRC system, map reference is 32H/07). The property covers 83 claims totalling an area of 4,645.45 hectares.

The property lies within the Lac à la Truite basin in the valley of the Rivière à la Truite. The lake is approximately 330 meters above sea level. This shallow depth lake covers the central part of the Crevier Property. The hills are about 20 meters higher than the lake in the northern part while the southern hills are about 100 meters above lake elevation.

The Crevier mineral deposit was discovered by SOQUEM in 1975. From 1975 to 1986, SOQUEM carried out various phases of exploration on the property. SOQUEM, in 1986, was in the process of a partial privatization of its producing assets and formed a new company named Cambior. The ownership of the Crevier Property was transferred to Cambior during this privatization process. In 2006, Cambior was bought by IAMGOLD which became the owner of the Crevier Property. In April 2008, Les Minéraux Crevier Inc. (Crevier) bought the property from IAMGOLD.

The igneous alkaline Crevier complex, 25 km<sup>2</sup> wide, is part of a gneissic Grenville formation. The origin, according to some authors, is associated with the major Saguenay Graben structures, which has given an alkaline metasomatic rim to the Grenville rocks.

The alkaline complex is divided into three (3) main lithological units (Units 1 to 3), the fourth unit being the Grenville rocks. These main units are composed of many specific distinct lithological units, defined by local mapping and diamond drilling.

- The first unit represents the major north-western part of the complex; its elongated shape is aligned along a North 320° axis. The composition is an alternating suite of bands of biotite-carbonate syenites, nepheline syenites, nepheline syenites with biotite and carbonatites with an orientation between North 300° and North 340°;



- The second unit mainly covers the south of the complex, but is also present in a 300 meter thick band surrounding the first unit. The composition is mainly nepheline syenite with nepheline-biotite syenite dykes crossing the formations along North 320°;
- The third unit is very small and is located in the south-western part of the complex, inside the second unit and is characterized by a large amount of syenite.

The chronologic sequence of the deposition of the Crevier complex is as follows:

- Alkaline metasomatism preceding the complex intrusion;
- Deposition of the nepheline-biotite syenites;
- Emplacement of carbonate-biotite melanosenite;
- Carbonatite injection;
- Intrusion of nepheline syenite dykes and biotite syenites.

The mineralized tantalum-niobium zone, associated with a porphyritic nepheline syenite dyke, is located in the southern part of the Crevier alkaline intrusive and extends some three (3) kilometers. The 20 meter thick dyke, oriented along North 320° and dipping to the North at 80° to 85°, is generally composed (95%) of nepheline syenite of pegmatitic texture containing large feldspar crystals and nepheline having variable grain size from a few centimeters to close to one meter in certain areas.

A total of 105 diamond drill holes were completed by previous owners, 72 by SOQUEM and 33 by Cambior. The hole spacing was approximately 50 meters on section with a spacing of 100 to 300 meters between sections. These holes were sampled generally at 1.5 meter intervals and assayed for oxides and particularly  $\text{Nb}_2\text{O}_5$  and  $\text{Ta}_2\text{O}_5$ . Results show that the niobium grade varies along strike and decreases from South to North while the dyke width increases towards the North. SGS Geostat analysis has highlighted a continuity axis striking North and dipping at 45°. This will need to be analysed from the latest exploration work performed in 2009. Tantalum is found within the niobium pyrochlore mineral grain in a ratio of 1 to 10.

The original assay intervals were standardized into 2.5 m composites. A capping analysis was performed on the composites and outliers were capped based on the statistical analysis.

Independent sampling by SGS Geostat lead to the resource estimation using the two (2) different sources of historical data for the same sector. The results showed a significant difference which was investigated. Based on studies done during this evaluation, SGS Geostat reduced the  $\text{Nb}_2\text{O}_5$  grades by 19% and the  $\text{Ta}_2\text{O}_5$  grades by 13% for all the SOQUEM composites used in the estimation to correct bias concerns.

SGS Geostat used interpolation parameters based on drill spacing, variograms, envelope extension and orientation to estimate the average grade of  $\text{Nb}_2\text{O}_5$  (%) and  $\text{Ta}_2\text{O}_5$  (in ppm) within the three (3) mineralized envelopes. A Final Mineral Resource estimate for the



property was completed by SGS Geostat using all the historical data with corrected SOQUEM diamond drill hole grades.

The classification method used is the simple search ellipsoid technique, where classification is done by the amount of composites within a specific search radius of the block. In general, for the Project and drilling intensity, it shows reliable classification.

At this stage not having the trench data computerized, SGS Geostat has not presented measured resources in its May 2009 resource technical report. Additional infill drilling of 2009, not included in this report, should help in defining measured resources.

For indicated resource classification, a search ellipsoid of 175 m North (as per the local grid), 125 m down dip 80°, 15 m across dip (East down 10°, as per the local grid) is used with a minimum of four (4) composites with maximum of two (2) from the same hole. The remaining blocks are classified as inferred.

Table ES 1 and

Table ES 2 present the official final classified resource statement for the three (3) zones as prepared by SGS Geostat.

**Table ES 1 – Official Final Classified Resource Statement for the Three (3) Zones**

<b>Indicated</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	30,940,000	0.168	183
<b>Inferred</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	28,850,000	0.122	166

**Table ES 2 – Mineral Resources within Crevier Mineral Deposit  
with cut-off at 0.1% Nb<sub>2</sub>O<sub>5</sub>**

<b>Indicated</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	25,750,000	0.186	199
<b>Inferred</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	16,880,000	0.162	204

Notes:

Nb<sub>2</sub>O<sub>5</sub> capped at 0.5%

Ta<sub>2</sub>O<sub>5</sub> in ppm capped at 550

SG: 2.63

SOQUEM composites corrected

Met-Chem was mandated to look at various alternatives to mine the deposit based on the SGS Geostat resource block model (effective date May 25, 2009).

The proposed mining production rate for the Project to be mined by open pit or underground mining methods has been established at 2,740 tonnes per day or 1.0 M tonnes per year.

Preliminary geotechnical parameters were developed using rock mass classification methods. Based on core and outcrop observations, all rock types are considered and qualified as competent rock. Based on the RMR rock mass classification system, rock may be qualified as very good to excellent rock. Presence of shear or fault zones indicate that further investigations would be required for the interpretation of the structural features observed in the core.

For the preliminary open pit design, the recommended mining slope parameter is 55° interramp. This value is considered suitable at this stage of the study. However, the available information and data indicate the possibility to increase it up to 60°, giving access to additional tonnage. However, in order to optimize the final pit wall or to increase slope angles, rock strength tests will be needed to confirm preliminary results.

The cut-off grade used for pit design is based on both the Nb<sub>2</sub>O<sub>5</sub> and Ta<sub>2</sub>O<sub>5</sub> content. Based on estimated mine and mill operating costs, estimated mill and refinery recovery and sales price, the resulting Nb<sub>2</sub>O<sub>5</sub> equivalent cut-off grade is estimated at 0.1087 %.

The economic pit limits were evaluated using the EPIT optimizer module of MineSight™ mine planning software, based on 3D Lerch-Grossman algorithm. A final economic pit shell (ultimate pit), delineated 25.4 Mt of indicated and 0.9 Mt of inferred resources (at a stripping ratio of 5.8 to 1) amenable to open pit mining. From this pit shell an engineered pit complete with ramps, and catch benches was designed. The resulting engineered pit recovers 25.8 Mt (or 98.3%) of the economic pit resources and increases the stripping ratio to 6.4 (10% increase) due to placement of the main ramps.

*The PEA is preliminary in nature and it includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the conclusions reached in the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.*

A 25 year mine plan was developed from the pit design based on a production rate of about 1.0 Mtpy of mineral, an external dilution factor of 5% (at zero grade) and a mineable recovery factor of 95% for uncontrollable losses during mining.

A review of the underground mining potential of the deposit was made early in this study. Mining of the portion of the mineral deposit below the economic pit limits as well as mining the entire mineral deposit with underground methods was reviewed. It was determined that, based on sub-level open stoping method and taking into consideration

mining cost as well as the process and services costs and sales price, results showed a profit well below the profit for mining the same deposit using an open pit method. It was therefore decided not to pursue the underground mining option early in the study.

The current metallurgical flow sheets and design criteria are based primarily on the test work reports from SGS Lakefield Research Limited (SGS Lakefield) and the operating experience of Met-Chem personnel.

The main concern in the development of the process was the amount of test work done on an unconventional mineral deposit. Met-Chem supports SGS Lakefield recommendations that future test work should focus on minimizing potential unstable operating plant conditions.

Metallurgical test work completed by SOQUEM and Cambior, demonstrates that a niobium (pyrochlore) concentrate can be produced by a combination of standard industrial processes or treatment.

The current expected metallurgical recovery at the flotation circuit for this mineralisation based on laboratory test work averaged 70%. The tests indicate that recovery might range between 60% and 80%. The refining recovery is expected to be 96% from the concentrate yielding an overall recovery of 67.2%.

The plant capacity is designed to process one (1) Mtpy of mineral, while working 365 days per year, 24 hours per day with an overall plant availability of 96%.

Due to their characteristics, the tailings will be managed in two (2) separate tailings ponds. The first pond will receive the residue from the flotation process which will produce more than 95% of the tailings. Results of analysis of total metal content and leaching tests conducted on the mineral show that tailings generated in the flotation process are considered low risk for environmental contamination. The second pond will receive the residues from the refinery, which represents less than 5% of the tailings. Because of the type of process, the chemicals used and the expected quantities of fluorine associated with the process, the residues produced at the refinery are considered as a higher environmental risk. However, it is to be noted that only one sample has been characterized at this point. Thorough environmental characterization of both types of tailings will need to be confirmed to validate the method of tailings management.

The off-site infrastructure required for the Project includes:

- A Class II access road to be built starting at km 30 from the end of pavement on Route R0206, opening an access to the site from the South, by way of 2.5 kilometers of road upgrading and 7.3 kilometers of road building. Some class IV roads exist but need to be upgraded or rebuilt.
- A transmission line from Normandin substation about 90 km from the site. Since the Hydro-Québec study is not yet available, Hydro-Québec L rate was used in this Project. Based on this rate, the unit consumption cost for the Project is estimated at: \$0.04318/kWh.

The on-site infrastructure required for the Project includes:

- Electrical sub-station and power distribution;
- Office building and gatehouse;
- Class IV service road to the tailings pond;
- Assay laboratory;
- Three (3) warehouses, two (2) for storage of chemical materials and one (1) for equipment and spare part storage;
- A garage with four (4) maintenance bays;
- Satellite antenna at the mine to provide telephone communications and internet access;
- A pumping station near Lake Kapapameutanu for an estimate of 20 m<sup>3</sup>/h process water requirement;
- Domestic water from a pumping station at Lake Kapapameutanu for human use such as showers, toilets, etc.;
- Bottled potable water;
- Two (2) large diesel tanks for one week consumption and one small gasoline tank for light vehicles complete with a supply station and a concrete containment basin fitted with an oil separator;
- A domestic wastewater treatment system comprised of a septic tank and an infiltration bed.

The following comments on the environment apply to the Project:

- According to information obtained from the Department of Natural Resources and Wildlife (MRNF) and the Ministry of Sustainable Development, Environment and Parks (MDDEP), no mention of plants threatened, vulnerable or likely to be so designated is reported for the area covered by the Project. No exceptional forest ecosystem is listed in the study area;
- Regarding land use, in addition to forestry activities, the area under study is used for vacation and for hunting and fishing while the Mistassini River is used for various recreational activities including canoe-camping;
- Federal procedures do not apply to the Project. The rate of mining and processing proposed for the Crevier Project is less than the current threshold for submission to the Environmental Impact Assessment and Review Regulation (7,000 t/d) and less than the proposed new threshold published in the Québec Mineral Strategy, released June 29, 2009 (3,000 t/d); therefore an evaluation study and review of environmental impacts will not be required;

- However, as per Article 22 of the Environment Quality Act, an application for a certificate of approval will have to be sent to the Saguenay-Lac-Saint-Jean Regional bureau of the Department of Sustainable Development, Environment and Parks (MDDEP). This application must be accompanied by an environmental assessment sufficiently detailed and meeting the requirements of *Directive 019* of the mining industry so that the MDDEP can rule on the acceptability of the Project. This type of approval process does not require public hearings;
- Three (3) rock samples (two (2) waste rock and one mineral) representatives of waste rock and mineral to be mined were characterized. The waste rock and the mineral samples analyzed are not considered generators of acid mine drainage. Results regarding total metal content indicate that the three (3) samples, according to *Directive 019*, waste rock and mineralisation are considered as low-risk. Results regarding leaching tests performed on the three (3) samples indicate that only cadmium, lead and zinc exceeded the criterion of resurgence in the surface waters of the Soil Protection and Contaminated Land Rehabilitation Policy. Radioactive elements should not be an issue in the context of this Project;
- Preliminary mitigation measures have been identified for the following Project activities:
  - Management of overburden for protection against erosion;
  - Management of waste rock;
  - Tailings management;
  - Water management.
- A rehabilitation and restoration plan is required for submission to the Minister for approval before commencing mining activities;
- The mining property is located in the traditional ancestral territory (Nitassinan) of Pekuakamiulnuatsh (*Montagnais du Lac-Saint-Jean*). It is the subject of land claims by the First Nation of Mashteuiatsh;
- The Agreement-in-principle, signed in March 2004, includes several references to the exploitation of natural resources, including minerals, but it does not provide for payment of additional royalties (i.e., other than those already paid to the Government of Quebec). Instead, the Innu tshishe utshimaut, the future Innu government will be entitled to a share (no less than 3%) of the royalties collected by Quebec on the natural resources of Nitassinan;
- Regarding Innu land use, the mining property is located in the Roberval beaver reserve. In a later phase, contacts should be established to identify the Innu families managing the territory corresponding to the mining property.

The schedule to complete the remaining studies (metallurgical tests works, environmental studies, geotechnical investigation and feasibility study) and execute the EPCM is estimated at 34 months.

The capital cost estimate that covers the Project for niobium and tantalum production includes the work required to develop the mine, built the mineral processing facilities and establish all the site and off-site infrastructure and services necessary to support the mine site. The cost estimate is based on Met-Chem's standard methods applicable for a scoping study to achieve an accuracy level of  $\pm 35\%$ . The base date for the cost estimate is the third quarter of 2009.

The initial capital cost for the scope of work is \$267.1 M of which \$185.1 M are direct costs and \$82.0 M are indirect costs.

Operating costs are subdivided into manpower, electrical power, reagents and consumables. These costs were derived from supplier information, Met-Chem's database or factored from similar operations. The process operating cost is estimated at \$29.00 /t.

The general and administration costs for the Project are estimated at \$3.2 M/y of operation and include costs for manpower as well as costs for material and services.

Mine operating costs were established by Met-Chem for mineral mining, as well as overburden and waste removal. These costs were estimated based on information provided by suppliers and on manpower rates provided by the client. The mining operating average cost is estimated at \$2.39 /t.

A pre-tax Project cash flow analysis has been completed for the Crevier Scoping Project based on a production rate of 2,740 tpd. The model reflects fourth quarter 2009 pricing. Some scenarios were prepared to improve the Project economics and analyze the Project sensitivity to the niobium selling price, the power line impact, the flotation recovery and the production rate.

The following Table ES 3 lists the main technical assumptions used in the Base Case cost estimate. The initial capital cost for the Project is estimated at \$267 M.

**Table ES 3 – Technical Assumptions**

Total mineral mined (LOM)	000' t	25,838
Average grade to mill Nb <sub>2</sub> O <sub>5</sub>	%	0.170
Average grade to mill Ta <sub>2</sub> O <sub>5</sub>	ppm	180.5
Processing Rate	t/d	2,740
Flotation Recovery	%	70
Refinery Recovery	%	96
Recoverable product Nb <sub>2</sub> O <sub>5</sub>	000' kg	29,462
Recoverable product K <sub>2</sub> TaF <sub>7</sub>	000' kg	3,134

The Net Present Value (NPV) at a 5% discount rate and the Internal Rate of Return (IRR) for the Base Case (70% flotation recovery and 96% refinery recovery) were calculated from the cash flow statement. The economic analysis indicates a positive NPV at a 5% discount rate of \$103.8 M and an IRR of 7.7% for the Base Case using a sales price of

US\$51.50 per kilo for oxide niobium product and an initial capital cost that includes construction cost of the power line.

*The PEA is preliminary in nature and it includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the conclusions reached in the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.*

Efforts have been made to identify additional scenarios to improve the economics of the Project. Three (3) additional scenarios to the Base Case (niobium oxide selling price of US\$51.50 and power line cost included) were added to the analysis based on increased production rates of 3,500 t/d, 4,000 t/d and 4,500 t/d.

Capital and operating costs estimates were factorized for the different production rates and used to develop corresponding cash flows. This data should be used only to have an order of magnitude. An amount corresponding to \$ 1.0 M was added to the production rate scenarios Indirect Costs to cover for the Environmental Impact Assessment that is expected to be required for these cases. Results based on the production rate scenarios are presented in Table ES 4.

The results at a flotation recovery of 70% indicate that the Base Case at a NPV of \$103.8 M may not be an optimized scenario. As shown in the table, for an additional 10% of capital cost, the NPV is almost doubled at the 3,500 t/d scenario. The 4,000 t/d scenario indicates that for an additional \$15 M in capital investment the gain on the NPV is an additional \$30 M.

As shown in the Table ES 4, a flotation recovery of 72% increases the IRR by approximately one point.

The economic analysis indicates a positive NPV at a 5% discount rate of \$ 233.5 M and an IRR of 12.7% based on a flotation recovery of 70% and a production rate of 4,000 t/d while the NPV and IRR increase to \$271.9 M and 13.9% for a flotation recovery of 72% and the same production rate.

**Table ES 4 – NPV Sensitivity (Production Rates Scenarios)**

	CAPEX	OPEX	Nb <sub>2</sub> O <sub>5</sub> @ US\$51.50		Nb <sub>2</sub> O <sub>5</sub> @ US\$51.50	
	CAD	\$/t CAD	Flotation Recovery 70%		Flotation Recovery 72%	
			NPV @ 5% CAD	IRR	NPV @ 5% CAD	IRR
Base Case	267,149,714 \$	39.85 \$	103,805,368 \$	7.7%	135,997,984 \$	8.5%
Production rate: 3,500 t/d	290,212,263 \$	38.25 \$	197,685,693 \$	11.2%	234,119,827 \$	12.3%
Production rate: 4,000 t/d	305,649,961 \$	37.08 \$	233,451,170 \$	12.7%	271,907,681 \$	13.9%
Production rate: 4,500 t/d	322,234,345 \$	36.16 \$	265,861,839 \$	14.1%	305,989,173 \$	15.4%



## 2.0 INTRODUCTION AND TERMS OF REFERENCE

### 2.1 General

Les Minéraux Crevier Inc. (Crevier) is a Montreal based company contemplating a Project for the construction, installation and operation of niobium and tantalum processing facilities to be located approximately 100 km North of St-Félicien, Quebec (the Project).

On April 14, 2009, MDN Inc. (MDN) entered into an agreement with Crevier which provides MDN with an option to acquire, over a three (3) years period, a majority equity interest in Crevier in return for funding the development and feasibility study of a NI 43-101 compliant niobium and tantalum resource for the Project.

A mineral resource estimate was reported in a NI 43-101 compliant technical report by SGS Geostat and titled: “Technical Report Niobium and Tantalum resource estimation of the Crevier deposit, North of Lac Saint-Jean, Quebec, Canada” dated May 25, 2009 available on SEDAR which is effective date and current resource estimates.

Met-Chem Canada Inc. (Met-Chem) was requested by Crevier to provide a Scoping Study Report for the exploitation of the Crevier deposit. The process flow sheets developed are based on work performed by SGS Lakefield to produce niobium oxide ( $\text{Nb}_2\text{O}_5$ ) and tantalum K-salt ( $\text{K}_2\text{TaF}_7$ ). The capital cost and the operating cost estimates have been developed for a production rate of 2,740 t/d, to an accuracy of  $\pm 35\%$ .

Efforts have been made to identify additional scenarios to improve the economics of the Project. Three (3) additional scenarios, factorized from the original Base Case, were added to the analysis based on increased production rates of 3,500 t/d, 4,000 t/d and 4,500 t/d.

### 2.2 Terms of Reference

This Technical Report summarizes the results of the Scoping Study for the Crevier Project.

The effective date of the Scoping Study is January 25, 2010.

As part of that study, Met-Chem was commissioned by MDN to compile a NI 43-101 compliant Technical Report with the participation of specialized consultants, who are listed in Table 2.1.

This Technical Report was prepared according to the guidelines set out under “Form 43-101F1 Technical Report” of National Instrument 43-101 Standards of Disclosure for Mineral Projects adopted pursuant to Section 143 of the Securities Act (Ontario).

Met-Chem performed a cursory review of the information provided by other consultants for completion of this NI 43-101 report. However, each consultant remains fully responsible for their own work and Certificates of Authors that comply with NI 43-101 regulations are included in Section 22.0.

Table 2.1 provides a detailed list of qualified persons and their respective sections of responsibility.

**Table 2.1 – Qualified Persons and their Respective Sections of Responsibility**

Section	Title of Section	Qualified Person
1.0	Executive Summary	Céline Charbonneau, Met-Chem Canada Inc.
2.0	Introduction and Terms of Reference	Céline Charbonneau, Met-Chem Canada Inc.
3.0	Reliance on Other Experts	Céline Charbonneau, Met-Chem Canada Inc.
4.0	Property Description and Location	Claude Duplessis, SGS Geostat
5.0	Accessibility, Climate, Local Resources, Infrastructure and Physiography	Claude Duplessis, SGS Geostat
6.0	History	Claude Duplessis, SGS Geostat
7.0	Geological Setting	Claude Duplessis, SGS Geostat
8.0	Deposit Types	Claude Duplessis, SGS Geostat
9.0	Mineralization	Claude Duplessis, SGS Geostat
10.0	Exploration	Claude Duplessis, SGS Geostat
11.0	Historical Drilling	Claude Duplessis, SGS Geostat
12.0	Sampling Method and Approach	Claude Duplessis, SGS Geostat
13.0	Sample Preparation, Analyses and Security	Claude Duplessis, SGS Geostat
14.0	Data Verification	Claude Duplessis, SGS Geostat
15.0	Adjacent Properties	Claude Duplessis, SGS Geostat
16.0	Mineral Processing and Metallurgical Testing	Ewald Pengel, Met-Chem Canada Inc. Gared J. Daniel, Met-Chem Canada Inc.
17.0	Mineral Resource Estimate	Claude Duplessis, SGS Geostat
18.1	Mining	Daniel Gagnon, Met-Chem Canada Inc.
18.2	Mineral Processing	Ewald Pengel, Met-Chem Canada Inc. Gared J. Daniel, Met-Chem Canada Inc.
18.3	Tailings Management	Sylvain Boucher, Roche
18.4.1	Access Road	Sylvain Boucher, Roche
18.4.2, 18.4.3	Power Line, Main Sub-Station and Power Distribution	Céline Charbonneau, Met-Chem Canada Inc.
18.4.4 to 18.4.10	Infrastructure and Services	Sylvain Boucher, Roche
18.5	Environmental Considerations	Sylvain Boucher, Roche
18.6	Project Schedule	Céline Charbonneau, Met-Chem Canada Inc.
18.7	Capital Cost Estimate	Céline Charbonneau and related QPS
18.8	Operating Cost Estimate	Céline Charbonneau and related QPS
18.9	Cash Flow Analysis	Céline Charbonneau, Met-Chem Canada Inc.
19.0	Interpretation and Conclusions	Céline Charbonneau, Met-Chem Canada Inc.
19.1 to 19.3	Interpretation and Conclusions/Resources	Claude Duplessis, SGS Geostat
19.4	Interpretation and Conclusions/Mining	Daniel Gagnon, Met-Chem Canada Inc.

Section	Title of Section	Qualified Person
19.5	Interpretation and Conclusions/ Mineral Processing	Ewald Pengel, Met-Chem Canada Inc. Gared J. Daniel , Met-Chem Canada Inc.
19.6	Interpretation and Conclusions/ Tailings Management	Sylvain Boucher, Roche
19.7	Interpretation and Conclusions/ Cash Flow Analysis	Céline Charbonneau, Met-Chem Canada Inc.
20.1	Recommendations/Mineral Resources	Claude Duplessis, SGS Geostat
20.2	Recommendations/Mine Design	Daniel Gagnon, Met-Chem Canada Inc.
20.3	Recommendations/Processing Plant and Metallurgical Testing	Ewald Pengel, Met-Chem Canada Inc. Gared J. Daniel , Met-Chem Canada Inc.
20.4	Recommendations/Tailings and Water Management	Sylvain Boucher, Roche
20.5	Recommendations/Infrastructure and Services	Céline Charbonneau, Met-Chem Canada Inc.
20.6	Futures Studies	Céline Charbonneau, Met-Chem Canada Inc.
21.0	References	
22.0	Certificates	
23.0	Additional Requirements for Technical Reports on Development Properties and Production Properties	

### 2.3 Sources of Information

The information presented in this Technical Report has been derived from the Scoping Study Report presented to Crevier Minerals in January 25, 2010 titled: “Scoping Study for Crevier Niobium” as well as from the technical report prepared by SGS Geostat in May 25, 2009 and titled “Technical Report Niobium and Tantalum Resource Estimation of the Crevier Deposit, North of Lac Saint-Jean, Quebec Canada”.

### 2.4 Units and Currency

In this report, all currency amounts are Canadian Dollars (CAD\$) unless otherwise stated, with commodity prices typically expressed in US Dollars (US\$). Quantities are generally stated in *Système International d’Unités* (SI) metric units, the standard Canadian and international practice, including metric tons (tonnes, t) for weight, and kilometers (km) or meters (m) for distance. Abbreviations used in this report are listed in Table 2.2.

Table 2.2 – List of Abbreviations

Symbol	Abbreviation	Symbol	Abbreviation
\$	Dollar sign	GEMS	Global Earth-system Monitoring using Space
%	Percent sign	h	Hour
¢/kWh	Cent per kilowatt hour	h/y	Hour per year
°	Degree	ha	Hectare
°C	Degree Celsius	HF	Hydrofluoric acid
3D	Three dimensions	HQ	Drill core size (6.4 cm diameter)
AI	Abrasion index	IRR	Internal rate of return
az	Azimuth	kPa	Kilopascals
bank	Bank cubic meter - volume of material in situ	kV	Kilovolts
BQ	Drill core size (3.65 cm diameter)	kW	Kilowatts
BWI	Bond ball mill work index	kWh	Kilowatt-hour
CAD	Canadian Dollar	l	Liter
CAPEX	Capital Expenditures	LOM	Life of Mine
CDC	<i>Claim design� sur carte</i>	LV	Low voltage
Ce	Cesium	m/h	Meters/hour
CIL	carbon in leach	Ma	Million years
CIP	Carbon in pulp	MCC	Motor control center
CWI	Crusher work index	MDDEP	<i>Minist�re du d�veloppement durable, environnement et parcs</i>
D2	Second generation of deformation	MIBK	Methyl Isobutyl Ketone
D3	Third generation of deformation	Mm <sup>3</sup>	Million cubic meters
D4	Fourth generation of deformation	MNR	Ontario Ministry of Natural Resources
DDH	Diamond drill hole	MOE	Ontario Ministry of the Environment
DGPS	Differential Global Positioning System	MRNF	<i>Minist�re des ressources naturelles et de la faune</i>
DWI	Drop weight index	Mt	Million tonnes
DWT	Drop weight test	MV	Medium voltage
DXF	Drawing interchange format	MW	Megawatts
E	East	N	North
EPCM	Engineering, Procurement, Construction Management	Nb	Niobium
g	Grams	NI	National Instrument
g/t	Grams per tonne	NPV	Net Present Value

Symbol	Abbreviation	Symbol	Abbreviation
NQ	Drill core size (4.8 cm diameter)	SNRC	<i>Système national de référence cartographique</i>
NTP	Normal temperature and pressure	t/h	Tonne per hour
OPEX	Operating Expenses	Ta	Tantalum
oz	Ounce (troy)	tpd	Tonne per day
oz/t	Ounce per tonne	tpy	Tonne per year
ppb	Part per billion	U	Uranium
ppm	Part per million	ULC	Underwriters Laboratories of Canada
PVC	Polyvinyl chloride	USD	United States Dollar
RMR	Rock Mass Rating	UTM	Universal Transverse Mercator
RQD	Rock Quality Designation	W	West
RWI	Bond rod mill work index	X	X coordinate (E-W)
S	South	XRD	X-ray diffraction
S/R	Stripping ratio	Y	Y coordinate (N-S)
SAG	Semi-autogenous grinding	Z	Z coordinate (depth or elevation)
SG	specific gravity	Zr	Zirconium
SMC	SAG mill comminution	µm	Microns

## 2.5 Disclaimer

Met-Chem has not researched legal ownership information such as property title and mineral rights and has relied on information provided by Crevier.

It should also be understood that the mineral resources presented in this report are estimates of the size and grade of the deposits based on a certain number of drill holes and sampling and on assumptions and parameters currently available. The level of confidence in the estimates depends upon a number of uncertainties. These uncertainties include, but are not limited to, future changes in metal prices and/or production costs, differences in size and grade and recovery rates from those expected, and changes in Project parameters. In addition, there is no assurance that the Project implementation will be realized.

### 3.0 RELIANCE ON OTHER EXPERTS

This report has been prepared by Met-Chem for MDN. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to Met-Chem at the time of the preparation of the March 2010 report;
- Data, reports, and opinions supplied by Crevier and other third party sources (listed below). Met-Chem does not guarantee the accuracy of conclusions, opinions, or estimates that rely on third party sources for information that is outside the area of technical expertise of Met-Chem. As such, responsibilities for the various components of the Summary, Conclusions and Recommendations are dependent on the associated sections of the report from which those components were developed.

Met-Chem relied on the following reports and opinions for information that is outside the area of technical expertise of Met-Chem:

- Information on property holdings, lease agreements and legal status of property title was provided by Crevier. Met-Chem did not review the title and ownership and Met-Chem does not express any opinion on this subject;
- Information on Test Work provided by SGS Lakefield;
- Information on Tailings and Water Management, on Environmental Permitting and on Closure Cost Estimate provided by André Vachon, Biologist, M.Sc. from Roche Ltée, Groupe-conseil.

## 4.0 PROPERTY DESCRIPTION AND LOCATION

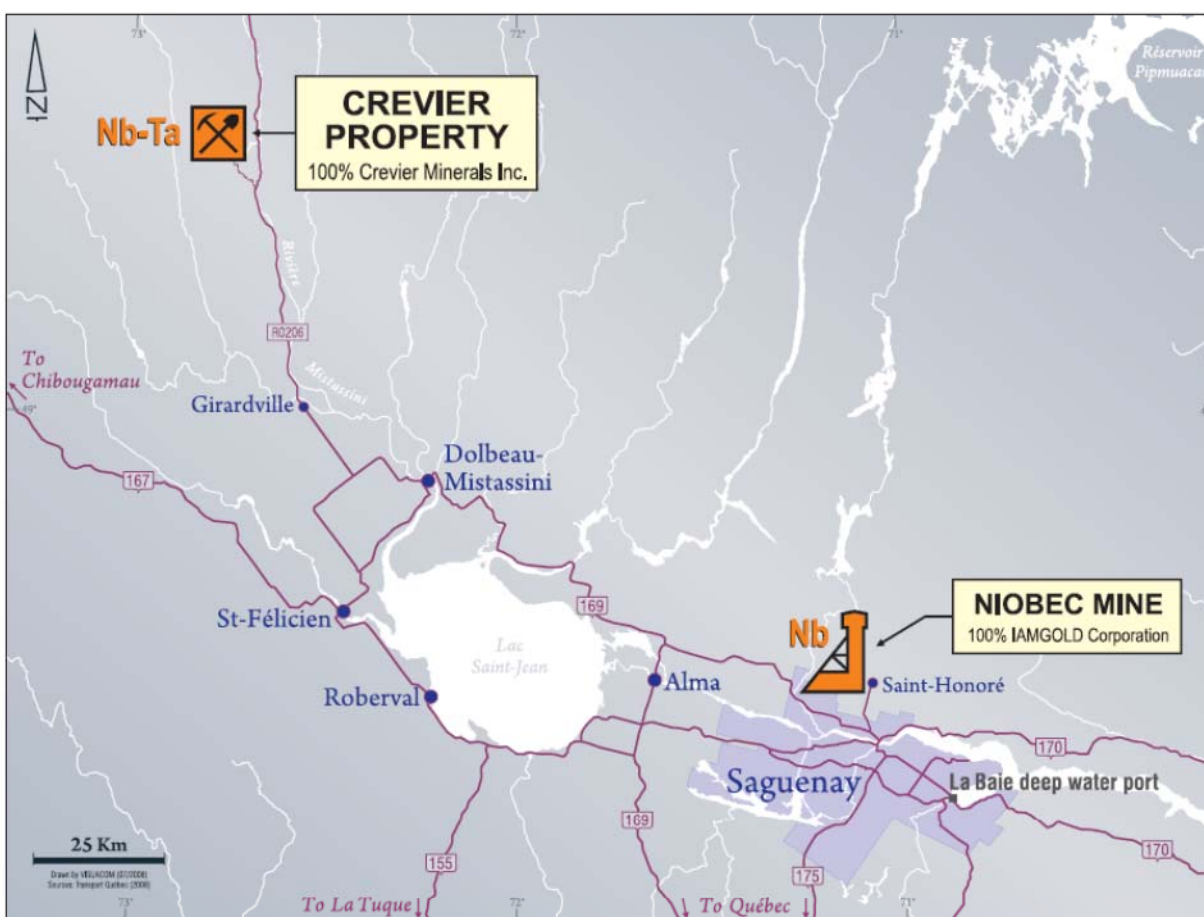
For details on the property description and location of the Crevier property, the reader should refer to SGS Geostat (2009) report. The following is taken from this report.

### 4.1 Location and Access

The Crevier Property is located in the Crevier and Lagorce Townships which are in the MRC of Maria-Chapdelaine in Roberval County. The property is located North of the Lac Saint-Jean area and the nearest city with all major services is Dolbeau-Mistassini about 85 km to the south.

The property is centered on latitude 49° 30' North and longitude 72° 49' West, SNRC map reference 32H/07 (see Figure 4.1).

**Figure 4.1 – Crevier Property - Saguenay - Lac Saint-Jean Location Map**



### 4.2 Property Ownership and Agreements

On April 3, 2008 Crevier Minerals Inc. came to an agreement for the purchase of a 100% interest of the property from IAMGOLD Quebec-Management Inc. for \$500,000 and issued 2,000,000 shares of Crevier Minerals Inc. to IAMGOLD. The agreement is private



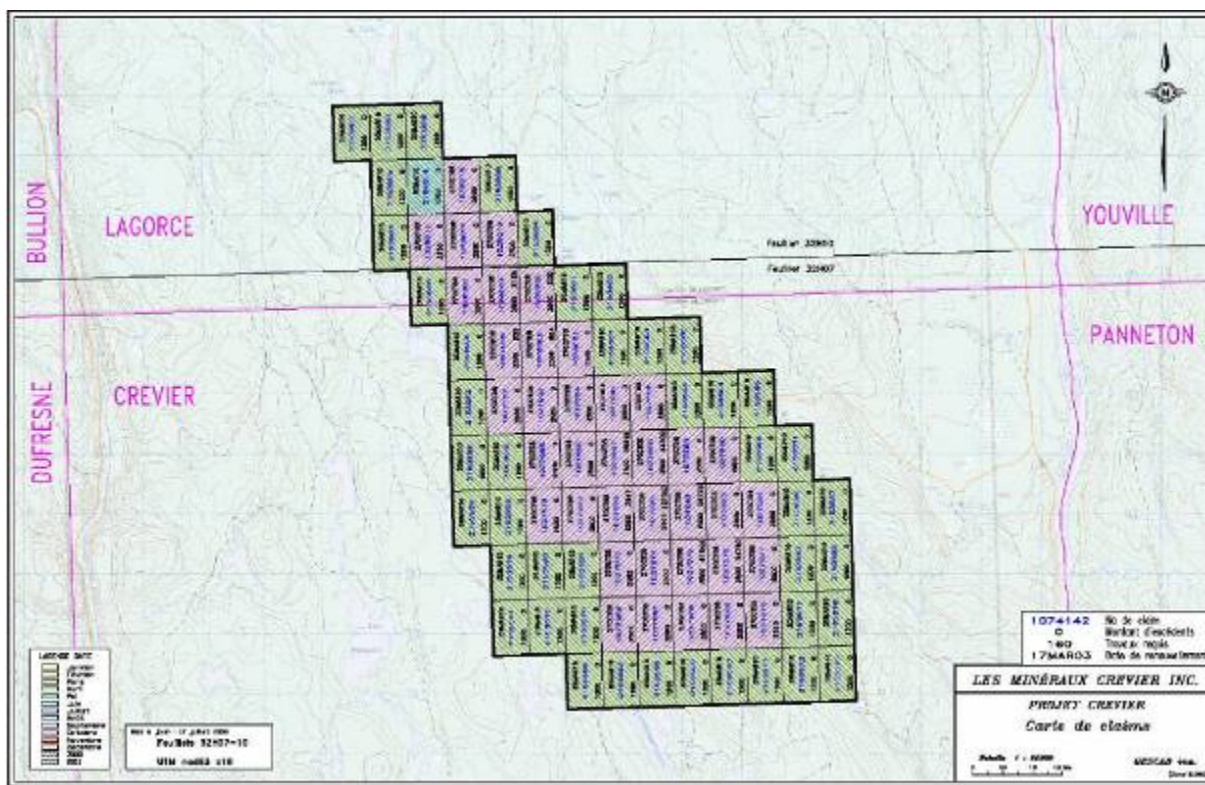
and confidential and has been reviewed by Claude Duplessis Eng., Qualified Person; the confirmation of the payment to IAMGOLD is also confirmed.

Shareholders are as per effective date May 25, 2009:

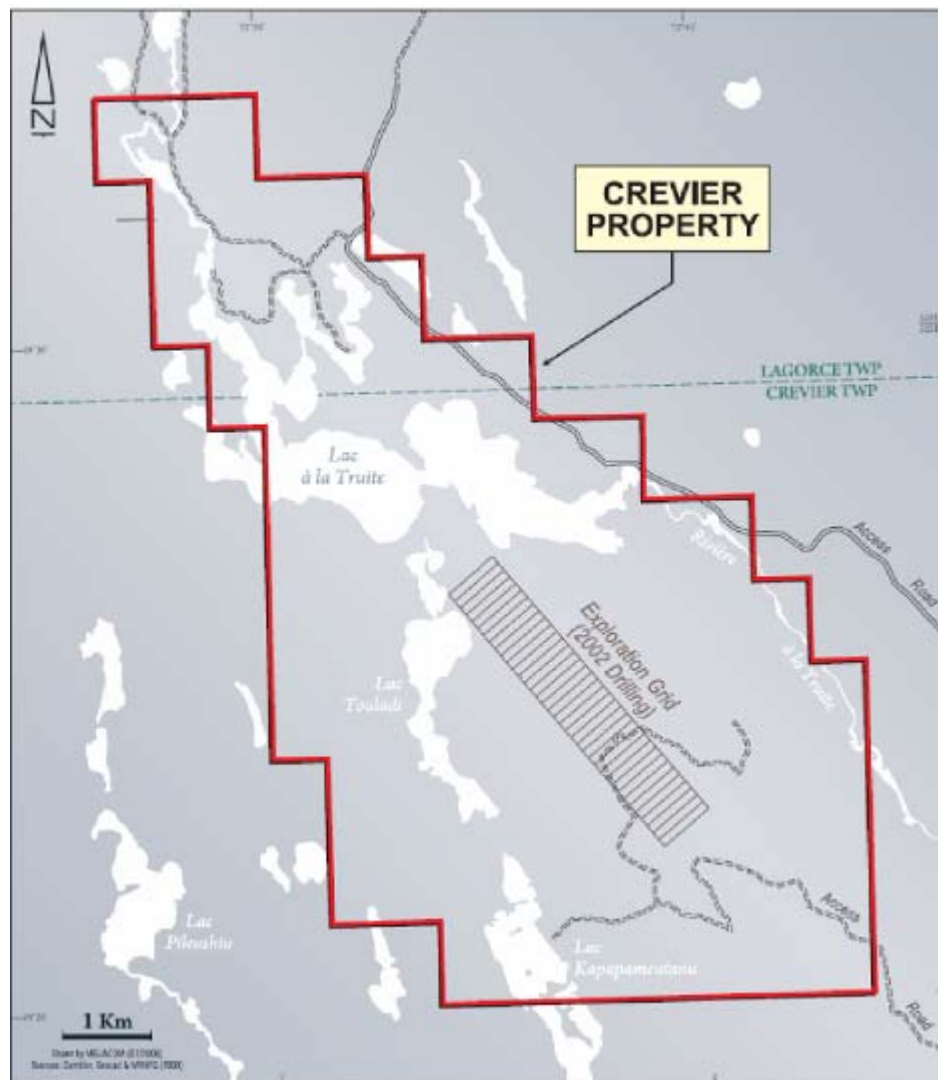
- IAMGOLD: 50 %, Dresden Capital: 15%, Camet Metallurgy: 10 %, MinQuest: 5% the balance being owned by two (2) individuals having 10% each;
- Total shares: 4,000,000, IAMGOLD has two (2) of a total of six (6) representatives on the board.

The property includes 83 claims covering an area of 4,645.45 hectares. One claim generally covers 56 hectares. The claims are registered in the Province of Quebec electronic system and boundaries in the field may be located with a differential global positioning system (DGPS). The claims were in good standing at the time of writing the report in May 25, 2009. A location map of the claims is provided in Figure 4.2.

**Figure 4.2 – Location of Claims and Property Limit**



The Claims of Crevier Minerals have been validated by SGS Geostat as per the May 2009 Technical Report, on the MNRQ Quebec GESTIM website. The property limit with the 2002 exploration grid is shown on Figure 4.3.

**Figure 4.3 – Property Limit and 2002 Exploration Grid**

The Claims of Crevier Minerals have been validated on the MNR/FG Quebec GESTIM website. A detailed list of claims is provided in Figure 4.4 and the on-line validation window for the Crevier claims is given in Figure 4.5.

Figure 4.4 – Property List of Claims

Sheet	Claim type	Claim Number	Claim Status	Registration Date	Expiration Date	Area	Titleholder (s) (Name, Number and Percentage)		
SNRC 32H07	CDC	1027966	Active	2001-11-19 00:00	2010-12-27 23:59	56,00	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027967	Active	2001-11-19 00:00	2010-12-27 23:59	56,00	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027968	Active	2001-11-19 00:00	2010-12-27 23:59	56,00	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027969	Active	2001-11-19 00:00	2010-12-27 23:59	56,00	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027970	Active	2001-11-19 00:00	2010-12-27 23:59	56,00	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027973	Active	2001-11-19 00:00	2010-12-27 23:59	55,99	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027974	Active	2001-11-19 00:00	2010-12-27 23:59	55,99	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027975	Active	2001-11-19 00:00	2010-12-27 23:59	55,99	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027976	Active	2001-11-19 00:00	2010-12-27 23:59	55,99	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027977	Active	2001-11-19 00:00	2010-12-27 23:59	55,99	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027978	Active	2001-11-19 00:00	2010-12-27 23:59	55,98	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027979	Active	2001-11-19 00:00	2010-12-27 23:59	55,98	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027980	Active	2001-11-19 00:00	2010-12-27 23:59	55,98	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027981	Active	2001-11-19 00:00	2010-12-27 23:59	55,98	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027982	Active	2001-11-19 00:00	2010-12-27 23:59	55,98	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027983	Active	2001-11-19 00:00	2010-12-27 23:59	55,98	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027984	Active	2001-11-19 00:00	2010-12-27 23:59	55,98	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027985	Active	2001-11-19 00:00	2010-12-27 23:59	55,97	Les Mineraux Crevier inc (82056)	100	% (responsible)
SNRC 32H07	CDC	1027986	Active	2001-11-19 00:00	2010-12-27 23:59	55,97	Les Mineraux Crevier inc (82056)	100	% (responsible)

Sheet	Claim type	Claim Number	Claim Status	Registration Date	Expiration Date	Area	Titleholder (s) (Name, Number and Percentage)
SNRC 32H07	CDC	1027987	Active	2001-11-19 00:00	2010-12-27 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027988	Active	2001-11-19 00:00	2010-12-27 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027989	Active	2001-11-19 00:00	2010-12-27 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027990	Active	2001-11-19 00:00	2010-12-27 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027992	Active	2001-11-19 00:00	2010-12-27 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027993	Active	2001-11-19 00:00	2010-12-27 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027994	Active	2001-11-19 00:00	2010-12-27 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027995	Active	2001-11-19 00:00	2010-12-27 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027996	Active	2001-11-19 00:00	2010-12-27 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1027999	Active	2001-11-19 00:00	2010-12-27 23:59	55,95	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1028000	Active	2001-11-19 00:00	2010-12-27 23:59	55,95	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1028001	Active	2001-11-19 00:00	2010-12-27 23:59	55,95	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1028006	Active	2001-11-19 00:00	2010-12-27 23:59	55,94	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1028007	Active	2001-11-19 00:00	2010-12-27 23:59	55,94	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	1028008	Active	2001-11-19 00:00	2010-12-27 23:59	55,94	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H10	CDC	1028011	Active	2001-11-19 00:00	2010-12-27 23:59	55,93	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H10	CDC	1028012	Active	2001-11-19 00:00	2010-12-27 23:59	55,93	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H10	CDC	1028013	Active	2001-11-19 00:00	2010-12-27 23:59	55,93	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H10	CDC	1028019	Active	2001-11-19 00:00	2010-12-27 23:59	55,92	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153566	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)

Sheet	Claim type	Claim Number	Claim Status	Registration Date	Expiration Date	Area	Titleholder (s) (Name, Number and Percentage)
SNRC 32H07	CDC	2153567	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153568	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153569	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153570	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153571	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153572	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153573	Active	2008-05-21 00:00	2010-05-20 23:59	56,01	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153574	Active	2008-05-21 00:00	2010-05-20 23:59	56,00	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153575	Active	2008-05-21 00:00	2010-05-20 23:59	56,00	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153576	Active	2008-05-21 00:00	2010-05-20 23:59	56,00	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153577	Active	2008-05-21 00:00	2010-05-20 23:59	56,00	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153578	Active	2008-05-21 00:00	2010-05-20 23:59	56,00	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153579	Active	2008-05-21 00:00	2010-05-20 23:59	55,99	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153580	Active	2008-05-21 00:00	2010-05-20 23:59	55,99	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153581	Active	2008-05-21 00:00	2010-05-20 23:59	55,99	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153582	Active	2008-05-21 00:00	2010-05-20 23:59	55,99	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153583	Active	2008-05-21 00:00	2010-05-20 23:59	55,99	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153584	Active	2008-05-21 00:00	2010-05-20 23:59	55,98	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153585	Active	2008-05-21 00:00	2010-05-20 23:59	55,98	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153586	Active	2008-05-21 00:00	2010-05-20 23:59	55,98	Les Mineraux Crevier inc (82056) 100 % (responsible)



Sheet	Claim type	Claim Number	Claim Status	Registration Date	Expiration Date	Area	Titleholder (s) (Name, Number and Percentage)
SNRC 32H07	CDC	2153587	Active	2008-05-21 00:00	2010-05-20 23:59	55,98	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153588	Active	2008-05-21 00:00	2010-05-20 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153589	Active	2008-05-21 00:00	2010-05-20 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153590	Active	2008-05-21 00:00	2010-05-20 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153591	Active	2008-05-21 00:00	2010-05-20 23:59	55,97	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153592	Active	2008-05-21 00:00	2010-05-20 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153593	Active	2008-05-21 00:00	2010-05-20 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153594	Active	2008-05-21 00:00	2010-05-20 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153595	Active	2008-05-21 00:00	2010-05-20 23:59	55,96	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153596	Active	2008-05-21 00:00	2010-05-20 23:59	55,95	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153597	Active	2008-05-21 00:00	2010-05-20 23:59	55,95	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153598	Active	2008-05-21 00:00	2010-05-20 23:59	55,95	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153599	Active	2008-05-21 00:00	2010-05-20 23:59	55,95	Les Mineraux Crevier inc (82056) 100 % (responsible)
SNRC 32H07	CDC	2153600	Active	2008-05-21 00:00	2010-05-20 23:59	55,94	Les Mineraux Crevier inc (82056) 100 % (responsible)

**Figure 4.5 – GESTIM On-Line Claims Validation Window of Owner Status**

The screenshot shows the 'GESTIM Plus' web application interface. The title bar indicates 'Gestion des titres miniers'. The main content area is titled 'Consultation du registre'. On the left, there is a sidebar menu with options: Accueil, Consultation du registre, Recherche, Carte, Territoires désignés, Site FTP, Mes documents, and Formulaire électroniques. The main area displays details for an 'Intervenant' (Intervenor) with the following information:

Numéro :	82056
Raison sociale :	Les Minéraux Crevier Inc
Catégorie :	Personne morale
Statut :	Actif
Adresse :	A/S Serge Bureau La Tour CIBC, 31e Et, 1155, Boul René-Lévesque Ouest
Ville :	Montréal
Code Postal :	H3B 3S6 1669x858
Province / État :	Québec
Pays :	Canada

Below this information, there is a section for 'Adresse(s) de correspondance' (Correspondence address) with an 'Annuler' (Cancel) button.

### 4.3 Royalties

There are no royalties attached to the property.

It is to be noted that the area is under aboriginal agreement with the Mashtiushtewash First Nation. Crevier Minerals President has already met with band authorities in July 2008 (*Conseil des Montagnais de Lac Saint-Jean*) in Roberval for preliminary Project information. The contacts are:

- Fabien Paul: External Affairs (*Chargé des affaires extérieures*);
- Carl Cleary: Coordinator External Affairs (Coordonnateur aux affaires extérieures, Négociation territoriale et globale).

### 4.4 Environmental Exposures

There are no environmental liabilities known to SGS Geostat at the time of filing the May 2009 report.

### 4.5 Permits

Work activities on the Project are only in the preliminary exploration stage and no governmental permits are required for such purposes. Further requirements regarding environmental permitting are discussed in Section 18.5 of this Report.



## 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

### 5.1 Accessibility

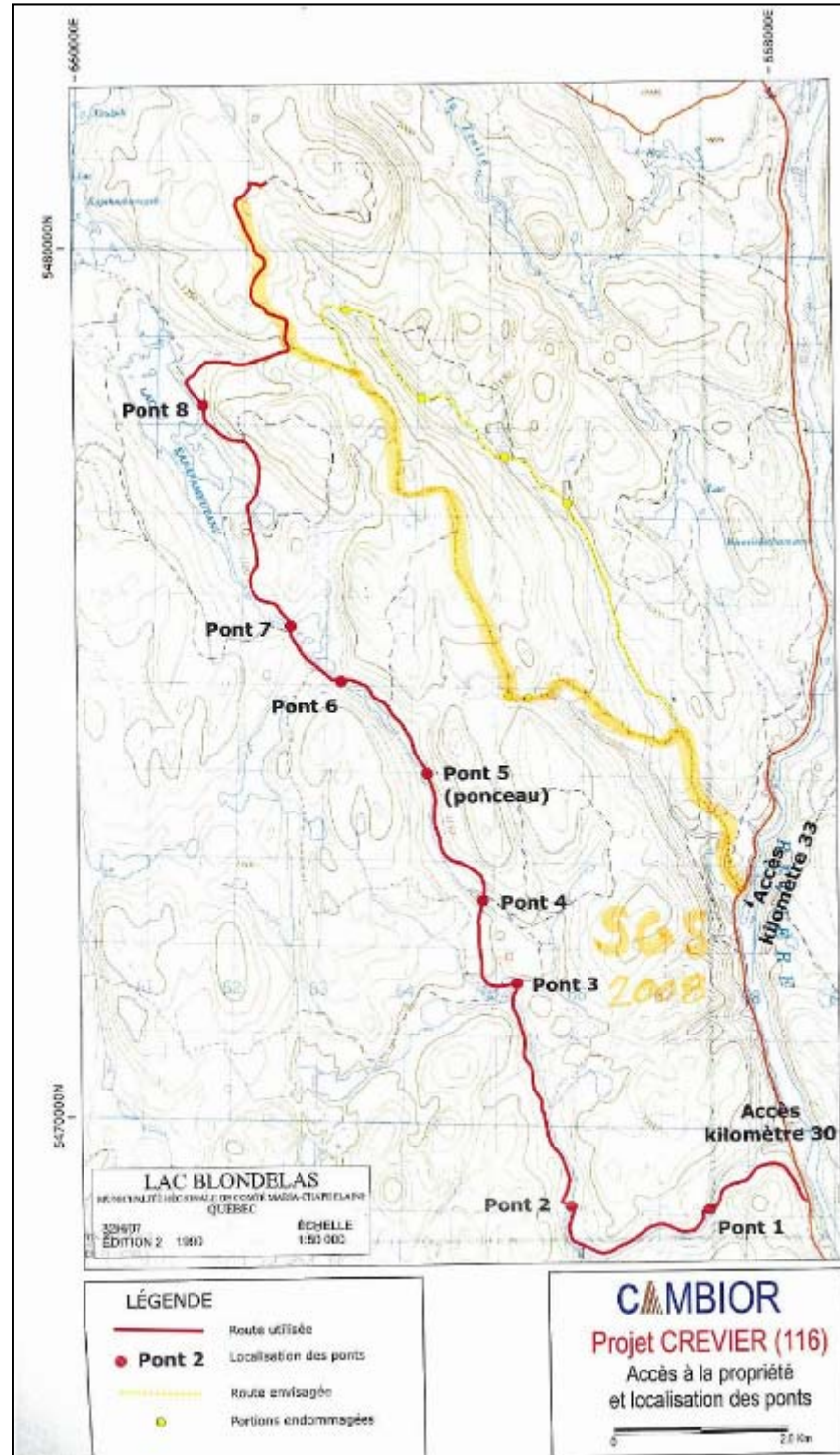
A gravel road from Girardville gives access to the property (see Figure 5.1). It is approximately 70 km north of the village. The main road follows the Mistassini River. This all-weather road is numbered RO206.

The northern portion of the property can be accessed via a small gravel road connecting to RO206 at kilometer 42; this road is used to access the neighbourhood of *Lac-à-la-Truite* cabins and fishing camps. The southern portion of the property is accessed from kilometer 33 (see Figure 5.2) on the RO206 by following a series of secondary gravel roads. These small access roads are only used in the summer.

**Figure 5.1 – Property Location with Regional Road Network**



Figure 5.2 – Road access used by SGS Geostat in orange on Cambior Map



## 5.2 Climate

Statistics from Bagotville, Saguenay which is the nearest official meteorological station from Meteomedia web site as per Tuesday, December 22, 2009:

**Latitude:** 48.20N    **Longitude:** 07.00W    **Altitude:** 159 m

**Table 5.1 – Temperature °C**

	<b>J</b>	<b>F</b>	<b>M</b>	<b>A</b>	<b>M</b>	<b>J</b>	<b>J</b>	<b>A</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>D</b>
<b>Maximum</b>	-9	-7	0	8	16	22	24	22	17	10	1	-6
<b>Minimum</b>	-21	-19	-11	-2	3	9	12	11	5	0	-5	-16
<b>Average</b>	-15	-13	-5	2	9	15	18	16	11	5	-1	-11

**Table 5.2 – Precipitation**

	<b>J</b>	<b>F</b>	<b>M</b>	<b>A</b>	<b>M</b>	<b>J</b>	<b>J</b>	<b>A</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>D</b>
<b>Rain (mm)</b>	4	4	12	31	77	89	114	100	99	67	35	8
<b>Snow (cm)</b>	67	56	48	23	4	0	0	0	1	11	49	86
<b>Total (mm)</b>	59	49	52	52	81	89	114	100	99	78	78	77
<b>Snow on ground (cm)</b>	48	55	26	1	0	0	0	0	0	1	13	41

**Table 5.3 – Other Parameters**

	<b>J</b>	<b>F</b>	<b>M</b>	<b>A</b>	<b>M</b>	<b>J</b>	<b>J</b>	<b>A</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>D</b>
<b>Hum. rel. (%)</b>	80	77	74	68	65	67	71	74	77	78	82	81
<b>Wind speed (km/h)</b>	16	16	18	17	16	14	12	12	14	15	16	16
<b>Wind direction</b>	270	270	270	270	90	270	270	270	270	270	270	270

**Table 5.4 – Number of Days Where**

	<b>J</b>	<b>F</b>	<b>M</b>	<b>A</b>	<b>M</b>	<b>J</b>	<b>J</b>	<b>A</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>D</b>
<b>Temp≤0°C</b>	31	28	30	23	9	0	0	0	4	15	26	31
<b>Rain≥0.2 mm</b>	2	1	3	8	14	15	15	16	17	14	8	2
<b>Rain≥5 mm</b>	0	0	0	2	5	6	7	7	6	5	2	0
<b>Rain≥10 mm</b>	0	0	0	0	2	3	4	3	3	2	1	0
<b>Rain≥25 mm</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Snow≥0.2 cm</b>	20	16	13	7	2	0	0	0	0	4	14	20
<b>Snow≥5 cm</b>	4	4	3	2	0	0	0	0	0	0	4	6
<b>Snow≥10 cm</b>	1	1	1	0	0	0	0	0	0	0	1	2
<b>Snow≥25 cm</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Pcpn total≥0.2 mm</b>	20	16	14	13	15	15	15	16	17	16	19	20
<b>Pcpn total≥5 mm</b>	4	4	3	4	6	6	7	7	7	5	5	5
<b>Pcpn total≥10 mm</b>	1	0	1	1	3	3	4	3	3	2	2	2
<b>Pcpn total≥25 mm</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Snow Cover≥1 cm</b>	31	28	31	17	0	0	0	0	0	1	17	30
<b>Snow Cover≥5 cm</b>	31	28	29	13	0	0	0	0	0	0	13	28
<b>Snow Cover≥10 cm</b>	30	28	29	11	0	0	0	0	0	0	9	25
<b>Snow Cover≥20 cm</b>	26	27	26	7	0	0	0	0	0	0	3	17
<b>Snow Cover≥50 cm</b>	10	14	11	2	0	0	0	0	0	0	0	4

The above statistics represent average values of the meteorological parameters for each month of the year. Sampling represents 30 years from 1961 to 1990.

### 5.3 Local Resources

The region north of Lac Saint-Jean has an extensive agricultural and forestry industry. The region has a significant hydro-power dam system to supply electricity to the aluminum production and transformation industry. The mining operations are mainly quarries for aggregates and dimensional stone. However, a niobium mine, Niobec, located 250 km east of the Crevier property is owned and operated by IAMGOLD.

Even if the region is not a mining area, qualified personnel may be found in the region. The University of Quebec in Chicoutimi has a well developed geological department. The Chibougamau area, not far from the Project, also offers mining facilities. The village of Girardville can provide basic needs such as food and limited accommodation, Dolbeau-Mistassini can provide more services. Several surrounding cities with their distinct services also provide extensive contractor services and supplies within a 200 km radius.



## 5.4 Infrastructure

The only infrastructure at the site is the access road which is generally in good condition but will need some repairs and culvert replacements due to beaver activities. The property area is large enough to support mining operations, infrastructure, processing facilities, waste rock storage and tailings storage. The nearest power line is the major transmission line from Chute-des-Passes. Another power line which the Project could connect to is at the former wollastonite project (Orleans Resources) near Saint-Ludger-de-Milot. Otherwise the Project will need to build its own power line to connect to the Normandin Hydro Quebec main substation located 80 km from the Project.

## 5.5 Physiography

The property lies within the *Lac-à-la-Truite* Basin in the valley of the *Rivière à la Truite*. The lake is approximately 330 m above sea level. The lake of shallow depth covers the central part of the Crevier igneous complex (see Photo 5.1). The hills are about 20 m higher than the lake in the northern part while the southern hills are about 100 m above lake elevation.

**Photo 5.1** – Topography near old Blasted Trenches, Lens # 1



The area was logged in the 1980s; there is presently little mature commercial wood left in the area of interest. There is no major difference in erosion pattern between the mineral and the surrounding rocks and the surface is relatively smooth. One remarkable aspect of the small scale erosion pattern was observed on outcrops where the porphyry texture is observed with the matrix protruding while the nepheline crystals are lightly carved inward.

Photo 5.1, taken during the July 2008 site visit shows the mineralized dyke with relatively recently grown vegetation.

## 6.0 HISTORY

For details on the Crevier property history the reader should refer to the SGS Geostat (2009) report. The following sections summarize information from this report.

### 6.1 Ownership History

The Crevier mineral deposit was discovered by SOQUEM in 1975. From 1975 to 1986, SOQUEM carried out different phases of exploration on the property. In 1986, SOQUEM privatized some of its producing assets and formed a new company named Cambior and the ownership of the Crevier Property was transferred to Cambior. In April 2008, Crevier Minerals Inc. bought the property from IAMGOLD, current owner of Cambior.

A summary of past exploration work is given in Table 6.1.

**Table 6.1 – Summary of Past Exploration Work**

Year	Type of Exploration Work	Comment
<b>SOQUEM</b>		
1975	Airborne radiometric survey Land claiming: 322 claims for 5,152 hectares (ha) Line cutting	Identified targets of interest
1976	Line cutting: 222 km (done in 1975 and 1976) Geological mapping Trenches Radiometric, induced polarization, magnetometric surveys and mineralogical studies Diamond drilling campaign: 6 holes for 1,156 meters	First hit by DDH
1977	Mapping and geological exploration (1" = 1,000 feet) Diamond drilling campaign: 6 holes for 981 meters	Extension of mineralization
1978	Geological mapping (1" = 1,000 ft; 1" = 200 ft) Diamond drilling campaign: 20 holes for 2,930 meters	Extension of mineralization
1979	Mineralogical studies Radiometric exploration on the boundary limits Diamond drilling campaign: 7 holes for 1,126 meters Overburden stripping and blasting of the niobium-tantalum zone Metallurgical tests in laboratory	Extension of mineralization and metallurgical testing
1980	Diamond drilling campaign: 27 holes for 3,426 meters Additional overburden stripping, mapping and surface sampling Surveyed line cutting (12.4 km) Bulk sampling of 100 tonnes Metallurgical testing (100 tonnes)	Understanding of the Nb zone, into the Syenite Porphyry dyke (SNp)



Year	Type of Exploration Work	Comment
1981	Diamond drilling campaign: 5 holes 81-67 to 81-71 (10-745 project) Additional overburden stripping, mapping and surface sampling Line cutting (15 km) Bulk sampling of 1,000 tonnes Mineralogical studies Metallurgical testing (various laboratories)	More comprehensive understanding of the Nb zone, into the Syenite Porphyry dyke (SNp)
1982	Metallurgical testing in laboratory Preliminary assessment (scoping) study Aerial and topographic surveys General survey Radiometric and geological exploration Geochemical survey of creeks sediments Overburden stripping and sampling of east and south showings	Results good enough to continue
1983	Overburden stripping of mineralized showings and sampling Radiometric surveys Mapping Preliminary assessment (scoping) study Mineralogical study Total drilling by SOQUEM 72 holes (13A & 13B) numbered 10-745-1 to 10-745-71	Results good enough to continue
<b>CAMBIOR</b>		
1986	Complete property acquisition by Cambior Feasibility study: Nb – Ta deposit	Results showed not enough robust economics due to metal price at the time
1997	SOQUEM takes an option on the property	Back in the hands of SOQUEM
1997-98	Claims staking, and exploration for apatite, sampling, geochemistry and mineralogy	Looking for phosphate
2000	SOQUEM drops the option on the property Cambior now holds 100% of the property	Back in the hands of Cambior
2002	Diamond drilling campaign by Cambior: 33 holes for 6,062 meters	Resource validation of SOQUEM work

## 6.2 Exploration and Historical Mineral Resources (not NI 43-101 compliant)

Details regarding exploration work on the Crevier property are provided in the SGS Geostat (2009) report. The following is a summary of the information provided on historical mineral resources in the SGS Geostat (2009) report.

Exploration summary reports were produced for 1975, 1976 and 1978 and are detailed in SGS Geostat (2009).

The first historical "reserve" summary was prepared in 1980 and showed a total of 15,838,000 tonnes (not NI 43-101 compliant), with Nb<sub>2</sub>O<sub>5</sub> grading 0.204% and Ta<sub>2</sub>O<sub>5</sub>

grading 212 ppm. The Historical "reserves" were qualified as semi-measured, indicated and semi-indicated categories (not NI 43-101 compliant).

A second historical preliminary "reserves" estimation, prepared in 1981, between the surface and level -300 meters showed 32,178,000 tonnes of mineral at 0.188% Nb<sub>2</sub>O<sub>5</sub> and 203 ppm of Ta<sub>2</sub>O<sub>5</sub> (not NI 43-101 compliant). These "reserves" were classified as semi-measured, indicated and semi-indicated. An extra 28,500,000 tonnes was added in the potential category, but no grade was attributed to them (not NI 43-101 compliant).

Various research programs and studies done in 1982, 1983 and 1986 are summarized in SGS Geostat (2009).

A description of the drilling campaign conducted by Cambior in 2002 is given in SGS Geostat (2009).

### **6.3 Present Cost (2008) of Past Exploration Work**

An estimation of the costs, in 2008 dollar value, of past exploration work excluding metallurgical tests is given in SGS Geostat (2009). This estimate includes a total of 17,124 m of diamond drill in 105 holes along with exploration work such as: line cuttings, geophysics, mapping, drilling, surveying and engineering studies. The cost is estimated to be between \$4.5 M and \$5.0 M.

## **7.0 GEOLOGICAL SETTING**

For details on the Crevier property geological setting, the reader should refer to SGS Geostat (2009) report. The following sections have been taken from this report.

### **7.1 Regional Geology**

It is generally understood that the Crevier intrusive complex was injected along the Wasnanipi-Saguenay couloirs, a major lineament going north from the St. Lawrence River towards the Superior and extending to the south limit of James Bay. Many alkaline injections are located along this axis, mainly St-Honoré, Crevier, the Dolbeau carbonatites dykes, the Montviel, Shortt Lake and Grevet carbonatites. Finally, there is also a series of kimberlites, such as the Desmaraisville dyke which appear to be linked to this lineament.

### **7.2 Property Geology**

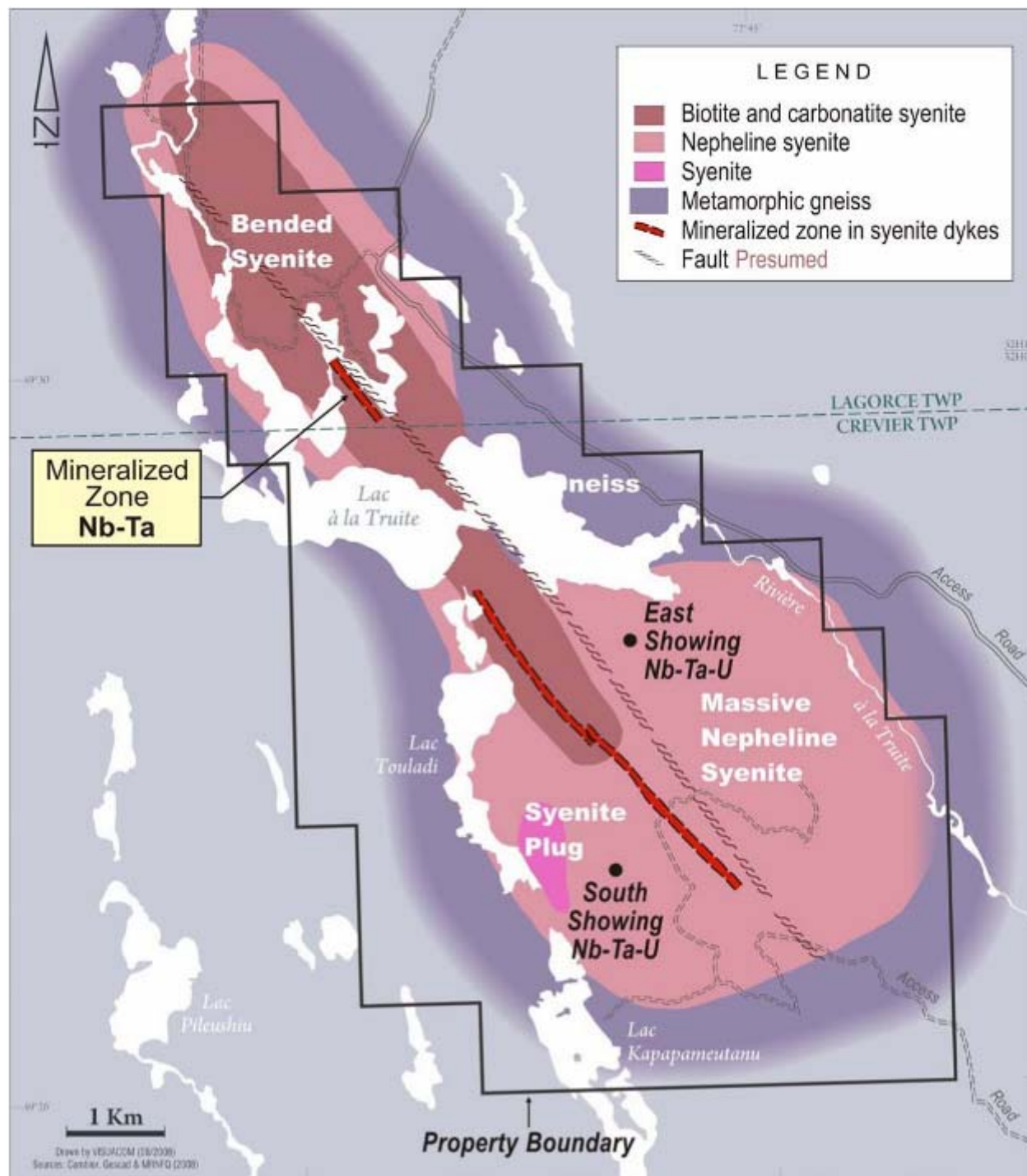
The geology of the complex was studied with various mapping and drilling campaigns as well as by university research projects. The results of this field work have defined the numerous facies and their relations.

The Crevier complex most likely contains four (4) separate units. Firstly there is, on the south eastern part, a near circular injection of nepheline syenite with variable biotite content going from traces to some percentages. This unit is cut by a second phase having an oblong shape with the main axis parallel to the Wasnanipi-Saguenay corridor, from north-west toward south-east (320° az).

In the south-west part of the intrusive there is a smaller mass of syenite with almost no nepheline. This mass, even though identified by two (2) drill holes, was isolated from the remaining of the complex and was extrapolated by geophysics which describes its contour, therefore giving what is defined as Unit #3.

There is also a period of alkaline metasomatism that has affected the host gneisses (Unit #4). The aegirine, a sodic pyroxene seems to be the main witness of this event which has happened before the intrusion of the complex.

Figure 7.1 – Simplified Property Geology as per Cambior, 2002



## 8.0 DEPOSIT TYPES

For details on the Crevier property deposit types, the reader should refer to SGS Geostat (2009) report. The following has been taken from this report.

The alkaline complex is divided into three (3) main lithological units (Units 1 to 3), the fourth unit being the Grenville rocks. These main units are composed of many specific distinct lithological units, defined by local mapping and diamond drilling.

- The first unit represents the major north-western part of the complex; its elongated shape is aligned along a North 320° axis. The composition is an alternating suite of bands of biotite-carbonate syenites, nepheline syenites, nepheline syenites with biotite and carbonatites with an orientation between North 300° and North 340°;
- The second unit mainly covers the south of the complex, but is also present in a 300 meter thick band surrounding the first unit. The composition is mainly nepheline syenite with nepheline-biotite syenite dykes crossing the formations along North 320°;
- The third unit is very small and is located in the south western part of the complex, inside the second unit and is characterized by a large amount of syenite.

The chronological sequence of the deposition of the Crevier complex is as follows:

- Alkaline metasomatism preceding the complex intrusion;
- Deposition of the nepheline-biotite syenites;
- Emplacement of carbonate-biotite melanosyenite;
- Carbonatite injection;
- Intrusion of nepheline syenite dykes and biotite syenites.

Two (2) main mineralization types of economic interest are present inside the Crevier complex. The first type of uranium-niobium mineralization is mainly located inside the first unit inside an uranopyrochlore unit. The second mineralization type is one of niobium-tantalum and is associated with a pegmatite-nepheline syenite dyke located inside the second unit and also inside the first unit.

Apatite is found in few spots inside the complex but is mainly located in the center part. The apatite rich zones are along the contacts inside the carbonatite dykes and inside the nepheline syenites.

The dyke is separated in four (4) lenses stretched over 4 km and has an average thickness of 20 meters. It has been recognized down to 300 meters below surface. Exploration work was aimed at defining the exact position and grade of the nepheline syenite porphyry dyke.

## 9.0 MINERALIZATION

### 9.1 Tantalum-Niobium Lenses

For details on the Crevier property mineralization, the reader should refer to SGS Geostat (2009) report. The following has been taken from this report.

The mineralized tantalum-niobium zone is located in the southern part of the Crevier alkaline intrusive. Previous field work such as stripping, geological mapping, trench sampling and diamond drilling have contributed to ascertain this mineralization over more than three (3) kilometers long.

The mineralization of the niobium-tantalum type is associated with a porphyritic nepheline syenite dyke. The dyke is composed of a minimum of four (4) sections or distinct lenses (numbered 1 to 4). The contacts with the host rocks are clean and can be easily seen. The dyke is generally composed (95%) of nepheline syenite of pegmatitic texture containing large feldspar crystals and nepheline having variable grain sizes from a few centimeters to close to one meter in specific areas. Many secondary minerals are observed, mainly: biotite, magnetite, pyrrhotite, pyrite, zirconium, sodalite, cancrinite, ilmenite, carbonates and pyrochlore.

The main dyke also contains 5% of secondary dykes and host rocks. The thickness of the secondary units varies from centimeters to meters.

Lens #1 is the most southern one and is located between sections 9,700N and 11,200N. This is the best known of all lenses, having been diamond drilled with twenty-four (24) holes and geologically mapped over more than 600 meters. Moreover, two (2) bulk samples of 100 tonnes (1980) and 876 tonnes (1981) have been processed for metallurgical testing. The thickness varies from 3 to 25 meters, the average being 19 meters.

Lens #2 is a relatively small lens (400 m long) located to the north of the #1 lens and appears as having been relocated. Its average thickness is 25 m, and has been intersected by four (4) diamond drill holes, one of them at a depth of 372 m. On the northern part, stripping and trench sampling have been done.

Lens #3 is approximately 1,200 m long and has been drilled on a grid varying from 200 to 300 m spacing horizontally. Seven (7) drill holes have intersected it at a maximum depth of 70 m. The lens is 20 m thick and is showing an “interdigitation” relation with the #2 lens.

Lens #4 is more than 900 m long and has been delineated with three (3) drill holes 300 m apart and four (4) exploratory trenches which are more than 900 m long. Its thickness varies from 8 to 36 m (average 29 m) and is still open to the north.



## 9.2 Other Mineralization

Uranium Niobium – Tantalum mineralization is present on the property. One is labelled East U-Nb-Ta showing which is north of the main dyke in the southern part of the property while the other is labelled South U-Nb-Ta showing which lays South West of the main dyke lens #1.

No significant apatite mineralization was observed or highlighted from work by SOQUEM near *Lac à la Truite*.

Other parameters of interest such as zirconium and cerium were analyzed in Cambior exploration campaign, but these are not considered in the current commodity assessment.

## 10.0 EXPLORATION

For details on the Crevier property exploration, the reader should refer to SGS Geostat (2009) report. The following has been taken from this report.

At the time of publication, May 25, 2009, the SGS Geostat report indicated that Crevier Minerals had not carried out extensive exploration work on the property. A site visit with independent sampling by SGS Geostat was done in July 2008 in addition to preliminary gravimetric concentration tests at COREM with blasted material stored in barrels by the previous owner Cambior. This material is from the blasted trenches.

Crevier has carried out a due diligence including a resource estimation update by SGS Geostat and the preparation of a NI 43-101 Technical report with compliant resource estimation and classification. Details regarding results of grab samples in old blasted trenches may be found in SGS Geostat (2009) report.

## 11.0 HISTORICAL DRILLING

For details on the Crevier property drilling, the reader should refer to SGS Geostat (2009) report. The following has been summarized from this report.

At the time of publication of the SGS Geostat report, May 25, 2009, Crevier Minerals had not yet started a drilling program on the property. A drilling program was recommended for 2009 but results have not been reviewed and are not part of this NI 43-101 compliant mineral resource estimate and classification.

Historical drilling on the property has consisted of BQ diamond drill holes. Historical maps show the location of some small percussion holes used to blast material near the surface for the bulk sample tests. This information is not computerized in the database.

A total of 105 diamond drill holes were completed by previous owners, 72 by SOQUEM and 33 by Cambior. Witness cores from both campaigns are stored at the Niobec mine owned by IAMGOLD in St-Honoré. SGS Geostat has visited the storage facility and has taken independent samples for data verification.

The drilling pattern is generally done with 100 m hole spacing on sections perpendicular to the dyke and with 50 to 75 m hole spacing on sections in lenses #1 and #2. Drill hole spacing further north is 200 to 300 m in lenses #3 and #4. Drill hole depth varied from 50 to 350 m.

## 12.0 SAMPLING METHOD AND APPROACH

For details on the Crevier property sampling method and approach, the reader should refer to SGS Geostat (2009) report. The following has been summarized from this report.

At the time of publication of the SGS Geostat report, May 25, 2009, Crevier Minerals Inc. had not yet started a drilling program on the property. Therefore, the sampling method and approach described here was used by previous owners.

The hole spacing was approximately 50 meters on section with a spacing of 100 to 300 meters between sections. These holes were sampled generally at 1.5 meter intervals. Samples were assayed for oxides and especially  $\text{Nb}_2\text{O}_5$  and  $\text{Ta}_2\text{O}_5$  from pulverized half core samples. Results show that the niobium grade varies along strike from South to North of the exploration grid, the grid being oriented  $321^\circ$ .

Sampling of the half core was done with a core splitter, the sample length is generally 1.5 m. The deposit is recognized over a length of 4 km and the tabular structure has an average true thickness of about 20 m.

The rock is competent and core recovery is extremely good. The samples are of good quality and are representative of the intersected rock.

The mineralized rock being of porphyry texture, the bigger the samples are, the better the reliability. SGS Geostat does not recommend to drill smaller than BQ diameter due to porphyry texture and the mineralization being relatively coarse with pyrochlore grains of millimetric size.

### 13.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

For details on the Crevier property sample preparation, analyses and security, the reader should refer to SGS Geostat (2009) report. The following has been taken from this report.

At the time of publication of the SGS Geostat report, May 25, 2009, Crevier Minerals Inc. had not yet started a drilling program on the property. Therefore, the sample preparation analyses and security description presented here refers to methods applied by past project owners.

#### 13.1 Sample Preparation and Analysis

SOQUEM and CAMBIOR historical records of the project indicate that samples collected from the project consisted of:

- Surface grab samples;
- Channel samples;
- Pit samples and bulk samples;
- Test drill hole cutting samples;
- Diamond drill core samples.

Few details are available on sample preparation of these types of sample. Core sampling involved core splitting in two (2) and witness core preservation. Pictures were taken prior to splitting by Cambior. Early exploration campaign emphasized  $U_3O_8$ ,  $Nb_2O_5$  and  $Ta_2O_5$ . Additional work mainly aimed at defining mineral resource estimate for  $Nb_2O_5$  and  $Ta_2O_5$ .

##### 13.1.1 Sample Preparation at the Laboratory

Little information about laboratory preparation is available from the 1976 – 1978 exploration campaign. Cambior used standard commercial preparation procedures.

##### 13.1.2 Analysis at the Laboratory

Several laboratories were used for earlier drilling program: Bondar-Cleg, École Polytechnique, X-Ray Lab, Metriclab and C.E.A.C. Cambior had mainly used Actlab for  $Nb_2O_5$  and  $Ta_2O_5$  analysis.

A formal review of assay certificates was carried out by SGS Geostat. Some of the assay certificates were not found, but SGS Geostat does not believe that this influences the quality of the information.

#### 13.2 Quality Control Program

Quality control programs were initiated by previous owners. SGS Geostat indicates that there have been important issues on results of standard sample from different laboratories. However, SGS Geostat has not found a specific report presenting all the investigations with a general compilation.

### 13.3 Security

In SGS Geostat opinion, the work has been done in a professional way.



## **14.0 DATA VERIFICATION**

For details on the Crevier property data verification, the reader should refer to SGS Geostat (2009) report. The following has been taken from this report.

### **14.1 Independent Sampling**

The database assay table was verified against the original paper logs on a random basis and did not find major errors.

Independent samples were taken from witness core holes (39 samples) and from site blasted trenches (10 grab samples) following a preparation and sampling protocol. The sample bags were sealed and delivered to the SGS laboratory facilities at Lakefield.

### **14.2 Sample Preparation at the Laboratory**

Sample preparation protocol was provided by SGS Lakefield.

### **14.3 Analysis at the Laboratory and Quality Control Program**

The rock samples were first assayed at SGS Lakefield while pulp samples were also sent to ALS Chemex of Val d'Or for laboratory verification.

Differences were noticed in the database between SOQUEM results versus 2008 commercial laboratory check values. The remaining pulps were sent to Niobec mine laboratory facility (IAMGOLD) and a second preparation took place at SGS Lakefield from the rejects. In addition to regular XRF analysis, SGS Lakefield has also been requested by SGS Geostat to test another analytical method with acid attack and ICP to have additional data and compare analytical technique results.

Results indicate that the average grade of the whole mineralized intersection from the Cambior campaign has been reproduced while the average from the SOQUEM hole could not be reproduced.

Blanks were also introduced in the sampling sequences and showed no major signs of contamination within the detection limits.

### **14.4 Additional Independent Sampling – Phase 2**

Following inconclusive reproduction of results between SGS Geostat new analytical data and old SOQUEM data in the Phase 1 independent sampling program, the decision was made to carry out a more extensive sampling program on existing witness cores. A new sampling program (October 2008), involving four (4) witness holes drilled by Cambior and two (2) witness holes drilled by SOQUEM, was designed to verify the bias between the assays.

Results confirm a bias for the SOQUEM data: the new SGS Lakefield data shows lower grade compared to the original SOQUEM data for Niobium. The Cambior holes show acceptable variations between both dataset. Tantalum is in the acceptable range of variations for both companies dataset.

## 14.5 Conclusions of verification

An appropriate correction was developed for the database based on a comparison block models on the two (2) sets of data, in order to use the information for the estimation of grade in mineral resource. A negative correction of 19% for the  $\text{Nb}_2\text{O}_5$  and 13% for  $\text{Ta}_2\text{O}_5$  in ppm for all SOQUEM data has been applied to the composites. This correction factor is based on the comparative resource estimation model and was supported by the independent SGS sampling programs.

## 15.0 ADJACENT PROPERTIES

As per information from SGS Geostat (2009) report, Mr. Senechal holds the adjacent claims North East of Crevier Minerals property. No public information of these claims is available.

## 16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

The current process flow sheets and design criteria are based primarily on the test work reports from SGS Lakefield Research Limited (SGS Lakefield) and the operating experience of Met-Chem personnel. The technical information comes mainly from three (3) SGS Lakefield reports.

The grinding and beneficiation flow sheet was developed from the SGS Lakefield report written in 2003. SGS Lakefield reviewed the test work in 2008 and arrived at the same flow sheet. The leaching, solvent extraction, stripping and precipitation flow sheet was determined by examining the SGS Lakefield reports from 2001 and 2002 related to the refinery section of the process.

The main concern in the development of the process was the amount of test work done on an unconventional mineral deposit. In the 2008 report, SGS Lakefield recommended that more test work should be done to optimize the comminution, flotation and refining processes. SGS Lakefield reported that during laboratory flotation testing there were pH control problems in the Nb-Ta rougher circuit. SGS Lakefield suspected calcite interference. Met-Chem supports SGS Lakefield recommendations that future test work should focus on minimizing potential unstable operating plant conditions.

Metallurgical test work completed by SOQUEM and Cambior, demonstrates that a niobium (pyrochlore) concentrate can be produced by a combination of standard industrial processes or treatment.

The current expected metallurgical recovery at the flotation circuit for this mineral based on laboratory test work averaged 70%. The series of tests indicate that recovery might range between 60% and 80%. The refining recovery is expected to be 96% from the concentrate yielding an overall recovery of 67.2%. According to information provided by Crevier, pyrometallurgical processing was previously evaluated but later discarded for the Project due to higher investment costs.

### 16.1 Review of Beneficiation Test Work

The SGS Lakefield 2008 report is a review of all previous test work and technical reports concerning the Project. The flotation test work selected by Crevier for this study was performed by SGS Lakefield in 2003.

SGS Lakefield test work results show that flotation of the mineral can be achieved with recovering about 70% metal of the desired minerals at the bench scale level. SGS Lakefield used Test # 9 and Test # 12 to produce the preliminary flow sheet design and the preliminary reagent scheme. The major problems noted during these two (2) tests were with the pH control in the Nb-Ta flotation circuit. Only 13 flotation tests were performed and thus the optimal flotation conditions have probably not been established.

Very little information on comminution is available and this area requires significantly more test work prior to expanding the accuracy of the mill design and layout.

Items that require more investigation include:

- Basic comminution test work and other test work

Prior to the next study level such basic tests as Crusher Work Index Test, SAG Mill Work Index, Ball Mill Work Index and possibly re-do the Rod Mill Work Index are required. Abrasion tests would be very helpful, but are not critical. Furthermore, settling tests have to be done if at all possible for thickener selection.

- De-sliming

SGS Lakefield has performed all the flotation tests after de-sliming. It would be interesting to evaluate flotation results without de-sliming. In Section 3.2 of the SGS Lakefield 2003 report, it is stated that: *“The fineness of the grind in the range tested had no effect on the Nb-Ta recoveries.”* This is not completely accurate. The table lists the rougher recoveries quite similar indeed, but the finer ground material had about 10% more niobium oxide and tantalum oxide removed prior to flotation.

The relative rougher flotation feed recovery is thus significantly higher for the finer flotation feed. If de-sliming is not absolutely necessary, a 5 to 6 % increase in recovery could be anticipated based on SGS Lakefield preliminary test work. Another item to be looked into is that if de-sliming is essential, can the slime material be re-processed separately to recover the lost niobium and tantalum minerals.

- Flow sheet development Nb-Ta cleaner flotation tailings

Met-Chem's simplified flow sheet presents a more practical solution. The changes made were to the Nb-Ta 2<sup>nd</sup> Cleaner Tailings which now goes to the Nb-Ta 1<sup>st</sup> Cleaner Feed rather than the Nb-Ta Rougher Feed, and similarly the Nb-Ta 3<sup>rd</sup> Cleaner Tailings now goes to the Nb-Ta 2<sup>nd</sup> Cleaner Feed rather than the Nb-Ta 1<sup>st</sup> Cleaner Feed.

- Specialty collectors

SGS Lakefield had created its own specialty collectors to obtain good flotation results. Simplification of the flotation process by using existing commercial collectors that get similar or better results should be investigated.

- Flow sheet development Nb-Ta flotation concentrate

The final Nb-Ta concentrate undergoes two-stage magnetic separation; the non-magnetic material is now sent to a pre-leach thickener and does not undergo additional separation treatment.

- Nb-Ta Flotation Concentrate Magnetic Separation

The fourth cleaner Nb-Ta concentrate undergoes magnetic separation. According to the test work, the fourth cleaner concentrate contains 17.4% Fe<sub>2</sub>O<sub>3</sub>, 21.17% Nb<sub>2</sub>O<sub>5</sub> and 2.617% Ta<sub>2</sub>O<sub>5</sub>. After magnetic separation, the non-magnetic concentrate

contains 16.8%  $\text{Fe}_2\text{O}_3$ , 22.43%  $\text{Nb}_2\text{O}_5$  and 2.767%  $\text{Ta}_2\text{O}_5$ . This is not a very significant upgrading increase. However, the  $\text{Nb}_2\text{O}_5$  and  $\text{Ta}_2\text{O}_5$  recovery decreased by 6.6 and 6.7% respectively. New test work will have to demonstrate that the iron removal step is indeed critical for the downstream process; otherwise the cleaner concentrate magnetic separation steps should be removed.

- Concentrate Thickener and Filtration System

Met-Chem added a concentrate thickener and filtration system in the design since there was no bridge between the beneficiation and refining processes. The refining process involving leaching, solvent extraction, stripping and precipitation will be treated as a separate section and therefore the thickener underflow will be stored in a filter stock tank with approximately one-day holding capacity.

- Final Tailings Treatment

The tailings from the mill and the refinery will be treated prior to discharge to the tailings pond. Lime will be added to precipitate potentially problematic by-products. Test work has to be done to ensure that the proper treatment is chosen.

## 16.2 Review of Refinery Test Work

The refinery test work was designed to examine whether the classical hydrometallurgical method of metal recovery and separation of niobium and tantalum would be suitable for the concentrates. The work investigated refining the concentrate by  $\text{HF}/\text{H}_2\text{SO}_4$  leach and solvent extraction.

The test work established that the  $\text{HF}/\text{H}_2\text{SO}_4$  leaching process is suitable for the concentrate and achieved high leach extraction levels for niobium and tantalum. The work showed less success in solvent extraction, stripping and metal compound precipitation. Further test work must be done in these areas. Results generated little useful information for process equipment design or sizing.

The test work mandate was limited in scope and the followings items will help to complete the test work program:

- A further test work program should be carried out, designed on the basis of the results of the scoping work, and focussing on solvent extraction, stripping and precipitation;
- The Nb and Ta extraction isotherms should be confirmed by a continuous, small scale extraction test to give better information on stage requirements and equipment sizing;
- The sensitivity of Nb loading on MIBK with HF concentration could be used to investigate alternative extraction regimes;
- The stripping steps should be investigated to decrease cross-contamination and improve product quality;
- Precipitation work should be repeated.



## 17.0 MINERAL RESOURCE ESTIMATE

There are no NI 43-101 compliant mineral "reserves" at this stage on this Project.

For details on the Crevier property mineral resource estimate, the reader should refer to SGS Geostat (2009) report. The following has been taken from this report.

The final drill hole database used for the resource estimation of the Crevier Project is in file Crevier.mdb dated November 5, 2008. The database has information on 105 drill holes from the entire Crevier Project.

The trench and surface samples was not integrated into the database at that moment.

A database in Gemcom format was transferred to SGS Geostat from the client. A review of the database was performed by SGS Geostat leading to some corrections from original logs. The corrected database has information on 105 drill holes from the entire Crevier property. After corrections the total drill holes length in database is 17,124 m. There are 4,789 assay records for %Nb<sub>2</sub>O<sub>5</sub> and Ta<sub>2</sub>O<sub>5</sub> in ppm. There are 555 deviation records. There are 935 lithology records and 1,961 RQD records.

Mineralized envelopes were then defined using geological description and grade information along the drill hole core. The interpretation of the mineralized structures (Lens/Porphyry Syenite dykes) was based on documented cross sections and interpretation from Cambior. In the SGS Geostat mineralized envelope interpretation there are three (3) lenses instead of four (4). Cambior Lenses # 1 and # 2 are combined since they merge and are relatively continuous while the lenses #2 and #3 correspond to Cambior #3 and # 4 respectively.

The original assay intervals do not have the same length. The majority of assay intervals have a length of 1.5 m. The selectivity of 1.5 m is not commonly achievable in bulk tonnage mining; therefore a 2.5 m standard length has been chosen. The capping analysis was performed on the 2.5 m length composites. The %Nb<sub>2</sub>O<sub>5</sub> composites were capped at 0.5% and 550 ppm for Ta<sub>2</sub>O<sub>5</sub>.

A specific gravity of 2.63 t/m<sup>3</sup> was used in the report. A block model was prepared by SGS Geostat. The dimensions of each block are 2.5 m (EW) by 25 m (NS) by 10 m (Z). The grades were estimated in each block of a regular matrix of 201 columns (EW), 150 rows (NS) and 54 benches (Z) with its center within the limits of the mineralized zones. Altogether, a total of 36,652 blocks were estimated within the envelope (final block model grade corrected). The block model is cut by the topography.

The average grade of Nb<sub>2</sub>O<sub>5</sub> (%) and Ta<sub>2</sub>O<sub>5</sub> (in ppm) of each block was interpolated by inverse square distance from nearby 2.5 m drill hole composites.

SGS Geostat used interpolation parameters based on drill spacing, variogram, envelope extension and orientation.

SGS Geostat prepared the corrected model in which the SOQUEM grades have been lowered by 19% for Nb<sub>2</sub>O<sub>5</sub>, and by 13% for Ta<sub>2</sub>O<sub>5</sub> in ppm.

The classification method is the simple search ellipsoid technique, where classification is done by the amount of composites within a specific search radius of the block. In general, for the Project and drilling intensity, it shows reliable classification.

At this stage not having the trench data computerized, SGS Geostat has not presented measured resources. With the computerization of the trenches and detailed DGPS survey of the contours of the lenses on surface, it would be possible to classify resources as measured near the surface. Additional drilling would help in defining measured resources.

For indicated resource classification, a search ellipsoid of 175 m North (as per the local grid), 125 m down dip 80°, 15 m across dip (East down 10°, as per the local grid) is used with a minimum of four (4) composites with maximum of two (2) from the same hole. The remaining blocks are classified as inferred.

Table 17.1 and Table 17.2 present the official final classified resource statement for the three (3) zones as prepared by SGS Geostat.

**Table 17.1 – Official Final Classified Resource Statement for the Three (3) Zones**

<b>Indicated</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	30,940,000	0.168	183
<b>Inferred</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	28,850,000	0.122	166

**Table 17.2 – Mineral Resources within Crevier mineral deposit  
with Cut-Off at 0.1% Nb<sub>2</sub>O<sub>5</sub>**

<b>Indicated</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	25,750,000	0.186	199
<b>Inferred</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	16,880,000	0.162	204

Notes:

Nb<sub>2</sub>O<sub>5</sub> capped at 0.5%

Ta<sub>2</sub>O<sub>5</sub> in ppm capped at 550

SG: 2.63

SOQUEM composites corrected

## 18.0 OTHER RELEVANT DATA AND INFORMATION

### 18.1 Mining

#### 18.1.1 Introduction

Met-Chem was mandated by Crevier to look at various alternatives to mine the deposit based on SGS Geostat block model (May 25, 2009).

#### 18.1.2 Preliminary Operating Parameters

The proposed mining production rate for the Project to be mined by open pit or underground mining methods has been established at 2,740 tonnes per day or 1.0 M tonnes per year.

#### 18.1.3 Mine Geotechnical Parameters

Preliminary geotechnical parameters were developed using rock mass classification methods based on two (2) different sources: geotechnical data taken from 2002 diamond drilling campaign (Cambior), and data collected during the 2009 the drilling campaign.

The CSIR Geomechanics Classification System and Rock Mass Rating (RMR) (Bieniawski, 1976) was used to estimate rock quality based on rock mass parameters such as intact rock strength, RQD, joint spacing, joint condition, and ground water condition. The geotechnical parameters developed based on this method are preliminary in nature but adequate for this study objective. However, it is to be noted that additional field data and testing will need to be collected for the next development stages.

Based on core and outcrop observations, all rock types are considered and qualified as competent rock. Based on RMR rock mass classification system, rock may be qualified as very good to excellent rock. Presence of shear or fault zones indicate that further investigation would be required for the interpretation of the structural features observed in the core.

For the preliminary open pit design, the recommended mining slope parameter is 55° interramp. This value is considered suitable for this stage of the study. However, the available information and data indicate possibility to increase it up to 60°, giving access to additional tonnage. However, in order to optimize the final pit wall or to increase slope angles, more geotechnical work will be needed to confirm preliminary results. More specifically, laboratory testing including uniaxial compressive strength (UCS, MPa) and Mohr-Coulomb Strengths (c, phi) will be required. The shear strength testing of rock mass discontinuities may be delayed up to the feasibility study stage.

#### 18.1.4 Open Pit Mining

This preliminary evaluation of the open pit limits and pit design of the Crevier Project was based on design and operating parameters that were selected based on projects of similar size, operating capacity and operating conditions or in-house Met-Chem or Crevier data. Final operating costs were re-evaluated in more detail based on the results of the mine planning tonnage and required equipment fleet. The cut-off grade used for pit

design is based on both the Nb<sub>2</sub>O<sub>5</sub> and Ta<sub>2</sub>O<sub>5</sub> content. Based on estimated mine and mill operating costs, estimated mill and refinery recovery and sales price, the resulting the Nb<sub>2</sub>O<sub>5</sub> equivalent cut-off grade is estimated at 0.1087 %.

The economic pit limits were evaluated using the EPIT optimizer module of MineSight™ mine planning software, based on 3D Lerch-Grossman algorithm. A final economic pit shell (ultimate pit), delineated 25.4 Mt of indicated and 0.9 Mt of inferred resources (at a stripping ratio of 5.8 to 1) amenable to open pit mining. From this pit shell an engineered pit complete with ramps, and catch benches was designed. The resulting engineered pit recovers 25.8 Mt (or 98.3%) of the economic pit resources and increases the stripping ratio to 6.4 (10% increase) due to placement of the main ramps.

*The PEA is preliminary in nature and it includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the conclusions reached in the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.*

A 25 year mine plan was developed from the design pit based on a production rate of about 1.0 Mtpy of mineral, an external dilution factor of 5% (at zero grade) and a mineable recovery factor of 95% for uncontrollable losses during mining. Mineral will be excavated with 6.2 m<sup>3</sup> hydraulic excavators and trucked to the crusher located near the plant to the southwest corner of the pit using off-highway quarry-type 41-metric ton dump trucks. All mine equipment is to be owned, operated and serviced by Crevier, except for explosives requirements, where a contractor will be responsible for explosives loading and blasting.

Details of the mine plan are shown in Table 18.1.

In addition to the production equipment, a number of auxiliary and service equipment such as bulldozers, graders, and service trucks are required for the mine operation and are accounted for in the mine capital and operating costs. The mine equipment fleet is presented in Table 18.2.

#### 18.1.5 Underground Mining

A review of the underground mining potential of the deposit was made early in this study. Mining of the portion of the mineral deposit below the economic pit limits as well as mining the entire mineral deposit with underground methods was reviewed. It was determined that, based on sub-level open stoping method and taking into consideration mining cost as well as the process and services costs and sales price, results showed a profit well below the profit for mining the same deposit using open pit method. It was therefore decided not to pursue the underground mining option early in the study.

**Table 18.1 – Detailed Mine Plan**

	Unit Cost	Pre-Production	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-8
<b>Mineral</b>	mt	84,423	971,670	906,857	1,023,121	1,039,285	1,026,151	3,050,550
<b>Nb<sub>2</sub>O<sub>5</sub></b>	%	0.14%	0.161%	0.160%	0.143%	0.155%	0.170%	0.156%
<b>Ta<sub>2</sub>O<sub>5</sub></b>	ppm	163.1	173.4	170.3	173.8	170.0	172.5	171.2
<b>Waste Rock</b>	mt	538,936	4,555,033	7,383,127	9,048,995	8,832,659	8,740,966	22,702,834
<b>Overburden</b>	mt	2,706,461	750,074	741,123	510,406	522,457	1,097,128	1,144,619
<b>S/R</b>			5.46	9.0	9.3	9.0	9.6	7.8

	Unit Cost	Years 9-11	Years 12-14	Years 15-17	Years 18-20	Years 21-23	Years 24-25	Total
<b>Mineral</b>	mt	3,120,972	3,138,169	2,939,125	3,004,338	3,098,147	2,435,248	25,838,056
<b>Nb<sub>2</sub>O<sub>5</sub></b>	%	0.144%	0.152%	0.161%	0.178%	0.192%	0.239%	0.167%
<b>Ta<sub>2</sub>O<sub>5</sub></b>	ppm	163.2	174.7	170.8	179.0	199.6	228.9	178.6
<b>Waste Rock</b>	mt	21,680,109	16,293,197	18,802,900	20,552,607	12,805,672	3,796,819	155,733,854
<b>Overburden</b>	mt	750,363	n/a	n/a	n/a	n/a	n/a	8,222,631
<b>S/R</b>		7.2	5.2	6.4	6.8	4.1	1.6	6.3

S/R: Stripping ratio

**Table 18.2 – Mine Equipment Requirement by Period**

	PP	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-8	Years 9-11	Years 12-14	Years 15-17	Years 18-20	Years 21-23	Years 24-25
<b>Trucks</b>	3	7	9	11	11	11	9	9	7	8	8	6	4
<b>Drills</b>	1	2	2	2	2	2	2	2	2	2	1	2	3
<b>Shovels</b>	1	2	3	3	3	3	3	2	3	3	3	2	1
<b>Dozers</b>	1	2	2	2	2	2	2	2	2	2	2	2	2
<b>Wheel Dozer</b>	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Graders</b>	1	2	2	2	2	2	2	2	2	2	2	2	2
<b>Service</b>	4	4	4	4	4	4	4	4	4	4	4	4	4
<b>Pick-up Trucks</b>	7	7	7	7	7	7	7	7	7	7	7	7	7
<b>Pumps</b>	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Total</b>	20	28	31	33	33	33	31	30	29	30	29	27	25

PP: Preproduction



## 18.2 Mineral Processing

### 18.2.1 Preliminary Design Criteria

The plant capacity is designed to process 1.0 Mtpy of mineral, while working 365 days per year, 24 hours per day with an overall plant availability of 96%. A summary of the process design criteria is presented in Table 18.3.

**Table 18.3 – Global Process Design Criteria**

Item	Data
Plant Operating Capacity	1,000,000 t/y
Plant Operating Schedule	365 d/y, 24 h/d
Plant Availability	96%
Operating Hours	8,419 h/y
Nominal Plant Throughput	119 t/h
Feed Grade - Nb	0.166 % Nb <sub>2</sub> O <sub>5</sub>
Feed Grade - Ta	0.018 % Ta <sub>2</sub> O <sub>5</sub>
Overall Niobium Recovery	67.2%
Overall Tantalum Recovery	67.2%
Niobium Oxide Production Rate	1,132.51 t/y
Potassium Tantalum Fluoride Production Rate	220.2 t/y
Product Grade - Nb	98.5% Nb <sub>2</sub> O <sub>5</sub>
Product Grade - Ta	99.5% K <sub>2</sub> TaF <sub>7</sub>

### 18.2.2 Beneficiation

A conceptual beneficiation process flow sheet (Figure 18.1) and a conceptual refinery process flow sheet (Figure 18.2) were developed from SGS Lakefield test work. A mechanical equipment list was developed for the main process equipment.

The beneficiation process flow sheet is composed of the following areas:

- Crushing Circuit (Primary, Secondary and Tertiary);
- Grinding Circuit;
- Calcite Flotation;
- Niobium - Tantalum Flotation;
- Concentrate Thickening, Filtration and Storage;
- Reagent Mixing and Distribution.

### 18.2.3 Refining

The refining process involves receiving the flotation concentrate from the beneficiation plant in 2-tonne bags, leaching the niobium and tantalum from the flotation concentrate, removing the leach residue by filtration, recovering the metals from the leachate by

solvent extraction, separating the metals by selective stripping, precipitating niobium as a hydroxide and tantalum as a fluoride, and packing the products for shipping.

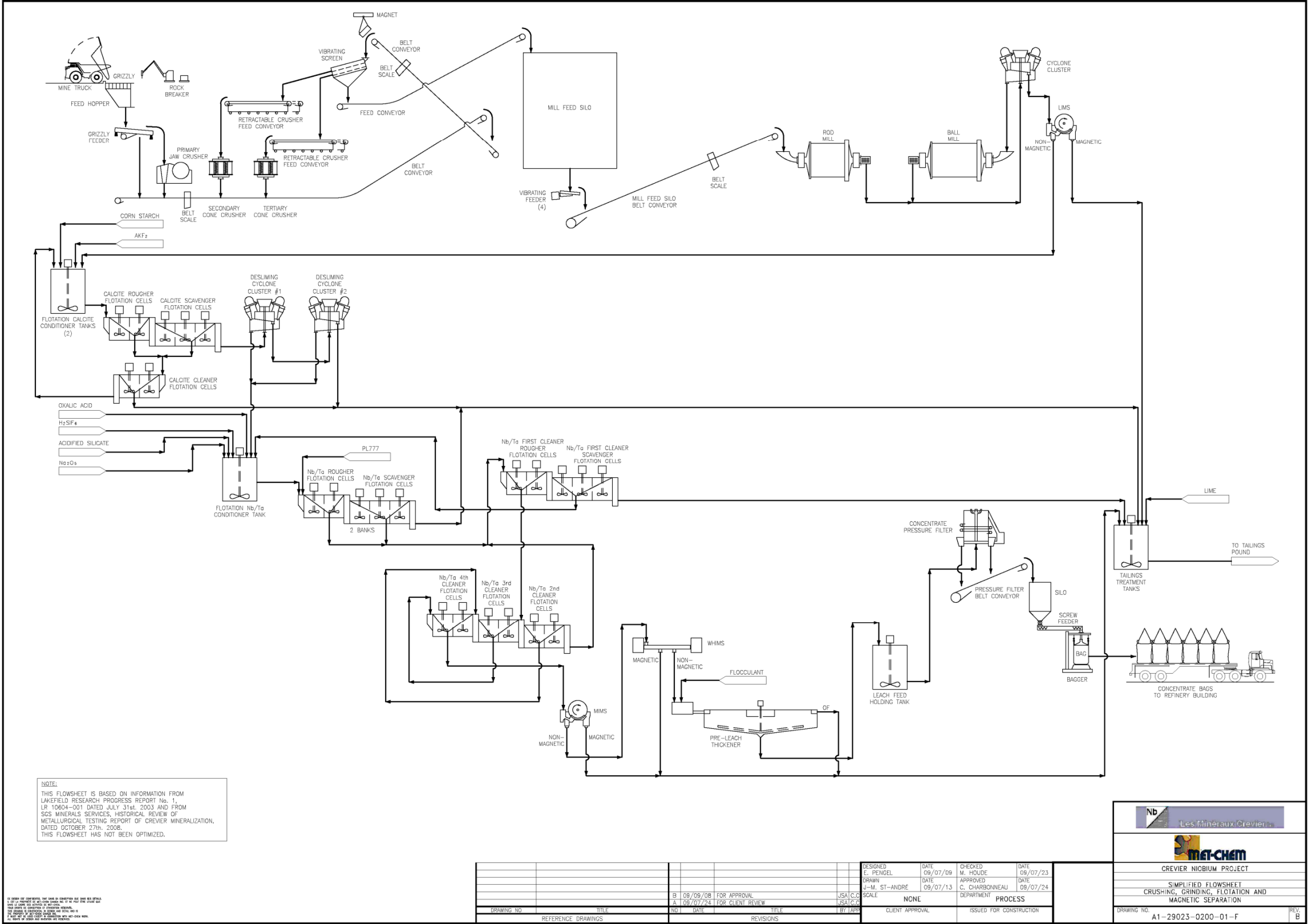
The different refining unit processes include:

- Niobium/Tantalum Concentrate Leaching;
- Leach Slurry Filtration;
- Niobium/Tantalum Solvent Extraction;
- Niobium Stripping and Cleaning;
- Tantalum Stripping;
- Niobium Precipitation, Drying and Calcining;
- Niobium Oxide Packing;
- Tantalum K-Salt Crystallization and Drying;
- K-Salt Packing.

The refinery tailings will undergo a thickening and filtering process before final disposal. The filtered tailings will be packaged in the same 2-tonne bags used for concentrate transport. These tailings bags would be returned by the same transport truck to the mine site for disposal in the leaching tailing pond.

The tailings thickening process overflow will go through an adsorption process with activated alumina columns to remove excess fluoride from the water. Treated water will be re-circulated back to the refinery after further treatment by reverse osmosis.

Figure 18.1 – Beneficiation Process Flow Sheet





## 18.3 Tailings Management

### 18.3.1 Introduction

Due to their characteristics, the tailings will be managed in two (2) separate tailings ponds. The first pond will receive the residue from the flotation process which will produce more than 95% of the tailings. Results of analysis of total metal content and leaching tests conducted on the mineral show that tailings generated in the flotation process are considered low risk. The second pond will receive the residue from the refinery, which represents less than 5% of the tailings. Because of the type of process, the chemicals used and the expected quantities of fluorine associated with the process, the residue produced at the refinery (leaching stage) are considered as higher risk. However, it is to be noted that only mineral sample has been characterized at this point. Thorough environmental characterization of both types of tailings will need to be confirmed to validate the method of tailings management.

### 18.3.2 Flotation Tailings

The storage capacity required for the tailings from the flotation is estimated at 26 Mt (1 M t/y over 26 years). Considering that the volumetric density of dry residue in the pond is 1.4, this represents a volume of about 19 Mm<sup>3</sup>.

Three (3) possible alternatives for the construction of the tailings pond were identified and compared on the basis of environmental, technical and economic criteria (see Figure 18.3).

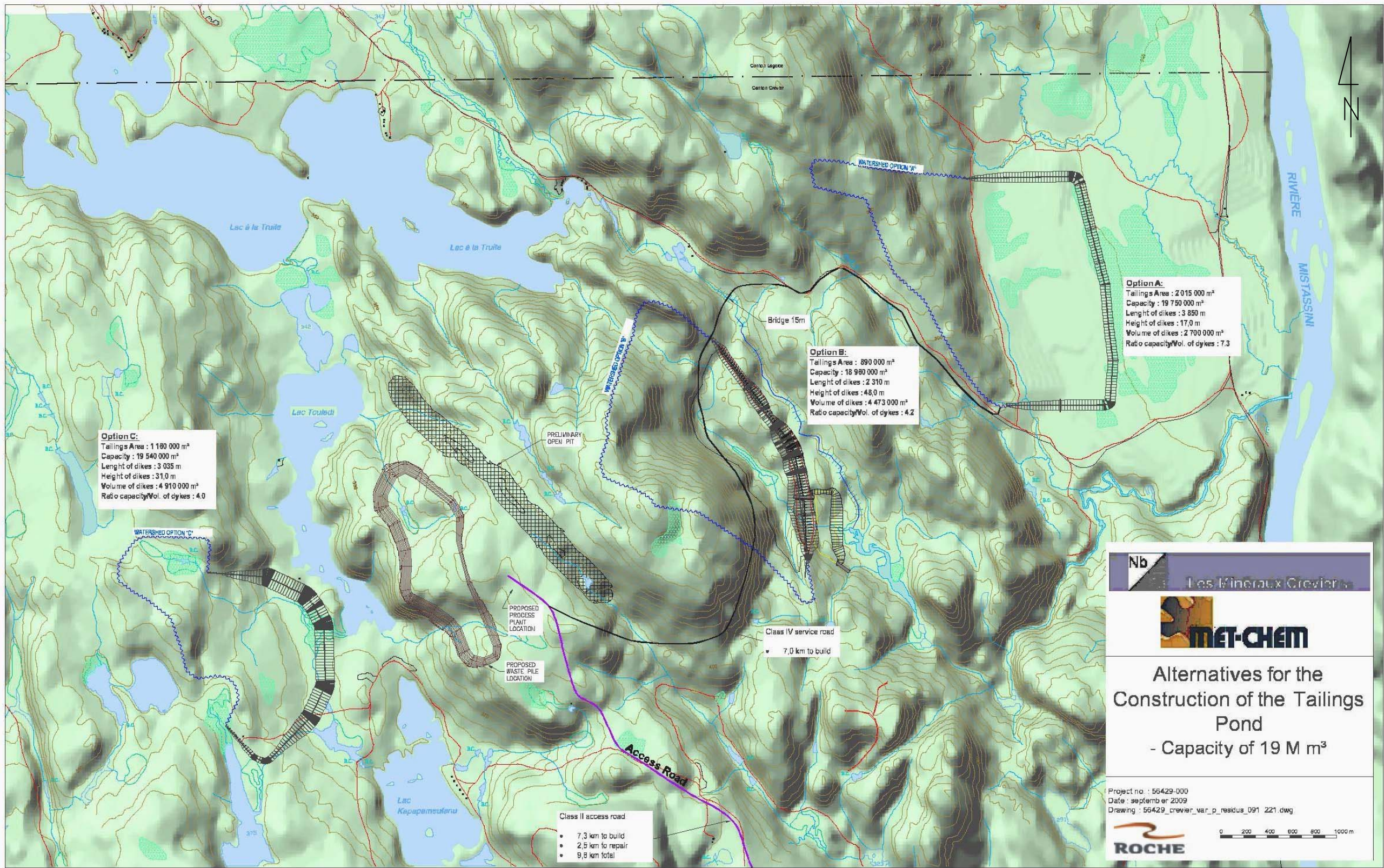
Although Alternative A is the farthest from the concentrator, it has been chosen because its topography is more favourable to the development of a tailings pond. Indeed, the volume of material needed for the construction of the dikes is much lower than for other variants. The height of the dikes is also much lower. The geotechnical characteristics of the tailings will need to be determined to confirm their potential use as building material before the potentially lower cost upstream dyke construction method can be chosen.

### 18.3.3 Leaching Tailings

The tailings from the leaching process will be stored in a separate cell that will meet the Level B criteria of *Directive 019*. The bottom and sides of the tailings pond will be protected by the superposition of two (2) synthetic waterproofing membranes. Tailings from the leach process will not be used as building material for the dikes. Considering a rate of tailings production of about 30,000 t/y and a mine life of 26 years this represents 780,000 t or a volume of approximately 625,000 m<sup>3</sup>.



Figure 18.3 – Alternatives for the Construction of the Tailings Pond





## 18.4 Infrastructure and Services

### 18.4.1 Access Road

Two (2) access road options, one reaching the site from the North (Option A) and one reaching the site from the South (Option B), were analyzed for the Crevier Property.

The access from the South (Option B) was selected for the Project. The Class II access road will be built starting at km 30 from the end of pavement on Route R0206, opening an access to the site from the South, by way of 2.5 kilometers of road upgrading and 7.3 kilometers of road building. Some class IV roads exist but need to be upgraded or rebuilt.

Figure 18.4 locates the two (2) options considered.

### 18.4.2 Power Line

The solution for the mine's electrical supply was first studied by Hydro-Quebec in 2003. This study was later updated in October 2009 with an Exploratory Study from Hydro-Quebec. This study is based on a transmission line from Normandin substation about 90 km from the site. Costs were evaluated at the time at \$ 88 M but include refection costs to the substations as well as maintenance costs.

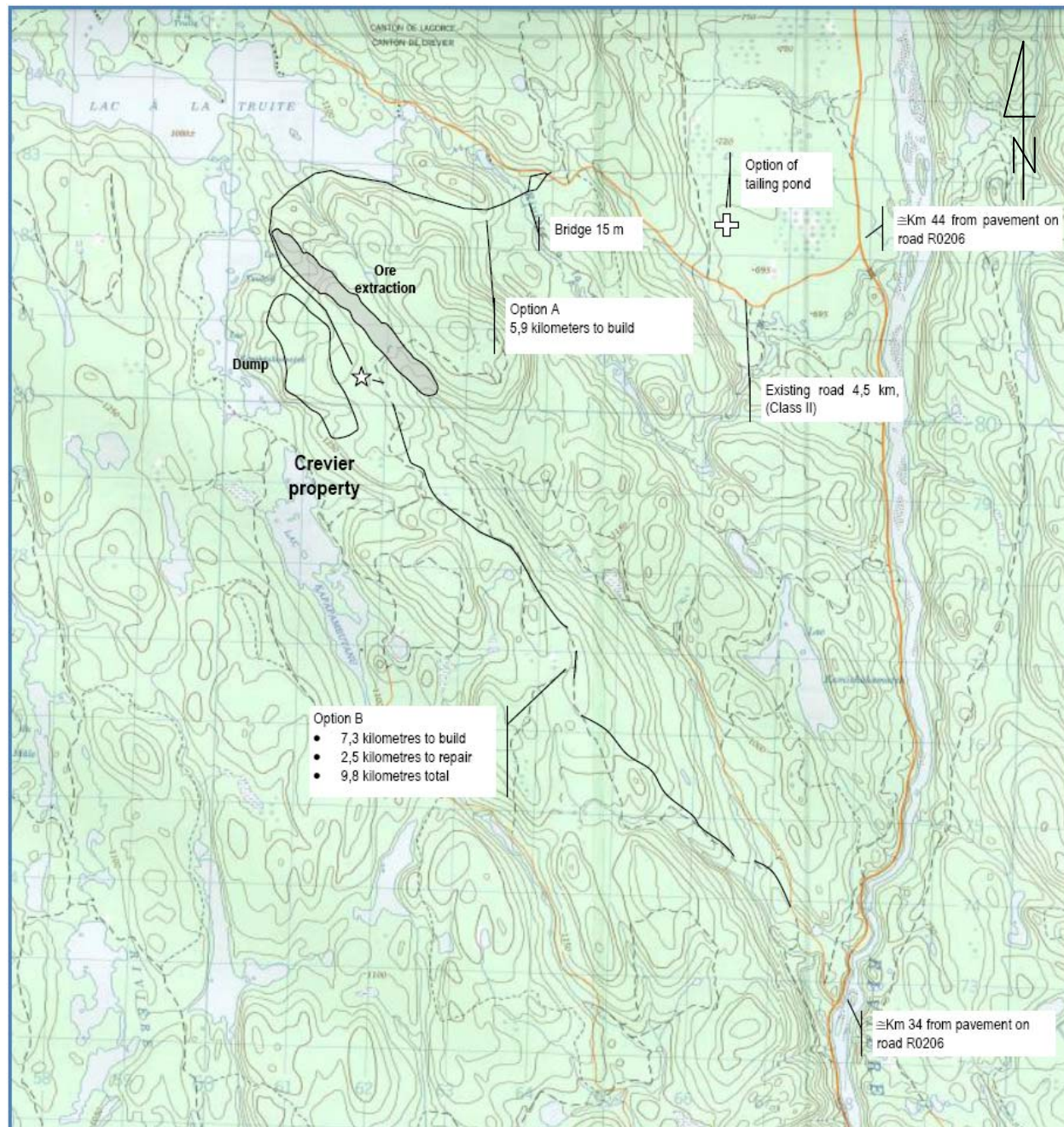
This Exploratory Study is expected to be revised by Hydro-Quebec for spring 2010 with a more complete Planning Study. In the mean time, the cost of the transmission line (\$45 M) used in the present Project was estimated using Met-Chem's in-house database.

Since the Hydro-Québec study is not yet available, Hydro-Québec L rate for power was used in this Project. Based on this rate, the unit power consumption cost for the Project is estimated at: \$0.04318/kWh.

Because the construction of the 161 kV line is a high cost and long delivery item, discussions should be held with Hydro-Québec (i.e. regarding the voltage level, the costs related to the construction and so on) early in the next phase of the Project.



Figure 18.4 – Options of Access to Crevier Property



### 18.4.3 Main Substation and Power Distribution

The estimated power demand is 11 MVA (10.5 MW at 95% power factor).

The substation is a standard outdoor design estimated at \$3.1 M with:

- One Main Disconnect Switch;
- One Metering Point;
- Two (2) branches, each with a breaker and a transformer 7.5/10 MVA (161 kV/ 4.16 kV).

The two (2) transformers are connected to a 4.16 kV Switchgear with the possibility to be tied. The main loads are generally supplied, using MV-MCC, at 4.16 kV (i.e. Ball Mill, Rod Mill) and the other loads are supplied at 600 V, via LV-MCC.

Because each transformer has the possibly to increase its capacity from 7.5 MVA to 10 MVA with the addition of cooling fans in an emergency mode, the total load could be feed by only one transformer.

However, the voltage drop (sags re. dips) when starting the mills should be considered.

### 18.4.4 Site Roads

The Class IV service road to the tailings pond will closely follow the pipeline, except for very short sections.

Since this road is expected to be used for the pipeline construction, a 70-ton bridge will be required.

### 18.4.5 Buildings

No campsite accommodation is required for the Project.

Provision has been made for an office building and gatehouse based on requirements for office space for a staff of twelve (12) people, meeting rooms, locker room, washroom with shower and kitchen and eating area. A water well and a septic system are also included.

Provision has been made for an assay laboratory equipped to conduct continuous tests at a rate of a few kilograms per hour on the concentrator's raw material and finished product.

Three (3) warehouses will be required, two (2) for storage of chemical materials and one (1) for equipment and spare part storage.

The garage will have four (4) maintenance bays and will contain the necessary equipment, tools and accessories to maintain and repair 50-ton mining trucks and other mobile equipment such as loaders, lift trucks and pickups. It will be equipped with:

- Two (2) 15-t overhead cranes;
- One 5-t overhead crane;

- One 3-t overhead crane;
- One hydraulic lift for light vehicles;
- One water treatment system for the washing bay.

#### 18.4.6 Telecommunication

It is proposed to install a satellite antenna at the mine to cover requirements for telephone communication and internet access.

#### 18.4.7 Water Supply

In order to meet the concentrator's process water requirement estimated at 20 m<sup>3</sup>/h, it is proposed to install a pumping station near Lake Kapapameutanu. Some design parameters such as elevations, length were assumed based on available topographic map for this preliminary evaluation.

The pumping station enclosed in a 5 m by 5 m building will be comprised of a 200-mm pipeline preceded by a strainer resting at the bottom of the lake on a concrete slab and two (2) submersible pumps (one operating and one stand-by).

The water supply line between the pumping station and the concentrator will be a 100-mm PVC DR-14 pipeline with a length of 1,100 meters. A purging manhole has been planned along its routing.

#### 18.4.8 Water Services

The domestic water will be provided by a pumping station at Lake Kapapameutanu. The water quality is assumed to be adequate for human use such as showers and toilets. This will be verified at the next stage of the Project.

Bottled potable water will be provided to specific areas and included in the operating cost.

#### 18.4.9 Domestic Waste Water Treatment

Provision for a domestic wastewater treatment system is made for the Project. It is based on the assumption that 150 employees will use the facilities and that no meals are prepared on site. It will be composed of a septic tank and infiltration bed using soil as the purifying element providing fine sandy soil is available for treatment on site. It consists of parallel trenches in which the wastewater to be treated percolates into the ground. Perforated rigid pipes installed in the trenches allow the wastewater distribution into the ground.

#### 18.4.10 Fuel Storage

Fuel storage will consist of two (2) large diesel tanks each able to contain one week of consumption (capacity of 20,000 imperial gallons or 90,900 L) and one small gasoline tank for the needs of light vehicles (capacity of 1,000 imperial gallons or 4,500 L). The tanks are double-skinned, out-of-ground horizontal cylinders with conic ends. They come complete with NPT taps, service vent, level indicator, lifting lugs, ground anchorages,

nameplate and epoxy paint exterior finish. Their design and fabrication complies with Standard ULC-S601.

The fuel storage system also includes a supply station for both products, consisting of a pump, hose, fittings, valves and fuelling gun. Ground contamination from spills and leaks will be prevented via a concrete containment basin fitted with an oil separator. The fuel storage system will be protected with a fence and bollards. A light post will be installed to allow night operation.

## **18.5 Environmental Considerations**

### **18.5.1 Environmental Context**

The mining property is located in the watershed of *Lac-à-la-Truite*, which is part of the catchment area of the Mistassini River.

According to information obtained from the Department of Natural Resources and Wildlife (MRNF) and the Ministry of Sustainable Development, Environment and Parks (MDDEP), no mention of plants threatened, vulnerable or likely to be so designated is reported for the area covered by the Project. No exceptional forest ecosystem is listed in the study area.

As for wildlife issues, to this date, no portion of the study area is included in the Registry of Protected Areas established under Section 5 of the Act on conservation of natural heritage. Furthermore, no land is currently under study at MDDEP to grant it a status under this Act. Within the boundaries of the study area, no wildlife habitats, mapped according to the regulations, is currently protected except for the fish habitat that consists of all the lakes, marshes, swamps, floodplains or streams where there are fish. Moreover, there is no mention of wildlife species threatened, vulnerable or likely to be so designated reported for the area covered by the Project. The nearest reference is located more than 8 km away from the study area.

Regarding land use, in addition to forestry activities, the area under study is particularly used for vacation and for hunting and fishing while the Mistassini River is used for various recreational activities including canoe-camping.

### **18.5.2 Environmental Authorization Process**

#### **Federal Government**

The federal environmental review procedures are dealt with the Act to establish a federal environmental assessment process (1992, C. 37).

The application of the federal procedure is required under certain conditions. The only condition that could be applied for this Project is related to federal authority's requirement of issuing permits, licenses or approvals as per various federal acts or regulations. The Fisheries Act is one judicial element that could be a trigger.



However, a review of topographic maps and aerial photographs suggests that the infrastructure required by the Crevier Project could be built without any watercourse being directly affected. Consequently, the federal procedure does not apply to the Project.

### Provincial Government

The rate of mineral mining and processing proposed for the Crevier Project is less than the current threshold for submission to the Environmental Impact Assessment and Review Regulation (7,000 t/d) and less than the proposed new threshold published in the Quebec Mineral Strategy, released June 29, 2009 (3,000 t/d); therefore an evaluation study and review of environmental impacts will not be required.

However, as per Article 22 of the Environment Quality Act, an application for a certificate of approval will be prepared and submitted to the Saguenay-Lac-Saint-Jean Regional bureau of the Department of Sustainable Development, Environment and Parks (MDDEP). This application must be accompanied by an environmental assessment sufficiently detailed and meeting the requirements of *Directive 019* of the mining industry so that the MDDEP can rule on the acceptability of the Project.

Even though, this type of approval process does not require public hearings, as it is the case when an environmental impact study is undertaken, it is strongly recommended to hold briefings with the local population, Innu community of Mashteuiatsh and local environmental groups.

In addition to the Certificate of Approval for the Project, other specific authorizations which can be requested in parallel or following application to the certificate will be needed from MDDEP and the Department of Natural Resources and Wildlife (MRNF). Note that these other applications will not affect the critical timing of the Project.

#### 18.5.3 Mineral and Waste Rock Characterization

In order to characterize the waste rock and mineral that will be produced by mining activities three (3) rock samples (2 waste rock and one mineral) representative of waste rock and mineral to be mined were tested.

All samples underwent tests for acid-generating potential analysis for total (environmental) metal content, leaching test and radioactivity.

Results regarding acid-generating potential indicate that the waste rock and the mineral samples analyzed are not considered generators of acid mine drainage.

Results regarding total metal content indicate that the three (3) samples present values inferior to criteria A of the Soil Protection and Rehabilitation of Contaminated Sites Policy for all the parameters analyzed. Thus, according to *Directive 019*, waste rock and mineral are considered low-risk.

Results regarding leaching tests performed on the three (3) samples indicate that only cadmium (2 out of 3 samples), lead (3 out of 3 samples) and zinc (3 out of 3 samples)

exceeded the criteria of resurgence in the surface waters of the Soil Protection and Contaminated Land rehabilitation Policy.

Results regarding radioactivity, with tests performed on uranium (total content and leachate) as well as radium-226 and thorium-230 indicate very low values for these elements, often below the limits of analytical equipment. Based on these results, radioactive elements should not be an issue in the context of this Project.

#### 18.5.4 Environmental Management Plan

Preliminary mitigation measures, highlighted in the Report, have been identified for the following Project activities:

- Management of overburden for protection against erosion;
- Management of waste rock;
- Tailings management;
- Water management.

#### 18.5.5 Rehabilitation Program

As per the Mining Act (L.R.Q., C. M-13.1), the land rehabilitation and restoration work of mining activities must be planned and approved by the MRNF (Department of Natural Resources and Wildlife). A rehabilitation and restoration plan will need to be prepared and submitted to the Minister for approval before commencing mining activities.

#### 18.5.6 First Nation Issues

The mining property is located in the traditional ancestral territory (Nitassinan) of Pekuakamiulnuatsh (*Montagnais du Lac-Saint-Jean*). The area is the subject of land claims by the First Nation of Mashteuiatsh.

In March 2004, the First Nations of Mamuitun – representing Mashteuiatsh, Betsiamites and Essipit – and the First Nation of Nutashkuan, Canada and Quebec signed the Agreement-in-principle of general nature<sup>1</sup>. The Agreement-in-principle includes several references to the exploitation of natural resources, including minerals, but it does not provide for payment of additional royalties (i.e., other than those already paid to the Government of Quebec). Instead, the Innu tshishe utshimaut, the future Innu governments, will be entitled to a share (no less than 3%) of the royalties collected by Quebec on the natural resources of Nitassinan.

Regarding Innu land use, the mining property is located in the Roberval beaver reserve. In a later phase, contacts should be established to identify the Innu families managing the territory corresponding to the mining property.

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<sup>1</sup> English translation of the French version of the Agreement known as « *Entente de principe d'ordre général entre les Premières Nations de Mamuitun et de Nutashkuan et le Gouvernement du Québec et le Gouvernement du Canada* » (EdPOG, 2004).

## 18.6 Project Schedule

A Project Summary Schedule was developed for the Project. The Schedule (Figure 18.5) is divided in three (3) sections:

- Studies;
- Beneficiation Area;
- Refinery, Precipitation and Packing Area.

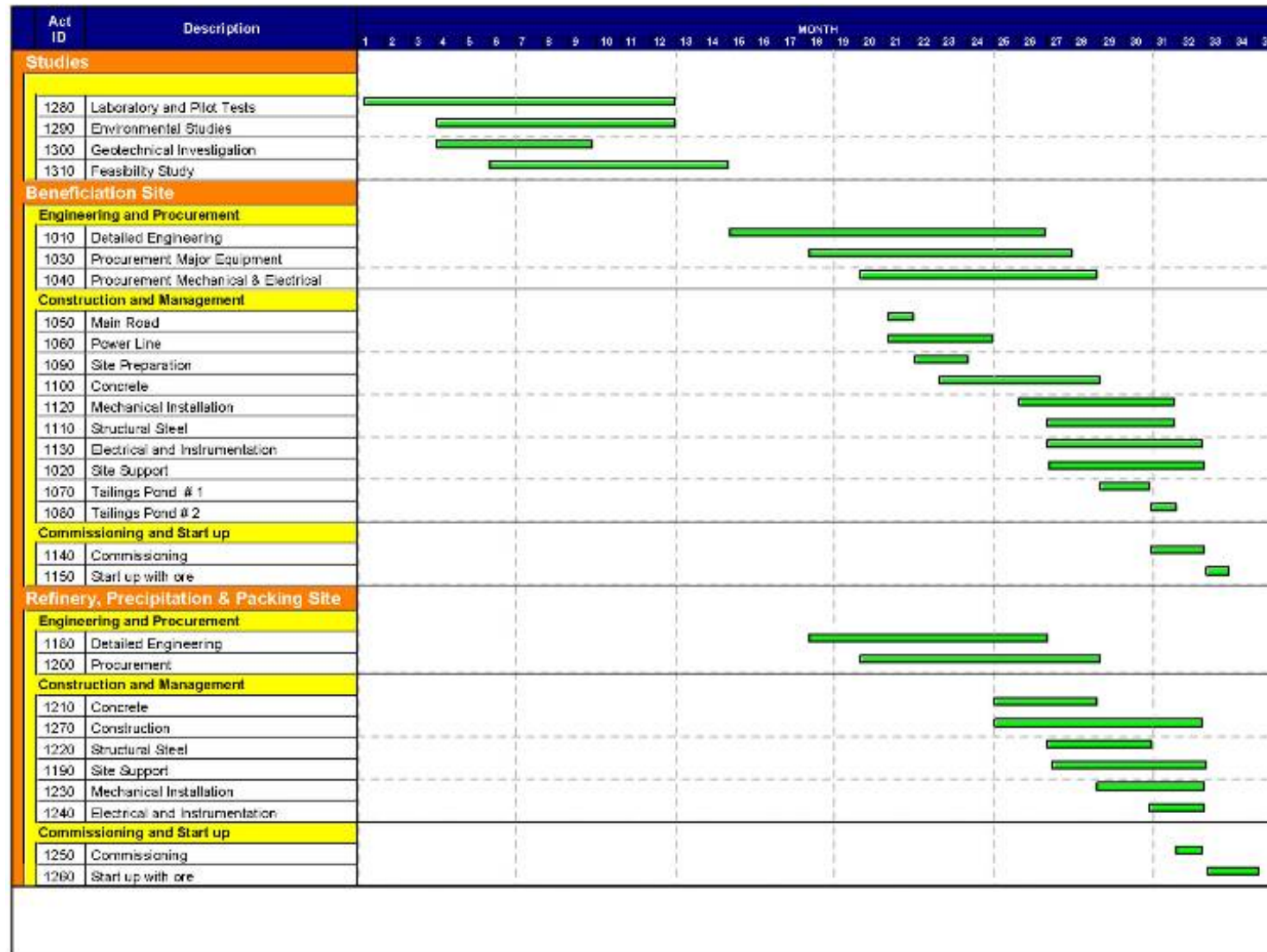
The studies included the metallurgical test work, the environmental studies and the geotechnical investigation, that should be done prior to the Feasibility Study.

The Beneficiation Area section includes the EPCM activities to be able to produce the concentrate. The detailed engineering will be done in twelve (12) months, the procurement in eleven (11) months, the construction in twelve (12) months, two (2) months for commissioning and one (1) month for the start-up.

The Refinery, Precipitation and Packing Area includes the EPCM activities to be able to produce the niobium oxide and the tantalum K-salt. The detailed engineering will be done in nine (9) months, the procurement in nine (9) months, the construction in eight (8) months, one (1) month for commissioning and two (2) months for the start-up.



Figure 18.5 – Project Schedule



## 18.7 Capital Cost Estimate

### 18.7.1 Capital Cost Summary

The capital cost estimate that covers the Project for niobium and tantalum production includes the work required to develop the mine, construct the mineral processing facilities and establish all the site and off-site infrastructure and services necessary to support the mine site. The estimate is based on Met-Chem's standard methods applicable for a scoping study to achieve an accuracy level of  $\pm 35\%$ . The base date for the cost estimate is the third quarter of 2009.

The initial capital cost for the scope of work is \$267.1 M of which \$185.1 M is direct cost and \$82.0 M is indirect cost. The costs are summarized in Table 18.4.

**Table 18.4 – Summary of Cost Estimate**

Item Description	\$ Total Initial
<b>Total Project Capital Cost</b>	<b>267,149,714</b>
<b>Direct Costs</b>	<b>185,113,199</b>
<b>Mining</b>	<b>15,124,900</b>
Open Pit Mining	15,124,900
<b>Process</b>	<b>100,568,790</b>
Crushing and grinding	25,301,761
Flotation	40,850,447
Refinery	28,016,582
Process Mobile Equipment	2,400,000
Design Allowance	4,000,000
<b>Tailings &amp; Waste Rock Disposal &amp; Reclaim Water</b>	<b>5,731,000</b>
Tailings	5,731,000
<b>Infrastructure &amp; Services</b>	<b>15,590,308</b>
Telecommunications	26,200
Off-Site Infrastructure	1,677,000
Site Infrastructure	12,819,808
Services	1,067,300
<b>Power Supply</b>	<b>48,098,200</b>
Power Line	45,000,000
Site Power Distribution - Substation	3,098,200

Item Description	\$ Total Initial
<b>Indirect Costs</b>	<b>82,036,515</b>
Subtotal Indirect for Project Development	9,679,000
Subtotal Indirect for Area 10 - Mining	3,526,000
Subtotal Indirect for Area 20 - Process	36,962,000
Subtotal Indirect for Area 30 - Tailings	2,235,000
Subtotal Indirect for Area 40 - Infrastructure	5,164,000
Subtotal Indirect for Area 50 - Power Supply	10,363,000
Subtotal Indirect Other owner's costs	14,107,000

### 18.7.2 Basis of the Estimate

Budget prices were established for major process equipment based on technical descriptions from qualified suppliers for more than 30% of the process equipment value, while the remaining equipment was estimated from a database from similar recent projects or in-house estimation.

Major mining equipment was sized using the mine production parameters and budget prices were obtained from a qualified supplier. Costs from recent similar projects were used for other equipment.

Quantities for civil work were calculated from the preliminary site plan and buildings layout. Budget unit prices for the civil and buildings work were established from recent similar projects.

Process piping, electrical and instrumentation costs were established as a factor on delivered process equipment based on recent similar projects.

### 18.7.3 Indirect Costs Summary

Provision has been made for indirect costs related to Project development, Project implementation, contingencies, financial costs and closure costs.

## 18.8 Operating Cost Estimate

### 18.8.1 Process

The estimated annual operating costs for the mill and refinery are summarized in Table 18.5. Operating costs are subdivided in manpower, electrical power, reagents and consumables. These costs were derived from supplier information, Met-Chem's database or factored from similar operations. Electrical power is required for equipment and services in the mill and refinery. The unit cost of electricity was established at \$0.043/kWh.

**Table 18.5 – Summary of Estimated Annual Process Plant Operating Costs**

Description	Mill Operation		Refinery Operation		Total Operation	
	\$/y	\$/t	\$/y	\$/t	\$/y	\$/t
Manpower	4,230,000	4.23	1,334,250	1.33	5,564,250	5.56
Electrical power	1,814,000	1.81	363,000	0.36	2,177,000	2.18
Grinding media	1,138,500	1.14	0	0.00	1,138,500	1.14
Steel liners	300,000	0.30	0	0.00	300,000	0.30
Reagents & Chemicals	4,760,743	4.76	13,329,867	13.33	18,090,610	18.09
Maintenance Supplies	1,050,000	1.05	675,000	0.68	1,725,000	1.73
<b>Total Operating Cost</b>	<b>13,293,243</b>	<b>13.29</b>	<b>15,702,117</b>	<b>15.70</b>	<b>28,995,360</b>	<b>29.00</b>

### 18.8.2 General and Administration

The general and administration costs for the Project are estimated at \$3.2 M/y of operation and include costs for manpower as well as costs for material and services.

### 18.8.3 Mine Operating Costs

Mine operating costs (Table 18.6) were established by Met-Chem for mineral mining, as well as overburden and waste removal. These costs were estimated based on information provided by suppliers and on manpower rate provided by the client. Explosives unit costs were provided by an explosives supplier and diesel fuel costs were established at \$1.00/l.

**Table 18.6 – Average Yearly and Unit Rate Costs**

Total Operating Costs			Operating Costs - Waste Rock		
	\$/y	\$/t		\$/y	\$/t
<b>Variable Costs</b>			<b>Variable Costs</b>		
Drilling & Blasting	7,007,473	0.43	Drilling & Blasting	6,072,901	0.44
Loading	2,250,828	0.14	Loading	1,795,731	0.13
Hauling	14,316,941	0.87	Hauling	12,050,226	0.88
Roads & Dumps	6,221,648	0.38	Roads & Dumps	5,181,221	0.38
<b>Fixed Costs</b>			<b>Fixed Costs</b>		
Operations Staff	1,269,520	0.08	Operations Staff	1,063,313	0.08
Engineering	1,575,862	0.10	Engineering	1,317,294	0.10
Maintenance	6,494,582	0.40	Maintenance	5,439,317	0.40
<b>Total Operating Cost</b>	<b>39,136,853</b>	<b>2.39</b>	<b>Total Operating Cost</b>	<b>32,920,003</b>	<b>2.39</b>
<b>Operating Costs - Overburden</b>			<b>Operating Costs - Mineral</b>		
	\$/y	\$/t		\$/y	\$/t
<b>Variable Costs</b>			<b>Variable Costs</b>		
Drilling & Blasting	n/a	n/a	Drilling & Blasting	934,572	0.44
Loading	115,923	0.15	Loading	383,580	0.18
Hauling	749,467	0.94	Hauling	1,800,743	0.85
Roads & Dumps	388,210	0.49	Roads & Dumps	810,110	0.38
<b>Fixed Costs</b>			<b>Fixed Costs</b>		
Operations Staff	54,280	0.07	Operations Staff	171,666	0.08
Engineering	72,981	0.09	Engineering	212,790	0.10
Maintenance	301,434	0.38	Maintenance	866,373	0.41
<b>Total Operating Cost</b>	<b>1,682,295</b>	<b>2.12</b>	<b>Total Operating Cost</b>	<b>5,179,833</b>	<b>2.44</b>

## 18.9 Cash Flow Analysis

A pre-tax Project cash flow analysis has been completed for the Crevier Scoping Project based on a production rate of 2,740 tpd.

A cash flow model was developed and a cash flow statement prepared for the life of the Project. The model reflects fourth quarter 2009 pricing.

### 18.9.1 Base Case Scenario

#### Economic Assumptions

The following assumptions have been used in the preparation of this simplified cash flow model of the Base Case:

- The exchange rate was established by Met-Chem at 0.90 CAD/USD;
- A discount rate of 5% for the computation of the Net Present Value (NPV) was used;
- All the remaining cost (Direct and Indirect) prior to production was considered and was included in the year proceeding the first production year.

The product sales prices were proposed by Crevier based on an internal market study which was not reviewed by Met-Chem. A sales price of US\$150.00/kg was used for  $K_2TaF_7$  and two (2) sales prices were used for  $Nb_2O_5$  in the cash flow analysis: US\$44.00/kg and US\$51.50/kg. The cash flow analysis was first performed on a current sales price of US\$44.00/kg. It was then decided to increase it to a forecasted sales price of US\$51.50/kg.

This cash flow analysis makes no provision for taxation.

#### Technical Assumptions

Table 18.7 lists the principal technical assumptions used in the base case. The initial capital cost for the Project is evaluated at \$267 M.

**Table 18.7 – Technical Assumptions**

Total mineral mined (LOM)	000' t	25,838
Average grade to mill $Nb_2O_5$	%	0.170
Average grade to mill $Ta_2O_5$	ppm	180.5
Processing Rate	t/d	2,740
Flotation Recovery	%	70
Refinery Recovery	%	96
Recoverable product $Nb_2O_5$	000' kg	29,462
Recoverable product $K_2TaF_7$	000' kg	3,134

The operating costs are identified as follows:

- Mining Cost Mineral: \$2.44/t;
- Mining Cost Waste: \$2.39/t;
- Mining Cost Overburden: \$2.12/t;
- Process Cost (including refinery): \$29.00/t;
- General and Administration Cost: \$3.40/t;
- Environmental Cost: \$0.50/t.

The initial capital is scheduled to be disbursed during the 33 months prior to the start of production for Pre-Feasibility Studies, Feasibility Studies and Construction/Pre-Production with the majority of the initial capital being disbursed at the onset of construction. It is expected that purchasing of long lead items will occur at the beginning of the construction period or one year before start-up.

### Results and Sensitivity Analysis

The NPV at a 5% discount rate and the Internal Rate of Return (IRR) for the Base Case (70% flotation recovery and 96% refinery recovery) were calculated from the cash flow statement. The economic analysis indicates a positive NPV at a 5% discount rate of \$103.8 M and an IRR of 7.7% for the Base Case identified with a sales price of US\$51.50 and an initial capital cost that includes the construction cost of the power line.

The Project sensitivity was first evaluated for:

- The impact of the power line (\$45 M);
- The variation of the niobium oxide selling price (US\$44.00 versus US\$51.50);
- The increase in production after five (5) years by 5 and 10%.

The results are shown in Table 18.8. This table indicates that the cost of the power line and a lower sales price have the most negative impact on the NPV and IRR while increasing the production rate slightly improved the economics of the Project.

*The PEA is preliminary in nature and it includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the conclusions reached in the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.*

**Table 18.8 – NPV Sensitivity (Base Case)**

	<b>Nb<sub>2</sub>O<sub>5</sub> @ US\$44.00</b>		<b>Nb<sub>2</sub>O<sub>5</sub> @ US\$51.50</b>	
	NPV @ 5% CAD	IRR	NPV @ 5% CAD	IRR
<b>Base</b>				
Without Power line	21,802,938 \$	5.7%	146,662,511 \$	9.4%
With Power line	(21,054,204 \$)	4.4%	103,805,368 \$	7.7%
<b>Tonnage increase by 5% after year 5</b>				
Without Power line	29,585,481 \$	5.9%	156,605,366 \$	9.8%
With Power line	(13,271,662 \$)	4.6%	113,748,223 \$	8.0%
<b>Tonnage increase by 10% after year 5</b>				
Without Power line	34,616,336 \$	6.1%	163,361,245 \$	10.0%
With Power line	(8,240,807 \$)	4.8%	120,504,102 \$	8.3%

### 18.9.2 Production Rate Scenarios

Efforts have been made to identify additional scenarios to improve the economics of the Project. Three (3) additional scenarios to the Base Case (niobium oxide selling price of US\$51.50 and power line cost included) were added to the analysis based on increased production rates of 3,500 t/d, 4,000 t/d and 4,500 t/d.

Capital and operating costs were factorized for the different production rates and used to develop corresponding cash flows. These data should be used only to have an order of magnitude. An amount corresponding to \$ 1.0 M was added to the production rate scenarios Indirect Costs, to cover the cost of an Environmental Impact Assessment that is expected to be required for these cases.

In addition to the production rates, an additional scenario was produced on the basis of an increased flotation recovery to 72%.

### Results

Results based on the production rate scenarios are presented in Table 18.9.

The results at a flotation recovery of 70% indicate that the Base Case at a NPV of \$103.8 M may not be an optimized scenario. As shown in the table, for an additional 10% of capital cost, the NPV is almost doubled at the 3,500 t/d scenario. The 4,000 t/d scenario indicates that for an additional \$15 M in capital investment the gain on the NPV is an additional \$30 M.

As shown in the Table 18.9, a flotation recovery of 72% increases the IRR by approximately one point.



The economic analysis indicates a positive NPV at a 5% discount rate of \$233.5 M and an IRR of 12.7% based on a flotation recovery of 70% and a production rate of 4,000 t/d while the NPV and IRR increase to \$271.9 M and 13.9% for a flotation recovery of 72% and the same production rate.

**Table 18.9 – NPV Sensitivity (Production Rates Scenarios)**

	CAPEX	OPEX \$/t	Nb <sub>2</sub> O <sub>5</sub> @ US\$51.50		Nb <sub>2</sub> O <sub>5</sub> @ US\$51.50	
	CAD	CAD	Flotation Recovery 70%		Flotation Recovery 72%	
			NPV @ 5% CAD	IRR	NPV @ 5% CAD	IRR
Base Case	267,149,714 \$	39.85 \$	103,805,368 \$	7.7%	135,997,984 \$	8.5%
Production rate: 3,500 t/d	290,212,263 \$	38.25 \$	197,685,693 \$	11.2%	234,119,827 \$	12.3%
Production rate: 4,000 t/d	305,649,961 \$	37.08 \$	233,451,170 \$	12.7%	271,907,681 \$	13.9%
Production rate: 4,500 t/d	322,234,345 \$	36.16 \$	265,861,839 \$	14.1%	305,989,173 \$	15.4%

## 19.0 INTERPRETATION AND CONCLUSIONS

The objective of the study was to estimate at  $\pm 35\%$  the capital and operating costs and the profitability of the Project.

The property contains the Crevier Pegmatitic Nepheline Syenite deposits explored and evaluated by SOQUEM and Cambior from 1976 to 2002. The property is located north of Lac St-Jean. The Crevier Carbonatite intrusive complex was put in place inside the gneisses of the Granulites Centrales (CGT) of the Grenville province.

Previous owners SOQUEM and CAMBIOR (now IAMGOLD) conducted various work programs including: geophysics, prospecting, mapping, grab and channel surface sampling, diamond drilling, bulk sampling, metallurgical testing, resource estimation and feasibility studies on the Syenite Porphyry Pegmatitic Dyke bearing niobium and tantalum on the property up to 2002 before selling it to Crevier Minerals in 2008.

A total of 105 diamond drill holes were completed by previous owners respectively; 72 by SOQUEM and 33 by Cambior. The holes were spaced approximately 50 meters apart on section with 100 to 300 meters between sections. These holes were sampled generally on 1.5 meter intervals. Assays were completed for oxides and particularly  $\text{Nb}_2\text{O}_5$  and  $\text{Ta}_2\text{O}_5$  from pulverized rock samples from half drill core. Results show that niobium grade varies along strike from south to north of the exploration grid, the grid North being oriented North  $321^\circ$ . The generally higher niobium grades are observed in the southern part and lowering in the northern direction but with increasing dyke horizontal width. SGS geostatistical analysis has highlighted a continuity axis striking north and dipping  $45^\circ$  that will need to be confirmed in the next phase of work. The tantalum is within niobium pyrochlore mineral grain in a ratio of 1 to 10.

Metallurgical testwork completed by SOQUEM and CAMBIOR demonstrates that a niobium (pyrochlore) concentrate can be produced by a combination of standard industrial processes or treatment.

### 19.1 Sampling Method and Approach

Independent sampling by SGS Geostat has lead to the resource estimation using the two (2) different sources of historical data for the same sector; the results have shown a significant difference that needs to be further investigated by new drilling should the client want to use the SOQUEM data without corrections. In a conservative approach, SGS Geostat has capped the outliers in the original database. From studies done during this evaluation SGS Geostat has reduced the  $\text{Nb}_2\text{O}_5$  grades by 19% and the  $\text{Ta}_2\text{O}_5$  grades by 13% for all the SOQUEM composites used for the estimation.

### 19.2 Data Verification

It is important to mention that two commercial laboratories, SGS Lakefield and ALS Chemex were used and they both reproduced the result from one Cambior hole mineralized intersection data (mainly Actlab) while they have shown a lower average

grade for one of the SOQUEM mineralized intersection data. A third laboratory, IAMGOLD Niobec mine facility laboratory, has shown similar results as the SOQUEM campaign and has shown higher average grade for the Cambior hole. According to those results a second phase of independent sampling of old witness core was done and results confirm the bias of SOQUEM data.

### 19.3 Mineral Resource Estimate

SGS Geostat completed a Mineral Resource estimate for the property using all the historical data with corrected SOQUEM diamond drill hole grades (Drill hole name series 10-745-xxx). The following table presents the May 25, 2009 current 43-101 compliant estimate:

**Table 19.1** – Official Final Classified Resource Statement for the Three (3) Zones

<b>Indicated</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	30,940,000	0.168	183
<b>Inferred</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	28,850,000	0.122	166

**Table 19.2** – Mineral Resources within Crevier Mineral Deposit  
with cut-off at 0.1% Nb<sub>2</sub>O<sub>5</sub>

<b>Indicated</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	25,750,000	0.186	199
<b>Inferred</b>			
Zone	Tonnage (metric tons)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)
All (3)	16,880,000	0.162	204

Notes:

Nb<sub>2</sub>O<sub>5</sub> capped at 0.5%

Ta<sub>2</sub>O<sub>5</sub> in ppm capped at 550

SG: 2.63

SOQUEM composites corrected

### 19.4 Mining Operations

The risks associated with the development and operation of the open pit mine are mainly directed towards the reliability of the geological model and towards the confirmation of the maximum slope angles used in the mine design.

Opportunities for improving the mine operation and reducing costs can be expected if results of future geotechnical studies allow the increase of the selected 55° maximum slope angle of the pit walls. Conversion of inferred resources to indicated resources for near-surface resources at the pit extensions will likely improve mine economics by reducing stripping requirements.

Detailed mine planning efforts may also enable engineers to identify areas where low grade mineral (below economic cut-off) may be separated from richer mineral thus increasing the average grade. It was not possible at the level of this study.

Another area where improvements are possible would be to optimize mine planning and include in-pit waste dumping early in the mine operation.

## **19.5 Mineral Processing**

The current mandate was to develop a process flow sheet based on SGS Lakefield flow blocks. The current flow sheet and design criteria are based primarily on the test work reports from SGS Lakefield and the operating experience of Met-Chem personnel.

The grinding and beneficiation flow sheet was developed from the SGS Lakefield report written in 2003. SGS Lakefield reviewed the test work in 2008 and arrived with the same flow sheet. The leaching, solvent extraction, stripping and precipitation flow sheet was determined by examining the SGS Lakefield reports from 2001 and 2002 related to the refining section of the process.

The main concern in the development of the process was the amount of test work done on an unconventional mineral deposit. In the 2008 report, SGS Lakefield recommended that more test work should be done to optimize the comminution, flotation and refinery processes. SGS Lakefield reported that during laboratory flotation testing there were pH control problems in the Nb-Ta rougher circuit. SGS Lakefield suspected calcite interference. Met-Chem supports SGS Lakefield recommendations that future test work should focus on minimizing potential unstable operating plant conditions.

Metallurgical test work completed by SOQUEM and Cambior, demonstrates that a niobium (pyrochlore) concentrate can be produced by a combination of standard industrial processes or treatment.

The current expected metallurgical recovery at the flotation circuit for this mineral based on laboratory test work averaged 70%. The series of tests indicate that recovery might range between 60% and 80%. The refining recovery is expected to be 96% from the concentrate yielding an overall recovery of 67.2%.

## **19.6 Tailings Management**

Due to their characteristics, the tailings will be managed in two (2) separate tailings ponds. The first pond will receive the residue from the flotation process which will produce more than 95% of the tailings. Results of analysis of total metal content and leaching tests conducted on the mineral show that tailings generated in the flotation

process are considered low risk. The second pond will receive the residue from the refinery, which represents less than 5% of the tailings. Because of the type of process, the chemicals used and the expected quantities of fluorine associated with the process, the residue produced at the refinery (leaching stage) are considered as higher risks. However, it is to be noted that only one mineral sample has been characterized at this point. Thorough environmental characterization of both types of tailings will need to be confirmed to validate the method of tailings management.

## 19.7 Cash Flow Analysis

The results at a flotation recovery of 70% indicate that the Base Case at a NPV of \$103.8 M may not be an optimized scenario. As shown on Table 18.9, for an additional 10% of capital cost, the NPV is almost doubled at the 3,500 t/d scenario. The 4,000 t/d scenario indicates that for an additional \$15 M in capital investment the gain on the NPV is an additional \$30 M.

*The PEA is preliminary in nature and it includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the conclusions reached in the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.*

## **20.0 RECOMMENDATIONS**

### **20.1 Mineral Resources**

In their 2009 report, SGS Geostat makes the following recommendations to improve the available data:

- The database should be expanded to include surface channel samples and short blast holes of the bulk sample;
- The database should also be expanded to include all the other elements which have been analyzed (Zr, U, etc.);
- Crevier should acquire the most recent high resolution satellite image;
- All geological, geographical, geophysical, property boundaries, access and surface analytical data should be integrated into a Geographical Information System.

### **20.2 Mine Design**

Regarding the mine design, the following recommendations were made:

- Include further work on revised geological model including most recent drilling results;
- Perform geotechnical studies on slope stability with the intent of increasing overall pit slopes;
- Drill near known surface extensions of the deposit that may become resources and increase mineral tonnage and decrease overall strip ratio;
- Perform detailed mine planning with the objective of delaying waste removal for the first few years of operation;
- Review mine planning to include possible in-pit waste dumps in certain portions of the pit;
- Re-assess the viability of sub-contracting mineral and waste mining in first few years of the Project to reduce CAPEX;
- Re-assess the possibility of recovering high grade areas of the bottom of the final pit using underground mining methods.

### **20.3 Processing Plant and Metallurgical Testing**

Further test work is required and should focus on capital cost reduction rather than improving process efficiency.

Test work should address such areas as:

- Slimes Removal;
- SAG Milling;
- Concentrate Magnetic Separation;
- Boiled Corn Starch;

- Sodium Peroxide;
- Solvent Extraction;
- Alternative Extraction Regimes;
- Stripping Test Work;
- Niobium Precipitation Test Work;
- Tantalum Precipitation Test Work;
- Hydrofluoric Acid Recovery;
- Design information for filtration and thickening.

## 20.4 Tailings and Water Management

Because of the type of process, the chemicals used and the expected quantities of fluorine associated with the process, the residue produced at the refinery (leaching stage) is considered as higher risk. However, it is to be noted that only mineral sample has been characterized at this point. Thorough environmental characterization of both types of tailings will need to be done to validate the method of tailings management.

In order to reduce initial construction costs, it is suggested to construct the flotation tailings storage area in stages. This will be done during years 0, 3, 5, 10, 15 and 20 of the Project. The possibility of raising the dikes of the flotation tailings pond, by the upstream construction method using flotation tailings for construction, will be evaluated in the next phase. The geotechnical characteristics of the flotation tailings should be determined to confirm or deny their potential use as building material and the selection of the upstream construction method. If the flotation tailings can be used, only the initial stage of construction would require borrowed materials. Moreover, the upstream construction method would significantly reduce the volume of dikes to build.

The leaching tailings from the leaching process will be stored in a separate cell that meets the Level B criteria of *Directive 019*. The bottom and sides of the tailings pond will be protected by the superposition of two (2) synthetic waterproofing membranes. The leaching tailings pond will be located near the concentrator so as to ensure greater oversight. It will be surrounded by dikes on all sides. In order to reduce initial construction costs, it is suggested to construct the leaching tailings by stage. This will be done during years 0, 3, 5, 10, 15 and 20 of the Project. The leaching tailings being considered a risk for the environment, they cannot be used for the construction of dams. Moreover, the upstream construction method cannot be considered to reduce the volume of the dikes.

## 20.5 Infrastructure and Services

The power line is a critical item for the Project. As the electricity is under the jurisdiction of Hydro-Quebec, and also as the construction of the 161 kV power line is a high cost a long delivery item, discussions should be held with Hydro-Quebec for the Project concerning all the electrical aspects and costs early in the next phase.



## 20.6 Future studies

The basis for the scoping study was a production rate of 2,740 tpd, however, the cash flow analysis shows that the economic rate will be more likely 4,000 tpd. A feasibility study is recommended to verify this assumption.

## 21.0 REFERENCES

SGS Geostat Ltd., Technical Report Niobium and Tantalum Resource Estimation of the Crevier Deposit North of Lac Saint-Jean, Quebec, Canada, May 25, 2009.

SGS Lakefield Research Limited, An Investigation into the Recovery of Tantalum & Niobium from Crevier Ta/Nb Ore, prepared for Cambior Inc., LR10604-001 – Progress Report No. 1, July 31, 2003.

SGS Lakefield Research Limited, An investigation into the Recovery of  $Ta_2O_5$  and  $Nb_2O_5$  from a Crevier Deposit Concentrate sample submitted by Cambior Inc., Progress Report No. 2, LR Project: 10352-002, July 26, 2002.

SGS Lakefield Research Limited, A review of the Extractive Metallurgy of Tantalum on behalf of Cambior Inc., LR Project: 10352-001 – Progress Report No. 1, November 13, 2001.

## 22.0 CERTIFICATES

## **CERTIFICATE OF AUTHOR**

To Accompany the Report entitled

“Revised Technical Report – Preliminary Economic Assessment of the Crevier Project for MDN Inc.” issue date December 23<sup>rd</sup>, 2011, with an effective date as January 28<sup>th</sup>, 2010.

I, Céline M. Charbonneau, Eng., do hereby certify that:

- 1) I am Project Manager with Met-Chem Canada with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;
- 2) I am a graduate from École Polytechnique de Montréal with B.Eng. in Geological Engineering in 1985;
- 3) I am a registered member of “Ordre des Ingénieurs du Québec” (41764);
- 4) I have worked as a Geological Engineer or Project Manager continuously since my graduation from university;
- 5) I have read the definition of “qualified person” set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;
- 6) I have participated in the preparation of this technical report and part of the sections 18.1, 19.4, 20.4;
- 7) I have visited the project site on July 14<sup>th</sup> 2009;
- 8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;
- 9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of MDN inc, or any associated or affiliated entities;
- 10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of MDN inc., or any associated or affiliated companies;
- 11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from MDN inc., or any associated or affiliated companies;
- 12) I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as

of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23<sup>rd</sup> day of December 2011.

*C.M. Charbonneau (signed)*

---

Céline M. CHARBONNEAU, Eng.,  
Project Manager  
Met-Chem Canada Inc.

## **CERTIFICATE OF AUTHOR**

To Accompany the Report entitled

“Revised Technical Report – Preliminary Economic Assessment of the Crevier Project for MDN Inc.” issue date December 23<sup>rd</sup>, 2011 with an effective date as January 28<sup>th</sup>, 2010

I, Claude Duplessis, Eng., do hereby certify that:

- 1) I am Sr. Geological Engineer with SGS Canada Inc. with an office at suite 203, 10 de la Seigneurie Blvd. East, Blainville, Canada;
- 2) I am a graduate from University of Quebec in Chicoutimi, Quebec in 1988 with a B.Sc.A in geological engineering and I have practised my profession continuously since that time;
- 3) I am a registered member of Ordre des Ingénieurs du Québec (45523);
- 4) I have worked as an engineer for a total of 22 years since my graduation. My relevant experience for the purpose of the Technical Report is: Over 17 years of consulting in the field of Mineral Resource estimation, orebody modelling, mineral resource auditing and geotechnical engineering since my graduation from university;
- 5) I have read the definition of “qualified person” set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;
- 6) I have participated in the preparation of this technical report and part of the sections 4-15, 17, 19.1-19.3, 20.1 which are extract from May 25<sup>th</sup> 2009 current SGS Technical report on resources;
- 7) I have personally visited the site on July 2<sup>th</sup> of 2008 for one day and I have personally taken independent samples at Niobec Mine core shack facilities on July 3<sup>rd</sup> of 2008 for the purpose of the May 25<sup>th</sup> 2009 resource report;
- 8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;

- 9) At the moment of completing this report and certificate, works are in progress to prepare an updated resource estimates which will be presented in a Technical report before June 2010.
- 10) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of MDN inc, or any associated or affiliated entities;
- 11) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of MDN inc., or any associated or affiliated companies;
- 12) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from MDN inc., or any associated or affiliated companies;
- 13) I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23<sup>th</sup> day of December 2011.

(Signed and Sealed) « Claude Duplessis »

---

Claude Duplessis,  
Senior Geological Engineer  
SGS Canada Inc.



## **CERTIFICATE OF AUTHOR**

To Accompany the Report entitled

“Revised Technical Report – Preliminary Economic Assessment of the Crevier Project for MDN Inc.” issue date December 23<sup>rd</sup>, 2011 with effective date as January 28<sup>th</sup>, 2010.

I, Daniel M. Gagnon, Eng., do hereby certify that:

- 1) I am Senior Mining Engineer with Met-Chem Canada with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;
- 2) I am a graduate from École Polytechnique de Montréal with B.Eng. in Mining Engineering in 1995;
- 3) I am a registered member of “Ordre des Ingénieurs du Québec” (118521);
- 4) I have worked as a mining engineer continuously since my graduation from university;
- 5) I have read the definition of “qualified person” set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;
- 6) I have participated in the preparation of this technical report and part of the sections 18.1, 19.4, 20.2;
- 7) I have not visited the site;
- 8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;
- 9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of MDN inc, or any associated or affiliated entities;
- 10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of MDN inc., or any associated or affiliated companies;
- 11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from MDN inc., or any associated or affiliated companies;
- 12) I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief,

the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23<sup>rd</sup> day of December 2011.

*Daniel M. Gagnon (signed)*

---

Daniel M. GAGNON, Eng.,  
Senior Mining Engineer  
Met-Chem Canada Inc.

## **CERTIFICATE OF AUTHOR**

To Accompany the Report entitled

“Revised Technical Report – Preliminary Economic Assessment of the Crevier Project for MDN Inc.” issue date December 23<sup>rd</sup>, 2011 with an effective date as of January 28<sup>th</sup>, 2010.

I, Ewald Pengel, P. Eng., do hereby certify that:

- 1) I am Senior Metallurgist with Met-Chem Canada with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;
- 2) I am a graduate from Queen’s University, Kingston, Ontario in 1982;
- 3) I am a registered member of Professional Engineers Ontario (90520297) and I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum;
- 4) I have worked for 25 years in the mineral industry since graduation;
- 5) I have read the definition of “qualified person” set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be an independent qualified person for the purposes of NI 43-101;
- 6) I have participated in the preparation of this technical report and part of the sections 16, 18.2, 19.5, 20.3;
- 7) I have not visited the site;
- 8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;
- 9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of MDN inc, or any associated or affiliated entities;
- 10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of MDN inc., or any associated or affiliated companies;

- 11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from MDN inc., or any associated or affiliated companies;
- 12) I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23<sup>rd</sup> day of December 2011.

*Ewald Pengel (signed)*

---

Ewald Pengel, P. Eng.,  
Senior Metallurgist  
Met-Chem Canada Inc.

## **CERTIFICATE OF AUTHOR**

To Accompany the Report entitled

“Revised NI 43-101 Technical Report – Preliminary Economic Assessment of the Crevier Project for MDN Inc.” issue date December 23<sup>rd</sup>, 2011, with an effective date as January 28<sup>th</sup>, 2010.

I, Gared J. Daniel, P.Eng., do hereby certify that:

- 1) I am a Senior Process Engineer with Met-Chem Canada with an office at Suite 300, 555 René-Lévesque Blvd West, Montréal, Canada;
- 2) I am a graduate from London University, Imperial College, Royal School of Mines, in 1966;
- 3) I am a professional engineer, registered by Professional Engineers Ontario, no. 10433019;
- 4) I have worked as a metallurgical engineer in process engineering, plant construction and plant operation continuously since my graduation from university;
- 5) I have read the definition of “qualified person” set out in National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be an independent qualified person for the purpose of NI 43-101;
- 6) I have participated in the preparation of this technical report and parts of sections 16, 18.2, 19.5 and 20.3;
- 7) I have not visited the site;
- 8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;
- 9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of MDN inc., or any associated or affiliated entities;
- 10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of MDN inc., or any associated or affiliated companies;
- 11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from MDN inc., or any associated or affiliated companies;

- 12) I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23<sup>rd</sup> day of December 2011.

*Gared J. Daniel (signed)*

---

Gared J. DANIEL, P.Eng.,  
Senior Process Engineer  
Met-Chem Canada Inc.

## CERTIFICATE OF AUTHOR

To Accompany the Report entitled

“Revised Technical Report – Preliminary Economic Assessment of the Crevier Project for MDN Inc.” issue date December 23<sup>rd</sup>, 2011, with an effective date as January 28<sup>th</sup>, 2010.

I, Sylvain Boucher, Eng., M.Sc., do hereby certify that:

- 1) I am currently employed as Project Manager – Industrial Sector in the consulting firm:  
  
Roche Ltd, Consulting Group  
3075 Quatre-Bourgeois Boulevard  
Suite 300  
Québec City (Québec)  
G1W 4Y4  
Canada
- 2) I graduated from Laval University of Québec City, Canada, with a B.Sc. in mechanical engineering in 1997 and with a M.Sc. in mechanical engineering in 2000;
- 3) I have practiced my profession continuously since my graduation;
- 4) I am responsible for the sections 18.3, 18.4.1, 18.4.4 to 18.4.10, 18.5, 19.6 and 20.4 regarding technical aspects of the *Revised Technical Report – Preliminary Economic Assessment of the Crevier Niobium Project for MDN Inc.*;
- 5) I have read the definition of “qualified person” set out in the National Instrument 43-101 (“NI 43-101”) and as a result of my education and past relevant work experience, I meet the requirement to be a “qualified person” for the technical aspects. In addition, I am a member of the Québec Order of Engineers (member #122251);
- 6) I have not visited the project site;
- 7) That, as of the date of the certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;
- 8) I am independent of the issuer applying all of the tests in Section 1.5 on National Instruments 43-101;
- 9) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;



- 10) I consent to the filing of the Technical Report with any stock exchange or any regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public;

Prepared in Québec City, December 23<sup>rd</sup>, 2011.

*Sylvain Boucher (signed)*

---

Signed

Sylvain Boucher, Eng., M.Sc.

### **23.0 ADDITIONAL REQUIREMENTS FOR TECHNICAL REPORTS ON DEVELOPMENT PROPERTIES AND PRODUCTION PROPERTIES**

The aspects which will have to be developed to bring the property to a further development stage have been covered in the previous Sections of the Report.