CRITICAL ELEMENTS LITHIUM CORPORATION

ROSE LITHIUM-TANTALUM PROJECT

FEASIBILITY STUDY NI 43-101 TECHNICAL REPORT

October 11, 2023

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ABBREVIATIONS

UNITS OF MEASURE

above mean sea level	amsl
acre	ac
ampere	A
annum (year)	a
billion	B
billion tonnes	Bt
billion years ago	Ga
British thermal unit	BTU
centimetre	cm
cubic centimetre	cm^3
cubic feet per minute	cfm
cubic feet per second	ft^3/s
cubic foot	ft^3
cubic inch	in
cubic metre	m^3
cubic yard	yd^3
Coefficients of Variation	Cvs
day	d
days per week	d/wk
days per year (annum)	d/a
dead weight tonnes	DWT
decibel adjusted	Ba
decibel	dB
degree	°
degrees Celsius	°C
diameter	ø
dollar (American)	US$
dollar (Canadian)	CAN$
dry metric ton	mt
foot	ft
gallon	gal
gallons per minute	gpm
Gigajoule	GJ
Gigapascal	GPA
Gigawatt	GW
gram	g
grams per litre	g/L
grams per tonne	g/t
greater than	>
hectare (10,000 m^2)	ha
hertz	Hz
horsepower	hp
hour	h
hours per day	h/d
hours per week	h/wk
hours per year	h/a
inch	in
kilo (thousand)	k
kilogram	kg
kilograms per cubic metre	kg/m^3
kilograms per hour	kg/h
kilograms per square metre	kg/m^2
kilometre	km
kilometres per hour	km/h
kilopascal	kPa
kiloton	kt
kilovolt	kV
kilovolt-ampere	kVa
kilowatt	kW
kilowatt hour	kWh
kilowatt hours per tonne	kWh/t
kilowatt hours per year	kWh/a
less than	<
litre	L
litres per minute	L/m
megabytes per second	Mb/s
megapascal	Mpa
megavolt-ampere	Mva
megawatt	MW
metre	m
metres above sea level	masl
metres Baltic sea level	mbsl
metres per minute	m/min
metres per second	m/s
microns	µm
milligram	mg
milligrams per litre	mg/L
millilitre	mL
millimetre	mm
million	M

million bank cubic metres .... Mbm^3
million bank cubic metres per annum .... Mbm^3/a
million tonnes .... Mt
minute (plane angle) .... '
minute (time) .... min
month .... mo
ounce .... oz.
pascal .... Pa
centipoise .... mPa·s
parts per million .... ppm
parts per billion .... ppb
percent .... %
pound(s) .... lb
pounds per square inch .... psi
revolutions per minute .... rpm
second (plane angle) .... "
second (time) .... s
short ton (2,000 lb) .... st
short tons per day .... st/d
short tons per year .... st/y
specific gravity .... SG
square centimetre .... cm^2
square foot .... ft^2
square inch .... in^2
square kilometre km2
square metre .... m^2
three-dimensional 3D
tonne (1,000 kg) (metric ton) .... t
tonnes per day .... t/d
tonnes per hour .... t/h
tonnes per year .... t/a
tonnes seconds per hour metre cubed..... ts/hm^3
volt V
week .... wk
weight/weight .... w/w
wet metric ton .... wmt

ACRONYMS

CAAQS .... Canadian Ambient Air Quality Standards
CAPEX .... Capital Expenditures
CAR .... Clean Air Regulation
CAN$ .... Canadian Dollars
CELC .... Critical Elements Lithium Corporation
CIF .... Cost, Insurance, and Freight
CIM .... Canadian Institute of Mining, Metallurgy and Petroleum
COFEX .... JBNQA Federal Review Panel
COMEV .... JBNQA Evaluating Committee
COMEX .... JBNQA Review Committee
Cp .... Run-Off Coefficient
Deutsche Bank .... Deutsche Bank Market Research
DMS .... Dense Medium Separation
DOL .... Direct-on-line
EEM .... Environmental Effects Monitoring
EPCM .... Engineering, Procurement, Construction Management
ESS .... Energy Storage Systems
EV .... Electric Vehicles
FOB .... Free on Board
FS .... Feasibility Study
GDP .... Gross Domestic Product

GHG .... Greenhouse Gas
HDPE .... High-Density Polyethylene
HLS .... Heavy-liquid Separation
HMI .... Human Machine Interface
IBA .... Impacts and Benefits Agreement
ISO .... International Organization for Standardization.
JBNQA .... James Bay and Northern Québec Agreement
LA-ICP-MS .... Laser Ablation Technique
LCE .... Lithium Carbonate Equivalent
LCT .... Locked Cycle Test
LNG .... Liquid Natural Gas
LOM .... Life of Mine
LoOP .... Life of Operations Plan
LRS .... Electrolytic Starter
MDDELCC .... Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques
MERN .... Ministère de l'Énergie et des Ressources naturelles
MLEGB .... Middle and Lower Eastmain Greenstone Belt
MDMER .... Metal and Diamond Mining Effluent Regulations
MMU .... Mobile Manufacturing Unit
MRNQ .... Ministère des Ressources naturelles du Québec
MSE .... Mechanically Stabilized Earth
MTO .... Material Take-Off
NPAG .... Non-Potentially Acid Generating
NPV .... Net Present Value
NSR .... Net Smelter Return
OEE .... Overall Equipment Efficiency
PF .... Powder Factor
PLC .... Programmable Logic Controller
ppm .... Part per Million
PPSRTC .... Politique de protection des sols et de réhabilitation des terrains contaminés
Project (the) .... Rose Lithium-Tantalum Project
Property (the) .... Rose Property
PV .... Photovoltaic
RF .... Revenue Factor
RFQ .... Request for Quotation
ROM .... Run-of-Mine
Roskill .... Roskill Information Services Limited
SCADA .... Supervisory Control and Data Acquisition
SS .... Soft-Start
TCLP .... Toxicity Characteristic Leaching Procedure
TEFC .... Totally Enclosed, Fan Cooled
THUA .... Thickener Hydraulic Unit Area

TSP .... Total Suspended Particulate
TSS .... Total Suspended Solids
TUFUA .... Thickener Underflow Unit Area
UPS .... Uninterruptible Power System
USGS .... United States Geological Survey
US$ .... United States Dollars
VFD .... Variable Frequency Drives
WBS .... Work Breakdown Structure
WHIMS .... Wet High-Intensity Magnetic Separation
WSI .... Weh-Sees Indohoun
XRD .... X-ray Diffraction

1 SUMMARY

1.1 Geology Setting and Mineralization

The Rose Property (the Property) is located in the southern portion of the Middle and Lower Eastmain Greenstone Belt (MLEGB). Although the MLEGB shows a wide variety of rock types, most of the Property is underlain by intrusive lithologies. These are mainly syntectonic (2,710 to 2,697 Ma), with lesser volumes of late to post-tectonic intrusions (<2,697 Ma).

Gabbros, pyroxenites, and diorites cut across the Property geology. Pegmatites occur as irregular but generally continuous lenses within biotite schists. Historical work in the 1960s by the Ministère des Ressources naturelles du Québec (MRNQ), now the Ministère de l'Énergie et des Ressources naturelles (MERN), followed by additional regional-scale government work, uncovered four showings on the Property, two of which (Rose and Pivert) were have been examined more closely by the issuer. Both are showings of lithium and rare-element mineralization in pegmatites.

Other rock types, including gneiss, dacite, quartzite and conglomerate, have also been reported. Lithologies are generally well foliated with a SE orientation, except for the more massive and unfoliated granites and pegmatites.

Mineralization recognized to date on the Property includes rare-element LCT-type pegmatites and molybdenum occurrences

Critical Elements started drilling the Property in late 2009. This report considers 287 holes drilled by the company for a total of 33,875.5 m. Of those 287 holes, 218 (totalling 27,684.9 m) were included in the current resource estimate.

1.2 Mineral Processing and Metallurgical Testing

Metallurgical test work performed at SGS Lakefield was used to define design criteria for the spodumene plant. Bench scale metallurgical test work was performed on outcrop and drill core samples having lithium grades from 1.0% Li_2O (bench scale test work) to 1.45% Li_2O (pilot scale test work). Variability drill core composites tested had head grades; 0.99% Li_2O to 2.15% Li_2O except for one composite (PEG2) with 0.80% Li_2O that did not produce acceptable grade-recovery due to the presence of higher levels of amphiboles and pyroxenes in the ore.

Metallurgical test work on nine representative drill core composites having a lithium head grade varying between 0.50% Li_2O and 1.70% Li_2O was conducted at SGS laboratory to investigate its effect on grade/recovery. Results show that a head grade of 0.87% Li_2O could produce a chemical grade lithium concentrate of 5.5% Li_2O with a recovery of 90% or a technical grade lithium concentrate of 6.0% Li_2O with a recovery of 87%.

Tantalum upgrading test work at SGS Lakefield shows that tantalum grading 2.0% Ta_2O_5 recovered by magnetic separation could be upgraded to 20% Ta_2O_5 by gravity separation.

The proposed flowsheet is comprised of conventional three-stage crushing and single-stage grinding followed by magnetic separation for the recovery of tantalum, mica flotation, and spodumene flotation.

Settling and filtration tests were performed by rewetting the combined dry tailings from the production tests to obtain design criteria for sizing thickener and filtration equipment. Dry spodumene concentrate available from previous test work was used to perform settling and filtration tests to generate design criteria for sizing spodumene concentrate dewatering circuit.

1.3 Mineral Resource Estimate

The 2023 Rose Deposit Mineral Resource Estimate presented in this report (the 2023 MRE) was prepared by Carl Pelletier, P.Geo., using all available information. The 2023 MRE was prepared as part of a mandate assigned by Critical Elements in 2023.

The 2023 main resource area measures 1,600 m along strike, 1,300 m wide and 300 m deep. The resource estimate is based on a compilation of all recent diamond drillholes and wireframed mineralized zones largely inspired by previous work. The final model was constructed by the QP. The result of this study is a single Mineral Resource Estimate for 24 mineralized zones. The estimate includes Indicated and Inferred resources for open pit and underground scenarios. The effective date of the resource estimate is Augut1 , 2023, based on compilation status.

Mineral Resources were compiled using a minimum NSR cut-off of CAN$121.12 for the underground potential extraction scenario and CAN$31.4 for the open-pit potential extraction scenario. Parameters used to determine such cut-offs are presented in the report. The NSR cut-offs must be re-evaluated continually according to prevailing market conditions and other factors, such as lithium and tantalum prices, exchange rate, mining method, related costs, etc.

Table 1.1 displays the results of the in situ Mineral Resource Estimate for the Project at the $31.4 NSR cut-off for the open-pit potential extraction scenario and at the $121.12NSR cut-off for the underground potential extraction scenario.

Table 1.1: Project Mineral Resource Estimate

Category		Tonnage	NSR (CAN$)	Li2O_Eq (%)	Li2O (%)	Ta2O5 (ppm)
Indicated	Pit constrained	29 922 000	185	1,03	0,93	145
	Underground	624 000	177	0,96	0,91	82
	Total Indicated	30 561 000	185	1,03	0,93	118
Inferred	Pit constrained	1 787 000	149	0,86	0,77	138
	Underground	597 000	150	0,87	0,80	101
	Total Inferred	2 384 000	149	0,86	0,78	129

— Notes:
— The Independent and Qualified Person for the Mineral Resource Estimate, as defined by NI 43101, is Carl Pelletier, P.Geo., of InnovExplo Inc. The effective date of the estimate is August 1, 2023. The MRE follow 2014 CIM Definition Standards and the 2019 CIM MRMR Best Practice Guidelines.
— These Mineral Resources are not Mineral Reserves as they do not have demonstrated economic viability.
— The model includes 24 mineralized zones.
— The reasonable prospect for eventual economic extraction is met by having constraining volumes applied to any blocks (potential open -pit or underground extraction scenario) using Whittle and the Deswik Stope Optimizer (DSO) and by the application of cut-off grades. The mineral resource is reported at a cut-off of $31.4 NSR for the open-pit potential; and of $121.12 NSR for the underground potential based on market conditions (metal price, exchange rate and production cost).
— A range of densities was used on a per-zone basis based on statistical analysis of all available data.
— A minimum true thickness of 2.0 m was applied, using the grade of the adjacent material when assayed or a value of zero when not assayed.
— High grade capping was done on raw assay data based on the statistical analyses of individual mineralized zones.
— Compositing was done on drill hole intercepts falling within mineralized zones (composite lengths vary from 1.5 m to 3 m in order to distribute the tails adequately).
— Resources were evaluated from drill holes using a 2-pass OK interpolation method in a block model (block size = 5 m x 5 m x 5 m).
— The inferred category is only defined within the areas where blocks were interpolated during pass 1 or pass 2 where continuity is sufficient to avoid isolated blocks being interpolated by only one drill hole. The indicated category is only defined by blocks interpolated by a minimum of two drill holes in areas where the maximum distance to the closest drill hole composite is less than 40 m for blocks interpolated in pass 1.
— Results are presented in-situ. The number of metric tons was rounded to the nearest thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43101.

- The qualified persons are not aware of any known environmental, permitting, legal, title-related, taxation, socio-political or marketing issues, or any other relevant issue, that could materially affect the potential development of mineral resources other than those discussed in the MRE.

1.4 Mineral Reserve Estimate

The Mineral Reserves estimate (Table 1.2) for the Project was prepared by Mr. Simon Boudreau, P.Eng, an employee of InnovExplo Inc. and is effective as of August 1st, 2023. The Mineral Reserves estimate stated herein is consistent with the CIM Standards on Mineral Resources and Mineral Reserves and is suitable for public reporting. As such, the Mineral Reserves are based on Measured and Indicated Resources, and do not include any Inferred Resources. Measured and Indicated Resources are inclusive of Proven and Probable Reserves.

The Feasibility Study (FS) Life-of-Mine plans and Mineral Reserves estimate were developed from the geological block model prepared by InnovExplo, with the exception that a constant mill recovery is used. The effects of using a constant recovery were found to not materially affect the results of the FS. As of the date of this report, the QP has not identified any risks, legal, political, or environmental, that would materially affect potential development of the Mineral Reserves.

Table 1.2: Mineral Reserves Estimate

Category	Tonnage (Mt)	NSR ($)	Li_2O_eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Probable	26.3	165	0.92	0.87	138
Total	26.3	165	0.92	0.87	138

Notes:

- The Independent and Qualified Person for the Mineral Reserve Estimate, as defined by NI 43-101, is Simon Boudreau, P.Eng, of InnovExplo Inc.
- The effective date of the Mineral Reserves estimate is August 1st, 2023.
- The reserve estimate is based on the current resource estimate except for a constant recovery of 85% Li_2O. Metal prices are set at US$20,000/t Li_2O and US130/kg Ta_2O_5 using an exchange rate of 1.30 CAN$:US$. Metallurgical recoveries set constant at 85% for Li_2O and 64% for Ta_2O_5. The cut-off NSR value of CAN$44.80/t.
- The reserve estimate includes 9.6% dilution and 5% ore loss.
- The model includes 20 mineralized zones, of which 17 are included in the mining plan.
- Calculations used metric units (metres, tonnes and ppm).
- The number of metric tons was rounded to the nearest hundred thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.
- InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing or other relevant issue that could materially affect the Mineral Reserve Estimate.

1.5 Mining Methods

The Rose deposit is made of stacked mineralized lenses oriented N296° with an average dip of 15° to the northeast (varying locally between 5° and 25°). The orebody is relatively flat and close to the surface, so the FS is based entirely on an open pit operation.

A conventional truck and shovel mining method is proposed to mine 219.6 Mt of material over the mine life, comprising 26.3 Mt of ore, 182.4 Mt of waste and 10.9 Mt of overburden, for an average stripping ratio of 7.35:1. This FS is based on a milling capacity of 1,610,000 tonnes per year. To achieve these milling production targets, the yearly mining production rate will vary accordingly between 11 and 16 Mt of rock material and decrease towards the end of the mine life. All overburden material will be mined by a contractor. The open pit mining schedule result in a LOM of 19 years, starting with 19 months of pre-production, 15 years and 4 months of production and 13 months of stockpile processing. The mine plan includes four different phases to delay overburden removal, to keep the ore extraction rate relatively constant, and to improve mill feed grade in the first years of the Project.

1.5.1 Geotechnical Considerations

The pit design for the Project is based on single benching with 10-m bench heights. This bench height was selected based on the loading and hauling equipment that would best suit the mining operation. The geotechnical report recommends an inter-ramp angle of 57° and an overall pit slope angle of 55°.

1.5.2 Final Pit Design

The final pit design is based on the selected optimized pit shell and geotechnical parameters. The pit design includes haulage ramp access to all benches, except for the final bench which will be excavated via a temporary ramp.

1.5.3 Mining Phase Designs

Based on the Whittle pit shell optimizations, three nesting intermediate pit shells were used as guidelines to design the mining phases. By subdividing the ultimate pit into these four separate phases, the ore mining rate is kept relatively constant. The selection of these mining phases results in a low production rate for the pre-production period and improves the mill feed grade in the first years of the Project.

1.5.4 Mine Production Schedule

The life-of-mine (LOM) plan for the Project is based on an ore processing rate of 1,610,000 t per calendar year. The LOM plan was prepared to supply the required ore quantities to the mill while reducing the overall quantities of material to be mined, and to send higher grade ore to the mill in the first years of operation.

1.5.5 Waste Rock, Overburden, and Tailings Management

Two stockpiles have been designed to store mining waste. One large waste rock stockpile is located directly to the west of the pit and near the main ramp exit, and one overburden stockpile is located south of the pit.

The waste rock pile will be constructed in two phases. A co-deposition strategy will be used to store dry tailings from the mill and mined waste rock on the same pile.

1.5.6 Mining Equipment

Based on the production targets and operational constraints, the loading fleet comprise a 7.4 m3 backhoe excavator for ore handling, a 15 m3 electric hydraulic front shovel for waste rock handling, and a 13.8 m3 production wheel loader for operational flexibility.

The ore mined from the pit will be hauled by a maximum of eight ±65t payload trucks while, while waste mining, dry tailings transport and reclaimed ore will be hauled by a maximum of seven ±135t payload trucks.

Most production drilling will occur in waste as the strip ratio for the Project is high. Two high-capacity rotary diesel blasthole drills are dedicated to drilling waste panels, whereas drilling in ore panels will be performed by a down-the-hole drill rig. The down-the-hole drill is also suited to perform pre-splitting of the final walls. During the pre-production period, this drill will also perform all drilling in waste panels.

1.5.7 Manpower

A total of 204 employees will be needed at the peak of mining operations, not including contractors. This manpower requirement is based on an operation that runs 24 hours per day, 7 days per week, and 350 days per year.

As the site is remotely located, the working schedule for all employees will be a fly-in/fly-out rotation of 2 working weeks and 2 rest weeks, for 12 hours each day.

1.6 Recovery Method

The spodumene plant will be located near the open pit mine. The plant will be designed to process 4,900 tonnes per day and 365 days per year at 90% availability. Run-of-Mine (ROM) will be transported to the crushing plant. The ore will be crushed to a P_{80} 12.7 mm in three stages using conventional crushing equipment: jaw crusher, secondary cone crusher, and tertiary cone crusher. The crushed ore will be stockpiled under a storage dome.

Crushed ore will be ground in a ball mill to a grind size, P_{80} 220 µm. The ground ore will feed the magnetic separation circuit for recovering tantalum grading 2.0% Ta_2O_5 from the flotation feed. Tantalite recovered will be thickened, filtered, dried to 1% moisture in an oven. A bagging system installed under the silo will be used to ship the tantalite concentrate in 1.0 tonne bags.

The non-magnetics from the magnetic separation circuit will be deslimed ahead of mica flotation. The flotation circuit consists of mica flotation followed by attrition scrubbing prior to spodumene flotation.

Mica concentrates, slimes from scrubbing, and spodumene scavenger tailings will be thickened and filtered in a vacuum belt filter for producing tailings with a moisture content of 15% for dry stacking. Truck and loading arrangement will be used to dispatch tailings to the waste rock facility. The spodumene flotation concentrate will be thickened and filtered to get 5% moisture. The dried spodumene concentrate will be stored in a storage facility prior to be transported by truck to rail transfer facility.

1.7 Project Infrastructure

The Project is accessible year-round from the Cree community of Nemaska using the well-maintained Eastmain-1 Road. Nemaska is accessible via Route du Nord (North Road) from Chibougamau or from Matagami using paved Billy-Diamond Road to reach Route du Nord. The closest airport is located in Nemaska, 30 km south of the Project, near Nemiscau electrical station (50 km by road). The airport is owned and operated by Hydro-Québec and weekday flights to Montréal via Air Creebec are offered. Figure 1.1 shows the Property location.

Figure 1.1: Rose Property Location

The project infrastructure includes:

- Camp complex
- Waste rock and dry tailings co-deposit stockpile
- Ore stockpile and industrial pad
- Main access, service, and haulage roads
- Overburden stockpile
- Surface water management ponds, ditches, pumping stations, and piping
- Explosive and cap magazine storage
- Diesel, propane, and gasoline storage and distribution
- Truck shop, warehouse, administrative building, and gatehouse
- Spodumene process plant
- Main electrical substation and distribution
- Communication system
- Final effluent treatment plant
- Fresh and potable water supply
- Sewage system

The combined waste rock and dry tailings co-disposal stockpile was selected to reduce infrastructure footprint. The total capacity of the pile is 206M T (107M m^3), which is sufficient to contain the waste rock and the dry tailings during mining operation. Dry tailings will be prepared in the spodumene process plant and hauled to the waste stockpile by trucks.

The ore pad will have an approximate capacity of 4,3M T (2.2M m^3) and will be adjacent to industrial pad. An overburden stockpile with a capacity of 10.9M T (6M m^3) will contain materials coming from the pit excavation required to reach bedrock and other infrastructure development.

The diesel and gasoline storage tanks and distribution system will be installed on the industrial pad, while propane tanks will be installed near the camp for kitchen equipment and common areas / crawl space heating.

The truck shop, wash bay, and warehouse structural steel arch-type fabric buildings will be installed side by side on the industrial pad and mounted on containers on a concrete slab. The truck shop will offer four repair bays, a lube unit room, a tool crib, offices and overhead cranes. The wash bay will be a dedicated building considering its special needs in terms of HVAC and water supply. The warehouse will also contain a small truck repair bay and a welding bay. There will also be a smaller heated fabric building to park the emergency vehicles.

The administrative building is planned to be a two-story modular construction with a heated crawl space for piping and service. The building will include offices, mine dry, and other required installations. The gatehouse will be an independent modular building. A 125-tonne truck scale will be installed near the gatehouse.

The contact water from open pit, waste stockpile, industrial pad, ore pad, overburden stockpile, and roads will be directed to an accumulation pond for final effluent treatment.

A 315 kV electrical transmission line owned by Hydro-Québec runs north-south over the eastern section of the Project. The transmission line will need to be relocated approximately 500 m east of the open pit by Hydro-Québec. The Project main substation will be fed by this 315 kV line (18.5 MVA load).

The internet will be supplied by optic fibre to the site by Eeyou Communications network. A site-wide optic fibre network will link all buildings, allowing transfer of data such as automation, administrative, security camera, fire alarm system, LTE, and voice over IP phone communications.

1.8 Environmental Studies, Permitting, and Social, or Community Impact

The final environmental impact assessment (EIA) was submitted to the governments of Canada and Quebec in February 2019. Critical Elements Lithium Corporation (Critical Elements) has answered a series of questions from both government bodies (COMEX and CEAA). In August 2021, Critical Elements announced that the Federal Minister of Environment and Climate Change had rendered a favorable decision in respect of the proposed Rose Project. In a Decision Statement, which included the conditions to be complied with by the Corporation, the Minister confirmed that the Project is not likely to cause significant adverse environmental effects when mitigation measures are taken into account.

In September 2022, the Review Committee (“COMEX”) has recommended that this project be authorized. Pursuant to the James Bay and Northern Quebec Agreement (JBNQA), the provincial environmental assessment was conducted jointly by the Cree Nation Government and the Government of Quebec, under the COMEX. In Novembre 2022, the project received the Certificate of Authorization pursuant to section 164 of Québec’s *Environment Quality Act* from the Québec Minister of the Environment, the Fight against Climate Change, Wildlife and Parks.

Now that the project has been approved by government authorities, Critical Elements must obtain the various permits required to build and operate the mine. In addition, a new development has been added to the project: the workers' camp, previously planned 25 km to the north, will be set up some 4 km south of the mine site, under Critical Elements's responsibility.

Critical Elements has been working since the beginning with the Eastmain Community, on whose lands the Project lies. The Corporation has also maintained good relations with the Grand Council of the Cree and with the neighbouring Nation of Nemaska. Consultations have been ongoing and are planned throughout the life of the Project. In 2019, Critical Elements entered into an impact and benefits agreement with the Cree Nation of Eastmain, the Grand Council of the Cree (Eeyou Istchee), and the Cree Nation Government called the Pihkuutaau Agreement.

The Corporation’s mine closure and restoration plan was accepted by the Ministry of Energy and Natural Resources of the Province of Québec (MERN) in May 2022.

1.9 Economic Analysis

A LOM cash flow model was constructed based on the LOM production schedule for the Rose deposit. The key outcomes of the economic evaluation for 100% of the Project, before any financing costs, are presented in Table 1.3. All costs are estimated in Canadian dollars (CAN$) and referenced as ‘$’, unless otherwise stated.

Table 1.3: Summary of Project Economics

Item	Units	Value
Production		
Project life (from start of construction to closure)	years	19
Mine life	years	17
Total mill feed tonnage	M t	26.3
Average mill feed grade		
Li_2O	% Li_2O	0.87
Ta_2O_5	ppm Ta_2O_5	138
Lithium Concentrate Production		
% of Production, Chemical Grade	%	75
% of Production, Technical Grade	%	25
Mill recoveries		
Li_2O, Chemical Grade	%	87.4
Li_2O, Technical Grade	%	84.8
Ta_2O_5	%	54.4
Payable		
5.5% Li_2O Concentrate, Chemical Grade	t	2,681,000
6% Li_2O Concentrate, Technical Grade	t	783,000
Ta_2O_5 contained in concentrate	kg	1,971,000
Commodity Prices		
5.5% Li_2O Concentrate, Chemical Grade, LoOP Average	US$/t conc.	2,162
6% Li_2O Concentrate, Technical Grade, LoOP Average	US$/t conc.	4,699
Ta_2O_5 contained in concentrate	US$/kg contained	150
Exchange rate		1.00 US$: 1.30 CAN$
		0.77 US$: 1.00 CAN$
Project Costs		**CAN$**
Average Mining Cost	$/t milled	35.13
Average Milling Cost	$/t milled	27.00
Average General & Administrative Cost	$/t milled	20.70
Average Concentrate Transport Costs	$/t milled	22.76
Project Economics		**CAN$**
Gross Revenue	$M	12,692
Total Selling Cost Estimate	$M	161
Total Operating Cost Estimate	$M	2,776
Total Sustaining Capital Cost Estimate	$M	310
Total Capital Cost Estimate	$M	611
Duties and Taxes	$M	3,688
Average Annual EBITDA	$M	599
Average Gross Profit Margin		78.8%
Pre-Tax Cash Flow	$M	8,835
After-Tax Cash Flow	$M	5,147
Effective Tax Rate		41.7%
Discount Rate*		8%
Pre-Tax Net Present Value @ 8%	$M	5,048
Pre-Tax Internal Rate of Return		95.9%
Pre-Tax Payback Period	years	1.3
After-Tax Net Present Value @ 8%	$M	2,851
After-Tax Internal Rate of Return		65.7%
After-Tax payback period	years	1.8

Note* Discounting starts with commencement of commercial production.

A sensitivity analysis was conducted on the economic model to test changes in key economic assumptions, namely commodity prices, operating cost, capital cost, and exchange rate. The Project's pre-tax and after-tax NPV were most sensitive to the factors impacting revenue, that is, Li_2O commodity pricing, Li_2O metal recovery, and currency exchange rate. All sensitivities were analyzed as mutually exclusive variations.

1.9.1 Risks

Factors such as the ability to obtain permits to construct and operate a mine, obtain major equipment and skilled labour on a timely basis may impact the ability to achieve the presented production plans and cost estimates, thus causing actual results to differ substantively from those presented in the economic analysis.

Project financing:

— As with all resource development projects there is an inherent risk that the project will not be able to raise the necessary capital to fund any new construction.

Commodity pricing:

— This Project is exposed to commodity pricing on the world markets, and in fact shows its greatest sensitivity to commodity pricing. Tight control on Capital and Operating spending will alleviate some of the sensitivity to commodity pricing, but under an extended period of depressed lithium markets, the Project would be marginal to uneconomical.

2 INTRODUCTION

This Technical Report was prepared to support a Feasibility Study (FS) in Québec's Regulation 43-101 respecting standards of disclosure for mineral projects. The main objective of the FS is to demonstrate that the Rose Lithium-Tantalum Project (the Project) has sufficient merit from a technical, environmental and economic point-of-view to justify moving towards the EPCM phase.

2.1 Purpose of the Technical Report

WSP Canada Inc. (WSP) was commissioned in May 2023 by Mr. Jean Sébastien Lavallée, Chief Executive Officer of Critical Elements Lithium Corporation (Critical Elements), to integrate an independent Technical Report on the Project. This Technical Report complies with National Instrument 43-101 Standards and Disclosure for Mineral Projects (NI 43-101), Companion Policy 43-101CP and Form 43-101F1, as amended on May 9, 2016. It includes an economic analysis of the potential viability of mining the mineral reserves of the Project.

The purpose of the FS consisted in evaluating the potential for mining, milling and metallurgical processes of the Project. This FS considered all necessary infrastructure required for the development of the Project. The results of the FS were disclosed by Critical Elements in a News Release on August 29, 2023.

This FS is based on developing the Project over a 17-year production period using a conventional truck and shovel open pit operation and a conventional milling process to produce technical and chemical grade spodumene concentrates and a tantalite concentrate.

This Technical Report was prepared as a collaborative effort between InnovExplo of Val-d'Or, Québec for the Mineral Resources, Mineral Reserves and Mining, Bumigeme of Montréal, Québec for the Metallurgy and Mineral Processing, and WSP Canada Inc., for all other aspects of the study including, surface infrastructures, assessment of a market study, economic analysis, environmental considerations, and report integration. The Report presents the Qualified Persons' findings, conclusions, and recommendations.

The economic analysis presented in this Technical Report is based on Probable Mineral Reserves. Probable Mineral Reserves contain Indicated Mineral Resources only. Inferred Mineral Resources have not been considered as these are considered too geologically speculative to have mining and economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There are currently no Proven Mineral Reserves for the Rose Lithium Open Pit.

2.2 Issuer of the Technical Report

This Technical Report was prepared for Critical Elements Lithium Corporation (Critical Elements), a Canadian mining exploration company based in Montréal, Québec, Canada. Critical Elements is the issuer of this Technical Report as per NI 43-101.

Critical Elements Lithium Corporation is listed on the *Registre des entreprises du Québec* (Registry of Québec Companies) as:

Name of company: Corporation Lithium Éléments Critiques
Critical Elements Lithium Corporation

Québec company number (NEQ): 1164063159

Address: 80, boul. de la Seigneurie Ouest, bureau 201

Blainville, Québec J7C 5M3
Canada

Critical Elements Lithium Corporation was incorporated under the Canadian Business Corporations Act R.S.C., 1985, c. C-44 on September 11, 2006 which is still in effect. Initially registered as Exploration First Gold Inc., the company changed its name to Critical Elements Corporation on February 18, 2011.

Mr. Jean-Sébastien Lavallée is the chief executive officer on record of Critical Elements Lithium Corporation. The shares of Critical Elements currently trade on the TSX Venture Exchange under the ticker symbol CRE, the American Over-the Counter QX (OTCQX) Exchange under the ticker symbol CRECF, and the Frankfurt Exchange under the ticker symbol F12. According to the Registry of Québec Companies, Critical Elements is a company in good standing, is not under bankruptcy, has never been the object of legal procedures by another company, is not the object of a continuation or transformation and is not the subject of liquidation or dissolution.

Critical Elements Lithium Corporation was registered on SEDAR on September 11, 2006, under the CUSIP Number 320377. Its reporting jurisdictions include Québec.

Critical Elements has interests in 10 properties in the province of Québec including: Rose Lithium-Tantalum, Nisk, Amiral, Arques, Bourier, Caumont, Dumulon, Duval, Lemare, and Valiquette. Further details concerning Critical Elements' projects and company structure, including news releases about the Rose Project, can be found on the company website at www.cecorp.ca.

2.3 Qualified Persons

This Technical Report was prepared for Critical Elements by or under the supervision of Qualified Persons (QPs). WSP, InnovExplo, and Bumigeme are responsible for various items of this Technical Report. The QPs responsible for the preparation of the Technical Report, as defined in NI 43–101 and in compliance with Form 43–101F1 are as follows:

1 Mr. Carl Pelletier, P.Geo., InnovExplo, Val-d'Or, Québec.
2 Mr. Simon Boudreau, P.Eng., InnovExplo, Val-d'Or, Québec.
3 Mr. Florent Baril, P.Eng., Bumigeme; Montréal, Québec.
4 Mr. Paul Gauthier, P.Eng., WSP, Quebec City, Québec.
5 Mr. Éric Poirier, P.Eng., PMP, WSP, Val-d'Or, Québec.
6 Mr. Olivier Joyal, P.Geo., WSP, Montréal, Québec.

The QPs' areas of responsibility for the various Items of the Technical Report are outlined in Table 2.1.

Table 2.1: Responsibilities of Qualified Persons

Qualified Person	Responsibility
Carl Pelletier	Items 6 to 12, 14, 23, and portions of Items 1, 2, 3, 24, 25, 26 and 27 that are based on those Items.
Simon Boudreau	Items 15, 16, 21.1.7, 21.2.1, and portions of Items 1, 2, 3, 24, 25, 26 and 27 that are based on those Items.
Florent Baril	Item 13, 17, 18.14, 18.15, 21.1.10, 21.2.2, and portions of Items 1, 2, 24, 25, 26 and 27 that are based on those Items.
Paul Gauthier	Items 19, 21.1.1 to 21.1.6, 21.1.12 to 21.1.15, 21.2.3, 21.2.4, 22, and portions of Items 1, 2, 3, 24, 25, 26 and 27 that are based on those Items.
Éric Poirier	Items 5 (excluding 5.2 to 5.4), 18 (excluding 18.14 and 18.15), 20.3.1, 21.1.8, 21.1.9, 21.1.11, and portions of Items 1, 2, 3, 24, 25, 26 and 27 that are based on those Items.
Olivier Joyal	Items 4, 5.2 to 5.4, 20 (excluding 20.3.1), and portions of Items 1, 2, 3, 24, 25, 26 and 27 that are based on those Items.

During the preparation of Items under his responsibility, Mr. Éric Poirier supervised a multi-disciplinary team for surface infrastructure design.

2.4 Terms of Reference

The technical information and economic parameters used to prepare this Technical Report and FS are current as of the following effective dates:

- Effective date of the Technical Report: August 29, 2023.
- Press release by Critical Elements: August 29, 2023.
- Effective date of the Mineral Resource Estimate: August 01, 2023.

In general, the Project components and costs were developed to a ±15% level of accuracy, commensurate with that of a Feasibility Study. Budgetary prices were obtained from various vendors for several items including mining equipment and infrastructure components. Other elements of the study were compared to those used in similar projects or estimated from costing manuals.

An exchange rate was assumed between the Canadian and the American dollars: (US$1.00/CAN$1.30). The prices for tantalum, technical grade lithium, and chemical grade lithium concentrates used in this FS were respectively set at values varying yearly that average US$150/kg, US$4699/t and US$2162/t over the Life of Operations Plan.

Capital and Operating costs were estimated in 2023 Canadian dollars. An economic evaluation of the Project was conducted using the Internal Rate of Return (IRR) and Net Present Value (NPV) methods.

2.5 Sources of Information

- Mr. Carl Pelletier, P.Geo., InnovExplo, Val-d'Or, QC, did not recently visit the site.
- Mr. Simon Boudreau, P.Eng., InnovExplo, Val-d'Or, QC, visited the site on May 31, 2022.
- Mr. Florent Baril, P.Eng., Bumigeme; Montréal, QC, did not visit the site.
- Mr. Éric Poirier, P.Eng., PMP, WSP Canada Inc., Val-d'Or, QC, visited the site on November 15, 2016.
- Mr. Olivier Joyal, P.Geo., WSP Canada Inc., Montréal, QC, did not visit the site.
- Mr. Paul Gauthier, P.Eng., WSP Canada Inc., Quebec City, QC did not visit the site.

Critical Elements, WSP, InnovExplo, and Bumigeme were in constant communication while carrying out the mandate. WSP prepared this Technical Report using the input data provided by Critical Elements and the parties listed in Table 2.1.

A portion of the background information and technical data presented in this Technical Report came from technical reports listed below and previously filed on SEDAR for the Rose Property by Critical Elements. No other companies filed NI 43-101 compliant reports or other technical reports concerning the Rose Property on SEDAR.

At the request of Critical Elements, InnovExplo prepared three independent NI 43-101 compliant Technical Reports on the Property which described the ongoing exploration work performed on the Property. InnovExplo's Technical Reports are dated as follows:

1. September 30, 2010: Technical Report on the Pivert-Rose Property.
   (This report does not include a Mineral Resources estimate).
2. January 24, 2011: Technical Report on the Pivert-Rose Property.
   (This report includes a Mineral Resources estimate but no Mineral Reserves estimate).

3 September 7, 2011: 43-101 Technical Report and Resource Estimate on the Pivert-Rose Property. (This report includes an update of the Mineral Resources estimate dated July 20, 2011, but no Mineral Reserves estimate).

At the request of Critical Elements, WSP, InnovExplo and Bumigeme co-authored an independent NI 43-101 compliant Technical Reports on the Property dated November 29, 2017, which described a FS undertaken for the purposes of evaluating the potential for mining, milling and metallurgical processes of the Project.

The present Technical Report and new Feasibility Study is based on the most recent Mineral Resources and Mineral Reserve (MRMR) estimates prepared by InnovExplo for the Property. The MRMR is dated August 1st, 2023 and presented in Items 14 and 15 of this report. Mineral reserves are based on results prior to receiving the variable recovery equations and are dated August 1st, 2023.

Other sources of information are listed at the end of this Technical Report in Item 27 - References.

The following individuals provided specialist input to Éric Poirier, QP:

- Stéphan Dupuis, P. Eng. (WSP) provided support for the design of the earthworks and civil works required for the surface infrastructure;
- João Paulo Lutti, P.Eng. and Patrick Couture, P.Eng. (WSP) provided support for the design of surface water management and treatment included in surface infrastructure;
- Yves Picard, P.Eng. (WSP) provided support for the design of the mechanical services, pumping and piping included in surface infrastructure;
- Yves Bouchard, P.Eng. (WSP) provided support for the design of the main electrical substation and site electrical distribution in surface infrastructure;
- Simon Barbeau, P.Eng. (WSP) provided support for the design of the potable and sanitary water treatment systems included in surface infrastructure;
- Gabriel Boucher, CEC, ECCQ (WSP) provided support for construction costs estimation.

3 RELIANCE ON OTHER EXPERTS

The Qualified Persons (QP) who prepared this report relied on information provided by experts who are not QPs. The QPs who authored the Items in this report believe that it is reasonable to rely on these experts, based on the assumption that the experts have the necessary education, professional designations, and relevant experience on matters relevant to the Technical Report.

- Olivier Joyal relied upon GESTIM Plus from Énergie et Ressources Naturelles du Québec for the mining titles extracted from their website as well as Critical Elements for guidance on the titles that are part of the Property described in Item 4.
- Olivier Joyal relied upon Critical Elements for the description of their relationship with stakeholders described in Item 20.
- Paul Gauthier relied upon independent consultant, Gerrit Fuelling, Diplome Ingenieur (TU) for market studies and contracts information used in Item 19.
  - Mr. Fuelling's relevant experience is as follows. Since April 1989 he has worked in the Lithium business, sales and marketing as well as management of Chemetall GmbH, later Rockwood Lithium GmbH till November 2015. This company and its successor is one of the leading integrated lithium suppliers in the world. He has been instrumental and responsible amongst other business duties for the Asian set up of the lithium business for more than 25 years as well as from 2011 initiator and mentor for the QA/QC program related to establish quality systems which comply with automotive standards. Between 2011 and 2015 Mr. Fuelling was President of Rockwood Lithium Asia and member of the management team of Rockwood Lithium GmbH and as such reporting to Dr. Steffen Haber, at that time CEO of the Rockwood Lithium Group. Asia is the focus of the global lithium battery and related materials development, and his work was essentially to lead, align adjust the business of Rockwood Lithium to this industry in this region (i.e. redirecting the business set up towards the emerging battery business for electro-mobility). As such, he has been in, and commanded over, business and personal relationships with most active and relevant market players on the customer side.
- Paul Gauthier relied upon Critical Elements and its external advisors for guidance on royalties and buy-back options as well as taxes and other government levies of the economic analysis described in Item 22.
- Paul Gauthier relied on Critical Elements for the implementation schedule described in Item 24.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Property is located in northern Québec's administrative region, on the territory of Eeyou Istchee James Bay, on Category III land, on the Traditional Lands of the Eastmain Community, some 40 km north of the Cree village of Nemaska. The latter is located at more than 300 km north-west of Chibougamau. Figure 4.1 shows the detailed Project location.

Figure 4.1: Detailed Project Location

The approximate central geographic coordinates of the Rose Pit area are presented in Table 4.1.

Table 4.1: Approximate Central Geographic Coordinates of the Rose Pit Area

WSG, 1984	UTM (Zone 18, NAD83)
52°0' 59,785'' North	5 761 000 m North
76°9' 36,711'' West	409 700 m East

4.2 Property Ownership and Agreement

The Project is made of 473 active mining titles spread over 24,654 hectares (ha). Mining titles are grouped into one continuous block (Figure 4.2).

The mineralization identified, to date, on the Project includes LCT-type pegmatites and molybdenum indices. An iron index is also mentioned in the government database.

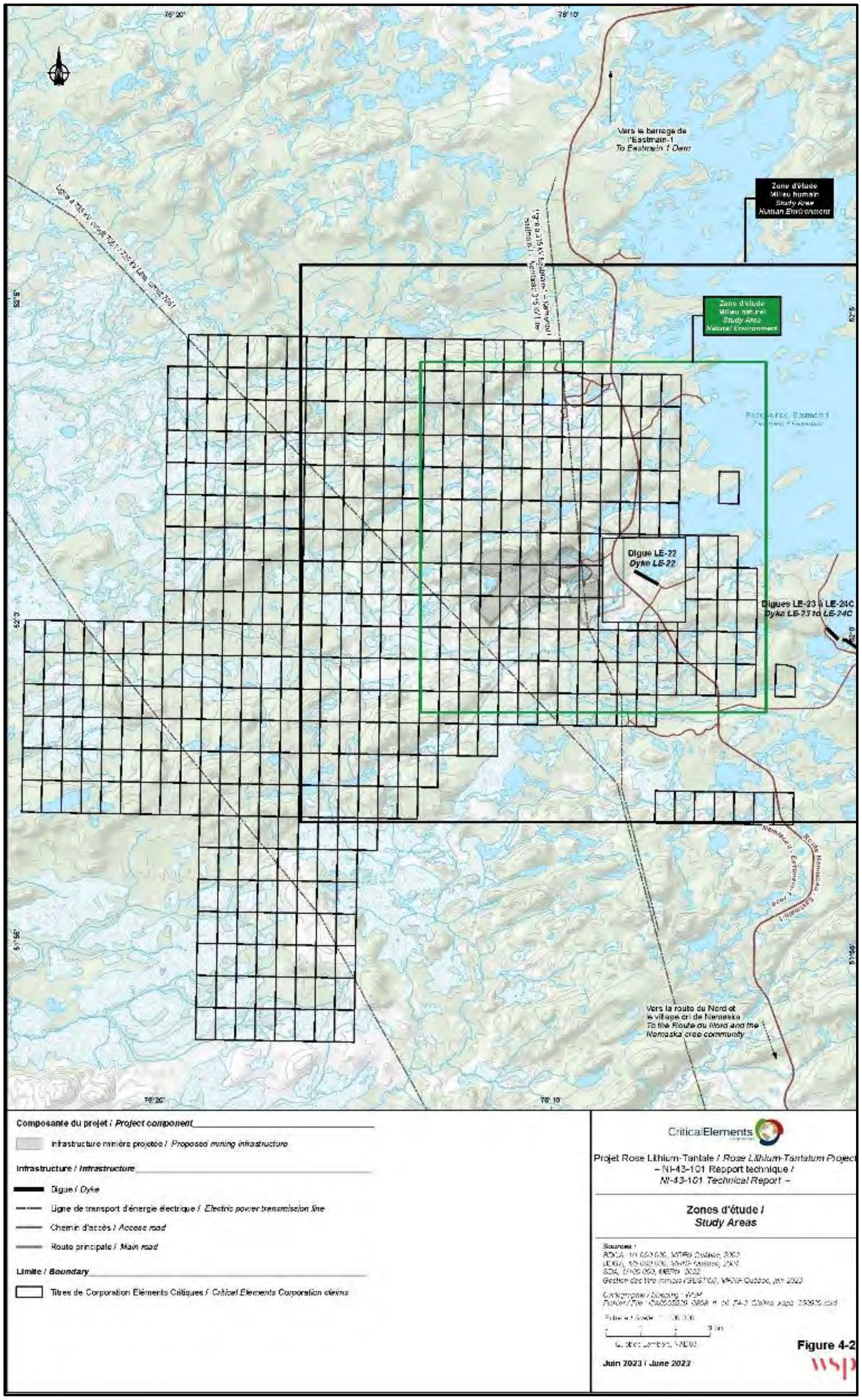
A table showing the mining titles comprising the Project as of June 19, 2023, is included in Appendix 4-A.

According to the GESTIM database (Québec's mining title management system), all mining titles comprising the Project are currently registered to Critical Elements Lithium Corporation. Other than what is discussed in the above transactions, no liens or charges appear to be registered against the Property.

All claims seem to be in good standing according to the GESTIM database (Québec's mining title management system), although a total of 69 active claims are affected by electrical power transmission lines.

On November 29, 2010, First Gold (now Critical Elements Lithium Corporation) announced the closing of a transaction with Jean-Sébastien Lavallée (a director and the interim president and chief executive officer of First Gold), Jean-Raymond Lavallée and Fiducie Familiale St-Georges (together the Vendors) to increase its interest in the Pivert-Rose project from 85% to 100% in consideration of a cash payment of $225,000 and the issuance of 7,500,000 common shares of First Gold. Critical Elements Lithium Corporation fulfilled its obligations and now owns 100% of the Rose property. The Vendors retained a 2 % net smelter return royalty on the Property, half of which (1 %) can be bought back by Critical Elements Lithium Corporation for $1,000,000.

Figure 4.2: Project Mining Titles



4.3 Tenure Rights

A land lease will need to be obtained from the provincial government (the custodian of the Crown lands). This will be applicable to all lands where construction work is required (surface rights). This land lease will need to be acquired before permit requests. As such, a land lease request will be prepared and submitted to the MERN at least a year before the permits are required as the Ministry must include consultation with Aboriginal Communities before delivery of the land lease.

A mining lease will also be needed for the area where the pit will be located. Request was filed on February 6, 2023 to MRNF

4.3.1 James Bay and Northern Québec Agreement

The territorial regime introduced by the James Bay and Northern Québec Agreement (JBNQA) is a determining factor in land use. It provides for the division of the territory into Category I, II, and III lands.

Category I lands are reserved for the exclusive use of the Cree. They may be used for residential, community, commercial, industrial or other purposes. In addition, the Cree have an exclusive right to hunting, fishing and trapping.

Category II lands are contiguous to Category I lands. They are part of the public domain of Québec. These are lands where the Cree have exclusive rights of hunting, fishing and trapping. They are part of the public domain of Québec.

Category III lands represent all lands in the Agreement Area not included in Category I and Category II lands. On these lands, the Cree enjoy the exclusive right to trap fur animals. In addition, certain wildlife species are reserved for their hunting and fishing activities. In these territories, hunting and fishing are permitted for both native and non-native people. In Category III lands, mining rights belong to the provincial government. The Project is located on Category III lands.

4.4 Royalties and Related Information

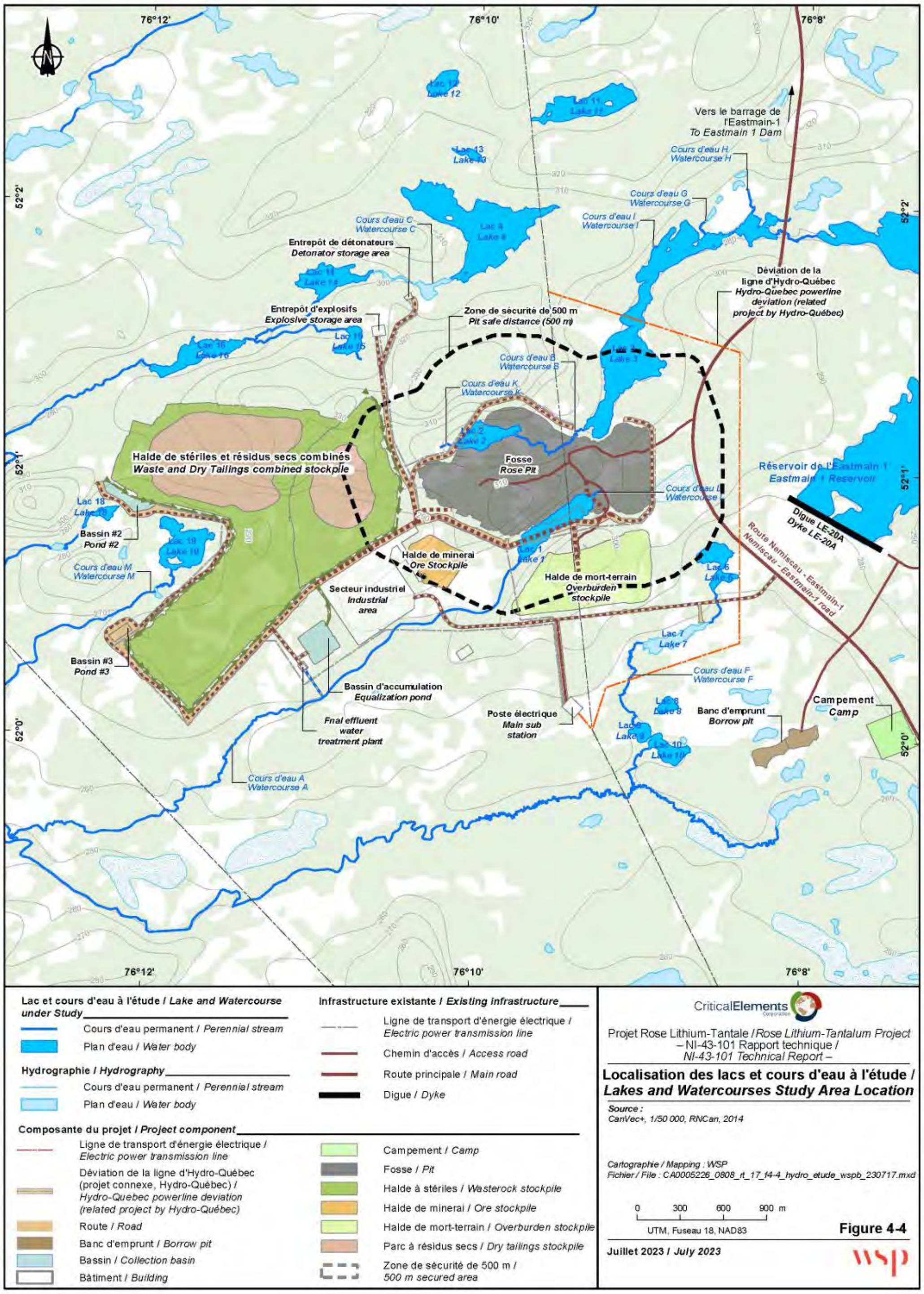
The Property is subject to a 2% net smelter return royalty to Jean-Raymond Lavallée, Jean-Sébastien Lavallée, and Fiducie Familiale St-Georges. Critical Elements may purchase half of the net smelter return (1%) for $1,000,000.

4.5 Environmental Liabilities

The mineral reserves will be mined by excavating an open pit to a depth of 200 m. The pit itself will disturb an area of about 100 ha. The combined pit and infrastructures of the Project will directly impact an area of approximately 725 ha.

It is worth noting that the development of the proposed open pit for the Project will require drainage of two small bodies of water, identified as Lake 1 and Lake 2 on Figure 4.3.

Figure 4.3: Location of Lakes 1 and 2 within the Project



4.6 Permits

All required permits to conduct exploration work are current.

The final environmental impact assessment (EIA) was submitted to the governments of Canada and Québec in February 2019. Critical Elements has answered a series of questions from both government bodies (COMEX and CEAA). In August 2021, Critical Elements announced that the Federal Minister of Environment and Climate Change had rendered a favourable decision in respect of the proposed Rose Project. In a Decision Statement, which included the conditions to be complied with by the Company, the Minister confirmed that the Project is not likely to cause significant adverse environmental effects when mitigation measures are taken into account.

In September 2022, the Review Committee ("COMEX") has recommended that this project be authorized. Pursuant to the James Bay and Northern Quebec Agreement (JBNQA), the provincial environmental assessment was conducted jointly by the Cree Nation Government and the Government of Quebec, under the COMEX. In Novembre 2022, the project received the Certificate of Authorization pursuant to section 164 of Québec's *Environment Quality Act* from the Québec Minister of the Environment, the Fight against Climate Change, Wildlife and Parks.

Now that the project has been approved by government authorities, Critical Elements must obtain the various permits required to build and operate the mine. In addition, a new development has been added to the project: the workers' camp, previously planned 25 km to the north, will be set up some 4 km south of the mine site, under Critical Elements' responsibility.

4.7 Other Relevant Factors

Three high-voltage power transmission lines cross over the Property. One of these crosses over the planned open pit operation and will need to be relocated. On January 9, 2023, following the positive recommendation by the Environmental and Social Impact Review Committee (the "COMEX"), the Québec Minister of the Environment, the Fight against Climate Change, Wildlife and Parks (the "Minister") has authorized Hydro-Québec's connection and powerline relocation project, subject to certain conditions.

The Eastmain hydroelectric reservoir is located to the east of the Property. Hydro-Québec has an exclusion zone east of the Project. Any work on the exclusion zone would require the consent of Hydro-Québec.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

5.1 Accessibility

5.1.1 Road

The Project is accessible year-round from Nemaska using the well-maintained Eastmain-1 gravel road. Nemaska is accessible via Route du Nord (North Road) from Chibougamau or from Matagami using paved Billy-Diamond Road to reach Route du Nord. Figure 5.1 shows the main access roads to the site.

The Route du Nord is a 407 km entirely unpaved road in central Québec. It starts at km 0 in Chibougamau and ends at a junction with Billy-Diamond Road (formerly James Bay highway), 275 km north of Matagami. Extensive logging is present along the southern half of the Route du Nord.

A junction with a main gravel road leading to the Eastmain-1 hydroelectric power station exists at km 291 of the Route du Nord. The Project is located some 43 km north of that junction. The east part of the Project overlaps the Eastmain-1 road so that the road passes a mere 320 m east of the proposed open pit. The Project is located less than 20 km south of the Eastmain-1 power station (24 km using roads).

5.1.2 Airport

The closest airport is located in Nemaska, 45 km south of the Project, at km 294 of the Route du Nord, near Nemiscau electrical station (50 km by road). The airport is owned and operated by Hydro-Québec. The Nemaska airport offers weekday flights to Montréal, via Air Creebec, a regional air carrier. Flight time from Nemaska to Montréal is approximately two-and-a-half hours.

Small craft landing strips are also located in Eastmain, 164 km west of the Project (258 km by road), and in Waskaganish, 190 km west of the Property (297 km by road).

5.1.3 Port

Limited Port facilities are found in Eastmain, 170 km west of the Project in the James Bay. Several marine terminals are found along the Saint-Lawrence seaway offering deep-sea general cargo port facilities, year-round activity, and accredited by the International Ship and Port Facility Code to receive vessels from abroad of more than 100,000 deadweight tonnes. They provide direct connection with international ocean shipping lines.

5.1.4 Railroad

The planned railway is in Matagami, providing a connection with the North American railroad network. Rail service is also available in Chibougamau. Figure 5.1 shows the location of Northern Québec's main roads, airports, ports, and railroads.

Figure 5.1: Northern Québec Main Roads, Airports, Ports, and Railroads

5.2 Physiography

The Project is located at the 52nd parallel north in Central Québec, Canada. The Project is characterized by a relatively flat topography (Figure 5.2). The relief in the vicinity of the Project consists of rounded hills separated by low vegetation-covered valleys. Elevations range between 269 masl and 328 masl.

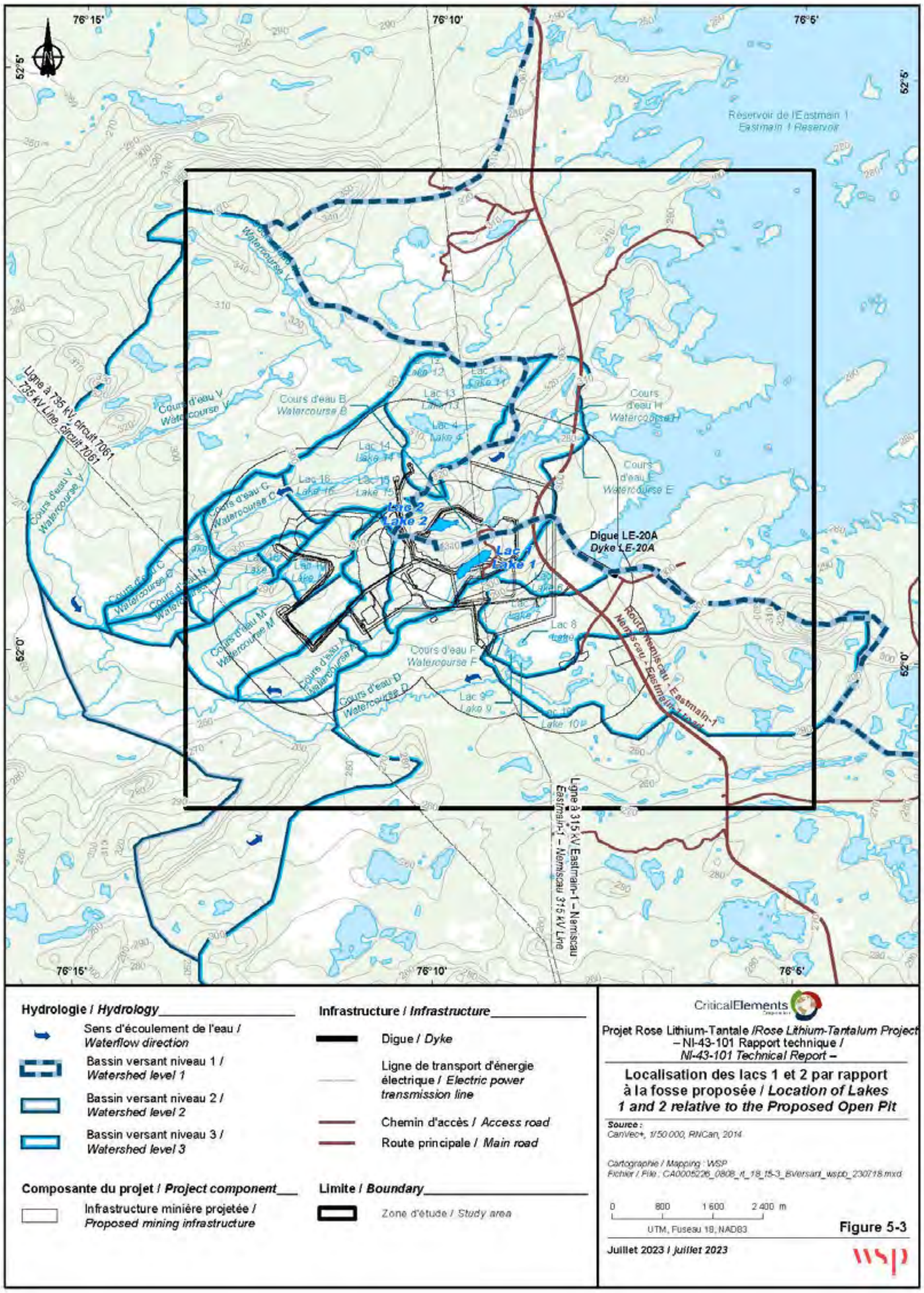
Figure 5.2: View of the Project Landscape – Lake 2 View

Source: WSP site visit

The Project lies on the line of demarcation of the Eastmain and Pontax watersheds. Figure 5.3 shows the various watersheds within the Property with the proposed infrastructure and open pit.

Several waterbodies are found on the Property. The proposed mining plan includes drainage of two small lakes identified as Lake 1 and Lake 2. The shoreline of these two lakes lies at elevation 288 masl. Lake 1 is located on the south side of the proposed open-pit, Lake 2 on its northwest side.

Figure 5.3: Rose Property Watersheds



A bathymetric assessment of Lake 1 and Lake 2 revealed that they are small and shallow waterbodies. Lake 1 has an elongated oval shape oriented in a general northeastern direction. Lake 1 is approximately 660 m long x 120 m wide x 2.3 m at its deepest point (Figure 5.4). Lake 2 has a diamond shape oriented in a general northeastern direction. Lake 2 is approximately 480 m long x 200 m wide x 6.5 m at its deepest point (Figure 5.5). The volume of water contained is estimated at approximately 90,050 m^3 for Lake 1, and at 186,300 m^3 for Lake 2.

Figure 5.4: Bathymetry of Lake 1 - South of the Proposed Rose Open-Pit

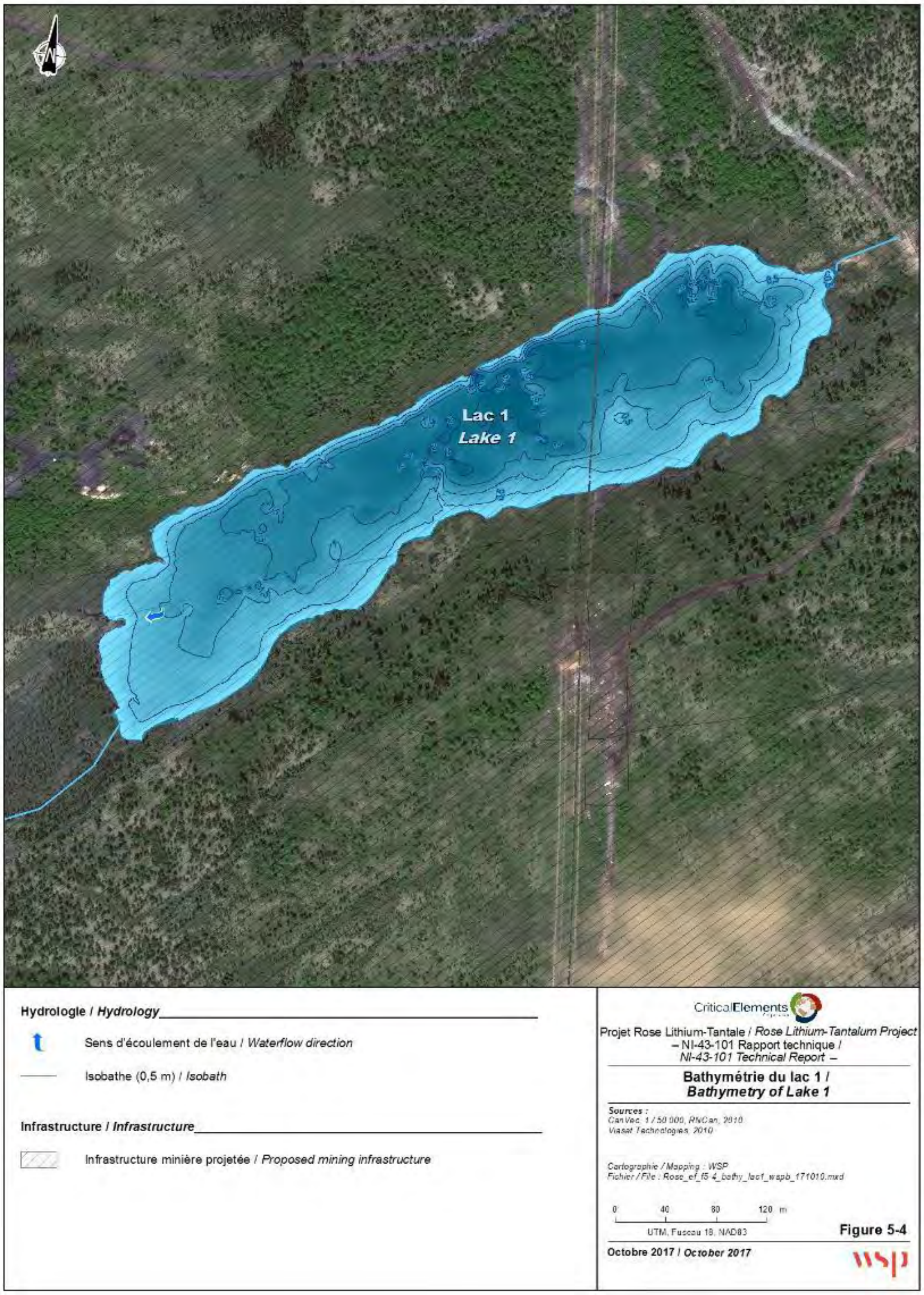
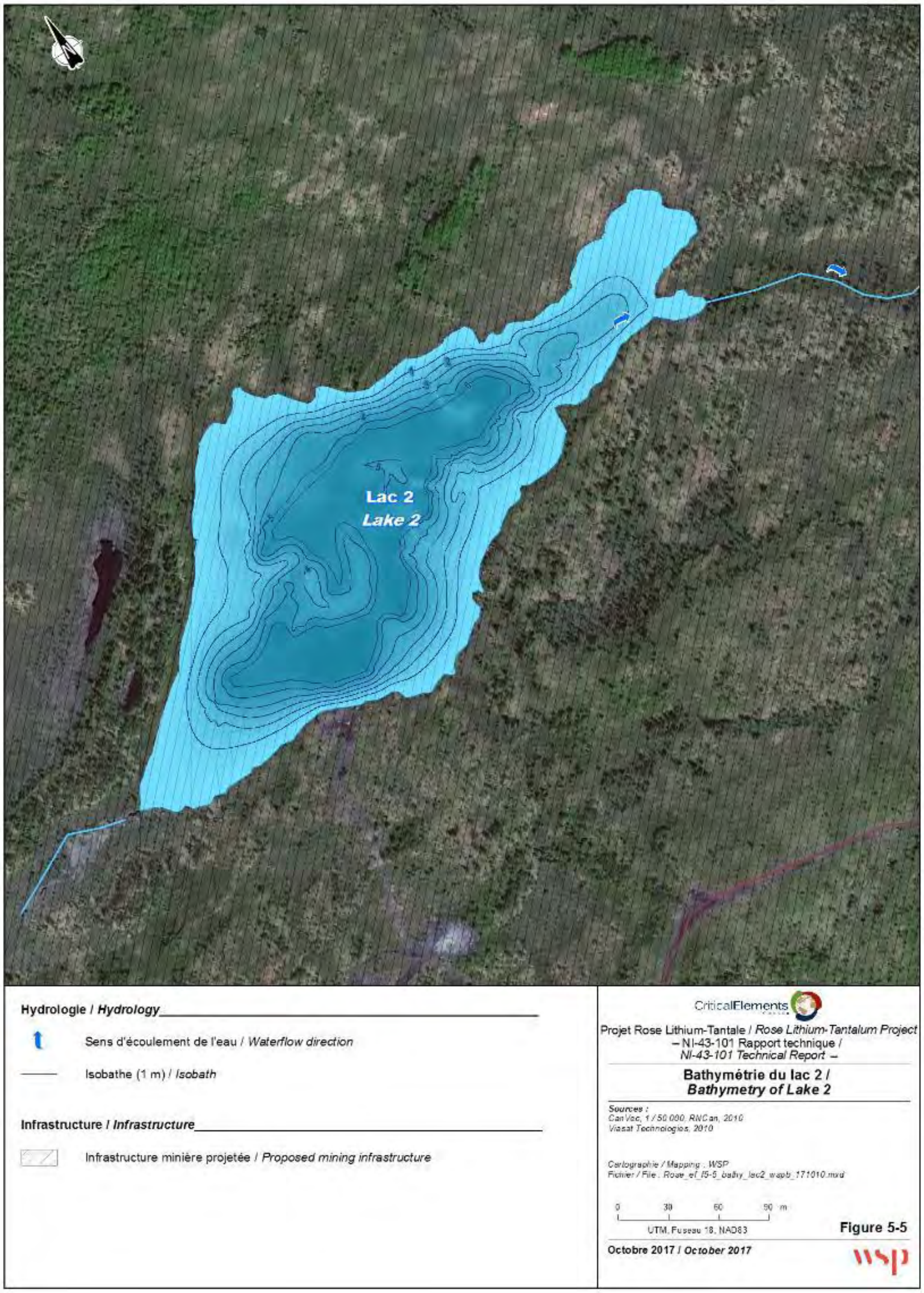


Figure 5.5: Bathymetry of Lake 2 - North-West of the Proposed Rose Open-Pit



5.3 Fauna and Flora

The vegetation of the Project is typical of the boreal forest (Figure 5.6). Mature black spruce constitutes the predominant tree species, with occasional birches, poplars, alders and deciduous bushes. The predominance of peatland and black spruce increases towards the north. The tree stratum is mostly composed of gray pine, black spruce and white spruce. The shrub stratum is mainly composed of green alder, sheep-laurel, Labrador tea, lowbush blueberry and few willows. The herbaceous stratum is sparse and little diversified. Eight wetland classes were identified in the study area, totalling a surface area of approximately 3,100 ha. No plant at risk was observed during the various field campaigns.

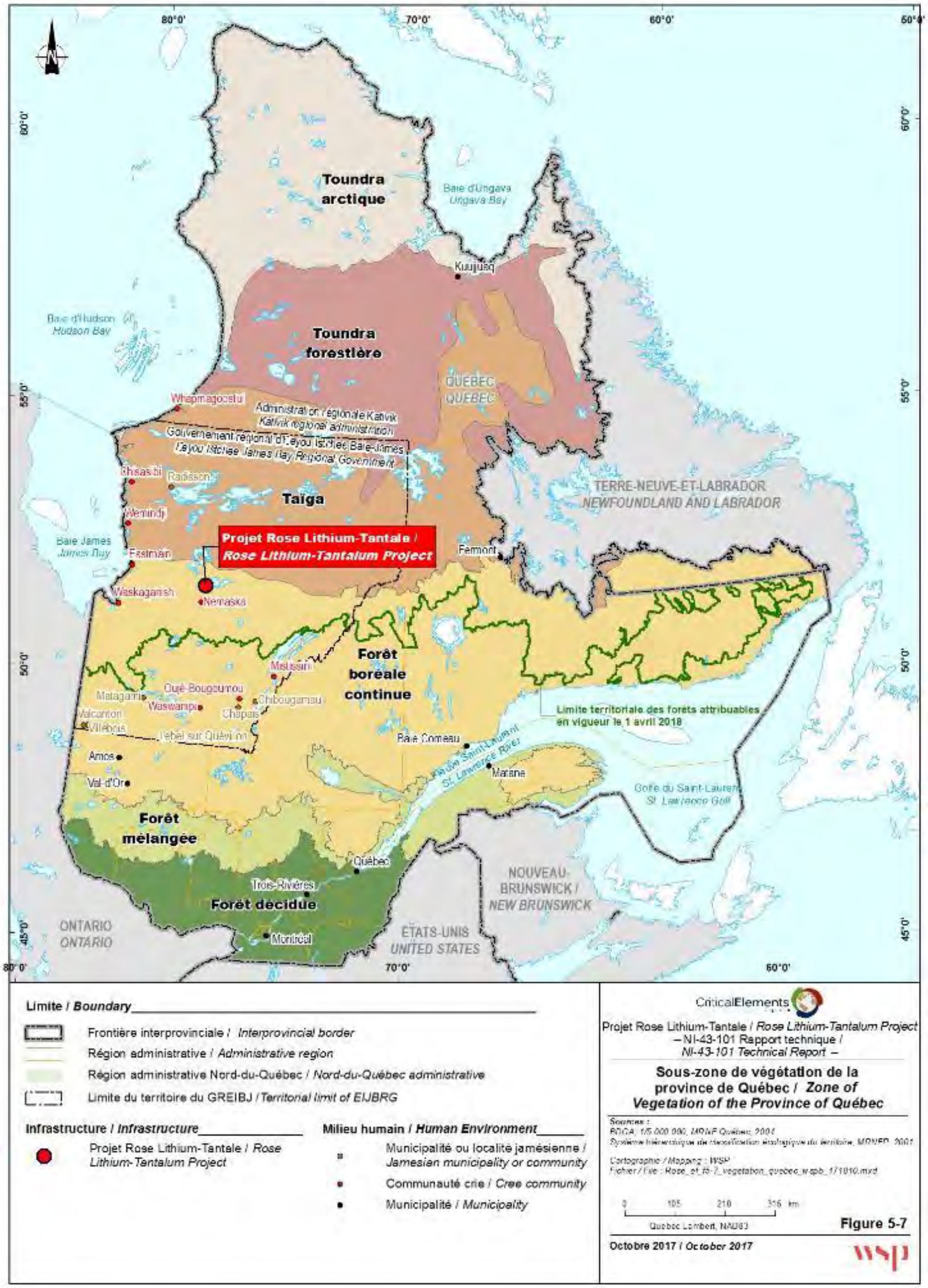
Field surveys have confirmed the presence of 12 fish species within the study area (WSP, 2017a). No species at risk were captured during surveys. Species caught are: white sucker, northern pike, yellow perch, lake whitefish, yellow walleye, brook trout, burbot, lake chub, pearl dace, longnose dace, mottled sculpin, and slimy sculpin. According to the Act respecting Hunting and Fishing Rights in the James Bay and Northern Québec Territories, lake sturgeon, white sucker, burbot, and lake whitefish are strictly limited to the use of First Nations.

Several herpetofauna species were observed during field surveys: american toad, northern spring peeper, mink frog, green frog, wood frog, northern two-lined salamander, and common garter snake. No species at risk were observed.

The various field surveys confirmed the presence of 87 bird species belonging to 30 families (WSP, 2017b). Nine species were confirmed to have the breeding status, 21 species the probable breeding status, and 38 the possible status. Five bird species at risk were observed in the study area: peregrine falcon, rusty blackbird, bald eagle (immature), short-eared owl, and common nighthawk.

Mammals found in the vicinity of the Project include moose, bear, fox, and caribou (woodland and migratory ecotypes).

Figure 5.6: Zones of Vegetation in the Province of Québec



5.4 Climate and Operating Season

Because of its continental location approximately 200 km east of James Bay, the Project area receives less precipitations than other regions located at similar latitude along the shore. The climate is sub-arctic, characterized by long cold winters and short cool summers. Break-up usually occurs early in June and freeze-up in early November.

Weather conditions have been recorded at La Grande Rivière A since 1975 (Table 5.1).

Table 5.1: Weather Station Located near the Project

Weather Station	Latitude	Longitude	Altitude (m)	Distance from Project (km)	Recording Period
La Grande Rivière A	53°38'00" N	77°42'00" W	194.8	205	1971-2010

Data recorded at the above weather stations include air temperature, wind speed, wind direction, precipitations and relative humidity. Each station records some of the data for part of the year.

On average, the Project site gets about 444 mm of rain and 267 cm of snow per year. Prevalent winds come from the south-east at an average speed of 15 km/h. Average wind speeds are fairly constant over the year, varying between 14 and 16 km/h.

Average annual temperature ranges between -23ºC in January and 14ºC in July (Table 5.2). The coldest temperature recorded at La Grande Rivière A weather station was -45ºC, while the warmest was 35ºC (WSP, 2017c).

Access to the Project is available year-round.

Table 5.2: Average Air Temperature between 1971 and 2000 – La Grande Rivière A Weather Station

Month	Average (°C)	Maximum (°C)	Minimum (°C)
January	-23.2	-18.3	-28.0
February	-21.6	-15.8	-27.4
March	-14.6	-8.2	-20.9
April	-4.9	0.7	-10.5
May	4.3	10.3	-1.6
June	10.5	17.1	3.9
July	13.7	20.0	7.4
August	12.9	18.4	7.4
September	7.4	11.6	3.1
October	1.2	4.4	-2.0
November	-6.3	-3.3	-9.4
December	-17.1	-13.0	-21.2

Source: Environment Canada 2011

5.5 Local Resources and Infrastructures

5.5.1 Local Resources

Limited services are available along the Billy Diamond Road and the Route du Nord. At km 290 of Route du Nord, the Cree Construction Company offers fuel and repair services. Also, fuel, food, and lodging can be obtained in the Cree village of Nemaska. Food and limited lodging may be available at the Eastmain-1 power station, provided prior arrangements have been made to that effect with Hydro-Québec. Eeyou-Istchee surrounding communities are shown on Figure 5.7.

The nearest significant communities to the Project are the towns of Chibougamau (population: 8,000) located 265 km south-east of the Property (350 km by road), and Matagami (population: 1,500) located 270 km south-west of the Property (430 km by road). They are major supply centres for regional resource-based industries.

5.5.2 Infrastructure

The Corporation maintained an exploration camp on the Project in recent years, with capacities adapted to drilling campaigns requirements. All equipment and supplies required for the exploration camp are brought on site via road transportation. Drill core samples are sent directly to Val-d'Or for storage. The Project is not fenced and no other infrastructures are currently found at the site.

Hydro-Québec established a camp, 24 km north of the Project on the Eastmain-1 Road, to service the workers' needs during the construction of the Eastmain1 power station. This camp had a capacity to lodge over 2,500 workers, but it is now dismantled. A much smaller camp was built on the same site in recent years for Eastmain-1 power station workers, with a much smaller capacity (around 150 people). Critical Elements will build is own camp to accommodate construction and operation near the mine site.

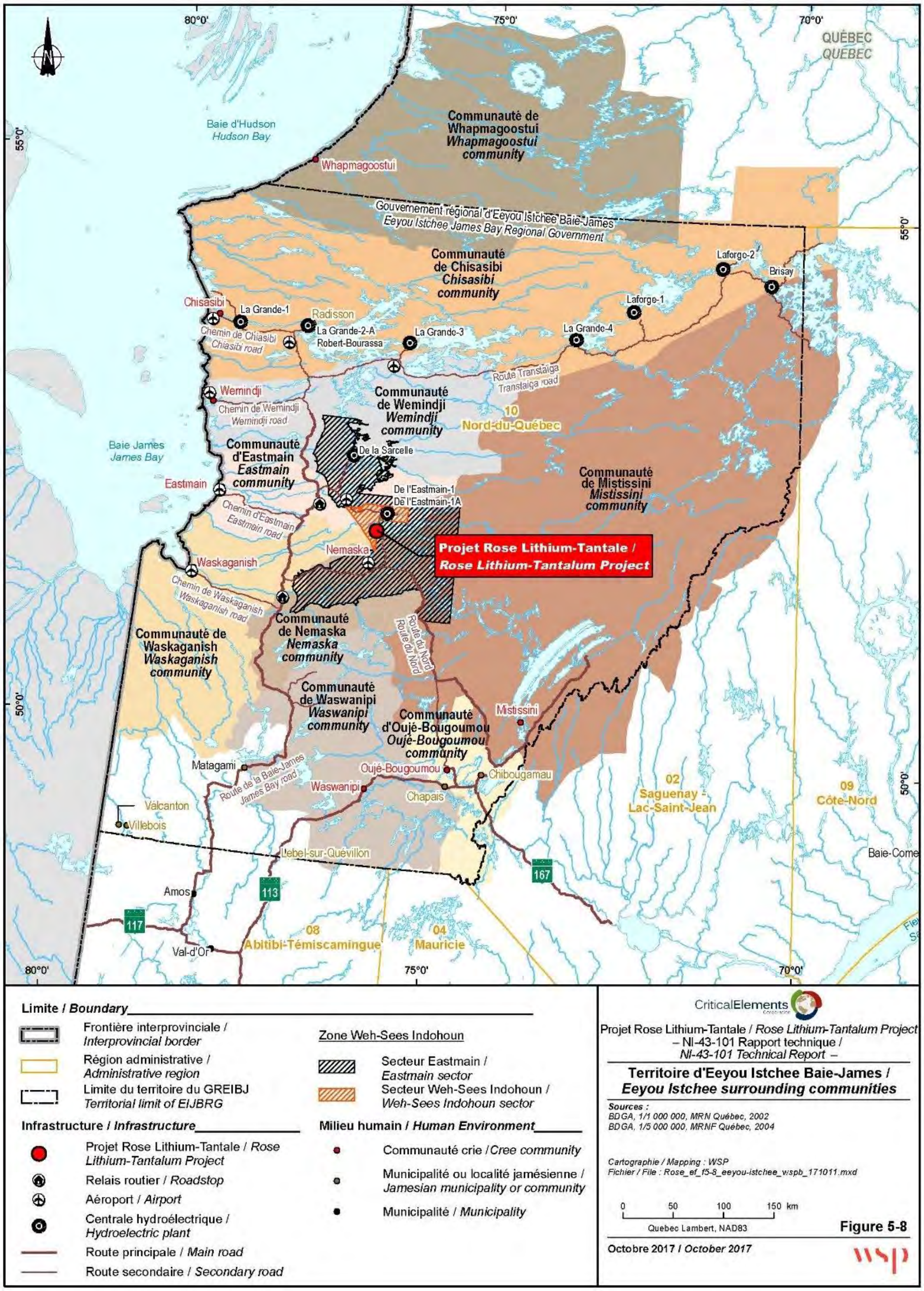
5.5.3 Power

Hydro-Québec owns several infrastructures and facilities in the area including the EM1-Nemiscau 315 kV transmission line, which bisects the proposed Project open-pit from north to south, and a 735 kV transmission line located some 3.5 km south of the Property.

Development of the proposed open-pit will require dismantling five towers of the 315 kV line (length of 2.7 km) and installing 11 new ones (4.2 km), east side of the open-pit. Pre-project studies for the site connection and the 315 kV transmission power line relocation were done in 2018. The energy block application to Hydro-Québec has been filed as requested in the new government directive. Once the energy block is granted and the agreements with Hydro-Québec are reached, the pre-project study will be updated and executed.

For security reasons related to mine blasting operations, a safety distance of 500 m from open-pit walls to the existing and new towers is complied with. Furthermore, usual precautionary measures during blasting, such as the use of proper stemming within boreholes collars, road signage warning of imminent blasting, banning of radio-transmission during blasting, will need to be applied to prevent damages that could arise from fly rocks.

Figure 5.7: Eeyou-Istchee Surrounding Communities



6 HISTORY

Most of the historical work prior to 2005 consisted of regional surveys conducted by the Government of Québec or by a few mining companies. Recently, there has been a bit more activity from mining companies in the area. Table 6.1 summarizes historical work declared as assessment work by mining companies working on, or in the vicinity of, the Property. Drilling from 2009 to 2016 is furthermore detailed in Item 10 - Drilling.

Only one historical drillhole is known to have been drilled on the current Property. Hole 555-09 was drilled by Dios Exploration in 2008 to test a magnetic anomaly. The hole intercepted biotite granitic gneiss followed by feldspar-porphyric diorite. No samples were assayed, and the core was left at the drill site.

Critical Elements started drilling on the Property in December 2009 under the name First Gold Exploration Inc. and acquired 100% interest in the Rose Tantalum- Lithium Project in November 2010 from J.-S. Lavallée, J-R Lavallée and Fiducie Familiale St-Georges. Details concerning the current ownership of the Property are presented in Item 4.2 of the present Technical Report.

Table 6.1: Historical Work on the Rose Property

Year	Company	Work	Reference
1936	Dome Mines Ltd	Geological survey; Drilling (outside the property)	GM 09863-A
1962	MRN	Geological survey	RP 483(A)
1963	MRN	Geological survey	CARTE 1510
1968	MRN	Geological survey	RG 136(A)
		Geological survey	RG 136
1972	Caron, Dufour, Séguin & Associates	Technical evaluation; Compilation	GM 34000
1974	MRN	Geochemistry	DP 419
		Geological survey	DP 278
	SDBJ	Geological survey; Geochemistry	GM 30960
		Geological survey; Ground Geophysics	GM 34071
		Geochemistry	GM 34044
		Technical evaluation	GM 34002
1975	MRN	Geological survey	DP 329
	SDBJ	Technical evaluation; Compilation	GM 34001
		Geochemistry	GM 34046
		Airborne geophysics	GM 34073
1976	MRN	Geological survey	DP 358
	SDBJ	Geochemistry	GM 34047
1978	MRN	Geological survey	DPV 574
		Geological survey	DPV 585
1979	SDBJ	Technical evaluation	GM 38167
1980	SDBJ	Geological survey; Geochemistry	GM 37998
1985	MRN	Geochemistry	MB 85-11
1990	MSV Resources Inc.	Airborne geophysics	GM 49771
1994	MRN	Technical evaluation	PRO 94-05
1995	MRN	Technical evaluation; Geological survey	PRO 95-06
1996	MRN	Geochemistry	MB 96-22
1998	MRN	Geochemistry; Geological survey	MB 98-10
1999	MRN	Compilation; Geological survey	MB 99-35
2000	MRN	Geological survey	RG 2000-04
2003	MRN	Geological survey; Compilation	ET 2002-05
		Geological survey; Compilation	ET 2002-06
2005	De Beers Canada Inc.	Airborne geophysics	GM 63031

Year	Company	Work	Reference
2006	Cambior Inc.	Geochemistry	GM 62452
		Technical evaluation	GM 62451
		Airborne geophysics	GM 62446
		Geochemistry	GM 62356
2007	Dios Exploration Inc. and Sirios Resources Inc.	Geochemistry	GM 62837
		Geological survey	GM 63046
		Ground and Airborne geophysics	GM 63034
	Iamgold Inc.	Geochemistry	GM 63267
	MRN	Compilation	PRO 2007-05
		Compilation	PRO 2007-06
	UQAC	Geological survey	ET 2007-01
2008	Dios Exploration Inc. and Sirios Resources Inc.	Geochemistry	GM 63475
		Technical evaluation; Geological survey	GM 63467
		Drilling (1 DDH on Block C)	GM 63907
	Iamgold Inc.	Geochemistry; Geological survey	GM 63606
	MRN	Compilation	EP 2008-02
		Compilation	PRO 2008-03
		Compilation	PRO 2008-04
	Virginia Mines Inc. and IAMGOLD Inc.	Airborne geophysics	GM 63781
2009	MRN	Compilation	EP 2009-02
		Geological survey	RP 483

7 GEOLOGICAL SETTING AND MINERALIZATION

The Property is located in the northeastern part of the Archean Superior Province (Figure 7.1) of the Canadian Shield, more precisely within the Middle and Lower Eastmain Greenstone Belt (MLEGB).

Much of the information presented in Item 7 was borrowed and modified from Card and Poulsen (1998), which provides a thorough description of the regional geology, and from Moukhsil et al. (2007), which synthesizes the geology and metallogenesis of the MLEGB. Other sources were also used to complete the description of the geological setting, such as assessment reports, the authors' personal knowledge of the region, and information provided by the issuer.

Figure 7.1: Map of the Superior Province Showing Subdivisions

Source : Map from Goutier et al. (2002), based on Card and Ciesielski (1986) and Thurston (1991)

7.1 Regional Geological Setting (Archean Superior Province)

The Archean Superior Province forms the core of the North American continent and is surrounded and truncated on all sides by Proterozoic orogens, the collisional zones along which elements of the Precambrian Canadian Shield were amalgamated (Hoffman, 1988, 1989). The Superior Province represents two million square kilometres free of significant post-Archean cover rocks and deformation (Card and Poulsen, 1998). Tectonic stability has prevailed since ca. 2.6 Ga in large parts of the Superior Province (Percival, 2007). The rocks of the Superior Province are mainly Mesoarchean and Neoarchean in age and have been significantly affected by post-Archean deformation only along boundaries with Proterozoic orogens, such as the Trans-Hudson and Grenville orogens, or along major internal fault zones, such as the Kapuskasing Structural Zone. The rest of the Superior Province has remained stable since the end of the Archean (Goodwin et al., 1972).

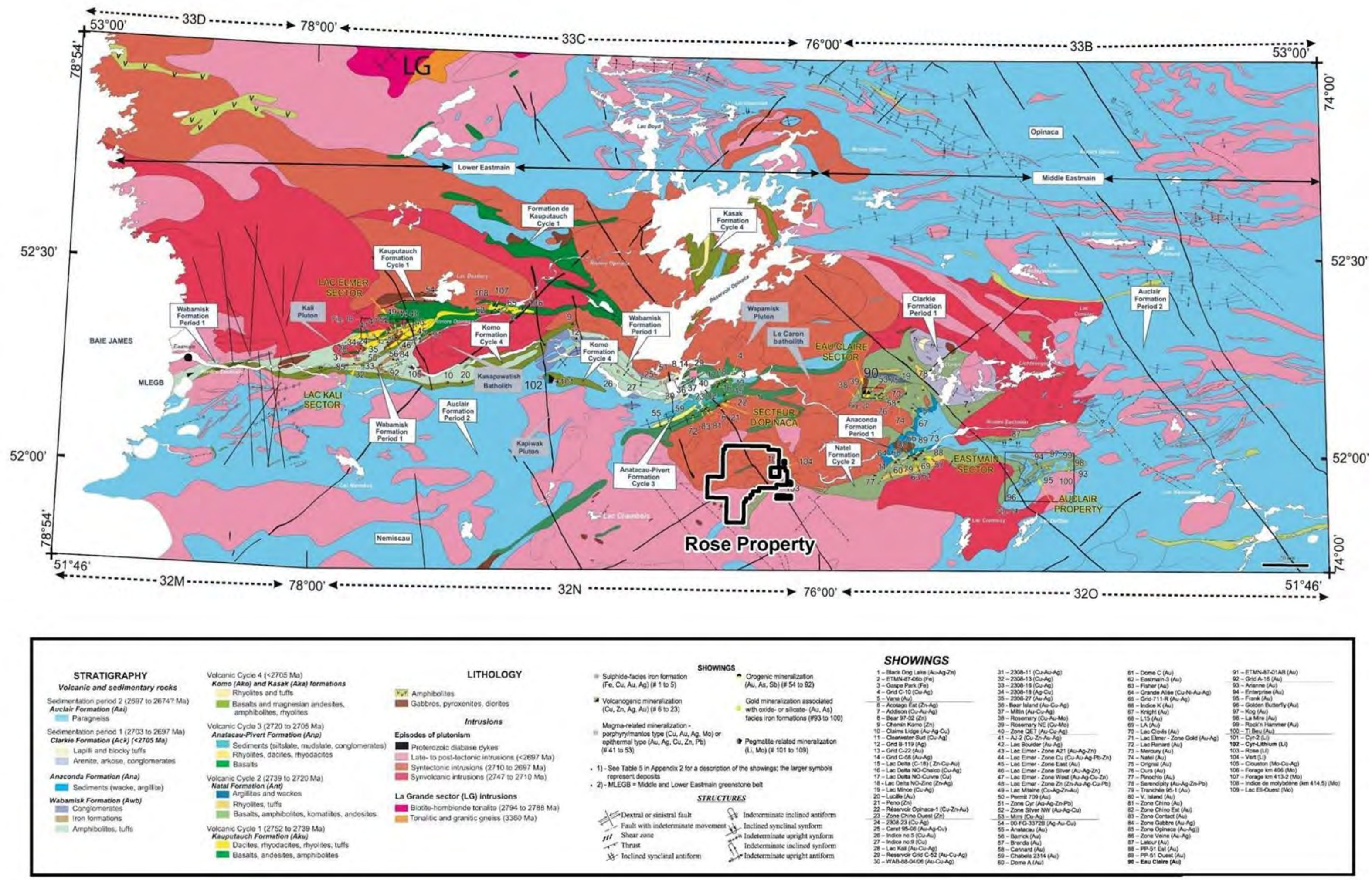
Proterozoic and younger activity is limited to rifting along the margins, emplacement of numerous mafic dyke swarms (Buchan and Ernst, 2004), compressional re-activation, large scale rotation at ca. 1.9 Ga, and failed rifting at ca 1.1 Ga. With the exception of the northwest and northeast Superior margins that were pervasively deformed and metamorphosed at 1.9 to 1.8 Ga, the craton has escaped ductile deformation. A first-order feature of the Superior Province is its linear subprovinces of distinctive lithological and structural character, accentuated by subparallel boundary faults (Card and Ciesielski, 1986). Trends in the Superior Province are generally easterly in the south, westerly to northwesterly in the northwest, and northwesterly in the northeast (Figure 7.1). The southern Superior Province (to latitude 52°N) is a major source of mineral wealth. Owing to its potential for base metals, gold and other commodities, the Superior Province continues to attract mineral exploration in both established and frontier regions.

7.2 Local Geological Setting (Middle and Lower Eastmain Greenstone Belt)

The MLEGB is located in the middle of the James Bay region, about 420 km north of Matagami (Figure 7.2). This greenstone belt trends approximately E-W and extends over an area 300 km long and 10 to 70 km wide (Moukhsil et al., 2007).

The MLEGB consists of volcano-sedimentary rock sequences derived from volcanic eruptions in an oceanic environment (i.e. mid-ocean ridges, oceanic platforms and volcanic arcs) that were subsequently injected by calc-alkaline intrusions of gabbroic to monzogranitic composition. Like the Abitibi Greenstone Belt, the MLEGB has no basement, sensu stricto. The La Pêche Pluton is the oldest intrusion, dated at 2747 +3/-2 Ma (Moukhsil and Legault, 2002), compared with 2751 +0.6/-0.8 Ma for the Kauputauch Formation (Moukhsil et al., 2001). The volcanism of the Eastmain sector therefore occurred in the absence of an ancient felsic crust (basement sensu stricto), as is evidenced by inherited zircon ages from volcanic rocks that range from 2745 to 2713 Ma and from intrusions that crosscut the MLEGB (2747 to 2723 Ma) (Moukhsil, 2000; Moukhsil et al., 2001). This contrasts sharply with the eruptive setting of the volcanic rocks of the La Grande Belt (2800 to 2738 Ma) (Figure 7.1), which was emplaced in the presence of an ancient (3520 to 2810 Ma) tonalitic protocraton (Goutier et al., 1999a,b and 1998a,b). Proterozoic activity in the MLEGB was limited to the injection of N-S, NW-SE and NE-SW diabase dykes.

Figure 7.2: Location of the Rose Property within the Geological Setting of the Middle and Lower Eastmain Belt



Source: Moukhsil et al., 2007

Note: The approximate location of the Rose Property is shown in black. The distortion when compared to other figures in this report is due to the different projection used by Moukhsil et al. (2007)

At least three deformation phases can be recognized within the MLEGB (Moukhsil et al., 2007). The first phase (D1), with an estimated age of 2710 to 2697Ma (minimum ages of syntectonic intrusions), is associated with roughly E-W schistosity (S1). The second phase (D2), with an estimated age of 2668 to 2706 Ma (Moukhsil and Legault, 2002), is associated with NE-SW schistosity (S2), roughly N-S in several areas. The D2 deformation phase is responsible for the second NNE-SSW shortening in the James Bay area and is probably equivalent to the event that occurred around 2690 Ma in Opatica (Boily, 1999). The third phase (D3), whose age is estimated at <2668 Ma (age of metamorphism), affects the syn- to post-tectonic intrusions, among others. This deformation phase was non-penetrative and less evident on a regional scale. However, it is more pronounced in the metasedimentary rocks where it trends WNW-ESE to NW-SE. The MLEGB was affected by a set of faults or shear zones. Most of these faults are spatially linked to the mineral occurrences found in the MLEGB. There are three possible orientation systems for the distribution of these structures. The first system runs E-W, the second ENE-WSW and the third NW-SE. Since the principal schistosity (S1) is E-W, Moukhsil et al. (2007) postulate that the E-W-trending faults predate the other faults. The relationship between the two other systems is not clear, but it appears that the NE-SW-trending faults predate the NW-SE-trending faults in the Lake Elmer section (Moukhsil et al., 2007).

There are several major tight to isoclinal regional-scale folds (Moukhsil and Doucet, 1999). Franconi (1978) prepared a synthesis on this topic, concluding that the MLEGB features a large synclinorium with an E-W axis, whose core is occupied by the rocks of Opinaca.

Metamorphism ranges from greenschist to amphibolite facies. Gauthier and Laroque (1998) and Moukhsil (2000) identified a metamorphic front characterized by large folds overturned to the south at the contact between Nemiscau metasediments and MLEGB volcanics. Contact metamorphism is amphibolite facies, especially around syn- to post-tectonic intrusions. Granulite facies has been identified mainly in the middle of the sedimentary basins of Nemiscau and Opinaca. Locally, a few orthopyroxene grains are observed in the paragneisses of the Auclair Formation (Moukhsil and Legault, 2002).

7.3 Property Geology

The Property is located in the southern portion of the Middle and Lower Eastmain Greenstone Belt (Figure 7.3).

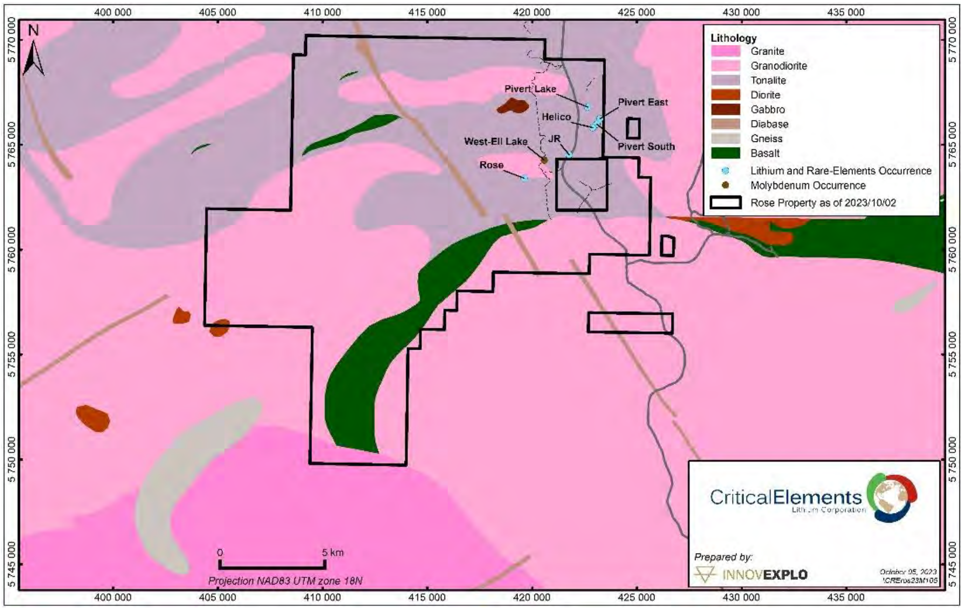
Although the MLEGB shows a wide variety of rock types, most of the Property is underlain by intrusive lithologies. Based on the regional geology interpretation of Moukhsil et al. (2007), these are mainly syntectonic (2,710 to 2,697 Ma), with lesser volumes of late to post-tectonic intrusions (<2,697 Ma).

Gabbros, pyroxenites, and diorites cut across the Property geology. Pegmatites occur as irregular but generally continuous lenses within biotite schists. Historical work in the 1960s by the Ministère des Ressources naturelles du Québec (MRNQ), now the Ministère de l'Énergie et des Ressources naturelles (MERN), followed by additional regional-scale government work, uncovered four showings on the Property, two of which (Rose and Pivert) have been examined more closely by the issuer. Both are showings of lithium and rare-element mineralization in pegmatites.

Other rock types, including gneiss, dacite, quartzite and conglomerate, have also been reported. Lithologies are generally well foliated with a SE orientation, except for the more massive and unfoliated granites and pegmatites.

Mineralization recognized to date on the Property includes rare-element LCT-type pegmatites (Block A) and molybdenum occurrences (Block A). An iron occurrence (Block B) is also mentioned in the government database.

Figure 7.3: Geology of the Rose Property Area



7.3.1 Pivert Showing

First discovered in 1961 by the MRNQ, the Pivert showing was later revisited during the MRNQ's regional mapping program in 2001. The showing is approximately 4.6 km south of Pivert Lake on Block A.

The MRNQ recognized lithium and beryllium mineralization in a pegmatite dyke hosted by paragneiss units. The pegmatite dyke was described as being approximately 10 m wide and of unknown length because it only cropped out for a few metres. It contains approximately 20% spodumene (lithium aluminum silicate), with crystals up to 20 cm long. Beryl (beryllium aluminum silicate) and molybdenite (molybdenum sulphide) were also noted. A grab sample taken from the MRNQ yielded 1.16% Li and 74 ppm Be.

7.3.2 Rose Deposit

Like the Pivert showing, the original Rose showing was discovered in 1961 by the MRNQ and revisited during a regional MRNQ mapping program in 2001. It is approximately 2.3 km southwest of Pivert on Block A.

The MRNQ's description of the Rose showing in 1961 was similar to the description for Pivert: lithium and beryllium in pegmatite dykes hosted by melanocratic gabbro. In contrast to Pivert, where only one pegmatite dyke was recognized at surface, Rose was described as several pegmatite dykes, with one up to 20 m wide.

The MRNQ reported that spodumene and lepidolite (potassium lithium aluminum silicate) constituted up to 40% of the pegmatites. A grab sample collected by the MRNQ yielded 0.21% Li and 129 ppm Be.

7.3.3 JR Showing

Discovered by Critical Elements while prospecting in the vicinity of the Rose and Pivert showings, the JR showing is approximately 2.4 km south-southwest from Pivert. It is easily accessible because it crops out on both sides of the main gravel road. It is now considered part of the Rose deposit.

7.3.4 Helico Showing

The Helico showing was discovered by Critical Elements while prospecting in the vicinity of the Rose and Pivert showings. It is located approximately 1 km SSE of the Pivert showing.

7.3.5 Pivert East Showing

The Pivert East showing was discovered by Critical Elements while prospecting in the vicinity of the Rose and Pivert showings. It is located approximately 1 km SE of Pivert.

7.3.6 Pivert South Showing

The Pivert South showing was discovered by Critical Elements while prospecting in the vicinity of the Rose and Pivert showings. It is located approximately 1 km SE of Pivert.

7.3.7 Other Occurrences

Another occurrence not mentioned in the government database is present on the property: a molybdenite- and spodumene-bearing pegmatite dyke on the side of the main gravel road (UTM83, Zone18: 422188E, 5765993N), midway between the Pivert (900 m NE) and JR showings (1.5 km SSW) (Figure 7.4). Molybdenite and spodumene were observed in the pegmatite, which cuts through a deformation zone without showing any signs of being affected by it.

No samples were analyzed, but its presence suggests other occurrences are likely in the area.

Figure 7.4: Another Pegmatite Occurrence (a road cut) in the Vicinity of the Rose and Pivert Showings

Photo taken during site visit

8 DEPOSIT TYPES

The Middle and Lower Eastmain Greenstone Belt (MLEGB) contains more than a hundred mineral showings exhibiting a variety of ages, host rocks, styles (disseminated sulphides, massive sulphides, veins and dykes) and metal suites.

The mineral occurrences of the MLEGB have been divided into six types according to Moukhsil et al. (2007):

- Type 1: Sulphide facies iron formation;
- Type 2: Volcanogenic mineralization;
- Type 3: Magma-related mineralization;
- Type 4: Orogenic mineralization;
- Type 5: Gold-bearing mineralization associated with oxide- or silicate-facies iron formations;
- Type 6: Pegmatite-related mineralization

Types 1 to 3 are associated with an episode of volcanic arc construction (volcanic cycles 1 to 4). Types 4 and 5 are contemporaneous with major deformation events (D1 and D2), whereas Type 6 is associated with post-tectonic intrusions.

Based solely on its geological environment, the Property has the potential to host a number of deposit types. However, based on the known discoveries, only the type recognized in Type 6 (Rare-Element LCT-type Pegmatite) will be discussed herein.

Pegmatites constitute a category of granite-related ore deposits that are distinct from the magmatic ores disseminated within granites and from hydrothermal assemblages. Granitic pegmatites have been the subject of numerous attempts at classification, but Cerny and Ercit (2005) provided the most recent update. These authors stipulate that, in addition to geochemical composition, the geological location should also be taking into account in the classification of granitic pegmatites, leading to the following division of five classes:

- Abyssal
- Muscovite
- Muscovite – rare-element
- Rare-element
- Miarolitic

Most of these classes can be subdivided into subclasses with fundamentally different geochemical (and in part geological) characteristics. Further subdivision of most subclasses into types and subtypes is based on more subtle differences in geochemical signatures or pressure and temperature conditions of solidification, expressed as different accessory mineral assemblages. The second approach proposed by Cerny and Ercit (2005) is petrogenetic and developed for pegmatites derived by igneous differentiation from plutonic parents. Three families are distinguished:

- An NYF family with progressive accumulation of Nb, Y and F (besides Be, REE, Sc, Ti, Zr, Th, and U), fractionated from subaluminous to metaluminous A- and I-type granites that can be generated by a variety of processes involving depleted crust or mantle contributions.
- A peraluminous LCT family marked by prominent accumulation of Li, Cs and Ta (besides Rb, Be, Sn, B, P, and F), derived mainly from S-type granites, less commonly from I-type granites.
- A mixed NYF + LCT family of diverse origins, such as contamination of NYF plutons by digestion of undepleted supracrustal rocks.

8.1 General Model for Rare Element LCT-Type Pegmatites

Based on the pegmatite classification in Cerny and Ercit (2005) and the assay results from the Property, the pegmatites recognized to date are clearly of the rare-element LCT-type. Thus, only this subtype will be discussed further.

8.1.1 General Characteristics

According to Cerny et al. (2005), rare-element pegmatite deposits of the LCT family are encountered in orogens from the early Archean to very recent; i.e. from ~3 Ga (Trumbull, 1995) to 6.8 Ma (Pezzotta, 2000). The granite-pegmatite suites are syn- to late orogenic and related to fold structures, shears and fault systems. The pegmatites vary greatly in form, controlled mainly by the competency of the enclosing rocks, the depth of emplacement, and the tectonic regime during and after emplacement. The pegmatites rarely occur within their parent granites, but in such cases they form swarms or networks of fracture-filling dykes hosted by contraction fractures or structures generated by post-consolidation stresses (e.g. Ginsburg et al., 1979). Most of the deposits are hosted by schists and gneisses, and their shapes vary from lenticular, ellipsoidal, turnip- or mushroom-like forms in plastic environments, to fracture-filling dykes and stocks in brittle host rocks (e.g. Cameron et al., 1949). The length of a mineralized pegmatite intrusion is typically tens to hundreds of metres, but they may attain several kilometres (Greenbushes, Australia; Partington et al., 1995), and interconnected dyke systems are known to be up to 12 km long (Manono, Zaire; Thoreau, 1950).

An important pattern emerges in the generalized scenario and especially in the zoning sequences for individual pegmatite districts (Cameron et al., 1949; Norton, 1983; Cerny et al., 2005). The minerals present in each zonal assemblage decrease in number from the margins (border and wall zones) to the central or latest primary unit, termed the core. Assemblages of the border and wall zones typically consist of quartz-plagioclase-microcline-muscovite-biotite-garnet-tourmaline-(beryl-apatite), and the internal zoning sequence usually ends with nearly monomineralic masses of microcline followed by a monomineralic quartz core. Crystallization along a liquidus surface, wherein the number of coexisting phases increases with decreasing temperature, produces the opposite trend in the sequence of mineral assemblages (e.g. Burnham and Nekvasil, 1986).

The shape and attitude of pegmatite intrusions have considerable control over the internal structure of the deposits (Cerny et al., 2005). Homogeneous bodies are exceptional, and a primary oriented fabric is generally restricted to the albite-spodumene type (e.g. Oyarzábal and Galliski, 1993). The pegmatites are largely concentrically zoned or layered, or they display a combination of both features (Cameron et al., 1949; Beus, 1966; Cerny, 1991b). Concentric patterns typical of substantially three-dimensional bodies can be extensively disturbed in flat pegmatites. Sub-vertical dykes commonly exhibit telescoping of strongly asymmetric zoning patterns, with the inner zones prominently shifted upward. The zoning progresses from finer grained zones of more or less granitic composition on the outside to inner zones that exhibit enrichment in rare-element mineralogy and textural diversity, but some are also near-monomineralic.

In conjunction with the accumulation of rare-element mineralization in the inner zones, complex pegmatites also show inwardly increasing geochemical fractionation in rock-forming minerals (e.g. Cerny et al. 1985; Cerny, 2005; London, 2005, which serves as an important exploration guide (e.g. Cerny, 1992).

More detailed descriptive information on general features of granitic pegmatite deposits, including mineralogy, geochemistry, REE abundances, and fluid inclusion studies can be found in Cameron et al. (1949), Beus (1966), Solodov (1962), Cerny (1989a, 1991b), and Cerny et al. (1998).

8.1.2 Emplacement of Pegmatite Melts

Passive emplacement of pegmatite magma was historically advocated by many authors, but structural-geological analysis contradicts this interpretation (Cerny et al., 2005). Forcible intrusion is indicated in all closely examined cases (Brisbin, 1986) and relevant theoretical considerations and experiments (e.g. Rubin, 1995a, b). Beus (1966) arrived empirically at 2 km for the maximum distance of a pegmatite from its parent granite. In contrast, Baker (1998) considers the magma pressure in the parental chamber sufficient to propel low-viscosity pegmatite melts up to 10 km from the source.

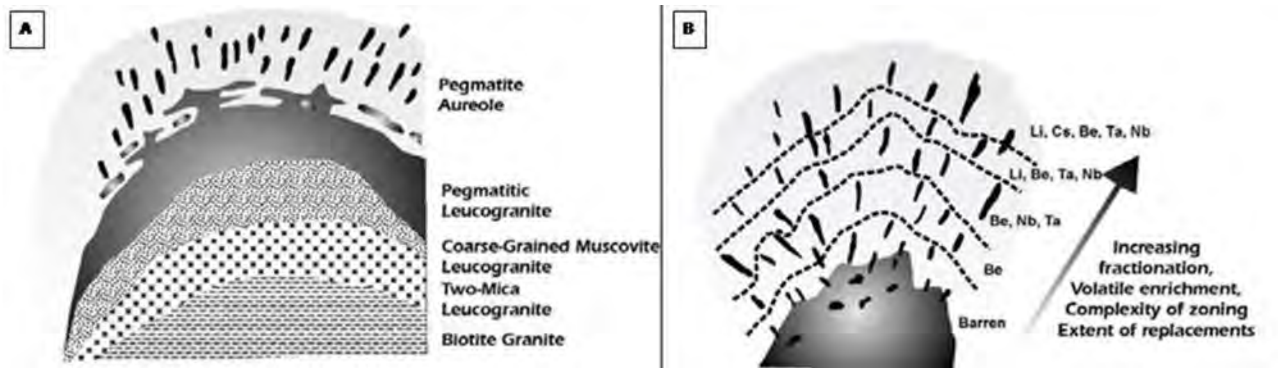
Increasing contents of Li, B, P, F, and H2O reduce polymerization, increase fluidity and mobility, and enhance thermal stability of pegmatite melts to lower temperatures (Cerny et al., 2005). Thus, the pegmatite melts that are most enriched in volatiles and rare-elements can travel the farthest from their source (Figure 8.1). This explains the regional zoning of rare-element pegmatites around parental granites (Cerny, 1992. The Li-rich complex pegmatites in general and the lepidolite-subtype dykes in particular, are invariably the most distal ones relative to the parent plutons (Cerny et al., 2005). These categories of LCT rare-element pegmatites locally appear to be divorced from granites by interplay of host structures and erosional exposure. In individual pegmatite dykes, internal diversity in fluidity promotes geochemical and paragenetic telescoping (e.g. Beus, 1948; Cerny and Lenton, 1995).

Pegmatite dykes commonly occur as groups of similar pegmatite-types that originated from the same parent granite intrusion. A pegmatite field can occur over territories of hundreds to thousands of square kilometres when favourable conditions are met. Finally, pegmatite provinces are described as huge terranes characterized by commonality of geologic history that tend to generate arrays of pegmatite fields that are at least loosely related in time, structural style, and mode of origin. A more detailed definition of these terms is given by Cerny et al. (2005):

- A pegmatite group is a spatially and genetically coherent pegmatite population, generated by differentiation of a single granitic pluton. Pegmatite dykes interior, marginal, and exterior to a particular fertile granite intrusion may be neatly distributed around the plutonic parent, although asymmetric arrays are much more common (Fig. 8.1; Beus, 1966; Kuzmenko, 1976; Cerny, 1989b, 1990, 1991c; Cerny et al. 2005). Radiometric dating confirms in many cases the link between fertile granites and surrounding pegmatite dykes (e.g. Baadsgaard and Cerny, 1993; Trumbull, 1995; Breaks et al., 2005). The pegmatites tend to show different kinds and degrees of mineralization in a regional zonal pattern, concentric to unidirectional. The common progression from proximal to distal pegmatites is from barren to Be, Be-Nb-Ta, Li-Be-Ta-Nb, and Li-Cs-Be-Ta-(F) assemblages, with B, P, and Sn appearing at (and generally also increasing from) locally different stages. The zoning tends to be particularly strongly developed vertically, with the most evolved pegmatites at the top of the three-dimensional array. Locally, the more evolved pegmatites are relatively late, as they crosscut the primitive dykes (e.g. Cerny, 1991c, 1992b).
- Pegmatite fields are the results of favourable conditions for partial melting that generate fertile granites and are regional in scale, and they commonly lead to intrusion and differentiation of multiple fertile plutons over territories of hundreds to thousands of square kilometres (Cerny et al., 2005). The ensuing pegmatite fields contain granite-pegmatite suites that are more or less closely related, having been mobilized and differentiated from related or identical metamorphic protoliths during a single anatectic event. This results in similarities in mineral assemblages and geochemical signatures of the granite-pegmatite groups.
- Pegmatite provinces are huge terranes characterized by commonality of geologic history that tend to generate arrays of pegmatite fields that are at least loosely related in time, structural style, and mode of

origin; geologic provinces locally represent rare-element pegmatite provinces of enormous dimensions (Landes, 1935; Gordiyenko, 1974; Ginsburg et al., 1979; Cerny, 1991a, c).

Figure 8.1: Regional Zoning in Fertile Granites and Pegmatites



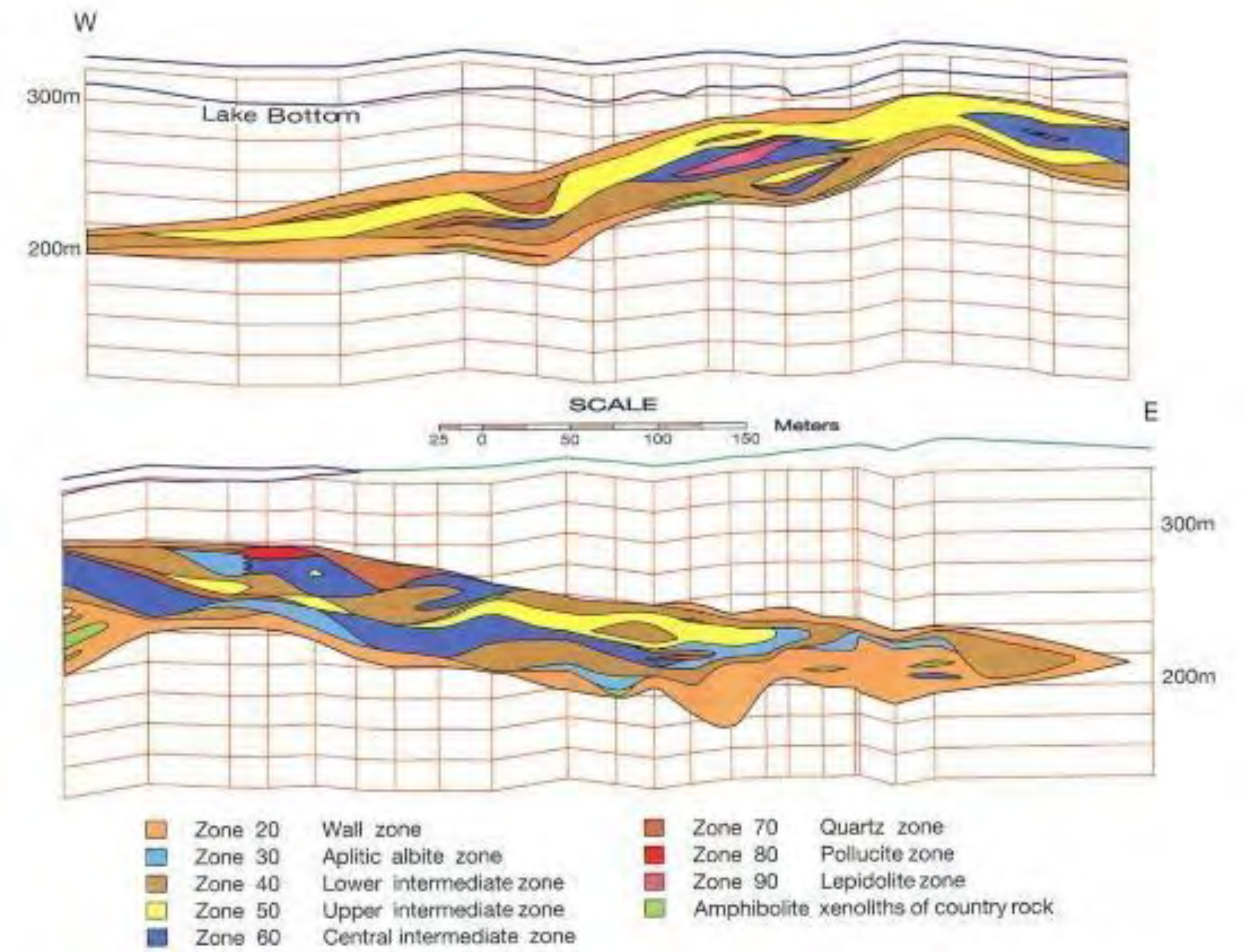
(Modified from Cerny, 1991b and Selway et al., 2005)
Notes: A) Regional zoning of a fertile granite (outwardly fractionated) with an aureole of exterior lithium pegmatites.
B) Schematic representation of regional zoning in a cogenetic parent granite and pegmatite group. Pegmatites increase in degree of evolution with increasing distance from the parent granite.

8.1.3 Well-Studied Pegmatite Ore Deposits

Two examples of well-studied pegmatite deposits showing similarities with the known Rose pegmatites are presented here as a reference. At the current exploration stage of the Property, the extent of the mineralized pegmatites has not yet been fully investigated. Therefore, the authors do not make any assumption that the Rose pegmatites are comparable in terms of tonnage and/or grade to the deposits presented in this Item. These deposits should be considered in light of their general characteristics and not in terms of their established economic characteristics.

The first example is the extensively studied Tanco deposit (Figure 8.2) in the Archean Superior Province of the Canadian Shield in southeast Manitoba. It is described in Cerny et al. (1998), Cerny (2005), Stilling et al. (2006) and Cerny et al. (2005). This 2640 Ma pegmatite is completely hidden and forms a subhorizontal lenticular body consisting of four concentric and five layered zones about 1.3 km long (Fig 8.2; Cerny et al., 2006). It belongs to an extensive series of cogenetic, closely associated pegmatites, but the parent granite is not exposed. However, nearby pegmatite groups of similar character show a clear connection to pegmatitic leucogranites. Near-extreme igneous fractionation of Rb, Cs, Ga, and Ta characterizes Tanco, which is enriched in these metals as well as Li, Be, B, and P, and a variety of industrial minerals. Nevertheless, the overall composition of the pegmatite is close to granitic, despite the assemblage of approximately 100 minerals (Stilling et al., 2006). Petalite, largely decomposed into secondary spodumene + quartz, dominates over minor late primary spodumene and over subordinate amblygonite-montebrasite and lepidolite.

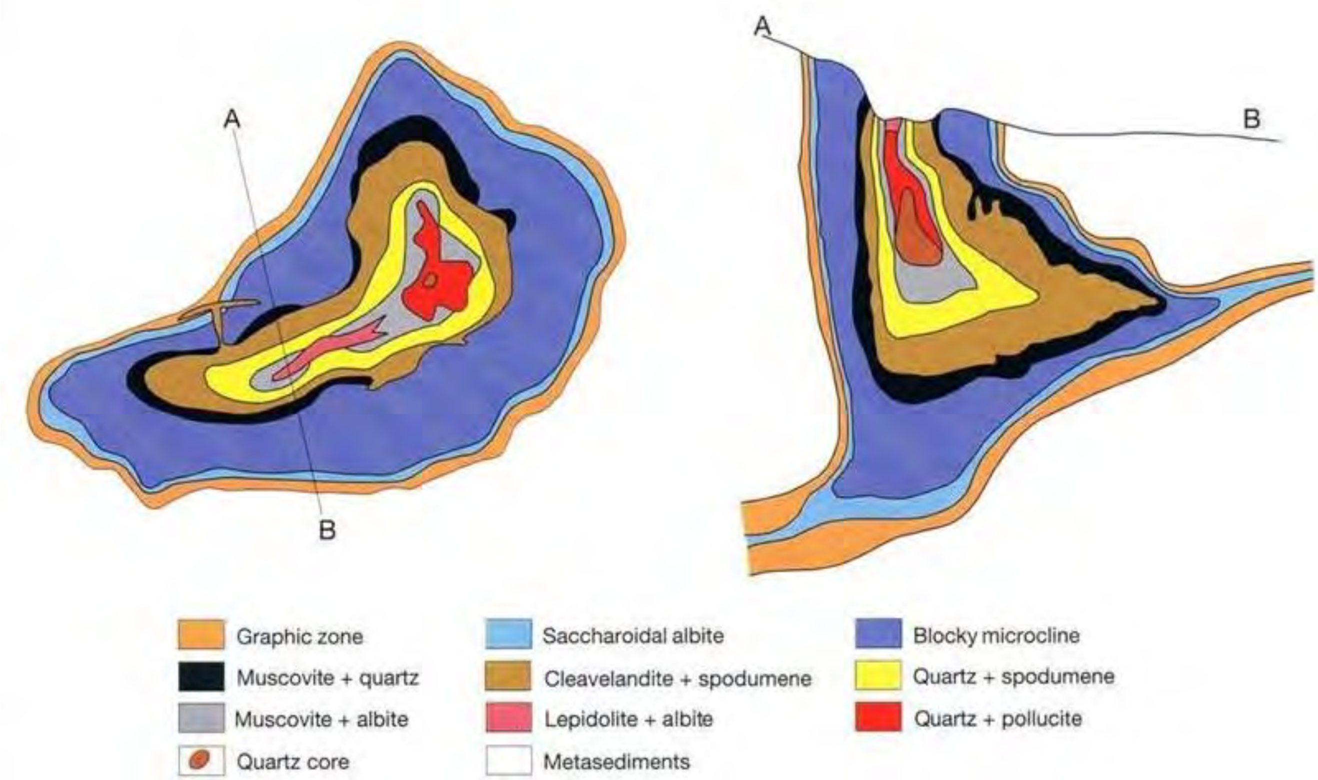
Figure 8.2: Longitudinal Fence Diagram (west to east section through the Tanco pegmatite)



Source: Modified from Stilling et al., 2006; Cerny et al., 2005
Note: The border zone (Zone 10) is too thin to be shown at this scale.

The second example is the Mongolian Altai 3 deposit (Figure 8.3), which shows extensive reserves of spodumene (Cerny et al., 2005). Mongolian Altai 3 (also known as Keketuhai, Keketuohai, or Koktogai), dated at 330 Ma, is located in the central part of an Altai Caledonian-Hercynian fold belt in northwest China. It belongs to an extensive suite of cogenetic leucogranites and pegmatites. The pegmatite forms a vertical plug with far-reaching sub-horizontal sheets branching from its base (Figure 8.3). Ten concentric zones show a classic progression from mineralogically simple outer assemblages to complex and then near-monomineralic associations in the interior. Multi-generational minerals show the same progressive fractionation pattern as in the Tanco pegmatite above.

Figure 8.3: Horizontal and Vertical Sections through the Mongolian Altai Pegmatite No. 3



Source: Modified from Lu et al., 1997; Cerny et al., 2005
Note: In the horizontal section at left, the pegmatite is approximately 150 x 250 m in size; the scale of the vertical section at right is slightly reduced.

8.2 Rare-Element Pegmatites from the Superior Province

Although Selway et al. (2005) reviewed only rare-element pegmatites in the Superior Province of Ontario and Manitoba, excluding the large portion of the Superior Province in Québec, the authors of this report consider the study to be applicable to the Québec portion of the Superior in which the Property is situated. The following text has been largely adapted from Selway et al. (2005).

According to Selway et al. (2005), rare-element pegmatite dykes within the Superior Province (in Ontario and Manitoba) usually cluster to form pegmatite fields that contain one or two large and highly fractionated pegmatites and numerous small pegmatite dykes. For example, the Bernic Lake pegmatite group, part of the Cat Lake-Winnipeg River pegmatite field in southeastern Manitoba, includes the Tanco pegmatite (1.99 km long x 1.06 km wide x 100 m thick; Stilling, 1998) and eight other smaller, less-fractionated pegmatite dykes (Cerny et al., 1981). The Separation Rapids pegmatite group lies to the east of the Cat Lake–Winnipeg River pegmatite within the same Bird River–Separation Lake metavolcanic belt (Breaks et al., 1975). The Separation Rapids pegmatite group contains two large highly fractionated pegmatites: Big Whopper (350 m in strike length x 60 m thick) and Big Mack (30 x 100 m; Breaks and Tindle, 1997 Breaks et al., 1999). The Big Whopper and Big Mack pegmatites are members of the Southwestern pegmatite subgroup, which contains at least 23 additional smaller pegmatite dykes. Additional large pegmatite fields in the Superior Province of Ontario with economic potential include: the Dryden pegmatite field, which includes the highly-fractionated Fairservice pegmatite dykes and Tot Lake pegmatite, and the Seymour Lake pegmatite group, which includes the highly-fractionated North Aubry and South Aubry pegmatites (Breaks et al., 2003). These pegmatites contain elevated Rb, Cs, Be, and Ta contents. The Case pegmatite in northeastern Ontario is unique in that it is a large, fractionated pegmatite with no identified associated smaller pegmatite dykes, likely due to thick overburden (Breaks et al., 2003).

Selway et al. (2005) also report on several geological features that are common among pegmatites of the Superior Province of Ontario (Breaks and Tindle, 2001; Breaks et al., 2003) and Manitoba (Cerny et al., 1981; Cerny et al., 1998):

- The pegmatites tend to occur along subprovince boundaries. For example, Tanco (Manitoba) and Separation Rapids (Ontario) pegmatites within the Bird Lake-Separation Lake metavolcanic belt occur along the boundary between the English River and Winnipeg River subprovinces; the beryl-phosphate Sandy Creek and McCombe pegmatites, and the Lilypad Lake pegmatite field occur along the Uchi–English River subprovincial boundary; the Dryden pegmatite field occurs within the Sioux Lookout Domain along the Winnipeg River–Wabigoon subprovincial boundary; and the North Aubry, South Aubry, and Tebishogeshik pegmatites occur along the English River–Wabigoon subprovincial boundary north of Armstrong.
- Most pegmatites in the Superior Province (in Ontario and Manitoba) occur along subprovince boundaries, except for those that occur within the metasedimentary Quetico Subprovince. Examples of pegmatites occurring in this area from west to east are: Wisa Lake (south of Atikokan), the Georgia Lake pegmatite field (north of Nipigon), and the Lowther Township (south of Hearst) pegmatites.
- Pegmatites are present at greenschist to amphibolite metamorphic grade. In Ontario and Manitoba, pegmatites are absent in the granulite terranes of the Quetico and English River subprovinces.
- Most pegmatites in the Superior Province (Ontario and Manitoba) are genetically derived from fertile parent granite. The Cat Lake–Winnipeg River pegmatite field (Manitoba) contains six leucogranite intrusions (Greer Lake, Eaglenest Lake, Axial, Rush Lake, Tin Lake, and Osis Lake) emplaced along east trending faults, which are parents to numerous pegmatites (Cerny et al., 1981; Cerny et al., 1998). In contrast, the Tanco pegmatite has no fertile granite outcropping in reasonably close vicinity that could be its potential parent (Cerny et al., 1998). The peraluminous Separation Rapids pluton (4 km wide) is the parent to the Separation Rapids pegmatite field, including Big Whopper and Big Mack pegmatites, north of Kenora, Ontario. The peraluminous Ghost Lake batholiths (80 km wide) is the parent to the Mavis Lake pegmatite group, including the Fairservice pegmatite dykes, north of Dryden, Ontario.
- Highly fractionated spodumene- and petalite- subtype pegmatites are commonly hosted by mafic metavolcanic rocks (amphibolite) in contact with a fertile granite intrusion along subprovincial boundaries, whereas numerous beryl-type pegmatites are hosted by metasedimentary rocks (metawacke or metapelite) of the Sioux Lookout Domain. Pegmatites within the Quetico Subprovince are hosted by metasedimentary rocks or their fertile granitic parents. For example, the spodumene-subtype Wisa Lake pegmatite is hosted by metasedimentary rocks south of Atikokan, Ontario. The MNW petalite-subtype pegmatite, north of Nipigon, Ontario, is enclosed within a medium-grained biotite-muscovite granite of the MNW stock, which is presumed to be its parent (Pye, 1965). The lepidolite-subtype Lowther Township pegmatite, south of Hearst, Ontario is enclosed within its parent garnet-biotite pegmatitic granite (Breaks et al., 2002). The spodumene-subtype Case pegmatite system is hosted by orbicular biotite tonalite in the southeastern part of the Case batholith north of Cochrane, Ontario, within the Opatica Subprovince.
- Biotite and tourmaline are common minerals within metasomatic aureoles in mafic metavolcanic host rocks to pegmatites. Tourmaline, muscovite, and biotite are common within metasomatic aureoles in metasedimentary host rocks.

- Most of the pegmatites of the Superior Province contain spodumene and/or petalite as the dominant Li mineral, except for the Lilypad Lake, Swole Lake, and Lowther Township pegmatite (all in Ontario), and the Red Cross Lake lithium pegmatite (Manitoba), which have lepidolite as the dominant Li mineral. Amblygonite- and elbaite-dominant pegmatites have not yet been found in the Superior Province, although amblygonite and elbaite occur in the Tanco pegmatite.
- Cesium-rich minerals only occur in the most extremely fractionated pegmatites. Pollucite occurs in the Tanco, Marko's, and Pakeagama petalite-subtype pegmatites, the Tot Lake spodumene-subtype pegmatites, and the Lilypad Lake lepidolite-subtype pegmatites (Teertstra and Cerny, 1995). The Pakeagama pegmatite is located in northwestern Ontario along the Sachigo-Berens River subprovincial boundary. Cesium-rich beryl occurs in the spodumene-subtype North Aubry, South Aubry, Case, Tot Lake, and McCombe pegmatites and the lepidolite-subtype Lowther pegmatite, all in Ontario, and in the Tanco pegmatite, Manitoba.
- Most pegmatites in the Superior Province contain ferro-columbite and mangano-columbite as the dominant Nb-Ta-bearing minerals. Some pegmatites contain mangano-tantalite as the dominant Ta-oxide mineral, for example the North Aubry, South Aubry, Fairservice, Tot Lake, and Tebishogeshik pegmatites. The Tanco pegmatite contains wodginite as the dominant Ta-oxide mineral. Tantalum-bearing cassiterite is relatively rare in pegmatites of the Superior Province, except for the Separation Rapids and Tanco pegmatites.
- Fine-grained Ta-oxides (e.g. manganotantalite, wodginite, and microlite) commonly occur in the aplite, albitized K-feldspar, mica-rich, and spodumene core zones in pegmatites in the Superior province. At Tanco, Ta mineralization occurs in the albitic aplite zone (30), central intermediate muscovite-quartz after microcline zone (60), and lepidolite zone (90).

9 EXPLORATION

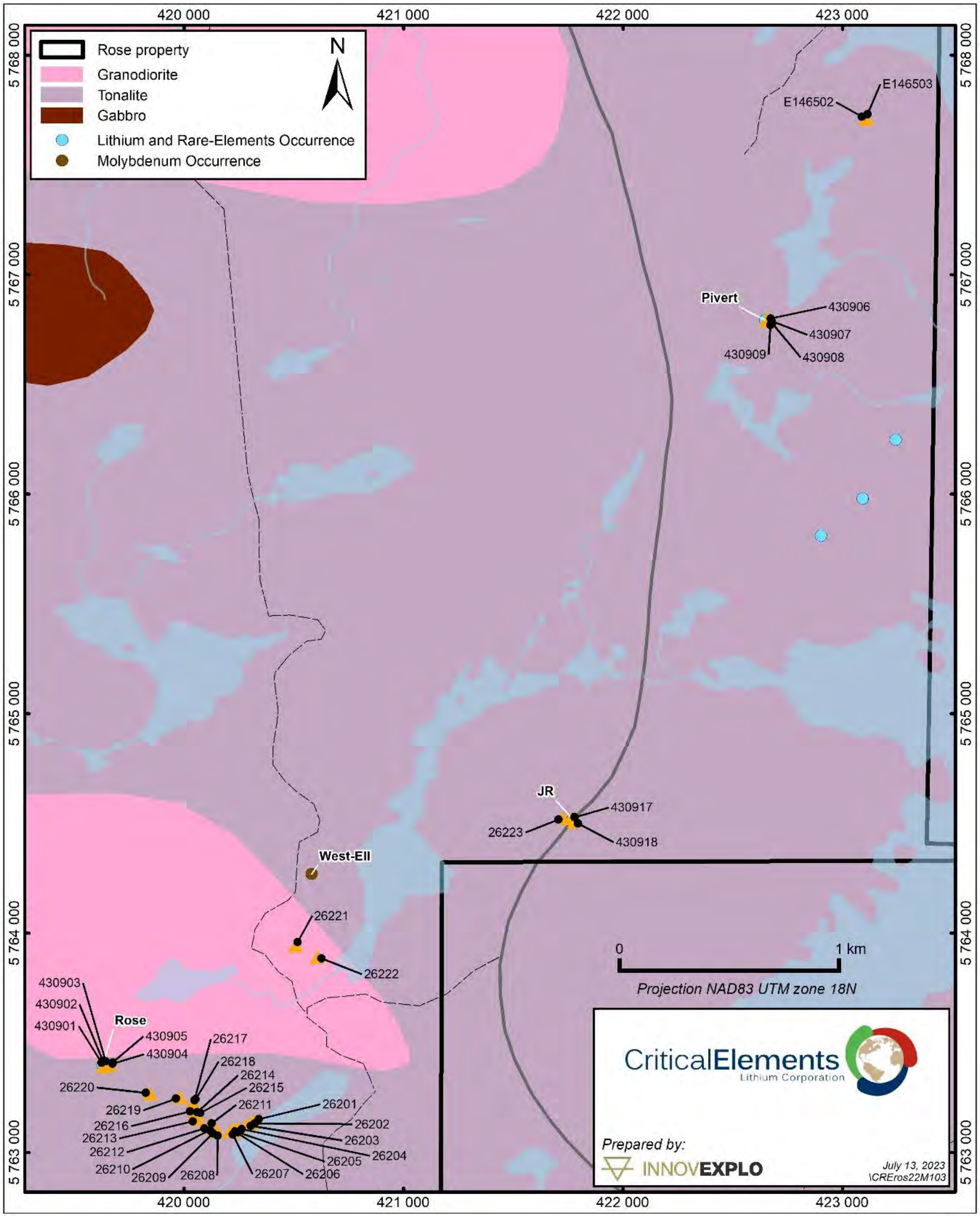
In addition to drilling (see Item 10), Critical Elements also performed limited prospecting activities on the Property that were restricted to the Pivert showing and Rose deposit areas. The work, which took place in the last decade, focused on grab sampling and the visual reconnaissance of pegmatites at both localities, and outcrop mapping at Rose only.

A total of 36 grab samples were collected and sent for analysis (Table 9.1). Grades for Li, Ta, Rb, Cs, and Be are reported in this Item as parts per million (ppm). Location of the grab samples on the Property are presented on Figure 9.1. Sampling and assaying protocols are further described in Item 11.

Table 9.1: Grab Samples Collected on the Rose Property by Critical Elements

Sample	Area	UTM83 Zone 18		Li	Rb	Ta	Cs	Be	Ga
		Easting	Northing	ppm	ppm	ppm	ppm	ppm	ppm
26221	Hydro	420509	5763942	7,270	900	110	70	67	92
26222	Hydro	420609	5763891	4,440	580	290	50	227	70
26223	JR	421723	5764524	12,900	490	120	20	57	114
430917	JR	421761	5764522	21,200	390	51	22	90	107
430918	JR	421779	5764508	14,700	1,290	44	50	65	93
430906	Pivert	422655	5766797	9,660	n/a	n/a	n/a	n/a	70
430907	Pivert	422660	5766796	8,020	n/a	n/a	n/a	n/a	60
430908	Pivert	422667	5766794	8,870	n/a	n/a	n/a	n/a	70
430909	Pivert	422672	5766790	454	n/a	n/a	n/a	n/a	50
26201	Rose	420321	5763147	5,700	2,520	79	67	38	75
26202	Rose	420304	5763132	11,500	680	31	45	270	75
26203	Rose	420285	5763124	4,990	4,740	210	150	176	69
26204	Rose	420243	5763110	7,330	1,520	99	67	206	61
26205	Rose	420227	5763098	2,760	1,320	89	45	150	60
26206	Rose	420216	5763105	6,980	1,390	91	64	191	86
26207	Rose	420214	5763099	1,580	2,720	140	110	224	80
26208	Rose	420152	5763095	12,400	660	85	51	117	98
26209	Rose	420144	5763100	10,300	620	80	38	107	107
26210	Rose	420134	5763110	9,810	1,340	74	49	115	81
26211	Rose	420110	5763121	9,490	1,350	80	70	202	82
26212	Rose	420110	5763121	9,320	2,200	170	210	842	74
26213	Rose	420058	5763152	7,080	2,050	140	90	289	81
26214	Rose	420046	5763171	7,210	1,150	190	60	280	65
26215	Rose	420057	5763177	13,300	1,760	220	60	56	110
26216	Rose	420045	5763198	8,160	1,580	88	46	102	88
26217	Rose	420042	5763219	8,800	3,280	61	91	119	72
26218	Rose	420042	5763225	9,510	1,500	60	50	147	79
26219	Rose	419982	5763251	8,580	3,290	490	130	134	92
26220	Rose	419844	5763269	3,870	1,060	220	80	147	68
430901	Rose	419635	5763393	10,200	n/a	n/a	n/a	n/a	70
430902	Rose	419637	5763400	6,220	n/a	n/a	n/a	n/a	70
430903	Rose	419647	5763397	2,840	n/a	n/a	n/a	n/a	90
430904	Rose	419655	5763398	7,140	n/a	n/a	n/a	n/a	80
430905	Rose	419660	5763398	11,500	n/a	n/a	n/a	n/a	80
E146502	Rose	423105	5767711	9,200	n/a	269	75	n/a	n/a
E146503	Rose	423106	5767714	10,400	n/a	244	84	n/a	n/a

Figure 9.1: Critical Elements Grab Sample Location

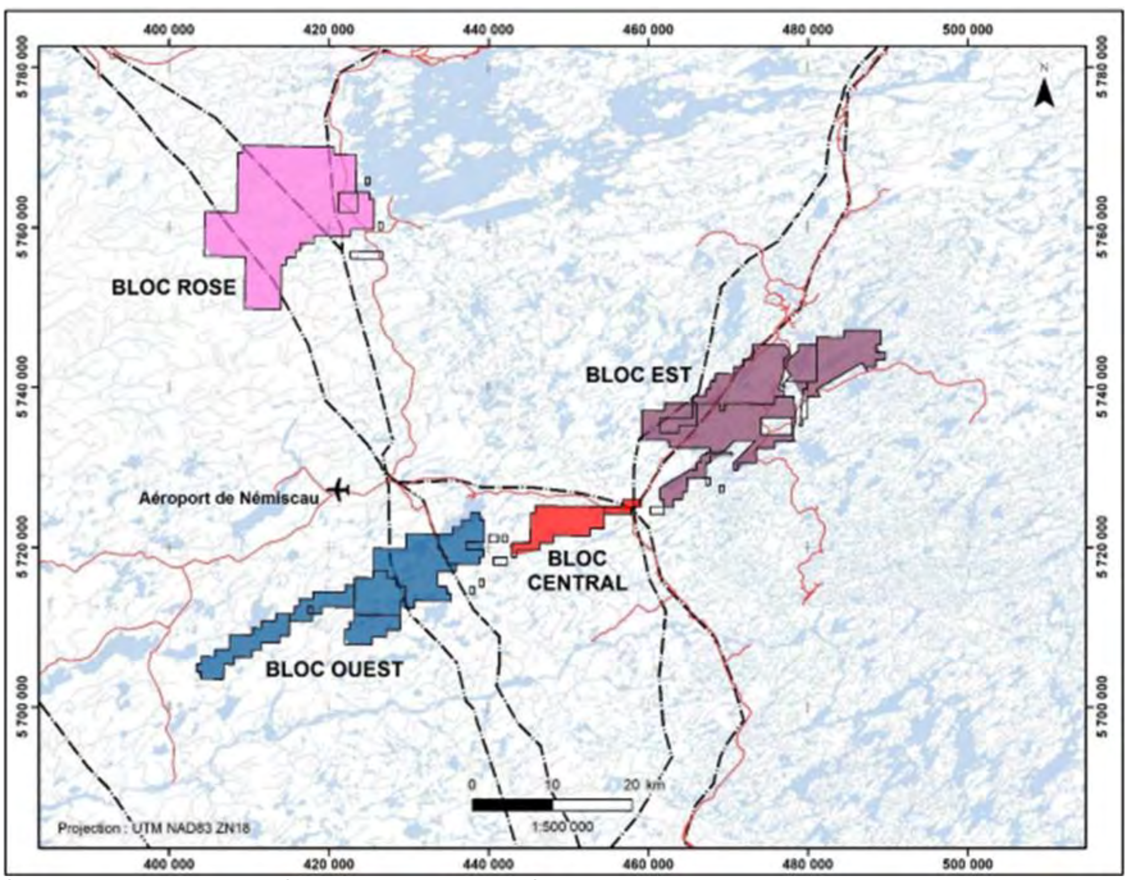


9.1 2021 High-Resolution Helicopter Borne Magnetometric Survey

During the month of March 2021, Critical Elements contracted Geo Data Solutions GDS/Geo Data Solutions GDS Inc. (GDS), to perform high-resolution helicopter-borne magnetometric survey on its properties located in the Eeyou Istchee James Bay region. Four blocks, Rose, East, West and Central, were covered for a total of 15,508 one-kilometre on flight lines. The nominal traverse line spacing was 50 m while control line spacing was 500 m for each survey block. The survey was flown following a pre-determined flight surface having a rate of climb and descent of 20% and a minimum ground clearance of 35 m. The data were recorded using a split-beam cesium vapour magnetometer mounted in a stinger fixed to the helicopter. The GDS technical report (Technical report high-resolution helicopter-borne magnetic survey Quebec's Eeyou Istchee James Bay projects) details the instrumentation, verification procedures and raw data processing. Figure 9.2 geographically locates the four claim blocks covered near the Cree village of Némaska and the Némiscau airport.

The high-resolution helicopter-borne magnetometric survey has made it possible to precisely locate lineaments, discontinuities and magnetic domains which enrich the geological interpretation of the region. Also, some direct exploration targets have been identified based on the types of mineralization potentially present and the geological context. Most targets such as Au, Ni-Cu or VMS targets are based on already recognized data, criteria, or assumptions. However, the diamondiferous potential that has also been identified is little known and recognized in the region.

Figure 9.2: Location Map of the Four Claim Blocks



Source: Work report by Jean-Sébastien Lavallée, 2017 GM 70347

10 DRILLING

Critical Elements started drilling the Property in late 2009. This report considers 287 holes drilled by the company for a total of 33,875.50 m. Of those 287 holes, 218 (totalling 27,684.9 m) were included in the current resource estimate.

10.1 Drilling on the Rose Deposit

Critical Elements drilled 231 holes (NQ core size; 29,202.90 m) on the Rose deposit in 2009, 2010, 2011, 2016 and 2020 (Table 10.3 and Table 10.4). Holes from the Hydro and JR showings are included in this total because they are now considered part of the Rose deposit after drilling expanded the original Rose showing to encompass Hydro and JR.

The original objective of the program, before 2022, was to confirm the continuity of the mineralized pegmatites observed at surface. This objective was quickly upgraded to systematic drilling of the mineralized pegmatites. The objective of 2022 drilling program on Rose deposit was to obtain additional geotechnical information for the optimization of mining engineering and at the same time the drillings allowed to have in-fill drill holes in the eastern part of the deposit. Table 105. shows best assay results.

The Rose drillholes were supervised, logged, and sampled by Consul-Teck. The program produced 4,900 core samples.

Table 10.1: Critical Elements Diamond Drillholes on the Rose Deposit

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
HD-10-01	420 624	5 763 935	293	210	-60	51
HD-10-02	420 584	5 763 932	294	210	-60	54
HD-10-03	420 473	5 763 975	298	210	-60	60
LR-09-01	419 674	5 763 337	294	335	-48	126
LR-09-02	419 638	5 763 408	295	157	-45	78
LR-09-03	419 669	5 763 417	297	156	-44	83
LR-09-04	419 655	5 763 458	300	155	-45	114
LR-09-05	419 692	5 763 357	294	335	-45	114
LR-09-06	419 723	5 763 371	295	335	-46	108
LR-09-07	419 705	5 763 412	297	335	-43	114
LR-09-08	419 733	5 763 348	296	335	-51	201
LR-09-09	419 735	5 763 411	297	335	-47	111
LR-09-10	419 762	5 763 351	298	335	-47	108
LR-10-11	419 763	5 763 350	299	335	-86	81
LR-10-12	419 776	5 763 324	300	335	-78	150
LR-10-13	419 799	5 763 276	301	335	-80	84
LR-10-14	419 822	5 763 309	303	316	-79	90
LR-10-15	419 784	5 763 373	299	334	-79	93
LR-10-16	419 760	5 763 427	299	324	-80	102
LR-10-17	419 762	5 763 282	300	335	-80	60
LR-10-18	419 708	5 763 306	296	335	-80	84
LR-10-19	419 618	5 763 380	295	335	-80	87
LR-10-20	419 837	5 763 343	303	335	-80	102
LR-10-21	419 696	5 763 259	295	335	-80	60
LR-10-22	419 663	5 763 285	295	335	-80	60

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LR-10-23	419 820	5 763 374	302	335	-80	120
LR-10-24	419 785	5 763 446	302	335	-79	117
LR-10-25	419 801	5 763 410	298	335	-80	102
LR-10-26	419 769	5 763 477	305	335	-80	141
LR-10-27	419 743	5 763 468	305	332	-79	123
LR-10-28	419 712	5 763 465	304	335	-80	117
LR-10-29	419 688	5 763 456	302	335	-80	105
LR-10-30	419 610	5 763 468	298	342	-80	114
LR-10-31	419 604	5 763 415	292	345	-81	105
LR-10-32	419 564	5 763 403	292	335	-80	69
LR-10-33	419 578	5 763 479	297	335	-80	120
LR-10-34	419 603	5 763 491	299	342	-70	141
LR-10-35	419 649	5 763 499	304	335	-70	159
LR-10-36	419 688	5 763 520	306	342	-70	153
LR-10-37	419 750	5 763 517	309	335	-70	138
LR-10-38	419 794	5 763 533	308	343	-70	150
LR-10-39	419 819	5 763 484	308	335	-80	141
LR-10-40	419 842	5 763 443	299	331	-80	123
LR-10-41	419 872	5 763 384	306	335	-80	117
LR-10-42	419 890	5 763 320	305	335	-79	126
LR-10-43	419 933	5 763 336	310	318	-81	129
LR-10-44	419 908	5 763 390	308	330	-80	129
LR-10-45	419 885	5 763 439	304	328	-80	135
LR-10-46	419 860	5 763 496	304	335	-80	150
LR-10-47	419 836	5 763 547	303	335	-80	153
LR-10-48	419 894	5 763 546	303	326	-80	159
LR-10-49	419 931	5 763 479	305	335	-80	156
LR-10-50	419 955	5 763 436	308	335	-80	156
LR-10-51	419 969	5 763 377	312	335	-80	162
LR-10-52	419 994	5 763 325	311	335	-81	105
LR-10-53	420 050	5 763 215	309	335	-80	75
LR-10-54	420 069	5 763 160	317	335	-79	102
LR-10-55	420 139	5 763 107	306	335	-80	51
LR-10-56	420 199	5 763 121	306	322	-80	45
LR-10-57	420 234	5 763 159	308	335	-80	75
LR-10-58	420 121	5 763 166	313	336	-80	45
LR-10-59	420 099	5 763 224	308	335	-80	51
LR-10-60	420 076	5 763 274	306	335	-80	75
LR-10-61	420 027	5 763 255	306	335	-80	51
LR-10-62	420 048	5 763 328	310	134	-79	132
LR-10-63	420 024	5 763 381	318	152	-81	102
LR-10-64	420 001	5 763 427	313	154	-79	165
LR-10-65	419 973	5 763 491	302	152	-81	165
LR-10-66	419 952	5 763 540	298	142	-80	156
LR-10-67	419 925	5 763 601	301	155	-80	174
LR-10-68	419 973	5 763 615	298	155	-80	189

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LR-10-69	420 002	5 763 557	303	150	-80	183
LR-10-70	420 026	5 763 500	311	142	-80	102
LR-10-71	420 098	5 763 340	313	150	-80	111
LR-10-72	420 122	5 763 283	309	151	-81	63
LR-10-73	420 144	5 763 230	309	155	-80	54
LR-10-74	420 172	5 763 175	310	156	-80	51
LR-10-75	420 077	5 763 391	317	146	-80	84
LR-10-76	420 218	5 763 196	310	146	-80	51
LR-10-77	420 193	5 763 249	310	155	-80	60
LR-10-78	420 169	5 763 306	311	155	-80	69
LR-10-79	420 145	5 763 361	314	155	-80	87
LR-10-80	420 121	5 763 409	318	155	-80	102
LR-10-81	420 095	5 763 468	317	155	-80	180
LR-10-82	420 074	5 763 520	310	155	-80	171
LR-10-83	420 051	5 763 571	303	153	-80	201
LR-10-84	420 024	5 763 629	299	155	-80	207
LR-10-85	420 069	5 763 655	295	136	-80	228
LR-10-86	420 089	5 763 599	305	148	-80	210
LR-10-87	420 122	5 763 535	308	155	-80	192
LR-10-88	420 046	5 763 450	317	136	-80	99
LR-10-89	420 148	5 763 484	313	155	-80	99
LR-10-90	420 174	5 763 436	315	155	-80	99
LR-10-91	420 201	5 763 382	313	155	-80	87
LR-10-92	420 230	5 763 325	313	155	-80	72
LR-10-93	420 239	5 763 264	312	150	-80	60
LR-10-94	420 264	5 763 217	309	150	-80	42
LR-10-95	420 281	5 763 181	306	155	-80	27
LR-10-96	420 306	5 763 226	306	152	-80	51
LR-10-97	420 285	5 763 288	311	155	-79	99
LR-10-98	420 267	5 763 352	312	155	-80	105
LR-10-99	420 246	5 763 396	312	150	-80	108
LR-10-100	420 209	5 763 455	313	155	-80	105
LR-10-101	420 185	5 763 505	309	155	-80	108
LR-10-102	420 157	5 763 573	309	152	-79	126
LR-10-103	420 137	5 763 612	308	155	-80	144
LR-10-104	420 108	5 763 670	295	152	-78	147
LR-10-105	420 085	5 763 718	295	158	-80	159
LR-10-106	420 138	5 763 712	295	155	-80	183
LR-10-107	420 156	5 763 674	295	155	-80	150
LR-10-108	420 190	5 763 609	306	168	-79	138
LR-10-109	420 219	5 763 555	304	145	-80	138
LR-10-110	420 239	5 763 505	308	155	-80	114
LR-10-111	420 266	5 763 449	311	143	-80	117
LR-10-112	420 287	5 763 400	311	155	-80	114
LR-10-113	420 315	5 763 346	310	155	-80	102
LR-10-114	420 335	5 763 300	309	155	-80	84

Hole	UTM83 Zone 18		Elevation (m)	Azimuth	Dip	Length (m)
	Easting	Northing				
LR-10-115	420 358	5 763 255	305	155	-79	63
LR-10-116	420 390	5 763 285	305	155	-79	69
LR-10-117	420 364	5 763 358	309	155	-80	108
LR-10-118	420 342	5 763 412	310	155	-80	114
LR-10-119	420 311	5 763 467	308	155	-80	123
LR-10-120	420 289	5 763 522	305	154	-80	123
LR-10-121	420 269	5 763 578	300	140	-80	135
LR-10-122	420 245	5 763 622	300	152	-80	135
LR-10-123	420 214	5 763 688	293	145	-80	174
LR-10-124	420 191	5 763 741	293	153	-80	201
LR-10-125	420 238	5 763 757	291	145	-80	204
LR-10-126	420 265	5 763 700	291	155	-80	159
LR-10-127	420 292	5 763 639	296	148	-80	177
LR-10-128	420 311	5 763 592	294	152	-80	135
LR-10-129	420 340	5 763 535	303	153	-79	135
LR-10-130	420 364	5 763 477	308	152	-80	123
LR-10-131	420 389	5 763 428	309	142	-79	120
LR-10-132	420 412	5 763 373	307	140	-79	105
LR-10-133	420 436	5 763 319	304	140	-80	87
LR-10-134	420 491	5 763 315	298	154	-80	90
LR-10-135	420 470	5 763 378	305	150	-78	117
LR-10-136	420 441	5 763 426	307	148	-77	129
LR-10-137	420 416	5 763 484	306	144	-80	132
LR-10-138	420 395	5 763 532	304	167	-80	153
LR-10-139	420 365	5 763 599	293	141	-79	150
LR-10-140	420 339	5 763 650	292	157	-80	201
LR-10-141	420 319	5 763 701	289	155	-80	183
LR-10-142	420 282	5 763 745	289	155	-80	201
LR-10-143	420 272	5 763 810	292	155	-80	228
LR-11-144	420 502	5 763 477	306	158	-76	150
LR-11-145	420 487	5 763 568	301	150	-75	174
LR-11-146	420 431	5 763 695	291	149	-75	201
LR-11-147	420 406	5 763 753	290	151	-76	225
LR-11-148	420 362	5 763 846	293	156	-74	243
LR-11-149	420 317	5 763 945	293	159	-76	276
LR-11-150	420 223	5 763 915	296	150	-75	276
LR-11-151	420 131	5 763 880	294	155	-76	234
LR-11-152	420 032	5 763 897	295	154	-76	252
LR-11-153	419 902	5 763 898	295	149	-73	300
LR-11-154	419 787	5 763 659	292	153	-76	153
LR-11-155	420 625	5 763 446	301	155	-75	150
LR-11-156	420 612	5 763 538	301	191	-71	210
LR-11-157	420 605	5 763 620	298	204	-71	192
LR-11-158	420 648	5 763 696	292	198	-71	186
LR-11-159	420 689	5 763 606	301	196	-71	177
LR-11-160	420 731	5 763 514	299	189	-71	150

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LR-11-161	420 753	5 763 405	288	199	-71	126
LR-11-162	420 863	5 763 466	289	196	-69	150
LR-11-163	420 826	5 763 552	290	195	-70	174
LR-11-164	420 781	5 763 637	297	193	-69	219
LR-11-165	420 742	5 763 724	290	205	-68	201
LR-11-166	420 838	5 763 753	286	199	-69	204
LR-11-167	420 882	5 763 667	291	189	-69	183
LR-11-168	420 923	5 763 588	292	190	-71	99
LR-11-169	420 963	5 763 490	291	197	-69	81
LR-11-170	421 003	5 763 403	294	186	-70	84
LR-11-171	421 021	5 763 616	294	192	-71	126
LR-11-172	420 976	5 763 723	293	199	-69	144
LR-11-173	420 912	5 763 841	287	194	-70	180
LR-11-174	420 966	5 763 967	287	196	-71	210
LR-11-175	421 016	5 763 860	288	196	-69	177
LR-11-176	421 065	5 763 739	297	197	-69	132
LR-11-177	421 078	5 763 959	288	192	-71	186
LR-11-178	420 604	5 763 841	286	198	-68	224
LR-11-179	419 801	5 763 200	295	10	-58	102
LR-11-180	419 436	5 763 401	290	9	-58	99
LR-11-181	419 600	5 763 620	299	14	-60	138
LR-22-188	420671	5763650	299	195	-80	81
LR-22-188A	420671	5763650	299	195	-70	180
LR-22-189	420770	5763687	293	195	-70	180
LR-22-190	420782	5763522	297	200	-70	210
LR-22-191	420828	5763610	292	200	-70	192
LR-22-192	420939	5763642	297	195	-70	183
LR-22-193	420883	5763535	291	195	-70	171
LR-22-194	420940	5763534	293	195	-70	150
LR-22-195	420975	5763579	294	200	-70	180
LR-22-196	420734	5763625	301	195	-70	180
LR-22-197	420648	5763696	292	160	-50	225
LR-22-198	420381	5763684	292	70	-52	225
LR-22-199	420904	5763728	291	310	-50	225
Total 197 holes						**26 470**

Table 10.2: Critical Elements Diamond Drillholes on the JR Zones (part of the Rose deposit)

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
JR-10-01	421 750	5 764 549	308	210	-60	54
JR-10-02	421 720	5 764 566	307	210	-60	57
JR-10-03	421 688	5 764 579	304	210	-60	57
JR-10-04	421 768	5 764 575	307	210	-60	48
JR-10-05	421 736	5 764 586	304	210	-60	75
JR-10-06	421 699	5 764 603	303	210	-60	45
JR-10-07	421 719	5 764 641	302	210	-60	45
JR-10-08	421 751	5 764 612	303	210	-60	45
JR-10-09	421 789	5 764 602	306	210	-60	45
JR-10-10	421 830	5 764 623	305	210	-60	45
JR-10-11	421 798	5 764 633	303	210	-60	45
JR-10-12	421 767	5 764 638	303	210	-60	66
JR-11-13	421 862	5 764 658	305	210	-75	75
JR-11-14	421 816	5 764 676	303	210	-75	99
JR-11-15	421 734	5 764 719	309	210	-75	69
JR-11-16	421 730	5 764 838	313	210	-75	84
JR-11-17	421 818	5 764 790	309	210	-75	81
JR-11-18	421 909	5 764 747	302	210	-75	78
JR-16-01	421 655	5 764 651	298	210	-75	54
JR-16-02	421 658	5 764 755	308	210	-75	99
JR-16-03	421 857	5 764 862	304	210	-80	99
JR-16-04	421 352	5 764 691	296	210	-75	75
JR-16-05	421 374	5 764 772	299	210	-75	54
JR-22-01	421260	5764660	294	210	-61.2	102
JR-22-02	421260	5764760	296	210	-59.5	111
JR-22-03	421260	5764860	291	210	-59.9	102
JR-22-04	421360	5764860	296	210	-59.6	111
JR-22-05	421460	5764660	300	210	-59.9	105
JR-22-06	421460	5764760	304	210	-60	102
JR-22-07	421460	5764860	303	210	-59.5	102
JR-22-08	421560	5764860	309	210	-57.2	99
JR-22-09	421560	5764760	310	210	-60.2	102
JR-22-10	421545	5764643	304	210	-60.2	102
JR-22-11	421660	5764560	301	115	-49.9	201
Total 34 holes						**2 733**

Table 10.3: Critical Elements Selected Best Assay Results on the Rose Deposit

Hole ID	From (m)	To (m)	Core Length (m)	Li_2O (%)	Ta_2O_5 ppm (g/t)
LR-10-140	113.6	119.4	5.8	1.23	138
LR-10-141	148.75	150.35	1.6	0.82	52
and	151.1	159	7.9	1.38	115
LR-10-142	169.3	185.4	16.1	1.32	114
LR-10-143	173.75	176.65	2.9	0.78	104
and	191.5	204.95	13.45	1.29	103
LR-11-14	31.75	36.95	5.2	1.41	120
and	50.9	52.1	1.2	0.7	107
LR-11-144	110.05	119.65	9.6	0.91	136
and	131.4	137.45	6.05	1.17	82
LR-11-145	137.15	151.15	14	0.98	78
LR-11-146	162.85	175.9	13.05	1.47	100
LR-11-148	217.65	230.65	13	0.84	71
LR-11-150	214.1	225.6	11.5	1.42	71
LR-11-151	179.6	187.05	7.45	1.42	134
and	188.5	189.6	1.1	1.6	147
and	191.85	194.45	2.6	0.82	111
LR-11-152	167.05	168.85	1.8	1.01	138
and	204.8	209.3	4.5	1.59	128
LR-11-153	183.45	186.65	3.2	0.81	58
and	231.05	235.65	4.6	0.86	77
LR-11-154	81.9	85.1	3.2	1.23	249
LR-11-155	93.85	106.55	12.7	0.92	110
LR-11-156	122.75	135.3	12.55	1.14	64
LR-11-157	150.45	155.7	5.25	1.22	101
LR-11-158	20.25	24.5	4.25	0.97	286
LR-11-159	131.35	145.35	14	1.29	66
LR-11-160	122.5	133.15	10.65	1.22	105
and	32	35.2	3.2	0.91	405
and	53.35	56.8	3.45	0.93	387
LR-11-161	83.55	90.95	7.4	1.41	85
LR-11-162	44.95	55.2	10.25	1.55	161
LR-11-163	134.85	139.75	4.9	0.93	114
and	14.6	18.25	3.65	0.97	319
and	45.9	55.1	9.2	1.64	226
LR-11-164	150.05	161.9	11.85	0.71	82
and	16.65	20.15	3.5	1.02	300
and	51.05	54.7	3.65	1.26	197
LR-11-165	161.7	173.7	12	1.77	67
LR-11-166	42.65	48.1	5.45	0.77	167
LR-11-167	32.6	38.5	5.9	1.29	275
and	95.4	103.75	8.35	1.3	133
LR-11-168	21.15	29.8	8.65	1.02	254
and	83.3	91.05	7.75	1.25	154
LR-11-169	57	59.9	2.9	0.77	78

Hole ID	From (m)	To (m)	Core Length (m)	Li_2O (%)	Ta_2O_5 ppm (g/t)
and	66.55	73.75	7.2	1.11	249
LR-11-170	55.45	58.75	3.3	0.98	164
LR-11-171	112.55	119.35	6.8	0.89	172
LR-11-172	127.85	136.8	8.95	1.09	101
LR-11-175	93.4	101.15	7.75	0.83	137
LR-11-176	85.2	94	8.8	1.06	206
LR-11-178	218	224.05	6.05	1.42	103
LR-22-188	25.1	28	2.9	0.72	243.46
and	36.8	39.4	2.6	1.22	252.89
LR-22-188A	33.7	36.7	3	0.94	261.15
and	133.4	146.6	13.2	1.33	66.41
LR-22-189	22.6	26.7	4.1	1.79	220.39
and	155.1	166.5	11.4	0.9	74.83
and	160.2	165.4	5.2	1.66	85.91
LR-22-190	51.8	59.4	7.6	1.78	205.62
and	126.7	133.6	6.9	1.52	119.22
and	129.4	133.6	4.2	1.85	147.75
LR-22-191	71.4	80	8.6	0.76	191.48
and	73.8	76.3	2.5	1.63	194.94
and	148	154.5	6.5	0.85	82.29
and	149.1	151	1.9	1.79	83.07
LR-22-192	42	50.7	8.7	1.41	216.49
and	43.9	50	6.1	1.91	207.71
and	101	109	8	1.09	128.09
LR-22-193	51.9	66.1	14.2	1.05	197.1
and	53.8	58.4	4.6	1.35	225
and	59.1	64.7	5.6	1.45	188.76
LR-22-194	20.9	27.7	6.8	0.78	196.62
and	76.5	85.8	9.3	1.06	137.81
and	77.4	85.2	7.8	1.25	148.81
LR-22-195	37.3	42.3	5	1.05	226.53
and	78.4	85.3	6.9	0.8	155.12
LR-22-196	19.6	23.5	3.9	1.56	249.48
and	57.4	60.5	3.1	0.78	266.99
and	138	150.9	12.9	1.12	60.04
LR-22-197	27.7	30.5	2.8	1.07	182.45
and	159.5	181.2	21.7	1.1	63.64
LR-22-198	195.3	199.8	4.5	0.49	100.63

Table 10.4: Critical Elements Best Assay Results on the JR Deposit

Hole ID	From (m)	To (m)	Core Length (m)	Li_2O (%)	Ta_2O_5 ppm (g/t)
JR-10-01	4.85	10	5.15	1.38	218
JR-10-02	2.1	7.6	5.5	1.53	151
and	17.8	20.3	2.5	0.89	257
JR-10-03	19.2	20.8	1.6	0.99	185
JR-10-04	12.4	24	11.6	1.15	173
JR-10-05	2.7	6.4	3.7	1.55	132
and	11	13.15	2.15	2.03	199
and	22.1	25.5	3.4	0.73	144
JR-10-06	20.9	22.6	1.7	1.96	415
JR-10-08	14	21.5	7.5	1.04	159
and	28	32.6	4.6	0.78	164
JR-10-09	16.15	26.3	10.15	0.98	205
JR-10-10	25.2	31	5.8	0.96	139
JR-10-11	20.9	22.45	1.55	0.83	240
and	23.25	26.8	3.55	1.53	135
and	29.1	31.4	2.3	1.12	152
and	35.4	36.65	1.25	1.96	190
JR-10-12	30.65	34.25	3.6	1.51	181
JR-11-17	63.65	66.8	3.15	0.93	145
JR-11-18	42.8	48.95	6.15	0.83	98
and	61	64.9	3.9	0.95	74
JR-22-01	47.8	49	1.2	0	256
JR-22-02	96.1	97.3	1.2	0	159
JR-22-03	No significant value				
JR-22-04	16.7	18.8	2.1	0	231
JR-22-05	29.3	35.2	5.9	0.76	132
and	78.2	78.9	0.7	0.01	159
and	85.1	85.8	0.7	0.01	220
JR-22-06	62.7	67.5	4.8	0.05	92
JR-22-07	86	87.4	1.4	0.74	115
JR-22-08	96.8	97.4	0.6	0.01	121
JR-22-09	56.6	58	1.4	0.01	155
and	63.3	68.8	5.5	0	85
JR-22-10	34.9	40.9	6	0.9	147
and	77.1	80.9	3.8	0.26	144
JR-22-11	28.5	38.5	10	0.16	109
and	87	91.3	4.3	0.43	117
and	116.3	118.7	2.4	0.02	155

Figure 10.1 shows the location of drillholes on the Rose deposit; Figure 10.2 shows the location of drillholes on the JR Showing Area.

Figure 10.1:Critical Elements Diamond Drillholes on the Rose Deposit

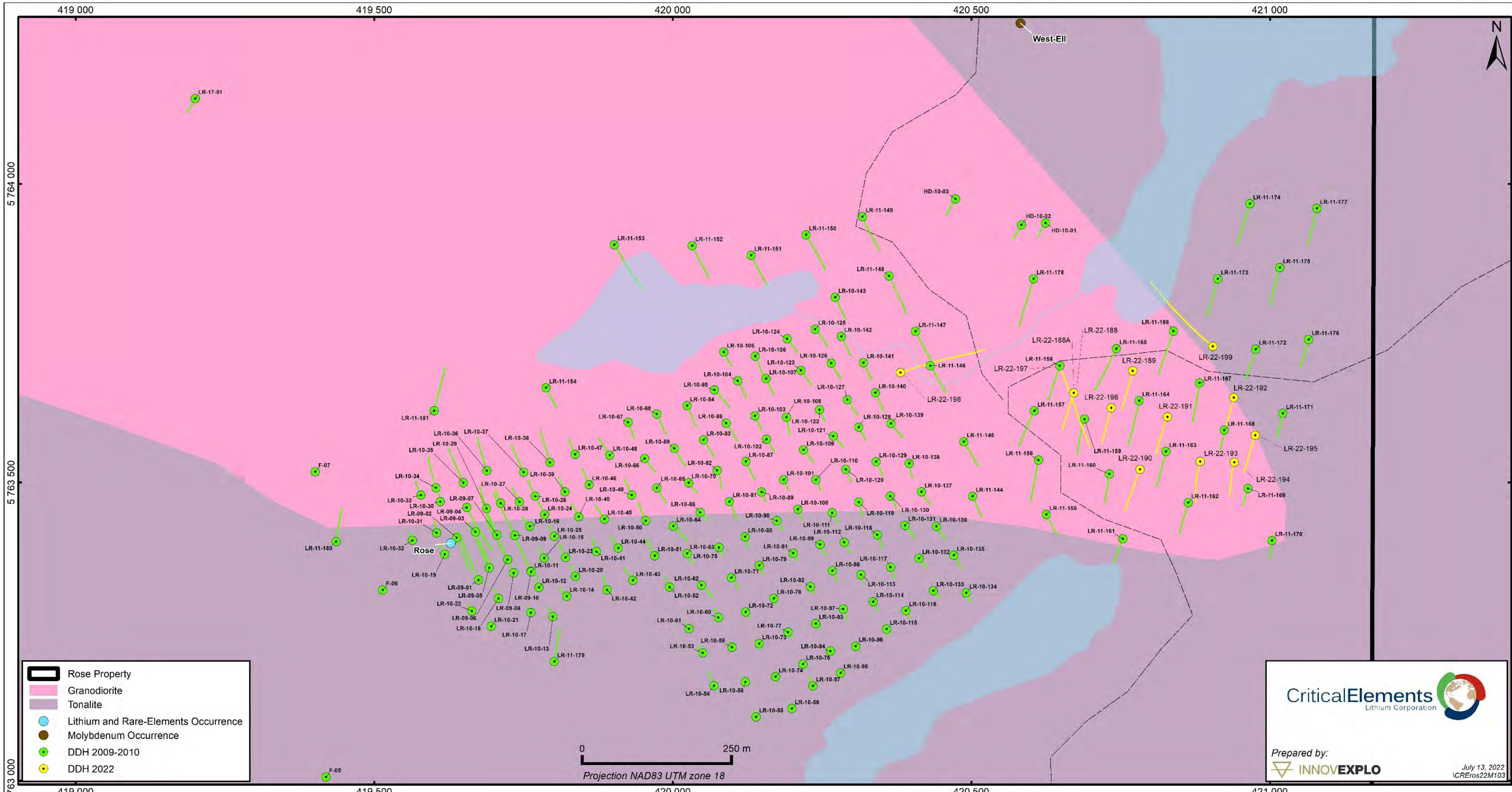
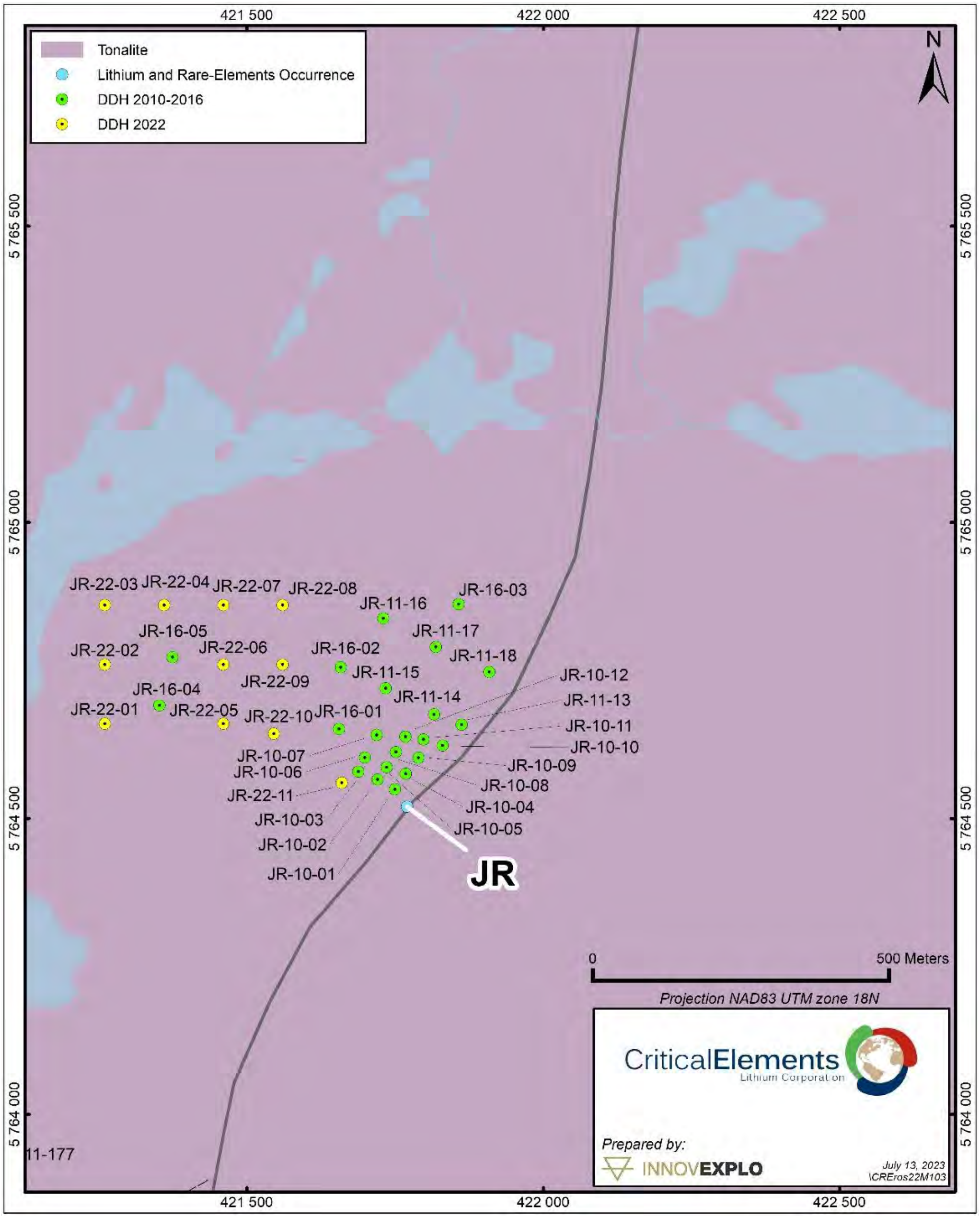


Figure 10.2: Critical Elements Diamond Drillholes on the JR Showing Area



10.2 Drilling on the Pivert Showing

Diamond drilling on the Pivert showing is limited to 16 holes (NQ core; total of 1 790.6 m) completed by Critical Elements in 2009, 2010, and 2016 and 2022 (Table 10.5). The objective of the program was to confirm the continuity of the mineralized pegmatite observed at surface. Table 10.6 shows best assay results.

The orientations of the eight holes varied from N225 to N010 and the dip varied from 45° to 75°.

All holes were supervised, logged, and sampled by Consul-Teck Exploration Inc. (Consul-Teck). The Pivert program produced 522 core samples. Hole LP-09-01 returned anomalous values in Li, Cs, and Rb, and Hole

LP-09-02 returned anomalous values in rare elements such as Rb and Cs. Hole LP-09-03 did not intersect any significant values. Holes LP-10-04 and LP-10-06 reported intersected Li, Ta, Rb, Cs, Be, and Ga mineralization, while hole LP-10-06 reported only anomalous values.

Table 10.5: Critical Elements Diamond Drillholes on the Pivert Showing

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LP-09-01	422 643	5 766 773	301	10	-45	126
LP-09-02	422 670	5 766 770	301	10	-45	123
LP-09-03	422 617	5 766 777	301	10	-45	103
LP-10-04	422 698	5 766 838	300	210	-60	54
LP-10-05	422 658	5 766 843	305	190	-60	51
LP-10-06	422 620	5 766 850	304	210	-60	51
LP-16-01	422 900	5 766 657	303	200	-75	83
LP-16-02	422 956	5 766 635	297	200	-50	81
LP-22-01	422860	5766670	295	225	-49	102
LP-22-02	422860	5766670	295	225	-70	111
LP-22-03	422914	5766657	294	225	-53	204
LP-22-04	422914	5766657	294	225	-75	210
LP-22-05	423000	5766610	292	225	-47	132
LP-22-06	423029	5766569	291	225	-54	153
LP-22-07	423065	5766540	290	225	-53	120
LP-22-08	423100	5766500	289	225	-53	87
Total 16 holes						**1791**

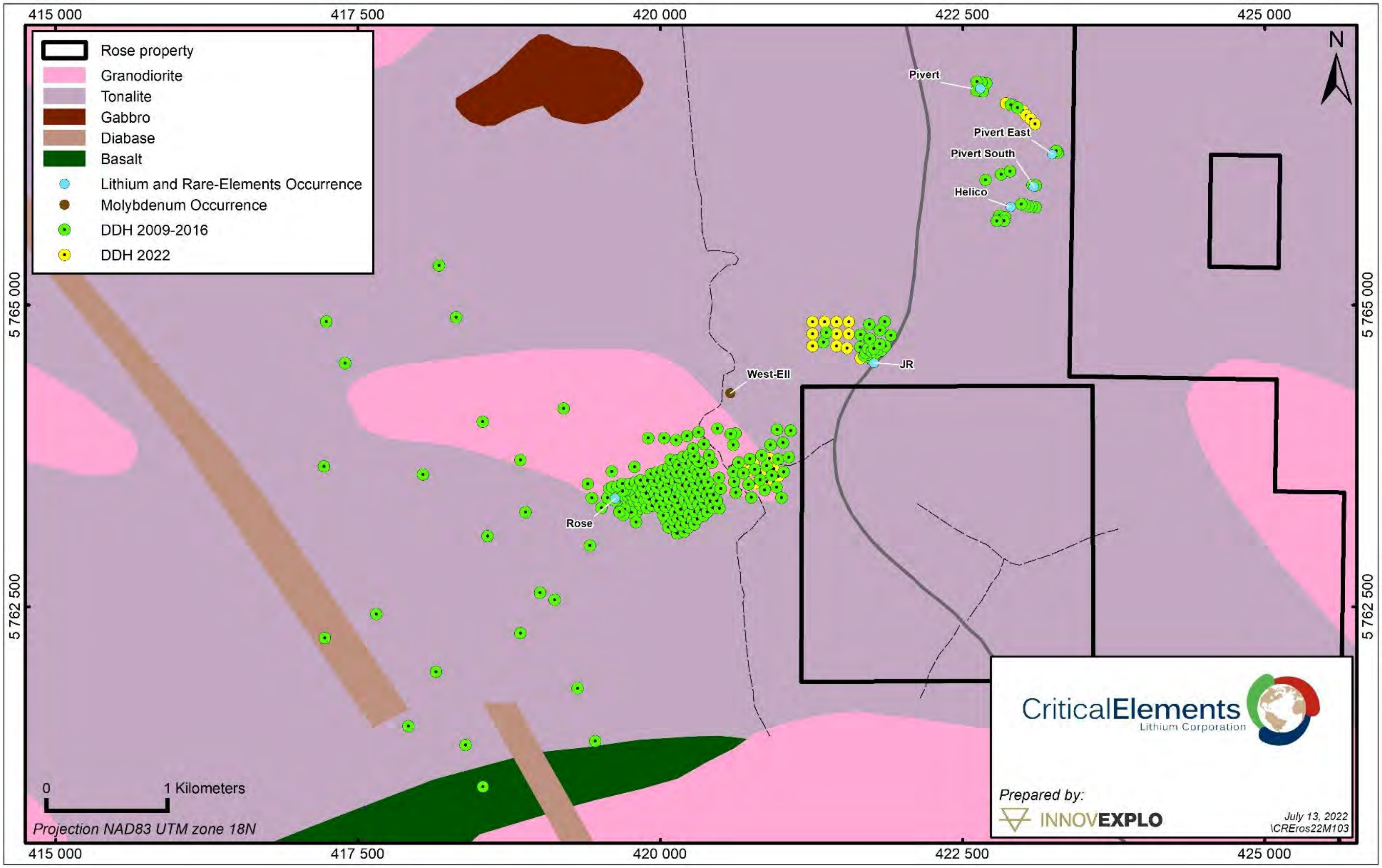
Table 10.6:Critical Elements Best Assay Results on the Pivert Showing

Hole ID	From (m)	To (m)	Core Length (m)	Li_2O (%)	Ta_2O_5 ppm (g/t)
LP-22-01	3.4	11.7	8.3	0.41	27
and	3.4	5.5	2.1	0.95	24
LP-22-02	3	4.2	1.2	1.16	53
and	10.1	11.8	1.7	1.22	75
LP-22-03	21.6	22.6	1	0.25	72
and	35.7	37.7	2	0.82	131
and	110.5	115.4	4.9	0.54	61
and	154.4	155.7	1.3	0.23	40
LP-22-04	No significant intersections				
LP-22-05	36.1	37.3	1.2	0.51	97
and	47.3	48.6	1.3	0.67	98
and	100.8	107.2	6.4	0.86	76
LP-22-06	30.8	31.7	0.9	0.37	69
and	43.5	46.3	2.8	0.36	78
and	82.2	90.7	8.5	0.64	49
and	88.2	90	1.8	1.52	60
LP-22-07	13.9	16	2.1	1.3	106

Hole ID	From (m)	To (m)	Core Length (m)	LI$_2$O (%)	Ta_2O_5 ppm (g/t)
and	19.9	20.8	0.9	0.74	84
and	70	73.8	3.8	0.71	66
and	76	77.3	1.3	0.76	52
LP-22-08	25.8	27.5	1.7	1.33	123

Figure 10.3 shows the location of drillholes on the Pivert showing.

Figure 10.3: Critical Elements Diamond Drillholes on the Pivert Showing



10.3 Drilling on Other Showings

Three other showings were drilled in 2010 and 2016 (Table 10.7). Nine holes totalling 879 m were drilled on the Helico showing, two totalling 102 m on Pivert East, and two totalling 102 m on Pivert South.

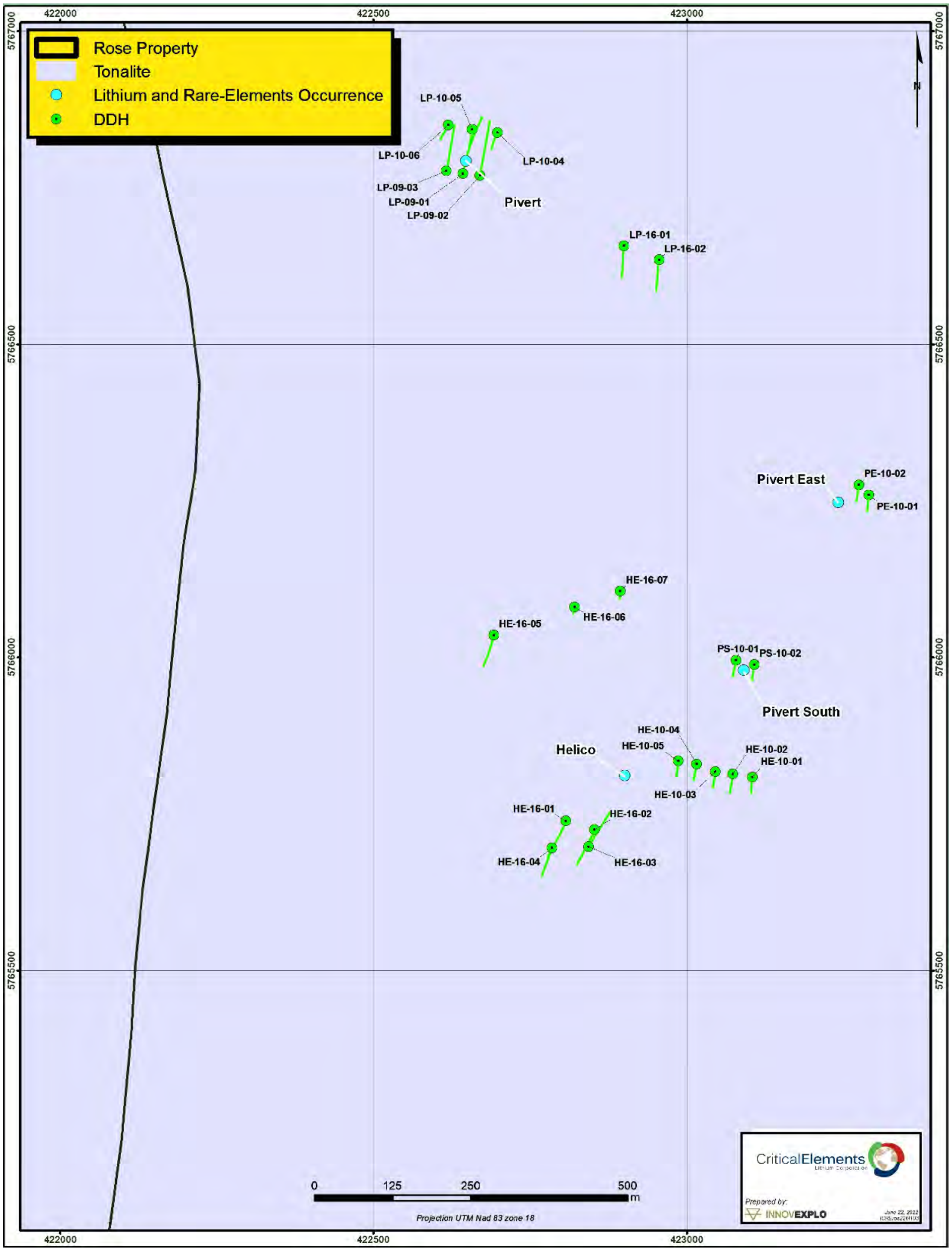
The original objective of the program was to confirm the continuity of the mineralized pegmatites observed at surface. Drillholes were supervised, logged, and sampled by Consul-Teck. The program produced 157 samples.

Table 10.7: Critical Elements Diamond Drillholes on Other Known Showings on the Rose-Pivert Property

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
HE-10-01	423 105	5 765 809	293	190	-60	51
HE-10-02	423 074	5 765 814	292	190	-60	60
HE-10-03	423 046	5 765 818	292	190	-60	51
HE-10-04	423 016	5 765 830	292	190	-60	51
HE-10-05	422 987	5 765 835	292	190	-60	51
HE-16-01	422 807	5 765 739	276	200	-50	102
HE-16-02	422 853	5 765 725	292	200	-50	102
HE-16-03	422 843	5 765 698	287	30	-50	102
HE-16-04	422 785	5 765 696	283	200	-50	75
HE-16-05	422 692	5 766 036	305	200	-50	84
HE-16-06	422 821	5 766 081	299	200	-80	75
HE-16-07	422 894	5 766 106	301	200	-80	75
PE-10-01	423 291	5 766 260	300	190	-60	51
PE-10-02	423 275	5 766 276	300	190	-60	51
PS-10-01	423 079	5 765 996	300	190	-60	51
PS-10-02	423 108	5 765 989	300	190	-60	51
Total 16 holes						**1 083**

Figure 10.4 shows the location of drillholes on other showings.

Figure 10.4: Critical Elements Diamond Drillholes on Other Showings



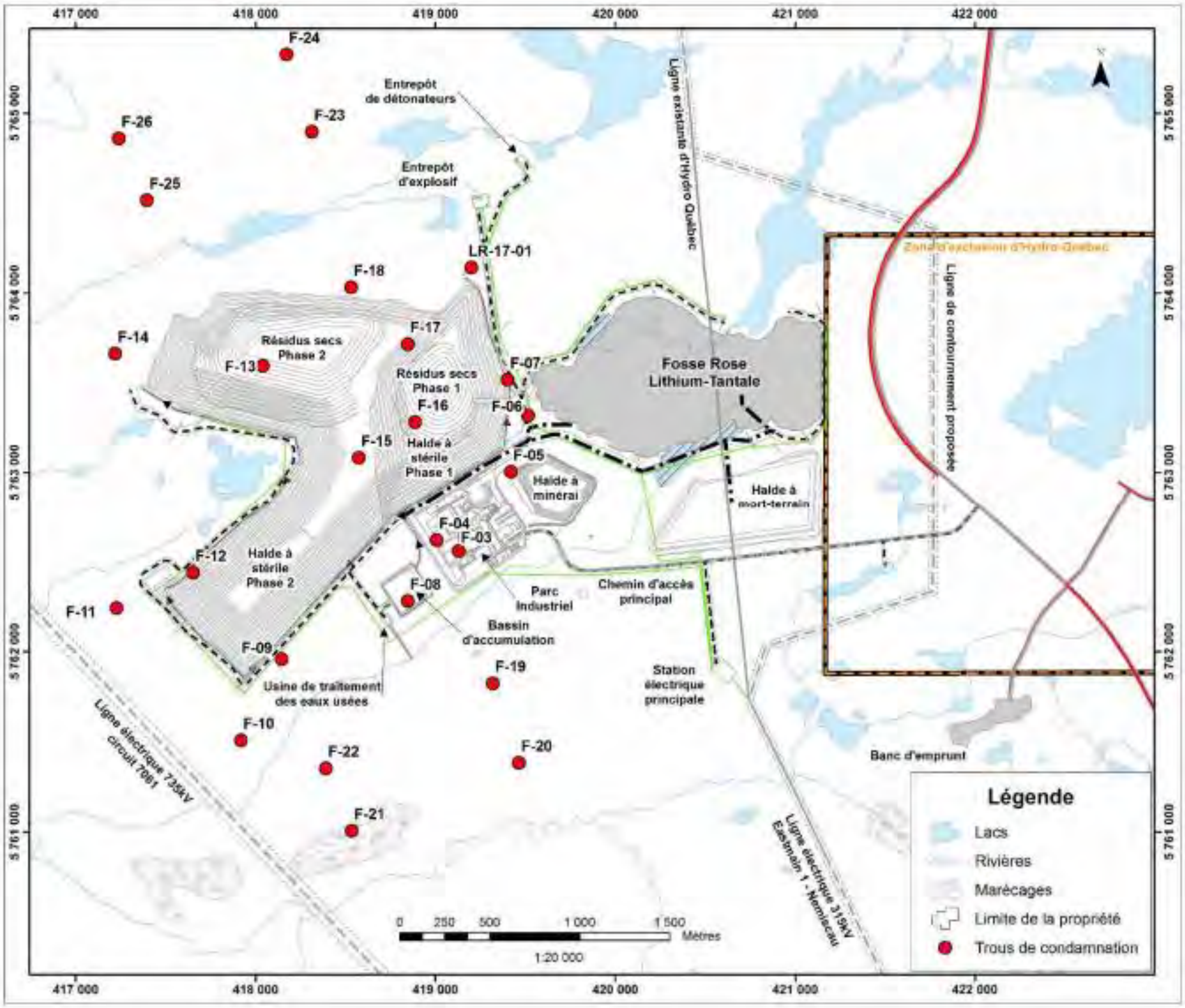
10.4 Condemnation Drilling

From January 24 to February 16, 2017, 25 holes totalling 1,880 m were drilled on the Property to confirm the absence of mineral resource potential in areas of proposed infrastructure. Table 10.8 lists the holes and Figure 10.5 shows location of condemnation drillholes and surface infrastructures. Only four pegmatite intervals totalling 6.8 m were intersected and no samples were taken as no spodumene mineralization was observed. Drillholes were supervised, logged, and sampled by Consul-Teck (Jourdain, J., 2018).

Table 10.8: Critical Elements Condemnation Diamond Drillholes on the Property

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
F-03	419 128	5 762 558	286	0	-90	75
F-04	419 006	5 762 617	277	0	-90	75
F-05	419 419	5 763 007	268	0	-90	75
F-06	419 514	5 763 320	281	0	-90	75
F-07	419 401	5 763 518	290	0	-90	75
F-08	418 845	5 762 281	275	0	-90	75
F-09	418 145	5 761 959	265	0	-90	75
F-10	417 917	5 761 510	265	0	-90	75
F-11	417 226	5 762 241	274	0	-90	75
F-12	417 651	5 762 438	286	0	-90	75
F-13	418 039	5 763 595	300	0	-90	75
F-14	417 219	5 763 664	282	0	-90	75
F-15	418 573	5 763 085	287	0	-90	75
F-16	418 886	5 763 283	283	0	-90	75
F-17	418 845	5 763 716	308	0	-90	75
F-18	418 531	5 764 033	330	0	-90	75
F-19	419 317	5 761 824	274	0	-90	75
F-20	419 463	5 761 385	256	0	-90	75
F-21	418 534	5 761 008	242	0	-90	75
F-22	418 390	5 761 354	266	0	-90	75
F-23	418 312	5 764 897	296	0	-90	75
F-24	418 171	5 765 327	304	0	-90	75
F-25	417 395	5 764 517	282	0	-90	75
F-26	417 239	5 764 861	290	0	-90	74
LR-17-01	419200	5764143	315	210	-70	81
Total 24 holes						**1,880**

Figure 10.5: Location Map of Condemnation Drillholes and Surface Infrastructures



11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Sampling Method and Approach

Regarding sampling method and approach the following process was enacted:

- The drill core is boxed, covered and sealed at the drill rig and moved to the side of the main gravel road by the drillers, where they are piled either on the ground or on a trailer. Consul-Teck personnel then carry the boxes once or twice a week to the core logging and sample preparation facility in Val-d'Or.
- After being examined and described (logged), the core is sampled according to an established protocol. The core of the selected section is first cut in half using a typical table-feed circular rock saw, with one half put aside for shipment to the laboratory. The second half of the core is put back in its place in the core box, and a tag bearing the same number is placed at the end of the sawed core halves forming the sampled length. Core sample intervals are selected based on the presence of favourable geological units (pegmatite) and placed into sample bags before being shipped to the assay laboratory.
- Channel samples collected from the Property by Critical Elements are referred to in company press releases as 'nonchosen grab samples' because the collection process differs from traditional channel sampling. Unlike traditional channel samples, they are not necessarily perpendicular to the interpreted strike of the pegmatite and they are of variable lengths. This type of channel sampling was employed in lieu of grab sampling since traditional grabs are very difficult or impossible to obtain from the smooth, hard outcrops surfaces using a hammer and chisel. The resulting samples, however, are similar to grab samples in that they are selective by nature and unlikely to represent average grades. The purpose of such sampling was to rapidly determine whether mineralization is constant throughout the outcropping pegmatite. The channels are approximately 5 cm wide and cut with a motorized circular saw to a depth of approximately 5 cm. Most are approximately 1 m long and entirely within the pegmatite dyke. As mentioned above, they are not necessarily perpendicular to the interpreted strike of the pegmatite. According to the issuer, samples were placed whole into bags before sending to the laboratory.
- Most core samples range in length from 0.10 to 2.00 m, with only a few exceptions exceeding 2.00 m. This is discussed further in Item 12 - Data Verification.
- Every pegmatite unit was systematically sampled. Samples collected by diamond drilling are generally intact with little possibility of loss due to wash out and are considered to be of good quality. Overall, the author Carl Pelletier considers the drill core sample recovery from mineralized zones to be representative.
- Consul-Teck's core logging facility in Val-d'Or was used for the drilling program. Consul-Teck defined the sample preparation, analysis, and security protocols for the Critical Elements drilling programs. Assays were mostly performed at the independent and accredited facilities of ALS Laboratory in Val-d'Or (ALS), but nine of the first grab samples (430901 to 430909) were sent to Techni-Labs S.G.B Abitibi Inc. in Ste Germaine-Boulé (Tech-Labs).
- After having been logged and sampled at Consul-Teck's Val-d'Or facility, the samples are delivered to the laboratory by Consul-Teck personnel.
- Upon arrival at ALS, the samples are dried then crushed (jaw crushers) to 70% passing 10 mesh (i.e. 2 mm). Samples are then riffle-split (Jones riffle splitters) to reduce the sample size for pulverization to a maximum of 1 kg. The 1-kg samples are then pulverized (ring and puck) to 85% passing 200 mesh (i.e. 75 µm). Analytical protocols require that all samples be analyzed for 48 elements by the UltraTrace Level method using ICP MS and ICP-AES (ALS internal code ME-MS61).
- The ALS protocol for this type of analysis stipulates that a prepared sample (0.25 g) is digested by perchloric, nitric, hydrofluoric, and hydrochloric acids. The residue is topped up with dilute

hydrochloric acid and analyzed by inductively coupled plasma–atomic emission spectrometry (ICPAES). Following this analysis, the results are reviewed for high concentrations of bismuth, mercury, molybdenum, silver, or tungsten and diluted accordingly. Samples with high concentrations are then analyzed by inductively coupled plasma–mass spectrometry (ICP-MS). Results are corrected for spectral inter-element interferences. ALS notes that although the four-acid digestion is able to dissolve most minerals, it is described as 'near-total digestion' because not all elements may be quantitatively extracted, depending on the sample matrix.

- In cases where Li is higher than the detection limit of the ME-MS61 method, selected samples are then analyzed using the ALS Ore Grade Lithium method by four-acid digestion with ICP-AES finish (ALS internal code Li-OG63). Approximately 0.4 g is first digested with $HClO_4$, HF, and HNO_3 until dryness. The residue is subsequently re-digested in concentrated HCl, cooled and topped up to volume. The samples are analyzed for Li by ICP-AES spectroscopy.
- In cases where Ta and/or Cs are higher than the detection limit of the ME-MS61 method, selected samples are then analyzed using the ALS Pressed Pellet Geochemical Procedure method (ALS internal code ME-XRF05). A finely ground sample powder (10-g minimum) is mixed with a few drops of liquid binder (Polyvinyl Alcohol) and then transferred into an aluminum cap. The sample is subsequently compressed in a pellet press at approximately 30 tons/in^2. After pressing, the pellet is dried to remove the solvent and analyzed by WDXRF spectrometry for the desired elements.
- In addition to the regular sampling and assaying of samples, Consul-Teck externally initiates additional quality control protocols by preparing various duplicate samples to evaluate the precision (i.e. reproducibility) and accuracy (i.e. correctness) of the values reported. According to the company database, a total of 192 samples from the Property were duplicated. In addition, 198 blank samples were inserted in the batches sent to the laboratory to verify that contamination did not occur during the preparation process. ALS also conducts internal quality control protocols.
- The laboratory delivered the results in electronic format, sent by e-mail only to Jean-Sébastien Lavallée. Assay results were then transferred directly to the Critical Elements database.

There is no indication of anything in the drilling, core handling and sampling procedures or in the sampling methods and approach that could have had a negative impact on the reliability of the reported assay results.

11.2 Analytical Methods

The QP obtained assay certificates from ALS to create an independent database. The QP used the independently compiled database to recalculate the results according to the following rules:

- For Li, two methods were present in the database: ME MS61 and ME OG63. ME OG63 is only available when ME MS61 shows >10,000 ppm and is a method capable of returning results for higher grades. Therefore, values from ME OG63 were used when available.
- For Be, two methods were present in the database: ME MS61 and ME ICP61a. ME ICP61a is only available when ME MS61 shows >500 ppm and is a method capable of returning results for higher grades. Therefore, values from ME ICP61a were used when available.
- For Rb, two methods were present in the database: ME MS61 and ME MS81. When both methods were available, an average of the two methods was applied. In cases where the result was >10,000 ppm Rb, a value of 10,000 was applied before proceeding with the average.
- For Ta, three methods were present in the database: ME MS61, ME MS81, and ME XRF05. When more than one method was available, an average was applied. In cases where Ta values were >100 ppm using method ME MS61, the average of ME MS81 and ME XRF05 was used. In each instance where this occurred, the results from either ME MS81 or ME XRF05 (or both) were available. In cases where Ta values were >10,000 ppm using method ME XRF05, the value of 10,000 was used.

— For Cs, three methods were present in the database: ME MS61, ME MS81 and ME XRF05. When more than one method was available, an average was applied. In cases where Cs values were >500 ppm using method ME MS61, the average of ME MS81 and ME XRF05 was used. In each instance where this occurred, results from either ME MS81 or ME XRF05 (or both) were available.

— For Ga, two methods were present in the database: ME MS61 and ME MS81. When both methods were available, an average of the two methods was applied.

— Grades for Li, Ta, Rb, Cs, and Be are reported in this section as parts per million (ppm).

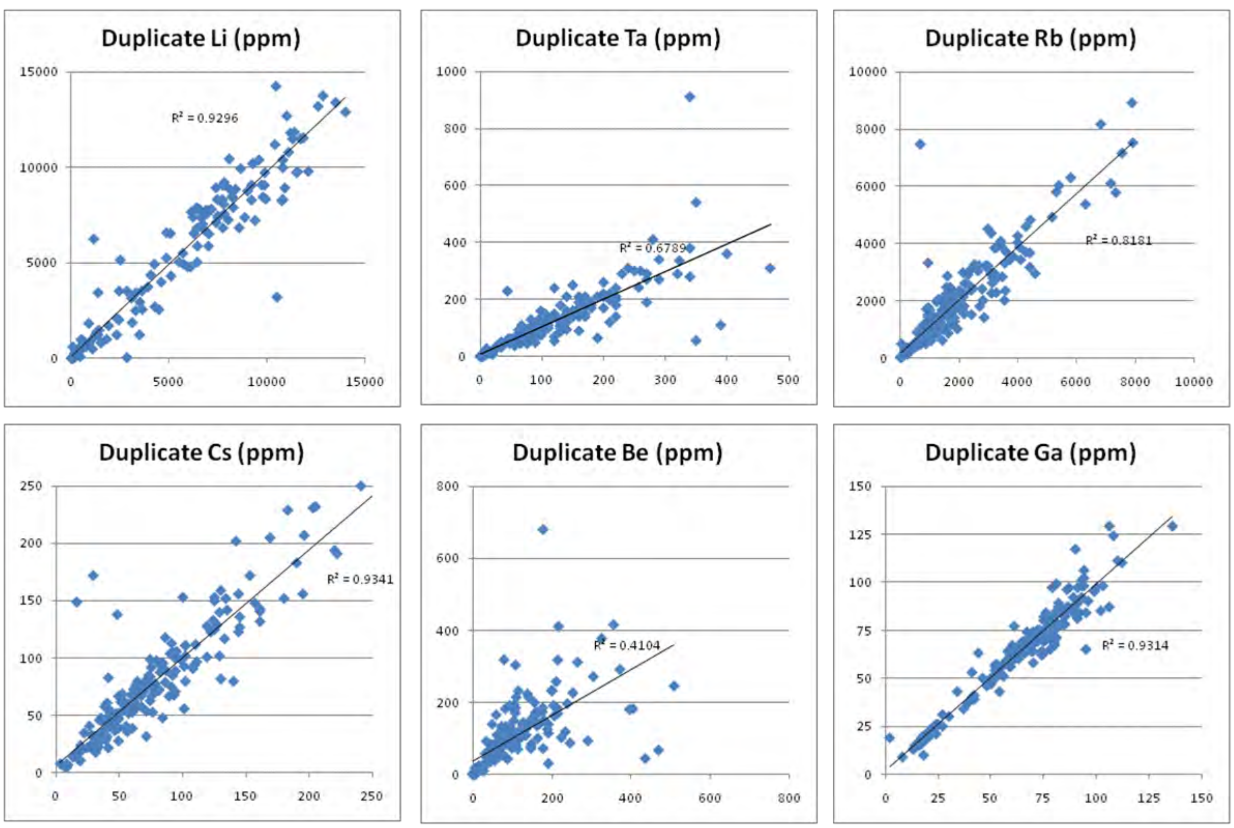
11.3 Critical Elements Quality Control

The quality control database for drill core assays contains 198 blank and 192 core duplicate samples that were sent to ALS as part of the program. Core duplicates are quarter-splits using what is left in the box after taking the original half-split sample. Certified standards were not included in the sample protocol.

According to the database, not every hole had blanks and/or core duplicates, but the majority did.

Field duplicates returned values similar to the original assays Figure 11.1), the only exception being Be and Ta which show less (although reasonable) coherence. Only four blanks (Samples 738810, 747847, 883610, and 883661) returned abnormally high results. After reviewing the weights received at the laboratory, the authors came to the conclusion that there must have been a mistake in the tag identification of Sample 747847 rather than a laboratory issue. However, the three batches containing Samples 738810, 883610, and 883661 should be quarter-split and re-assayed with new blanks and duplicates. With the exception of those three suspicious batches, there were no signs of significant contamination.

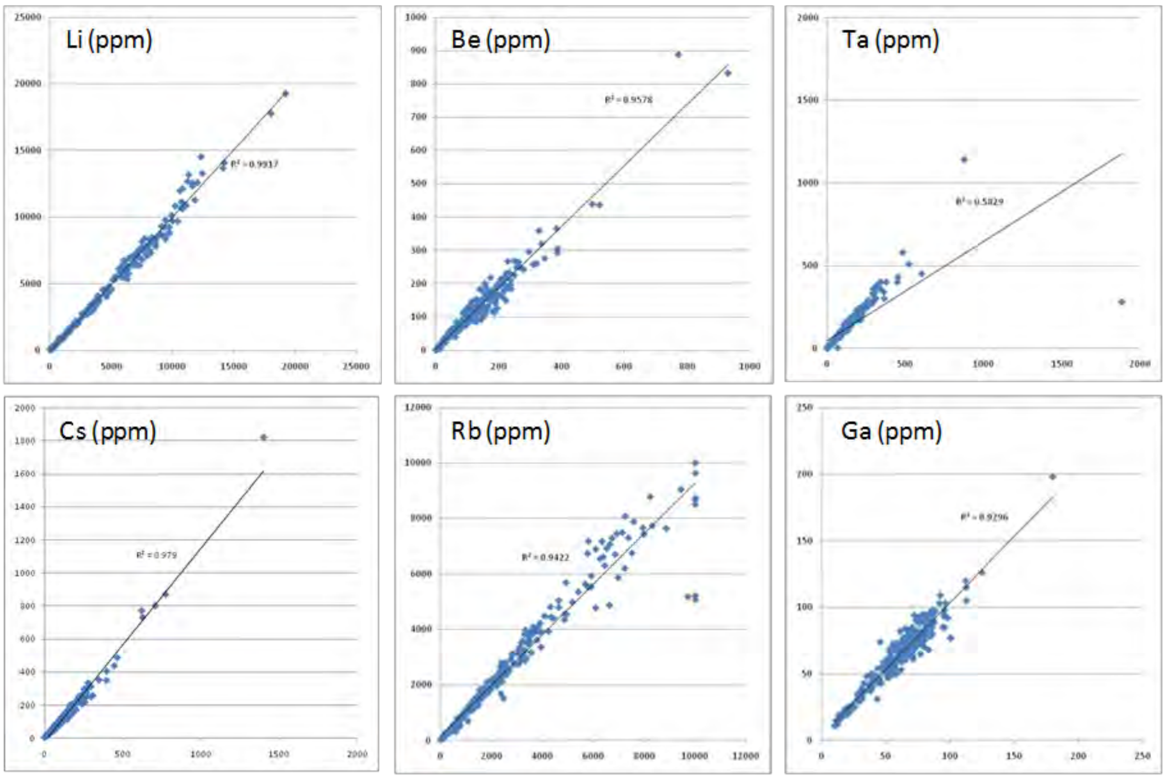
Figure 11.1: Verification of Core Duplicates



Approximately 10% of the Rose deposit samples sent to ALS were sent to a third laboratory in November 2010 to confirm the values. CRITICAL ELEMENTS chose Acme Analytical Laboratories Ltd (Acme) as the third laboratory, and the results were obtained on November 26, 2010, via electronic transmission.

Acme's values for pulp re-assays are similar to the original assays (Figure 11.2). Initially it may appear that this is not true for the Ta results, which show an R-squared value of 0.58, but the value becomes 0.9618 if the single outlier (lower-right corner of the chart) is omitted from the database. The QP therefore conclude that the two sets of assays correlate well.

Figure 11.2: Re-assays Performed at a Third Laboratory



Note: (Acme; Y-axis) compared against original assays (X-axis)

12 DATA VERIFICATION

Grades for Li, Ta, Rb, Cs, and Be are reported in this Item as parts per million (ppm). Refer to Table 12.1 for converting into Li_2O, Ta_2O_5, Rb_2O, Cs_2O, and BeO.

Table 12.1: Unit Conversion Factors

Element	From	To	Multiplied by	Example
Lithium	Li	Li_2O	2.1530	1 ppm Li = 2.1530 ppm Li_2O
	Li	Li_2O_3	5.3234	1 ppm Li = 5.3240 ppm Li_2O_3
Tantalum	Ta	Ta_2O_5	1.2211	1 ppm Ta = 1.2211 ppm Ta_2O_5
Rubidium	Rb	Rb_2O	1.0940	1 ppm Rb = 1.0940 ppm Rb_2O
Cesium	Cs	Cs_2O	1.0600	1 ppm Cs = 1.0600 ppm Cs_2O
Beryllium	Be	BeO	2.7750	1 ppm Be = 2.7750 ppm BeO

12.1 Historical Work

The historical information used in this report was taken mainly from reports issued by the Québec government's geological survey (the MRNQ, now the MERN) as part of its vast regional programs. Little information is available about sample preparation or analytical and security procedures in these documents, but the QP assumes that the government's exploration activities were in accordance with prevailing industry standards at the time.

Only one historical drillhole is reported for the current Property. There was therefore no historical database for the author to validate.

12.2 Critical Elements Database

The Critical Elements ACCESS database comprises 229 NQ-size diamond drillholes totalling 28,333.5 m. A total of 4,996 core samples (4,771 from the Rose deposit and 225 from the Pivert, Pivert-East, Pivert-South and Helico showings) are included, as are 450 QA/QC samples (blanks and duplicates).

The QP was granted access to the official results from ALS Laboratory (ALS) for all holes and grab samples discussed in this report (holes LR-09-01 to LR-11-181; LR-22-188 to LR-22-198; JR-10-01 to JR-11-18; HD-10-01 to HD-10-03; LP-09-01 to LP-10-06; HE-10-01 to HE-10-05; PE-10-01 to PE-10-02; PS-10-01 to PS-10-02). The QP downloaded every certificate directly from the laboratory and built the tables presented in this report using the information contained therein. Very few errors were noted in the database, and these were considered minor and of the type normally encountered in a project database. None of the observed errors would affect the integrity of the database, and it is considered to be of very good overall quality.

The QP considers the Critical Elements database for the Project to be valid and reliable.

12.3 Critical Elements Diamond Drilling

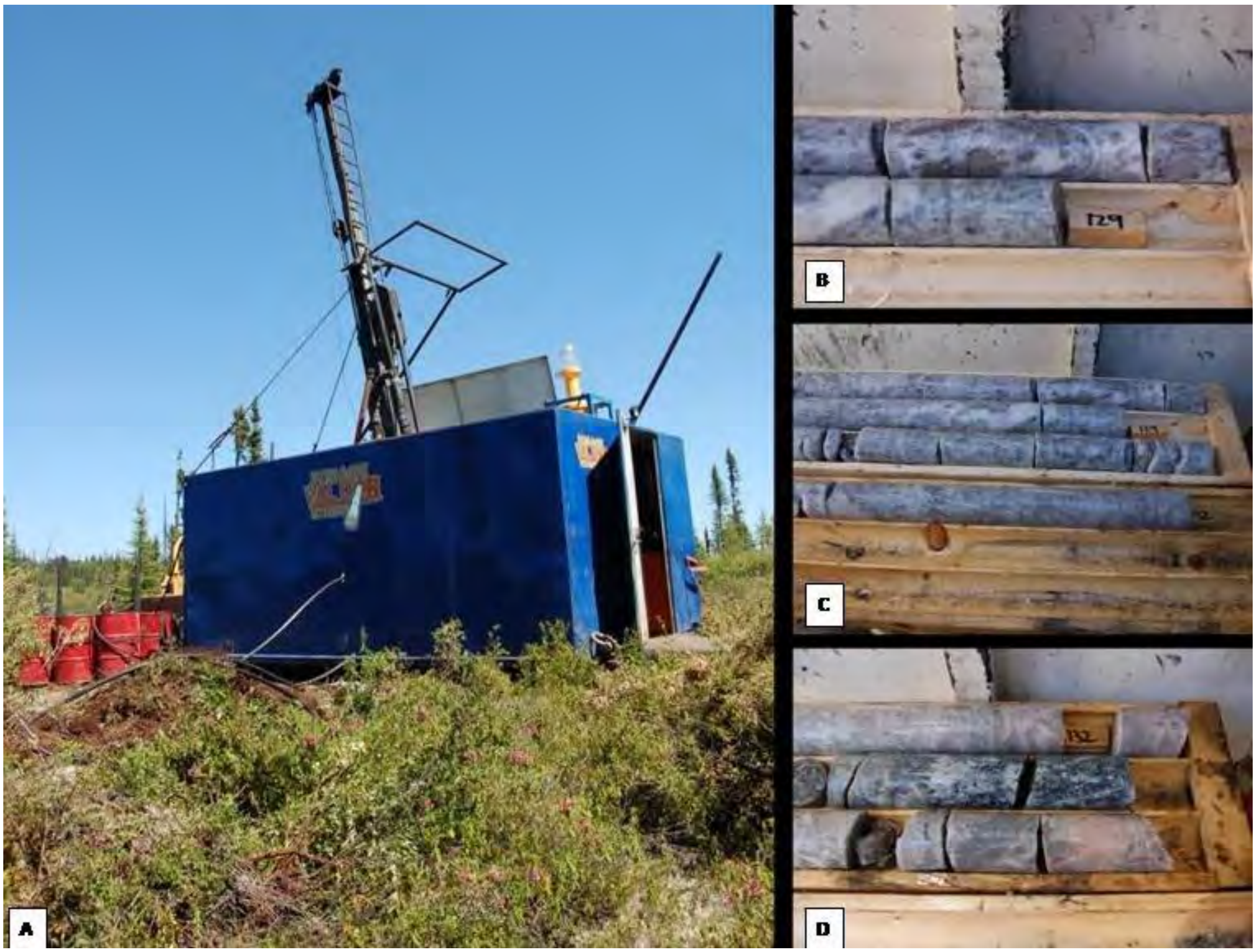
Every collar on the Rose deposit was professionally surveyed. Most of the other collars were surveyed using a handheld GPS. The surveys conducted on the Rose deposit are considered adequate for the purpose of a resource estimate. The great majority of the holes were surveyed by a Flexit instrument (single shots approximately every 60 m).

Carl Pelletier, P.GEO., QP for the 2023 MRE did not visit the property for the current mandate but a verification of the core from the 2022 drilling program was made on August 21, 2023 at the core storage facility in Val-d'Or. A site visit done by the one of the previous QP in 2010 and 2011 was performed under his supervision. Although the information presented below are not considered as a valid site visit, the QP is of the opinion that it is relevant information for the project.

Simon Boudreau, P.Eng., QP and responsible for the site visit for Item 15 has visited the Property and confirmed that no change to property was observed.

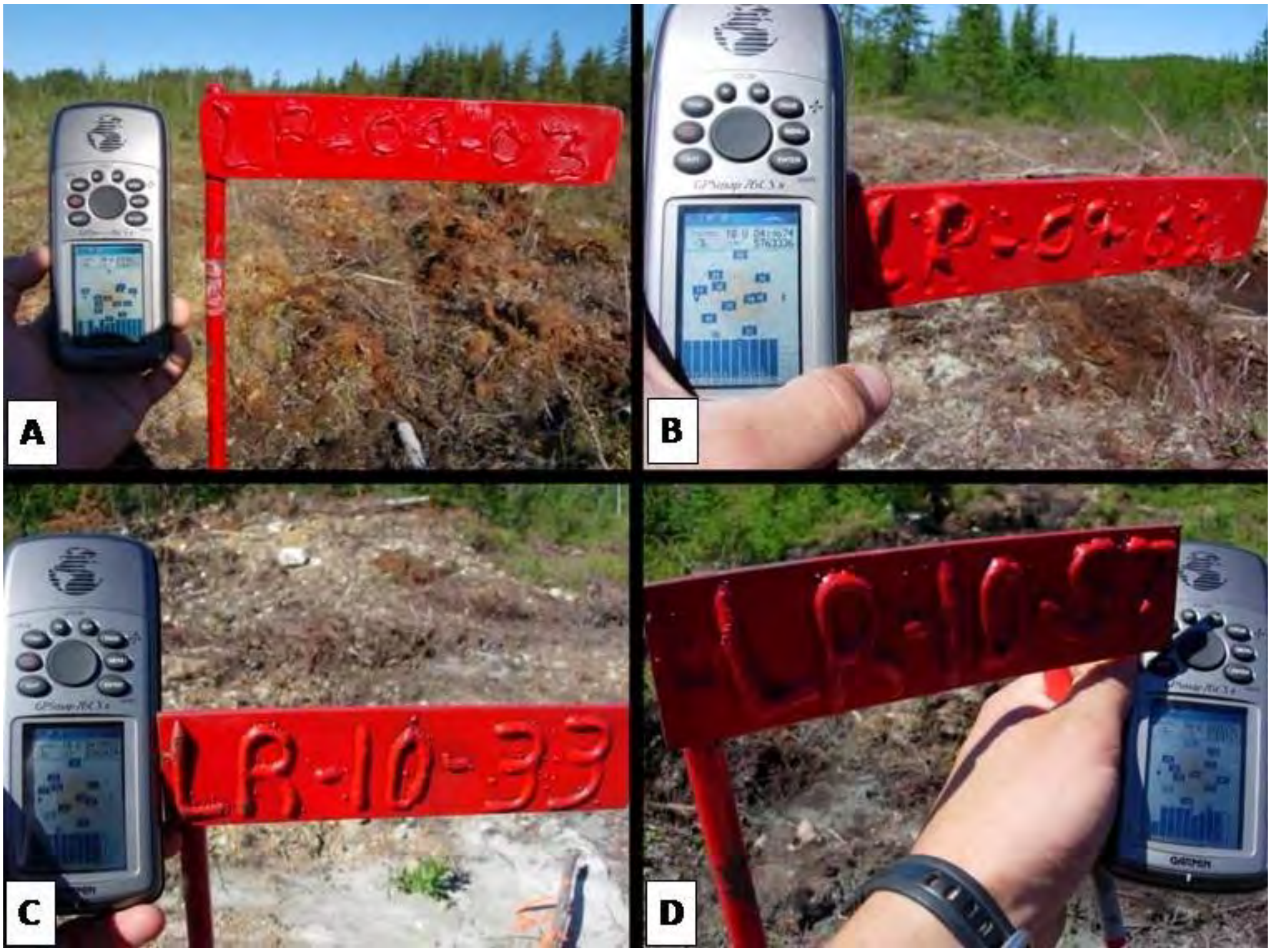
Drilling was underway (Hole LR-10-86) when previous QP first visited the site on July 13, 2010 (Figure 12.1). He visited the drill rig during the site visit and witnessed approximately 9 m of core being pulled from underground. He also observed spodumene in the core section. There was no active drill rig on site during the second visit in July 2011. He was able to confirm the location of many casings using a handheld GPS during both visits (Figure 12.2 and Figure 12.3).

Figure 12.1: Drilling at the Rose Deposit



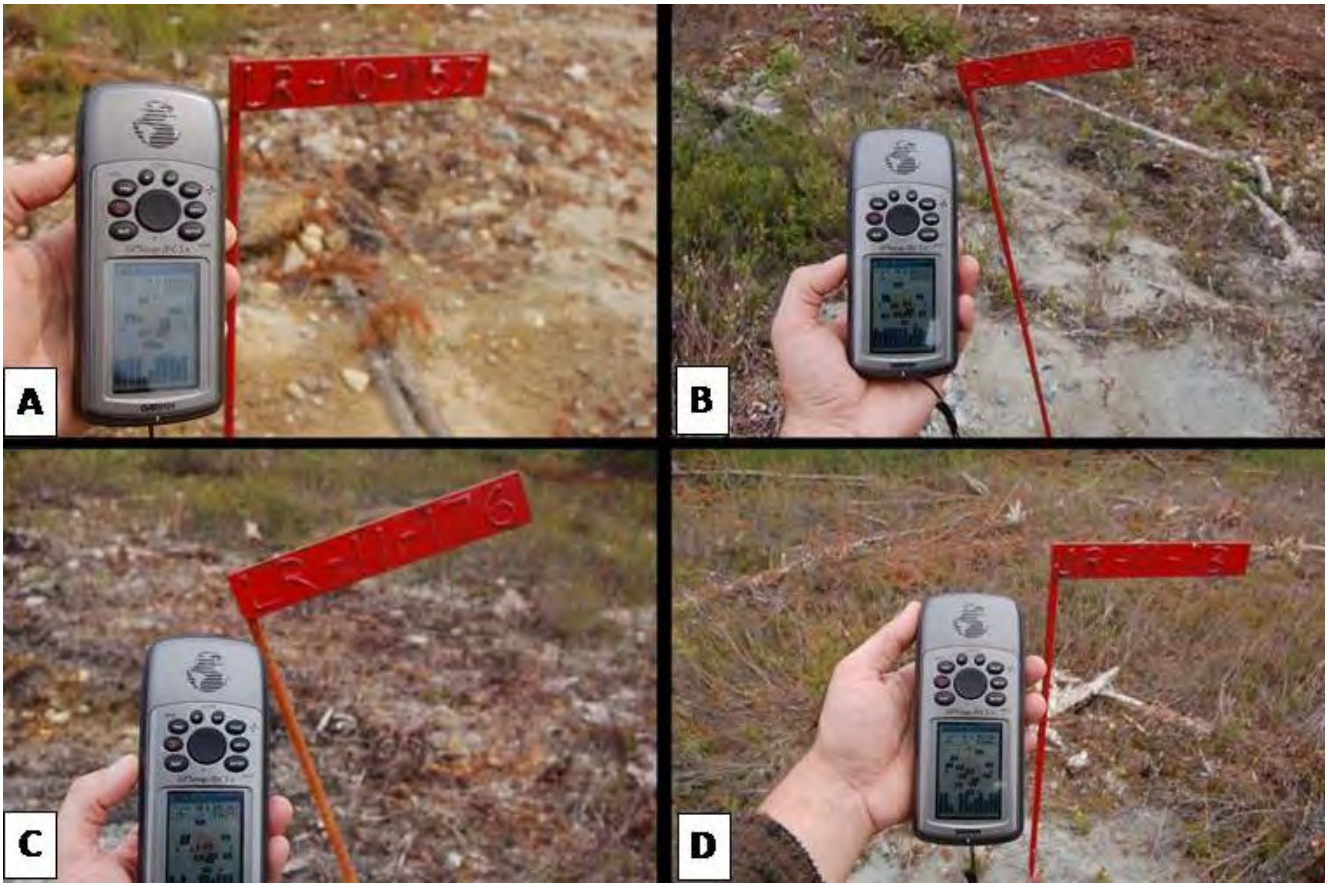
Notes: A)Drill rig in action on Hole LR-10-86 at the time of the site visit.
B) to D) Views of the Rose pegmatite in core at the drill site.

Figure 12.2: Casing Locations Verified on the Rose Property during the First Site Visit in 2010



Notes: A) LP-09-03
B) LR-09-02
C) LR-10-33
D) LR-10-57

Figure 12.3: Casing Locations Verified on the Rose Property during the Second Site Visit in 2011



Notes: A) LR-10-157
B) LR-11-165
C) LR-11-176
D) JR-11-13

12.4 Critical Elements Outcrop Sampling

As discussed in Item 11, Critical Elements refers to channel samples from the Property as 'non-chosen grab samples' in company press releases because the collection process differs from traditional channel sampling. Unlike traditional channel samples, they are not necessarily perpendicular to the interpreted strike of the pegmatite and they are of variable lengths.

This type of channel sampling was employed in lieu of grab sampling because traditional grab samples are very difficult or impossible to obtain from smooth, hard outcrops surfaces using a hammer and chisel. However, the channel samples are similar to grab samples in that they are selective by nature and unlikely to represent average grades. The purpose of such sampling is to rapidly determine whether mineralization is constant throughout the outcropping pegmatite.

For this reason, channel samples collected on the Project to date should be considered as grab samples and not be used in any future resource estimates, even with proper surveying.

12.5 Critical Elements Sampling and Assaying Procedures

Several mineralized core sections were reviewed during the visit to the core storage facility in Val-d'Or in 2011 (Figure 12.4 and Figure 12.5). All core boxes were labelled and properly stored outside. Sample tags, located at the end of each sample, were still present in the boxes. Marks on the bottom of the box were also found, indicating sample intervals. It was possible to validate sample numbers and confirm the presence of spodumene for each of the samples in the mineralized zones.

Figure 12.4: Core Verification at the Core Storage Facility in Val-d'Or during the visit in 2010

Notes: A) General view of the facility and some of the boxes that were examined
B and C) Hole LR-10-11
D and E) Hole LR-10-27
F) and G) Hole LR-10-55

Figure 12.5: Core Verification at the Core Storage Facility in Val-d'Or during the visit in 2011

Notes: A) and B) Hole LR-11-178
C and D) Hole JR-11-13
E and F) Hole LR-10-27
F) and G) Hole HD-10-01

Figure 12.6: Core Verification at the Core Storage Facility in Val-d'Or during the visit in 2023

Notes: A) Hole LR-22-188A, interval from 133.4m to 146.6m, grading 1.33% Li_2O and 66.41 g/t Ta_2O_5
B) Hole LR-22-189. Example of sample tag located at the end of each sample
C) Hole LR-22-190. Core box properly labelled

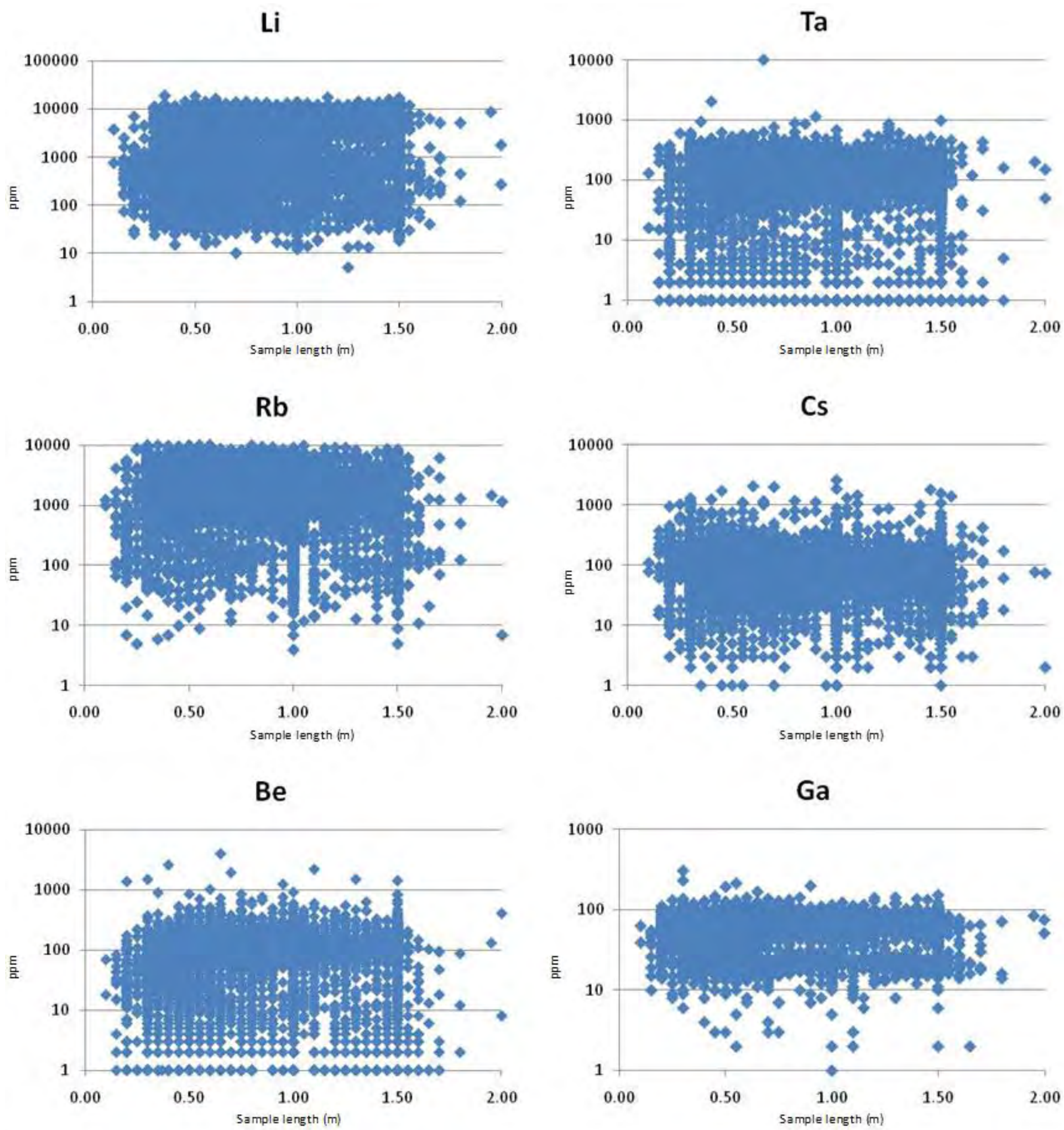
The entire path taken by the drill core was reviewed and judged adequate, from the drill rig to the logging and sampling facility (Figure 12.6). Core sample lengths were also reviewed. After Critical Elements made corrections, only 6 of the 4,633 reviewed samples from the Rose deposit were found to be more than 2 m long (3.75 m being the maximum), and 728 were less than 0.50 m. The smallest sample was 0.10 m long.

Figure 12.6: Path of Core from Drill Rig to Final Storage Facility

Notes: A) Drill rig on the Rose deposit
B) Core carefully boxed and ready for transport by Consul-Teck personnel to the Val-d'Or facility
C) Consul-Teck logging facility where the core is logged and marked for sampling;
D) Core splitter used to sample the core
E) Half-core bagged by Consul-Teck personnel and later shipped to the assay laboratory
F) Core adequately stored outside in roofed-racks

The grade versus sample length graph shows a very homogeneous distribution for all elements considered (Li, Ta, Rb, Cs, Be, Ga), without any detectable bias due to small interval sampling (Figure 12.7). A comparison of grade versus sample length seemed appropriate considering more than 15% (728) of the 4,633 samples in the database are less than 0.50 m long. This kind of sampling procedure can sometimes conceal high-grade values derived from small samples by spreading them over longer composite intervals when a suitable capping grade has not been applied.

Figure 12.7: Verification of Grade vs. Sample Length for Critical Elements Drillholes (logarithmic scale)



12.6 Independent Grab Sampling

During the 2010 site visit,12 grab samples were collected for the purpose of conducting an independent analysis. Samples were collected, bagged and delivered to ALS by one of the authors. Table 12.2 presents the results for those samples.

The goal of this verification was to confirm the presence of the reported Li, Be, Ta, Cs, Rb, and Ga mineralization. Mineralization-level values were successfully obtained for all of the visited showings, except Hydro: samples from this showing failed to yield significant results for Li, with only Ta returning significant levels (>100 ppm). However, the QP is of the opinion that all showings presented in this report truly contain Li and rare-element mineralization, and grab samples are unlikely to represent average grades.

Table 12.2: Samples Independently Collected by InnovExplo as part of Data Verification for the Rose Property

Sample	Showing	UTM83 Zone 18		Li	Rb	Ta	Cs	Be	Ga
		Easting	Northing	ppm	ppm	ppm	ppm	ppm	ppm
58001	Pivert	422649	5766795	5,570	38	45	44	1,420	64
58002	Hydro	420487	5763947	136	214	>100	23	171	61
58003	Hydro	420600	5763893	28	204	>100	22	510	60
58004	Rose	419628	5763381	7,950	128	>100	155	3,650	68
58005	Rose	419601	5763387	>10,000	171	>100	122	3,260	84
58006	Rose	419628	5763468	55	16	>100	37	1,140	69
58007	Rose	419597	5763496	111	123	36	57	1,470	34
58008	Rose	419692	5763373	7,100	96	>100	121	3,660	95
58009	Rose	420044	5763217	>10,000	133	100	47	1,260	78
58010	Rose	420047	5763174	4,320	127	45	104	3,140	57
58011	JR	421764	5764520	9,870	172	>100	54	1,360	75
58012	JR	421777	5764505	7,150	305	57	121	4,170	68

13 MINERAL PROCESSING AND METALLURGICAL TESTING

The following chapter captures the extensive testing and metallurgical developments that were carried out, leading to the issue of the project Feasibility Study (Nov. 2017). It is repeated here as a refresher. The final sections cover the work to develop the tantalite circuit, but it is evident that more testing is essential. Bumigeme strongly suggests that the tantalum flowsheet be further tested in pilot-plant trials in the new lithium concentrator.

13.1 Metallurgical Test Work Summary

SGS Canada Inc., Lakefield developed a conceptual flowsheet based on a series of bench scale tests on various samples from the Rose deposit. Bench scale metallurgical test work was performed on outcrop and drill-core samples having lithium grades from 1.0% Li2O (bench scale test work) to 1.45% Li2O (pilot scale test work). Variability drill-core composites tested had head grades; 0.99% Li2O to 2.15% Li2O except for one composite (PEG2) with 0.80% Li2O that did not produce acceptable grade-recovery due to the presence of higher levels of amphiboles and pyroxenes in the ore.

Metallurgical test work on nine representative drill-core composites having a lithium head grade varying between 0.50% Li2O and 1.70% Li2O was conducted at SGS laboratory to investigate its effect on grade/recovery. Results show that a head grade of 0.87% Li2O could produce a chemical grade lithium concentrate of 5.5% Li2O with a recovery of 90% or a technical grade lithium concentrate of 6.0% with a recovery of 87%.

The proposed flowsheet is comprised of conventional three-stage crushing and single stage grinding followed by magnetic separation for the recovery of tantalum, mica flotation and spodumene flotation. The flowsheet is capable of producing a spodumene concentrate with a minimum of 6.0% Li2O and lithium recovery around 85% from a spodumene ore with 1.15% Li2O. Settling and filtration tests were also performed for sizing dewatering equipment.

Historical metallurgical test works are presented in Section 13.2 and 13.3. The bench scale at ACME metallurgical testing is presented in 13.2. The SGS bench scale test work is presented in Section 13.3. The final spodumene concentrate production tests are presented in Section 13.4. Solid-liquid separation test work is presented in Section 13.5. Flotation pilot plant test work is presented in Section 13.6. Section 13.7 shows the ongoing tantalum concentrate upgrading test work, and Section 13.8 presents the test work on the nine variability samples.

13.2 Historical Bench Scale Test Work – ACME Metallurgical Limited

A preliminary Economic Assessment (PEA) study was completed in 2011. Bench scale metallurgical testing was performed at ACME Metallurgical Limited in Vancouver in 2011. Details are reported in ‘Technical Report and Preliminary Economic Assessment on the Rose Tantalum-Lithium Project’,

Project111-52558-00 December 10, 2011. The results from these tests were used for the PEA study. Three composites, the Rose (main structure), the Rose Sud-Est (Southeast structure) and Tantalum (secondary structure with higher tantalum and lower lithium content) were subjected to various metallurgical tests.

The head assays of the samples are presented in Table 13.1 and indicate that the Rose composite is rich in lithium and low in tantalum whereas the Tantalum composite is rich in tantalum and low in lithium with a lithium content of 0.3% Li2O.

Table 13.1: Head Assay of the Composite Samples

Composite	Li_2O%	Ta%	Fe_2O_3%	Na_2O%	K_2O%	SiO_2%	Al_2O_3%	CaO%	MgO%
Rose	1.30	0.015	0.76	4.51	2.31	73.4	15.6	0.15	0.02
Rose (Sud-Est)	1.16	0.022	0.73	5.8	1.99	74.0	14.9	0.32	0.07
Tantale	0.30	0.028	0.90	4.27	2.87	72.3	15.7	0.14	0.07

Most of the test work was performed on the Rose Composite as it was likely the most representative of the known resource at the time. Grindability tests, rod mill and ball mill work index tests and abrasion tests were performed on the composites. Bond rod mill index, 9.82 kWh/t, ball mill work index, 13.3 kWh/t, and an abrasion index, 0.429 Ai were determined.

Heavy-liquid separation tests performed at 2.7, 2.9, and 3.2 g/cm3 specific gravities concluded that the mineralization was not amenable to dense media separation at a coarser grind size of 500 µm.

Mineralogical examination of the flotation products indicated that tantalum was present as mangano-tantalite in liberated grains of 50 to 150 µm and as small inclusions within spodumene minerals. The spodumene, feldspars, quartz, and mica minerals were liberated at a grind size of 150 µm.

Twenty-eight (28) bench scale flotation tests were performed on 4 kg samples at different grinds. Test F-28 performed at the optimum grind size of 80% passing 150 µm produced a spodumene concentrate containing 5.86% Li2O and 90.7% lithium recovery. The final flotation spodumene concentrate assayed 0.08% Ta grade with 85% Ta recovery.

Thirteen high-gradient wet magnetic separation tests were performed on the spodumene flotation concentrate to recover magnetic tantalum minerals. Tests performed up to 14,000 Gauss showed that about 60% of the tantalum contained in the spodumene concentrate was recovered in a concentrate assaying 1.14% Ta.

13.3 Historical Bench Scale Test Work – SGS Canada Inc. Lakefield

Bench scale metallurgical test work performed at SGS Lakefield (SGS) in 2015 were aimed at optimizing a flowsheet for producing spodumene concentrate with a minimum of 6.0% Li2O grade at about 90% lithium recovery. Improving tantalum recovery from 50% from previous study at ACME Metallurgical Limited to a higher level was also a focus. The detailed results of the metallurgical test work were reported by SGS Canada Inc. 'Phase 1 Beneficiation bench scale testing on the Rose Lithium/Tantalum Project', Project 14120-001 Final report, April 20, 2015.

13.3.1 Sample Description

Rose outcrop and South Rose outcrop rock samples were first received at SGS Canada in June 2013. Five variability drillcore composites received later in September 2013 were identified as 1st shipment variability samples. Five additional variability drillcore samples received subsequently in December 2013 were identified as 2nd shipment variability samples.

Rose outcrop rock sample was referred to as Rose sample by SGS during metallurgical test work. Mineralogical characterization, grindability, heavy-liquid testing, gravity separation, magnetic separation, and flotation tests were performed on the Rose sample.

Rose sample was used for the development of flowsheet.

The head assays of the Rose sample, South Rose sample, 1st shipment variability samples (PEG2 1st, RSE 1st, ROSE 2 1st, ROSE 3 1st, ROSE 4 1st), and 2nd shipment variability samples (PEG2, RSE, ROSE 2, ROSE 3, ROSE 4) are presented in Table 13.2.

Table 13.2: Head Assay of the Composite Samples Tested

Sample ID	Li_2O %	Ta %	Fe_2O_3 %	Na_2O %	K_2O %	SiO_2 %	Al_2O_3 %	CaO %	MgO %
Rose sample	1.00	0.0349	0.19	4.87	2.42	75.0	16.1	0.10	0.04
South Rose	2.15	0.0072	0.46	3.09	2.23	75.5	16.3	0.07	0.04
PEG2 (1st)	0.99	0.0195	0.39	4.67	2.72	74.0	15.9	0.28	0.11
RSE (1st)	1.40	0.0142	0.52	4.00	2.53	75.3	16.1	0.22	0.11
ROSE 2 (1st)	1.10	0.0292	0.84	4.29	2.65	73.2	16.1	0.56	0.37
ROSE 3 (1st)	1.25	0.0231	1.06	4.11	2.32	74.1	16.0	0.71	0.38
ROSE 4 (1st)	1.23	0.0155	0.84	4.32	2.24	74.2	15.8	0.47	0.31
PEG2	0.80	0.0164	1.79	4.45	2.63	71.2	16.0	1.36	0.78
RSE2	1.42	0.0082	0.32	4.14	2.46	74.9	16.0	0.13	0.05
Rose 2	1.33	0.0164	0.47	3.91	2.58	74.7	16.3	0.34	0.12
Rose 3	1.18	0.0164	0.28	4.41	2.97	74.9	16.4	0.19	0.04
Rose 4	1.49	0.0082	0.37	3.96	2.63	74.5	16.0	0.17	0.07

The lithium content of the samples ranged from a low of 0.80% Li2O for the PEG2 sample to a high of 2.15% Li2O for the South Rose sample. Tantalum was reported high at 0.0349 % Ta in the Rose sample.

tantalum content in the other samples ranged from 0.0072 %Ta to 0.0292 % Ta. Deleterious elements, Fe2O3, CaO, and MgO are low in all samples except for PEG2 sample with high contents of 1.79% Fe2O3, 1.36% CaO, and 0.78% MgO which affect negatively on spodumene flotation and produce a concentrate that may not meet spodumene concentrate product specifications for certain applications. PEG2 sample is mostly composed of material from Zone 119 while all the others are mostly from Zone 115 as shown in Table 13.3. Zone 119 is not in the feasibility mine plan. Zone 115 represents more than 50% of the feasibility mine plan.

The variability tests were aimed at investigating differences in metallurgical results on ore from various areas of the operation. The sample composites were gathered from diamond drill-core at different locations and depth of the pit. The composites RSE2, ROSE 2, ROSE 3, and ROSE 4 were made of material mostly from Zone 115 with the exception of composite PEG2 which is mostly composed of material from Zone 119.

Table 13.3: Source of Samples

Zone	Proportion of Zone in Composite%						
	Outcrop Samples SGS rec'd June 2013		DDH Composites – 2nd Shipment SGS received December 2013				
	Rose	South Rose	PEG2	RSE2	Rose 2	Rose 3	Rose 4
104	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-

Zone	Proportion of Zone in Composite%						
	Outcrop Samples SGS rec'd June 2013		DDH Composites – 2nd Shipment SGS received December 2013				
	Rose	South Rose	PEG2	RSE2	Rose 2	Rose 3	Rose 4
108	-	-	-	-	-	-	-
109	-	-	-	-	-	-	-
111	-	-	-	-	-	-	-
112	-	-	-	1%	-	2%	19%
113	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-
115	100%	100%	-	96%	92%	98%	81%
116	-	-	-	3%	4%	-	-
117	-	-	-	-	-	-	-
118	-	-	0.3%	-	-	-	-
119	-	-	86%	-	-	-	-
120	-	-	11%	-	-	-	-
NA	-	-	3%	-	0%	-	-
Total	100%	100%	100%	100%	96%	100%	100%

Source: Critical Elements Corp

13.3.2 Mineralogical Evaluation

Mineralogical studies were performed on the Rose composite sample with QEMSCAN, electron microprobe, X-ray diffraction (XRD) and electron microscopy. The Rose sample was crushed to 100% passing 600 µm, screened into four size fractions; +425 µm, -425/+300 µm, -300/+106 µm, and -106 µm to characterize the minerals present and their liberation characteristics. The mineralogical report can be found in 'An Investigation by High Definition Mineralogy into the Mineralogical Characteristics of One Beneficiation Head Sample from the Rose Lithium/Tantalum Project', SGS Canada Inc. Project 14120-001 Final report, April 20, 2015.

Plagioclase, 43.3% was found to be the dominant mineral in the Rose sample with moderate quartz 25.5%, spodumene 14.5%, K-feldspar 13.8%, minor mica 2.7%, and trace amounts, less than 1% of tantalite and other minerals. Electron microprobe analysis showed that tantalite [(Fe,Mn),(Nb,Ta)2O6] occurs as the main phase and liandratite [U6 + (Nb,Ta)2O8] and tantalite (Ta2O5) in minor amounts.

13.3.3 Grindability Tests

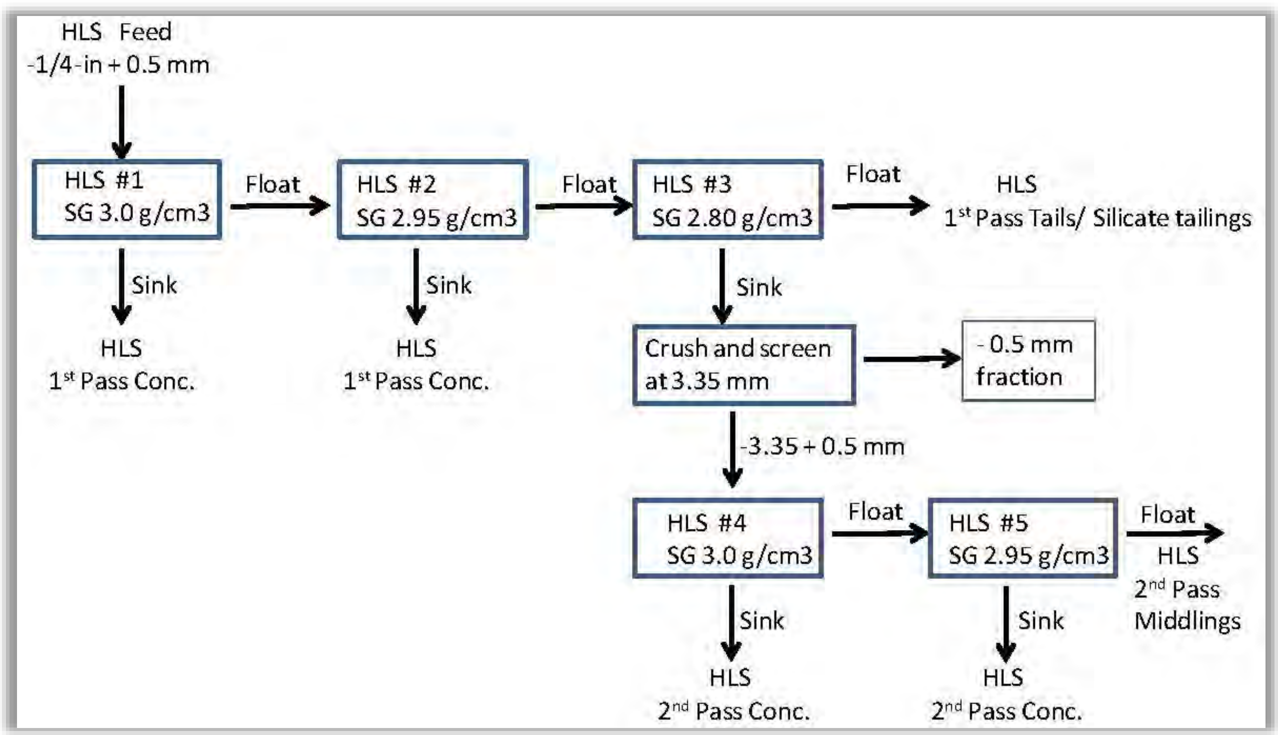
Bond grindability test was performed on the Rose sample only and it was categorized as moderately soft with a ball mill work index of 12.9 kWh/t and a rod mill work index of 8.0 kWh/t.

13.3.4 Heavy Liquid Separation Tests

Heavy-liquid separation (HLS) tests were performed on the -1/4”/+0.5 mm fraction of Rose sample for evaluating the potential for gravity separation. Methylene iodide was mixed with acetone to achieve target specific gravity (SG) for the HLS tests.

Simplified HLS test flowsheet is shown on Figure 13.1. The -1/4”/+0.5 mm fraction was separated at 3.0 g/cm3 and the float fraction was separated further at a media specific gravity (SG) 2.95 g/cm3 . The SG 2.95 g/cm3 float was separated at SG 2.80 g/cm3 . The sink 3.0 sinks, 2.95 sinks, and the SG 2.80 floats were collected as products. The 2.8 SG test sink product was stage crushed to 3.36 mm (6 Mesh) and the - 0.5 mm fraction was screened out. The -3.36+0.5 mm fraction was sequentially separated at SG 3.0 g/cm3 and 2.95 g/cm3. The initial 3.0 SG sinks fraction graded 6.74% Li_2O and the second 3.0 SG sink fraction achieved a higher Li_2O grade of 6.89%.

Figure 13.1: Heavy Liquid Separation Test Flowsheet



An overview of the combined heavy-liquid test results is presented in Table 13.4.

Table 13.4: Heavy-Liquid Separation Tests Summary

Product	SG	Weight	Assay %		Distribution %	
	g/cm3	%	Li2O	Ta	Li	Ta
HLS Total Concentrate	2.95	8.94	6.27	0.0568	54.9	16.7
Middlings & -0.5 mm fraction		29.5	1.06	0.0443	30.8	43.0
HLS Silicate Tailings	2.80	61.5	0.24	0.0200	14.3	40.4
Feed		100	1.02	0.0305	100	100

The HLS tests produced a combined sink product at 2.95 g/cm3 grading 6.27% Li2O with 54.9% lithium recovery. Details of the HLS tests can be found in 'Phase 1 Beneficiation Bench Scale Testing on the Rose Lithium/Tantalum Project', Project 14120-001 SGS Canada Inc., Final report, April 20, 2015.

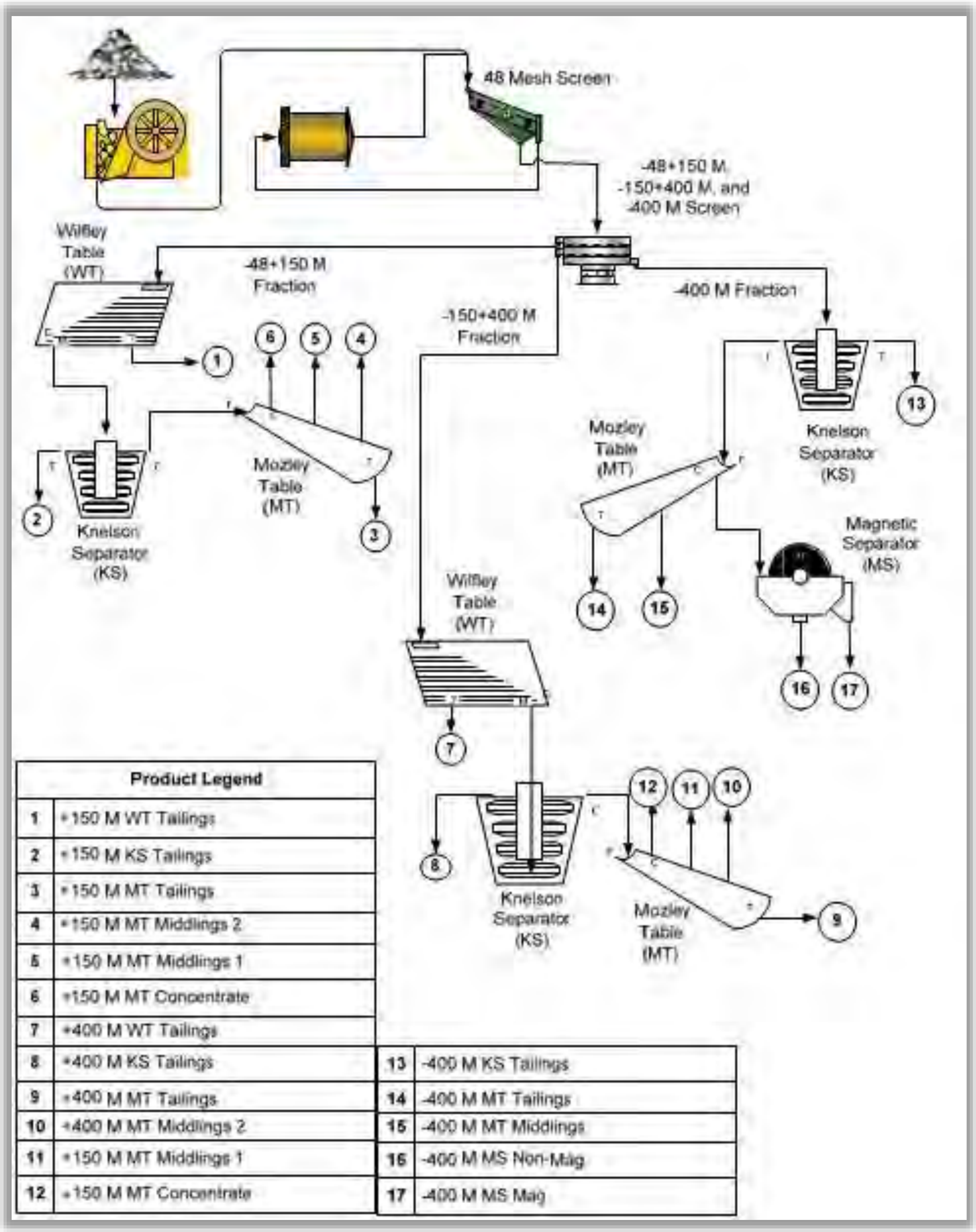
Based on these results, Dense Medium Separation (DMS) might have good potential to produce spodumene concentrate with 6.0% Li2O in the early stage of the process prior to grinding followed by flotation. However, in such a DMS operation, the density of the media should not be lower than 2.90 g/cm3 to produce concentrate grading higher than 6.0% Li2O. The results also confirmed that DMS operation will be sensitive to media density, and deviation from the target media density may result in a spodumene concentrate with less than 6.0% Li2O grade.

Low tantalum recovery of 16.7% Ta in the HLS concentrate was attributed to poor liberation of tantalum minerals at -1/4"/+0.5 mm fraction. The HLS silicate tailings at 2.8 g/cm3 had significant spodumene loss, 14.3% lithium at 0.24% Li2O grade with 61.5% of the mass reporting to the tailings. The losses were due to poor liberation of spodumene at -1/4"/+0.5 mm fraction.

13.3.5 Gravity Separation Tests

Gravity separation tests were performed on three (3) size fractions of the Rose sample: -48/+150 mesh (-300/+105 µm), -150/+400 mesh (-105/+37 µm), and -400 mesh (37 µm) fractions using a combination of Wilfley Table, Knelson Concentrator, and Mozley Table. The gravity separation test flowsheet is shown on Figure 13.2. The objective of the test work was to improve the recovery of tantalum. Each size fraction was first processed on a Wilfley Table and the concentrate further processed on a Knelson Concentrator; the Knelson concentrate further upgraded on a Mozley Table. The finer size fraction, -400 mesh (-37 µm) was processed on the Knelson Concentrator; as it was too fine for processing on the Wilfley Table and the Knelson concentrate, further processed on the Mozley Table. The Mozley concentrate from the -400 mesh product stream was further processed on a low intensity magnetic separator. The combined gravity concentrate recovered about 57% tantalum with 5.6% Ta grade in 0.29% weight for the combined -48 mesh (-300 µm) fraction. Results are shown in Table 13.5.

Figure 13.2: Gravity Separation Test Flowsheet



Source: SGS Canada Project 14120-001 April 2015

Table 13.5: Summary of Gravity Separation Tests (combined -48 mesh fraction)

Combined Concentrate Fractions	Weight	Assay %		Distribution %	
	%	Ta	Li2O	Ta	Li
-48 M Mozley conc.	0.29	5.59	0.63	56.7	0.20
-48 M Mozley conc.& Middlings 1	0.46	4.02	1.23	63.3	0.60
-48 M Mozley conc. & Middlings 1-2	0.54	3.42	1.54	64.1	0.89
-48 M Knelson conc.	1.50	1.26	2.25	65.2	3.6
+400 M Wilfley conc. & -400M conc.	16.7	0.14	1.46	81.0	25.9
Feed (-48 M fraction) (Calc.)		0.029	0.94		

However, low lithium upgrade ratios suggest that gravity flowsheet selected was not suitable for the recovery of spodumene.

The performance of gravity separation was greatly affected by the grain size. The flowsheet involving these gravity separators was complex and operating such a circuit at plant scale may not be practical.

Magnetic separation tests were performed on the -48 mesh (300 µm) Rose sample, with the aim of recovering tantalum bearing minerals without the desliming step. A simplified flowsheet is shown on Figure 13.3. Wet High-Intensity Magnetic Separation (WHIMS) tests were conducted at 5 Amps (5,000 Gauss), 15 Amps (14,000 Gauss), and at 30 Amps (20,000 Gauss). Some tests were also performed on the lithium flotation concentrates to recover tantalum.

Figure 13.3: Wet High-Intensity Magnetic Separation Test Flowsheet

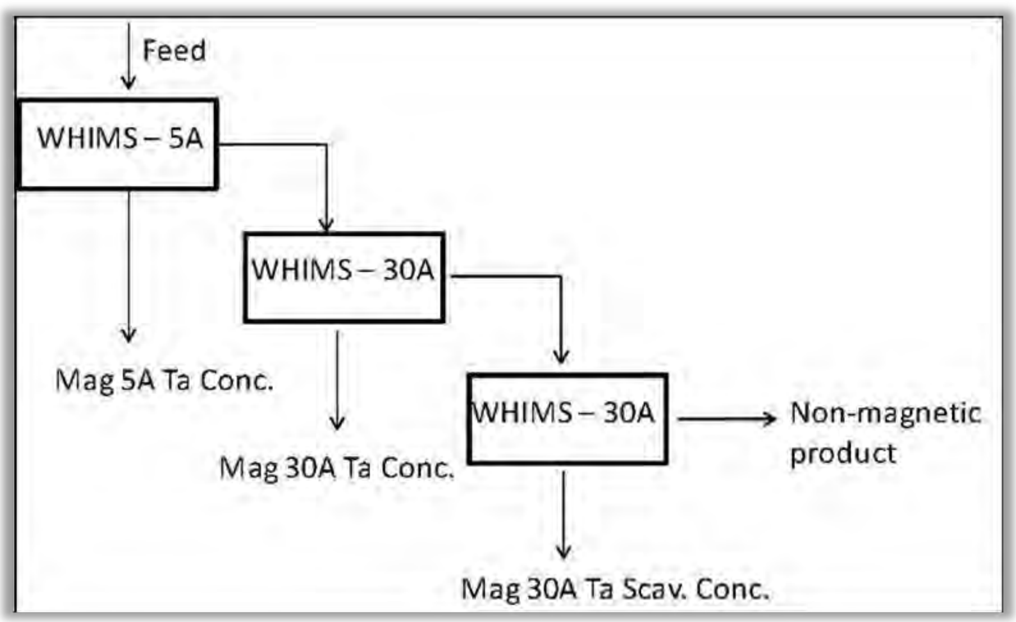


Table 13.6 shows the results of WHIMS tests. The test (Test F1), performed on spodumene concentrate produced a low recovery tantalum at 6.3%. Magnetic separation test (Test F11) performed on the -48 mesh (300 µm) feed sample produced a magnetic concentrate having a grade of 1.04% Ta with a highest recovery of 84% Ta at a mass pull of about 1.7%. The tests suggest that performing wet high-intensity magnetic separation (WHIMS) at high current intensities of 30 Amps (20,000 Gauss) on the -48 mesh feed obtained the best results for tantalum recovery. It was observed that magnetic separation greatly affected by magnetic intensities applied and number of passes. High magnetic fields up to 20,000 Gauss and multiple passes are required to achieve high-grade tantalum and better recovery.

Table 13.6: Wet High-Intensity Magnetic Separation Tests Summary (tantalum recovery)

Test No.	Test Sample	Products	Weight	Assay %		Distribution %	
			%	Ta	Li2O	Ta	Li
F10	-48 Mesh Feed	Mag 5A Ta Conc. Mag 30A Ta Conc. Mag 30A Ta Sca.Conc. Combined Ta Conc. Combined Ta Tail	1.0 0.44 0.20 1.64 98.4	1.04 1.86 0.32 1.17 0.004	0.88 1.10 1.87 1.06 1.07	43.6 34.0 2.7 80.3 19.7	0.83 0.45 0.35 1.62 98.4
F11	-48 Mesh Feed	Mag 5A Ta Conc. Mag 30A Ta Conc. Mag 30A Ta Scav. Conc. Combined Ta Conc. Combined Ta Tail	1.01 0.32 0.32 1.65 98.4	0.65 2.24 1.06 1.04 0.003	0.69 0.93 1.59 0.91 0.95	32.1 35.2 16.7 84.0 16.0	0.73 0.31 0.54 1.59 98.4
F12	-48 Mesh Feed	Mag (5A+30A)Ta Conc. Combined Ta Tail	1.70 98.3	1.12 0.006	0.95 0.92	73.9 26.1	1.76 98.2
F13	-48 Mesh Feed.	Mag (5A+30A) Ta Conc. Combined Ta Tail	1.90 98.1	1.02 0.005	1.08 1.00	77.6 22.4	2.0 98.0
F14	-48 Mesh Feed	Mag (5A+30A) Ta Conc. Combined Ta Tail	1.77 98.2	1.00 0.006	0.97 1.07	72.2 27.8	1.6 98.4
F1	Spodumene Flotation concentrate	Li 5A Mag Li 15A Mag Li 15A Non-Mag Li Conc (calc mag head) Combined Ta Conc. Combined Ta Tail	0.48 0.16 10.5 11.1 0.64 99.4	0.34 0.20 0.002 0.021 0.30 0.029	0.52 2.86 6.52 6.21 1.11 0.99	5.3 1.0 0.9 7.2 6.3 93.7	0.25 0.47 68.5 69.2 0.72 99.3

13.3.6 Bench Scale Flotation Tests

Fifteen (15) flotation tests were performed on Rose sample stage-ground to 100% passing 48 mesh (300 µm). The P80 of the ground material was similar for different grind schemes with a P80 of about 220-230 µm for the flotation feed. Desliming and scrubbing processes were identified and demonstrated by all tests as necessary to achieve high-grade spodumene concentrate with high recoveries. The loss of lithium in the slimes is a function of slimes mass. Test results showed that better spodumene flotation performance was obtained after separating about 3% slimes with about 2% lithium losses.

Separation of mica prior to spodumene flotation was found necessary since the head sample had considerable amounts of mica impacting spodumene flotation performance. Mica reporting to spodumene concentrate could be better controlled by separating mica prior to spodumene flotation. Sulphuric acid was used to lower the pulp pH to 3.0 before conditioning with collector amine (Armac T) for achieving better performance in mica flotation.

Laser ablation technique (LA-ICP-MS) was suggested to determine the loss of spodumene to the mica concentrate to find out if lithium is present as solid solution in the mica crystal structure.

Borresperse CA, a calcium lignosulfonate reagent, was used for improving the dispersion of fine particles and improving desliming performance. Sodium hydroxide was used in scrubbing to improve slimes suspension and facilitate the separation of spodumene grains from iron contaminants. Soda ash was the preferred pH regulator in spodumene flotation. The performance of spodumene rougher flotation was found dependent on fatty acid-2 dosage and flotation time.

The upgrading of beryllium, gallium, and rubidium in the flotation products were evaluated in Tests F11, F12, and F13. The beryllium- and gallium-bearing minerals were upgraded to some extent in the spodumene concentrates. Over 40% of the beryllium and gallium minerals were distributed in the lithium rougher scavenger tailings (Test F13). Rubidium achieved fairly good upgrading in the mica concentrate and was likely to be associated with mica. Detailed results can be found in the 'Phase 1 Beneficiation bench scale testing on the Rose Lithium/Tantalum Project', Project 14120-001 SGS Canada Inc., Final report, April 20, 2015.

Flotation Tests F11, F12, and F13 performed by duplicating F10 test conditions, obtained fairly consistent results in spodumene rougher and scavenger stage. Test F13 achieved the best performance and produced a spodumene concentrate containing 6.43% Li2O with 91.9% lithium recovery in 14.3% weight recovery (mass pull). Flotation tests results are presented in Table 13.7.

Flotation test (F9) conducted on the -0.5 mm fraction from the HLS test produced a rougher concentrate with 3.53% Li2O with 78.6% lithium recovery in 15.3% weight recovery. Cleaner flotation further failed to produce +6.0% Li2O grade. Poor flotation performance was due to the different mineralogical composition of the flotation feed (HLS test, -0.5 mm fraction).

Table 13.7: Flotation Tests Summary on Rose Sample

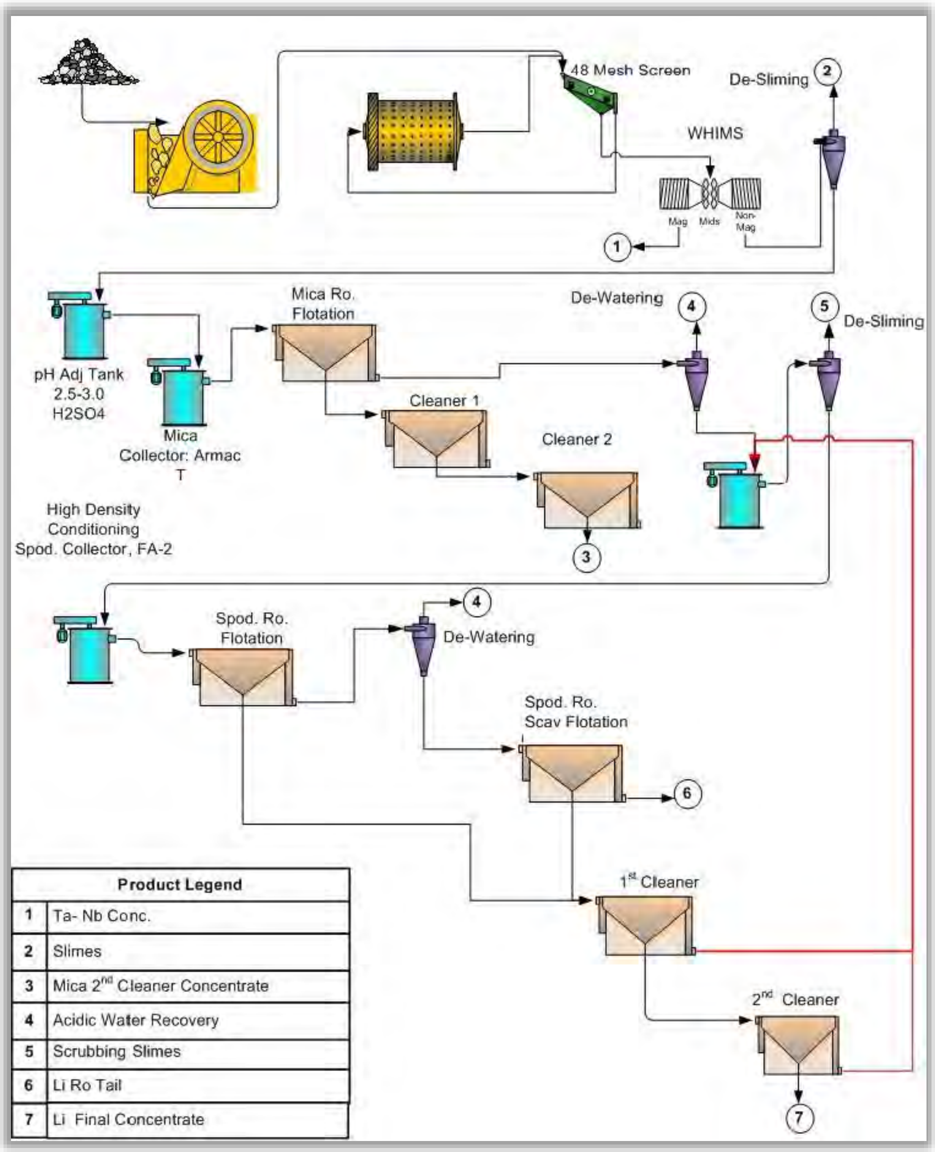
Test No.	Products	Weight	Assay %, g/t		Distribution %	
		%	Li2O	Ta	Li	Ta
F10	Li 3rd Cl Conc.	12.2	6.89	25	78.9	1.3
	Li 2nd Cl Conc.	12.7	6.85	29	82.1	1.5
	Li 1st Cl Conc.	13.4	6.77	37	85.3	2.0
	Li Ro. Conc.	14.3	6.48	54	87.4	3.2
	Li Ro & Scav. Conc	14.8	6.43	59	89.5	3.6
	Ro Scav. Tails	74.9	0.04	36	2.6	10.9
	Scrubber Slimes	1.5	0.71	200	1.0	1.3
	Mica Ro Conc.	3.5	1.03	200	3.4	2.8
	Mica Ro Scav. Conc.	2.1	0.56	200	1.1	1.7
	Mica Slime	1.6	0.54	200	0.8	1.3
	Head (calc.)		1.06	245		
F11	Li 3rd Cl Conc.	13.3	6.24	26	87.5	1.7
	Li 2nd Cl Conc.	13.6	6.18	34	88.9	2.3
	Li 1st Cl Conc.	14.0	6.06	44	90.1	3.0
	Li Ro & Scav. Conc	15.0	5.75	60	91.3	4.4
	Ro Scav. Tails	75.3	0.02	16	1.7	5.9
	Scrubber Slimes	1.9	0.65	169	1.3	1.6
	Mica Ro Conc.	5.1	0.34	125	1.8	3.1
	Mica Slime	1.0	2.07	197	2.2	1.0
	Head (calc.)		0.95	204		
F12	Li 2nd Cl Conc.	11.1	6.76	52	82.2	2.25
	Li 1st Cl Conc.	12.0	6.61	61	86.4	2.8

Test No.	Products	Weight	Assay %, g/t		Distribution %	
		%	Li2O	Ta	Li	Ta
	Li Ro Conc.	13.6	6.12	73	90.7	3.9
	Li Ro & Scav. Conc	14.0	6.01	76	91.6	4.1
	Ro Scav. Tails	77.2	0.02	59	2.0	17.7
	Scrubber Slimes	2.6	0.56	145	1.6	1.5
	Mica Ro Conc.	3.7	0.30	140	1.2	2.0
	Mica Slime	0.9	1.89	228	1.9	0.8
	Head (calc.)		0.92	257		
F13	Li 2nd Cl Conc.	13.7	6.59	35	90.3	1.92
	Li 1st Cl Conc.	14.3	6.43	44	91.9	2.5
	Li Ro & Scav. Conc	15.7	5.91	58	93.1	3.6
	Scav. Tails	75.5	0.03	49	2.0	14.8
	Scrubber Slimes	2.1	0.62	134	1.3	1.1
	Mica Ro Conc.	3.9	0.30	122	1.2	1.9
	Mica Slime	0.9	0.50	254	0.4	0.9
	Head (calc.)		1.00	249		
F9	Li 3rd Cl Conc.	9.8	4.56	-	65.0	-
	Li 2nd Cl Conc.	11.1	4.28	-	69.2	-
	Li 1st Cl Conc.	13.9	3.75	-	75.9	-
	Li Ro Conc	15.3	3.53	-	78.6	-
	Ro Scav. Tails	65.7	0.11	-	10.1	-
	Mica Ro Conc.	8.8	0.34	-	4.4	-
	Mica Ro Scav. Conc.	7.2	0.47	-	5.0	-
	Mica Slime	2.9	0.45	-	1.9	-
	Head (calc.)		0.69	-		-

13.3.7 Locked Cycle Tests

Two locked cycle tests (LCT) were performed on the Rose sample using the flowsheet developed. Figure 13.4 shows the flowsheet for LCT-2. The difference between the two LCT flowsheets is that LCT-2 flowsheet included two stages of mica cleaner flotation, whereas LCT-1 had only one stage of mica rougher flotation. LCT-2 flowsheet was used to produce spodumene concentrate for hydrometallurgical test work. LCT-1 tests were performed in 6 cycles whereas LCT-2 tests in 8 cycles. The results of LCT-1 presented are the average projected balance for the 2 cycles D to E. For LCT-2, the average projected balance is for three cycles from Cycle E to G.

Figure 13.4: Flowsheet for Locked Cycle Test LCT2



Source: SGS Canada Project 14120-001 April 2015

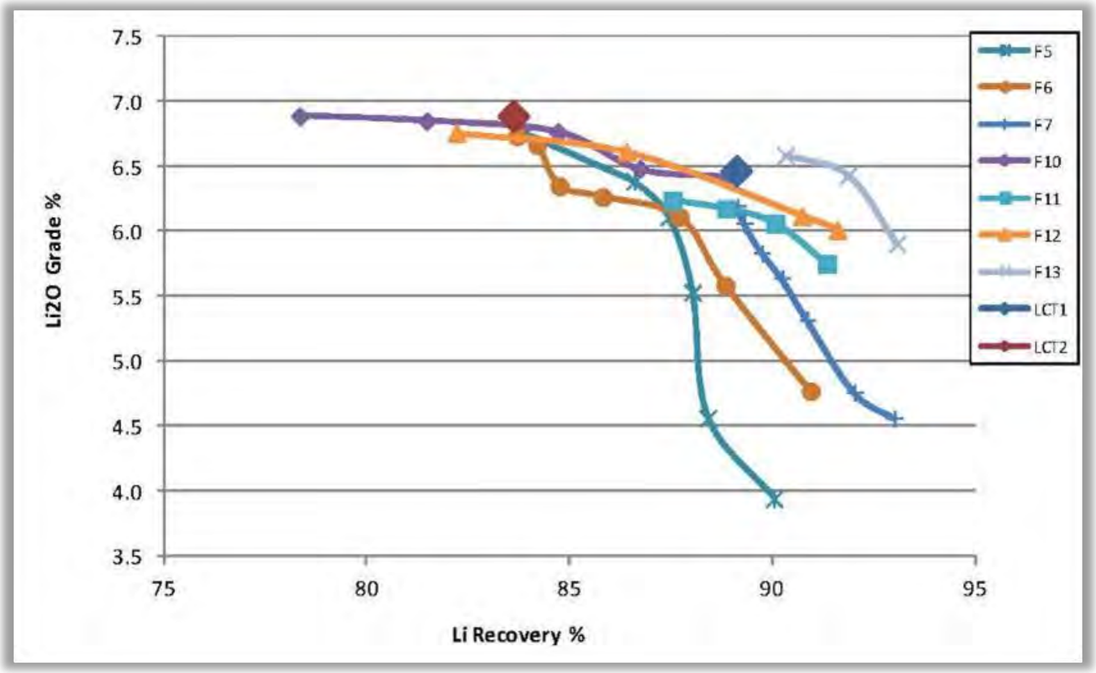
The LCT tests did not achieve higher recoveries than the batch tests due to the effect of recirculating streams that contain less than 3% lithium. LCT-1 achieved higher recovery, 89.1%, compared to LCT-2 that achieved 83.6% recovery. Low recovery in LCT-2 is mainly due to significant loss of lithium in scavenger tailings and the loss of lithium in scrubber slimes in LCT-1. Results from the LCT tests are shown in Table 13.8.

Table 13.8: Locked Cycle Tests Summary

Test No.	Products	Weight %	Assay %		Distribution %	
			Li_2O	Ta	Li	Ta
LCT1	Li 2nd Cl Conc.	13.4	6.47	0.0087	89.1	4.8
	Li RO Scav. Tail	75.5	0.06	0.0042	4.3	13.0
	Scrubber Slimes	3.55	0.78	0.0212	2.8	3.1
	Mica Conc.	3.91	0.29	0.0101	1.2	1.6
	Mica Slime	1.82	0.62	0.0175	1.2	1.3
	Mag Conc.	1.76	0.81	1.062	1.5	76.3
	Head (calc.)		0.98	0.0245		
LCT2	Li 2nd Cl Conc.	13.0	6.89	0.0078	83.6	4.1
	Li RO Scav. Tails	77.6	0.15	0.0047	11.2	14.9
	Scrubber SLimes	2.54	0.92	0.0149	2.2	1.5
	Mica 2nd Cl Conc.	2.53	0.19	0.0104	0.4	1.1
	Mica 2nd Cl Tails	0.38	0.57	0.014	0.2	0.2
	Mica 1st Cl Tails	0.86	0.52	0.0115	0.4	0.4
	Mica Slime	2.39	0.68	0.0148	1.5	1.4
	Mag Conc.	0.69	0.67	2.723	0.4	76.3
	Head (calc.)		1.07	0.0247		

Figure 13.5 presents a comparison of grade-recovery for the batch tests and LCTs for the Rose sample. It can be seen that LCT tests grade-recovery fall within the range of batch tests for the same sample.

Figure 13.5: Grade-Recovery for the Rose Sample



13.3.8 Variability Tests

A total of eight variability beneficiation tests were performed using the developed flowsheet on the samples. PEG2, Rose 2 samples from 1st shipment were tested and tests on other samples were not performed as it was reported that 1st shipment samples were not the correct samples. All variability samples from 2nd shipment were tested; PEG2, RSE2, Rose 2, Rose 3, Rose 4 and South Rose samples. Test F13 conditions, which achieved best results on the Rose sample, were used for the variability tests.

QEMSCAN Mineralogy was not performed on the variability samples. The lithium grade of South Rose sample was relatively high at 2.15% Li2O and varied from 0.80% to 1.49% Li2O for other variability samples. The impurities such as MgO, CaO and Fe2O3 were similar compared to the Rose sample, except for PEG2 from 2nd shipment that contained relatively high impurities; 1.79% Fe2O3, 0.78% MgO, and 1.36% CaO.

Figure 13.6 shows the grade-recovery for the variability samples and the Rose sample. The spodumene flotation results varied greatly for the variability samples using the developed flowsheet on Rose sample. Test F18 performed on South Rose sample produced superior results; 6.89% Li2O with 90.9% lithium recovery compared to Test 13 on the Rose sample. Test F22 on PEG2 produced a low-grade concentrate, 4.15% Li2O with 55.1% lithium recovery. Low metallurgical performance of was attributed to the presence of amphiboles and pyroxenes in the ore, which tend to float with spodumene and impair spodumene selective flotation.

Flotation tests on the variability samples indicate that a spodumene concentrate having +6.0% Li2O with 73-90% lithium recoveries could be achieved. In general, the higher lithium head grade samples had better lithium recovery in an overall trend.

Tantalum performance was not evaluated on the variability samples as tantalum was assayed only on selected products. The tantalum grade of the magnetics ranged from 0.71% Ta on the PEG2 to 1.08% Ta on the Rose 3 sample and was likely dependent on the tantalum head grade.

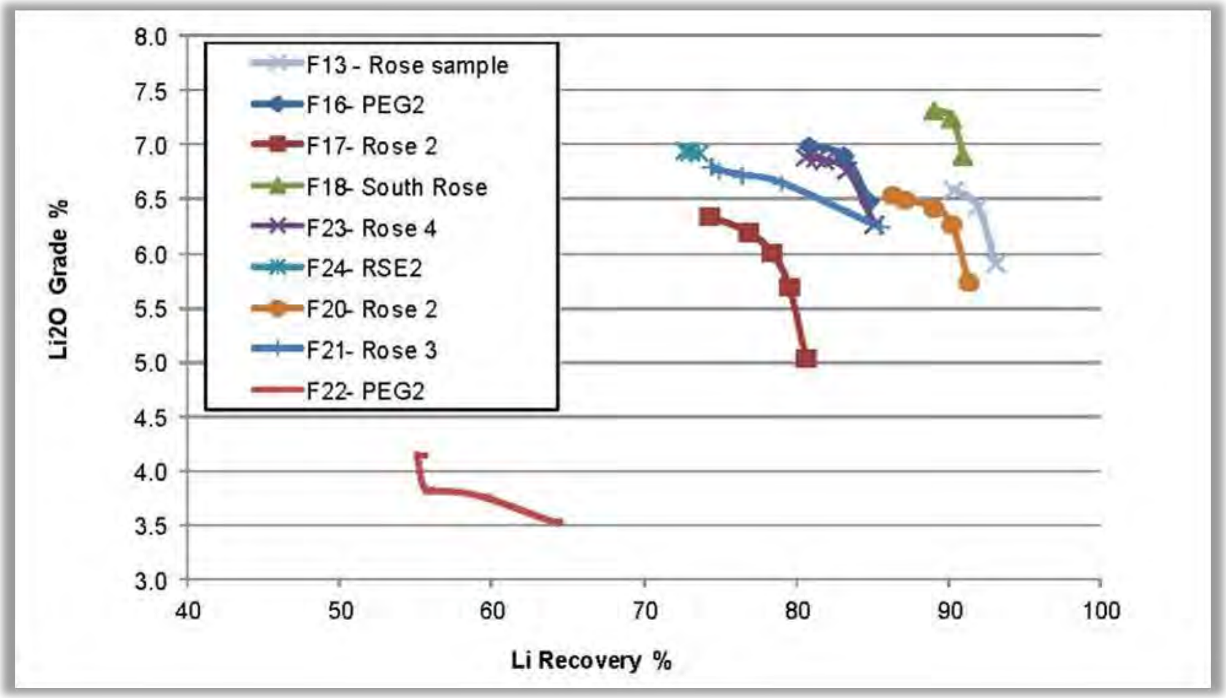
It was noted that the developed beneficiation flowsheet cannot be effective if the flotation feed contains a significant amount of amphiboles and pyroxenes, as observed in Test F22 performed on PEG2 sample.

Statistical analysis was performed on the results of grade and recovery. Variability of the results was evaluated using coefficient of variation (CV) on: 1. on same composite, and 2. between composites.

Rose Sample: Statistical analysis of the grade and recovery for twelve Rose samples indicate that a CV of 8% for Li2O concentrate grade and 15% for lithium recovery. Low coefficient of variation suggests that the results are consistent within acceptable variability.

Between Composites: Statistical analysis of the grade and recovery for Rose composite and seven variability composites indicate that a very low CV of 1% for Li2O concentrate grade and an acceptable CV of 58% for lithium recovery. The coefficient of variation for grade and recovery suggests that the results are consistent within acceptable variability.

Figure 13.6: Grade Recovery for the Variability Samples



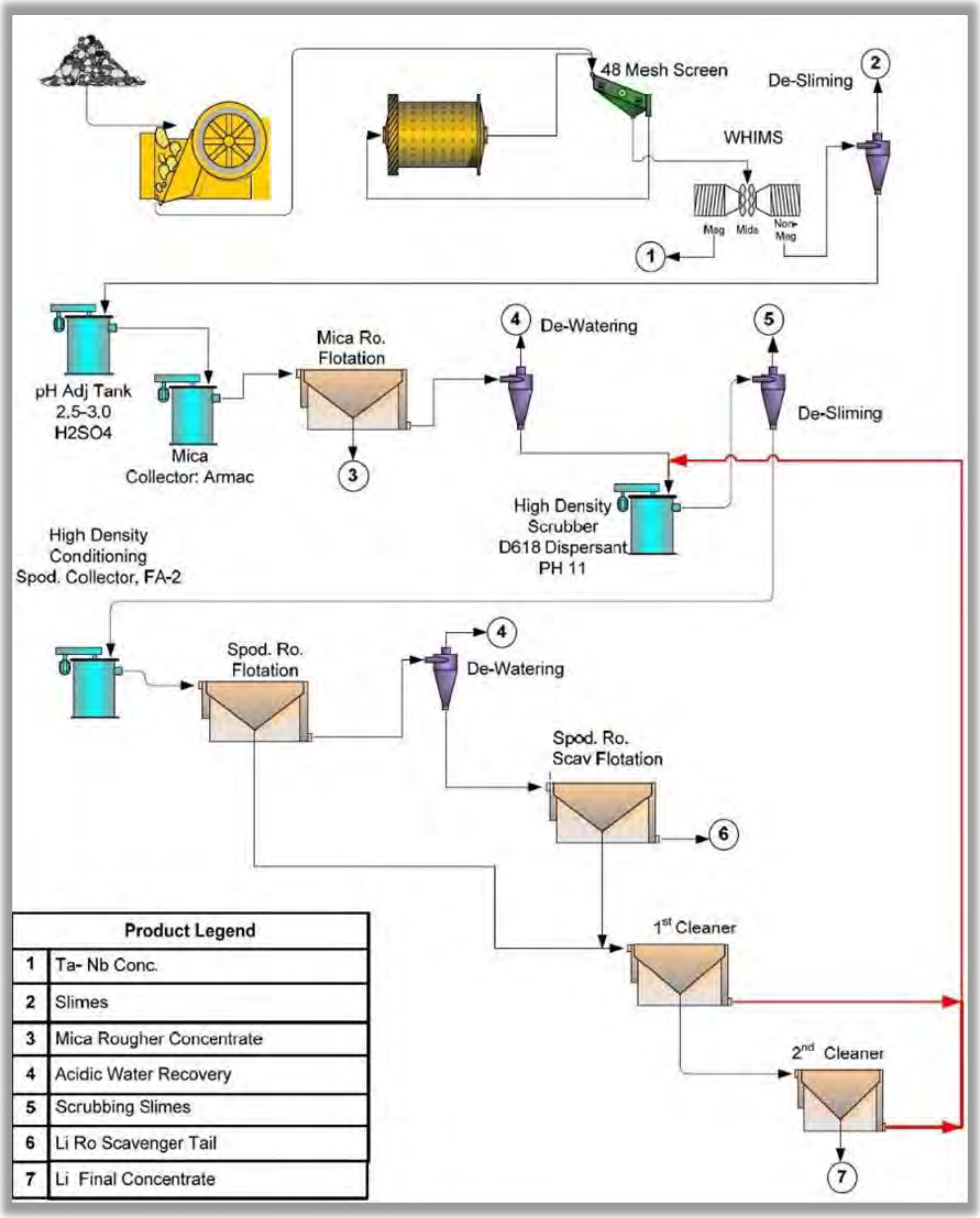
13.4 Spodumene Concentrate Production Tests – SGS Canada Inc. Lakefield

Bench scale spodumene concentrate production and phase transformation tests were performed at SGS in 2016. The test work produced around 5 kg spodumene concentrate from 40 kg Rose sample, left over from previous test program, following the previously developed beneficiation flowsheet.

The flowsheet is presented on Figure 13.7. All spodumene concentrate produced was further used for spodumene phase transformation test work.

The head assay for the Rose sample is presented in Table 13.9.

Figure 13.7: Beneficiation Flowsheet for Spodumene and Tantalum Recovery



Source: SGS Canada, Project 14120-001 Final report April 20, 2015

Table 13.9: Head Assay of Rose Sample

Sample ID	Li2O %	Ta, %	Fe2O3 %	Na2O %	K2O %	SiO2 %	Al2O3 %	CaO %	MgO %
Rose sample	0.90	0.03	0.45	4.81	2.44	74.8	15.9	0.12	0.03

The Rose sample was stage crushed and ground to -300 µm (48 mesh), with a P80 203 µm.

Four beneficiation tests were performed using the flowsheet and reagent scheme developed for the Rose sample in the previous test program described in Section 13.3. Minor adjustments to reagent scheme were made for improving the spodumene concentrate grade.

The tantalum recovery circuit shown on Figure 13.7 is oversimplified and indicates a single-stage magnetic separation.

Wet high-intensity magnetic separation (WHIMS) tests were conducted at a current intensity of 5 Amps (~5,000 Gauss) and the non-magnetics passed on WHIMS at either 15 Amps (~15,000 Gauss) or 30 Amps (~26,000 Gauss) in a rougher-scavenger arrangement. The first two tests (F1-F2) and (F3-F4) were performed at 5A and 15A current intensities. Tests F5-F6 and F7-F8 were performed at 5A and 30A current intensities.

The results of WHIMS tests are shown in Table 13.10.

Table 13.10: Summary of Tantalum Recovery

Test No. & Product	Wt%	Grade%			Distribution %		
		Ta	Li2O	Fe_2O_3	Ta	Li	Fe_2O_3
F1-F2 Mag. Conc. (15A)	0.9	2.09	1.25	11.0	63.4	1.1	40.3
F3-F4 Mag. Conc. (15A)	0.9	2.19	1.18	9.9	64.0	1.0	32.8
F5-F6 Mag. Conc. (30A)	1.1	1.93	1.29	13.4	68.3	1.3	37.0
F7-F8 Mag. Conc. (30A)	1.2	1.62	1.21	16.0	63.7	1.4	44.6
Head (Direct)		0.03	1.10	0.84	100	100	100

The WHIMS test results show that a tantalum concentrate (rougher-scavengers concentrate) grading 1.62% - 2.19% Ta with 63% - 68% Ta recoveries in 0.9-1.2% weight was produced by multiple-stage magnetic separation. Test F5-F6 produced highest Ta recovery of 68.3% Ta with a tantalum grade of 1.93% Ta. About 33% to 45% Fe2O3 in the feed reports to the tantalum concentrate. Lithium losses to the tantalum concentrate were low, from1.0% to 1.4%.

Mica flotation was performed at an alkaline pH, 9.5 using Aero 3030C as collector, eliminating the need for mica flotation in an acidic environment. The addition of dispersant F220 in the roughers and cleaners of Test F3-F4 improved lithium recoveries compared to the base case test (Test F1-F2).

The four production bench scale tests produced 4.9 kg spodumene concentrate containing an average concentrate grade 6.83% Li2O, 63.7% SiO2, 26.8% Al2O3, and 0.51% Fe2O3. The overall combined recovery from the open circuit tests was 84.6%. The assays for the combined spodumene concentrate are presented in Table 13.11. The detailed results for the four production tests are shown in Table 13.12. Spodumene production test report can be found in ‘An Investigation into Spodumene Concentrate Production and Phase Transformation’, Project 14120-003 SGS Canada Inc., Final report, November 29, 2016.

Table 13.11: Combined Spodumene Concentrate Assay

Sample ID	Li_2O %	SiO_2 %	Al_2O_3 %	Fe_2O_3 %	MgO %	CaO %	Na_2O %	K_2O %	TiO_2 %	P_2O_5 %
Flotation conc.	6.83	63.7	26.8	0.51	0.04	0.10	0.49	0.19	0.01	0.02

Particle size distributions were determined for the spodumene concentrate and rougher tailings and the P80 for the spodumene concentrate was 209 µm, P80 for the rougher tailings were 220 µm and 216 µm.

Specific gravity of solids for the magnetic product was 3.72 g/cm3, for final spodumene concentrate, 3.13 g/cm3, for mica concentrate 2.76 g/cm3 and for rougher tailings, 2.65 g/cm3.

Table 13.12: Metallurgical Results for the Spodumene Concentrate Production Tests

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li2O	Ta g/t	SiO2	Al2O3	K2O	Na2O	CaO	P2O5	Fe2O3	Li	Ta	SiO2	Al2O3	K2O	Na2O	CaO	P2O5	Fe2O3
F1-F2	Li 3rd Cl Conc.	1333	13.7	3.03	6.52		63.8	26.7	0.18	0.58	0.10	0.02	0.56	88.6		11.9	23.3	1.1	1.7	7.7	13.2	30.9
To produce Spod Concentrate, Base Case	Li 2nd Cl Conc.	1355	13.9	3.00	6.46		63.9	26.6	0.20	0.63	0.10	0.02	0.56	89.1		12.1	23.6	1.2	1.9	7.9	13.5	31.3
	Li 1st Cl Conc.	1409	14.5	2.93	6.30		64.1	26.3	0.25	0.77	0.10	0.02	0.55	90.4		12.6	24.3	1.6	2.4	8.3	13.7	31.9
	Li Ro Conc.	1537	15.8	2.70	5.80		65.2	25.3	0.40	1.15	0.10	0.02	0.52	90.8		14.0	25.5	2.8	3.9	9.1	15.0	33.1
	Li Ro & Scav. Conc.	1575	16.2	2.64	5.68		65.1	25.3	0.51	1.20	0.10	0.02	0.51	91.2		14.3	26.1	3.7	4.2	9.5	15.2	33.6
	Li Ro Tail	6968	71.7	0.01	0.02	---	77.5	12.5	2.24	5.68	0.11	0.02	0.04	1.1		75.4	57.0	71.2	87.4	44.3	69.2	11.5
	Slimes 1/2	349	3.6	0.33	0.71	---	70.6	17.1	3.40	4.44	1.17	0.03	0.40	2.5		3.4	3.9	5.4	3.4	23.6	5.2	5.8
	Mica Ro Conc	559	5.8	0.20	0.43	---	57.7	27.7	6.81	2.33	0.09	0.02	0.34	2.5		4.5	10.1	17.4	2.9	2.9	5.6	7.9
	Mica Slimes	179	1.8	0.42	0.90	---	72.4	15.2	2.59	4.66	1.70	0.03	0.13	1.7		1.8	1.8	2.1	1.8	17.6	2.7	1.0
	15A Mag Conc (F1+F2)	88.4	0.9	0.58	1.25	20900	43.3	17.9	0.42	1.36	0.41	0.05	11.0	1.1	63.4	0.5	1.0	0.2	0.3	2.1	2.2	40.3
	Head (calc.)	9719	100	0.47	1.01		73.7	15.7	2.25	4.66	0.18	0.02	0.25	100		100	100	100	100	100	100	100
	Head (Dir.)			0.42		300	74.8	15.9	2.44	4.81	0.12	0.02	0.45									
F3-F4	Li 2nd Cl Conc.	1288	13.3	3.09	6.65		63.3	26.6	0.20	0.53	0.11	0.02	0.43	87.5		11.3	22.6	1.2	1.6	7.1	9.0	21.6
To produce Spod Concentrate, Base Case	Li 1st Cl Conc.	1352	13.9	3.02	6.50		60.3	25.3	0.19	0.50	0.10	0.02	0.41	89.7		11.3	22.6	1.2	1.6	7.1	9.0	21.6
	Li Ro Conc.	1505	15.5	2.75	5.93		57.0	23.7	0.23	0.59	0.10	0.02	0.38	91.1		11.9	23.5	1.5	2.0	7.5	9.4	22.2
	Li Ro Tail (F3+F4)	7122	73.4	0.01	0.03	---	78.5	12.6	2.30	5.48	0.13	0.03	0.11	1.9		77.4	59.1	74.2	88.8	46.2	74.4	30.6
	Slimes 2/3 (F3+F4)	281	2.9	0.35	0.75	---	71.1	15.7	2.92	4.46	1.81	0.03	0.23	2.2		2.8	2.9	3.7	2.9	25.4	2.9	2.5
	Mica Conc (F3+F4)	483	5.0	0.21	0.45	---	55.1	29.3	7.02	2.00	0.10	0.04	0.33	2.2		3.7	9.3	15.3	2.2	2.4	6.7	6.2
	Slimes 1 (F3+F4)	225	2.3	0.33	0.71	---	69.6	16.9	3.35	4.27	1.41	0.05	0.52	1.6		2.2	2.5	3.4	2.2	15.8	3.9	4.6
	15A Mag (F3+F4)	85.0	0.9	0.55	1.18	21900	43.0	17.9	0.42	1.27	0.40	0.05	9.90	1.0	64.0	0.5	1.0	0.2	0.2	1.7	1.5	32.8
	Head (calc.)	9701	100	0.47	1.01		74.4	15.7	2.28	4.53	0.21	0.03	0.26	100		100	100	100	100	100	100	100
	Head (Dir.)			0.51	1.10	300	73.2	16.1	2.65	4.29	0.56	0.05	0.84									
F5-F6	Li 2nd Cl Conc.	1153	12.0	3.37	7.25		63.2	26.8	0.22	0.42	0.10	0.02	0.53	79.4		10.1	20.5	1.2	1.1	6.2	6.6	16.5
To produce Spod Concentrate and to study the addition of Sodium Silicate N in Cleaners	Li 1st Cl Conc.	1361	14.2	3.20	6.89		53.5	22.7	0.19	0.36	0.08	0.02	0.45	89.0		10.1	20.5	1.2	1.1	6.2	6.6	16.5
	Li Ro Conc.	1607	16.7	2.82	6.06		53.5	22.6	0.37	0.51	0.08	0.02	0.42	92.5		11.9	24.0	2.7	1.9	7.1	7.2	18.1
	F5+F6 Li Ro Tail	7170	74.6	0.01	0.02	---	78.6	13.0	2.41	5.43	0.12	0.04	0.19	1.6		78.3	61.8	79.6	89.3	46.2	82.5	36.8
	F5+F6 Slimes 2/3	363	3.8	0.36	0.77	---	71.4	15.9	2.99	4.38	1.49	0.02	0.23	2.7		3.6	3.8	5.0	3.6	29.0	2.1	2.3
	F5+F6 Mica Conc	252	2.6	0.23	0.50	---	58.5	27.2	6.44	2.56	0.11	0.05	0.37	1.2		2.0	4.5	7.5	1.5	1.5	3.6	2.5
	F5+F6 Slimes 1	120	1.2	0.32	0.69	---	67.5	17.5	3.48	4.09	1.96	0.05	0.66	0.8		1.1	1.4	1.9	1.1	12.6	1.7	2.1
	F5+F6 30A Mag	102.1	1.1	0.60	1.29	19300	43.4	17.1	0.48	1.44	0.38	0.05	13.40	1.3	68.3	0.6	1.2	0.2	0.3	2.1	1.5	37.0
	Head (calc.)	9613	100	0.51	1.10		74.9	15.7	2.26	4.54	0.19	0.04	0.39	100		100	100	100	100	100	100	100
	Head (Dir.)			0.51	1.10	300	73.2	16.1	2.65	4.29	0.56	0.05	0.84									
F7-F8	Li 2nd Cl Conc.	1183	12.3	3.24	6.97		64.7	27.3	0.16	0.43	0.11	0.02	0.51	82.9		10.6	21.3	0.9	1.2	6.8	6.7	14.8
To produce Spod Concentrate and to Study FA2 Mix Collector	Li 1st Cl Conc.	1283	13.4	3.16	6.79		59.7	25.2	0.15	0.40	0.10	0.02	0.47	87.6		10.6	21.3	0.9	1.2	6.8	6.7	14.8
	Li Ro Conc.	1460	15.2	2.87	6.18		57.0	23.7	0.18	0.50	0.10	0.02	0.43	90.7		11.5	22.9	1.2	1.7	7.2	6.9	15.6
	F7+F8 Li Ro Tail	7016	73.1	0.01	0.03	---	79.1	12.7	2.32	5.54	0.11	0.04	0.17	1.8		77.0	58.9	74.1	88.6	40.1	78.9	29.3
	F7+F8 Slimes 2/3	268	2.8	0.40	0.86	---	70.4	15.2	2.68	4.40	2.13	0.02	0.22	2.3		2.6	2.7	3.3	2.7	29.7	1.5	1.5
	F7+F8 Mica Conc	501	5.2	0.19	0.41	---	56.8	28.5	6.96	2.21	0.09	0.04	0.42	2.1		3.9	9.4	15.9	2.5	2.3	5.6	5.2
	F7+F8 Slimes 1	246	2.6	0.33	0.71	---	70.4	16.7	3.32	4.30	1.37	0.06	0.44	1.8		2.4	2.7	3.7	2.4	17.5	4.2	2.7
	F7+F8 30A Mag	113.3	1.2	0.56	1.21	16200	45.8	16.4	0.70	1.78	0.35	0.06	16.00	1.4	63.7	0.7	1.2	0.4	0.5	2.1	1.9	44.6
	Head (calc.)	9604	100	0.48	1.04		75.0	15.8	2.29	4.57	0.20	0.04	0.42	100		100	100	100	100	100	100	100
	Head (Dir.)			0.51	1.10	300	73.2	16.1	2.65	4.29	0.56	0.05	0.84									

Source: SGS Canada, Project 14120-003, Final report November 29, 2016

13.5 Solid – Liquid Separation Test Work – SGS Canada Inc. Lakefield

13.5.1 Vacuum Filtration Tests

Solid-liquid separation tests were performed on the spodumene concentrate and combined mica, spodumene flotation tailings in 2016. Details of these tests can be found in 'Solid-liquid separation responses of process samples from the Rose Deposit', SGS Project No. CALR-14120-003, Final report April 05, 2017. Since all of the concentrate produced was used for the phase transformation tests, spodumene concentrate available from previous test work was used for determining the design criteria for sizing thickener and filtration equipment.

Static settling tests were performed only on the spodumene concentrate due to shortage of sample; Table 13.13 shows the results. Static settling tests on the spodumene concentrate indicated that the concentrate settled well in the presence of 7 g/t BASF Magnafloc 10 flocculant, producing 73% w/w solids underflow from a 15% w/w solids thickener feed. Resulting supernatant appeared clear after 30 minutes of elapsed settling time. The total suspended solids (TSS) were 33 mg/L.

Table 13.13: Settling Test Summary for Spodumene Concentrate

Feed % w/w	U/F % w/w	TUFUA m2/(t/d)	THUA m2/(m3/d)	ISR m3/m2/d	Supernatant Visual %	TSS mg/L	Flocculant Dosage g/t
15	73	0.026	0.006	905	Clear	33	7.0

Relevant thickener sizing data included was 0.026 m2 /(t/d) thickener underflow unit area (TUFUA), 0.006 m2 /(m3 /d) thickener hydraulic unit area (THUA) and 905 m3 /m2 /d rise rate. An abridged version of standard vacuum filtration tests were conducted on the thickener underflow due to limited spodumene concentrates sample availability. Results are shown in Table 13.14. Tests were performed at reduced vacuum level of about 20 inches mercury level (0.68 bar) due to rapid filtration rate. Micronics 89415 cloth was selected for spodumene concentrate filtration tests. Filter cake thickness ranged from 25 to 40 mm. The resulting solids throughput ranged from 2, 022 to 18, 8803 kg/m2 .h. The discharge cake residual moisture content ranged from 7.9% to 19.9% w/w. The filtrates were clear by visual observation and total suspended solids (TSS) ranged from 44 to 67 mg/L.

Settling tests were performed on a spodumene-mica combined flotation tailings sample prepared by SGS Lakefield. Both static and dynamic settling tests were performed on the tailings sample. Dynamic settling tests on the combined spodumene mica flotation tailings sample indicated that the tailings settled well in the presence of 30 g/t BASF Magnafloc 10 flocculant, producing 60.3% w/w solids underflow from a 25% w/w feed density. The test results are presented in Table 13.15.

Relevant thickener sizing data included was 0.05 m2 /(t/d) thickener underflow unit area (TUFUA), 0.02 m2 /(m3 /d) thickener underflow unit area (THUA). This corresponded to 54 m3 /m2 /d net rise rate, 0.833 t/m2 /h solids loading, and 2.25 m3 /m2 /h net hydraulic loading. The total suspended solids (TSS) contained in the overflow was 56 mg/L. Vacuum filtration test results for the combined tailings are presented in Table 13.16. Vacuum filtration tests were conducted on the tailings underflow from the thickener tests at about 24 inches mercury vacuum level (0.85 bar). Testori P6124Q cloth was selected for tailings filtration tests. For the tests at 60% feed solids, the cake thickness ranged from 30 to 49 mm. The resulting solids throughput ranged from 1 915 to 16 136 kg/m2 .h. The discharge cake residual moisture content ranged from 10.7% to 24.6% w/w. The filtrates were hazy by visual observation and total suspended solids (TSS) ranged from 26 to 115 mg/L. Test performed at 40% feed solids produced a cake thickness, 47 mm at a solids throughput rate, 961 kg/m2 .h. Discharge cake moisture was 14.5% w/w and total solids suspended in the overflow, 26 mg/L.

Table 13.14: Summary Spodumene Concentrate Vacuum Filtration Tests Results

Operating Conditions					General Filter Throughput				
Feed Solids % w/w	Vacuum Level Inch, Hg	Form Time, Sec	Dry Time, Sec	Form/Dry Ratio	Cake Thickness, mm	Feed Rate, Dry kg/m2.h	Cake Moisture % w/w	Filtrate TSS, mg/L	Cake Texture
68.0	20-17	10	1	8.50	40.0	18803	19.9	56	Tacky
		8	2	4.33	28.0	16031	18.9	67	Tacky
		8	40	0.19	28.0	3216	9.5	44	Tacky
		6	60	0.10	25.0	2022	7.9	60	Dry to touch

Table 13.15: Dynamic Settling Test Result Summary for Combined Tailings

Feed % w/w	U/F % w/w	TUFUA m2/(t/d)	THUA m2/(m3/d)	Net Rise Rate m3/m2/d	Solids Loading t/m2/h	TSS mg/L	Net Hydraulic Loading m3/m2/h
25.0	60.3	0.050	0.02	54.0	0.833	56	2.25

Table 13.16: Summary for Combined Tailings Vacuum Filtration Test Results

Operating Conditions					General Filter Throughput				
Feed solids % w/w	Vacuum level Inch, Hg	Form Time, Sec	Dry Time, Sec	Form/Dry Ratio	Cake Thickness, mm	Feed rate, Dry kg/m2.h	Cake Moisture % w/w	Filtrate TSS, mg/L	Cake Texture
60	24.8 - 23.0	14	2	7.7	49	15272	16.0	73	Dry to touch
		11	2	6.0	41	16136	24.6	110	
		15	9	1.7	41	8651	21.7	43	
		10	17	0.6	42	7581	16.2	115	
		16	75	0.2	43	2388	13.2	94	
		7	70	0.1	30	1915	10.7	85	
40		35	175	0.2	47	961	14.5	26	

13.5.2 Pressure Filtration Tests

The vacuum filtration tests described in section 13.5.1 has given a cake moisture of 14-15% which necessitates the addition of a rotary dryer to reduce the moisture of the concentrate to 5% or less to avoid freezing of the spodumene concentrate during transportation in winter from the mine site to southern Quebec. The addition of a dryer has substantial impact on the Capex and Opex costs.

In March 2023, the management of Critical Element has mandated Metso-Outotec and SGS Lakefield to conduct a pressure filtration testing on the concentrate to evaluate the possibility to reduce the moisture content to around 5% and eliminate the rotary dryer. For those tests a sample of 20kg of concentrate generated from the pilot plant test in 2017 was shipped to SGS Lakefield.

For complete test details, refer to Metso-Outotec report number 3372491TQ1 of April 26, 2023 (Appendix 13-A)

ANALYSIS OF SAMPLES

The spodumene concentrate sample was generated during a pilot plant testing campaign at SGS Lakefield in 2017. The sample was provided by Critical Element Lithium in a 20 L pail which contained four ~5kg bags of dry solids. The provided sample was labelled as follows:

- Rose Pilot Plant Conc. Sample – 4X ~5 kg charges

Prior to starting the filtration testwork, the sample was diluted and mixed using SGS Lakefield process water and the wt.% solids was adjusted to the expected filter feed density of approximately 65% solids. All test work was done at ambient temperature.

A representative sample was collected and submitted to SGS Lakefield for particle size analysis and specific gravity. The specific gravity was tested in a gas pycnometer and the result is presented in Table 13.17.

Table 13.17: Specific Gravity Measurement

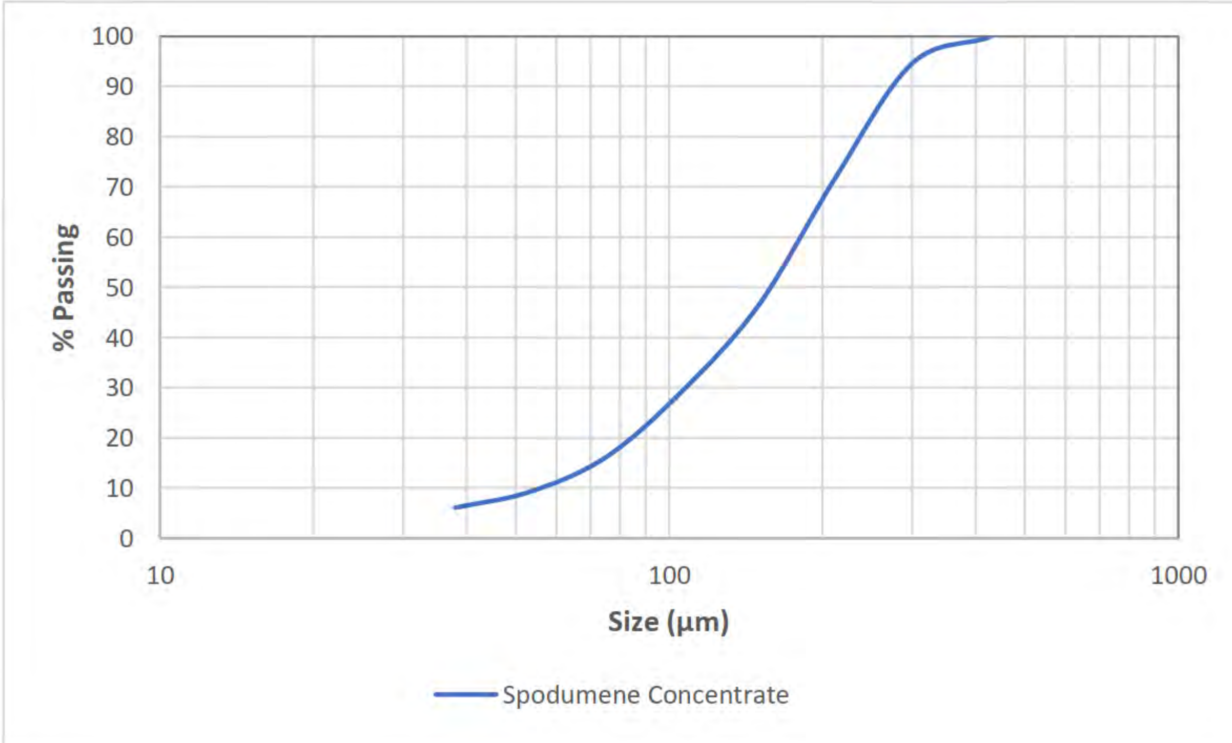
Sample	SG
Spodumene Concentrate	3.09

The particle size distribution (PSD) for the sample was measured using sieve screen analysis. The PSD result is summarized in Table 13.18 and shown graphically in Figure 13.8. The full particle size analysis for the sample can be found in Appendix 13-A, page 12.

Table 13.18: Particle Size Distribution Summary

Sample	P30	P50	P80
	Um		
Spodumene Concentrate	108	159	243

Figure 13.8: Particle Size Analysis Results



OBJECTIVE OF TESTS AND SELECTED TEST EQUIPMENT

Metso Outotec conducted filtration testwork on a spodumene concentrate sample. The following filtration testing was performed using Metso Outotec's Labox 100 bench scale unit to determine the filtering properties of the samples and the corresponding data would be used for filter operating and sizing criteria. Other objectives of the testwork were to determine:

— Cake thickness
— Filtration capacity
— Moisture content of the cake
— Cake handling characteristics

SELECTED TEST EQUIPMENT

The Labox 100 test filter has been designed to permit bench scale testing of both Metso Outotec's Larox FFP and Larox PF technology and to mimic the characteristics of large-scale pressure filters and membrane filter presses (MFP) so that the full-scale filter size can be accurately calculated based on the test results. For the following filtration testwork only the PF technology will be examined.

Pressure Filtration (PF)

The filter includes a filtration area of 0.01 m2, made of polypropylene, chamber heights available in 25, 33, 45, 60, 75mm. The feed system is done with a pneumatically operated diaphragm pump with polypropylene housing for slurry feed. Filter cloth is clamped between the end plate and the chamber cylinder, forming a cup-like chamber. Filter cake pressing is done with a pneumatically operated air booster pump for diaphragm pressing to simulate the pressures used in full scale filters.

Figure 13.9: Labox 100 Test Unit in PF Orientation as Tested

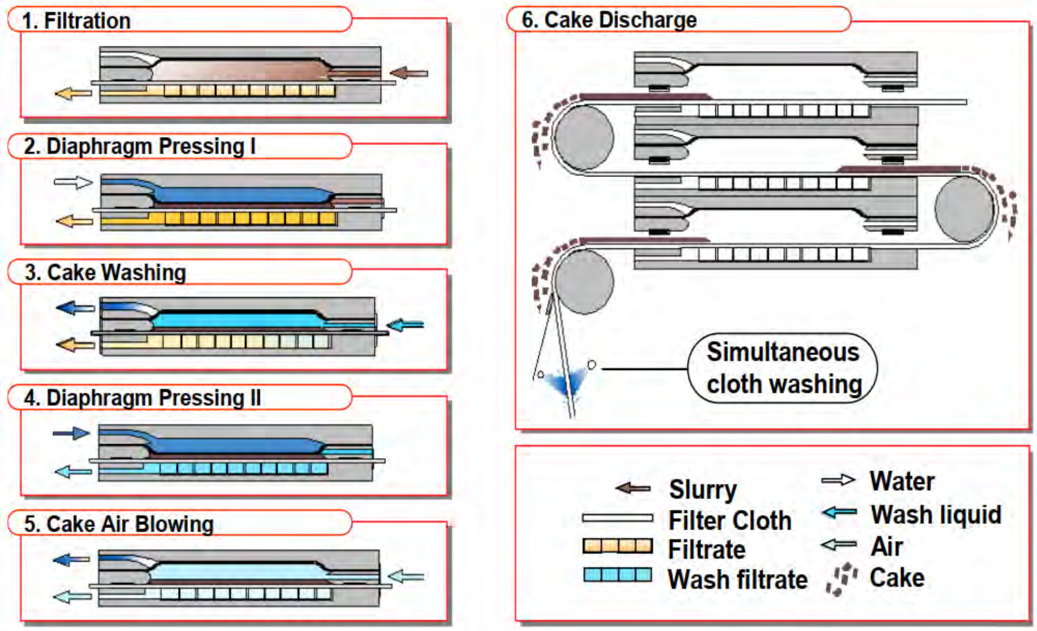
DESCRIPTION OF FILTRATION PROCESS AND SIMPLIFIED FLOWSHEET

PF Filtration technology was used during this test campaign and Figure 13.10 represent the steps of the filtration process as carried out in the laboratory on the bench scale unit and the full-scale production unit filtration cycle.

Metso Outotec Larox PF

Operational steps of Metso Outotec's Larox PF are introduced below. Operational steps are filtration, pressing, washing (optional) air blowing and finally cake discharge.

Figure 13.10: Pressure Filtration Cycle With Cake Washing



PRODUCTION DATA REQUIREMENTS

- Production Rate : 53 tph of dry solids (45 m3/h) (operating 18.7 hr/day and 288 days/year).
- Required Capacity : 555 kg D.S. /m2h.
- Filter cake : Cake contains: 5% wt. moisture.

TEST – PRODUCT AND WASH LIQUID DATA

- Spodumene Concentrate Slurry
- Temperature : 18 °C
- Density : 1.608 g/l
- Solids content : 55 wt%
- pH : 7.1
- Sizing p80 : µm
- Solids phase Composition : 75% Spodumene, 20% Silica (Quartz)
- Liquid phase Composition : Process water
- Corrosive Elements : No

FILTRATION TEST DATA

A total of 5 runs were completed using pressure filtration testing on the Labox 100 bench scale unit.

The following filtration parameters were used:

- 60mm chamber
- AINO T30 Filter media
- Filter Feed Density – 65% and 55% solids

— Slurry Temperature – 18 °C
— 6 bar pumping pressure
— 12 bar pressing pressure
— 10 bar air drying pressure

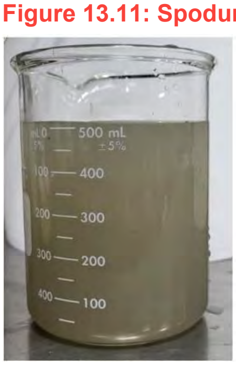
The results are presented in Table 13.19.

Table 13.19: Spodumene Concentrate Sample Filtration Results

Parameters	Units	Run#1	Run#2	Run#3	Run#4	Run#5
Feed Density	% w/w	-55%	-55%	-55%	-55%	-55%
Filter Cloth		AINO T30	AINO T30	AINO T30	AINO T30	AINO T30
Chamber Depth	mm	60	60	60	60	60
Cycle Time	min	9	9.25	6.25	9.08	7.08
Pumping Pressure	bar	6	6	6	5	5
Pressing Pressure	bar	6	12	12	12	12
Air Drying	bar	10	10	10	10	10
Cake Thickness	mm	57.2	56.6	56.5	56.3	56.0
Cake Moisture	% w/w	5.1	4.8	6.8	4.5	4.8
Filtration Rate D.S.	Kg/m2h	587	573	844	583	746

For all tests completed the filter cakes released off the filter cloth easily and crumbled using only your fingers. Filter cloths were easy to wash and there was no cloth blinding noticed during testing. The filtrate from all test runs initially had some ultra-fines pass through the cloth while the cake was forming but became clear after approximately 10 seconds. The quality of the filtrate is shown in Figure 13.11.

Figure 13.11: Spodumene Concentrate - Filtrate Quality



Initial test run was performed at the expected filter feed target of 65% solids, however during the pumping process the pump would cycle for a brief time while recirculating and then would stop since the sample had packed the pump and lines. To aid in pumping, the sample was diluted to 55% solids and the test was repeated. During the second attempt the pump cycled without issues. During this run the final cake moisture was approximately 5% and achieved a cake thickness of 57mm for a 60mm chamber. During the test run it was observed that the pump cycle time was very short and filled the chamber very quickly and while pressing the diaphragm in the chamber would not hold a seal and was constantly slipping at higher pressure and therefore only a 6-bar pressing pressure was achievable.

For run#2, the same parameters were used as run#1 and precautions were taken to ensure that the diaphragm was properly seated and sealed tightly so that the pressing diaphragm would not lose pressure while pressing. During this run the pressing functioned normally and the final cake moisture achieved was 4.8% and had a cake thickness of 57mm. For the third run, the same parameters were used, except a 1-minute air drying cycle was used to examine the impact on the final cake moisture. At the shorter drying time the final cake moisture was 6.8% and had a cake thickness of ~57mm.

Additional testing was completed to determine if a thinner cake closer to 48mm could be achieved. For run#4, the same cycle parameters were used except a short pumping time of 5 seconds was utilized during the filling cycle. In the pumping cycle, the pump was ramped up to only 5 bar within the 5 second interval. The remaining cycles (i.e., pressing, air-drying) were completed using the same parameters tested earlier. The final cake moisture attained was 4.5% and the cake thickness remained unchanged at approximately 56mm.

A final run was completed using the 5 second pumping interval and the drying time was shortened by half to observe any change in cake moisture. At the shorter air-drying time the final cake moisture increased slightly to 4.8%.

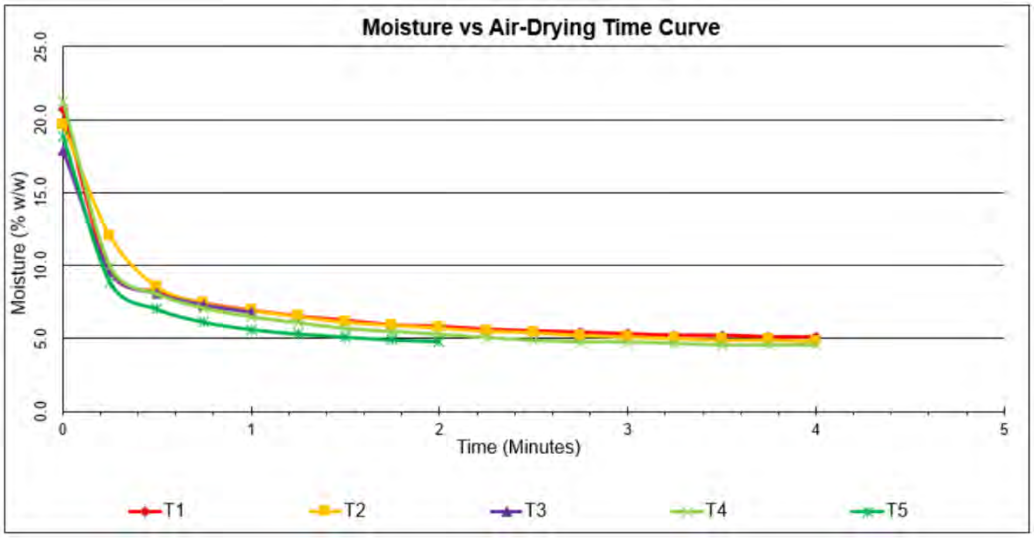
Overall, all the cakes appeared to have a similar consistency and looked like beach sand. An example of the filter cake using the 60mm chamber can be seen in Figure 13.12.

Figure 13.12: Spodumene Concentrate – Filter Cake

Effect of Air-Drying Time vs. Cake Moisture

The following curves presents the cake moisture throughout the air blow cycle. The moisture contents were back calculated based on the filtrate mass during the air blowing stage (air-drying cycle). The data collected can be seen for the following runs in Figure 13.13.

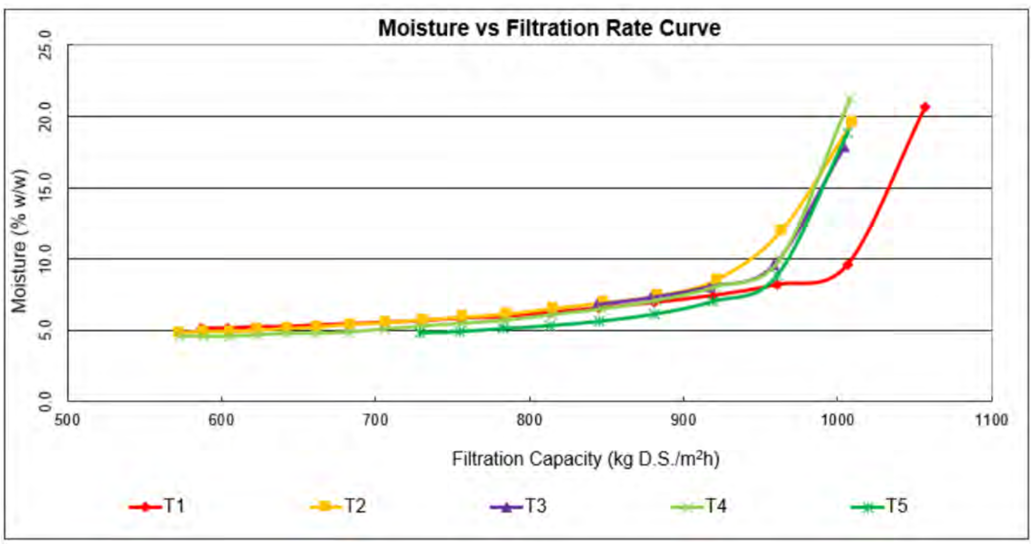
Figure 13.13: Spodumene Concentrate – Effect of Drying Time on Moisture



Moisture vs. Filtration Rate

In Figure 13.14 the relationship between the filtration rate and air-drying cycle time are shown. As can be seen in the graph, the filtration rate increases as the drying time are reduced

Figure 13.14: Spodumene Concentrate – Filtration Rate vs Cake Moisture



CONCLUSIONS

Filtration testwork was performed on a spodumene concentrate sample taken from Critical Element Lithium's Rose project to determine the filtration parameters to aid in generating design data to permit filter sizing. Based on the test results, the following conclusions can be made for the spodumene concentrate sample:

Spodumene Concentrate

- Filter Feed of 65% was not pumpable due to limitations of the diaphragm pump and the coarseness of the sample.
- Filter Feed of 55% was shown to be pumpable in the bench scale test unit.
- Filter cake thickness ranged from 56-57mm while using the 60mm chamber.
- Filter cake moistures ranged from 4.5-5.1% when using an air-drying time of 2 to 4 minutes.
- When a 1-minute air drying time was utilized, cake moisture increased to 6.8%.
- Pumping cycle was shown to be very quick

13.6 Pilot Plant Flotation Test Work – SGS Canada Inc. Lakefield

A pilot plant program based on the previously developed beneficiation flowsheet (Figure 13.7) was conducted in early 2017. Pilot tests report can be found in 'An Investigation into Flotation Pilot Plant testing on Material from the Rose Lithium/Tantalum Project', SGS Canada Inc. Project 14120-005 – Final report August 18, 2017. The main objective of pilot plant program was to produce spodumene concentrate for further pilot scale tests for producing lithium carbonate. Secondary objectives were to prove metallurgical performance on a continuous pilot scale and to generate metallurgical and operating data for further studies.

13.6.1 Head Sample Characterization

The Rose sample graded 0.67% Li (1.44% Li2O and 250 g/t Ta, while the Rose South sample graded 0.71% Li (1.53% Li2O) and 170 g/t Ta. The two samples had similar size distributions, with K80 values of approximately 7 mm at minus 9.45 mm (3/8") and 2.5 mm at minus 3.35 mm (6 mesh). X-ray diffraction analysis indicated that mineral proportions of both samples were similar, with 31.5-34.3% quartz, 26.4-35.4% albite, and 16.4-19.5% spodumene.

13.6.2 Comminution Testing

The two samples were very similar in terms of grindability, with the Rose South sample generally slightly harder than the Rose sample. Results are summarized in Table 13.20.

Table 13.20: Comminution Test Results Summary

Sample Name	Relative Density	CWI (kWh/t)	BWI (kWh/t)	AI (g)
Rose	2.74	7.9	14.4	0.302
Rose South	2.71	8.5	14.8	0.300
Rose PP Com P	-	-	13.6	-
Rose South PP Com P	-	-	14.1	-

13.6.3 Bench Scale Gravity Separation Testing

Heavy-liquid separation (HLS) testing on the feed samples at a density of 3.00 g/cm3 generated a concentrate grading 6.4% Li2O at a lithium recovery of 36-37%. More than 40% of the mass was rejected as barren silicates, with lithium losses of 2.5-3.3%. These results indicate that dense medium separation (DMS) would likely be a viable process option for generating lithium concentrate and rejecting a substantial portion of the silicate gangue minerals.

Lithium in the flotation feed (which mainly consisted of HLS middlings and the undersize fraction) was upgraded from 0.7% Li2O to ~0.9% Li2O, with a mass pull of approximately 50%. The majority of the tantalum (74%) reported to the flotation feed and can likely be recovered by magnetic separation.

Heavy-liquid testing on the combined flotation rougher and cleaner tailings sample recovered ~45% of the tantalum from the flotation tailings.

A Wilfley Table test conducted on the pilot plant SLon magnetic separator feed from the PP-07 campaign recovered ~49% of the tantalum at a grade of 9,113 g/t Ta with a concentrate mass pull of 1%. Approximately 3% of the lithium was lost to the tantalum concentrate.

13.6.4 Bench Scale Flotation Testing

Nine batch flotation tests were conducted on the Rose and Rose South samples to re-evaluate the previously developed flotation scheme and grind size with the pilot plant feed samples. The feed for the bench scale flotation tests was prepared by stage grinding, followed by magnetic separation and mica pre-flotation.

For the Rose sample, 62% of the tantalum was recovered into a magnetic concentrate with a mass pull of 1% and grade of ~1.5% Ta. For the Rose South sample, tantalum recovery was lower, at ~47%, with a magnetic concentrate mass pull of 0.7% and grade of ~1.1% Ta.

On average, the mica concentrate mass pull was 5.7% at a K2O grade of 6.3% and K2O recovery of 15.6%. About 2% of the lithium was lost into the mica concentrate.

There was no significant difference in lithium flotation performance using either Aero 3030C or Armac T as the collector.

One locked-cycle test was conducted on each of the Rose and Rose South samples. In both cases, the final spodumene concentrate graded 6.65% Li2O, with higher than 89% lithium recovery and ~20% weight recovery.

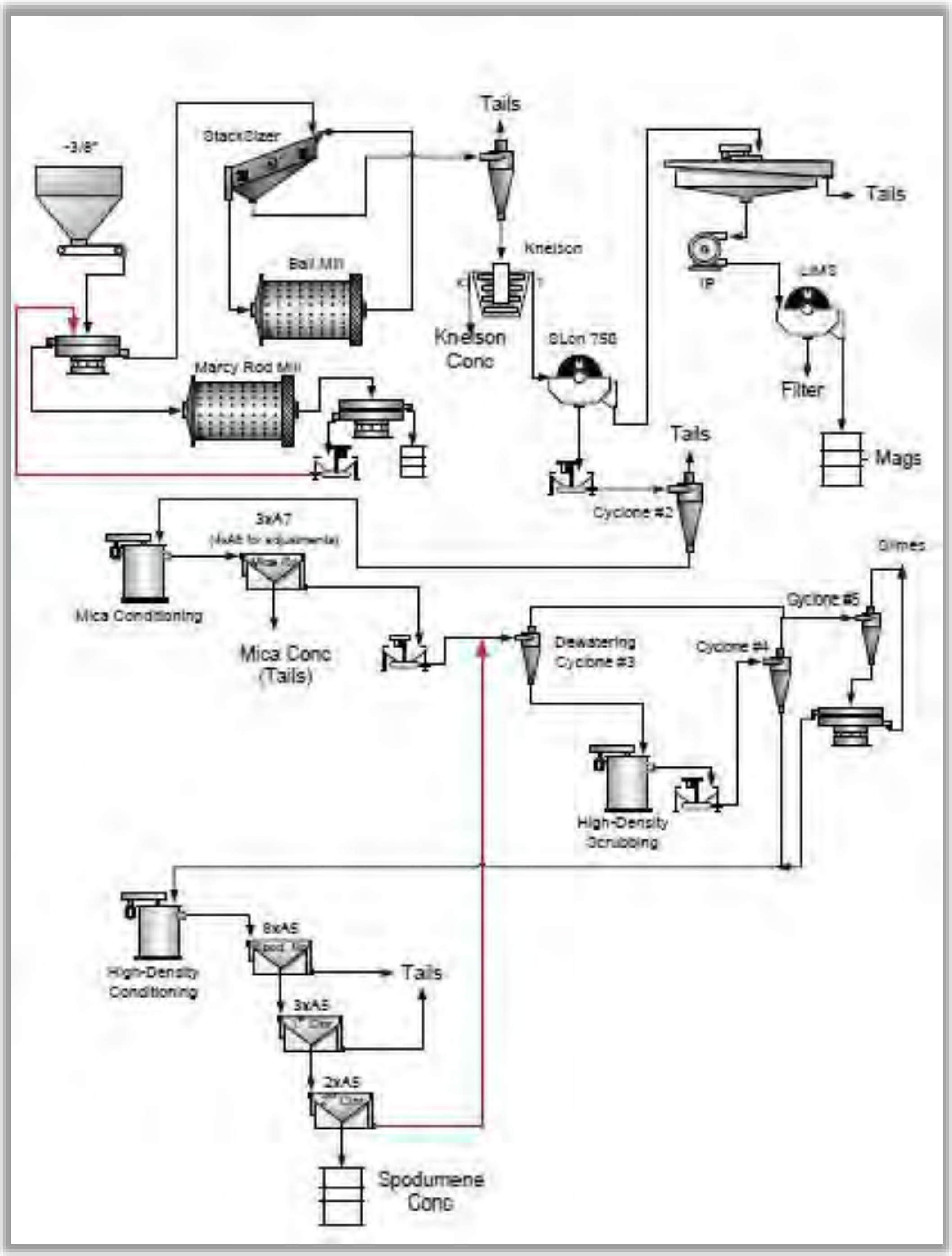
13.6.5 Pilot Plant Operation

Pilot plant testing commenced on February 14, 2017, and was completed on March 17, 2017, in a series of twenty-two shifts. The pilot plant was constructed according to the flowsheet displayed on Figure 13.15. The pilot plant was designed to process material at a target feed rate of approximately 250 kg/h.

The first eleven operating shifts were completed on the Rose South sample. Shifts PP-01 to PP-07 were considered as commissioning and optimization day shifts, followed by four shifts (PP-08 to PP-11) of round-the-clock continuous operation, to demonstrate metallurgical performance and generate products over an extended uninterrupted period.

The final eleven operating shifts were completed on the Rose sample. A low-intensity drum magnetic separator was added to the magnetic separation circuit to treat the SLon magnetics stream, and the spodumene 3rd cleaner stage was removed, such that only two stages of cleaning of the spodumene rougher concentrate were required. The focus of day shifts PP-12 and PP-13 was to transition the pilot plant to the new sample and achieve operating stability with some degree of optimization. The final nine shifts (PP-14 to PP-22) were intended as continuous operation to demonstrate metallurgical performance and generate products over an extended uninterrupted period.

Figure 13.15: Pilot Plant Flowsheet



Source: SGS Canada, Project 14120-005 Final report August 18, 2017

During the continuous operation of the Rose South sample, the overall grinding circuit unit energy consumption was 9.7 kWh/t, for an operating work index of 17.6 kWh/t. During the continuous operation of the Rose sample, the overall grinding circuit unit energy consumption was 9.3 kWh/t, for an operating work index of 16.3 kWh/t. Consistent with the observations at bench scale, the Rose South sample required slightly more energy than did the Rose sample.

During the continuous operation of the Rose South sample, the magnetic concentrate represented 1.0% of the original feed mass, at a tantalum recovery of 47.8% and an associated lithium loss of 1.8%. During the continuous operation of the Rose sample shifts that included a Knelson Concentrator, the combined Knelson gravity concentrate, and SLon 750 magnetic concentrate represented 3.5% of the original feed mass, at a tantalum recovery of 63.5% and an associated lithium loss of 6.2%.

Spodumene flotation was conducted in a rougher stage followed by either three (Rose South) or two (Rose) stages of cleaning. The feed K80 values were almost identical for the two samples during the extended runs, at 216~218 µm on average. Slightly different dosages of FA-2 collector were employed for the two samples, at 772 g/t for the Rose South sample extended run and 854 g/t for the Rose sample extended run.

13.6.6 Pilot Plant Metallurgical Results

Concentrate grades varied from 4.5% Li2O to 6.4% Li2O during the start-up and commissioning runs on the Rose South sample, PP-01 to PP-07. Concentrate grades were consistently above the target of 6.0% Li2O for all other shift surveys, from PP-08 to PP-22, indicating stable operation and metallurgical performance throughout the extended run of the Rose South sample and the entire campaign of the Rose sample.

Lithium recoveries ranged from 45% to 60% during the start-up and commissioning runs on the Rose South sample, PP-01 to PP-07. During the Rose South extended run, PP-08 to PP-11, lithium recoveries were significantly improved, ranging from 56% to 82%, and averaging 68%. Lithium recoveries during the Rose sample campaign were consistently in the range from 74% to 83% and averaged 79%.

Metallurgical performance of the Rose sample campaign, from shifts PP-12 to PP-22, was better than that of the Rose South sample campaign, from shifts PP-01 to PP-11, in terms of both consistency and overall performance. This is undoubtedly due, at least in part, to instability of the circuit during the commissioning and optimization runs PP-01 to PP-07, with the continual manipulation of circuit parameters. Once stability had been achieved (i.e., during the extended run, starting at PP-08), the operation and metallurgical performance of the Rose South sample was in line with that of the Rose sample.

Table 13.21 summarizes the results of the best shift and the comparable bench test results (from the locked cycle testing) for the two samples. Lithium recoveries were lower in the piloting campaign than that achieved in the locked cycle tests, which was due in part to less efficient desliming in the pilot plant, resulting in higher lithium losses to the slimes streams. Further optimization in continuous operation should focus on improvements in that area.

Table 13.21: Summary of Results – Optimal Shift Metallurgy and LCT Results

PP ID	Product	Mass %	Assay (Adjusted) %							Distribution %						
			Li2O	Ta (g/t)	SiO2	Al2O3	Fe2O3	Na2O	K2O	Li	Ta	SiO2	Al2O3	Fe2O3	Na2O	K2O
Optimal Rose South (PP-11)	O/F Cyclones Mag Conc. Mica Conc.	14.8	1.16	109	72.5	16.3	0.88	3.54	3.52	12.2	13.9	14.1	15.7	23.5	15.4	19.5
	Li Ro Tail	0.8	2.54	6460	54.3	18.8	13.4	1.34	1.35	1.5	44.8	0.6	1.0	19.6	0.3	0.4
	Li 1st Cl Tail	6.7	0.38	43	74.7	15.6	0.35	2.66	5.30	1.8	2.5	6.6	6.8	4.2	5.3	13.3
	Li 3rd Cl Conc.	58.8	0.05	33	81.1	11.8	0.19	4.28	2.78	2.0	16.7	62.6	45.1	19.9	74.2	61.5
		1.4	0.60	104	78.2	13.8	0.28	4.47	2.59	0.6	1.2	1.4	1.2	0.7	1.8	1.3
		17.5	6.56	139	64.4	26.5	1.01	0.60	0.60	81.9	20.9	14.8	30.3	32.1	3.1	4.0
Optimal Rose (PP-15)	O/F Cyclones Mag Conc. Mica Conc.	12.6	1.07	229	73.2	16.3	0.61	4.65	2.44	10.6	27.8	12.3	12.8	19.5	12.7	14.9
	Li Ro Tail	0.6	1.12	2230	47.3	15.4	21.0	2.05	0.90	0.5	12.3	0.4	0.5	30.3	0.3	0.2
	Li 1st Cl Tail	7.6	0.30	71	69.0	20.0	0.20	3.73	5.09	1.8	5.2	7.0	9.5	3.8	6.2	18.8
	Li 2nd Cl Conc.	61.6	0.07	67	79.1	12.7	0.16	5.75	2.03	3.2	39.8	65.2	48.9	24.9	77.1	60.7
		0.9	0.75	238	74.9	15.7	0.39	5.29	2.16	0.5	2.0	0.9	0.8	0.8	1.0	0.9
		16.7	6.38	81	63.8	26.2	0.49	0.75	0.53	83.4	13.0	14.3	27.4	20.7	2.7	4.3
Benchmark	O/F Cyclones	5.7	1.1		69.5	16.2	1.12	4.13	2.69	4.1		5.3	5.8	18.2	5.9	7.7
	Mag Conc.	0.8	1.5		43.3	17.0	15.6	1.33	0.47	0.8	64.4	0.5	0.9	36.5	0.3	0.2
LCT Rose	Mica Conc.	6.8	0.4	1.95	62.0	24.8	0.24	2.85	6.39	1.8		5.7	10.6	4.8	4.8	21.8
Sample	Li Ro Tail	63.3	0.0		80.7	11.7	0.08	5.26	2.04	1.8		68.0	46.4	15.2	82.6	64.5
	Li 1st Cl Tail	3.2	1.1		77.5	14.2	0.15	4.56	1.82	2.2		3.3	2.8	1.3	3.6	2.9
	Li 3rd Cl Conc.	20.2	6.7		64.4	26.4	0.42	0.57	0.29	89.3		17.3	33.5	24.0	2.8	2.9
Benchmark	O/F Cyclones	8.1	0.9		70.5	15.7	1.10	3.74	3.41	5.1		7.6	8.4	16.4	9.2	10.6
	Mag Conc.	0.7	1.6		44.9	15.3	20.8	1.18	0.87	0.8	48.1	0.4	0.7	26.6	0.2	0.2
LCT Rose South Sample	Mica Conc.	3.8	0.4	1.18	56.8	27.5	0.99	1.82	7.98	0.9		2.9	6.9	7.0	2.1	11.7
	Li Ro Tail	64.4	0.0		80.5	10.9	0.13	4.18	2.92	1.7		68.9	46.3	14.9	81.9	72.2
	Li 1st Cl Tail	2.9	1.0		77.1	14.1	0.26	3.71	2.73	1.9		3.0	2.7	1.4	3.3	3.0
	Li 3rd Cl Conc.	20.2	6.6		64.6	26.2	0.91	0.54	0.29	89.7		17.3	34.9	33.8	3.3	2.3

Source: SGS Canada, Project 14120-005 Final report August 18, 2017

13.7 Tantalite Concentrate Upgrading Tests

The final report of SGS in June 2018 (Project 14120-007) "Tantalum upgrading Testwork on Low-Grade concentrate generated from a Lithium Pilot Plant" contents mineralogical analysis and the description of the beneficiation tests with results of Ta2O5 concentrate grades and recoveries. The beneficiation testing progress has been realized on four (4) processes:

- Magnetic separation
- Batch flotation testing
- Heavy liquid separation testing
- Gravity separation testing

13.7.1 The Mineralogical Analysis

A subsample of the Ta feed was submitted to the SGS Advanced Mineralogy Facility for QEMSCAN analysis. The main objectives of the analysis were to determine the deportment of tantalum, to determine the liberation characteristics of tantalum-bearing minerals and to assess the mineralogical factors which may limit various metallurgical processes.

The results of the mineralogical analysis in the SGS report of June 2018 can be resumed as follows:

- The sample was dominated by spodumene (36.4%); plagioclase (24.1%); moderate quartz (15.2%); minor spessartine (9.14%); K-feldspar (6.27%); mica clays (5.02%); tantalite (< 1%); Fe-oxides and others minerals (See Figure 2 of the June 2018 SGS Report, page 6).
- The main tantalum mineral is tantalite which accounts for 0.97% of the sample mass.
- The tantalite appeared to be well liberated at a K80 of 211 µm; with free or liberated tantalite accounting for 84.8% of the total tantalite.
- Free and liberated silicates accounts for 99.7% of the total silicates.
- Free and liberated spodumene accounts for 94.8% of the total spodumene.
- The grain size distribution indicates that 5-10% of the tantalite grains are - 20 µm.

13.7.2 Beneficiation Testing

MAGNETIC SEPARATION TESTING

The sample of tantalum recovered from the pilot run was assaying 0.48% Ta2O5 and SGS tried to upgrade this sample by magnetic testing at different magnetic intensities of 2000, 5000, 8000, 10000 and 15000 Gauss.

The sample was split in two size fraction of + 106 µm and – 106 µm.

The best results were obtained on fraction -106 µm with a grade of 4.87 Ta2O5 and a recovery of 88.3% at magnetic intensity of 15000 Gauss. With the + 106 µm the grade obtained was 1.39% Ta2O5 and a slightly better recovery at 91.0%.

Those tests have failed to upgrade the tantalum concentrate at 20% or more.

BATCH FLOTATION TESTING

The primary goal of the flotation tests was to attempt to identify a reagent scheme and flowsheet suitable for upgrading the tantalum concentrate to the target grade of 20% Ta2O5 or plus.

Those tests failed to increase the grade of the tantalum concentrate and the flowsheet proposed by SGS does not correspond to the flowsheet retained by Critical Element, Bumigeme and SGS for Rose Lithium project. In the flowsheet retained, the tantalum is recovered by magnetic separation before mica flotation. For some reasons, SGS tried to recover the tantalum after the mica flotation. The recovery was over 95% but no improvement in the grade (0.45 to 0.49% Ta2O5).

Following direction from Critical Element Corporation, the flotation testwork was curtailed after five tests in favor of conducting additional gravity separation testwork.

HEAVY LIQUID SEPARATION TESTING

As the specific gravity of tantalite is significantly higher than the majority of other minerals in the tantalum concentrate, gravity separation was considered an important potential method of upgrading tantalum.

The HLS test was performed in two passes, with the first pass using a heavy liquid (Methyl Iodide) specific gravity of 3.30 and the second pass using a specific gravity of 3.10. The float product from each pass served as the feed of the subsequent pass. The sink products from each pass and the final float product were collected as products. Each product was split into two sizes, + 150 µm and – 150 µm.

The results show that the tantalum was upgraded in the combine S.G. 3.30 sink to 4.63% Ta2O5 with a recovery of 73.1% of the tantalum in 6.8% of the feed mass. The SG 3.10 sink product graded 0.15% Ta2O5 and recovered only 7.5% of the feed tantalum.

The Ta2O5 were relatively similar in both fractions (+ 150 µm and – 150 µm).

The upgrading observed in the combined SG 3.30 sink product (0.43 to 4.63% Ta2O5) indicated that gravity separation has the potential for upgrading the tantalum concentrate. Based on these results it was decided to proceed with physical gravity separation tests including Wifley table and Knelson concentrator.

WILFLEY TABLE TESTING

Wilfley table tests were performed on the Ta feed subsample who was splitted in two size fractions (+ 150 µm and – 150 µm). The tests were done to ascertain the performance of the Wilfley Table in tantalum upgrading and to determine the effect of particle size on gravity separation.

The Wilfley tests were conducted in open-circuit and each test included a rougher stage and a scavenger stage with the rougher tailings serving as the feed for the scavenger.

The results have confirmed those obtained with HLS tests. The + 150 µm rougher concentrate gave a concentration of 5.24 Ta2O5 with a recovery of 32.5% while the – 150 µm produced a rougher concentrate of 13.7 % Ta2O5 with a recovery of 75.0.

The losses of lithium in the rougher concentrate were low at 0.4% in the + 150 µm fraction and 1.5% in the -150 µm fraction. For global results, the rougher concentrate reported 10.3% Ta2O5 with 59.2% recovery in a 2.6% of the feed mass. This represents an upgrade factor of 22.4.

Around 99% of the lithium contained in the feed sample reported in the rougher middlings and tailings at a grade of 2.8-3.0% Li2O. Studies should be done to add those products to the lithium flotation, even if the amount of lithium in those fractions is small as overall lithium in the feed to the mill.

A larger proportion of the + 150 µm tantalum reported in the table middlings (47.5%) as compared to – 150 µm fraction (17.8%). This trend was somewhat surprising as coarser particles are generally more susceptible to gravity separation techniques. A possible explanation could be poor tantalite liberation in the + 150 µm fraction. This should be investigated after start-up or in a new serie of tests.

KNELSON CONCENTRATOR TESTING

Knelson Tests KC #1

Similar to the Wifley table test, the first Knelson Concentrator test (KC #1) was performed on two size fractions (+ 150 µm and – 150 µm) of the Ta feed to evaluate the tantalum beneficiation performance of a Knelson concentrator and to ascertain the effect of particle size on gravity separation.

Each test included five (5) passes through a Knelson MD -3 batch concentrator with the concentrate from each pass further upgraded on a Mozley Table. The Knelson tailings from each pass acted as the feed to the subsequent pass through the concentrator.

Excellent tantalum upgrading was observed in the Mozley table concentrates with the combined concentrate from the first four passes grading 20.2% Ta2O5 and recovery 55.5% of the tantalum in 1.6% of the mass. Tantalum recovery increased to 61.9% after the fifth pass but with a small decrease in the combined concentrate to 19.3% Ta2O5. The combined Knelson concentrate from all five passes graded 4.67% Ta2O5 with 76.9% recovery. The Knelson concentrate after the first pass had a grade of 9.31% Ta2O5 with a recovery of 33.7%.

These results indicate that the upgrading of the Knelson concentrate on the cleaner Mozley Table was critical to the achievement of the target concentrate grade of 20% Ta2O5 minimum.

It was observed during the test that the finer fraction (- 150 µm) contained a higher Ta2O5 grade with a better recovery than the coarser (+150 µm) fraction concentrates.

Knelson Tests KC #2

Based on the superior performance of the – 150 µm fraction in KC #1 tests, a second Knelson concentrator test (KC #2) was conducted on a 100% - 150 µm stage – ground Ta feed sample. The ground sample passed through a hydrocyclone to reject the -20 µm slimes. The deslimed sample was passed four times through a Knelson MD-3 batch concentrator with the Knelson concentrate from each pass upgraded on a Mozley table.

The Mozley table concentrator generated in KC #2 tests contained higher tantalum grades than the equivalent Mozley Table concentrates generated in KC #1 while recovering similar proportion of feed tantalum. The combined Mozley Table concentrates from the four passes in KC #2 met the higher tantalum concentrate grade target of 25% Ta2O5 with a grade of 25.5% Ta2O5 and 56.8% tantalum recovery.

As in KC #1, the Knelson concentrate had to be upgraded by a Mozley Table, as the grade from each pass (1 to 4) diminish from 15.2%, 9.07%, 5.66% and 2.95% Ta2O5 successively. The combined Knelson concentrates from the four passes assayed 8.41% Ta2O5 and 74.4% recovery.

The final Knelson tailings of KC#2 recovered 96.6% of the lithium in the feed and assayed 2.88% Li2O.

Knelson Tests KC #3

SGS realized a third set of Knelson concentrator to study the effect centrifugal bowl speed (G force) on tantalum beneficiation. It was expected in doing so to increase recovery of fine particles with higher concentrator G Force.

Three tests of 5 kg samples of Ta feed were passed separately through the Knelson MD batch concentrator with only a single pass per test. The three Knelson tailings were each screened into + 20 µm and -20 µm fractions which were analyzed separately.

The results of the three tests at a G-Force of 60, 90 and 120 have not shown any significant improvement with higher G Force as shown in Table 13.22.

Table 13.22: Particles Recovery at Different Knelson Concentrator Centrifugal Bowl Speed

G Force	% Weight		% Ta2O5		Global Distribution	
	+20 µm	-20 µm	+20 µm	-20 µm	+20 µm	-20 µm
60	94.9	3.3	0.26	1.25	54.4	9.3
90	95.2	3.1	0.35	1.33	72.9	9.1
120	94.4	3.8	0.33	1.26	67.7	10.5

The results of the three tests show that the proportion of tantalum deporting to the -20 µm fraction remained fairly constant in the three tests and the concentrator G-Force had negligible effect on tantalum recovery in the range of G Force tested. May be higher G Force (in the order of 300-500 G Force) could be require for noticeable increase.

WILFLEY TABLE + KNELSON CONCENTRATOR (WK #1)

A new serie of tests was conducted on Wilfley Tables and a Knelson MD-3 concentrator. For this a 100 kg Ta Feed was stage-ground to 100 % passing 150 µm, followed by a desliming stage to remove the -20 µm fraction.

The flowsheet consisted in two Wilfley Tables, on operating as rougher and the second one as scavenger.

The middlings collected from the rougher table returned to the table feed. The tailings of the rougher table were sent to the scavenger table and the scavenger concentrate was collected and analyzed.

The Wilfley rougher table concentrate was passed five times through the Knelson concentrator at a G-Force of 60. The concentrate from each pass and the final Knelson tailings were submitted for analysis. The results are summarized as follows:

- The five passes produced a concentrate of 23.0% Ta2O5 with a recovery of 39% of the tantalum contained in the Feed sample.
- The scavenger concentrate assayed 5.25% Ta2O5 and accounted for 41.3% of the tantalum contained in the Feed sample.
- The combination of the Knelson concentrates and the scavenger concentrate accounted for 80.3% of the tantalum in the feed sample with a grade of 8.40% Ta2O5. The Wilfley tables alone has failed to produce a tantalum concentrate of 20% Ta2O5 or better.
- The scavenger Wilfley Table concentrate (5.25% Ta2O5) was processed through the Knelson Concentrator to evaluate the tantalum upgrading potential. The test consisted of three passes through the Knelson concentrator with each pass at a G-Force of 60 g. Only marginal tantalum upgrading was achieved as the first pass gave a concentrate of only 7.64% Ta2O5, short of the target of + 20 % Ta2O5 grade. Furthermore 54.5% of the tantalum reported to the Knelson tailings, with a grade of 4.26% Ta2O5.

13.7.3 Conclusion

Assuming the tantalum recovery with the SLON Magnetic separators at 80% of the tantalum contained in the ore and 80% of the tantalum recovered in the upgrading process with a final concentrate of 8.4% Ta2O5 an overall recovery of plus 60% seems possible. But if the market requires a grade of 20% Ta2O5 or more, it is evident that more testing becomes necessary.

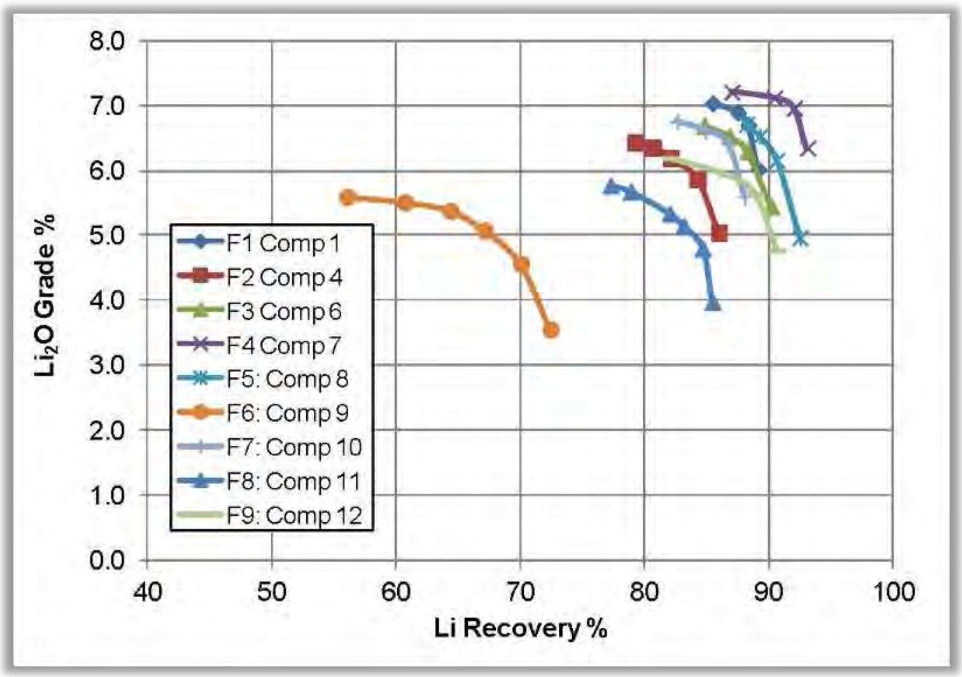
Bumigeme strongly suggests that the tantalum flowsheet be tested in pilot-plant trials in the new lithium concentrator based on SGS flowsheet and collect material for further testing.

The testing program should concentrate on obtaining more knowledge of the granulometry of the tantalum concentrate recovered at the SLON magnetic separator and should include a series of tests with the Mozley concentrator developed for the process of tin ore. Also, the reader should refer to the recommendations of SGS in their report of June 2018 (project 14120-007).

13.8 Lithium Variability Tests

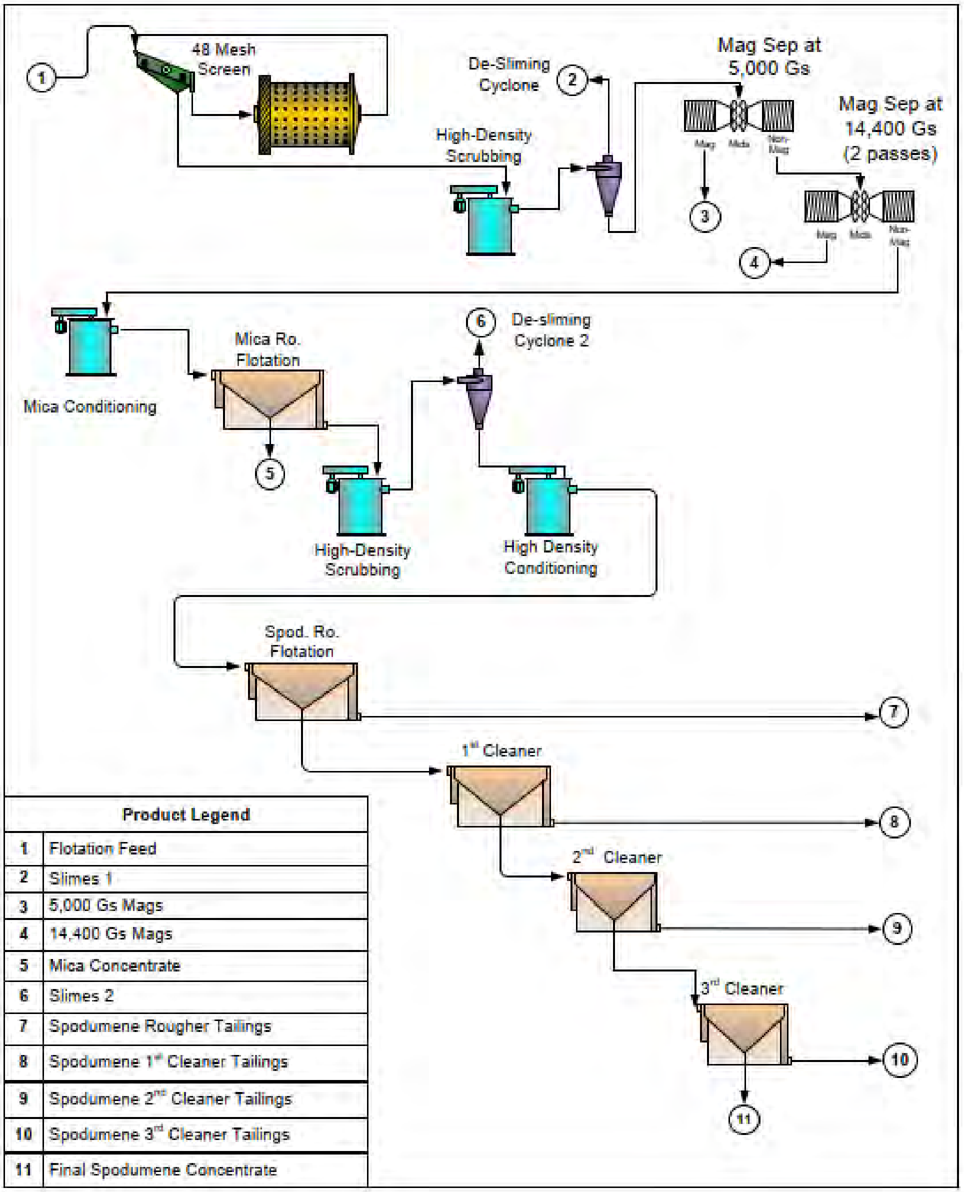
SGS laboratory conducted a small test program in August 2017 to investigate grade/recovery results with varying lithium head grades using the design process flowsheet presented in Figure 13.17). Nine samples were tested having head grades varying between 0.50% Li2O and 1.70% Li2O; the results are shown in Figure 13.16 and in Table 13.23. The grade recovery results show that samples with head grades higher than 1.0% Li2O produce a lithium concentrate of 5.0% Li2O with a recovery over 90% and of 6.0% Li2O with a recovery over 86%. The sample with a 0.50% Li2O head grade produces a concentrate 5.0% Li2O with a recovery of 67%. A head grade of 0.85% Li2O produces a 5.0% Li2O concentrate with a recovery of over 85%.

Figure 13.16: Grade-Recovery Relationships for the Variability Test Results



Source: SGS Canada, Project 14120-008 Flotation Tests-Variability August, 2017

Figure 13.17: Grade-Recovery Relationships for the Variability Test Results



Product Legend	
1	Flotation Feed
2	Slimes 1
3	5,000 Gs Mags
4	14,400 Gs Mags
5	Mica Concentrate
6	Slimes 2
7	Spodumene Rougher Tailings
8	Spodumene 1st Cleaner Tailings
9	Spodumene 2nd Cleaner Tailings
10	Spodumene 3rd Cleaner Tailings
11	Final Spodumene Concentrate

Table 13.23: Metallurgical Results for the Lithium Variability Tests

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li_2O	Ta g/t	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3	Li	Ta	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3
F1	Comp 1- F1 Li 3rd Cl Conc.	343	13.8	3.27	7.04		63.8	26	0.22	0.55	0.16	0.03	0.73	85.4		11.8	23.6	0.8	2.1	7.7	18.3	25.4
Using Developed Flowsheet on Comp 1 Sample	Comp 1- F1 Li 2nd Cl Conc.	358	14.4	3.21	6.9		64.1	25.8	0.27	0.65	0.16	0.03	0.72	87.4		12.3	24.4	1.1	2.5	8.2	18.8	26.3
	Comp 1- F1 Li 1st Cl Conc.	372	15	3.11	6.7		64.5	25.4	0.33	0.78	0.17	0.03	0.72	88.3		12.9	25	1.4	3.2	8.7	19.3	27.1
	Comp 1- F1 Li Ro Conc.	418	16.8	2.8	6.02		66.1	24	0.59	1.19	0.17	0.03	0.66	89.1		14.9	26.6	2.8	5.4	9.8	21	28
	Comp 1- F1 Li Ro Tail.	1638	65.9	0.02	0.03		78.9	12.3	3.74	4.44	0.14	0.02	0.16	1.9		69.6	53.3	68.9	79.3	32.1	58.2	26.6
	Comp 1-F1 Mica Conc	295	11.9	0.16	0.34		68	18.6	6.92	3.16	0.12	0.02	0.33	3.6		10.8	14.5	22.9	10.2	4.9	10.5	9.9
	Comp 1-F1 Total Slimes	110	4.4	0.41	0.88		67.5	15.2	3.88	3.74	3.25	0.04	1.28	3.4		4	4.4	4.8	4.5	50.1	7.8	14.4
	Comp 1-F1 Mag 5A	13	0.5	0.91	1.96		59.2	17.5	1.84	2.13	0.93	0.05	3.31	0.9		0.4	0.6	0.3	0.3	1.7	1.2	4.4
	Comp 1-F1 Combined Mag Prod.	25.4	1	1.03	2.21		58.2	17.2	1.96	2.16	0.86	0.05	8.19	2		0.8	1.2	0.6	0.6	3	2.5	21.1
	Head (calc.)	2487	100	0.53	1.14		74.7	15.2	3.58	3.69	0.29	0.02	0.4	100		100	100	100	100	100	100	100
	Head (Dir.)			0.56	1.21	100	74.9	15.1	3.53	3.62	0.12	0.02	0.24									
F2	Comp 4- F2 Final Li Conc.	335	14.3	2.99	6.44		64.3	25.2	0.43	0.74	0.2	0.11	1.05	79.2		12.2	23.4	2.7	2.6	11.1	52	19.9
Using Developed Flowsheet on Comp 4 Sample	Comp 4- F2 Li 3rd Cl Conc.	345	14.7	2.95	6.36		63.9	25.1	0.44	0.74	0.2	0.11	1.19	80.6		12.5	24.1	2.9	2.7	11.6	53.4	23.2
	Comp 4- F2 Li 2nd Cl Conc.	360	15.4	2.88	6.2		64.3	24.8	0.49	0.83	0.2	0.11	1.19	82		13.1	24.8	3.3	3.2	12	53.9	24.2
	Comp 4- F2 Li 1st Cl Conc.	391	16.7	2.73	5.87		65.1	24.1	0.58	1.01	0.2	0.1	1.17	84.2		14.4	26.1	4.3	4.2	12.8	54.7	25.9
	Comp 4- F2 Li Ro Conc.	464	19.8	2.34	5.05		67.2	22.2	0.76	1.51	0.19	0.09	1.07	85.9		17.6	28.6	6.7	7.4	14.7	55.7	28
	Comp 4- F2 Li Ro Tail.	1378	58.7	0.02	0.05		81.7	11.8	1.97	5.09	0.16	0.01	0.24	2.4		63.6	45.1	51.4	74	36.6	19.4	18.7
	Comp 4-F2 Mica Conc	335	14.3	0.19	0.41		67	19.9	5.34	3.61	0.13	0.03	0.73	5		12.7	18.5	33.9	12.8	7.2	14.2	13.8
	Comp 4-F2 Total Slimes	121	5.1	0.42	0.9		68.3	15.8	2.72	3.9	1.93	0.04	2.17	4		4.7	5.3	6.2	5	38.7	6.8	14.9
	Comp 4-F2 Mag 5A	21	0.9	0.65	1.4	7300	53.3	18.2	1.52	1.87	0.39	0.05	5.66	1.1		0.6	1	0.6	0.4	1.3	1.5	6.6
	Comp 4-F2 Combined Mag Prod.	48.6	2.1	0.7	1.5	5004	51.1	18.6	1.86	1.64	0.34	0.06	8.96	2.7		1.4	2.5	1.7	0.8	2.8	3.8	24.6
	Head (calc.)	2346	100	0.54	1.16		75.4	15.4	2.25	4.04	0.26	0.03	0.75	100		100	100	100	100	100	100	100
	Head (Dir.)			0.53	1.14	100	75.3	15.3	2.25	4.12	0.13	0.04	0.56									
F3	Comp 6- F3 Li 3rd Cl Conc.	346	15.1	3.11	6.69		64.6	26.4	0.41	0.62	0.14	0.03	0.48	84.8		13.2	25.4	2.4	2.2	7.4	20.1	18.3
Using Developed Flowsheet on Comp 6 Sample	Comp 6- F3 Li 2nd Cl Conc.	364	15.9	3.03	6.53		64.7	26.2	0.48	0.73	0.14	0.03	0.49	86.8		13.9	26.5	3	2.7	8	20.8	19.5
	Comp 6- F3 Li 1st Cl Conc.	383	16.7	2.93	6.3		65	25.8	0.57	0.89	0.15	0.03	0.49	88.2		14.7	27.5	3.7	3.4	8.6	21.6	20.6
	Comp 6- F3 Li Ro Conc.	453	19.8	2.53	5.44		66.6	24.1	0.88	1.48	0.15	0.03	0.46	90.2		17.8	30.4	6.8	6.8	10.7	22.9	22.8
	Comp 6- F3 Li Ro Tail.	1578	69	0.02	0.04		77.9	12.8	2.83	5.22	0.13	0.02	0.18	2.2		72.4	56.2	76.1	83.2	31.5	61.2	31.3
	Comp 6-F3 Mica Conc	61	2.7	0.16	0.34		57.9	26.8	7.84	2.31	0.11	0.03	0.62	0.8		2.1	4.6	8.2	1.4	1	3.6	4.2
	Comp 6-F3 Total Slimes	163	7.1	0.38	0.81		68.9	16	2.92	4.71	2.16	0.03	1.13	4.9		6.6	7.3	8.1	7.8	54.2	9.5	20.3
	Comp 6-F3 Mag 5A	14.6	0.6	0.75	1.61		56.3	18.7	1.24	2.33	0.57	0.04	2.76	0.9		0.5	0.8	0.3	0.3	1.3	1.1	4.4
	Comp 6-F3 Combined Mag Prod.	31.8	1.4	0.79	1.7		57.7	18	1.61	2.63	0.54	0.05	6.11	2		1.1	1.6	0.9	0.8	2.6	2.8	21.4
	Head (calc.)	2287	100	0.56	1.2		74.2	15.7	2.57	4.33	0.29	0.02	0.4	100		100	100	100	100	100	100	100
	Head (Dir.)			0.58	1.25	200	74.8	15.8	2.61	4.27	0.11	0.02	0.25									
F4	Comp 7- F4 Li 3rd Cl Conc.	584	22.1	3.35	7.21		64.4	26.8	0.13	0.43	0.1	0.02	0.35	86.9		19.2	36.4	1.2	2.7	9.1	21.5	29.7

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li2O	Ta g/t	SiO2	Al2O3	K2O	Na2O	CaO	P2O5	Fe2O3	Li	Ta	SiO2	Al2O3	K2O	Na2O	CaO	P2O5	Fe2O3
Using Developed Flowsheet on Comp 7 Sample	Comp 7- F4 Li 2nd Cl Conc.	615	23.3	3.31	7.12		64.6	26.6	0.15	0.49	0.1	0.02	0.35	90.4		20.3	38.1	1.5	3.3	9.7	22.7	31.3
Using Developed Flowsheet on Comp 7 Sample	Comp 7- F4 Li 2nd Cl Conc.	615	23.3	3.31	7.12		64.6	26.6	0.15	0.49	0.1	0.02	0.35	90.4		20.3	38.1	1.5	3.3	9.7	22.7	31.3
	Comp 7- F4 Li 1st Cl Conc.	639	24.3	3.24	6.97		64.9	26.3	0.19	0.6	0.1	0.02	0.35	92		21.2	39.2	2	4.1	10.3	23.6	32.2
	Comp 7- F4 Li Ro Conc.	709	26.9	2.95	6.35		66.2	25.1	0.4	0.98	0.11	0.02	0.33	93.1		24	41.3	4.5	7.4	12.1	26.2	34.1
	Comp 7- F4 Li Ro Tail.	1672	63.4	0.01	0.03		79.4	11.9	2.87	4.73	0.14	0.02	0.14	1		67.8	46.3	76.5	84.5	36.5	61.7	34
	Comp 7-F4 Mica Conc	114	4.3	0.22	0.47		59	26.1	7.45	2.34	0.09	0.02	0.36	1.1		3.4	6.9	13.5	2.8	1.6	4.2	6
	Comp 7-F4 Total Slimes	114	4.3	0.66	1.42		68.9	16	2.73	3.82	2.68	0.02	1.07	3.3		4	4.2	5	4.7	47.6	5.2	17.7
	Comp 7-F4 Mag 5A	21	0.8	1.1	2.37	11700	57.3	19.4	1.05	1.72	0.47	0.04	2.08	1		0.6	0.9	0.3	0.4	1.5	1.5	6.2
	Comp 7-F4 Combined Mag Prod.	27.7	1.1	1.18	2.54	11392	58.8	19.5	1.13	1.92	0.53	0.05	2.06	1.5		0.8	1.3	0.5	0.6	2.3	2.7	8.3
	Head (calc.)	2636	100	0.85	1.84		74.3	16.3	2.38	3.55	0.24	0.02	0.26	100		100	100	100	100	100	100	100
	Head (Dir.)			0.79	1.7	200	74.7	15.9	2.41	3.72	0.13	0.02	0.31									
F5	Comp 8- F5 Li 3rd Cl Conc.	368	15.6	3.12	6.72		64.6	25.6	0.37	0.79	0.17	0.03	0.94	88.2		13.5	25.5	2.5	2.7	8.7	21	26
Using Developed Flowsheet on Comp 8 Sample	Comp 8- F5 Li 2nd Cl Conc.	383	16.2	3.03	6.53		65	25.2	0.42	0.91	0.17	0.03	0.93	89.2		14.1	26.2	3	3.2	9.2	21.6	26.7
	Comp 8- F5 Li 1st Cl Conc.	412	17.5	2.86	6.16		65.8	24.5	0.52	1.15	0.18	0.03	0.89	90.6		15.4	27.4	4	4.4	10.1	22.7	27.6
	Comp 8- F5 Li Ro Conc.	522	22.1	2.31	4.97		68.4	22.2	0.88	1.94	0.18	0.03	0.74	92.4		20.2	31.3	8.5	9.4	13	26.8	29.2
	Comp 8- F5 Li Ro Tail.	1622	68.8	0.01	0.03		78.7	12.9	2.45	5.6	0.17	0.02	0.16	1.5		72.4	56.7	73.1	84.3	38.5	61.7	19.6
	Comp 8-F5 Mica Conc	109	4.6	0.17	0.37		60.3	24.9	7.24	2.8	0.12	0.02	0.92	1.4		3.7	7.3	14.5	2.8	1.8	4.1	7.5
	Comp 8-F5 Total Slimes	64	2.7	0.43	0.92		66	15.1	2.57	4.29	4.84	0.03	1.48	2.1		2.4	2.6	3	2.5	43.1	3.7	7.1
	Comp 8-F5 Mag 5A	21.2	0.9	0.72	1.55	5300	55.6	19.1	1.01	2.08	0.62	0.04	3.67	1.2		0.7	1.1	0.4	0.4	1.8	1.6	5.9
	Comp 8-F5 Combined Mag Prod.	42.8	1.8	0.77	1.66	4341	54	17.4	1.2	2.24	0.6	0.05	11.36	2.5		1.3	2	0.9	0.9	3.6	3.7	36.6
	Head (calc.)	2359	100	0.55	1.19		74.8	15.6	2.3	4.57	0.3	0.02	0.56	100		100	100	100	100	100	100	100
	Head (Dir.)			0.54	1.16	200	75.6	15.5	2.37	4.59	0.17	0.02	0.47									
F6	Var-F6 Final Li Conc.	114	4.7	2.6	5.6		62.5	24.4	0.4	1.21	1.91	0.96	1.26	56		4.2	7.2	0.5	1.3	8.6	48.4	4.9
Using Developed Flowsheet on Comp 9 Sample	Var-F6 Li Conc. After 5 A Meg	126	5.2	2.56	5.51		62.1	24.3	0.48	1.24	1.94	0.92	1.58	60.6		4.6	7.9	0.6	1.4	9.6	51.2	6.8
	Var-F6 3rd Li Conc.	137	5.6	2.5	5.38		61.5	24.2	0.63	1.22	1.96	0.9	2.04	64.3		4.9	8.5	0.9	1.5	10.6	54.2	9.5
	Var-F6 Li 2nd Cl Conc.	151	6.2	2.36	5.08		61.6	23.9	0.71	1.48	2.01	0.83	2.13	67		5.5	9.3	1.1	2	12	55.5	10.9
	Var-F6 Li 1st Cl Conc.	175	7.2	2.12	4.56		62	23.4	0.85	1.92	2.11	0.74	2.25	70		6.4	10.5	1.6	3.1	14.6	56.9	13.4
	Var-F6 Li Ro Conc.	233	9.6	1.65	3.55		63.5	22	1.12	2.76	2.23	0.57	2.15	72.4		8.7	13.2	2.8	5.9	20.6	58.7	17
	Var-F6 Li Ro Tail.	1702	70.1	0.01	0.03		73.3	14.4	3.77	5.03	0.85	0.02	0.22	4.2		73.4	63	68.4	78.6	57.3	15	12.7
	Var-F6 Mica Conc	316	13	0.19	0.41		63.7	19.2	5.61	3.65	0.78	0.12	2.88	11.3		11.8	15.6	18.9	10.6	9.7	16.7	30.9
	Var-F6 Total Slimes	100	4.1	0.17	0.38		66.1	17	4.71	4.15	2.43	0.13	2.07	3.3		3.9	4.3	5	3.8	9.6	5.8	7
	Var-F6 5A Mag	32	1.3	0.51	1.1	1600	50.8	18.3	5.43	1.81	0.96	0.14	11.4	3.1		0.9	1.5	1.8	0.5	1.2	2	12.3
	Var-F6 Combined Mag Prod.	78.6	3.2	0.6	1.29	1124	49	19.1	5.97	1.54	0.91	0.11	12.1	8.9		2.3	3.9	5	1.1	2.8	3.8	32.4
	Head (calc.)	2428	100	0.22	0.47		70	16	3.87	4.48	1.04	0.09	1.21	100		100	100	100	100	100	100	100
	Head (Dir.)			0.23	0.5		71.5	16.1	3.91	4.44	1.01	0.1	1.19									

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li2O	Ta g/t	SiO2	Al2O3	K2O	Na2O	CaO	P2O5	Fe2O3	Li	Ta	SiO2	Al2O3	K2O	Na2O	CaO	P2O5	Fe2O3
F7	Var-F7 Li 3rd Cl Conc.	247	11.4	3.14	6.76		64.4	25.9	0.33	0.67	0.21	0.06	0.96	82.6		10.1	18.2	1	1.7	11	19.3	27.7
Using Developed Flowsheet on Comp 10 Sample	Var-F7 Li 2nd Cl Conc.	259	11.9	3.07	6.62		64.6	25.7	0.37	0.77	0.21	0.06	0.98	84.9		10.6	18.9	1.2	2.1	11.7	19.8	29.8
	Var-F7 Li 1st Cl Conc.	273	12.6	2.98	6.41		64.9	25.3	0.44	0.92	0.22	0.06	0.98	86.7		11.2	19.7	1.5	2.6	12.7	20.3	31.4
	Var-F7 Li Ro Conc.	318	14.6	2.6	5.6		66.4	23.9	0.77	1.39	0.22	0.05	0.91	88		13.4	21.7	2.9	4.6	14.5	21.5	33.8
	Var-F7 Li Ro Tail.	1470	67.7	0.01	0.02		75.5	13.7	4.02	5.19	0.16	0.03	0.16	1.4		70.3	57.4	71.1	79.9	49.7	57.5	27.5
	Var-F7 Mica Conc	286	13.2	0.17	0.37		67.6	19.6	6.23	3.87	0.16	0.04	0.5	5.2		12.2	16	21.4	11.6	9.7	14.9	16.7
	Var-F7 Total Slimes	71	3.2	0.35	0.76		68	17	4.42	4.33	1.55	0.04	1.23	2.6		3	3.4	3.8	3.2	23	3.8	10.1
	Var-F7 5A Mag Conc	18	0.8	0.83	1.79	7800	59.4	19.1	2.26	2.35	0.49	0.06	3.86	1.6		0.7	1	0.5	0.4	1.9	1.4	8.2
	Var-F7 Combined Mag Prod.	28.4	1.3	0.91	1.96	7225	60.5	19.2	2.44	2.51	0.52	0.06	3.6	2.8		1.1	1.6	0.8	0.7	3.1	2.4	11.9
	Head (calc.)	2173	100	0.43	0.93		72.7	16.2	3.83	4.4	0.22	0.04	0.39	100		100	100	100	100	100	100	100
	Head (Dir.)			0.46	0.99		73.5	16.2	3.71	4.48	0.18	0.03	0.33									
F8	Var-F8 Final Li Conc.	193	8.7	2.68	5.77		63.9	24.7	0.63	1.07	0.77	0.38	0.85	77.2		7.7	13.9	1.5	2.1	12.5	45	9.1
Using Developed Flowsheet on Comp 11 Sample	Var-F8 Li Conc. After 5 A Meg	200	9.1	2.64	5.68		63.6	24.6	0.67	1.08	0.9	0.38	1.03	78.8		7.9	14.3	1.7	2.3	15.3	46.8	11.4
	Var-F8 3rd Li Conc.	222	10	2.48	5.34		62.1	24.2	0.89	1.07	1.37	0.38	2.01	82		8.6	15.6	2.4	2.5	25.7	51.2	24.6
	Var-F8 Li 2nd Cl Conc.	233	10.6	2.39	5.14		62.5	23.9	0.96	1.2	1.35	0.36	2	83.1		9.1	16.2	2.8	2.9	26.6	51.9	25.8
	Var-F8 Li 1st Cl Conc.	254	11.5	2.23	4.8		63.3	23.2	1.1	1.43	1.3	0.34	1.94	84.6		10	17.1	3.5	3.8	28	52.9	27.3
	Var-F8 Li Ro Conc.	310	14.1	1.84	3.97		65.9	21.4	1.44	2.03	1.16	0.28	1.68	85.4		12.7	19.3	5.5	6.5	30.4	53.9	28.9
	Var-F8 Li Ro Tail.	1525	69.1	0.01	0.02		76.5	13.6	3.74	5.1	0.21	0.02	0.2	2.3		72.7	60.3	70.8	80.8	27	18.7	16.9
	Var-F8 Mica Conc	234	10.6	0.15	0.32		65.7	19.8	5.89	3.51	0.39	0.11	1.01	5.2		9.6	13.5	17.1	8.5	7.7	15.8	13.1
	Var-F8 Total Slimes	71	3.2	0.26	0.55		66.5	16	4.14	4.12	2.76	0.12	1.68	2.7		3	3.3	3.7	3.1	16.6	5.5	6.6
	Var-F8 5A Mag	30.6	1.4	0.37	0.8	2700	48.5	18.5	2.9	1.42	2.66	0.12	8.71	1.7		0.9	1.6	1.1	0	6.9	2.3	14.7
	Var-F8 Combined Mag Prod.	66	3	0.44	0.96	2273	49.6	18.4	3.5	1.56	3.29	0.15	9.51	4.4		2	3.5	2.9	1.1	18.3	6.1	34.5
	Head (calc.)	2206	100	0.3	0.65		72.7	15.6	3.65	4.36	0.54	0.07	0.82	100		100	100	100	100	100	100	100
	Head (Dir.)			0.32	0.69		72.9	15.5	3.57	4.49	0.48	0.08	0.74									
F9	Var-F9 Li 3rd Cl Conc.	285	13.6	2.88	6.2		63.8	25.6	0.67	1.08	0.24	0.05	0.99	82		11.6	22.6	3.3	3.4	10.6	26.4	31.7
Using Developed Flowsheet on Comp 12 Sample	Var-F9 Li 2nd Cl Conc.	314	15	2.76	5.94		64.1	25.3	0.78	1.27	0.25	0.05	0.98	86.6		12.8	24.6	4.2	4.4	12	27.4	34.6
	Var-F9 Li 1st Cl Conc.	339	16.2	2.62	5.64		64.5	24.8	0.91	1.48	0.25	0.05	0.96	88.9		14	26.1	5.3	5.6	13.1	28.4	36.5
	Var-F9 Li Ro Conc.	409	19.5	2.21	4.77		66.3	23.1	1.23	2.06	0.24	0.04	0.85	90.6		17.3	29.4	8.6	9.4	15.5	31	39.3
	Var-F9 Li Ro Tail.	1452	69.3	0.01	0.03		78.7	12.6	2.99	5	0.14	0.02	0.15	1.9		73	56.8	74.4	80.9	31.6	53.8	24.5
	Var-F9 Mica Conc	63	3	0.16	0.34		56	27.2	7.68	2.29	0.16	0.04	1.38	1		2.2	5.3	8.3	1.6	1.6	4.7	9.7
	Var-F9 Total Slimes	135	6.4	0.29	0.62		69	15.6	3.22	4.62	2.3	0.03	0.81	3.9		5.9	6.5	7.4	6.9	48.1	7.5	12.3
	Var-F9 5A Mag Conc	25	1.2	0.64	1.38	5200	62.1	17.7	2.02	2.86	0.54	0.04	3.74	1.6		1	1.4	0.9	0.8	2.1	1.8	10.5
	Var-F9 Combined Mag Prod.	36	1.7	0.73	1.57	4952	62.5	18.3	2.2	2.9	0.59	0.05	3.49	2.6		1.4	2	1.4	1.2	3.3	3.1	14.2
	Head (calc.)	2095	100	0.48	1.03		74.7	15.4	2.79	4.28	0.31	0.03	0.42	100		100	100	100	100	100	100	100
	Head (Dir.)			0.48	1.03		75.1	15.1	2.7	4.36	0.19	0.03	0.33									

Source: SGS Canada, Project 14120-008 Flotation Tests-Variability August, 2017

14 MINERAL RESOURCE ESTIMATE

The 2023 Project Mineral Resource Estimate presented herein (the 2023 MRE) was prepared by Carl Pelletier, P.Geo. using all available information. The 2023 MRE was prepared as part of a mandate assigned by Critical Elements in 2023. The 2023 MRE is primarily based on changes made to the net smelter return (NSR) parameters, supported by new assumptions concerning metal prices and the creation of potentially mineable shape to constrain the MRE for the potential underground extraction scenario. No changes to the interpretation and interpolation parameters were deemed necessary. The mineral resource model for the current MRE is based largely upon the model generated for the 2017 Feasibility Study.

The 2023 main resource area measures 1,600 m along strike, 1,300 m wide and 300 m deep. The resource estimate is based on a compilation of all recent diamond drillholes and wireframed mineralized zones largely inspired by previous work. The final model was constructed by InnovExplo of Val-d'Or, QC.

The mineral resources herein are not mineral reserves as they have no demonstrable economic viability. The result of this study is a single Mineral Resource Estimate for 24 mineralized zones. The estimate includes Indicated and Inferred resources for open pit and underground scenarios. The effective date of the resource estimate is August 01, 2023, based on compilation status.

14.1 Drillhole Database

The Leafrogdiamond drillhole database (the Leapfrogdatabase) contains 287 surface drillholes (33,875.5 m; Figure 14.1) including the condemnation holes for which there are no samples. A subset of 218 holes cut across the mineralized zones of the Project (this total includes holes from the zones formerly known as the JR and Hydro showings). All 287 holes in the GEMS database were compiled and validated for the resource estimate.

The information for the 218 diamond drillholes includes lithological descriptions taken from drill core logs, as well as 4,996 sampled intervals amounting to 4,160.3 m of core. The holes cover the strike-length of the Project at a drill spacing of 30 to 70 m (mostly less than 50 m).

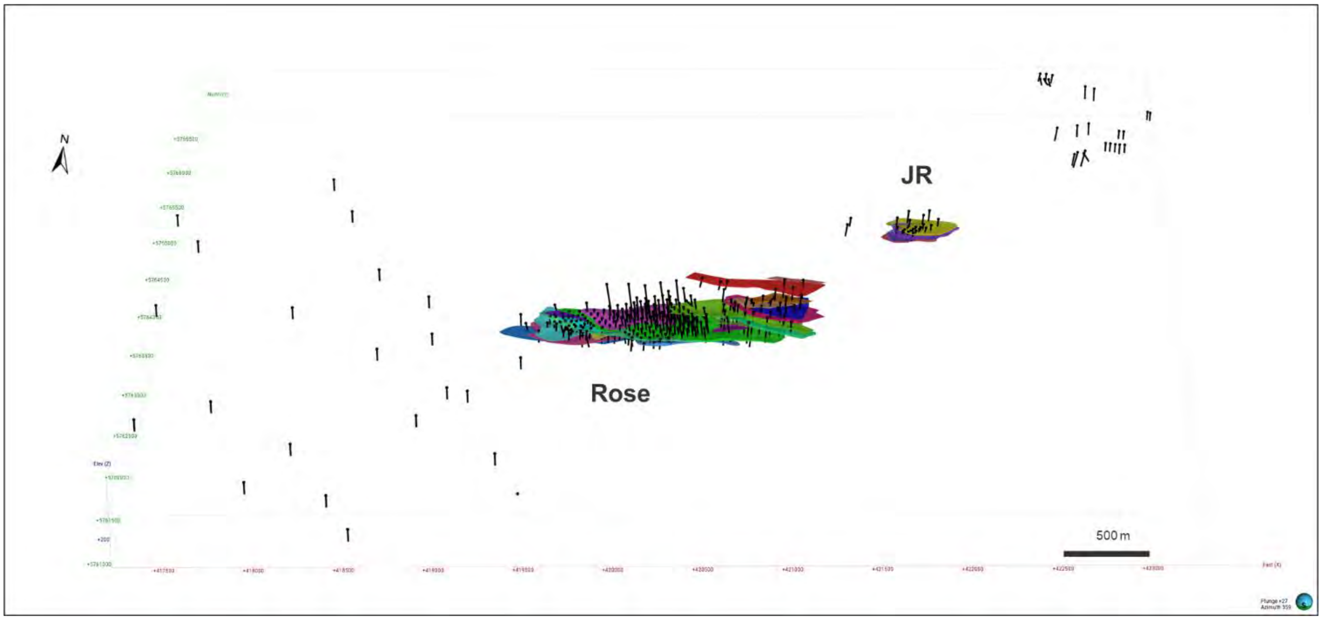
In addition to basic tables of raw data, the Leapfrog database also includes several tables of calculated drillhole composites and wireframe solid intersections, which were used for the statistical evaluation and resource block modelling.

Data verification by the QP comprised the following and is summarized in Item 12:

- A review of QA/QC protocols and downhole surveys;
- A review of assays and the descriptions of lithologies, alterations and structures in the database; and
- Confirmation that there are no mined-out areas.

Twelve drill core quarter-splits were collected during the 2011 site visit and sent them to the laboratory for an independent review.

Figure 14.1: Surface Plan View of the Drillholes in Leapfrog Edge



Note: Perspective view looking north - image not to scale

14.2 Interpretation of Mineralized Zones

In order to conduct accurate resource modelling, the mineralized-zone wireframe model was based on the database and the author's knowledge of the Project and similar deposits.

The interpretation of the Project was based on geological and grade continuity using Leapfrog software.

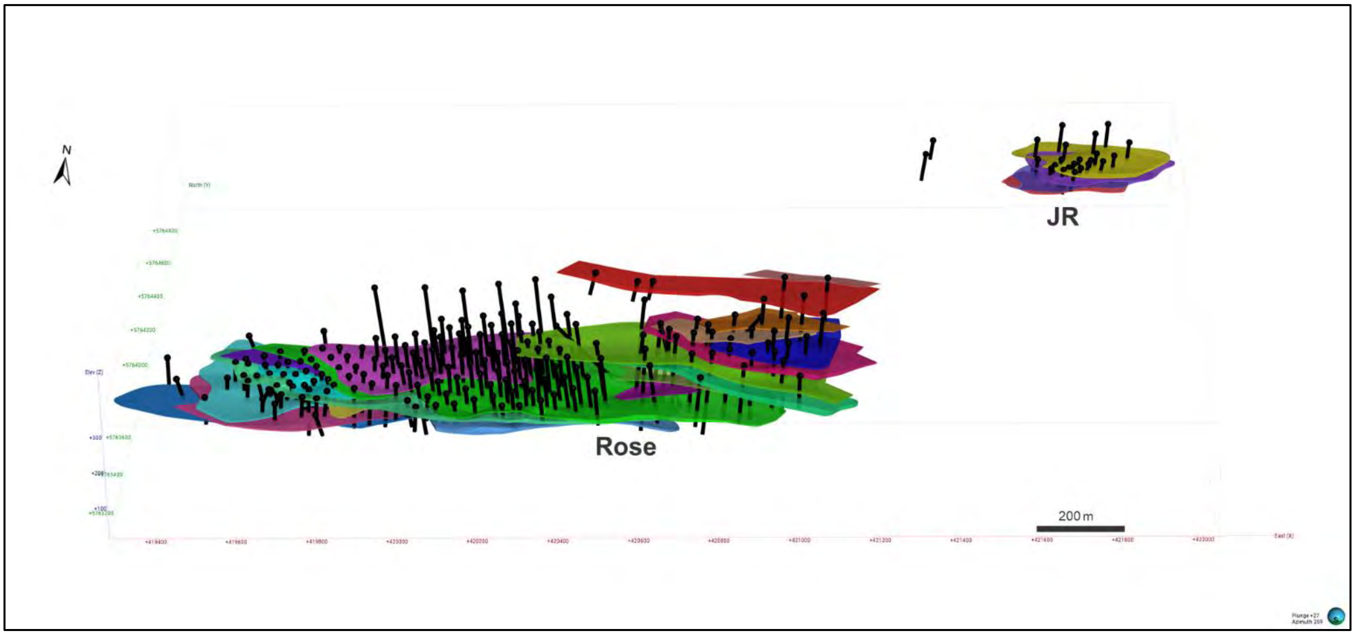
The model comprises 24 mineralized solids that honour the drillhole database.

The mineralized zones were defined solely on lithium and tantalum grades and did not take into account other elements (Rb, Cs, Ga, Be). However, these other elements were interpolated inside the mineralized zones.

Two surfaces were also created to define topography and overburden. These surfaces were generated from drillhole descriptions and survey information provided by Critical Elements.

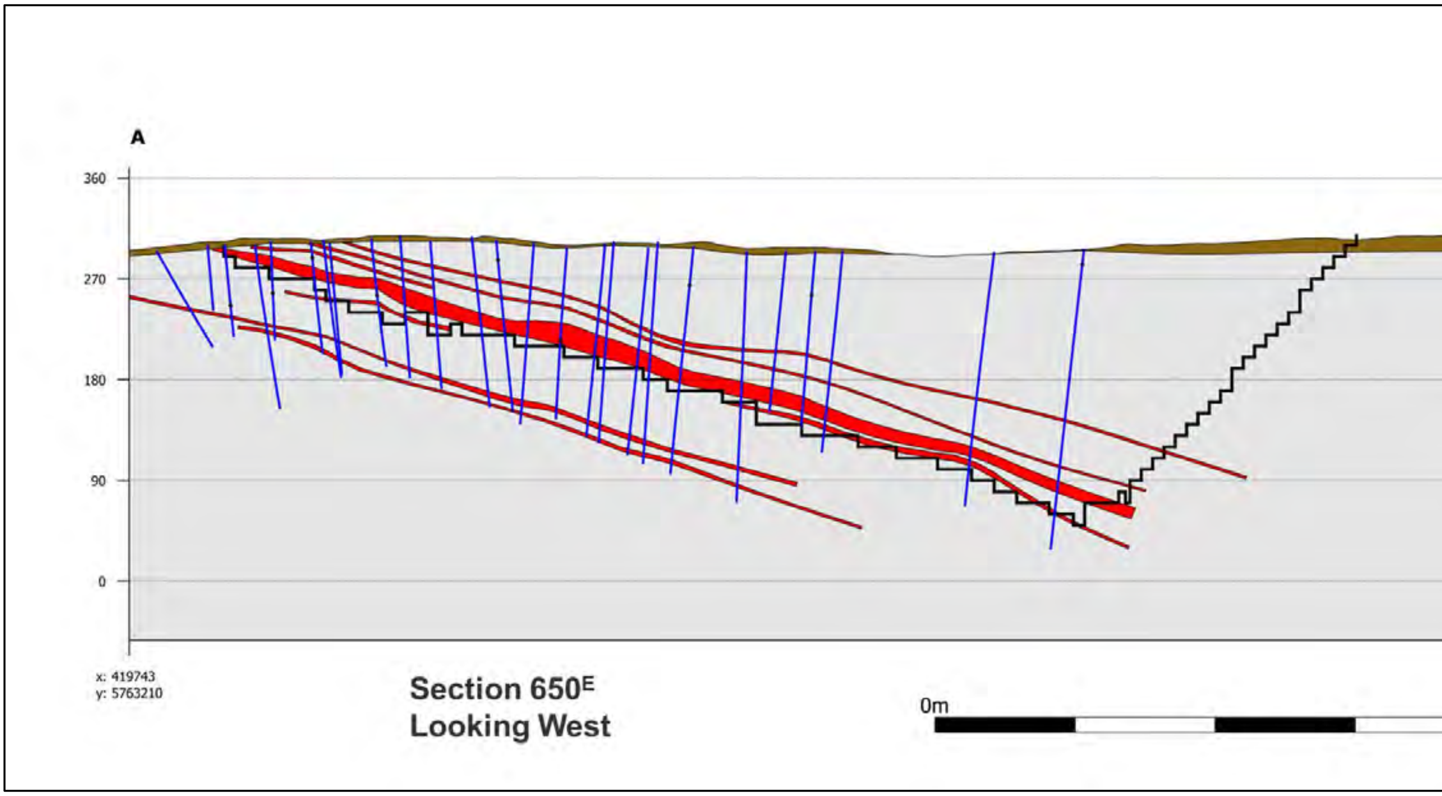
Figure 14.2 presents a 3D view of the mineralized solids with drillholes used for the resource estimate. Figure 14.3 presents a typical cross-section through the Project.

Figure 14.2: 3D View of the Mineralized Model for the Project



Note: Perspective view looking north - image not to scale

Figure 14.3: Section View Looking West of the Mineralized Model for the Project and Resource Pit Shell



14.3 Voids Model

The Project was never the subject of underground or surface excavation work.

14.4 High-Grade Capping

Codes were automatically attributed to all drillhole assay intervals that intersect the mineralized zones using the name of the 3D solids, and these coded intercepts were used to analyze sample lengths and generate statistics for high-grade capping and composites.

Basic univariate statistics were performed on the raw assay dataset.

The following criteria were used to decide whether capping was warranted or not (inspired by Parrish, 1997), and to determine the threshold when warranted:

— If the quantity of metal contained in the last decile is above 40%, capping is warranted; if below 40%, the uncapped dataset may be used.
— No more than 10% of the overall contained metal must be contained within the first 1% of the highest grade samples.
— The probability plot of grade distribution must not show abnormal breaks or scattered points outside of the main distribution curve.
— The log normal distribution of grades must not show any erratic grade bins nor distanced values from the main population.

Table 14.1 and Table 14.2 present a summary of the statistical analysis for each element. Figure 14.4 to Figure 14.9 show graphs supporting the capping threshold decisions.

Table 14.1: Summary Statistics for the Raw Lithium Assays

Dataset	Rockcode	Count	Lithium (ppm)						
			Max	Uncut Mean	High-Grade Capping	Cut mean	# of samples cut	% of samples cut	COV
Mineralized Zone RO_01	101	4	97	69	15 000	69	0	0.00%	0.36
Mineralized Zone RO_02	102	19	5670	422	15 000	422	0	0.00%	2.96
Mineralized Zone RO_03	103	6	2490	556	15 000	556	0	0.00%	1.56
Mineralized Zone RO_04	104	37	13300	3677	15 000	3402	0	0.00%	1.04
Mineralized Zone RO_05	105	63	10750	4197	15 000	3888	0	0.00%	0.76
Mineralized Zone RO_06	106	72	9000	1516	15 000	1455	0	0.00%	1.45
Mineralized Zone RO_07	107	66	14350	1274	15 000	1274	0	0.00%	1.89
Mineralized Zone RO_08	108	150	12800	4156	15 000	4074	0	0.00%	0.90
Mineralized Zone RO_09	109	25	9010	858	15 000	858	0	0.00%	2.29
Mineralized Zone RO_10	110	27	11150	3321	15 000	3321	0	0.00%	1.10
Mineralized Zone RO_11	111	79	6720	365	15 000	365	0	0.00%	2.65
Mineralized Zone RO_12	112	448	17400	3464	15 000	3459	2	0.45%	1.10
Mineralized Zone RO_13	113	9	8110	1632	15 000	1632	0	0.00%	1.73
Mineralized Zone RO_14	114	43	7860	880	15 000	880	0	0.00%	1.76
Mineralized Zone RO_15	115	1700	19300	5239	15 000	5231	5	0.29%	0.71
Mineralized Zone RO_16	116	165	14050	2515	15 000	2515	0	0.00%	1.25
Mineralized Zone RO_17	117	24	9800	3336	15 000	3336	0	0.00%	0.98
Mineralized Zone RO_18	118	60	16100	625	15 000	607	1	1.67%	3.39
Mineralized Zone RO_19	119	179	13500	2706	15 000	2706	0	0.00%	1.26
Mineralized Zone RO_20	120	57	9380	874	15 000	874	0	0.00%	2.15
Mineralized Zone JR_01	201	140	13000	4407	15 000	4407	0	0.00%	0.82
Mineralized Zone JR_02	202	85	12700	3184	15 000	3184	0	0.00%	0.94
Mineralized Zone JR_03	203	29	8070	1518	15 000	1518	0	0.00%	1.40
Mineralized Zone JR_04	204	15	6070	875	15 000	875	0	0.00%	1.64

Table 14.2: Summary Statistics for the Raw Tantalum Assays

Dataset	Rockcode	Count	Tantalum (ppm)						
			Max	Uncut Mean	High-Grade Capping	Cut Mean	# of samples cut	% of samples cut	COV
Mineralized Zone RO_01	101	4	200	183	1 000	183	0	0.00%	0.08
Mineralized Zone RO_02	102	19	470	300	1 000	300	0	0.00%	0.32
Mineralized Zone RO_03	103	6	860	276	1 000	276	0	0.00%	0.96
Mineralized Zone RO_04	104	37	550	168	1 000	156	0	0.00%	0.78
Mineralized Zone RO_05	105	63	737	202	1 000	187	0	0.00%	0.58
Mineralized Zone RO_06	106	72	760	165	1 000	159	0	0.00%	0.84
Mineralized Zone RO_07	107	66	450	142	1 000	142	0	0.00%	0.90
Mineralized Zone RO_08	108	150	680	155	1 000	152	0	0.00%	0.80
Mineralized Zone RO_09	109	25	620	220	1 000	220	0	0.00%	0.88
Mineralized Zone RO_10	110	27	450	69	1 000	69	0	0.00%	1.23
Mineralized Zone RO_11	111	79	520	183	1 000	183	0	0.00%	0.64
Mineralized Zone RO_12	112	448	10000	141	1 000	152	1	0.22%	3.39
Mineralized Zone RO_13	113	9	553	308	1 000	308	0	0.00%	0.57
Mineralized Zone RO_14	114	43	630	210	1 000	210	0	0.00%	0.78
Mineralized Zone RO_15	115	1700	2030	138	1 000	145	1	0.06%	0.74
Mineralized Zone RO_16	116	165	600	122	1 000	122	0	0.00%	0.74
Mineralized Zone RO_17	117	24	270	118	1 000	118	0	0.00%	0.67
Mineralized Zone RO_18	118	60	1140	197	1 000	428	1	1.67%	1.13
Mineralized Zone RO_19	119	179	750	183	1 000	183	0	0.00%	0.63
Mineralized Zone RO_20	120	57	450	145	1 000	145	0	0.00%	0.73
Mineralized Zone JR_01	201	140	940	126	1 000	126	0	0.00%	0.82
Mineralized Zone JR_02	202	85	420	118	1 000	118	0	0.00%	0.71
Mineralized Zone JR_03	203	29	190	89	1 000	89	0	0.00%	0.67
Mineralized Zone JR_04	204	15	170	64	1 000	64	0	0.00%	0.82

Figure 14.4: Graphs Supporting a Capping Grade of 15,000 ppm Li for Mineralized Zones

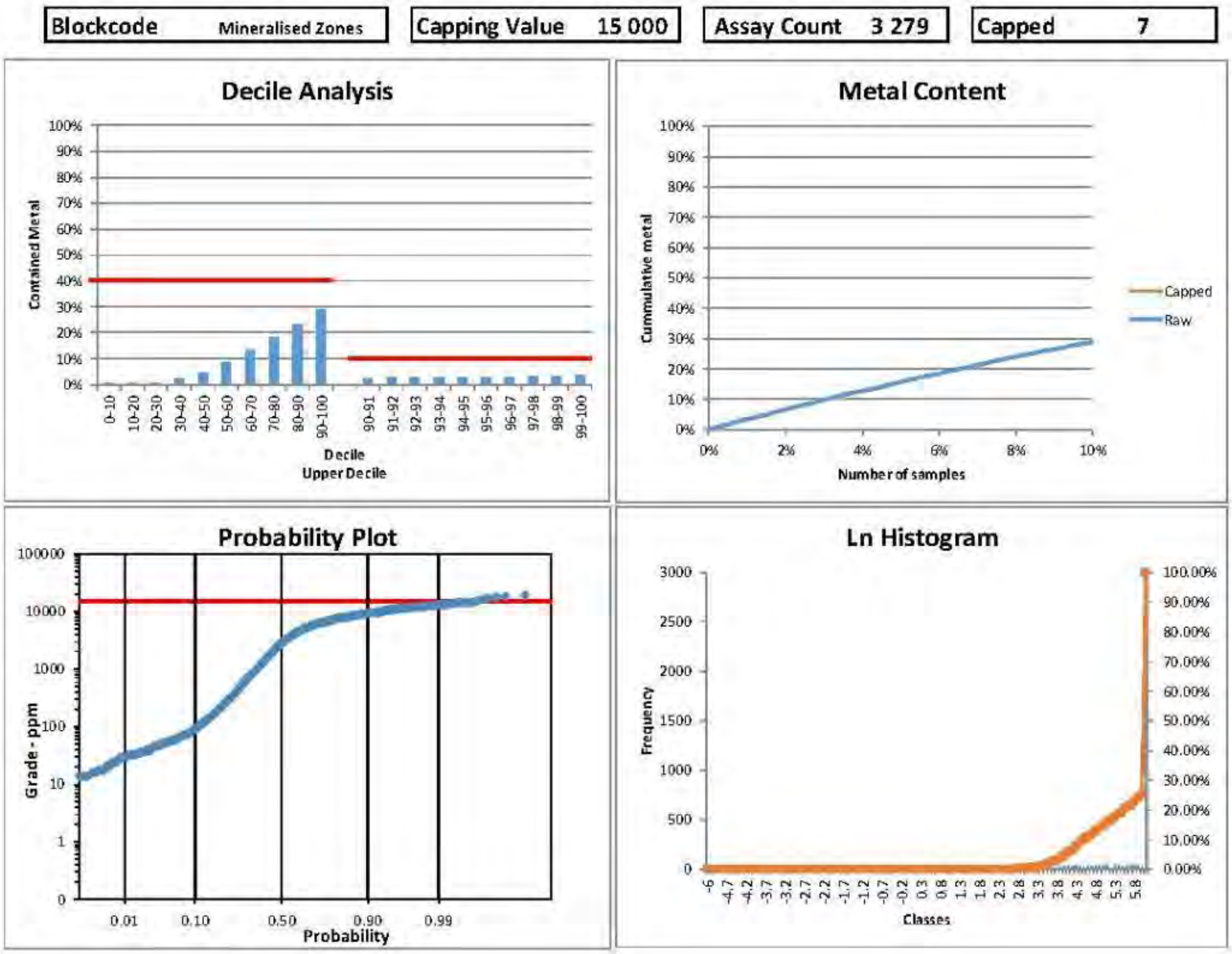


Figure 14.5: Graphs Supporting a Capping Grade of 1,000 ppm Ta for Mineralized Zones

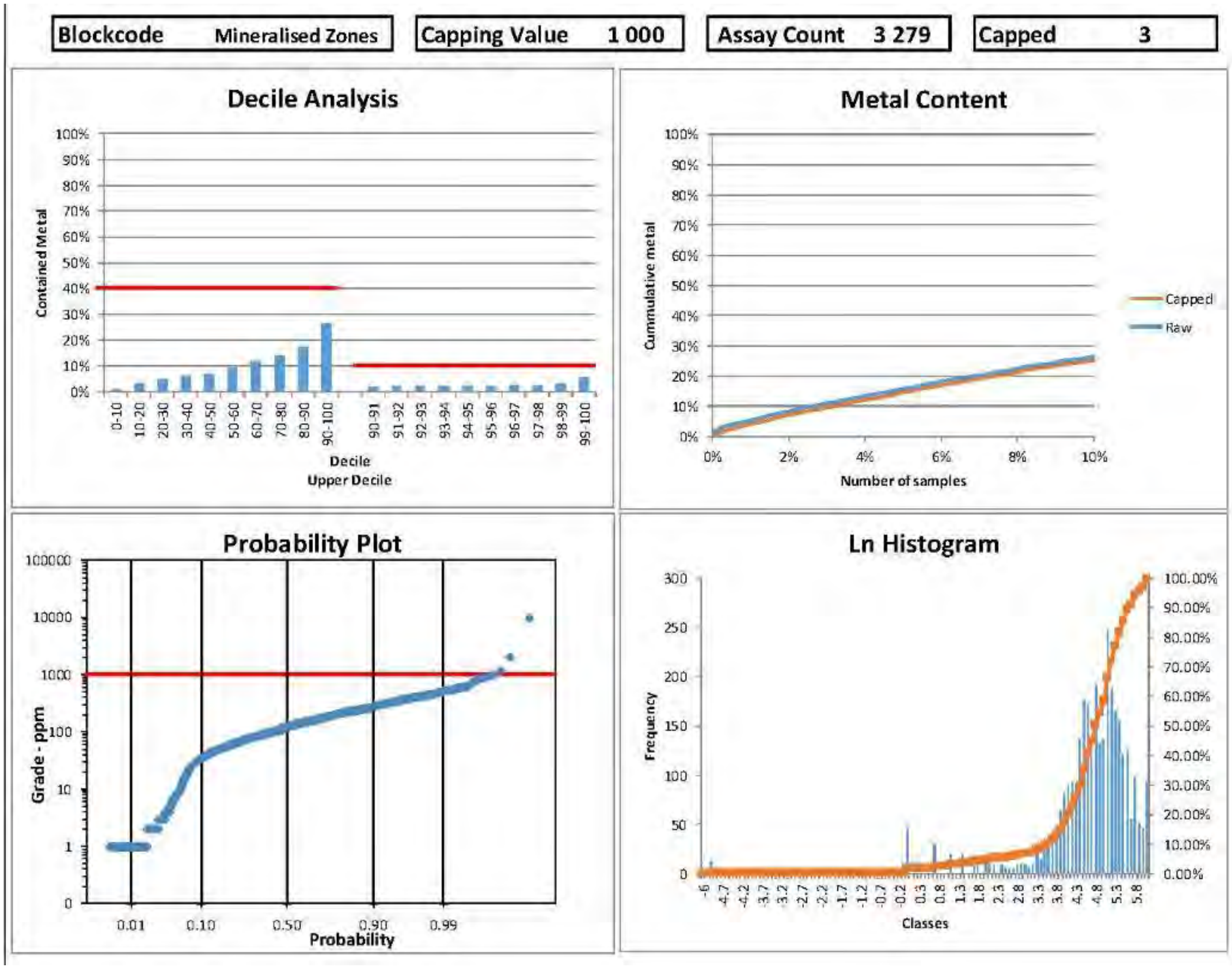


Figure 14.6: Graphs Supporting a Capping Grade of 10,000 ppm Rb for Mineralized Zones

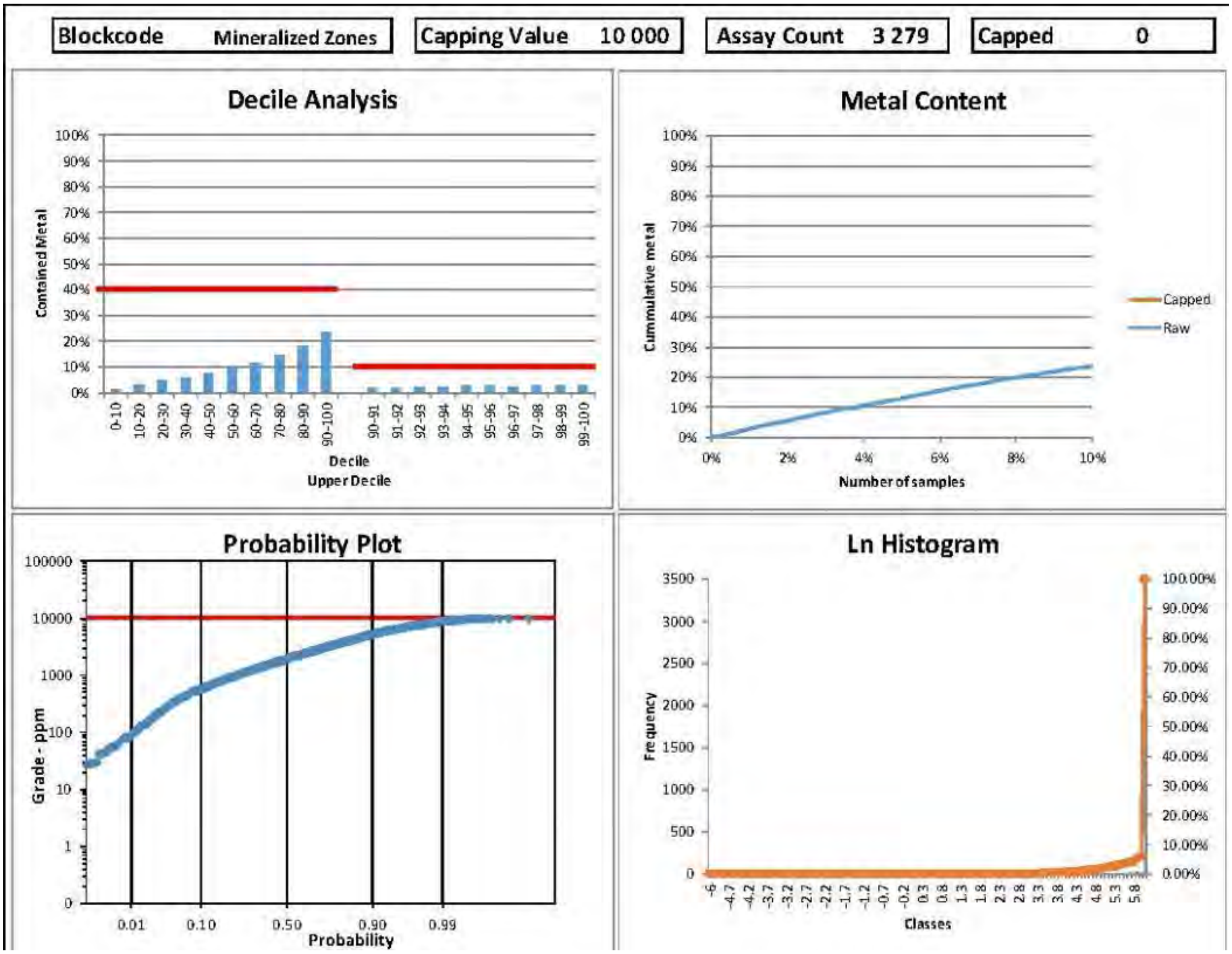


Figure 14.7: Graphs Supporting a Capping Grade of 2,000 ppm Cs for Mineralized Zones

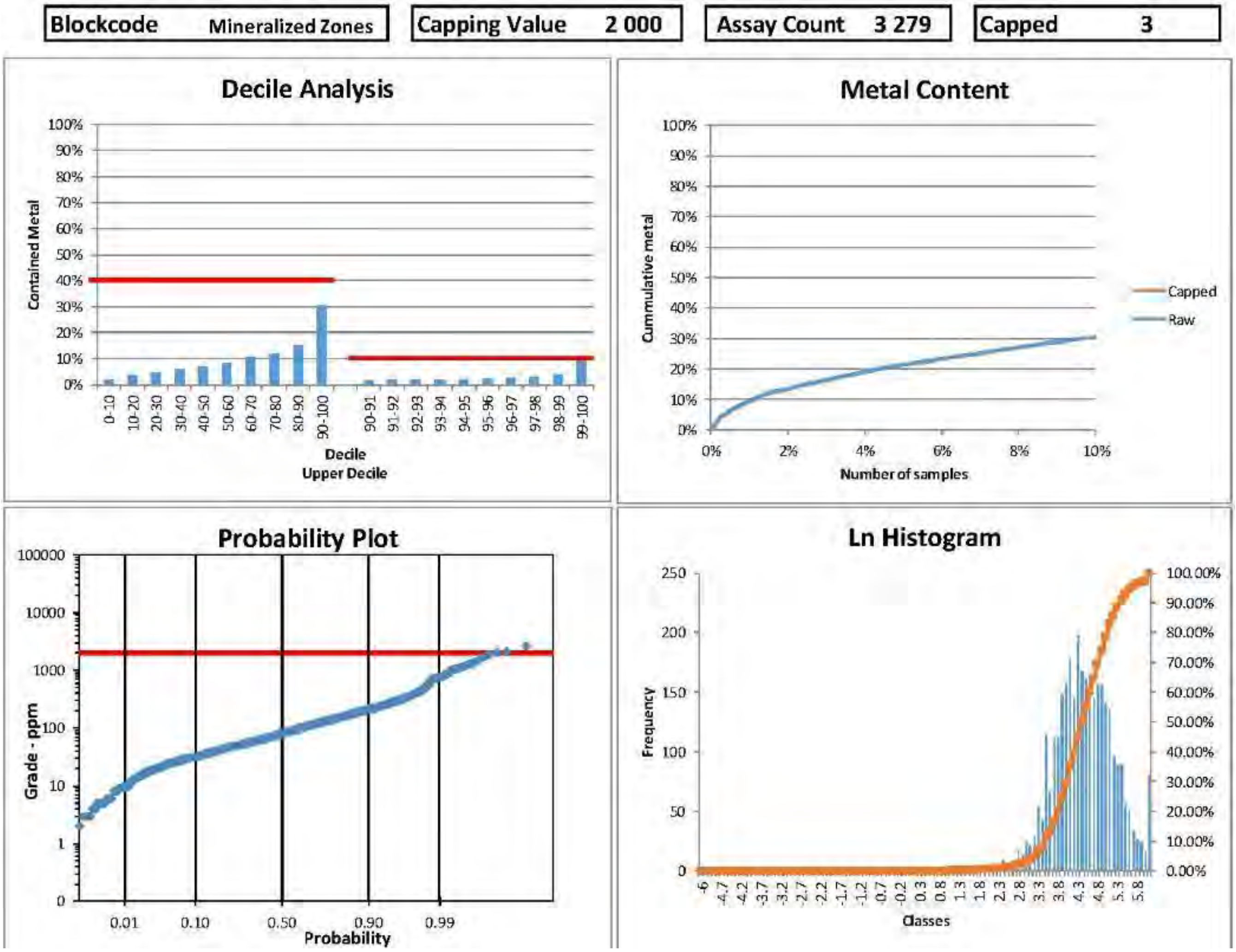


Figure 14.8: Graphs Supporting a Capping Grade of 150 ppm Ga for Mineralized Zones

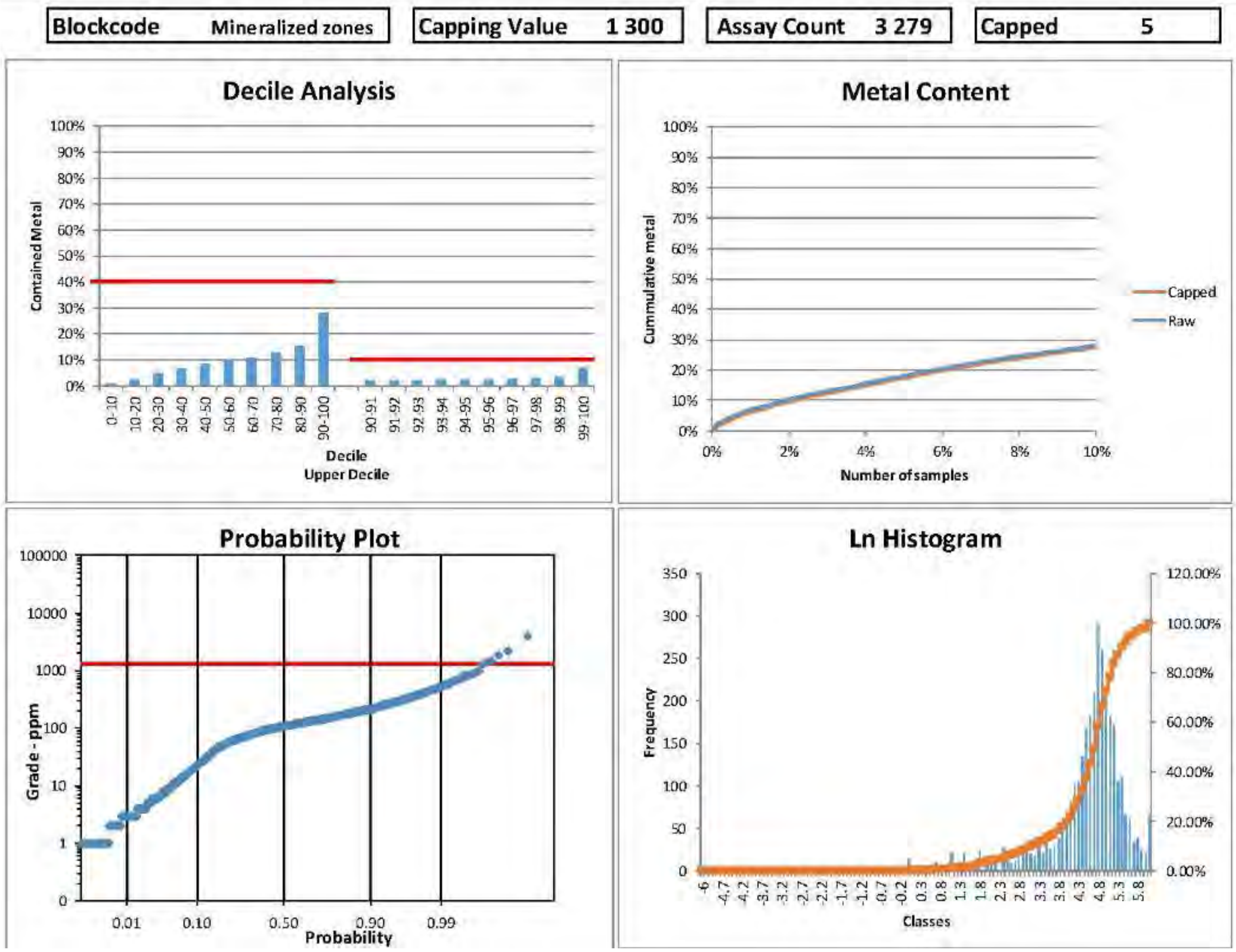
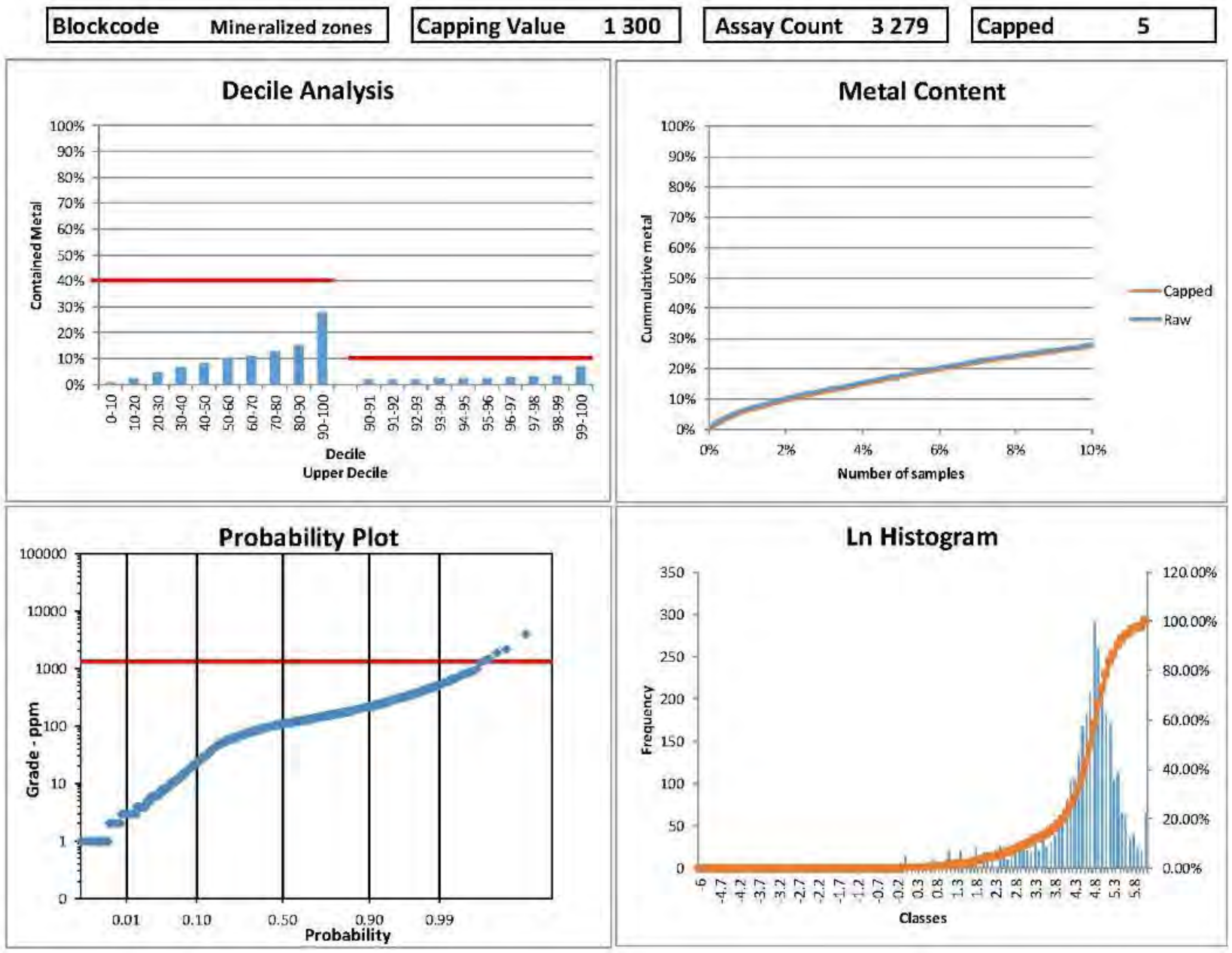


Figure 14.9: Graphs Supporting a Capping Grade of 1,300 ppm Be for Mineralized Zones



14.5 Compositing

In order to minimize any bias introduced by the variable sample lengths, capped DDH assays were composited.

For geological and statistical reasons, a 2-m composite, with an allowable spread of 1.5 to 3 m was selected as the logical option for the Project. The total number of composites used in the DDH dataset is 1,830. A grade of 0.00 ppm was assigned to missing sample intervals. Table 14.3 shows the basic statistics for composites by zone.

Table 14.3: Summary Statistics for Composites

Dataset	Rockcode	Count	Lithium			Tantalum		
			Max (ppm)	Mean (ppm)	COV	Max (ppm)	Mean (ppm)	COV
Mineralized Zone RO_01	101	2	72	59	0.22	171	162	0.06
Mineralized Zone RO_02	102	10	3 045	338	2.43	360	194	0.64
Mineralized Zone RO_03	103	5	1 788	304	2.00	329	105	1.00
Mineralized Zone RO_04	104	12	10 025	3 281	0.93	354	135	0.73
Mineralized Zone RO_05	105	31	9 985	3 208	0.92	389	149	0.74
Mineralized Zone RO_06	106	28	5 877	1 118	1.45	346	116	0.87
Mineralized Zone RO_07	107	46	7 336	702	2.27	336	59	1.26
Mineralized Zone RO_08	108	50	10 346	3 840	0.85	601	132	0.77
Mineralized Zone RO_09	109	13	4 583	401	2.78	347	70	1.47
Mineralized Zone RO_10	110	7	9 416	1 844	1.56	234	31	1.59
Mineralized Zone RO_11	111	56	3 598	204	2.96	275	81	0.90
Mineralized Zone RO_12	112	238	14 663	2 894	1.04	476	85	0.80
Mineralized Zone RO_13	113	6	5 409	849	2.10	400	131	0.96
Mineralized Zone RO_14	114	34	2 503	276	2.17	368	70	1.18
Mineralized Zone RO_15	115	827	13 467	5 394	0.52	566	134	0.56
Mineralized Zone RO_16	116	111	10 408	1 348	1.61	286	61	1.08
Mineralized Zone RO_17	117	10	5 852	2 810	0.81	159	82	0.78
Mineralized Zone RO_18	118	73	7 777	257	4.10	627	71	1.83
Mineralized Zone RO_19	119	115	9 080	1 929	1.29	498	127	0.80
Mineralized Zone RO_20	120	55	5 432	433	2.57	263	59	1.20
Mineralized Zone JR_01	201	53	11 001	4 186	0.69	262	111	0.48
Mineralized Zone JR_02	202	30	7 486	2 527	0.86	246	87	0.71
Mineralized Zone JR_03	203	14	7 170	855	1.94	98	43	0.85
Mineralized Zone JR_04	204	4	3 148	544	1.75	96	33	1.00

14.6 Density

Densities were used to calculate tonnages from the volume estimates in the resource-grade block model.

The author examined all available data to establish which values could be used for the Project resource estimate. A total of 475 density values were judged adequate for the current study, 296 of which are in mineralized zones and 179 in barren country rocks. The average density value of each individual zone was used in the block model. Although values are considered realistic, additional sampling is recommended in order to improve confidence in the density model.

Based on this information, the QP used the density values presented in Table 14.4.

Table 14.4: Summary Statistics for the Density Database

Unit	Name	Blockcode	Count	Min	Max	Average	Median	COV	Density Used
Mineralized Zones	RO_01	101	2	2.62	2.64	2.63	2.63	0.00	2.63
	RO_02	102	1	2.61	2.61	2.61	2.61	0.00	2.61
	RO_03	103	2	2.62	2.63	2.63	2.63	0.00	2.63
	RO_04	104	4	2.63	2.80	2.70	2.69	0.03	2.70
	RO_05	105	5	2.63	2.77	2.69	2.66	0.02	2.69
	RO_06	106	5	2.62	2.75	2.68	2.65	0.02	2.68
	RO_07	107	6	2.62	2.70	2.66	2.65	0.01	2.66
	RO_08	108	10	2.63	2.79	2.70	2.69	0.02	2.70
	RO_09	109	5	2.61	2.73	2.65	2.63	0.02	2.65
	RO_10	110	3	2.61	2.64	2.63	2.63	0.00	2.63
	RO_11	111	9	2.57	2.67	2.63	2.63	0.01	2.63
	RO_12	112	27	2.53	2.85	2.71	2.73	0.03	2.71
	RO_13	113	3	2.63	2.64	2.64	2.64	0.00	2.64
	RO_14	114	7	2.61	2.79	2.66	2.65	0.02	2.66
	RO_15	115	125	2.33	3.00	2.72	2.73	0.03	2.72
	RO_16	116	12	2.60	2.85	2.69	2.66	0.03	2.69
	RO_17	117	2	2.64	2.80	2.72	2.72	0.03	2.72
	RO_18	118	8	2.63	2.75	2.68	2.67	0.02	2.68
	RO_19	119	24	2.53	2.81	2.67	2.67	0.02	2.67
	RO_20	120	10	2.62	3.15	2.73	2.66	0.06	2.73
	JR_01	201	10	2.62	2.82	2.70	2.68	0.03	2.70
	JR_02	202	10	2.61	2.76	2.69	2.68	0.02	2.69
	JR_03	203	3	2.61	2.67	2.65	2.66	0.01	2.65
	JR_04	204	3	2.62	2.65	2.63	2.63	0.00	2.63
Lithologies	Amphibolite	I3 (M16)	41	2.68	3.18	2.96	3.02	0.05	2.96
	Gneiss	M1 (M8,M22)	108	2.56	3.10	2.78	2.75	0.04	2.78
	Metasediment	S	4	2.73	3.05	2.84	2.80	0.04	2.84
	Porphyry	FP (I1)	26	2.65	3.05	2.76	2.73	0.03	2.76

14.7 Block Model

The block model covers an area sufficient to host an open pit and has been pushed down to a depth of approximately 300 m below surface. The block model was not rotated. Block dimensions reflect the sizes of the mineralized zones and plausible mining methods. Table 14.5 provides the properties of the block model.

Table 14.5: Block Model Properties in Leapfrog Edge

Properties	X (Columns)	Y (Rows)	Z (Levels)
Origin coordinates (UTM NAD83)	418 875	5 762 750	350
Block size (m)	5	5	5
Sub Block size (m)	1.25	1.25	1.25
Number of blocks	660	480	88
Block model extent (m)	3 300	2 400	440
Rotation	NO		

An octree sub-blocked in Leapfrog was applied.. Octree block models are an established type of sub-blocked model in which blocks are subdivided into smaller sub-blocks where triggering surfaces intersect the blocks.

Table 14.6 provides details about the naming convention for the corresponding Leapforg solids, as well as the rock codes and block codes assigned to each individual solid. The multi-folder percent block model thus generated was used for the mineral resource estimation.

Table 14.6: Block Model Naming Convention and Codes

	Description	Rockcode				
	Mineralized Zone RO_01	101				
	Mineralized Zone RO_03	103				
	Mineralized Zone RO_05	105				
	Mineralized Zone RO_07	107				
	Mineralized Zone RO_09	109				
	Mineralized Zone RO_12	112				
	Mineralized Zone RO_14	114				
	Mineralized Zone RO_16	116				
	Mineralized Zone RO_17	117				
	Mineralized Zone RO_19	119				
	Mineralized Zone JR_01	201				
	Mineralized Zone JR_03	203				
	Mineralized Zone RO_02	102				
	Mineralized Zone RO_04	104				
	Mineralized Zone RO_06	106				
	Mineralized Zone RO_08	108				
	Mineralized Zone RO_10	110				
	Mineralized Zone RO_11	111				

	Description	Rockcode				
	Mineralized Zone RO_13	113				
	Mineralized Zone RO_15	115				
	Mineralized Zone RO_18	118				
	Mineralized Zone RO_20	120				
	Mineralized Zone JR_02	202				
	Mineralized Zone JR_04	204				
	Predominantly Amphibolite	510				
		510				
		510				
		510				
	Predominantly Gneiss	520				
		520				
		520				
		520				
	Predominantly Metasediment	530				
		530				
		530				
		530				
	Predominantly Porphyry	540				
		540				
		540				
		540				
	Overburden	50				

14.8 Variography and Search Ellipsoids

Three-dimensional directional variography was completed for the main mineralized zone using DDH composites of capped assay data. The study was carried out in Supervisor software. The directional-specific investigations yielded the best-fit model along an orientation that corresponds to the strike and dip of the mineralized zones. Lithium and tantalum, but also other elements such as rubidium, cesium, gallium, and beryllium, were investigated.

Figure 14.10 and Figure 14.11 show examples of the main zone variography results for lithium and tantalum, respectively.

Two ellipsoids were built from the results of the variography study. These correspond to: a) one quarter (1/4x) of the variography ranges; and b) whole (1x) variography ranges. Figure 14.12 shows the Pass 1 ellipsoid for the main zone on a 3D view.

Figure 14.10: Example of Variography Study for Lithium in the Main Zone

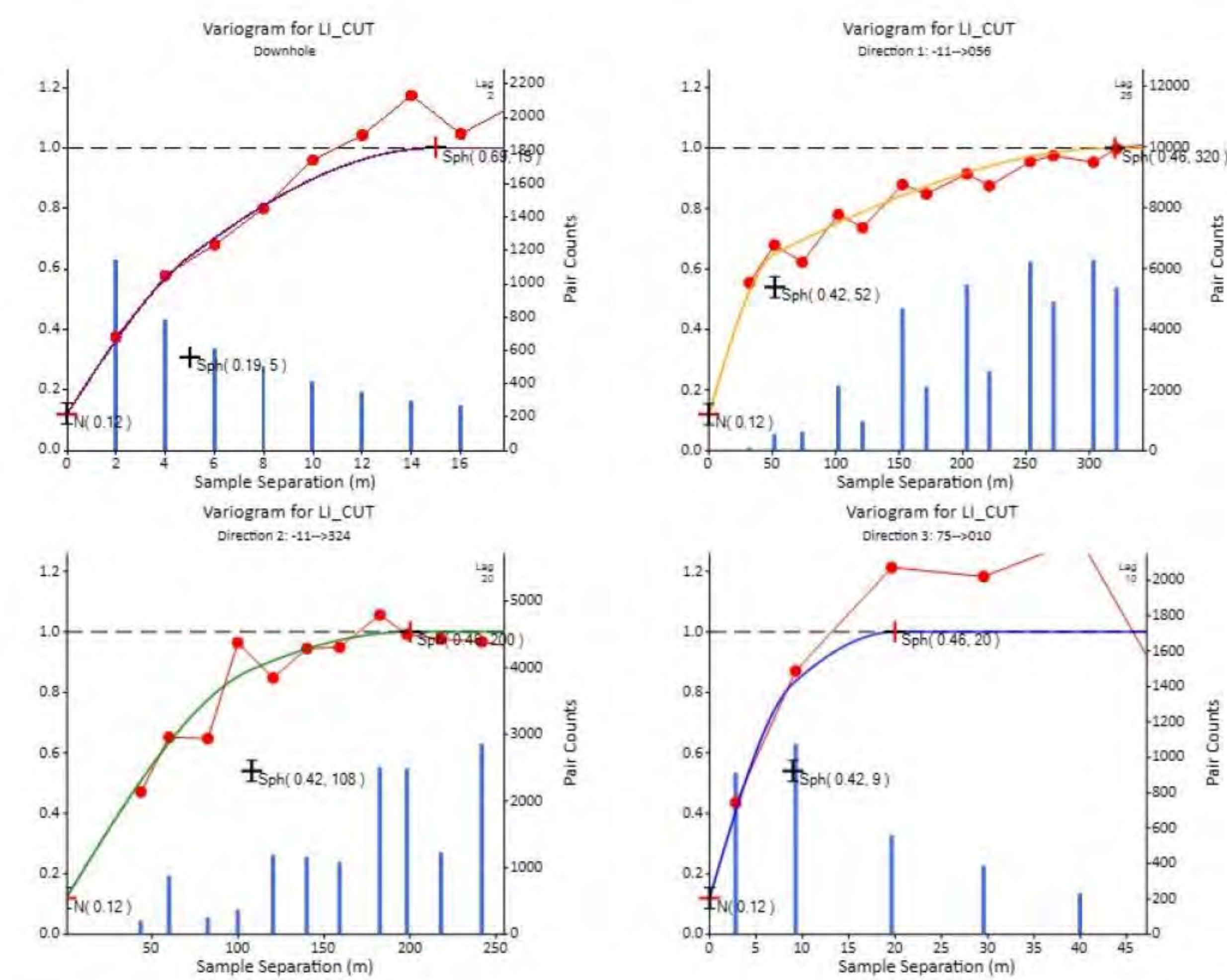


Figure 14.11: Example of Variography Study for Tantalum in the Main Zone

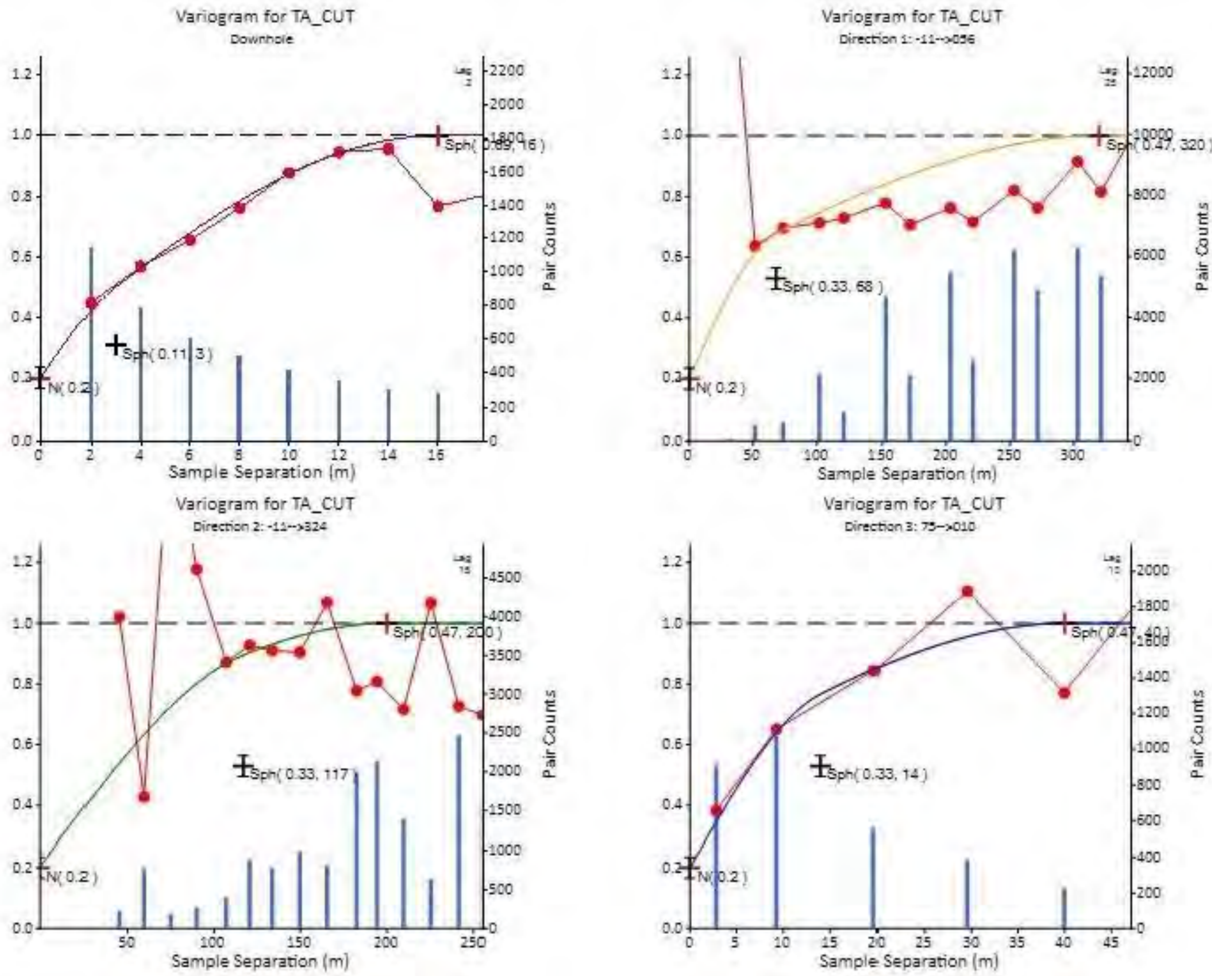
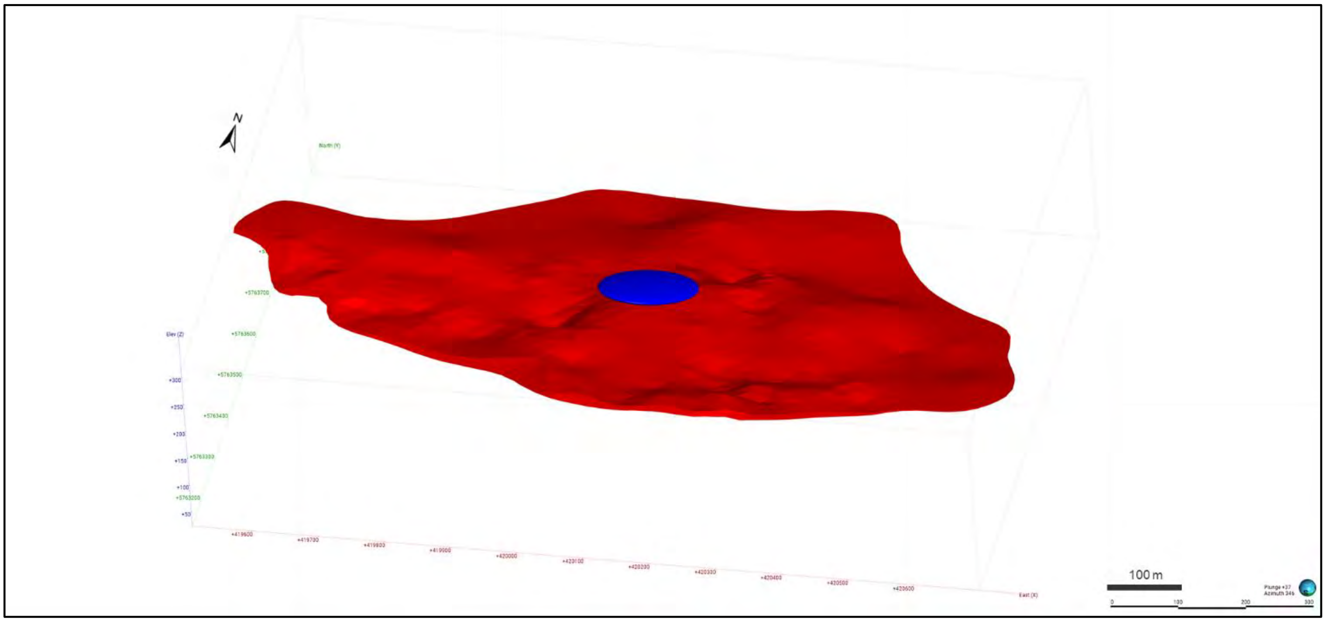


Figure 14.12: 3D View of the Main Zone, Looking North-Northwest, Showing the Ellipsoid used for Pass 1



14.9 Grade Interpolation

The variography study provided the parameters to interpolate the grade model using composites of capped grade data in order to produce the best possible grade estimate for the defined resource. The interpolation was run on a point area workspace extracted from the DDH dataset.

The composite points were assigned block codes corresponding to the mineralized zone in which they occur. The interpolation profiles specify a single composite block code for each mineralized-zone solid, thus establishing hard boundaries between the mineralized zones and preventing block grades from being estimated using sample points with different block codes than the block being estimated.

The interpolation profiles were customized to estimate grades separately for each of the mineralized zones. After multiple methods were considered (ID^2, ID^3, OK, NN), the ordinary kriging (OK) method was selected for the final resource estimation as it better honour the grade distribution of the Project.

Two passes were defined. The ellipsoid radiuses from Pass 1 were established using one quarter of the variography ranges. Ellipsoid radiuses from Pass 2 used the full ranges. Pass 2 interpolated only those blocks that were not interpolated during Pass 1.

Parameters used to interpolate Lithium and Tantalum during Pass 1 were as follows:

- ¼ variography range results;
- Minimum 2 holes;
- Minimum 6 composites;
- Maximum 18 composites.

Parameters used to interpolate Lithium and Tantalum during Pass 2 were as follows:

- 1x variography range results;
- Minimum 4 composites;
- Maximum 18 composites.

14.10 Resource Categories

14.10.1 Mineral Resource Classification Definition

The resource classification definitions used for this report are those published by the Canadian Institute of Mining, Metallurgy and Petroleum in their document 'CIM Definition Standards for Mineral Resources and Reserves' (CIM, 2014).

Measured Mineral Resource: that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough to confirm both geological and grade continuity.

Indicated Mineral Resource: that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

Inferred Mineral Resource: that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes. Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.

14.10.2 Mineral Resource Classification

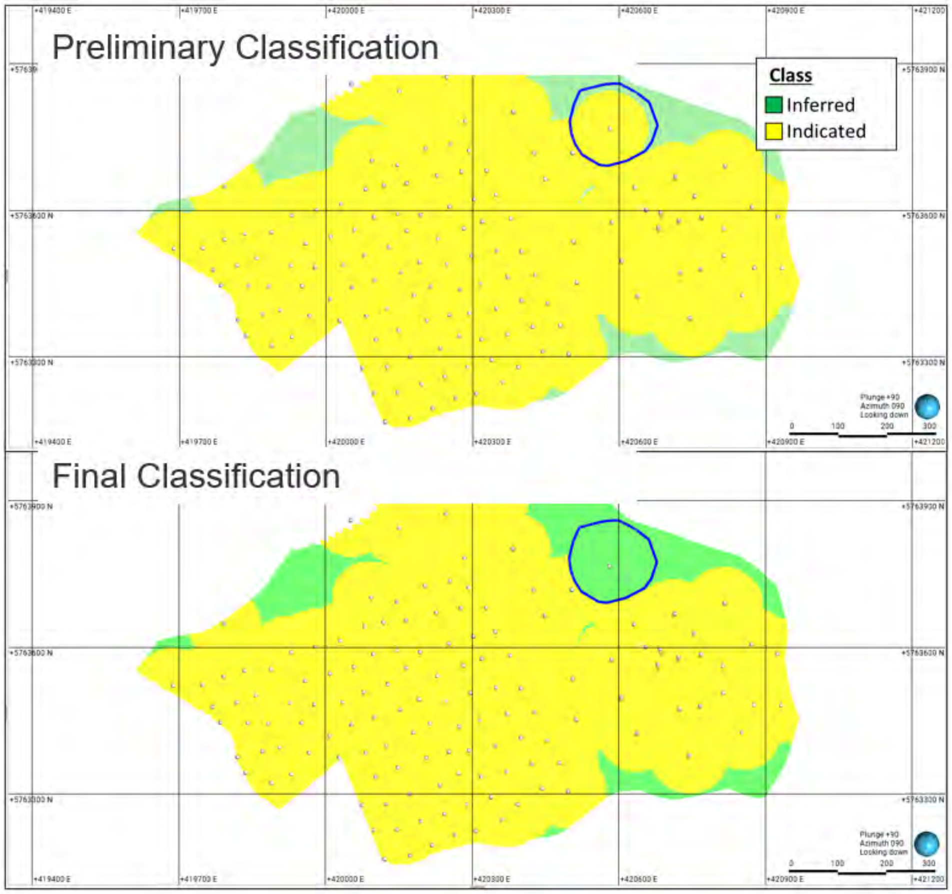
All interpolated blocks were assigned to the Inferred category during the creation of the grade block model, ensuring that sufficient continuity was observed in order to avoid isolated blocks being interpolated by only one hole. Moreover, the average maximum distance to any composite was set at approximately 100 m.

The reclassification to an Indicated category was done for blocks meeting all the conditions below:

- Blocks showing geological and grade continuity
- Blocks from well-defined mineralized zones only
- Blocks from Pass 1
- Blocks interpolated by a minimum of two holes
- Blocks for which the distance to the closest composite is less than 40 m

A series of outline rings (clipping boundaries) (Figure 14.13) were created in long views using the criteria described above, while keeping in mind that a significant cluster of blocks is necessary to obtain a resource. Within the Indicated resource outlines, some Inferred blocks were upgraded to the Indicated category, whereas outside these outlines, some Indicated blocks were downgraded to the Inferred category. The author is of the opinion that this was a necessary step to homogenize (smooth out) the resource volumes in each category, and to avoid isolated blocks from being included in the Indicated category.

Figure 14.13: Boundary for Final Classification of Mineral Resource (Zone 112)



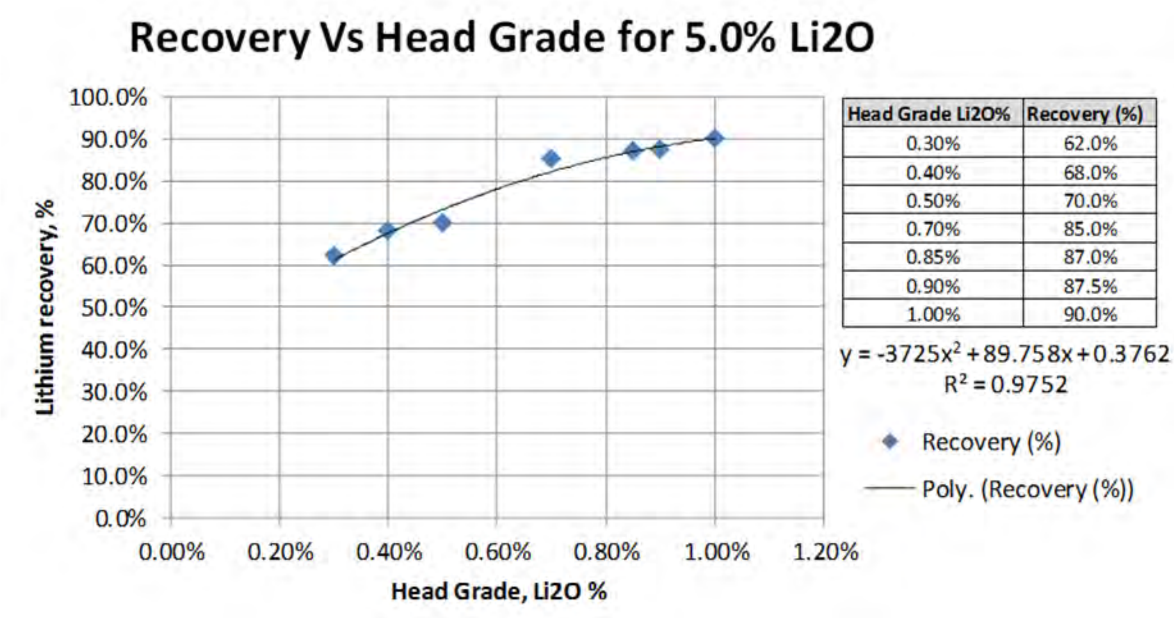
14.11 Metallurgical Recovery and NSR Calculation

Given the polymetallic (Li and Ta) nature of the mineralization comprising the Project, the author created an NSR block model by calculating the value of each mineralized block.

A lithium recovery formula was provided by Critical Elements. The formula applied a top-cut recovery value of 91.6905% for any lithium grade above 5,595 ppm. Furthermore, a lithium recovery of 0% was applied to Zone 119 as requested by Critical Elements.

Figure 14.14 shows the seven tests results and the metallurgical recovery formula derived from them. InnovExplo has not seen the study supporting these values.

Figure 14.14: Lithium Recovery based on Lithium Grade



Note: Figure compiled from data provided by Paul Bonneville.

A fixed recovery of 64% was applied to tantalum throughout the deposit. This recovery value was provided a representative of Critical Elements. The author has not seen the study supporting this value.

No penalty was applied to the NSR calculation as no supporting information was provided to the author. The resultant is Lithium and Tantalum being payable where all other elements (Rb, Cs, Ga, Be) do not contribute to the economics of the deposit.

The NSR calculation used a USD/CAD exchange rate of 1.30, a lithium price of US$20,000 per tonne Li_2O, and a tantalum price of US$130 per kilogram Ta_2O_5. These exchange rate and metal prices were provided by Critical Elements, a representative of Critical Elements.

Using the information provided to the author mentioned above, the NSR value is given by the following formula:

NSR Value = [(Li_2OGrade (%) x LiRecovery (%) x LiPrice ($) x Exchange Rate) – (Concentrate Transport Cost x Exchange Rate x Li_2OGrade (%) / AverageMillFeedGrade (%))] + (Ta_2O_5Grade (%) x TaRecovery (%) x TaPrice ($) x Exchange Rate).

Metallurgical Recoveries: The resource model recovery information was provided to Critical Elements by Bumigeme Inc. The grade recovery curve was developed based on recent metallurgical test work on low-grade composites at SGS Minerals Lakefield.

Metal Prices: Although the author was not provided with confidential contract terms held by Critical Elements, an online review allowed him to confirm that the lithium and tantalum prices submitted by Critical Elements for the resource model (20,000 US$/t Li_2O and 130 US$/kg Ta_2O_5) are in line with recent contract pricing terms in the industry.

Transport Costs: Transport costs used for the resource estimate cut-off grades calculation are identical to what has been used elsewhere in the Report (Item 15). The author reviewed this cost and found it adequate for this study.

14.12 Cut-Off Parameters

Mineral Resources were compiled using a minimum NSR cut-off of CAN$121.12 for the underground potential and CAN$31.40 for the open-pit potential. Parameters used to determine such cut-offs are presented below.

The NSR cut-offs must be re-evaluated continually according to prevailing market conditions and other factors, such as lithium and tantalum prices, exchange rate, mining method, related costs, etc.

14.12.1 Parameters for Determination of In-Pit Resource Cut-Off

The final selected Whittle input parameters for the in-pit Mineral Resource Estimate are defined in Table 14.7.

Table 14.7: Whittle Input Parameter

Input Parameter	Value	Note
Exchange rate[1]	US$ 1.00 : CAN$ 1.30	
Li_2O price[1]	20,000 US$/t	
Ta_2O_5 price[1]	130 US$/kg	
Li_2O recovery[1]	85%	
Ta_2O_5 recovery[1]	64%	
Transport costs[1]	30.05 CAN$/t milled	
Mining Dilution	0%	
Mining Recovery	100%	
Overburden Removal costs	3.10 CAN$/t mined	
Mining costs	4.00 CAN$/t mined	applied to Ore and Waste
Rehabilitation costs	0.12 CAN$/t mined	applied to Ore, Waste and Overburden
Ore Processing costs[2]	18.10 CAN$/t milled	
General and Administration[2]	13.30 CAN$/t milled	
Whittle Processing costs	31.40 CAN$/t milled	
Increment bench costs	0.03	
Pit slope	21°	Overburden
	50°	North area
	55°	All other areas
NSR Marginal cut-off	31.40 CAN$	

Notes:
1. Parameters used in the Block Value calculation, not directly inputted in Whittle
2. Parameters used in the Whittle Processing costs, not directly inputted in Whittle

The two commodity prices considered for the economic pit are lithium oxide (Li_2O) at US$20,000 per tonne and tantalum oxide (Ta_2O_5) at US$130 per kg. No commodity selling costs were considered for the Whittle run.

The design of the in-pit mineral resource shell was based on geotechnical study provided by Mine Design Engineering in their report, titled "Update to Rose Pit Geotechnical Model and Open Pit Stability Assessment", issued on March 1, 2017. An overall slope angle of 55° was applied to all pit areas except for the North area where a 50° overall slope angle is suggested. The pit walls in overburden will have a 21° overall slope angle. Operating costs are based on Feasibility study, dated October 20, 2017.

The marginal NSR cut-off (MNSR) used in Whittle was calculated using the input parameters of Table 14.7, according to the following equation:

$$M_{NSR} = \frac{Whittle\ Processing\ costs \cdot (\text{Mining Dilution} + 1)}{Mining\ Recovery} = 31.40\ CAN\$$$

The in-pit Resource Estimate presented herein used 31.40 CAN$ as the marginal NSR cut-off.

Two exclusions to the block model were considered:

— The Eastmain Reservoir of the public utility Hydro-Québec, adjacent to the east side of the Project, and a 30 m buffer zone around its perimeter.

— Lake #3, next to the north area of the pit outline, and a buffer zone of 30 m around the lake.

The blocks falling into these zones were discarded from the optimization in Whittle.

14.12.2 Underground Resource Cut-Off Parameters

The underground cut-off value was determined using the parameters presented in Table 14.8.

Table 14.8: Underground Cut-Off Parameters

Input Parameter	Value
Ore processing costs	18.10 CAN$/t milled
General and Administration	13.30 CAN$/t milled
Global mining costs	89.60 CAN$/t mined
Rehabilitation	0.12 CAN$/t/mined
Transport	30.05 CAN$/t mined
Total cost by metric tonne	121.12 CAN$
Cut-off value	121.12 CAN$

The variable used for the selection of mineable areas is the NSR (in Canadian dollars).

The ore processing costs, the general and administration costs, and the sustaining capital are based on Feasibility study, dated October 20, 2022. The mining costs are based on hands-on knowledge with comparable projects.

The underground NSR cut-off is calculated using the parameters of Table 14.8, according to the following equation:

UG_NSR=Mining+Processing+G&A= CAN$121.12

The Underground Resource Estimate presented herein uses a value of $CAN121.12 for the underground NSR cut-off.

To ensure potentially mineable shapes were used as resource, stope optimization was completed using the Deswik program and the Deswik Stope Optimizer (DSO) for the underground part of the deposit. The main mining method used for the optimization is cut & fill mining, due to the low dip of the lenses. This mining method ensure flexibility during the optimization process. Anneal parameters add an additional layer of the flexibility to maximize resource conversion to DSO. The economic pit shell was removed from the optimization and no pillars were considered for the resources. The parameters used for the optimization process are summarized in Table 14.9.

Table 14.9: DSO Parameters

Input Parameter	Value
Cut-Off Grade	121.12 CAN$
Level (height)	4 m
Section (length)	10 m
Stope Width (min)	3.5 m
Side Ratio	1.5
Dip (min/max)	85°/95°

Regarding resource classification of the resulting DSO, the dominant system is used to ensure all resources are associated with one of the evaluated categories (indicated or inferred). The category of each DSO is dictated by the most prominent category by volume included in each solid.

14.13 Mineral Resource Estimate

All amounts are reported in Canadian dollars.

Given the density of the processed data, the search ellipse criteria, the drillhole density, and the specific interpolation parameters, the QP is of the opinion that the current mineral resource estimate can be classified as Indicated and Inferred resources. The estimate was prepared in accordance with CIM's standards and guidelines for reporting mineral resources and reserves. The QP is of the opinion that the reasonable prospect for eventual economic extraction is met by having constraining volumes applied to any blocks (potential open-pit or underground extraction scenario) using Whittle and the Deswik Stope Optimizer (DSO) and by the application of cut-off grades.

Table 14.10 displays the results of the in situ Mineral Resource estimate for the Project at the official $31.4 NSR cut-off for the potential open-pit extraction scenario and at the official $ 121.12 NSR cut-off for the potential underground extraction scenario. Table 14.11 to Table 14.14 display the in-situ resource and sensitivity at other NSR values scenarios. The reader should be cautioned that values listed in Table 14.11 to Table 14.14 should not be misinterpreted as a mineral resource statement. The reported quantities and grade estimates at different NSR values are provided for the sole purpose of demonstrating the sensitivity of the resource model to the variation of commodity price.

Figure 14.15 and Figure 14.16 show the grade distribution and classification, respectively, for the open-pit scenario. Figure 14.17 and Figure 14.18 show different views of the above.

Sensitivity charts are presented on Figure 14.18 to Figure 14.21.

Table 14.10: Project Mineral Resource Estimate

Category		Tonnage	NSR (CAN$)	Li2O_Eq (%)	Li2O (%)	Ta2O5 (ppm)
Indicated	Pit constrained	29 922 000	185	1,03	0,93	145
	Underground	624 000	177	0,96	0,91	82
	Total Indicated	30 561 000	185	1,03	0,93	118
Inferred	Pit constrained	1 787 000	149	0,86	0,77	138
	Underground	597 000	150	0,87	0,80	101
	Total Inferred	2 384 000	149	0,86	0,78	129

Notes:

- The Independent and Qualified Person for the Mineral Resource Estimate, as defined by NI 43101, is Carl Pelletier, P.Geo., of InnovExplo Inc. The effective date of the estimate is August 1, 2023. The MRE follow 2014 CIM Definition Standards and the 2019 CIM MRMR Best Practice Guidelines.
- These Mineral Resources are not Mineral Reserves as they do not have demonstrated economic viability.
- The model includes 24 mineralized zones.
- The reasonable prospect for eventual economic extraction is met by having constraining volumes applied to any blocks (potential open -pit or underground extraction scenario) using Whittle and the Deswik Stope Optimizer (DSO) and by the application of cut-off grades. The mineral resource is reported at a cut-off of $31.4 NSR for the open-pit potential; and of $121.12 NSR for the underground potential based on market conditions (metal price, exchange rate and production cost).
- A range of densities was used on a per-zone basis based on statistical analysis of all available data.
- A minimum true thickness of 2.0 m was applied, using the grade of the adjacent material when assayed or a value of zero when not assayed.
- High grade capping was done on raw assay data based on the statistical analyses of individual mineralized zones.
- Compositing was done on drill hole intercepts falling within mineralized zones (composite lengths vary from 1.5 m to 3 m in order to distribute the tails adequately).
- Resources were evaluated from drill holes using a 2-pass OK interpolation method in a block model (block size = 5 m x 5 m x 5 m).
- The inferred category is only defined within the areas where blocks were interpolated during pass 1 or pass 2 where continuity is sufficient to avoid isolated blocks being interpolated by only one drill hole. The indicated category is only defined by blocks interpolated by a minimum of two drill holes in areas where the maximum distance to the closest drill hole composite is less than 40 m for blocks interpolated in pass 1.
- Results are presented in-situ. The number of metric tons was rounded to the nearest thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43101.
- The qualified persons are not aware of any known environmental, permitting, legal, title-related, taxation, socio-political or marketing issues, or any other relevant issue, that could materially affect the potential development of mineral resources other than those discussed in the MRE.

A range of densities was used on a per-zone basis based on statistical analysis of all available data.

A minimum true thickness of 2.0 m was applied, using the grade of the adjacent material when assayed or a value of zero when not assayed.

High-grade capping was done on raw assay data based on the statistical analyses of individual mineralized zones.

Compositing was done on drillhole intercepts falling within mineralized zones (composite lengths range from 1.5 m to 3 m to adequately distribute the tails).

Resources were evaluated from drillholes using a 2-pass OK interpolation method in a block model (block size = 5 m x 5 m x 5 m).

The Inferred category is only defined within the areas where blocks were interpolated during Pass 1 or Pass 2 where continuity is sufficient to avoid isolated blocks being interpolated by only one drillhole. The Indicated category is defined only by blocks interpolated by a minimum of two drillholes in areas where the maximum distance to the closest drillhole composite is less than 40 m for blocks interpolated in Pass 1.

The number of metric tons was rounded to the nearest hundred. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.

InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the Mineral Resource Estimate.

Table 14.11: Project Mineral Resource Estimate NSR Sensitivity for the Indicated In-Pit Scenario

Variation of NSR value	Indicated resource						
	Tonnage (000s)	BV $	LI_CUT ppm	TA_CUT ppm	LI2OEQ	LI2O %	Ta2O5 %
-20%	28 953	188.25	4387.03	119.44	1.04	0.94	0.015
-10%	29 419	186.95	4359.48	119.16	1.03	0.94	0.015
Base case	29 922	185.38	4326.27	118.84	1.03	0.93	0.015
+10%	30 198	184.62	4311.22	118.42	1.02	0.93	0.014
+20%	30 349	184.14	4300.34	118.47	1.02	0.93	0.014

Note: The pit shell optimization was re-run for every scenario

Table 14.12: Project Mineral Resource Estimate NSR Sensitivity for the Indicated Underground Scenario

Variation of NSR value	Indicated resource						
	Tonnage (000s)	BV $	LI_CUT ppm	TA_CUT ppm	LI2OEQ	LI2O %	Ta2O5 %
-20%	734	158.08	3 775.34	78.99	0.87	0.81	0.01
-10%	639	168.90	4 024.34	74.82	0.92	0.87	0.01
Base case	624	176.50	4 211.52	69.61	0.96	0.91	0.01
+10%	551	186.03	4 418.14	68.46	1.00	0.95	0.01
+20%	498	197.16	4 656.52	68.20	1.05	1.00	0.01

The DSO were re-run for every scenario in accordance with the pit shell sensitivity.

Table 14.13: Project Mineral Resource Estimate Cut-Off Sensitivity for the Inferred In-pit Scenario

Variation of NSR value	Inferred resource						
	Tonnage (000s)	BV $	LI_CUT ppm	TA_CUT ppm	LI2OEQ	LI2O %	Ta2O5 %
-20%	1 520	152.37	3609.56	115.38	0.87	0.78	0.014
-10%	595	150.81	3578.63	114.82	0.86	0.77	0.014
Base case	1 788	149.35	3554.83	113.26	0.86	0.77	0.014
+10%	1 808	146.03	3472.72	115.17	0.85	0.75	0.014
+20%	1 823	146.07	3471.85	115.38	0.85	0.75	0.014

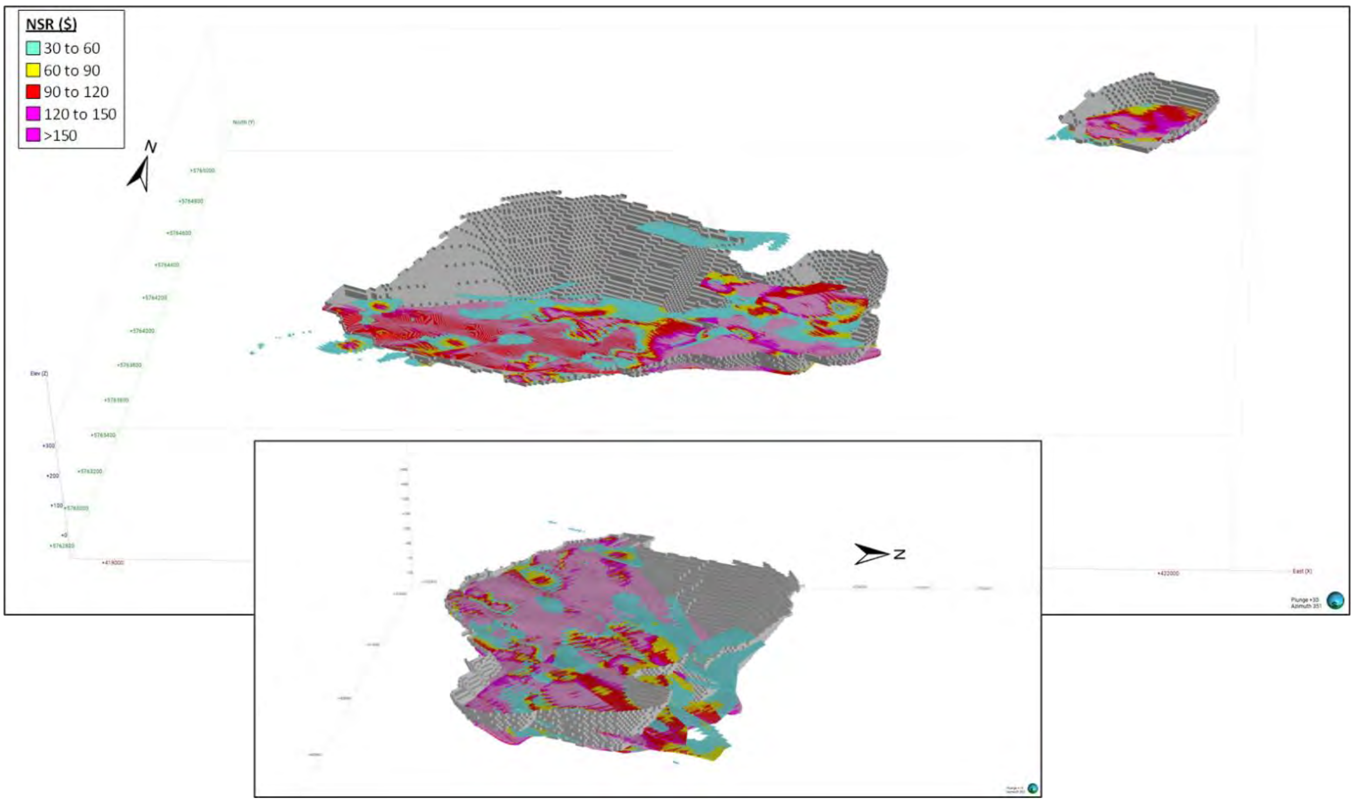
The pit shell optimization was re-run for every scenario.

Table 14.14: Project Mineral Resource Estimate NSR Sensitivity for the Inferred Underground Scenario

Variation of NSR value	Inferred resource						
	Tonnage (000s)	BV $	LI_CUT ppm	TA_CUT ppm	LI2OEQ	LI2O %	Ta2O5 %
-20%	819	138.56	3 326.32	83.41	0.78	0.72	0.01
-10%	699	147.64	3 538.36	82.84	0.82	0.76	0.01
Base case	597	156.85	3 738.98	82.64	0.87	0.80	0.01
+10%	482	166.63	3 950.61	80.94	0.91	0.85	0.01
+20%	406	176.89	4 176.47	76.82	0.95	0.90	0.01

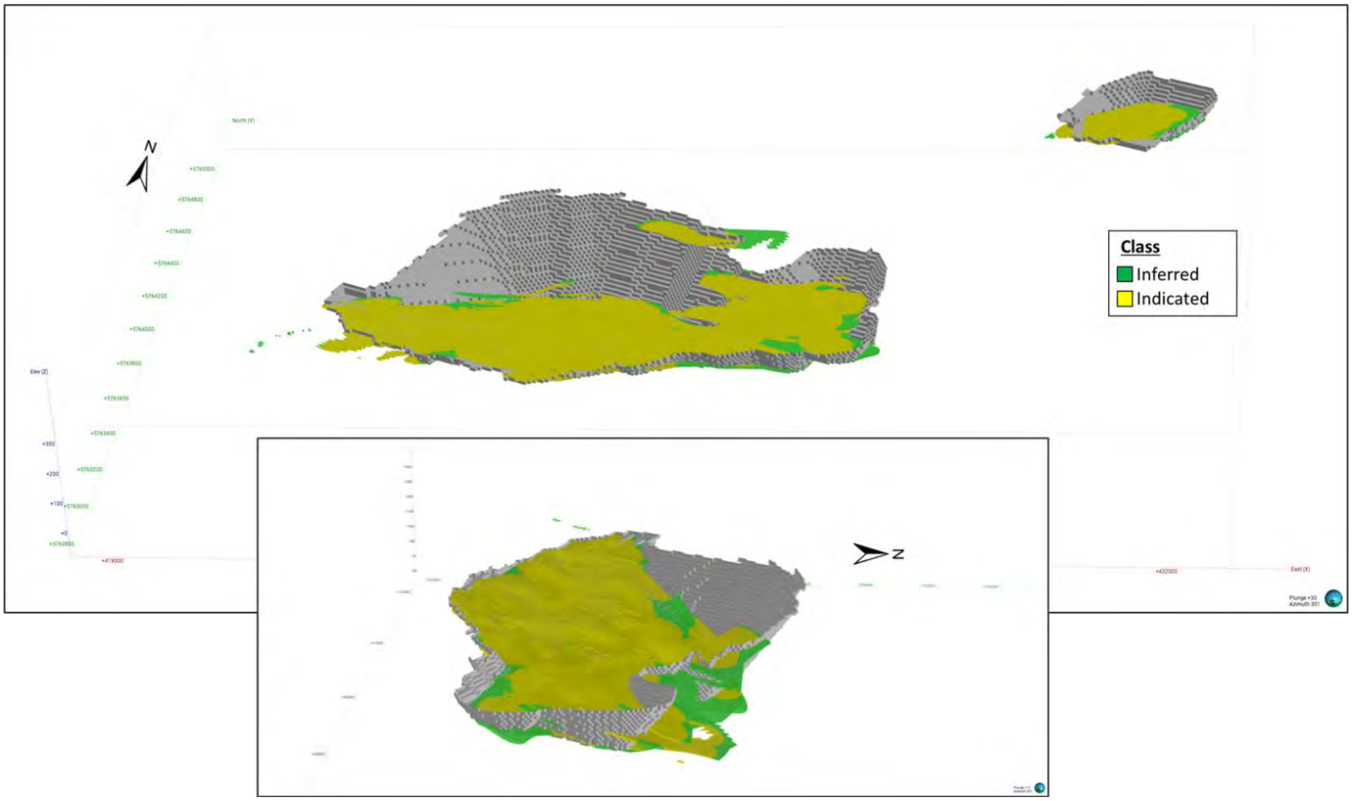
The DSO were re-run for every scenario in accordance with the pit shell sensitivity.

Figure 14.15: NSR Distribution above the Selected Official $31.40NSR Cut-Off for the Open-Pit Scenario



Note: Looking down toward west – perspective view - not to scale.

Figure 14.16: Classification Distribution for the Open-Pit Scenario



Note: Looking down toward west– perspective view - not to scale.

Figure 14.17: NSR Distribution for the Project Open-Pit Scenario

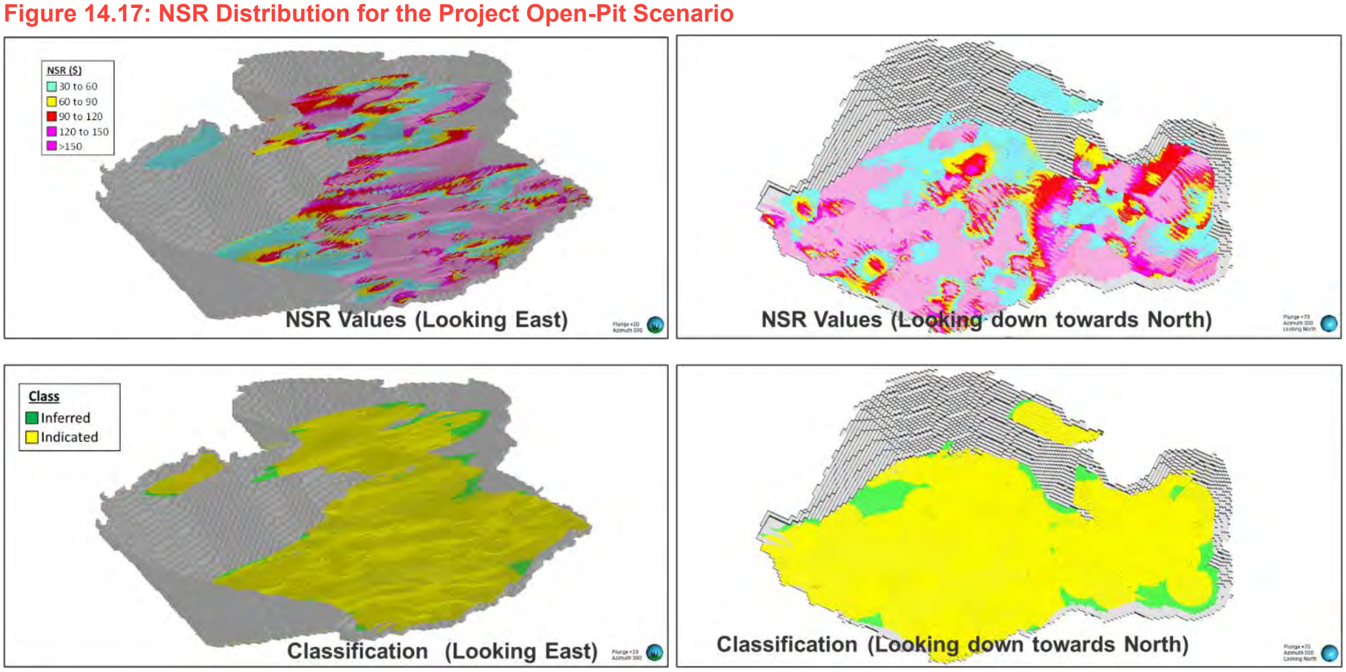
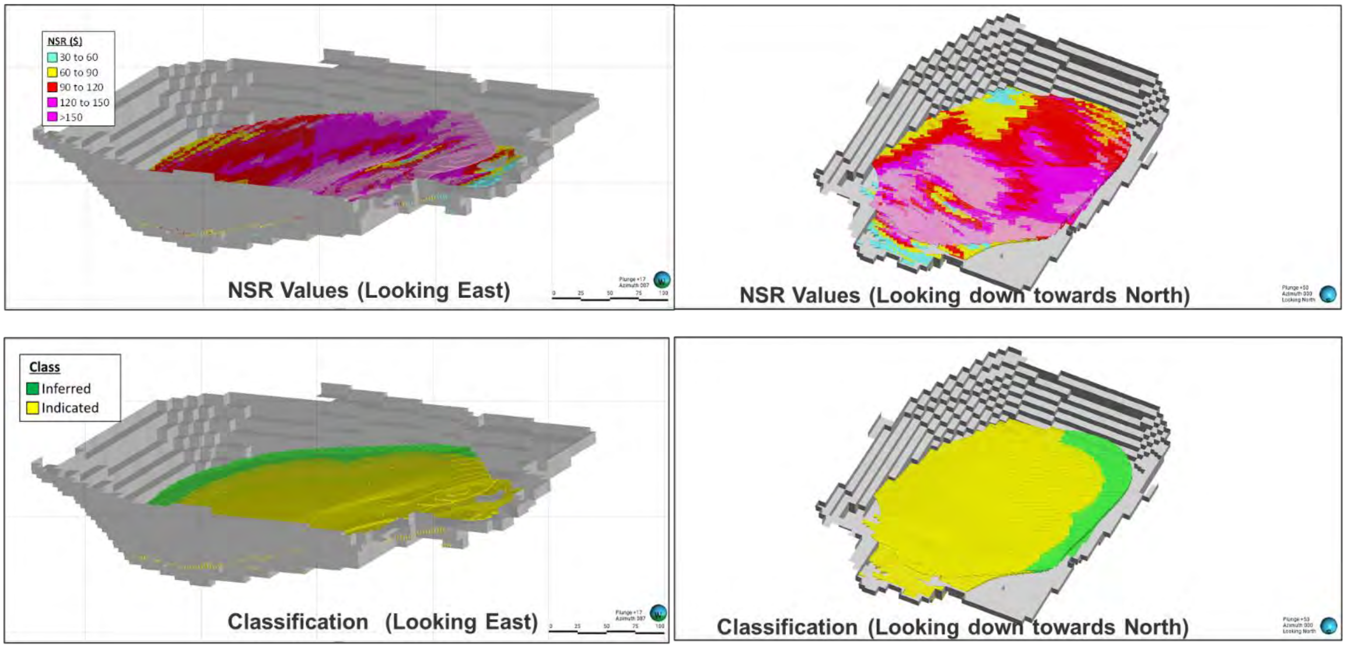


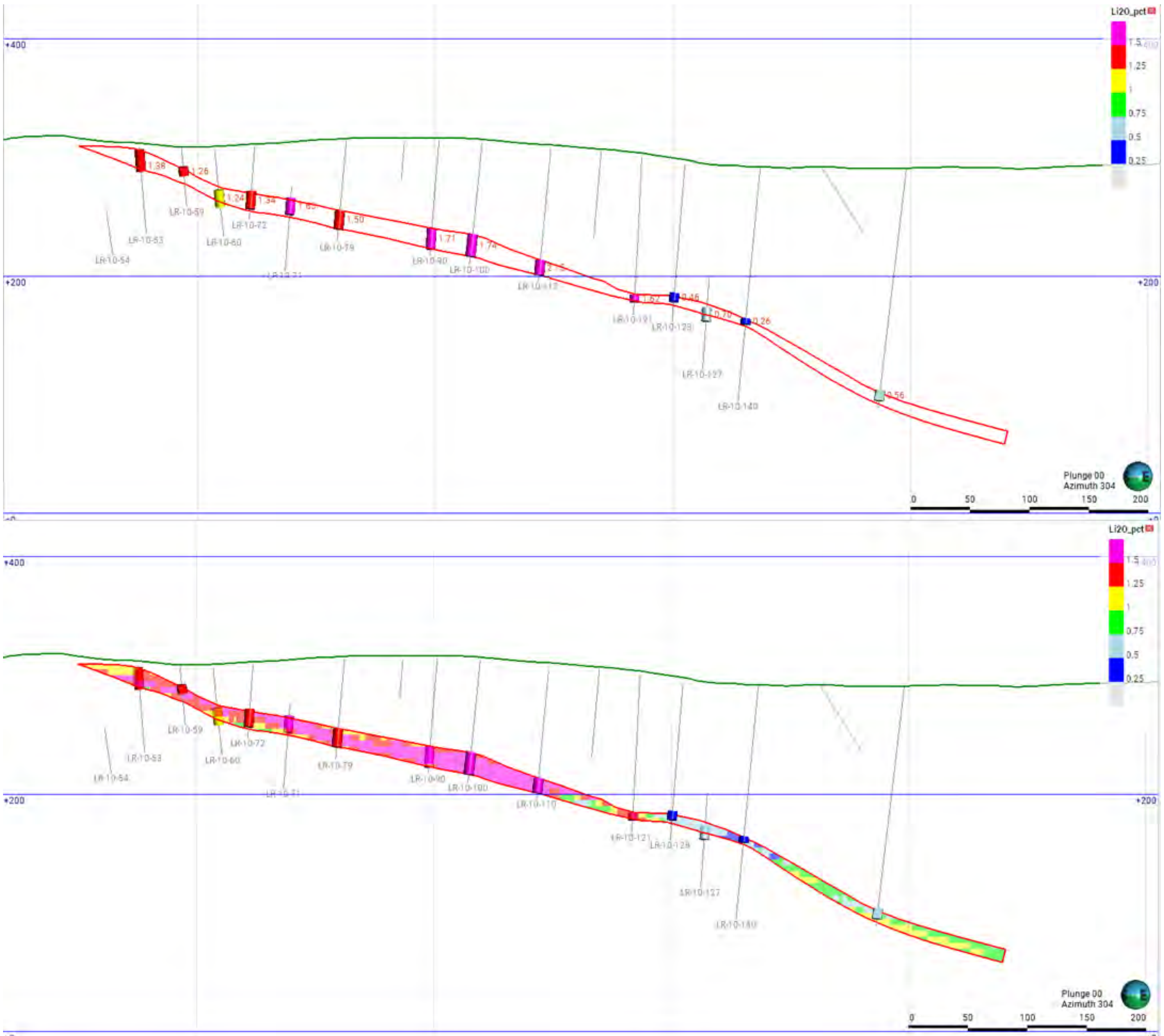
Figure 14.18: Classification Distribution for the JR Open-Pit Scenario



14.14 Block Model Validation

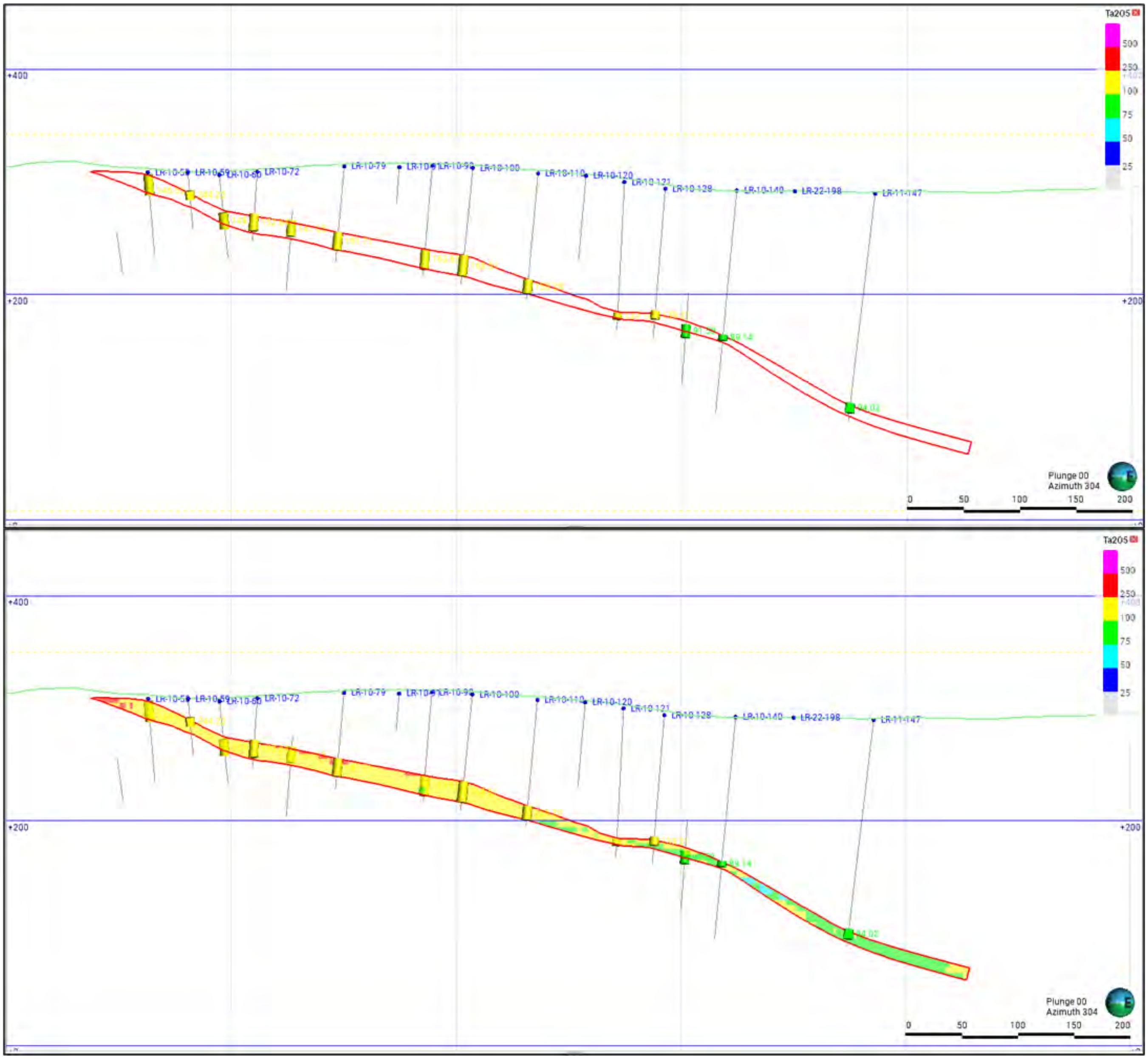
Block model grades and composite grades were visually compared on sections, plans and in 3D. No significant differences were observed during the comparison. Typical cross-section views are on Figure 14.19 and Figure 14.20.

Figure 14.19: Typical Cross Section showing Drillhole Intercepts (above) and Interpolated Blocks (below) for Li_2O



Note: For clarity, only Zone 115 is shown interpolated. This is a projected view; despite any appearance to the contrary, topography and interpretation are perfectly snapped to drillholes.

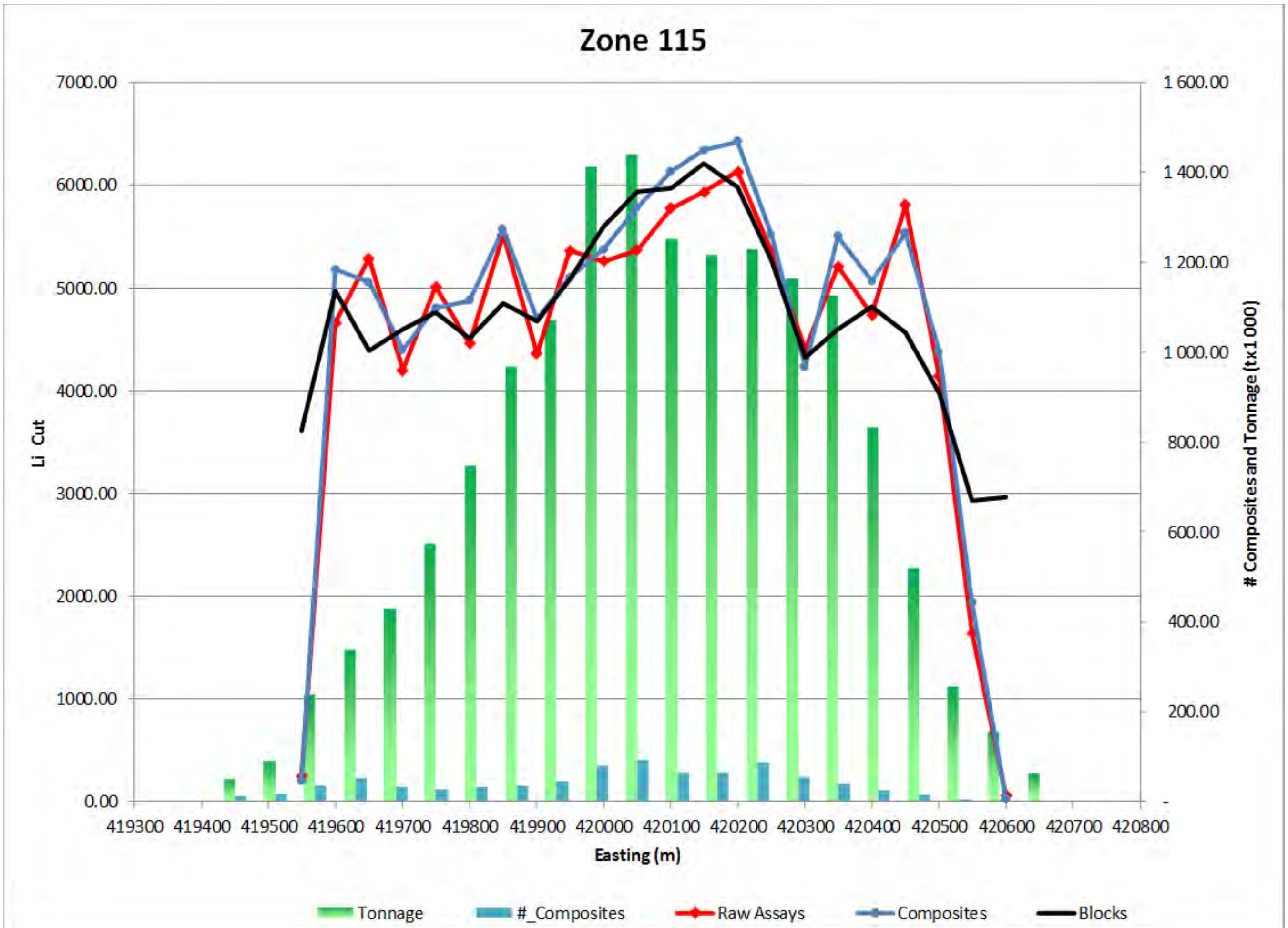
Figure 14.20: Typical Cross Section showing Drillhole Intercepts (above) and Interpolated Blocks (below) for Ta_2O_5



Note: For clarity, only Zone 115 is shown interpolated. This is a projected view; despite any appearance to the contrary, topography and interpretation are perfectly snapped to drillholes.

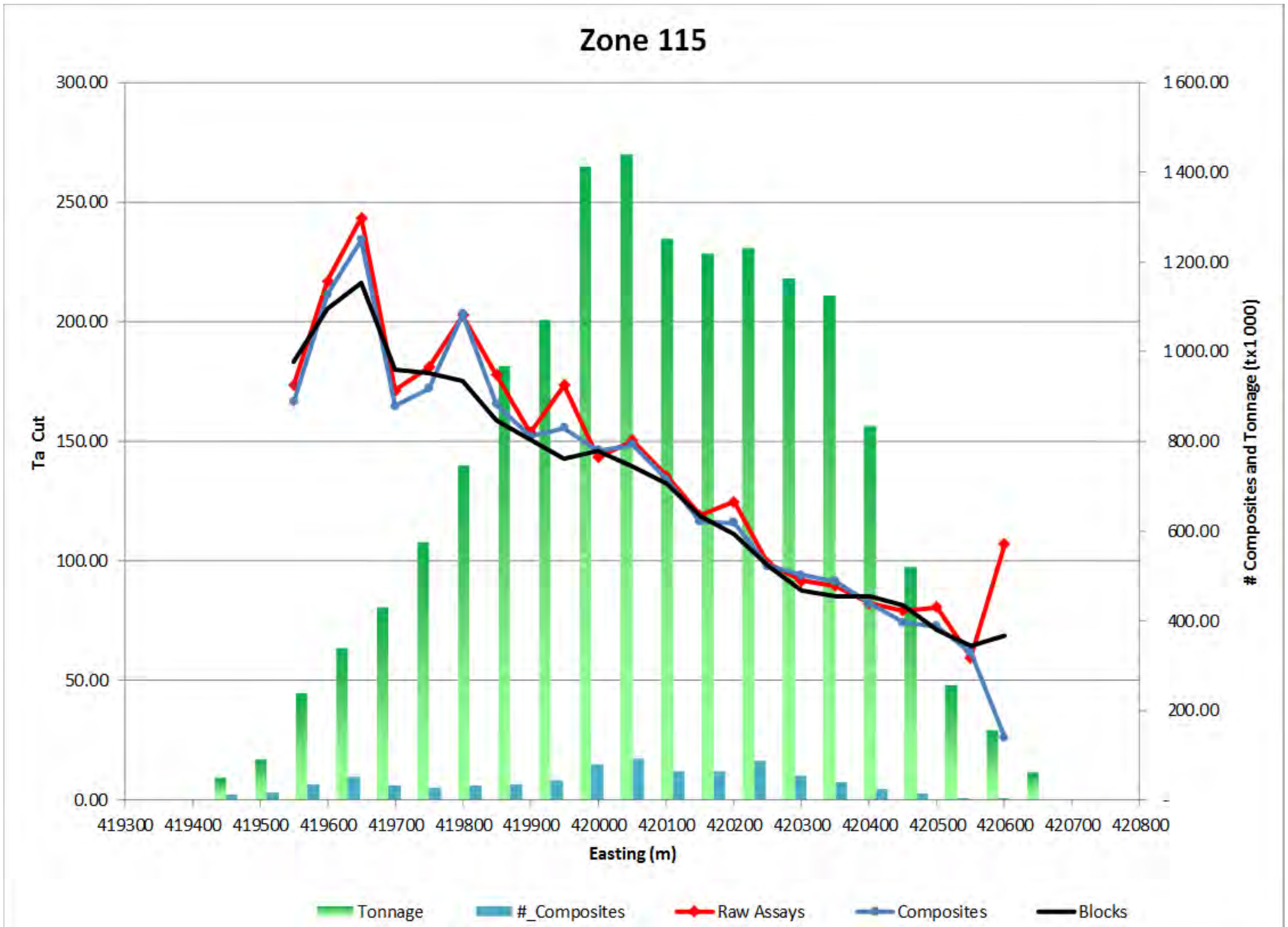
Swath plots for Li and Ta were constructed at 50-m E-W intervals for the principal mineralized zone, Zone 115 (Figure 14.21 and Figure 14.22). The Li plot demonstrates that variability is generally greater to the east where there are fewer composites but stays within an acceptable range.

Figure 14.21: Li Swath Plot (50-m eastings) for Zone 115



Note: Given that this is a percent model, to avoid bias, the only blocks retained are those for which 50% or more by volume is contained within the zone.

Figure 14.22: Ta Swath Plot (50-m eastings) of Zone 115



Note: Given that this is a percent model, to avoid bias, the only blocks retained are those for which 50% or more by volume is contained within the zone.

15 MINERALS RESERVE ESTIMATE

15.1 Introduction

The Mineral Reserve estimate is based on the geological block model prepared by InnovExplo and presented in Item14.0, with the exception that a constant mill recovery is used. The effects of using a constant recovery were found to not materially affect the results of the FS.

Other Items of this FS address mining, processing, metallurgic, economic, and other relevant factors that allow the classification of the Probable Mineral Reserve. These figures were estimated by selecting an optimal pit. The methodology to achieve the optimal pit shell is explained below.

15.2 Open Pit Optimization Methodology

The objective of pit optimization is to generate an ultimate pit contour that maximizes the value of a deposit and to use this contour as a basis for mine design, scheduling, and economic analysis. Design parameters, such as operating costs, mining and metallurgical recoveries, dilution, and NSR were used to generate an optimal pit shell.

15.2.1 Resource Block Model

From the grade category block model created for the mineral resource, an NSR attribute was populated using the grades from the indicated resources. The NSR value was calculated using preliminary production and processing parameters and commodity metal prices, as follows:

$$NSR_{(CAN\$)} = \left\{ \begin{array}{c} \dfrac{(Li_{ppm} \cdot \text{Li recovery} \cdot \text{Li}_2\text{O price}) - \text{Transport costs Li}_2\text{O}}{(\%\ \text{Li in Li}_2\text{O}) \cdot 100\,000} \\ \\ + \dfrac{Ta_{ppm} \cdot \text{Ta recovery} \cdot \text{Ta}_2\text{O}_5\ \text{price}}{(\%\ \text{Ta in Ta}_2\text{O}_5) \cdot 1\,000} \end{array} \right\} \cdot \text{Exchange rate}$$

Where:

- Exchange rate = USD:CAD = 1:1.3
- % Li in Li_2O = 46.45%
- % Ta in Ta_2O_5 = 81.90%
- Li recovery = 85%
- Ta recovery = 64%
- Li_2O price = US$20,000 per tonne of metal contained
- Ta_2O_5 price = US$130 per kilogram of metal contained
- Transport costs of Li_2O concentrate = CAN$30.05 per Li_2O%

This calculation was applied to all mineralized rock types except Rock Type 119. The lithium recovery drops dramatically in Rock Type 119, so it was considered to be 0% in the NSR calculation.

The resulting model contained the NSR variable used in the Lerchs-Grossman algorithm for pit optimization. The original block size of 5 x 5 x 5 (in metres) was reblocked to 10 x 10 x 10. The reblocking was done by merging blocks together while preserving the ore percent of each block. This action adds minimal in-pit dilution due to the support effect (Chilès and Delfiner, 1999) but maintains the amount of ore inside the pit.

The block value of three rock codes were imported into Whittle™ software from Dassault Systems GEOVIA to perform the pit optimization:

— The overburden, coded OB.
— The waste host rock, coded WAST, which included the meta-sediment, amphibolite, porphyry and gneiss rock types.
— The ore rock from the Rose deposit, coded ORE, which included the 20 pegmatite mineralized zones, 101 to 120.

These three rock codes were imported separately and were assigned different production and processing parameters during the optimization. The specific density of each rock type was used in the optimization process.

15.2.2 Physical Constraints on Block Model

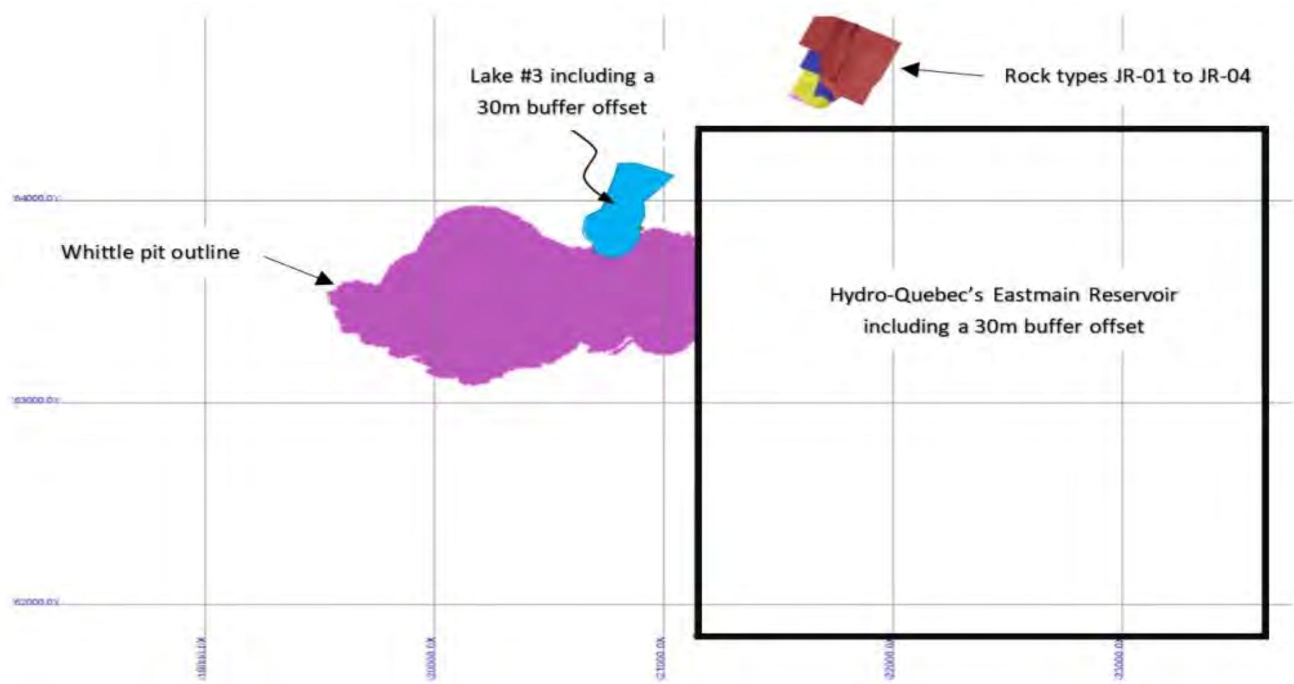
The Eastmain hydroelectric reservoir is located to the east of the Property. Hydro-Québec has an exclusion zone east of the Project which constitutes a physical constraint for the east side of the pit (Figure 15.1). The pit excavation was limited to a distance not closer than 30 m from the exclusion zone.

As per Critical Element’s request, two additional exclusion zones were considered:

— Rock types JR-01 to JR-04 representing mineralized zones 750 m to the northeast of the eastern limit of the main Rose deposit;
— Lake #3, in the northern area of the pit outline (a 30 m buffer zone around the lake was considered).

Blocks in these three zones were discarded from the optimization.

Figure 15.1: Restriction Zones on the Project



15.2.3 Determination of Open Pit Optimization Parameters

OPERATING COSTS

The pit optimization is based on operating costs derived from 2022 Feasibility study and contractors budgetary estimates. These costs were used as the required inputs in Whittle to obtain an optimal pit shell reflecting the economic profile of the Project. The costs are presented in Table 15.1.

Table 15.1: Summary of Operating Costs

Preliminary Costs	
Mining costs (CAN$/t mined)	4.00
Overburden removal costs (CAN$/t mined)	3.10
Processing costs (CAN$/t milled) (spodumene concentrator)	22.97
General & Administration costs (CAN$/t milled)	15.14

COMMODITY METAL PRICES

The two commodity metal prices considered for the economic pit are lithium oxide (Li_2O) at US$20,000 per tonne, and tantalum oxide (Ta_2O_5) at US$130 per kilogram. No prices were directly input in Whittle as the NSR calculations in the model already included them.

PROCESS RECOVERY

A constant processing recovery of 85% Li and 64% Ta was used in the NSR calculation. The latest data provided by Critical Elements shows that lithium recovery varies by grade. As this information was received late in the FS process, the effects of this variable recovery were assessed, and the results showed that it would not materially affect the results of the FS.

MINING DILUTION AND MINING RECOVERY

An excavation precision of 0.5 m was assumed for the mining of mineralized zones with hydraulic shovels. A diluted tonnage, initially calculated for each zone, led to an average mining dilution of 11.7% on total ore tonnage. Given that ore and waste are easily distinguishable, a 95% mining recovery was judged acceptable the selected mining equipment, and this value was applied to the ore.

OVERALL SLOPE ANGLE

The economic pit was designed based on the latest geotechnical study provided by Mine Design Engineering Inc. (MDE), titled “Update to Rose Pit Geotechnical Model and Open Pit Stability Assessment”, issued in July 2017. An overall slope angle of 50° was used on the block on the north wall of the pit, while a steeper angle of 55° was used for the rest of the pit. The pit walls in overburden will have an overall slope angle of 21°.

ANNUAL DISCOUNT RATE

The annual discount rate used for the NPV calculation in Whittle is set at 8%. The NPV and discounted NPV values calculated in Whittle are not final values, but they are preliminary comparative tools to guide the optimization process toward the most lucrative scenario.

15.3 Determination of Cut-Off Value

The NSR cut-off value (M_{NSR}) was calculated using the input parameters in Table 15.2, according to the following equation: $M_{NSR} = \frac{Processing\ Cost\ X\ (\mathrm{Dilution}+1)}{Mining\ Recovery} = 44.80\$$

This cut-off value applies to a modified NSR value, which only considers the Li; i.e.:

$$NSR_{(CAN\$)} = \frac{(Li_{ppm} \cdot \mathrm{Li\ recovery} \cdot Li_2O\ \mathrm{price}) - \mathrm{Transport\ costs}\ Li_2O}{(\%\ Li\ \mathrm{in}\ Li_2O) \cdot 100\ 000} \cdot \mathrm{Exchange\ rate}$$

This modified NSR value has the effect of privileging blocks with NSR values attributable to Li, therefore, increasing the in-pit average grade of Li. The Whittle input parameters are summarized in Table 15.2.

Table 15.2: Summary of Whittle Input Optimization Parameters

Input Parameter	Value	Comment
Mining dilution	11.71%	
Mining recovery	95%	
Overburden removal costs	CAN$3.10/ t mined	
Mining costs	CAN$4.00/ t mined	applied to Ore and Waste
Ore processing costs[1]	CAN $22.97/ t milled	
General and Administration[1]	CAN $15.14/ t milled	
Whittle processing costs	CAN $38.11/ t milled	
Pit slope	21°	Overburden
	50°	North area
	55°	All other areas
NSR marginal cut-off	CAN$44.80	

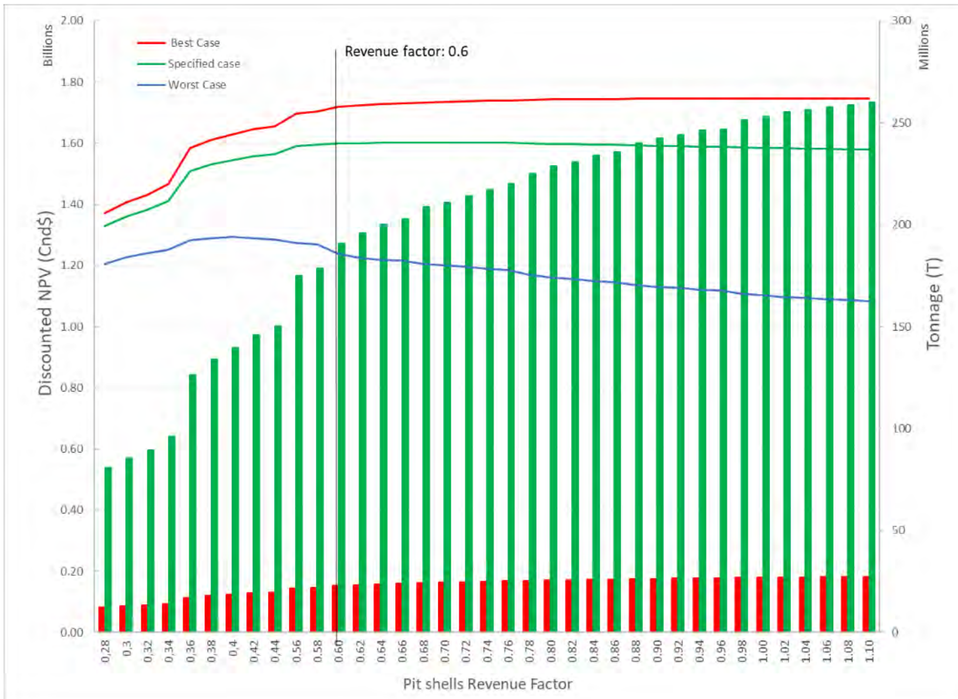
Note:

1. Parameters used in the Whittle Processing costs, not directly input in Whittle

15.4 Final Pit Shell Selection

The pit shell with a 0.6 revenue factor (RF) was selected. This pit shell was selected as the base case pit shell for further phasing and scheduling work for the Project. Mining additional resources by open pit beyond the limits of this pit shell increases the strip ratio and the footprint but does not increase significantly the NPV of the Project. This pit shell ensures an average Li_2O grade above 0.85%, as requested by Critical Elements. The chosen pit shell has an average grade of 0.88% Li_2O. Figure 15.2 compares the pit shells with different revenue factors. Selected pitshell expansion is limited by the constrained discussed in item 15.2.2.

Figure 15.2: Best, Specified, or Worst Discounted NPV and Tonnage of Pit Shells



Based on a cut-off of CAN$44.80 NSR, the selected Whittle pit shell contains 26.3 Mt of diluted and recovered ore, of which 100% are Indicated Resources, 182.4 Mt of waste rock, and 10.9 Mt of overburden. The selected final pit shell average diluted grade is 0.88 Li_2O% and 138 Ta_2O_5 ppm. Table 15.3 presents the pit optimization results.

Figure 15.3 to Figure 15.5 show the optimal pit in orthogonal, plan and section views. The pit is approximately 1,600 m long x 900 m wide x 220 m deep.

Table 15.3: Pit Optimization Results with Revenue Factor Equal to 0.6

Pit Optimization Results	Value
Total tonnage (Mt)	207.6
Diluted recovered ore tonnage (Mt)	25.1
Diluted Li_2O average grade (%)	0.88%
Li_2O tonnage (t)	187,800
Ta_2O_5 average grade (ppm)	138
Ta_2O_5 tonnage (t)	2,217
Waste tonnage incl. overburden (Mt)	182.6
Mining dilution (%)	11.7%
Strip ratio	7.28
Life-of-mine (years)	17.2

From this Whittle shell, the final pit was designed to include ramps and catch berms. The final pit design is presented in Item 16 and was used to create a mining plan that serves as the basis for ore material in the mineral reserve estimate. Dilution was re-evaluated within the engineered pit with the same basis as for the Whittle shell and found to be 9.6% on average.

Figure 15.3: Isometric View of Selected Pit Shell (RF=0.6) with Li Assay Distribution (%)

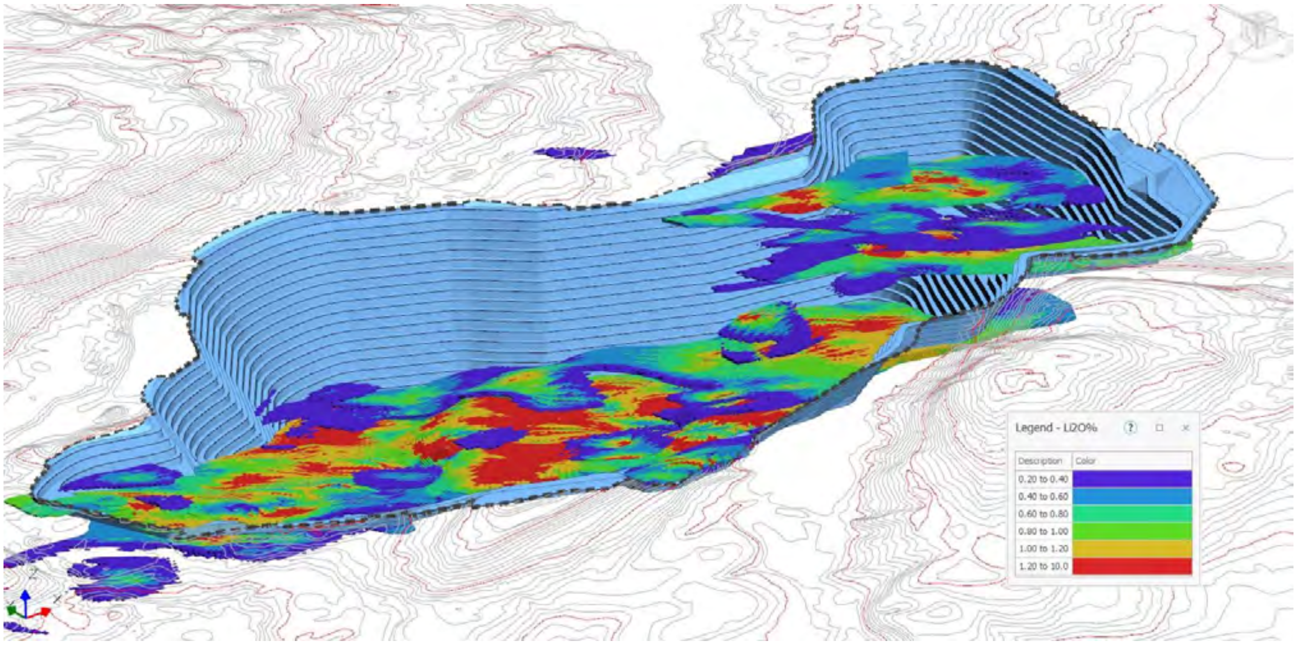


Figure 15.4: Plan View of Selected Pit Shell (RF=0.6) with Li Assay Distribution (%)

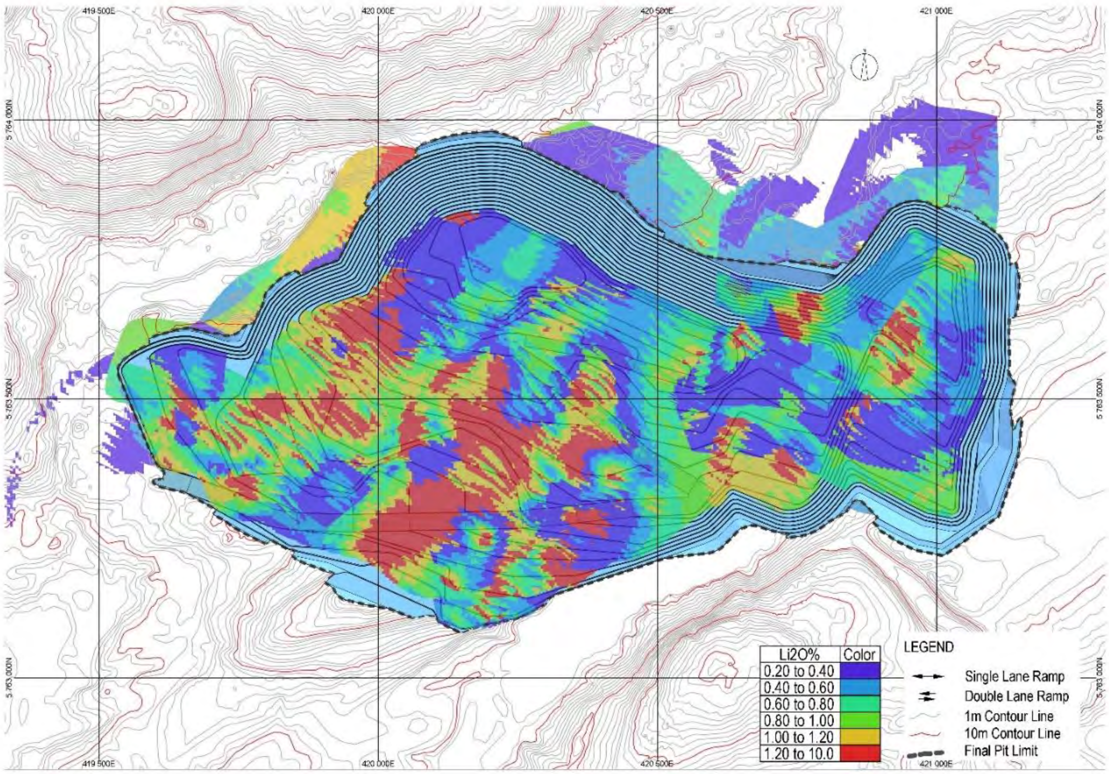
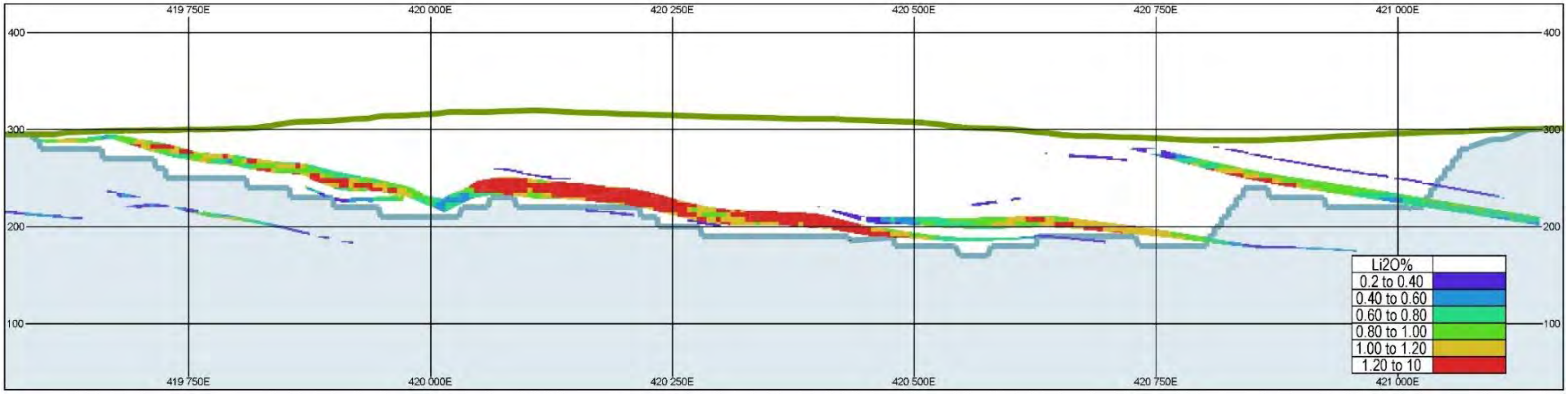


Figure 15.5: Vertical Section of Selected Pit Shell (RF=0.6) with Li Assay Distribution (%)



15.5 Mineral Reserves

15.5.1 Mineral Reserve Classification, Category, and Definition

MINERAL RESERVE

The Mineral Reserve estimates presented herein conform to CIM Definition Standards (2014) and include Measured and Indicated Mineral Resources but do not include Inferred Mineral Resources. According to CIM Definitions Standards, a Mineral Reserve is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.

PROBABLE MINERAL RESERVE

A Probable Mineral Reserve is the economically mineable part of an Indicated and, in some circumstances, a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

PROVEN MINERAL RESERVE

A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect potential economic viability.

15.5.2 Mineral Reserve Estimate

The mineral resource block model contains only Indicated resources. Indicated resources were converted into Mineral Reserves. Following the detailed design of the final pit and detailed production scheduling with the cut-off NSR value, a total of 26.3 Mt of diluted ore exists inside the mine design. The detailed pit design and production plan are discussed in Section 16. Table 15.4 presents the reserves inside the engineered pit.

Table 15.4: Mineral Reserve Estimate

Category	Tonnage (Mt)	NSR ($)	Li_2O_Eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Probable	26.3	165	0.92	0.87	138
Total	26.3	165	0.92	0.87	138

Notes:

- CIM Definition Standards for Mineral Resources and Mineral Reserves (2014) were used for reporting of Mineral Reserves.
- The independent and qualified person for the mineral reserve estimate, as defined by NI 43-101, is Simon Boudreau, P.Eng, of InnovExplo Inc. The effective date of the mineral reserves estimate is August 1st, 2023.
- The reserve estimate is based the current resource estimate with a constant recovery of 85% Li2O. Metal prices are set at US$20,000/t Li2O and US$130/kg Ta2O5 using an exchange rate of 1.3 CAD:USD. Metallurgical recoveries are set at constant values of 85% for Li2O and 64% for Ta2O5. The cut-off NSR value is CAN$44.80/t.
- The reserve estimate includes 9.6% dilution and 5% ore loss.
- The model includes 20 mineralized zones, of which 17 are included in the mining plan.
- Calculations used metric units (metres, tonnes and ppm).
- InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the mineral reserve estimate.

16 MINING METHODS

This Item describes the results of the technical work undertaken by InnovExplo to produce a mine plan for this Feasibility Study (FS) for the Project.

The Project deposit is made of stacked mineralized lenses oriented north 296° having an average dip of 15° to the northeast (varying locally between 5° and 25°). The orebody is relatively flat and close to the surface; and therefore, the FS was based entirely on an open pit operation.

A conventional truck and shovel mining method is proposed to mine 219.6 Mt of material over the mine life, comprised of 26.3 Mt of ore, 182.4 Mt of waste, and 10.9 Mt of overburden, for an average stripping ratio of 7.35:1. This FS is based on a milling capacity of 1,610,000 t per year. To achieve these milling production targets, the mining operation yearly production rate will vary accordingly between 11 and 16 Mt of rock material and decrease towards the end of the mine life. All overburden material will be mined by a contractor. An open pit mining schedule was planned and resulted in a LOM of approximately 19 years, starting with 19 months of pre-production, just over 16 years of production and ending with 5 months of stockpile processing. Table 16.1 presents the LOM mining production plan and Table 16.2 presents the resulting milling production plan.

Table 16.1: Mining Production Plan

Period	Pre-Production		Production																	LOM
Year	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Total material mined (kt)	1,514	2,813	11,279	16,259	15,524	15,830	16,640	15,884	15,254	15,733	15,310	12,921	14,253	14,421	16,349	13,028	5,442	1,159	0	219,614
Overburden mined (kt)	1,004	367	697	1,098	1,076	924	2,340	566	0	1,192	1,435	235	0	0	0	0	0	0	0	10,934
Waste mined (kt)	460	2,378	9,066	13,378	12,597	13,148	12,569	13,483	13,615	12,923	12,204	11,031	12,456	12,784	14,710	11,241	3,674	675	0	182,393
Ore mined (kt)	50	68	1,516	1,783	1,851	1,758	1,730	1,836	1,639	1,618	1,670	1,656	1,797	1,637	1,639	1,787	1,768	483	0	26,287
Dilution (%)	8.9%	10.3%	9.8%	9.8%	9.2%	9.5%	9.6%	9.3%	8.9%	9.9%	9.7%	9.5%	9.3%	9.9%	10.1%	10.2%	10.0%	9.7%	0.0%	9.6%
Grade mined (ppm Li)	4,085	2,445	3,674	4,067	5,112	4,467	4,350	4,480	4,434	3,940	3,830	3,982	2,891	3,286	4,091	3,531	4,105	4,485	0	4,029
Grade mined (% Li2O)	0.88%	0.53%	0.79%	0.88%	1.10%	0.96%	0.94%	0.96%	0.95%	0.85%	0.82%	0.86%	0.62%	0.71%	0.88%	0.76%	0.88%	0.97%	0.00%	0.87%
Grade mined (ppm Ta)	187	137	137	140	129	117	123	113	133	85	93	119	129	133	87	82	85	79	0	113
Grade mined (ppm Ta2O5)	229	168	167	171	158	143	150	138	163	104	113	145	158	162	106	100	104	96	0	138
Ore stockpile size (kt)	50	100	287	354	481	491	532	558	558	558	558	558	558	558	558	621	1,224	724	0	0
Material re-handled (kt)	0	0	0	80	80	80	80	80	80	80	80	80	80	80	80	80	503	1,151	0	2,700
Material transported (kt)	1,514	2,813	11,279	16,340	15,605	15,910	16,720	15,965	15,334	15,814	15,391	13,002	14,334	14,502	16,430	13,109	5,945	2,309	0	222,314

Table 16.2: Milling Production Plan

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	LOM
Total material processed (kt)	1,215	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	927	26,287
Mined from pit (kt)	1,215	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,165	483	0	23,788
Reclaimed from stockpile (kt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	445	1,126	927	2,499
Lithium head grade (ppm Li)	3,880	4,329	5,607	4,766	4,560	4,944	4,494	3,955	3,934	4,064	3,103	3,324	4,146	3,742	3,346	2,811	2,776	4,020
Lithium head grade (% Li_2O)	0.84%	0.93%	1.21%	1.03%	0.98%	1.06%	0.97%	0.85%	0.85%	0.87%	0.67%	0.72%	0.89%	0.81%	0.72%	0.61%	0.60%	0.87%
Tantalum head grade (ppm Ta)	137	144	132	122	125	117	134	85	93	119	132	133	87	82	88	91	101	113
Tantalum head grade (ppm Ta_2O_5)	167	175	162	149	153	143	163	104	113	145	161	163	106	100	107	111	124	138

16.1 Pit Design

16.1.1 Geotechnical Study and Pit Design Parameters

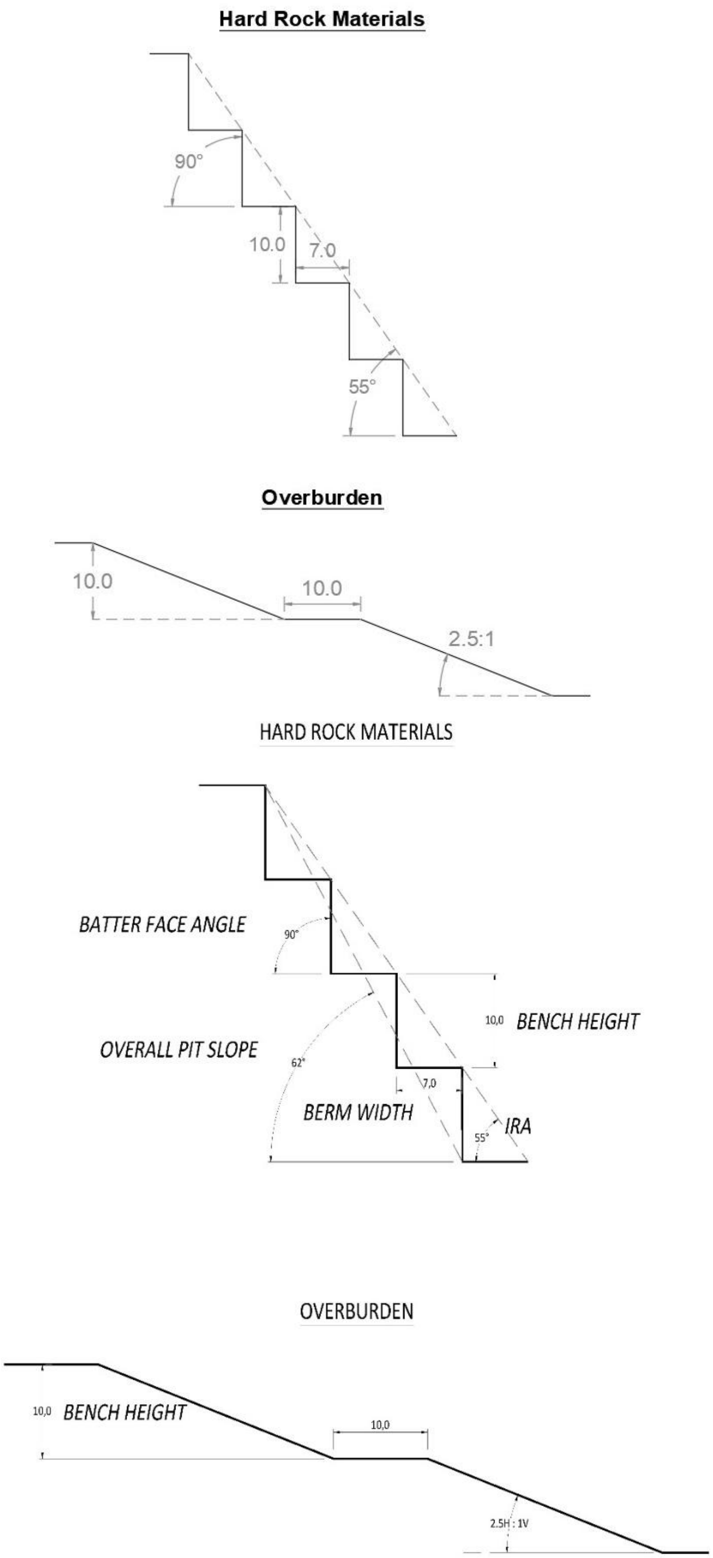
Mine Design Engineering Inc. conducted the geotechnical analysis for the Rose Lithium-Tantalum Project and supplied their recommendations in their report titled 'Update to Rose Pit Geotechnical Model and Open Pit Stability Assessment' for the hard rock materials of the proposed pit.

The Project pit design is based on single benching with 10-m bench heights. This bench height was selected based on the loading and hauling equipment that would best suit the mining operation. The geotechnical report recommends an inter-ramp angle of 57° and an overall pit slope angle of 55°. A 90° face angle was considered so a minimum berm width of 6.5 m was recommended to respect the inter-ramp angle. However, a berm width of 7.0 m corresponding to the recommended overall slope angle was used, as ramps were only designed on moderately sloped pit walls (i.e. intermediate pit walls and the ultimate south wall).

The pit slopes in overburden respect a face ratio of 2.5:1 with a 10 m berm width, resulting in an overall slope of 3.5:1, as per the design of the overburden stockpile. The pit slope requirements in overburden for the pit walls should be analyzed in further studies. This configuration could be steepened during the mining phase to reduce overburden waste mining.

Figure 16.1 shows the pit slope design parameters used for the ultimate pit walls.

Figure 16.1: Pit Slope Design Parameters



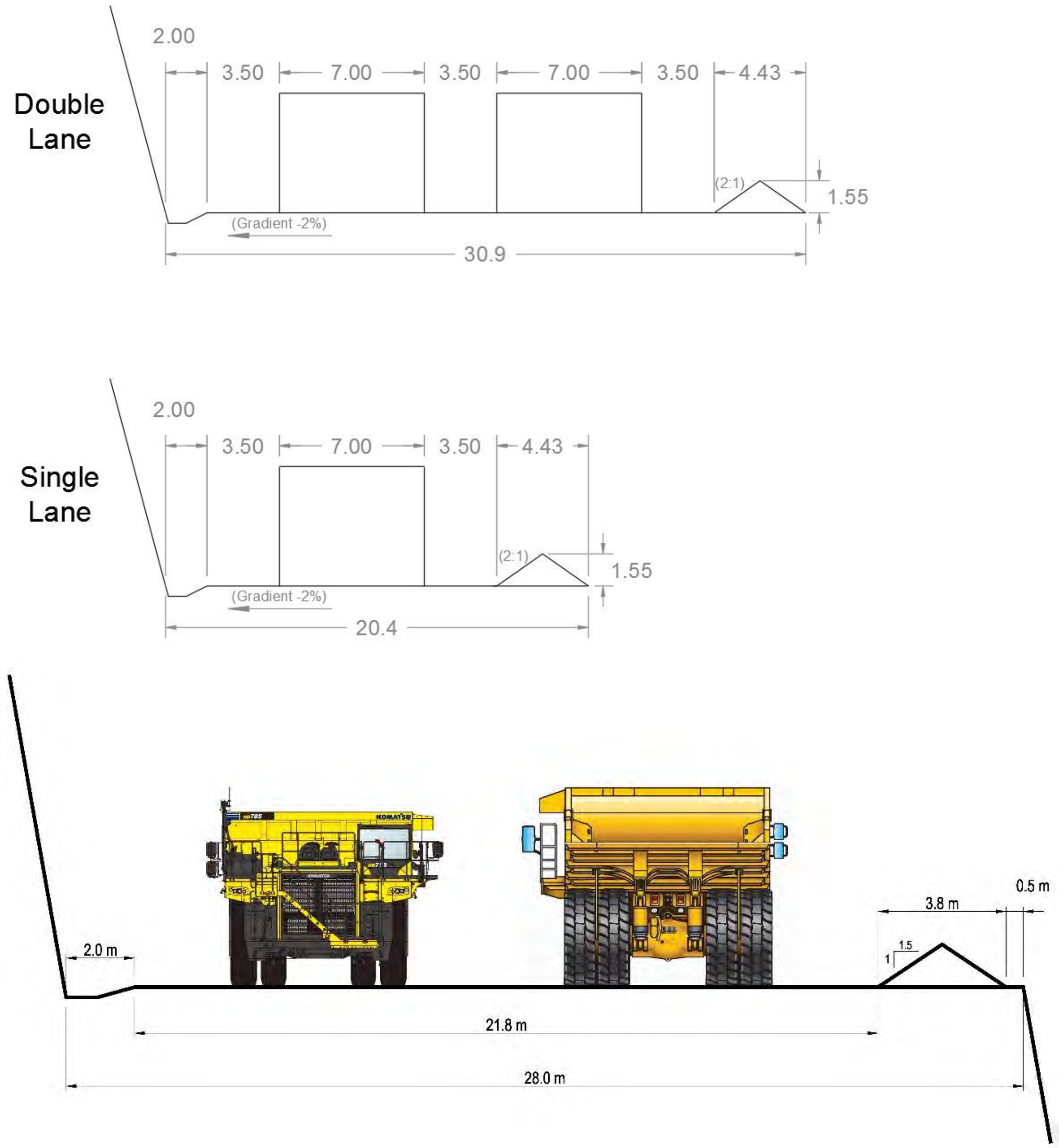
For intermediate pit walls, an overall slope angle of 45° was respected. This reduction in the wall angle will improve slope stability and allow time for the operation to better assess the pit wall characteristics and optimize the final pit design. Also, less work will be required to maintain the walls in good condition.

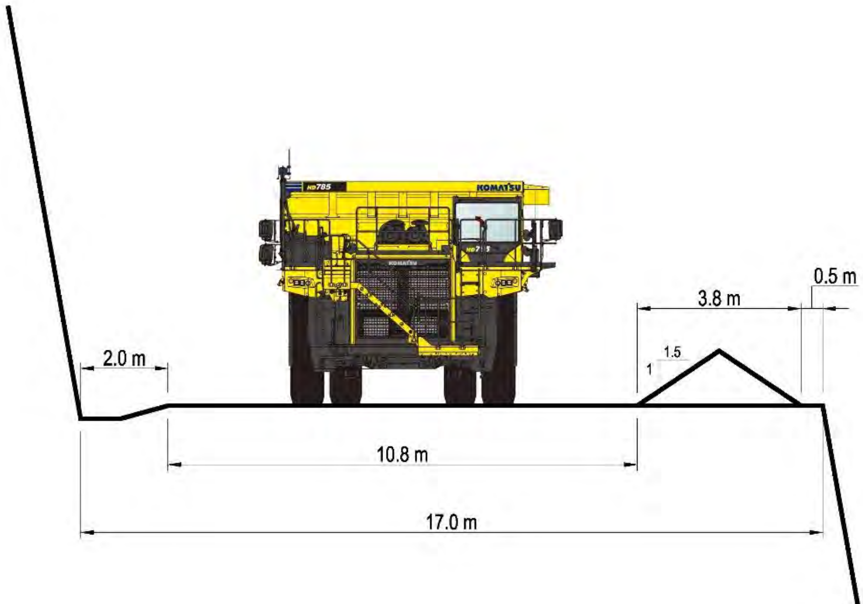
Several risks were identified in the geotechnical study. The analyses conducted by Mine Design Engineering Inc. consider only dry pit slope conditions. A hydrogeological model for the site will be completed. The model will be taken in account by Mine Design Engineering Inc. for re-analysis. Furthermore, joint persistence should be further investigated when excavating the mine.

16.2 Haul Road Design

The haulage ramps are based on the largest haulage truck and are designed for double lane traffic, except for the last benches of each phase which are designed for single lane traffic. The pit ramp designs are presented on Figure 16.2.

Figure 16.2: Pit Ramp Design Parameters





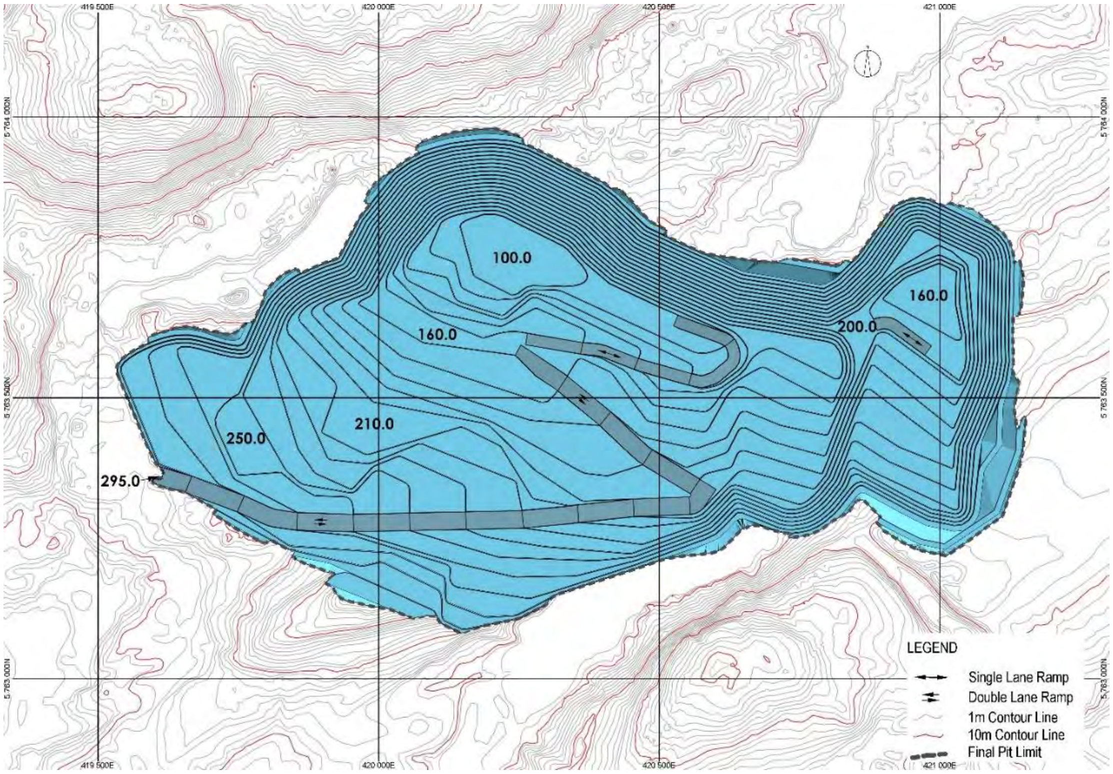
For both ramp designs, a half-truck width is considered as buffer space. A safety ridge is designed considering a height equivalent to the radius of a haul truck tire and with a 2:1 slope. Lastly, a 2 m wide ditch is included to allow for water drainage and pipe installation.

The maximum gradient of the inner curvature of all ramp segments is 10%. All switchbacks are designed with a flat rolling surface.

16.3 Final Pit Design

Based on the selected optimized pit shell and the geotechnical parameters, a final pit design was created (Figure 16.3). The mine design process is iterative and aims to convert the optimal pit shell into an operational open pit mine design. Once completed, the total contents of the designed pit do not differ considerably from the contents of the optimized shell. The detailed pit design was created using the Deswik mining software. The pit design includes haulage ramp access to all benches, except for the final bench which will be excavated via a temporary ramp.

Figure 16.3: Final Pit Design



The final pit design is approximately 1 620 m long, 900 m wide, and 200 m deep.

It should be noted that the pit design respects the geotechnical slope recommendations with the material classification from the block model. Further site investigations and test pits were conducted following the generation of the block model and found varying depths of overburden in certain areas. The pit design will need to be reviewed as mining progresses to account for changes in the depth of overburden.

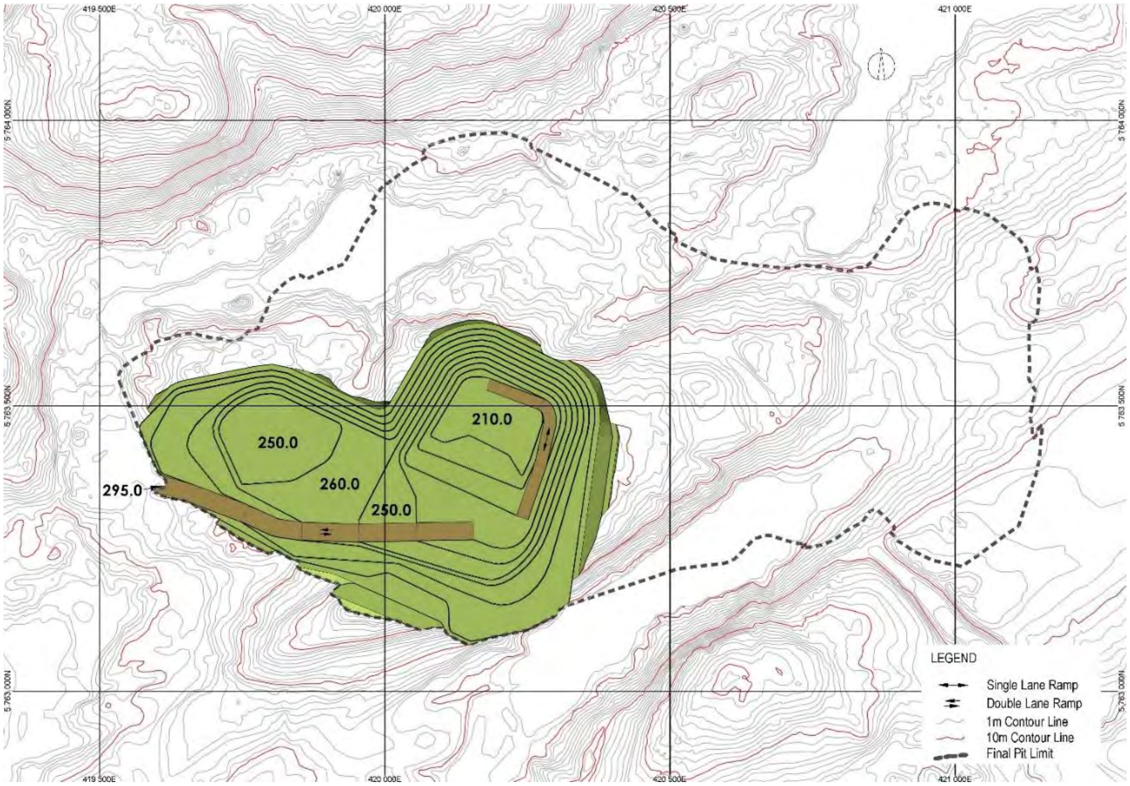
Lastly, a 30 m perimeter around Lake 3 was maintained to avoid water infiltration in the pit. However, this perimeter is estimated and not based on a hydrogeological study with a corresponding geotechnical analysis. This perimeter should be reviewed in further studies when more information is available. A limit to the east of the pit corresponding to Hydro-Québec's Eastmain reservoir was also respected.

16.4 Mining Phase Designs

Based on the Whittle pit shell optimizations, three nesting intermediate pit shells were used as guidelines to design the mining phases. By sub-dividing the ultimate pit into these four separate phases, the mining rate of ore is kept relatively constant. The selection of these mining phases results in a low production rate for the pre-production period and improves the mill feed grade in the first years of the Project.

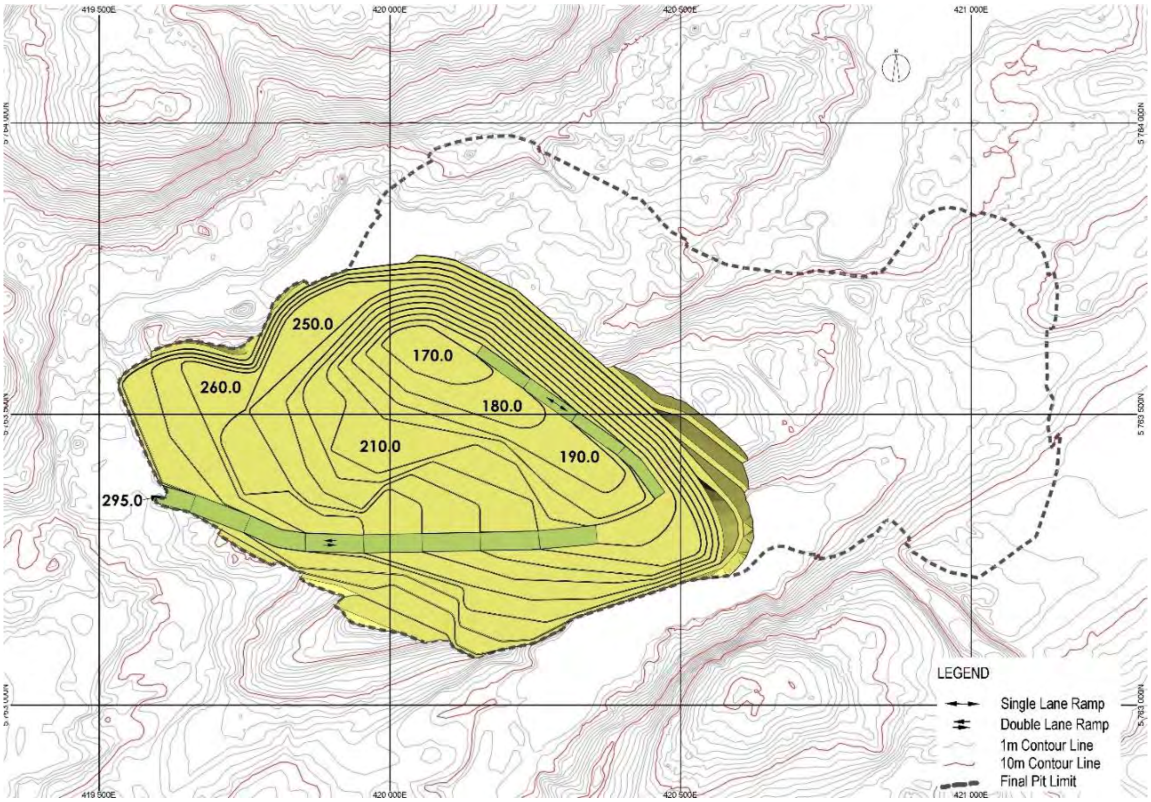
Phase 1 is the first intermediate and smallest of the mining phases. It is approximately 840 m long, 570 m wide, and 90 m deep. It is in the south-east corner of the final pit. The first five ramp segments of the final pit ramp are developed. The design is presented on Figure 16.4.

Figure 16.4: Phase 1 Design



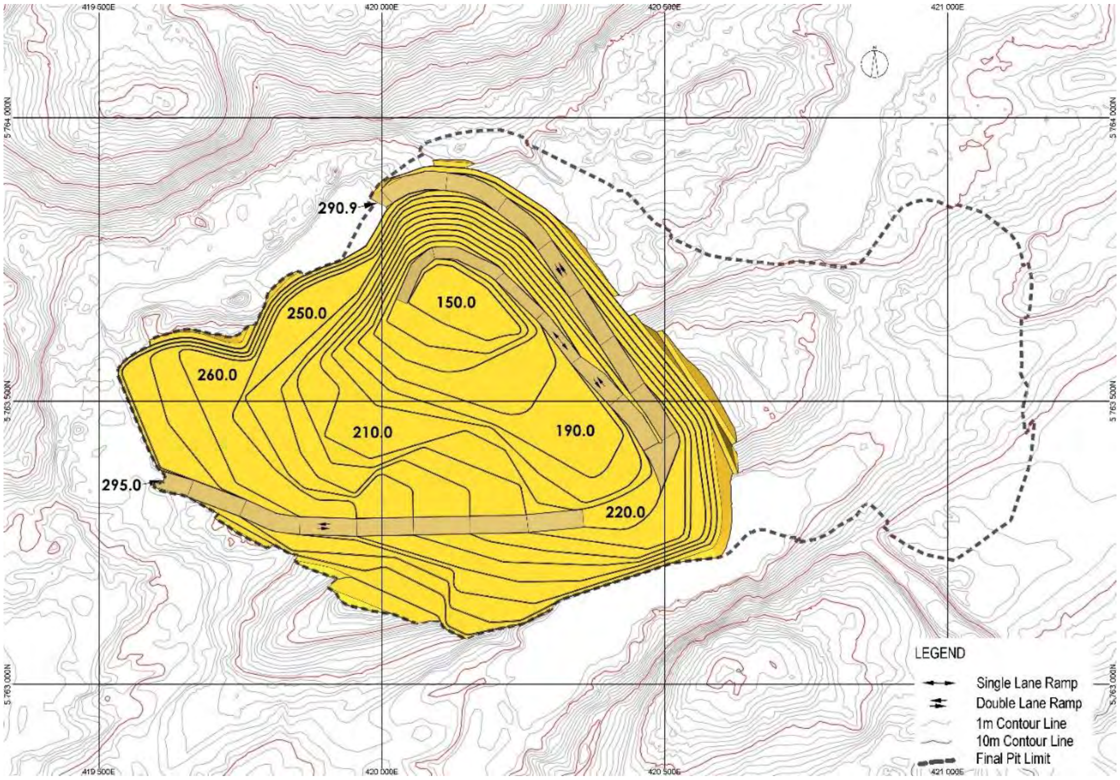
Phase 2 is the second intermediate phase. It is approximately 1,100m long, 700 m wide, and 130 m deep. The design is presented on Figure 16.5. The upper benches will be mined either directly from the surface or by returning on some of the final south wall benches.

Figure 16.5: Phase 2 Design



Phase 3 is the third intermediate phase. It is approximately 1,400m long, 840 m wide, and 160 m deep. The design is presented on Figure 16.6. A double-lane ramp was included in the northern wall for mining the upper benches. When the phase reaches the depth to continue the main ramp on the south wall, access will be switched to this ramp and continued to be driven down.

Figure 16.6: Phase 3 Design



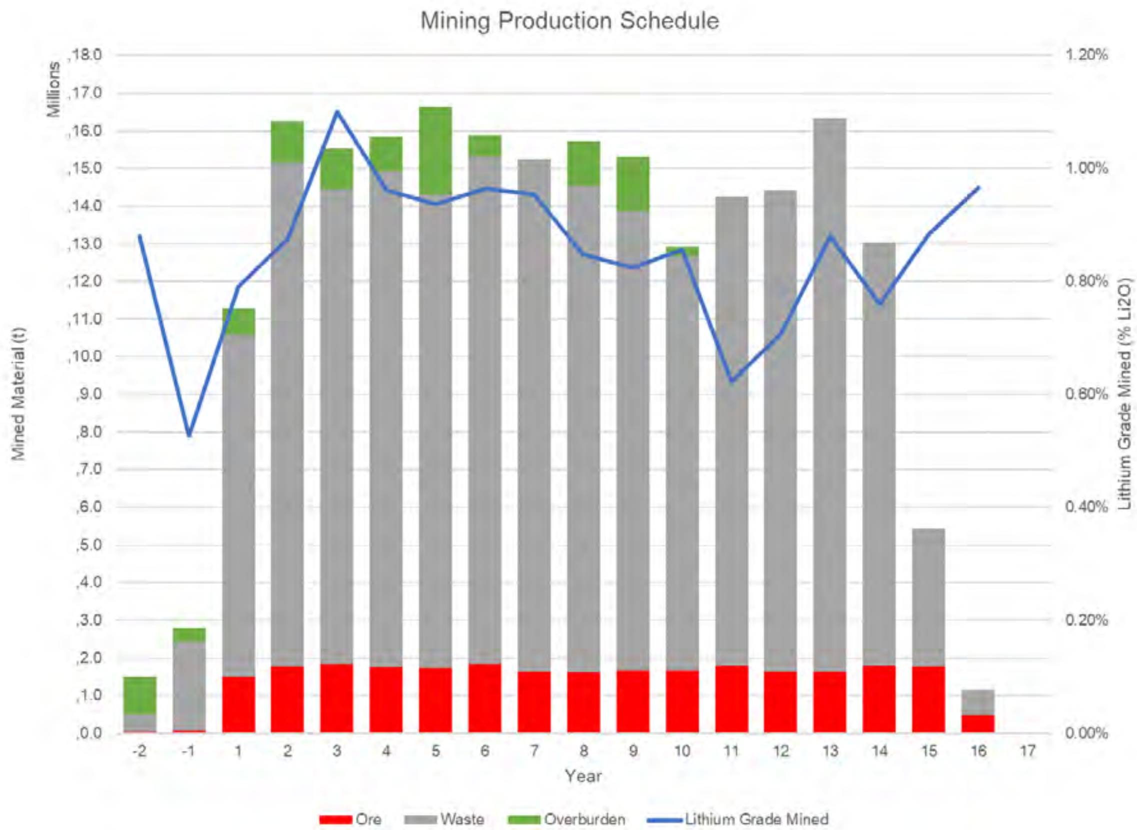
Phase 4 is the ultimate pit phase design and was previously presented on Figure 16.3. The upper benches of this phase will also be mined either directly from surface or by returning on some of the south wall benches.

16.5 Mine Production Schedule

The LOM for the Project is based on an ore processing rate of 4,600 tpd and 350 operating days per calendar year. The LOM plan was prepared to supply the required ore quantities to the mill while reducing the overall quantities of material to be mined and to send higher grading ore to the mill in the first years of operation. Year 1 represents the start of the production period as the mill begins to process ore. Critical Elements will undertake the mining of all hard rock material with its own equipment fleet and operators, while a mining contractor will undertake all overburden mining and stockpiling work.

Figure 16.7 presents a graph of the mining production plan.

Figure 16.7: Mining Production Plan Graph



For the pre-production period, mining will occur only in Phase 1. This period will last 19 months. During this period, the mining contractor will begin overburden removal work and a single backhoe excavator will have sufficient capacity to load all the hard rock material in the mine plan. All ore will be stockpiled to prepare for the start-up of the mill. A total of 4.3Mt of material will be mined, including 1.4Mt of overburden, 2.8Mt of waste, and 0.1Mt of ore.

In Year 1, the production rate increases to mine just enough ore material to feed the mill. As of Year 2, Phase 2 overburden removal is started, and Phase 3 is started in Year 4. The final phase, Phase 4, is started in Year 8. A hard rock mining rate between 11.0 and 16.0 Mt is maintained until Year 14, followed by a gradual reduction to the end of mine life, as sufficient ore material is accessible.

Strip ratios in the first nine years range between 6.4 and 8.7.The overall strip ratio for the Project is 7.35.

This production plan produces enough ore material to supply the mill, except for Year 13 and the two final years of operation, where a significant portion of the ore feed will come from the ore stockpile.

16.6 Ore Stockpile Management

A stockpile capable of storing up to 3.9 Mt of ore was designed by WSP. The design criteria for this stockpile are elaborated in Item 18.1.

The ore stockpile area is located directly to the east of the crusher and just to the south-west of the main ramp exit and will store any surplus ore that is mined at any given time. An area capable of storing some ore on the Run-of-Mine pad is also available to manage spontaneous issues with the crusher.

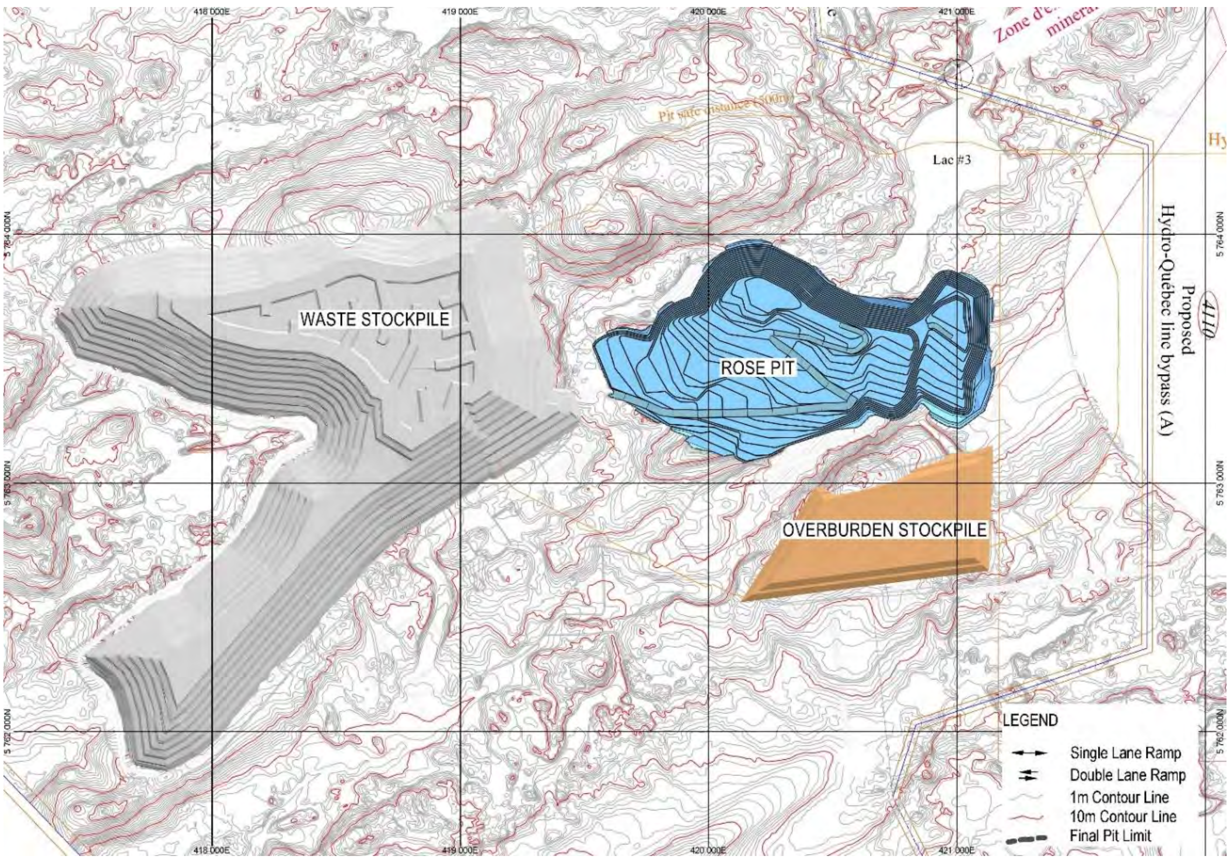
During the pre-production period, all ore material mined from the pit is stockpiled. During the production period, ore exiting the mine is sent to the crusher, as this material has precedence over material from the ore stockpile. This process will reduce the quantity of material to be re-handled. During production periods where more ore material is mined than can be processed, lower grading ore is sent to the stockpile to ensure that higher grading ore is processed earlier. Only during production periods where insufficient ore is mined will ore be reclaimed from the stockpile.

16.7 Waste and Tailings Management

Two piles have been designed for the storage of waste material. One large waste rock pile is located directly to the west of the pit and near the main ramp exit, and one overburden pile is located to the south of the pit, as presented on Figure 16.8.

The waste stockpile will be constructed in two phases. A co-disposal strategy will be used to store both the dry tailings produced by the mill and the mined waste rock material on the waste stockpile. However, the strategy should be reviewed for both operational efficiency and geotechnical stability (Item 18).

Figure 16.8: Stockpile Map



Some waste material will be needed for mining the upper benches of Phase 2 and 4. As previously described, the upper benches of Phase 2 and 4 will be mined by returning on some of the south wall benches via temporary ramps. As such, waste material will be used to create temporary ramps from the main ramp and to backfill some narrow benches to allow for haulage trucks to travel safely. These quantities were not considered in the deposition plan as they are not significant and could be re-handled throughout the final years.

16.8 Mining Operation

The mining operation will run 24 hours per day and all year round, based on a 350-day year. The equipment performance indexes were estimated to properly evaluate the number of each type of main production equipment needed.

The mechanical availability of an equipment is defined as the percentage of time that the equipment is mechanically functional. For the haulage and loading equipment, an initial mechanical availability of 90% was used in the beginning of the Project, with a gradual reduction to 82% at the end of the mine life. For the drills, a constant 82% mechanical availability was used, as this equipment tends to work in more difficult conditions. All other equipment were considered to have a constant 85% mechanical availability.

The use of availability of equipment is defined as the percentage of time that the equipment is running when mechanically available. This factor accounts for all delays such as lunch breaks and shift changes. The use of availability, for the haul trucks, the production backhoe excavator and the production wheel loader, was 82.5%, and the electric shovel was 83.9%. Table 16.3 and Table 16.4 present the delays considered. The electric shovel does not need to be re-fueled, so this delay does not apply. The production drills were assigned a use of availability of 75%. All other equipment were given various rates depending on the needs of the operation. For example, while the water trucks are necessary, they will not be constantly in operation, so a lower rate was considered to reflect the need.

Table 16.3: Delays Attributed to the Haul Trucks, Backhoe Excavator, and Production Wheel Loader

Non-Operating Periods	Daily (min)	Daily (hr)
Tool box meeting and dispatch	20.0	0.33
Beginning of day (mobilize)	20.0	0.33
Start-up checks (walk-around)	30.0	0.50
Fueling	20.0	0.33
Lunch (including stop/start)	120.0	2.00
Shift change	0.0	0.00
End of day (demobilize)	20.0	0.33
Blast (applied per day)	0.1	0.00
Security meeting	4.3	0.07
Delays due to rotation change	17.1	0.29
TOTAL	251.5	4.19

Table 16.4: Delays Attributed to the Electric Front Shovel

Non-Operating Periods	Daily (min)	Daily (hr)
Tool box meeting and dispatch	20.0	0.33
Beginning of day (mobilize)	20.0	0.33
Start-up checks (walk around)	30.0	0.50
Fueling	0.0	0.00
Lunch (including stop/start)	120.0	2.00
Shift change	0.0	0.00
End of day (demobilize)	20.0	0.33
Blast (applied per day)	0.1	0.00
Security meeting	4.3	0.07
Delays due to rotation change	17.1	0.29
TOTAL	231.5	3.86

The efficiency of the equipment is defined as the percentage of time that the equipment is used for actual production work when running. For example, when a shovel operator cleans his bench and moves to better position the shovel with regards to the excavation face, the shovel is mechanically available, and it is running. However, the shovel is not loading any material into a truck, so it is not producing. The efficiency index considers this unproductive time. A proportion of 55 efficient work minutes per 60-minute hour was used for the Project.

The product of all these indexes is the overall equipment efficiency (OEE). These factors were used to determine the quantity of equipment needed and the production rates. Furthermore, these rates were used to evaluate the consumables costs (i.e. tires, wear parts, fuel, etc.) and the manpower needs for each equipment.

16.9 Loading

Several factors contributed to the selection of the type of loading equipment for the mining operation. First, as the mineralized pegmatite dykes are narrow and dip sub-horizontally (between 5° and 25°), a small backhoe excavator was evaluated for ore mining purposes. Furthermore, to reduce dilution, it is planned for mineralized areas to be mined in 5 m flitches. Based on the production targets and these operational constraints, a 7.4 m³ backhoe excavator was selected.

Second, as the pit has a relatively high strip ratio, an equipment capable of loading greater quantities of waste rock was desired, therefore, a 15 m³ hydraulic front shovel was selected. Given that the operation is connected to Hydro-Québec's hydroelectric grid, this equipment will be electrically driven, thus reducing power costs and gas emissions.

Third, a 13.8 m³ production wheel loader was added to the loading fleet, as it will provide operational flexibility. This equipment can quickly be dispatched to anywhere in the pit or to the ore stockpile.

Given the varying thickness of the mineralized zones, some instances where the ore zone is thick enough to be mined by the front shovel or the wheel loader should be evaluated during the operation.

16.10 Hauling

As there are two different sized loading shovels, two different types of trucks will be used. The ±65 t payload trucks will be paired with the backhoe excavator and the ±135 t payload trucks will be paired with the hydraulic front shovel and the production wheel loader. The ±65 t payload trucks will be used for transporting both ore and waste material out of the pit, while the ±135 t payload trucks will be used to transport mined waste material out of the pit, reclaimed ore from the ore stockpile to the crusher, and the dry tailings to the waste stockpile.

The ±135 t haul trucks will haul all the stockpiled ore to the crusher and the tailings from the tailings plant to the waste stockpile. To consider crusher down times (both expected and unexpected), 5% of all ore from the pit that should have been sent directly to the crusher was considered to be sent to the ore stockpile and re-handled within the same period. Furthermore, as the tailings will be stockpiled in the same area as the waste from the pit, the mine operation haul trucks will also transport this material.

The haul fleet requirements meet the production objectives of the LOM and were adjusted to optimize the purchase and replacement plan. The requirements are based on haul cycles times for each year of mining by material type, by phase, and by truck type. Conservative average truck speeds per segment type (i.e. loaded/unloaded, uphill/flat/downhill, etc.) were used to calculate the haul cycle times.

16.11 Drilling

Most production drilling will occur in waste as the strip ratio for the Project is high. Two high-capacity rotary diesel blasthole drills are dedicated to drilling waste panels, whereas drilling in ore panels will be performed by a down-the-hole drill rig. The down-the-hole drill is also suited to perform pre-splitting of the final walls. During the pre-production period, this drill will also perform all drilling in waste panels.

Table 16.5 presents the drilling patterns for the ore and waste blasts and the pre-split holes.

Table 16.5: Ore, Waste, and Pre-Split Drilling Patterns

Parameters		Ore	Waste		Pre-Split
Drillhole diameter	(mm)	152.4	228.6	152.4	101.6
Burden	(m)	4.5	7.0	5.3	
Spacing	(m)	3.0	5.0	3.0	1.3
Bench height	(m)	10.0	10.0	10.0	10.0
Sub-drilling	(m)	0.8	0.8	0.8	0.0%
Total length	(m)	10.8	10.8	10.8	10.0
Stemming	(m)	4.3	4.3	4.3	
Charge length	(m)	6.5	6.5	6.5	8.8
Powder factor	(kg/t)	0.37	0.32	0.32	

The spacing and burden dimensions of drilling patterns were designed primarily to reach a targeted powder factor for optimal blasting. This geometry was also chosen to allow a decent working area for the blasthole drills in the waste pattern and for the down-the-hole drill rig in all patterns. Pre-split holes will only be drilled for ultimate pit walls with 10 m holes at 1.25 m apart.

16.12 Blasting

The blast designs were optimized to reach a targeted powder factor (PF) for optimal blasting in each rock domain. The ore domain, mainly constituted of pegmatite and gneiss, was attributed a PF of 0.37. The waste domain was attributed a PF of 0.32.

The ore and waste blast patterns were also planned to reduce the charge density, while achieving the targeted PF, to reduce explosives costs. The designs are presented in Table 16.5.

These parameters will need to be re-evaluated with the experience gained during the mining operation. Further analyses should be performed to evaluate the particle size distribution needed for the crusher's operation. The ore blast pattern could potentially be widened and consequently reduce the PF.

16.12.1 Explosives and Accessories

A bulk emulsion, composed of ammonium nitrate pearls in an emulsion matrix, was selected as the explosive for the Project. The two components are transported and stored separately on site. These components are combined in a mobile manufacturing unit (MMU) truck on the blast panel to create the emulsion.

This type of bulk emulsion is recommended for multiple reasons:

- The product's matrix is conceived to resist the multiple transfers during the transportation to site. A total of four transfers will be required from the manufacturing plant to the blast panel (plant, transport tank truck, ISO container on site, MMU truck, blast panel).
- The addition of ammonium nitrate pearls in the emulsion increases the quality of the fragmentation and the rock heave during the blast.
- The emulsion performs well in summer and in winter.
- The emulsion is very resistant to water.

The MMU trucks will be used to pump the explosive emulsion in the blastholes. The Project will require two trucks: one operating and one as a backup.

The explosive that was selected for pre-splitting needs is a packaged emulsion in a continuous cartridge, traced with 10g/m detonating cord. The continuous explosive column provides a consistent blast pressure along the entire loaded hole resulting in a uniform tensile shearing effect, much needed for pre-splitting.

Only electronic detonators are considered for this Project, as they allow for more precise blasts and consequently provide better control on rock projection and vibrations. Their high precision leads to more stable highwalls, fewer misfires, reduced oversize and undersize rock fragments, and a better rock heave.

All the equipment and consumables will be provided by the explosive supplier, except for the stemming material which will be provided by the mine.

16.12.2 Site-Mixed Emulsion Facility

A site-mixed emulsion facility will be built for the Project. All the civil and earth works for the plant will be managed by the mine during pre-production. A geotechnical study, site preparation, foundations, sanitary systems, electricity, potable water, process water, and the required lifting equipment will be provided by the mine.

The explosive supplier will oversee the construction of the facility. For the magnitude of the Project, a storage capacity of 40,000 kg of bulk emulsion, 52,000 kg of ANP, 20,000 kg of package emulsion, and 15,000 detonator units are required. Also, a heated truck shop for the MMU truck maintenance and office space are necessary. The site selection meets the minimum distance requirements as specified by Natural Resources Canada Explosives Regulatory Division.

16.12.3 Blast Monitoring

As dilution control and mining recovery will be important factors for the mining operation, it will be essential to monitor the movement of each blast in mineralized areas. As such, a monitoring system has been considered for the Project. Beacons will be placed strategically in holes throughout the ore blast patterns. The position of these beacons will be surveyed before and after each blast. The geology department will then be able to re-interpret the location of the ore after each blast.

By monitoring the movement of each blast, the drill and blast technicians will be able to adjust the patterns and blast sequences in order to improve the heave of the ore blasts and, consequently, dilution and recovery.

16.13 Stockpile and Road Maintenance and Mine Services

Several other equipment will be needed to operate the mine to support the main production fleet. A wheel dozer and some motor graders will be required to maintain cleared roads and pit floors. Several bulldozers will be needed to maintain the waste and ore stockpiles. An auxiliary excavator will be required for scaling and general work around the pit and will also have a hammer attachment to break oversize rocks. A smaller wheel loader will be required also for general work around the pit and to move the electrical equipment required to power the electric hydraulic shovel (i.e. cables and substation). Some trucks will be required to spray the pit roads with water in the warmer months to suppress dust and to spread sand in the winter for better traction. A fuel and lube truck will be needed to replenish all track-mounted and stationary equipment.

16.14 Equipment Summary

A detailed list of all the main production mining equipment required per year throughout the mine life is presented in Table 16.6. Other smaller equipment, such as transport vehicles and tower lights, are also required for the operation of the mine.

Table 16.6: Mining Equipment Fleet

Mining Fleet	Year																		Max.
	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Backhoe excavator	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Electric front shovel	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Production wheel loader	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Haul trucks (65 t)	0	0	0	5	5	5	6	6	6	6	6	6	6	8	8	8	8	8	0	8
Haul trucks (135 t)	0	0	0	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	0	7
Rotary drills	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	0	2
DTH drills	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Bulldozers	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Wheel dozer	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1
Motor graders	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
Auxiliary excavator	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Auxiliary wheel loader	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Water/sand trucks	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1

16.15 Mine Dewatering

Shallow lakes and rivers characterize the area around the pit. In fact, two lakes are within the pit limits and will be pumped during the pre-production period. As previously explained in Item 15, an exclusion zone surrounding a third lake to the north of the pit was included in the pit optimization simulations, as per the request of Critical Elements. Also, the reservoir for Hydro-Québec's Eastmain complex is located directly to the east of the pit.

The precipitation and weather values considered are the 30-year average values measured at the 'La Grande Rivière A' station between 1971 and 2000. The groundwater measurements have indicated high flow rates in the pit. As this quantity would be too great to handle with an in-pit dewatering network, dewatering wells will be drilled around the pit to prevent inflow to the mine (see Item 18.13.4 for further details on the dewatering wells). This strategy is also conservative as the geotechnical analysis was evaluated only under dry conditions. As such, mine dewatering needs in the pit are limited to precipitation and an estimated 100 m^3/hr of inflow.

During the pre-production period, all dewatering work will be executed by the mining contractor. During the production period, a combination of diesel-powered pumps will be used to dewater the pit. Diesel powered pumps were considered as they can be easily moved anywhere in the pit, however the use of electric pumps should be considered in future studies.

A complete review of mine dewatering needs is necessary once a hydrogeological model of the site is completed.

16.16 Maintenance

The maintenance department will consist mainly of mechanics, mechanic helpers, welders, and electricians. The ratio used to estimate the personnel needs for this department is 60% of the total operators of the main production mining departments. Furthermore, maintenance planners will coordinate all maintenance work.

While the Project is remotely located, it is still easily accessible year-round by road. As such, damaged parts can easily be sent out to the equipment suppliers for repairs or be replaced with new ones, and specialized personnel can be sent to the site for special repairs.

16.17 Engineering Department

The engineering department will be responsible for providing all production and technical support to the mining operations. The department will consist of a chief engineer, a senior engineer, planning engineers, drill and blast technicians, geotechnical and hydrogeological technicians, and surveyors.

16.18 Geology Department

The geology department will be responsible for updating all the geological information and following the mineralized zones. The department will consist of a chief geologist, a senior geologist, production geologists, and grade control technicians.

16.19 General and Administration Department

The general and administration department will be responsible for all supervision and administrative work. This department consists of the mine and technical services superintendents, the mine, pit, and maintenance foremen, a mine trainer, an administrative assistant, and some clerks.

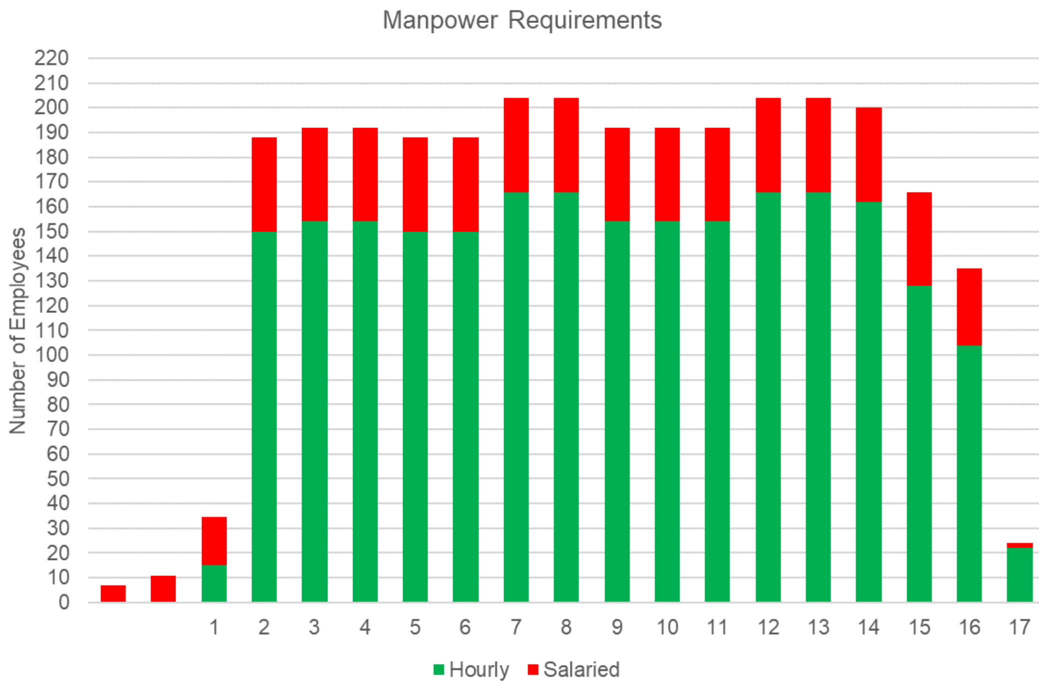
16.20 Manpower

A total of 204 employees will be needed at the peak of mining operations, excluding contractors. This manpower requirement is based on an operation that runs 24 hours per day, 7 days per week, and 350 days per year.

As the site is remotely located, the working schedule for all employees will be a fly-in/fly-out rotation of 2 working weeks and 2 rest weeks, for 12 hours each day.

Manpower requirements for the Project will vary over time, as presented on Figure 16.9. Some personnel, such as surveyors and maintenance teams, will be needed even after mining operations are completed for ore stockpile reclaiming purposes and other general activities.

Figure 16.9: Manpower Requirements



17 RECOVERY METHODS

17.1 Spodumene Plant Description

The Rose Lithium Tantalum Project is designed to process 4,900 tonnes per day (equivalent to 1,610,000 tonnes per year) of lithium ore, having a grade of 0.87% Li_2O. The layout of the process plant follows general convention in that the crusher is conveniently located adjacent to the mine and ROM pad. Mined product is delivered to the crusher dump pocket in 65-tonne trucks and occasionally, 135-tonne trucks; the pocket itself has capacity to accommodate a little over 1.5 truckloads (135-tonne trucks). Truck traffic to and from the pocket is controlled to eliminate queues and to improve operational safety.

The crushing plant has sufficient capacity to feed the process plant at 50% availability or 12 hours per day. The remaining time will be reserved for maintenance, clean-up and other non-production activities, or production activities when required.

An apron feeder delivers the material to the primary jaw crusher where it is reduced prior to screening, secondary and tertiary crushing.

The crushing operations are concentrated in two separate buildings. The first building calls 'transfer building' contains the primary vibrating screen and the second building (main building) houses the secondary vibrating screen and the jaw, secondary and tertiary crushers.

A central plant control room brings the plant operators together thereby improving communications. The streamlined operations could be supported by a single operator in the control room of the main building and cover all the operation values chain including the water management.

The crushing product (80% passing 13 mm) is delivered to a storage area, a covered dome structure, and reclaimed by belt feeders on a conveyor to be delivered to the concentrator.

Ore processing starts in a ball mill in closed circuit with classifier (cyclones), through two (2) wet magnetic separators where the magnetic particles and tantalite components are removed from the feed. Bumigeme`s flow sheet is based on trials at SGS and includes these steps:

1) Reject slimes
2) Reject mica (after tantalite recovery)
3) Scrubbing (at high density)
4) Conditioning at high density (60% to 65% pulp density; this step activates the spodumene)
5) Dewatering: getting rid of high pH and slimes to increase density.
6) Washing pulp, then floating lithium product (Li_2O).

From the magnetic concentrators, a small amount of tantalite is recovered on a daily basis. The non-magnetic ore, after scrubbing and desliming, passes through a flotation system.

Spodumene product (> 5.5% Li_2O) is recovered and dewatered on a pressure filter. The filter cake product is conveyed to a storage area for shipping by trucks and train to the port. The process flow sheet, supported by test-work, is designed to yield > 85% of Lithium recovery. Tailings are dewatered and co-disposed with waste rocks of by dry stacking.

The following sections cover the process plant with emphasis on the spodumene concentrator. The main spodumene plant or concentrator consists of beneficiation and dewatering areas.

The concentrator will be designed to produce a spodumene concentrate grading 6.16% Li2O (technical grade) or higher. However, spodumene concentrate grading 5.56% (chemical grade) could also be produced. Spodumene concentrate will be recovered by froth flotation.

To achieve this concentration, the beneficiation processes include grinding, magnetic separation, and flotation. The spodumene concentrate, tantalum concentrate, and tailings will undergo further steps of thickening, filtration, drying, and material handling, including storage and loading. Filtered spodumene concentrate will be loaded on trucks and the tantalum concentrate will be bagged for shipping. Tailings will be dry stacked in the waste rock facility.

Shipping of dried spodumene concentrate (moisture level below 5%) is recommended in the winter months. This is primarily done to avoid freezing of the product over long distances and over a period of several days. The experience of other mines illustrates the fact that product could freeze solid if moisture content is > 6%. Thus, unloading at the destination (or shipping port) can be difficult and could require a number of remedial steps such as thawing, breaking up of the frozen cake, shipping delays, loss of product and other undesirable situations.

Plant layout has yet to be optimized more rigorously; however, at this stage the layout is designed with an eye on the flow of materials. As real estate, the land area is not limited Accessibility to plant and equipment is paramount and working areas are spread out to avoid congestion, facilitate maintenance routines and shutdowns and improve safety overall. A travelling overhead crane runs the length of the crusher and concentrator buildings and will provide lifting power when needed.

Dust levels are controlled by local de-dusting equipment and a comfortable ambient temperature is maintained in work areas. Provincial and local regulations regarding work place safety, fire detection/protection, noise and dust control, have been dutifully considered. However, in the next phase of engineering these topics will be scrutinized in greater detail.

17.2 Process Design Criteria

All throughput rates were based on milling of 1,610,000 dry tonnes per year. The spodumene process flowsheet retained is capable of producing spodumene concentrates grading > 5.5% Li2O.

Tantalum concentrate grading 2% Ta2O5 will be produced. Further, 20% Ta2O5 could be produced by adding gravity concentration equipment as demonstrated by the ongoing test work at SGS. As explained in Chapter 13.7, this section will start as a pilot plant to improve the process developed by SGS.

Based on the feed variability simulations developed by Outotec Finland, 'Feed Variability Simulation of Critical Elements Spodumene Concentrator', Outotec Report 17015-MP-R Confidential September, 2017, the spodumene plant will be able to produce a spodumene concentrate, grading 6.16% Li2O with a lithium recovery of 84.8% at feed grade of 0.87% Li2O.

The spodumene plant will operate 24 hours per day, 7 days per week, and 52 weeks per year. The concentrator operating availability will be 90%, and the crushing plant will be operated at 50% availability. The concentrator capacity has been established at a nominal throughput rate of 4,900 dry tonnes per day.

The process design criteria is presented in Table 17.1.

Table 17.1 : Process Design Basis

Parameter	Units	Value

Total ore processing rate	Dry tons per year	1,610,000
Nominal ore processing rate	Dry tons per day	4,900
Ore moisture	%	3.0
Spodumene ore feed grade (Li_2O)	%	0.87
Tantalum ore feed grade (Ta_2O_5)	%	0.0138
Crusher operating time	%	50.0
Nominal ore crushing rate	Dry tons per hour	408.3
Concentrator operating time	%	90.0
Design ore processing rate	Dry tons per hour	226.9
Tantalum concentrate grade (Ta_2O_5)	%	2.0
Tantalite concentrate recovery	%	40.0
Spodumene concentrate grade	%	5.56
Spodumene concentrate recovery	%	87.4
Spodumene concentrate production	Dry tons per year	203,765

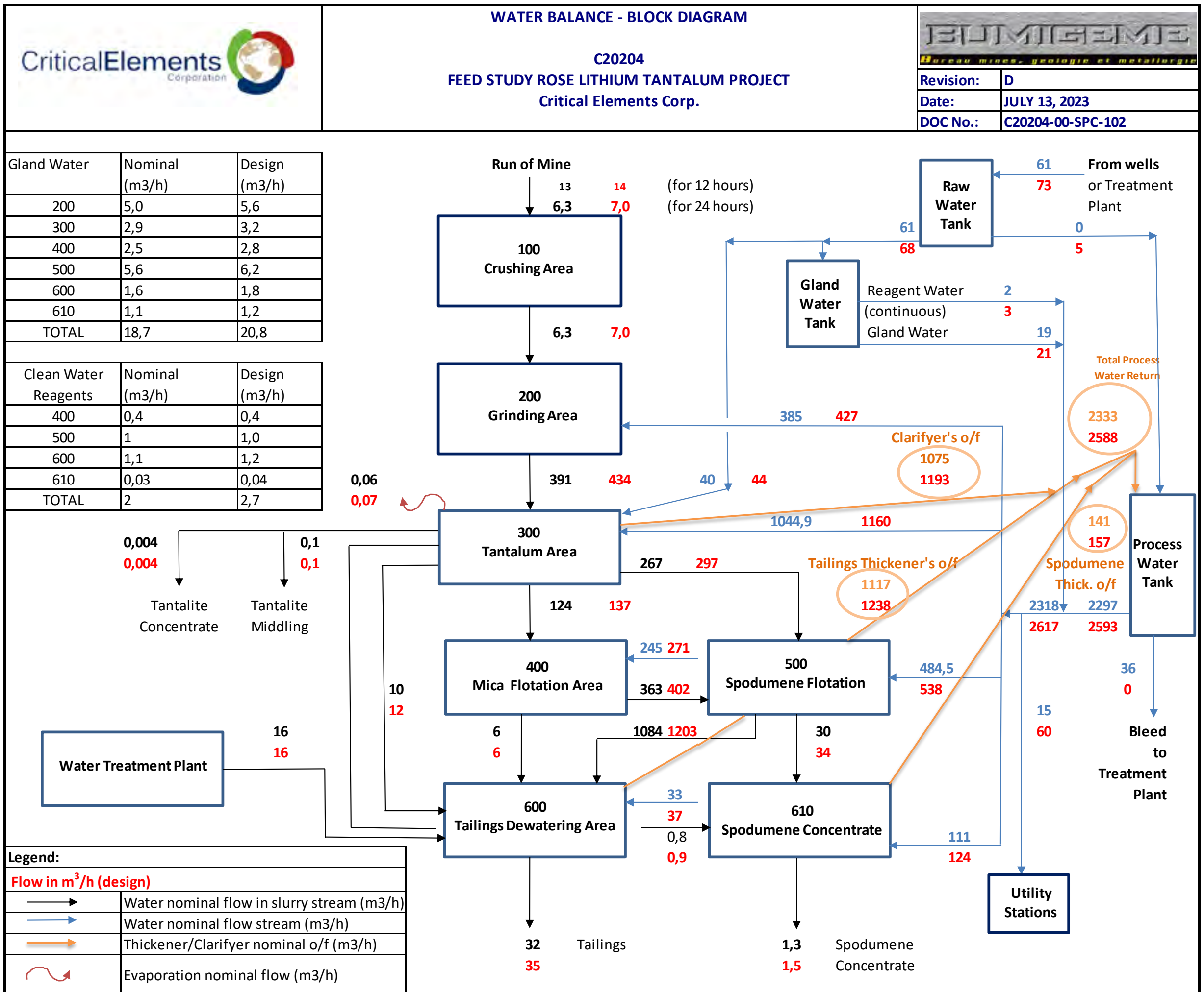
17.3 Mass Balance and Water Balance

Table 17.2 shows the summary of the mass balance and Figure 17.1 shows the water balance for the spodumene plant. See Appendix 17-A for design criteria, detailed mass balance and water balance.

Table 17.2 : Summary Spodumene plant Process Mass Balance

Mass Entering System				Mass Exiting System			
Streams	Dry Solids (t/d)	Water (m^3/d)	Total Mass (t/d)	Streams	Dry Solids (t/d)	Water (m^3/d)	Total Mass (t/d)
Fresh water from well and treatment plant		1,464	1,464	Evaporation from Tantalite dryer		1.4	1.4
Spodumene ore to plant	4,896	152	5,052	Tantalite concentrate	0.48	0.005	0.49
Water Treatment Plant Studge to Tailings Thickener		384	384	Tantalite middlings	1.85	0.33	2.2
				Spodumene concentrate	598	31	624
				Final tailings	4,294	758	5,042
				Bleed to water Treatment		864	864
				Utility Stations		360	360
Total In	4,896	2,000	6,900	Total Out	4,894	2,015	6,904

Figure 17.1 : Water Balance



Gland Water	Nominal (m3/h)	Design (m3/h)
200	5,0	5,6
300	2,9	3,2
400	2,5	2,8
500	5,6	6,2
600	1,6	1,8
610	1,1	1,2
TOTAL	18,7	20,8

Clean Water Reagents	Nominal (m3/h)	Design (m3/h)
400	0,4	0,4
500	1	1,0
600	1,1	1,2
610	0,03	0,04
TOTAL	2	2,7

NOMINAL

Area	IN	OUT
100	6,3	6,3
200	391	391
300	1476	1477
400	368	368
500	1114	1114
600	1149	1149
610	143	143
Proc. Water	2352	2354
Fresh Water	61	61
Mill	83	84

DESIGN

Area	IN	OUT
100	7	7
200	434	434
300	1639	1638
400	409	409
500	1237	1237
600	1273	1273
610	158	158
Proc. Water	2614	2617
Fresh Water	73	73
Mill	96	97

17.4 Flowsheets and Process Description

Simplified flowsheet indicating the process is presented on Figure 17.2. Detailed process flowsheets have been developed and are presented in Appendix 17-B. The crushing facility can operate independent of the concentrator. The concentrator has three distinct areas, magnetic separation for tantalum recovery, flotation for mica, and spodumene concentrates and thickening, filtration, drying and loading.

The detailed description of the process areas is given below.

17.4.1 Crushing

The crushing section includes jaw crusher and secondary and tertiary cone crushers and screens.

The ROM ore will be dumped onto a feed ore hopper by the mine haul trucks. The grizzly feeder installed under the hopper feeds the oversize to the jaw crusher. The jaw crusher breaks the ore being fed at (F100) 850 mm, (F80) 600 mm and the broken material along with the grizzly feeder undersize will be transported via conveyor No. 1 to the No. 1 double deck screen. The jaw crusher discharge will have a particle size distribution of 80 % less than (P80) 150 mm. The undersize (P80), 13mm passing trough the primary screen is conveyed to the crushed ore stockpile dome. The oversizes from the two top decks are conveyed by conveyor No. 3 to the No. 2 secondary two deck screen. The oversize from the secondary screen (top deck), feeds the secondary cone crusher and the oversize of the lower deck feeds the tertiary cone crusher. Both cone crushers discharge on the No. 1 belt conveyor. The secondary cone crusher reduces the ore to a (P80), 39mm and the tertiary cone to a (P80), 13mm.

A dust collector allows for maintenance of a dust-free area. Self-cleaning magnet and metal detector located on the conveyors will eliminate the possibility of metallic objects being carried along.

17.4.2 Crushed Ore Storage Dome

Crushed ore will be stored in a storage dome having 24 hours stockpile live capacity. The stockpile has been designed to hold ore stock for two (2) days of uninterrupted milling capacity.

Ore will be withdrawn from the crushed ore stockpile using three (3) belt feeders. The operating belt feeders transfer the crushed ore via conveyor No. 14 to the ball mill.

17.4.3 Grinding

The grinding circuit consists of a ball mill operated in closed circuit with DECyclones clusters. The two-stage cyclone classification system minimizes overgrinding of spodumene ore and helps minimize spodumene losses as slimes.

The ball mill is fed with (F100), 16 mm, (F80), 13 mm crushed ore and delivers (P80), 200 µm grinded ore. The underflow from the 2nd stage cyclone cluster will be returned to the mill for grinding, while the overflow is sent to a wet magnetic separation circuit.

Primary and secondary pulp samplers are installed on the combined overflow and collect samples at regular interval for determining the head assays.

17.4.4 Tantalum Recovery

Wet magnetic separation will be performed in two stages, rougher and scavenger magnetic separation for recovering magnetic tantalum minerals from the feed.

The magnetic tantalum concentrates recovered will be sent to a vibrating screen and then stored in a magnetics silo. The oversize captured in the screen are directed to a regrind mill to reduce its granulometry down to 150 µm (P80). The grinded magnetics ore is then recirculated back to the vibrating screen. The magnetics silo feeds a gravity concentrator followed by a Wilfley table which splits the magnetics in three separate streams: the tailings, the concentrate tantalum and the middlings. The tailings are directly pumped to the tailings thickener, the concentrate and the middlings are stored in individual silos. The following step in the process of extracting the tantalum consists in passing batches of concentrate and middlings, in alternating sequences, through a pan filter. The middling filter cake is collected and stored in bags. The concentrate filter cake is collected in a tray, dried in an oven and collected in drums. The dryer removes residual moisture down to 1% by weight to store the tantalum concentrate in bags for shipment.

A pulp sampler installed on the magnetic product stream determines the tantalum concentrate grade. Another sampler is located on the tailings stream at the exit of the Wilfley table. Those samplers will be installed only at final process tantalum flowsheet.

17.4.5 Mica Flotation

The removal of slimes is done prior to mica flotation to improve flotation performance and reduce the reagent dosage, as slimes have a tendency to increase the reagent consumption. The cyclone underflow will be conditioned with AERO 3030C and Soda ash (Na2CO3) for floating mica.

In mica flotation, the floated mica will be considered as tailings. There will be two (2) stages of mica flotation. The first stage is the rougher mica flotation stage to remove as much liberated mica as possible and the second stage is a cleaner flotation stage, which releases the entrained spodumene particles back into the beneficiation process. The mica cleaner concentrate goes to the tailings thickener. The mica rougher and cleaner tailings go to the attrition circuit for further processing.

A primary and secondary pulp samplers are installed on the feed line to the mica flotation area. A third sampler is installed on the mica rejects line.

17.4.6 Attrition

A dewatering cyclone step prepares the feed for attrition. The attrition scrubbing circuit will remove deleterious slimes prior to spodumene flotation. Caustic soda (NaOH) and Sodium lignosulfonate dispersant will be added to facilitate scrubbing. The attrition step has to be performed at a higher pulp density (60% solids) to be effective.

A desliming cyclones cluster will remove slimes generated from attrition prior to spodumene flotation and provides the high slurry density required for spodumene ore conditioning.

17.4.7 Spodumene Flotation

The spodumene flotation circuit starts with high density conditioning. High density conditioning is a process requirement to obtain proper flotation results. Sodium lignosulfonate dispersant, soda ash (Na2CO3) and Fatty acid collector will be added to high density conditioning (60%) tank. Slurry is then diluted in separate tank at approximately 40% solids.

Spodumene flotation will be a standard rougher–scavenger and cleaner flotation process. The spodumene will be floated to produce a rougher concentrate. To minimize spodumene losses during flotation, the rougher tailings will be further floated in a scavenger flotation circuit. The rougher and scavenger concentrates undergoes two-stage cleaning to produce a high grade spodumene concentrate (>6.0% Li2O technical grade or chemical grade at > 5.5% Li2O depending on the market conditions). Sodium lignosulfonate dispersant and Fatty acid collector will be added to the cleaner flotation to improve performance. The second cleaner flotation concentrate will be pumped to the concentrate thickener. The first cleaner tailings return to the rougher circuit.

Several pulp samplers are installed in the spodumene flotation area:

— A primary and secondary samplers on the feed to the attrition scrubber.
— A primary and secondary samplers on the feed to the rougher flotation cells.
— A single sampler between the rougher and the scavenger circuits.

— A primary and secondary samplers on the tailings stream at the exit of the scavenger flotation circuit.
— A single sampler on the spodumene concentrate effluent sent to the dewatering area.

17.4.8 Spodumene Concentrate Dewatering and Storage

Spodumene cleaner flotation concentrate from second cleaner will be thickened to 65% solids in a high-rate thickener. The thickened concentrate will then be filtered to 5% moisture on a pressure filter. The filtered concentrate will be stored in a dome with a capacity of 24 hours. Trucks and train will be used to ship the concentrate to the port.

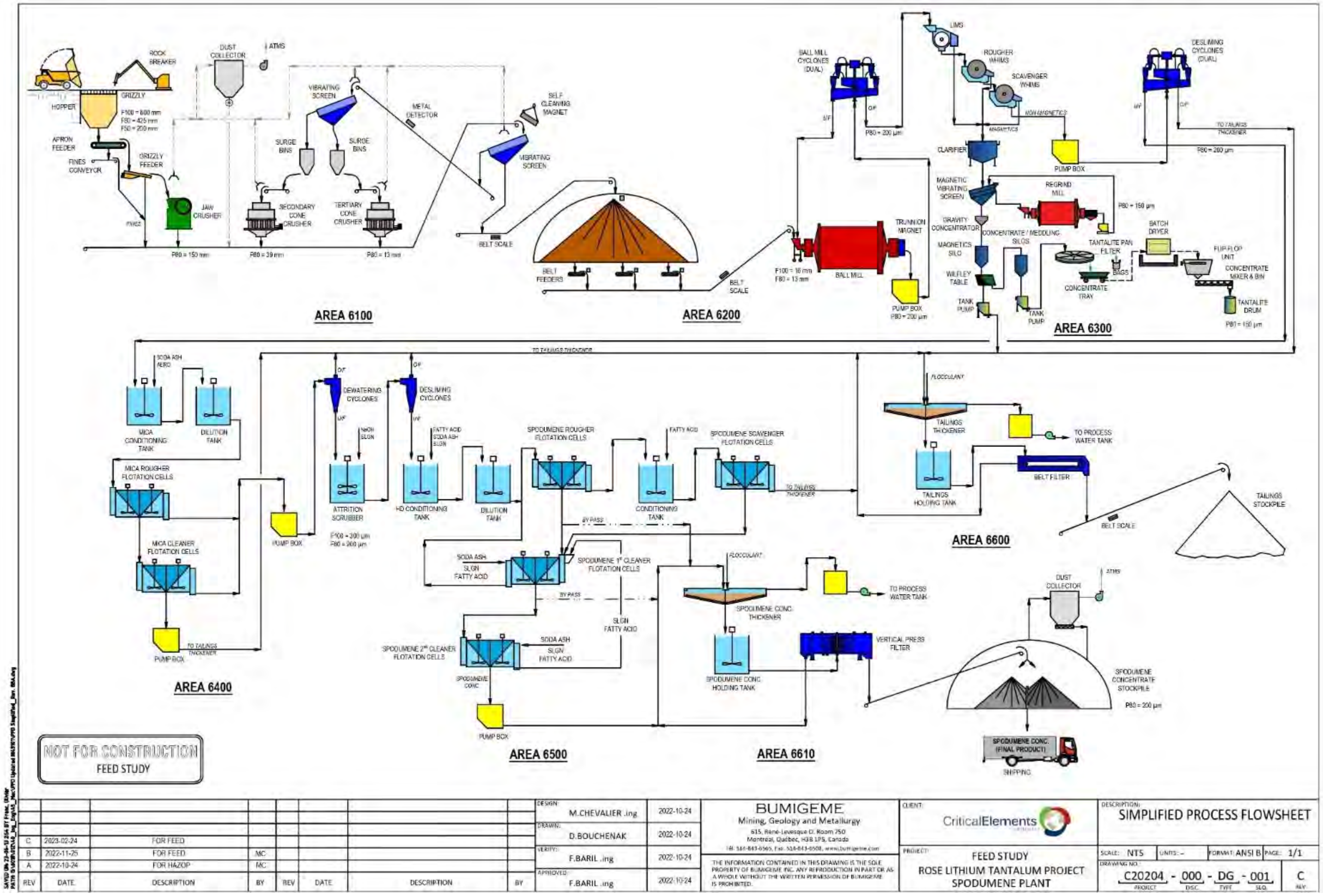
17.4.9 Tailings Dewatering and Storage

Tailings from several locations in the plant will be collected and thickened to 60% solids in a high-rate thickener. The thickened tailings will be filtered to 15% moisture using a belt filter. The filtered tailings will be discharged on a conveyor that brings the dried tailings to the tailings stockpile building near of the concentrator. Storage capacity of the tailings stockpile building is 12 hours.

A primary and secondary pulp samplers are installed on the tailings line feeding to the belt filter.

Mine haul trucks transport the tailings to the waste rock facility disposal area.

Figure 17.2 : Simplified Process Flowsheet



17.5 Spodumene Plant – Equipment Sizing and Selection

The equipment selection was based on the design criteria developed from the metallurgical test work. The equipment list was prepared and the equipment was sized according to the developed design criteria, the flowsheet drawings, and the mass balance. An equipment list is presented in Appendix 17-C.

17.5.1 Primary Crushing

The main crushing building houses the ore hopper, stationary grizzly (600mm x 600mm), rock breaker, the vibrating grizzly feeder, the jaw crusher, the screen No. 1 and the secondary & tertiary cone crushers. ROM ore will be hauled from the open pit mine. The mine haul trucks dump directly into the ore hopper. A stationary grizzly installed on the hopper prevents oversized rocks reporting to the jaw crusher. A rock breaker breaks the oversize boulders. A vibrating grizzly feeder extracts the ore from the hopper and feeds the oversize to a 224 KW jaw crusher. The undersize, less than (P80) 135 mm in size bypass jaw crusher. The crushed ore and the fines will be conveyed to screen No.2.

A 25-tonne overhead crane installed in the main crushers building will be used for maintenance. A dust collector with various pickup points collects dust generated at conveyor discharges and transfer points.

17.5.2 Secondary and Tertiary Crushing

The crushed ore from the jaw crusher, secondary and tertiary cone crushers will be screened on the No.2 vibrating screen double-deck screen with first (50 mm) and second (18 mm) decks screen aperture.

The oversize from the top deck will be crushed in the secondary cone crusher of 315 kW producing crushed ore, at a (P80) of 39 mm.

The oversize from the bottom deck will be crushed in the tertiary cone crusher of 315 kW and will produce crushed ore at a P80 of 13 mm (P100 of 16 mm).

17.5.3 Crushed Ore Storage Dome

The crushed ore is conveyed to a storage dome which is located outside the crushing buildings, close to the mill. The crushed ore storage dome is 50 m diameter x 24 m high and will have a live storage capacity of 24 hours.

Three variable speed belt feeders are installed under the storage dome. Two belt feeders are capable of supplying the rated tonnage to the ball mill. The feeders discharge the ore on the mill feed conveyors.

Bin vent type dust collectors control dust emissions from the storage dome and the belt feeders.

17.5.4 Grinding

Grinding will be performed in an overflow discharge ball mill. The ball mill, 5.2 m diameter x 8.8 m long, with 4000 kW motor will be operated in closed circuit with a DECyclones classification system. Grinding is performed using 75 mm dia. grinding balls at a ball load of ~285 tonnes. Mill discharge will be pumped to the DECyclone cluster (6 cyclones) and the overflow returns to the mill for grinding while the overflow goes to the magnetic separation circuit for tantalum recovery.

A 25 tonnes overhead crane will be used for mill maintenance.

The ball mill sizing was based on the bond ball mill work index test. Two-stage classification ensures that overgrinding of the liberated spodumene ore is minimum and helps minimize generation of slimes.

17.5.5 Tantalum Recovery

The combined overflow from the two-stage cyclone clusters will be sent to a wet magnetic separation circuit to recover tantalum bearing minerals. Tantalum concentrate will be recovered in two stages. In the first stage, one 5.8 m L x 5.0 m W x 5.4 m H single drum wet magnetic separator operated at 5,000 Gauss will be used as rougher. The non-magnetics from the rougher will be sent to the second stage magnetic separation that will use one 5.8 m L x 5.0 m W x 5.4 m H single-drum magnetic separators operated at 15,000 Gauss as scavenger to recover the remaining magnetic tantalite minerals from that stream. The magnetics concentrate from both roughers and scavenger will be combined and sent to the magnetics vibrating screen (1m diameter x 1 m high), while the non-magnetics product will be further deslimed in a desliming DECyclone cluster. The cyclone cluster ensures slimes removal before mica flotation. The desliming cyclone cluster consists of twenty-eight (28) cyclones.

Once passed the vibrating screen, the magnetics are stored in a 14 m3 silo (2.5 m in diameter and 3.5 m high). The oversizes captured in the screen are directed to a 20 KW regrind mill. The magnetics silo feeds a (25 KW) Falcon type gravity concentrator of Force G 60 followed by a Wilfley table. The concentrate and the middlings separated from the tailings are stored in individual silos (1m diameter x 1 m high for the tantalum concentrate silo (0.7 m3) and 2 m diameter x 2.5 m high for the middlings silo (3.5 m3).

Tantalum concentrate from the silo will be sent to a vacuum pan filter. A batch dryer further removes the residual moisture down to 1% by weight. The dried tantalum middlings will be bagged and the tantalum concentrate will be put in drums for shipping. A pan filter will be use to dewater the tantalite concentrate and the middlings. The batch dryer requires an estimated 75 KW to remove the residual moisture in the tantalum concentrate prior to shipment.

The magnetic separators were sized using bench scale test work results. The cyclones sizing was based on optimal slimes removal.

17.5.6 Mica Flotation

The desliming DECyclone cluster underflow slurry will feed the conditioning tank by gravity, where reagents will be added for mica flotation.

The conditioned slurry will be pumped from the conditioning tank into the dilution tank to reduce the pulp density prior to mica rougher flotation.

The mica flotation circuit consists of a conditioning tank, 1.5 m diameter x 1.8 m high, equipped with 3.7 kW agitator and a dilution tank, 1.5 m diameter x 1.8 m high, equipped with 3.7 kW agitator. Mica rougher flotation consists of five tank cells in series, 20 m3 each. The rougher concentrate will be pumped to the mica cleaner flotation circuit consisting of three mechanical cells in series, 1.5 m3 each. The mica cleaner concentrate will be pumped to the tailings thickener.

In the mica flotation, undesired mica will be removed as flotation concentrate from the spodumene ore prior to spodumene flotation.

The flotation circuit was designed based on the 5 kg spodumene concentrate production test results and other bench scale tests.

17.5.7 Dewatering, Attrition and Desliming

The combined mica rougher tailings and cleaner tailings will be pumped to a dewatering cyclone cluster for increasing the percent solids of the underflow stream prior to attrition scrubbing. The dewatering cyclone cluster No.1 consists of eight (08) cyclones.

Attrition scrubbing is carried out to clean the mineral surfaces and remove slimes from the spodumene mineral surface. The dewatering cyclone cluster No.1 underflow will discharge into the attrition circuit with four (4) attrition scrubber cells of approximately 19.3 m3 each. The attrition scrubber cells residence time is of 15-20 minutes.

The scrubber discharge will be further deslimed in a desliming cyclone No.2 cluster. This cyclone cluster is required to ensure thickening before high density conditioning. The desliming cyclone cluster No.2 consists of ten (10) cyclones.

The cyclones sizing was based on optimal slime removal.

17.5.8 Spodumene Flotation

The spodumene flotation circuit is designed to produce good quality spodumene concentrate grading from 5.0% to 6.0% Li_2O with low iron content. The flotation circuit was designed based on the metallurgical test work performed at SGS Lakefield.

The desliming cyclone cluster No.2 underflow slurry will feed the high density spodumene conditioning tank by gravity. The high-density conditioning is a requirement for optimal performance of spodumene flotation.

The conditioned slurry will be pumped to a dilution tank where the slurry is diluted with process water to obtain the correct flotation pulp density for maximum performance in the spodumene rougher flotation cells. The HD Conditioning tank will be 2 m diameter x 2.3 m high; the dilution tank will be 2.5 m diameter and 2.9 m high and each will be equipped with a 9.2 kW agitator.

Spodumene rougher flotation will consist of four tank cells in series, 20 m3 each and the scavenger flotation consisting of two tank cells in series, 20 m3 each. The spodumene cleaner flotation consists of two stages of cleaning. The spodumene first cleaner flotation cells will consist of three tank cells in series, 10 m3 each, while the spodumene second cleaner flotation cells will be two tank cells in series, 10 m3 each. The second cleaner concentrate will be pumped to the spodumene concentrate thickener. The first cleaner tails return to the rougher flotation circuit.

The spodumene rougher tailings will be pumped to the conditioning tank prior to scavenger flotation. The conditioning is done in a 3 m dia. x 3.5 m tank with a 9.2 kW agitator. The conditioned slurry is then pumped to scavenger flotation. Scavenger concentrate will be pumped to the first cleaner flotation circuit, while the tailings will be pumped to the tailings thickener.

A 15-tonne overhead crane installed in the flotation area will be used for the maintenance of all flotation equipment.

17.5.9 Spodumene Concentrate Dewatering and Storage

The spodumene cleaner concentrate will be pumped to the 8 m diameter concentrate thickener. The thickener overflow will be collected in an overflow tank (4.8 m diameter x 4.0 m high). From the overflow tank, the water will be pumped to the process water tank for recirculation of process water, while the concentrate thickener underflow at 65% solids will be pumped to spodumene concentrate holding tank 7.0 m diameter x 8.0 m high. The solids will be kept in suspension with a 45-kW agitator. From the holding tank the concentrate will be pumped to the concentrate pressure filter. The filtrate will be re-circulated to the spodumene concentrate thickener by a filtrate pump.

The high-rate concentrate thickener was sized based on the results of sedimentation test work conducted at SGS. FLOPAM AN 905 VHM (MC) will be added to the thickener as the flocculant. The belt filter was sized by filtration test work results as well.

The filter cake at 5% moisture will be conveyed to a storage site of 24 hours capacity and transported by trucks and train to the port.

A 15-tonne overhead crane is installed in the spodumene dewatering area.

17.5.10 Tailings Dewatering and Storage

Various streams from the plant, including mica concentrate from mica flotation, overflows from desliming cyclone clusters, and dewatering cyclone clusters, scavenger tailings from spodumene flotation circuit will be directed to the 20 m diameter thickener. The high-rate tailings thickener size was selected based on dynamic settling tests. FLOPAM AN 905 VHM (MC) will be the flocculant that will be added to the tailings thickener.

The thickener overflow will go by gravity to the process water tank. The tailings thickener underflow at 60% solids will be pumped to the tailings holding tank 12.0 m diameter × 8.0 m high agitated with a 112 kW agitator.

From the holding tank, the tailings will be pumped to the tailings belt filter (4.4 m wide x 18.2 m long). The belt filter was sized based on filtration tests results. The filtrate will be re-circulated to the tailings thickener by a filtrate pump.

The filter cake at 15% moisture will be transported via conveyors to the dry tailings stockpile. Mine haul trucks will be used to transport the tailings to the waste rock facility.

17.6 Spodumene Plant - Reagents

17.6.1 Frothers

Frother is added to each flotation cell. The purpose of the frother is to strengthen the surface tension of the air that is injected into the flotation cell. As the air rises in the shape of bubbles, they come into contact with the mineral laden collector which attaches itself to the air. The bubbles will continue to rise until they reach the surface and flow over the launder of the flotation cells.

A tote tank of frother is to be installed in the reagent area. Frother is fed to each flotation cell circuit by a dedicated dosing pump. The frother agent proposed in this feed study is Methyl Isobutyl Carbinol (MIBC).

17.6.2 Aero 3030C Promoter

AERO 3030C is the promoter to be injected in the mica flotation conditioning tank which is operating at pH 9. This promoter is designed to operate across a broad range of alkalinity levels and its purpose is to provide a faster flotation kinetics, especially at lower alkalinity levels. AERO promoters increase grade, recovery and throughput. Ultimately, they provide a better overall metallurgical performance.

A tote tank of promoter is to be installed in the reagent area. A dosing pump will provide a precise flowrate to the only consumption point in the concentrator; the mica flotation conditioning tank.

17.6.3 Soda Ash

In flotation, pH control is a vital method to control selective mineral separation. Soda ash is an alkaline reagent of pH 11 that will help clean the surface of the mineral and strengthens the bond between the collector and the surface of each mineral particle.

Soda ash will be delivered by truck in bulk quantity. The solid soda ash will be stored in a silo and batch 15% solution will be prepared twice a day. The solution will be pumped using dosing pumps to four different locations in the mica and spodumene flotation circuit. The dosage will be based on pH measurement. The targeted pH value is 9.

17.6.4 Fatty Acid Collector

A collector is a chemical that selectively binds to the surface of target minerals and imparts hydrophobicity to those mineral particles, a necessary condition for air bubble attachment. The proposed fatty acid is CustoFloat TM 7080.

The fatty acid is delivered by truck in bulk quantity. The liquid is unloaded in an agitated storage tank to keep the product homogeneous. Dosing pumps allow to transfer the reagent to the three different injection points within the spodumene flotation area.

17.6.5 Sodium Lignosulfonate - Dispersant

Dispersant are widely used in mineral flotation to modify colloidal interactions and thus prevent particle aggregation. Sodium lignosulfonate (Pionera F220) will be delivered in 600 kg big bags. A 10% solution will be produced stored and distributed using dosing pumps to the attrition scrubber, to the spodumene rougher HD conditioning tank and to the spodumene cleaner flotation bank cells no. 1 and no.2.

17.6.6 Sodium Hydroxide (NaOH)

Addition of sodium hydroxide (NaOH) exposes more the Li positive sites on the mineral surface leading to an improved flotation.

Sodium hydroxide (or caustic) will be delivered in bulk quantity by truck. The 50% solution delivered will be stored in a storage tank and mixed with water to produce a 15% solution. A dosing pump will transfer the diluted reagent to the attrition scrubber.

17.6.7 Flocculant

A flocculant is a chemical added to help suspended solids bind together and form heavier particles. Flocculant is added in the tailings thickener and in the spodumene thickener to speed up the settling process and thus, the solid recovery.

The anionic flocculant foreseen is FLOPAM AN 905 VHM (MC). It is delivered in 25 kg or 600 kg bags. The installation for storage, dilution at 0.5% and distribution is standard. The diluted solution will be further diluted at 0.05%, in-line, just prior to being injected in the thickeners feed tank and feed well.

17.7 Spodumene Plant - Utilities

17.7.1 Concentrator Water Services

The water consumption is based on concentrator plant nominal water consumption per hour.

17.7.2 Fresh (Raw) Water

Raw water will be supplied to the concentrator from the water treatment plant or from the water wells depending on the needs and availability. The fresh water will be stored in a 250 m3 tank (800-TAK-001). This water reserve will feed two tanks; the process water tank (800-TAK-002) and the gland water tank (800-00-TAK-003).

RAW WATER TO PROCESS WATER TANK

The flow to the process water tank will be an intermittent make-up. It is highly possible that this make-up be rarely required due to the fact that the amount of process water in the circuit is large and increased by the gland water supply added continuously. Thus, the process water feed pumps will be started whenever process water makeup is needed. Otherwise, those pumps will be on stand-by.

RAW WATER TO GLAND WATER TANK

The raw water fed to the gland water tank will be continuous and steady. A minimum flow recirculation is in place to absorb the flow requirement fluctuation since the gland water tank is also a source of water for the batch reagents preparation.

17.7.3 Process Water

The process water is added in various tanks and pump box throughout the concentrator to adjust the slurry dilution level to the targeted values. The process water is recuperated at the spodumene and tailings dewatering areas through the thickener's overflows and recycled back in the process water tank.

The process water tank (800-TAK-002) has a capacity equal to 1550 m3. The level shall be kept low to provide a storage capacity large enough to absorb a water accumulation since the amount of water circulating through the process water network is constantly increased by the gland water addition to the slurry pumps. Thus, every 20-30 hours and depending on the use of process water via utility stations, the network shall be bled to lower the level in the process water tank. This operation will also allow to keep the reagent content to an acceptable level. The water bled out of the network is directed to the water treatment plant. A minimum flow recirculation line is in place to absorb any fluctuation in process water consumption throughout the concentrator although consumption is expected to be regular at 1176 m3/h.

17.7.4 Gland (Clear) Water

The gland water tank has a capacity equal to 130 m3. The raw water feeding the gland water tank passes through a filter to ensure the water is free from any debris. The clean water contained in tank 800-TAK-003 is used to feed gland water to the various slurry pumps and to prepare the reagent solutions.

GLAND WATER FOR SLURRY PUMPS

To protect the pumps, a minimum flow recirculation is installed on the gland water distribution pumps even if the gland seal water flowrate shall be regular and continuous.

CLEAN WATER TO REAGENT PREPARATION

The clean water contained in the gland water tank will also be used to prepare batches of reagent. Indeed, most of the reagents are purchased in concentrated solid or liquid form and need to be diluted prior to be used. The use of clean water for reagent preparation will be frequent enough to keep the pumps in operation 24 hours per day. However, the use of a minimum flow recirculation line is fundamental since the batches/flow will be intermittent.

17.7.5 Potable Water

Potable water is used for the sanitary installation and to feed the safety showers. The safety shower and eye wash fountains are equipped with heating system allowing to produce tempered water.

17.7.6 Concentrator Compressed Air

HIGH-PRESSURE AIR

The concentrator will have two (2) air compressors supply air at 100 Psig (690 kPag). An air dryer and receiver tanks will be used for both instrument and process air. One compressor is on standby.

The crusher area will be equipped with its own compressors. One compressor, a dryer and an air receiver will be dedicated in supplying instrument air to the dust collector. A second compressor and air receiver will be used for utility air requirements in the crusher area.

LOW-PRESSURE AIR

The flotation cells will receive low-pressure air about 4.0 Psig (27 kPag) from two (2) air blowers. One blower is on standby.

17.7.7 Power Requirements

The total electrical power demanded for the spodumene plant is estimated at 8.21 MW. The plant will be hooked up to the Hydro-Québec Grid. All power consumed will be hydroelectric.

Table 17.3 : Summary – Electrical Power Demand

Equipment & Power Consuming Items	MW
Crusher	1.03
Grinding	3.86
Tantalum	0.21
Mica Flotation	0.37
Spodumene Flotation	1.27
Tailings Filtration	0.53
Spodumene Filtration	0.30
Reagent Mixing	0.05
Services	0.59
Total Power	8,21

17.7.8 Control System

Processes are controlled by a SCADA automation system. The control system is implemented thru a redundant Fibre Optic PLC based Ring structure that connects all PLCs and E-Houses across the various plant areas via IT switches. This ring structure allows data from each process area and from each E-House Motor centre to reach the Servers at the main control room to be displayed on the Operators screens for real-time control of the plant processes.

Where exigencies permit local control stations are strategically situated near critical pieces of equipment and operator stations are enclosed. Each area possesses its own field PLC cabinet along with Remote Input/Output racks to collect the real-time process data from sensors/instruments and carry the data information to the PLC which will send it to the Central Control Room via IT switches installed in the various field PLC cabinets.

Also, MCCs for one or two areas are located inside E-Houses and have an Ethernet interface to move the motor/relays data to E-House local IO panel switch and finally thru the ring structure to the main control room for monitoring and control.

Operator can start/stop a motor, open/close a valve, acknowledge alarms and monitor the state of each device/instrument thru client station HMI graphical pages in the control room and in the fields.

All process logic is programmed into the PLCs thru a software development platform and displayed on the HMI operating stations thru an Ethernet network that connects HMI client stations, redundant HMI and data Servers and Level 1 and Level 2 IT switches.

18 PROJECT INFRASTRUCTURE

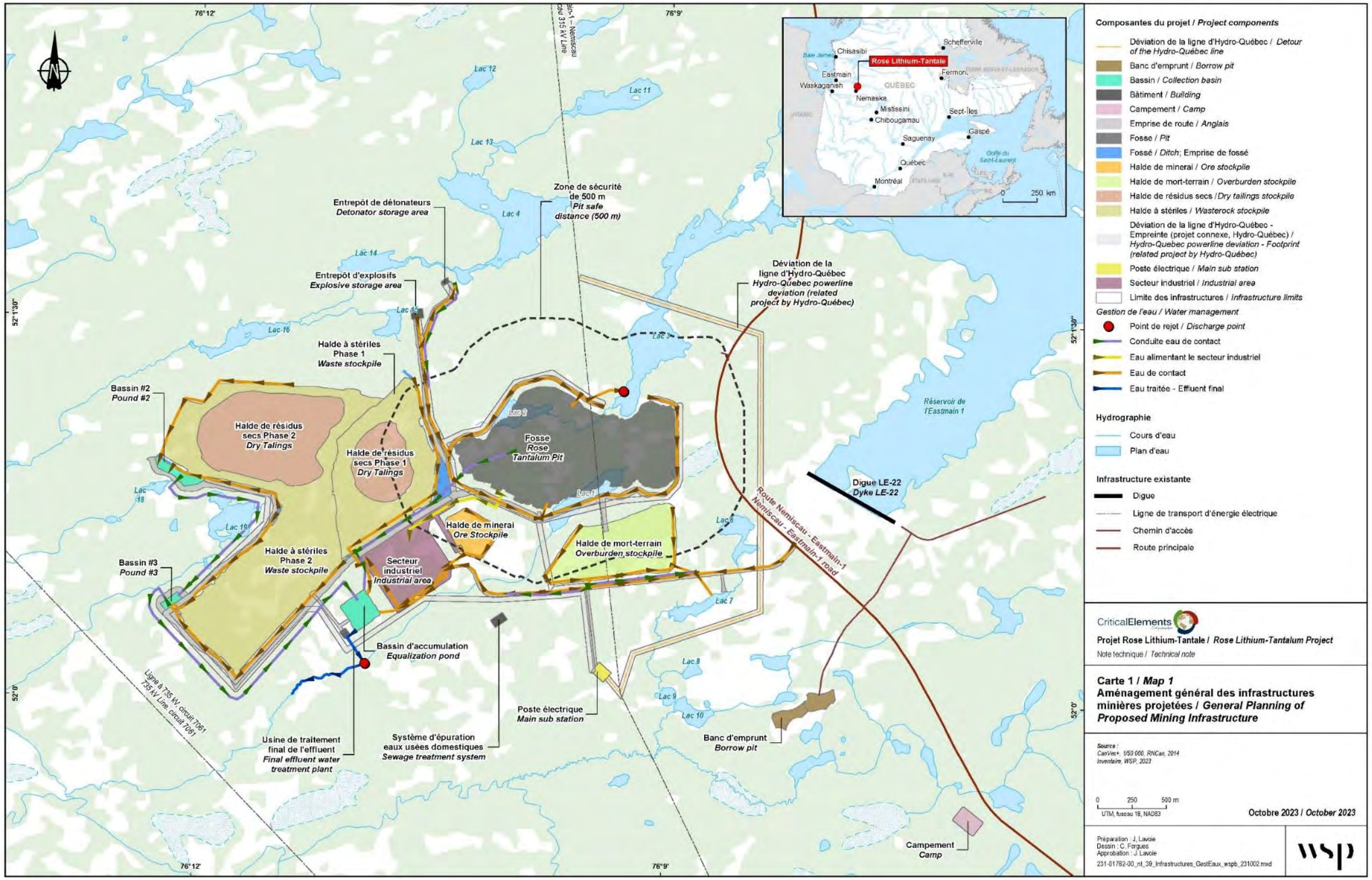
The following Item details the site infrastructure of the Project.

The project infrastructure considered in this Item includes:

- Main access, service and haulage roads;
- Camp Complex
- Waste rock and dry tailings co-deposit stockpile;
- Ore stockpile;
- Overburden stockpile;
- Industrial pad;
- Surface water management ponds, ditches, pumping stations and piping;
- Pads for other infrastructures;
- Diesel and gasoline storage and distribution;
- Truckshop and warehouse;
- Administrative building and gatehouse;
- Spodumene process plant;
- Main electrical substation and distribution;
- Communication system;
- Explosive and cap magazine storage
- Fresh and potable water supply;
- Sewage system;
- Final effluent treatment plant.

Figure 18.1 shows the mine site layout.

Figure 18.1: Rose Lithium Site Layout



18.1 Ore Stockpile Pad

An ore pad with an approximate capacity of 4,300,000 T (2.2M m^3) is expected to hold the ore stockpile.

The design of the ore pad complies with Directive 019 related to the mining industry. It is understood that materials used for the ore pad are considered as 'low risk mining waste'. No waterproofing measure is expected for the ground water protection. Run-off water coming from the ore pad will be directed in the surrounding ditches and redirected towards the accumulation pond using gravity.

The following design criteria were selected. These criteria were validated with the Geotechnical Stability Analysis of stockpiles prepared by WSP in 2017.

— Slope for each level: 1.5H : 1V;
— Maximum bench height: 10 m;
— Maximum bench offset: 10 m;
— Maximum number of benches: 4.

The proposed ore pad will be placed on a surface cleared, stripped, and levelled with waste materials. All stored material will be processed at the plant at the end of the Project.

The subsoil (natural soil) of the pile is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samples collected under the supervision of WSP.

18.2 Waste Rock and Dry Tailings Co-Disposal Stockpile

A combined waste and dry tailings co-disposal stockpile is proposed. The total capacity of the pile is 107M m^3, which is sufficient to contain the waste rock and the dry tailings, including transitional layers placed in the low locations between the tailings and waste rock areas. The volume was assessed based on the optimized pit shell.

The pile design was completed in accordance with Québec government's Directive 019 related to the mining industry. It is understood that materials used for the stockpile are considered as 'low-risk mining waste'. No waterproofing measure is expected for the ground water protection. In addition, no accumulation on surfaces is located less than 60 m from nearby watercourses. All the run-off water from the stockpile is being caught through ditches and directed to the accumulation pond.

The co-disposal pile has an approximate capacity of 182 MT (91M m^3) for mine waste and 24 MT (16 M m^3) for the dry tailings. The co-disposal facility will be developed in two phases. The first phase covering the two years of mine pre-production and the first four years of mine operations, while the second phase would cover the following years. A detailed sequence of filling will be developed during detailed engineering.

Figure 18.2. shows the section view of the waste rock and dry tailings co-disposal stockpile.

The particle size of waste materials was determined using information provided by InnovExplo.

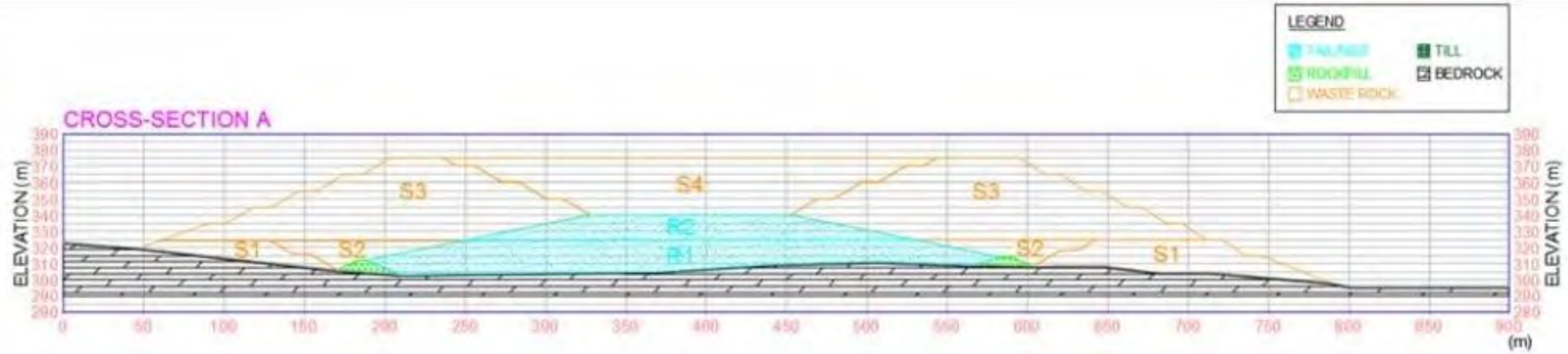
The volume assessment considers slopes of the co-disposal pile of 3H to 3.5H:1V. Stability analyses were undertaken by WSP to reflect the co-disposal concept and possible filling sequence.

Soil parameters from geotechnical data collected from recent campaign (WSP 2022) and surface deposit maps were used in the design. The subsoil (natural soil) of the pile is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samplings collected under the supervision of WSP.

The area to be deforested covers the entire area of the co-disposal facility. The area to be stripped is the portion of the co-disposal facility where only waste rock is present. Based on the soundings in the co-disposal facility area, it is assumed that 0.3 m of organic material must be stripped. It is likely that some areas will not require stripping. It is also possible that some areas will require up to a few meters of stripping.

A service road will be built around the waste rock pile to allow for maintenance of the ditches, the ponds, and the pumps.

Figure 18.2: Waste Rock and Dry Tailings Co-Disposal Stockpile Section View



18.3 Industrial Pad

A 260,000 m² industrial pad, over which most of the industrial infrastructures are located, is included in the Project. This proposed industrial pad is on two levels in order to match the natural ground.

The industrial pad is built over the natural soil which is cleared and stripped of organic materials. The organic materials will be stocked in a distinct pile to be used during progressive site restoration.

The subsoil (natural soil) of the pad is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samplings collected under the supervision of WSP.

Embankments, up to 0.9 m below the finished ground, are made with materials coming from class-2 excavated materials or raw muck. The last 0.9 m is filled with crushed material from the pit's waste material.

Materials used for the industrial pad are considered as 'low-risk mining waste'. No waterproofing measure is expected for the underground water protection.

On the top of the ROM pad near the primary crusher ore dumping station, a concrete slab with a bumper is needed to take up lateral loads induced by mining truck CAT 765D when it unloads ore on the grizzly, instead of the crusher ramp retaining wall.

Run-off water coming from the industrial pad will be directed in the surrounding ditches and redirected towards the accumulation pond by gravity.

Figure 18.3 shows the industrial pad detailed layout.

18.3.1 Buried Services

Piping sizing used for buried services are shown in Table 18.1.

Table 18.1: Buried Piping Sizing

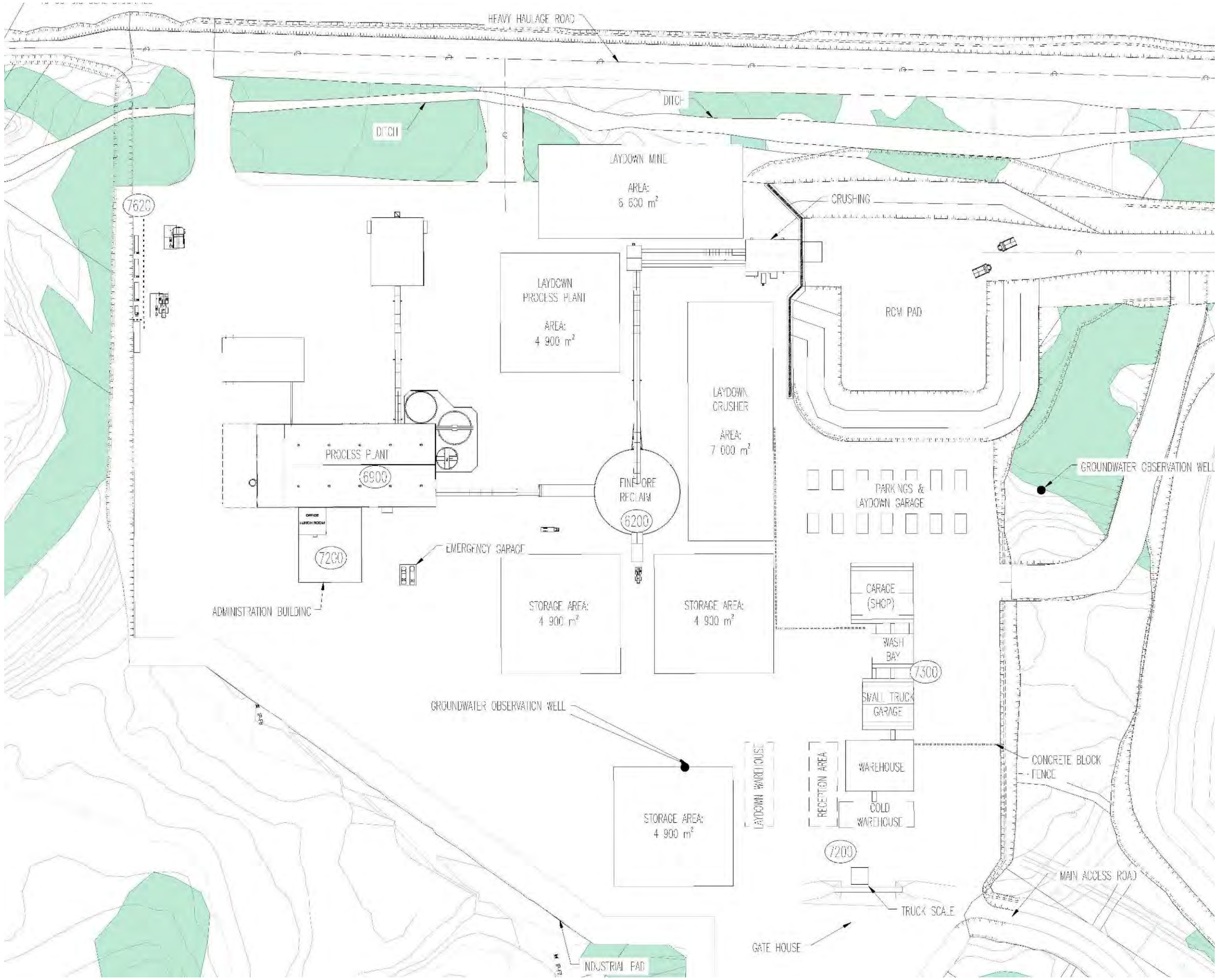
Service	D_{min}	Material
Sanitary wastewater	200 mm	HDPE
Fresh water mains	100 mm	HDPE
Fresh water supply	100 mm	HDPE
Fire protection water supply	200 mm	HDPE
Drinking water supply	100 mm	HDPE

Piping is designed to comply with the following standard: BNQ 1809-300, "Construction Work - General Technical Specifications - Drinking Water and Sewer Lines". The freezing depth, which is considered, is such as described in Table 2 of standard BNQ 1809-300. For the municipality of Chapais, it is 3.51 m. To reduce excavation and to allow easier maintenance, a minimum burial of 2.1 m is expected. To prevent pipes from freezing, sheets of isolating material (100 mm) will be installed to increase protection against freezing at the required level. Isolation material will be placed in a reversed 'U' shape.

For productivity reasons during the installation, high-density polyethylene (HDPE) conducts are recommended.

These conducts will be installed in trenches and backfilled in accordance with the cross-section and alignment shown on drawings.

Figure 18.3: Industrial Pad Layout



18.4 Service and Haulage Roads

Two types of roads, service and haulage, are included in this Project. Some service roads with very limited traffic will have a 5 meters platform width. The key characteristics of these two types of roads are defined in the Table 18.2 and typical cross-sections are shown on Figure 18.4.

Table 18.2: Key Characteristics of Service and Haulage Roads

Characteristics	Service Road	Haulage Road
Displayed speed	60 km/h	60 km/h
Vehicle used in design	Legal load truck	110 T mining truck
Platform width	8.0 m	21.0 m
Material and thickness of sub-foundation	Blasted rocks 0-600 / MG 112 (600 mm)	Blasted rocks 0-600 (1,700 mm)
Material and thickness of foundation	Crushed rock MG 56 / MG 20 (300 mm)	Crushed rock 0-56 mm (300 mm)
Minimum radius of curves	135 m Reduction to 55 m was accepted, speed will be reduced in those sectors	135 m Reduction to 55 m was accepted, speed will be reduced in those sectors
Convex / concave curves Kmin	16 / 8 m	16 / 8
Distance of visibility	85 m	85 m
Berm	Yes, if falling height > 3 m	Yes, if falling height > 3 m
Maximum vertical slope	7%	10%

The roads are settled on the natural soil which is cleared and stripped from organic materials. The organic materials will be stocked in a distinct pile in order to be used when the site is restored.

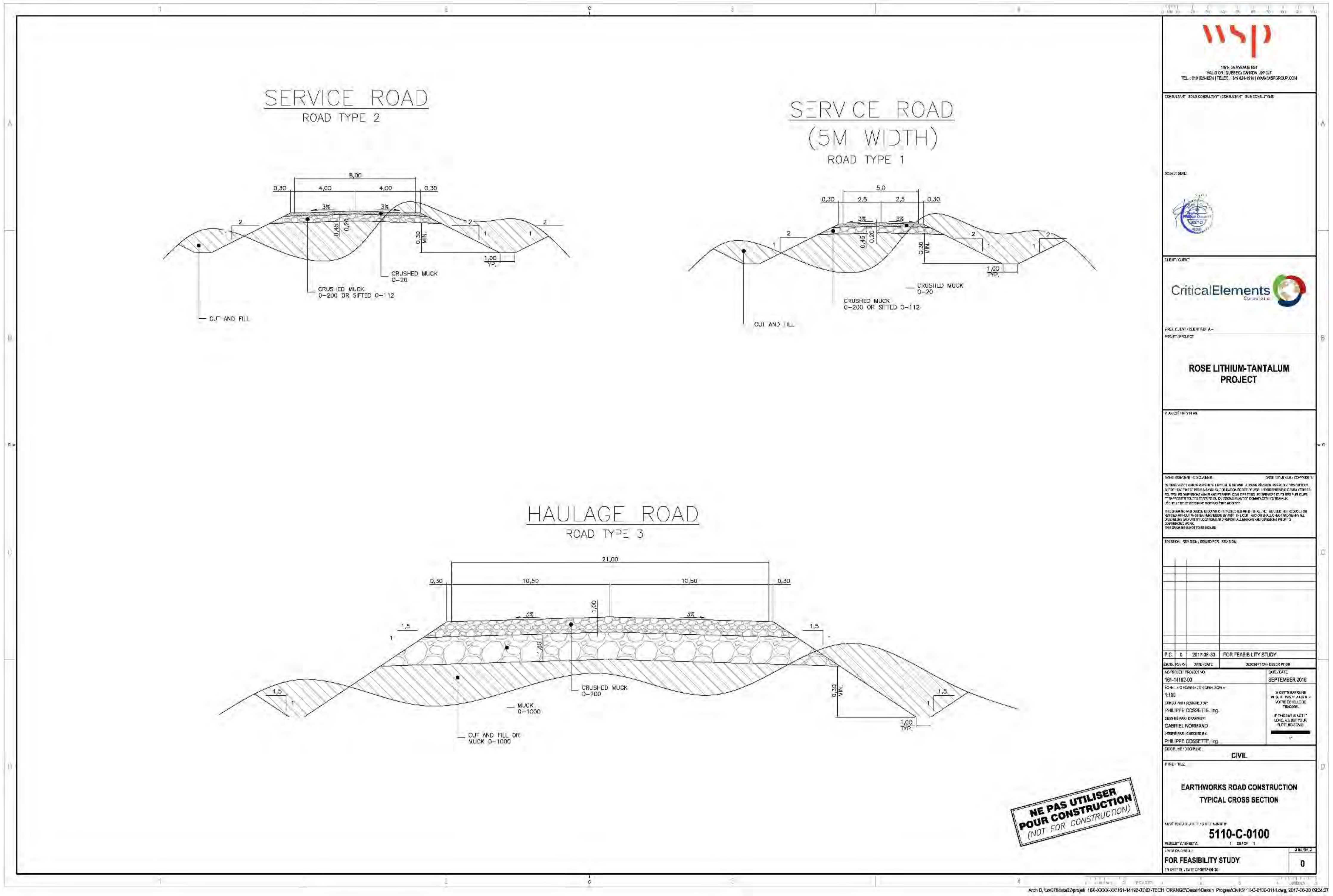
The subsoil (natural soil) of the roads is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samplings collected under the supervision of WSP. In December 2022, WSP produced a geotechnical report recommending the foundations and rolling surfaces to be used for each type of road.

Embankments, up to the infrastructure line, are made with materials coming from natural soil Class-2 excavated materials and Class-1 blasted rock. Materials used for the industrial pad are considered as 'low-risk mining waste'. No waterproofing measure is expected for the underground water protection.

Run-off coming from roads will be directed in the lateral ditches and redirected to collecting ponds by gravity and carried to the accumulation pond for treatment before being released to the effluent.

Galvanized corrugated steel culverts installed in compliance with the *Guide d'aménagement des ponts et ponceaux dans le milieu forestier* are required to direct water towards the effluent and ensure an adequate drainage of the road.

Figure 18.4: Service and Haulage Roads Typical Cross-Sections



18.5 Overburden Stockpile

An overburden stockpile with a capacity of 10.9M T (6M m^3) is expected to contain materials coming from the pit excavation required to reach bedrock.

Test pits indicated that the overburden stockpile would be made of coarse-grained soil (sand with gravel, stones, and erratic blocks). Organic materials (topsoil) will be disposed of in a distinct section of the stockpile, so they are used for rehabilitation work.

The overburden stockpile design will be produced in accordance with Directive 019 related to the mining industry. It is expected that materials used for the overburden stockpile will be considered as 'low risk tailings'. No specific measures to protect ground water, such as a membrane, is expected. In addition, the stockpile will be located at least 60 m from the surrounding watercourses.

The following design criteria were selected. These criteria were based on geotechnical data collected from historical test pits, however, a slope of 3H: 1V, instead of the calculated 2.5H: 1V was used to ease revegetation.

- Slope for each level: 3 H : 1V;
- Height of benches: 10m;
- Space between benches: 10m;
- Maximum number of benches: 3.

The proposed overburden stockpile will be placed on the cleared, but not stripped, natural soil to allow an effective management of sediment.

Stormwater coming from the overburden stockpile will be collected in the lateral ditches and redirected to the accumulation pond by gravity.

During operation, the top of the piles will be levelled so the water flow is split throughout the whole surface of the overburden stockpile to avoid significant changes in the natural flow pattern.

18.6 Pads for other Infrastructures

Pads used for other buildings are settled over the natural soil which is cleared and stripped of organic materials. The organic materials will be stocked in a distinct pile in order to be used when the site is rehabilitated.

The subsoil (natural soil) of all pads is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samples collected under the supervision of WSP.

Embankments, up to 0.9 m below the finished ground, are made with materials coming from Class-2 excavated materials or raw muck. The last 0.9 m is filled with crushed material coming from the pit's waste material and crushed stones.

Materials used for the industrial pad are considered as 'low-risk mining waste'. No waterproofing measure is expected for the ground water protection.

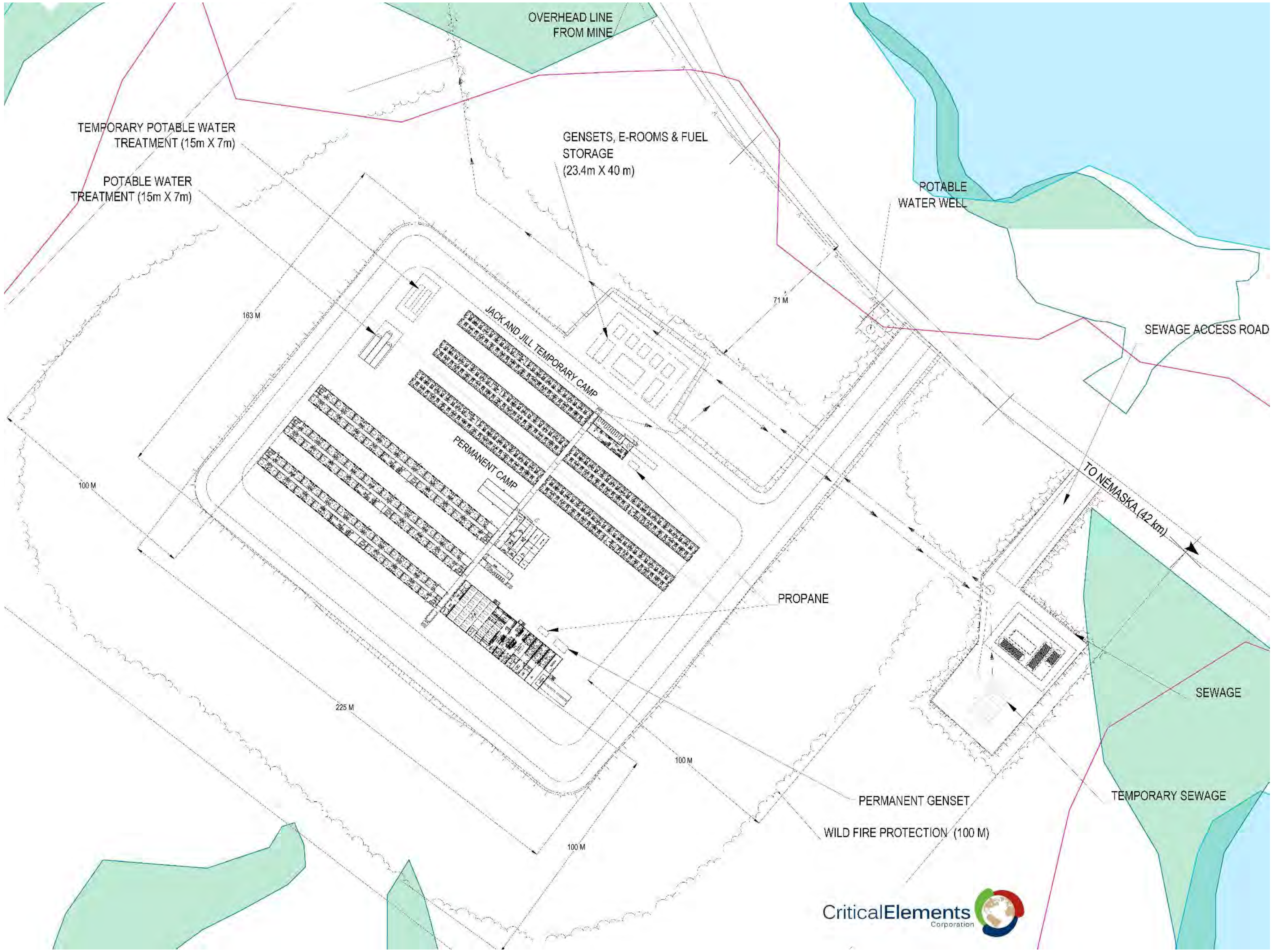
18.7 Camp Complex

The camp complex requires the following:

- Temporary accommodation capacity of +/- 250 rooms during construction.
- Permanent accommodation capacity of +/- 250 rooms.
- Kitchen and dining room for 500 people.
- Generators for 2 years.
- Permanent water treatment system.
- Permanent drinking water treatment system.
- Permanent sewage system.
- Laundry module for 500 people.
- Reception building.
- Gymnasium and recreational facilities.
- Internet connection with Wi-Fi access points.
- Parking with outlets and lighting.

The site chosen for the camp complex will be around 4 km from the mine site, with direct access to the Nemiscau - Eastmain-1 Road. The site is outside Hydro-Québec's exclusion zone and will accommodate both temporary installations required during infrastructure construction and then the permanent buildings for the mining operation. At full development, the site will have dimensions of 217 m by 153 m (33,200 m²), with infrastructure grouped within a 5.4 ha quadrangle. The temporary camp will be powered by generators, while the permanent camp will have an overhead line connection from Critical Elements' main electrical substation. Treatment and distribution facilities for drinking water and wastewater will be installed for the temporary camp, but with sufficient capacity to be used during the mine operation.

Figure 18.5: Camp Complex Layout



18.8 Diesel and Gasoline Storage

The diesel and gasoline storage and distribution system will also be installed on the industrial pad.

Three 45,000-L double-wall tanks with both high and low flow delivery system (gas boy) for diesel will be installed on site for the supply of vehicles. A concrete slab will be erected in the delivery area to ease leak recuperation.

A 10,000-L double-wall tank and delivery system for gasoline will be installed near the diesel tank for the supply of vehicles. Both systems will share the same concrete slab.

18.9 Service buildings

18.9.1 Truckshop and Warehouse

The truckshop, wash bay, and warehouse will be installed side by side on the industrial pad. They will be structural steel arch-type fabric buildings which use sea containers as foundation, all mounted on a concrete slab and equipped with HVAC systems, lighting, and services. Containers will be designed to provide lube unit, tool crib, material storage, mechanical room, electrical room, restrooms, hydraulic and machine shops, and offices.

The truckshop (36.5m L x 35m W x 18m H) will offer four repair bays, a lube unit room, a tool crib, and offices and will be equipped with two 20-ton overhead cranes. The wash bay (24m L x 20m W x 15m H) will be a dedicated building considering its special needs in terms of HVAC and water supply. Repair and wash bays are designed to accommodate a Caterpillar 785D truck.

Both truckshop and wash bay buildings will have pits connected to an oil separator used to collect oil and lubricant transported by washouts. The oil separator installation will be preceded by a sand trap to collect oil and lubricant transported by washouts. The oil separator will be designed to process an estimated flow of 150 US gpm while respecting the hydrocarbon C_{10}-C_{50} discharge standard of 15 ppm in the garage's industrial sewer system. Oil recovered in the oil separator will be periodically transferred into a waste oil storage tank before being disposed of at an authorized site by a specialized contractor.

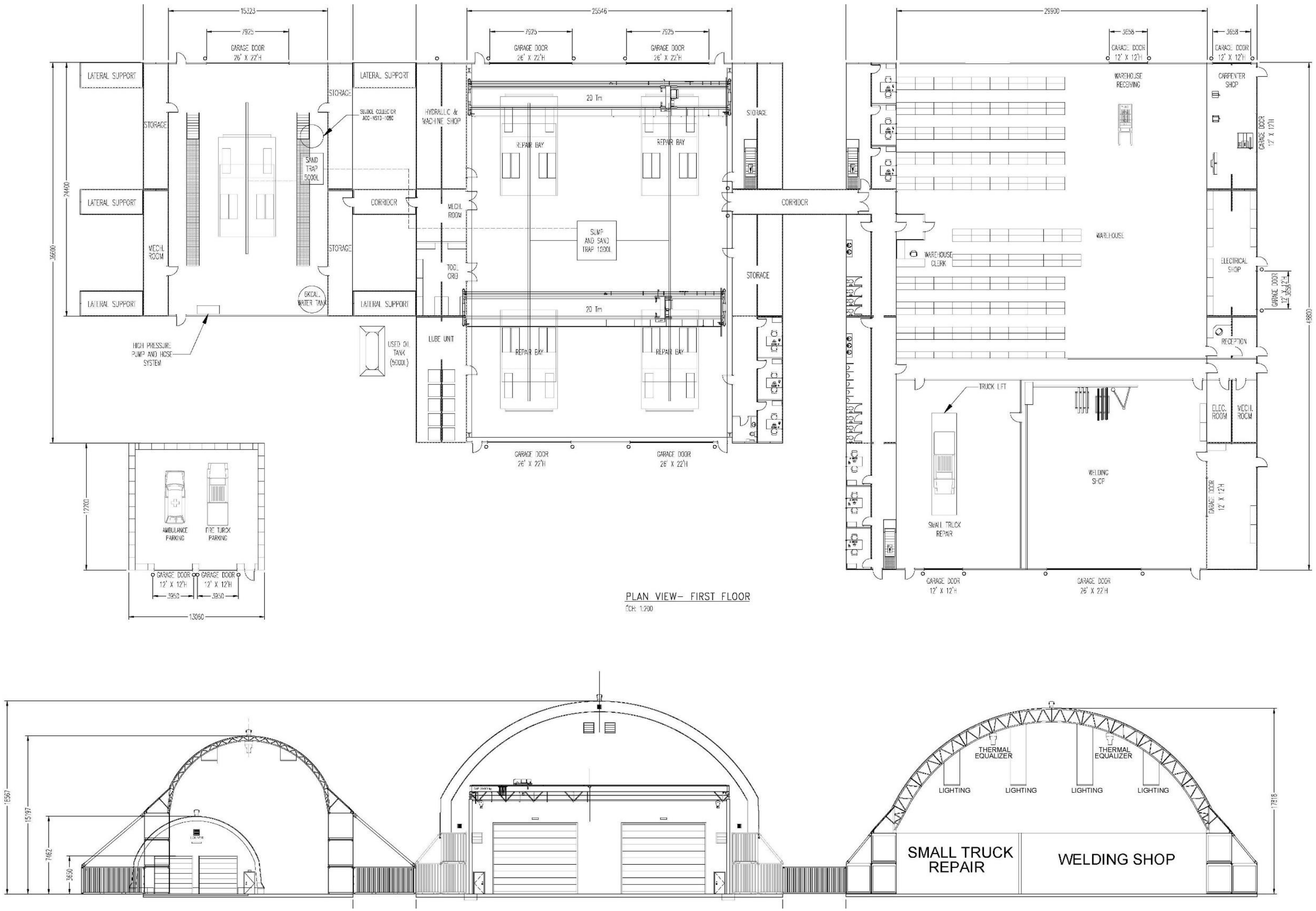
The warehouse will have dimensions 49m L x 40m W x 18m H) and will also contain a small truck repair bay with a lift and a welding bay equipped with welding equipment, dedicated HVAC system and welding fumes collection system with a mobile arm. The container foundation will allow extra storage area and specialized shops.

There will also be a smaller heated fabric building to park the emergency vehicles mounted on concrete blocks (18m L x 12.5m W x 8m H).

A cold warehouse building is also planned, constructed as a fabric building (44m L x 15m W x 9m H) mounted on top of concrete blocks. The building is made of steel truss dome with flames retardant white canvas.

Figure 18.6 shows the truckshop and warehouse layout.

Figure 18.6: Truckshop and Warehouse Layout



18.9.2 Administrative Building and Gatehouse

The administrative building is planned to be a two-storey modular construction mounted on tripod foundations with a skirt to allow heating of the piping installed underneath. The building is 47.5m x 20m. Ground floor includes men dry (40 showers and 340 lockers), women dry (36 lockers) and some offices for health and safety. First floor includes several offices, conference rooms, an infirmary, a mine rescue meeting room, and a lunchroom for 54 employees. Building is made of a wooden structure with wall isolation, exterior and interior finishing walls, HVAC, plumbing, electrical and all office furniture included

Figure 18.7 shows the administrative building layout.

The gatehouse will be an independent module mounted on tripod foundations. The building of 9m x 5.5m includes a mechanical room, a restroom, and an office of two (2) places. The modular building is made of a wooden structure with wall isolation, exterior and interior finishing wall, HVAC, plumbing, electrical, and all office furniture. This module will include a desk with monitors for the security and process cameras systems and the main fire alarm panel.

A parking lot (capacity of 48) is planned for visitors and staff, considering most of the employees will commute by bus from the camp.

A 125-tonne truck scale will be installed near the gatehouse with a remote monitoring system to keep a record of spodumene concentrate or incoming deliveries weightings.

18.9.3 Water Treatment Plant Building

The effluent water treatment plant building is a prefabricated building (40m L x 30m W x 8m H) mounted on a concrete foundation installed next to the Accumulation Pond. The building is delivered in pre-assembled wall panels. The wall panels are composed of girts, fiberglass insulation and exterior and interior sidings. The roof is a steel deck on steel joists.

All equipment is considered to be under the supplier's responsibility, mostly skid-mounted, except for the HVAC, lighting and electrical services.

The capacity for Phase 1 will be 650 m^3/h and will be upgraded to 920 m^3/h in Phase 2. The design criteria were based on the requirements of the Minister of Fisheries and Oceans Canada Metal and Diamond Mining Effluent Regulations (MDMER 2017). Further studies on water to be treated will be required to optimize the design. The proposed plant presents three treatment steps to achieve effluent requirements, which include different reagents (hydrated lime, coagulant, polymer, microsand, and sulphuric acid):

1 Metal precipitation and sludge recirculation;

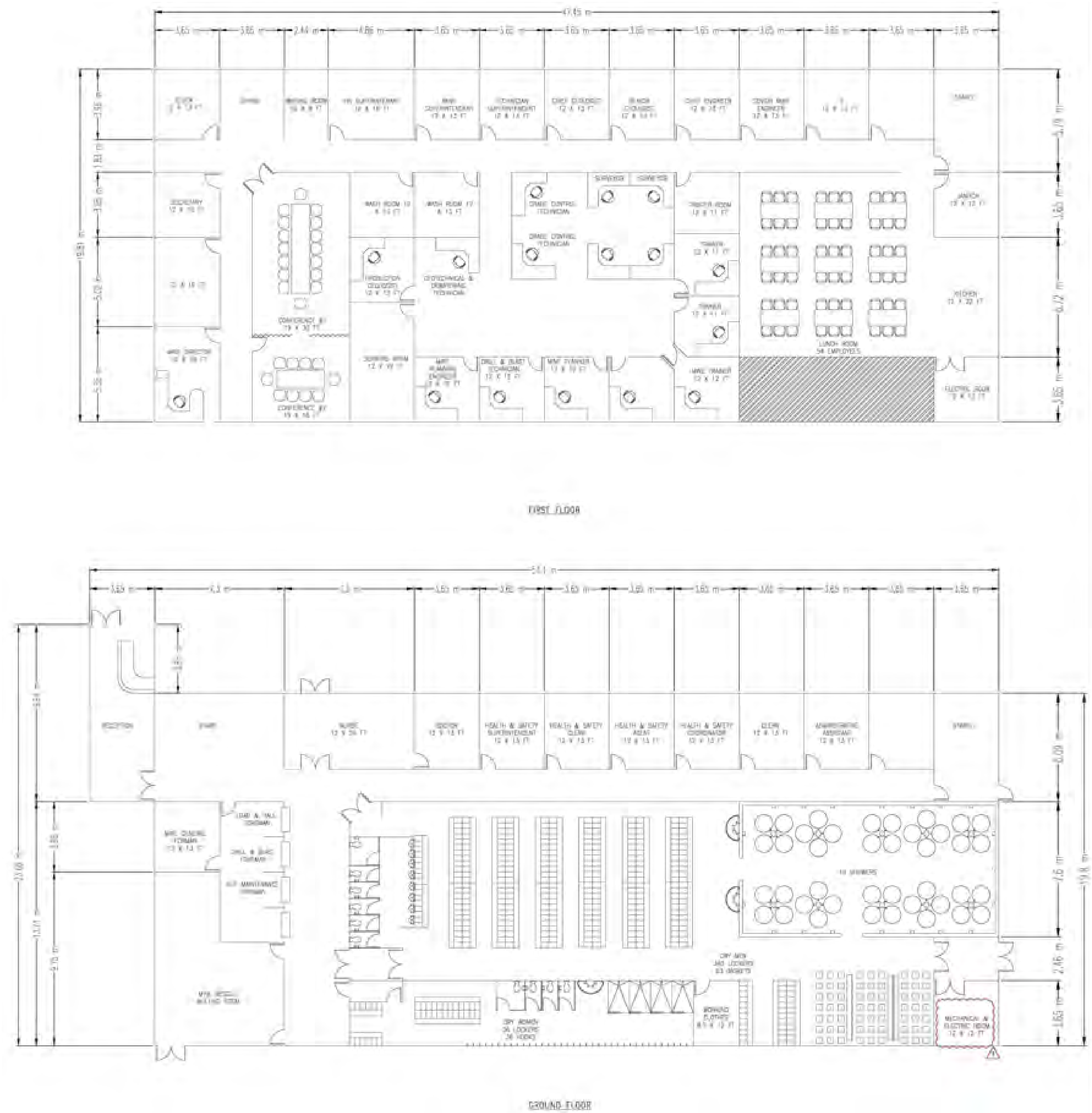
2 High rate clarifier; and

3 pH correction.

Reagents will be used in different steps.

The system will be automated and controlled by a PLC. Effluent water quality monitoring and alarming will include pH and turbidity before discharging to Stream A through a ditch.

Figure 18.7: Administrative Building Layout



18.10 Site Services

18.10.1 Process Water Supply

The process water supply for the industrial pad buildings, including the process plant and the truck shop, will mostly come from the treated effluent water, being recycled instead of released to the stream A. For dyer periods, the backup for this system will be drawn from the first submersible pump installed in the de-watering wells located around the open pit.

18.10.2 Potable Water Supply

Some of the water pumped to the industrial pad will be treated for potable water usage. The soils in the area are largely Esker deposits and there is an absence of direct sources of natural or anthropogenic contamination of the water source. In these conditions where the quality of the groundwater is very good, the treatment chain will only require filtration and disinfection of the groundwater before its distribution.. The potable water treatment equipment will be installed in a prefabricated building. Underground storage tanks are planned to the supply during peak consumption hours. The final treatment system will have to be optimized according to underground quality water. Water bottles will also be supplied in various buildings for drinking.

18.10.3 Fire Protection Water

The fire protection water looped buried piping network will supply all the buildings on the industrial pad, either directly to sprinklers inside the building or through fire hydrants located nearby.

The water station building for fire protection (33' L x 12' W x 9' H) is prefabricated building supplied by the vendor with most of the equipment skid-mounted, installed on a concrete slab. It has been considered as an independent building installed near the freshwater tank. The planned capacity of the pumping station is 575 m^3/hr. Main equipment to be supplied are:

— Diesel fire pump (backup)

— Electric fire pump

— Jockey pump

— Structural steel skid for equipment

— Carbon steel piping, valves, drains and connections

— Control panel and instruments

— HVAC

— Electrical distribution and services

18.10.4 Sewage

The selection criteria for a domestic wastewater treatment technology mostly depends on the natural soil conditions and on the presence of waterbodies. Natural soils at the industrial site seem to be favorable for a soil infiltration technology while available areas could allow the compliance with the minimum distance of 200 m from waterbodies.

A conventional leach field (modified purifier element) is planned, but a geotechnical survey is needed to confirm soil quality and performance. This option represents the lowest cost for installation and maintenance but requires a larger footprint. The recommended technology would be able to reduce the incoming organic load and suspended solids to a concentration of less than 5 mg/L. Globally, the proposed system will allow the respect of environmental requirements prescribed by the actual regulations.

The design of the wastewater treatment system is based on the unitary wastewater flows prescribed by the MELCC in its “Guide pour l'étude des technologies conventionnelles de traitement des eaux usées d'origine domestique”.

18.11 Main Electrical Substation and Distribution

A 315-kV electrical transmission line (L3176), owned by Hydro-Québec, runs north-south over the eastern side of the Project. The transmission line will need to be relocated approximately 500 m east of the mining pit. The transmission line relocation technical study was completed by Hydro-Québec in 2018. The power demand for the Project is estimated to 19,453 kW (21,747 kVA) and a reserve of 25 MVA has been requested to Hydro-Québec.

To meet the anticipated electrical power needs of the Project, it is proposed to install two 20 MVA (25 MVA with one ventilation stage) transformers 315 kV to 25 kV connected to Hydro-Québec’s 315 kV main power line. The two main transformers will operate at the same time to feed the site and the process plant, but one transformer would be able to withstand all loads in case of failure of one transformer. Each transformer will be protected by a circuit breaker fitted with isolating switches located upstream and downstream of the transformers. A 315 kV measuring device will be installed upstream of each transformer and the readings from both transformers will be combined. Hydro-Québec needs a differential protection and communication between the new protection relays and their existing installations to coordinate the protection.

Figure 18.8 shows the electrical distribution on site.

The transformers will feed a 25 kV structure equipped with two series of four 25 kV exterior breakers connected with a tie circuit breaker to ensure continuous supply in the event of a breakdown of either of the two main transformers. Two banks of capacitors will be installed to correct the power factor. Three 25 kV transmission lines will be installed on site: two dedicated to the process plant and the other one to the supply of the rest of the site, including the camp complex. Various transformers will be installed to supply 4.16 kV or 600 V to the buildings and equipment according to the power requirements of that sector. A substation will be installed near the ramp of the open pit to supply the electrical mining equipment and the pumping stations around the pit.

Figure 18.9 shows the main power station layout.

Figure 18.8: Electrical Distribution on Site

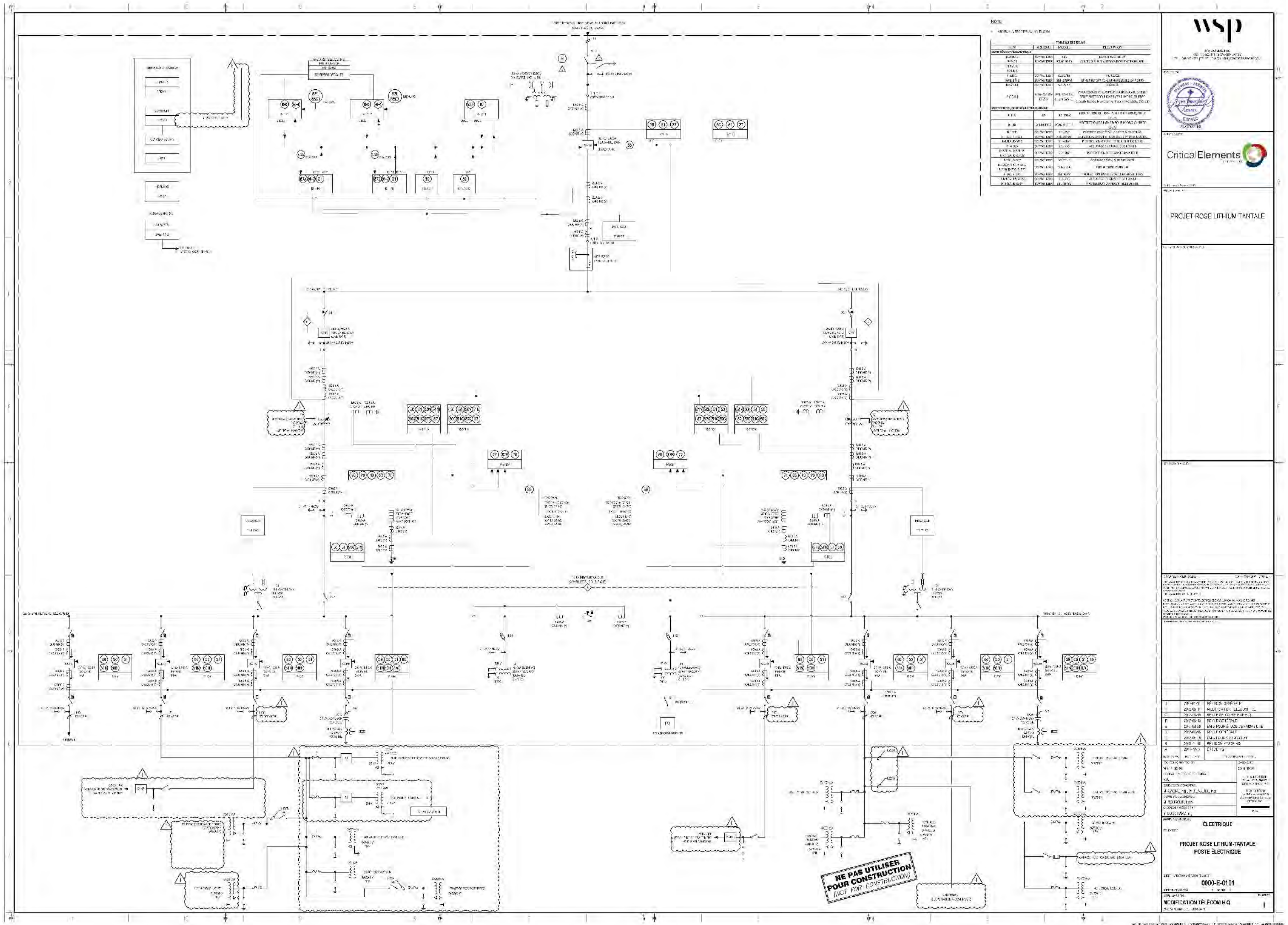
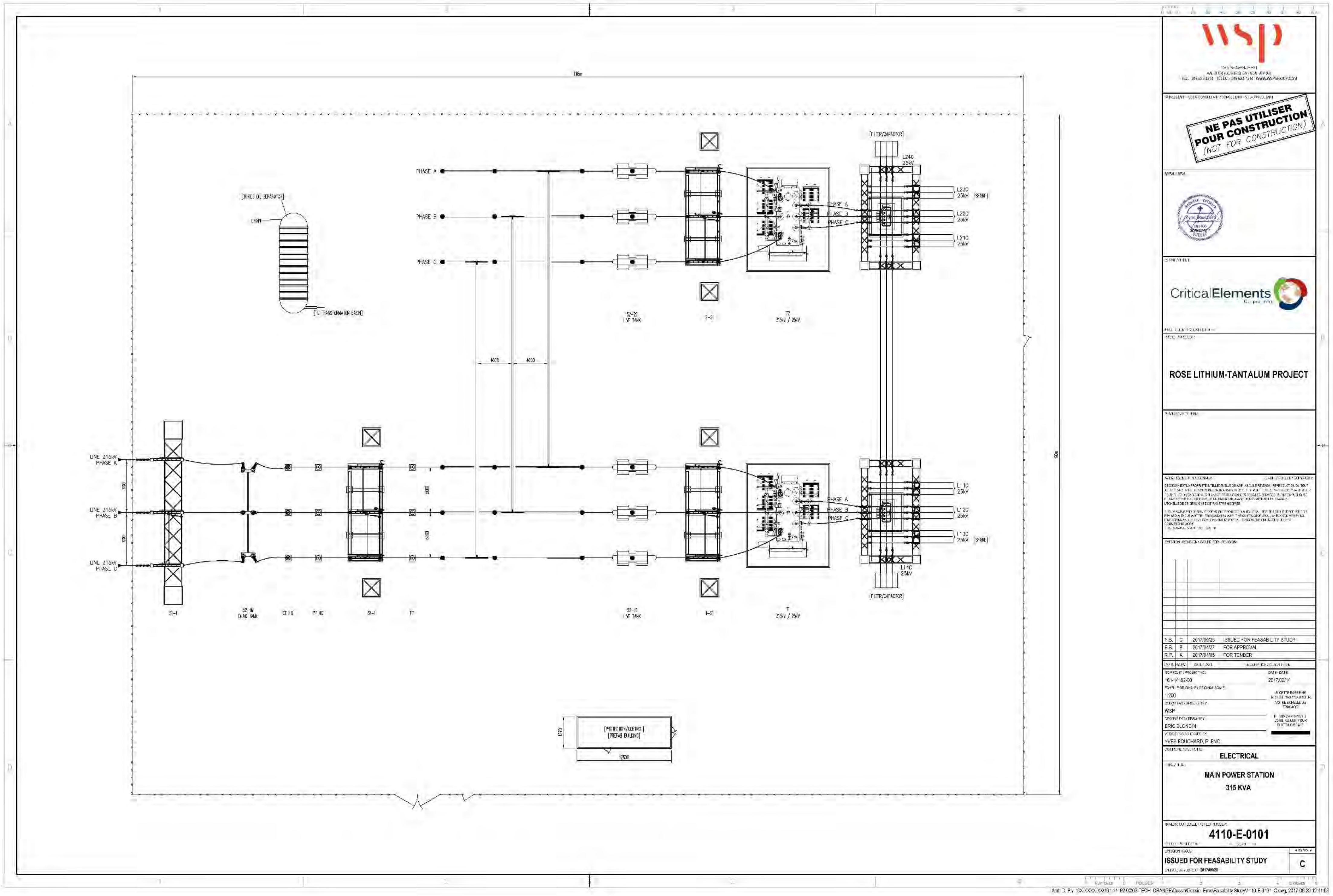


Figure 18.9: Main Power Station Layout



18.12 Communication System

The main network is composed of fibre optic cables connecting the various buildings together. These include the administrative building, the truck shop, the warehouse, the gatehouse, the process plant, the crushing plant, the explosive storage area, the blasting cap storage area, the water treatment plant, and various pumping stations.

The fibre count will remain the same across the network. That way, every subnetwork will be available from all locations. This will be useful in the future if, for example, a camera is necessary in an area that was initially deemed unimportant. The network will use 24-fibre or 48-fibre cables. Table 18.3 shows the fibre distribution.

Table 18.3: Fibre Distribution

Number of Fibres	Description of Network
6	Automation network (ring topology + 2 dedicated spares)
4	Administrative network (internet, printers, file servers, etc.)
2	Security camera network
2	Fire alarm system
2	LTE network

The network will be as linear as possible, meaning that a location will receive a cable from the previous location and send a cable to one other location. There are some exceptions that cannot be avoided at this point, mostly at the pumping stations. Usually, administrative networks are designed in a star configuration, but the site layout makes it difficult to do so without increasing the cost. One option would be to use the spare fibres.

Each location will include a network cabinet. This cabinet will include fibre optics patch panels to receive the various networks and redistribute them to the next location, cat6 patch panels for the various end users (cameras, phones, computers, etc.), one or more switches depending on the needs at that specific location, and an uninterruptible power system (UPS) to maintain the network integrity in case of a power failure. The UPS is particularly important for the security camera and the fire alarm system networks. Some cabinets will be installed outside and will require necessary protection rating and heating system.

The server room in the administrative building will include two general purpose servers to handle the files, printers, emails, user accounts, etc., and one special server for the voice over IP (VoIP) phone system. A hardware firewall will also be used to protect the network from intrusions.

The workers will mostly communicate using the phone system via Wi-Fi or LTE or portable radios.

The Internet will be supplied by the locally implanted supplier Eeyou Communication Networks. The mine site will be connected using fibre connection to be installed along the Eastmain 1A road with microwave towers as a backup. An existing tower already connected to the Eeyou network should be used as a base connection point, like at CCDC in Nemaska with repeater towers built and maintained by the supplier on a monthly based fee.

18.13 Surface Water Management

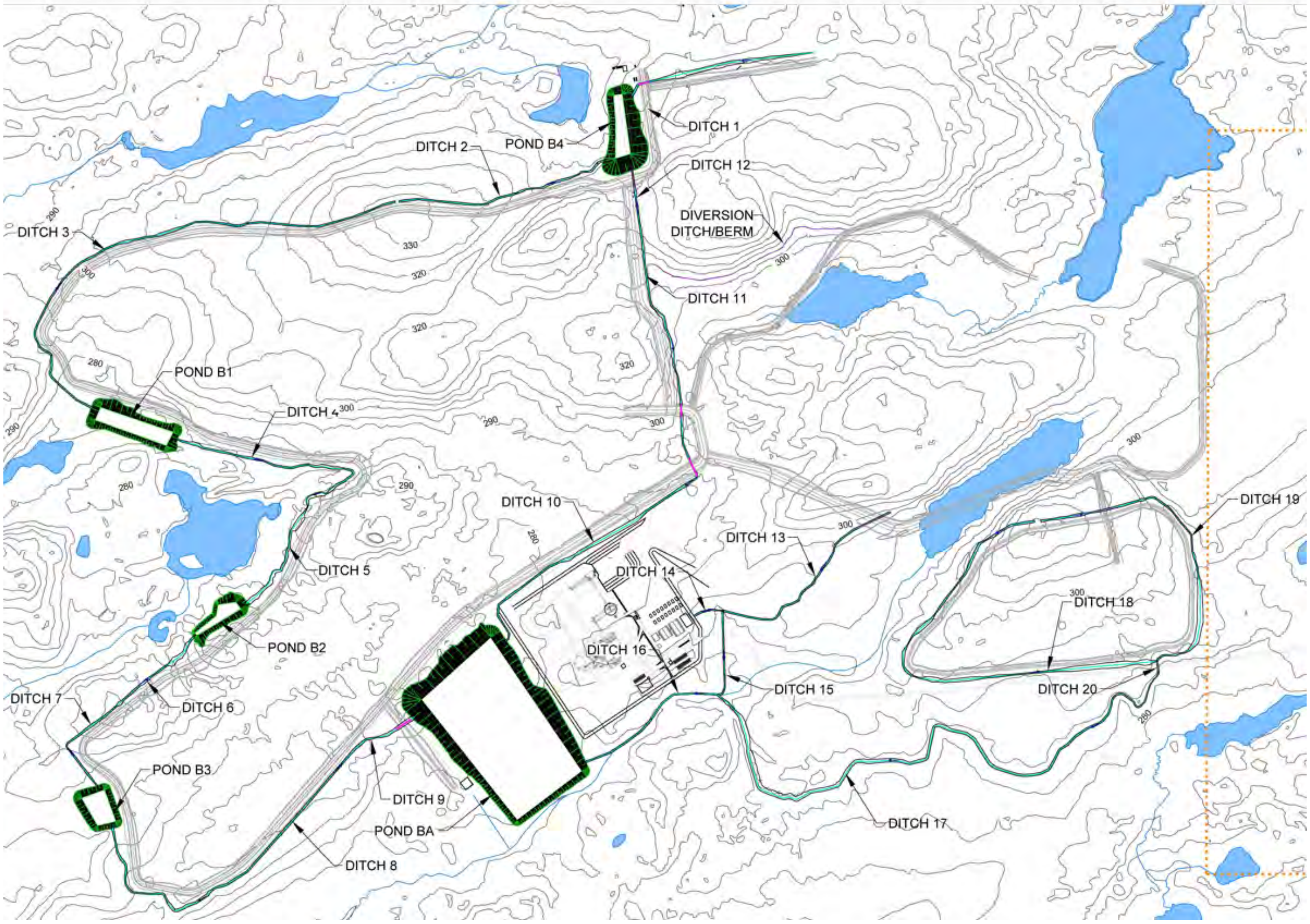
18.13.1 Site Surface Water Management Strategy

The water management strategy and the design of water management infrastructure were defined based on following recommendations from the Quebec's *Directive 019 pour l'industrie Minière* (Directive 019), 2012 version:

- Segregate contaminated water from natural runoff (non-contaminated water) not impacted by the mining activities. In order to reduce the volume of contact water requiring management. Based on Life of Mine (LOM) site layout for the Project, a diversion channel or berm north of the Open pit will be required. The runoff from a small sub catchment not impacted by the mining activities will be diverted by a ditch or small berms towards Lake #3.
- All runoff water generated by precipitation, which falls on areas impacted by mining activities, is considered as contact water. Contact water will be collected by perimeter ditches that drain to five ponds (B1, B2, B3, B4, and the Accumulation Pond BA). Water will be pumped from the previous ponds and the open pit to the BA Pond. Collected contact water will be treated and quality monitored prior to its release to the single effluent point (Creek A).
- Prioritize reuse of contact water from the accumulation Pond to the process plant to minimize freshwater requirements.
- Drainage system surrounding waste rock and tailings management facility should be designed to convey the 1:100-year flood without overflow.
- Water retention structures should be designed to contain a design flood event without spillage to the environment. The design flood event for the collection water ponds is a combination of a 1:100-year, 24-hour spring rainfall and snowmelt from 1:100-year snow accumulation over 30 days. Ponds will be equipped with a pumping system with enough capacity to safely manage the design flood event without overflow.

The Project surface water management layout is presented in Figure 18.10.

Figure 18.10: Surface Water Management Layout



18.13.2 Water management Ponds and Ditches

The surface water management strategy requires the following infrastructures:

- **Ponds B1, B2 and B3** – will collect runoff from the waste rock and tailings co-disposal facility. Water collected in each pond will be pumped to the accumulation pond. These ponds are designed to operate at a low water level most of the time, ensuring that the active volume will be totally available to manage a design flood.
- **Pond B4** – This pond will collect runoff from a portion of the waste rock and tailings co-disposal facility and runoff from the explosive and blasting cap storage areas. Water collected in this pond will be pumped to the accumulation pond.
- **Accumulation Pond BA** – this pond is designed to function as the main water management pond of the site and will ultimately collect runoff from the entire mine site and groundwater inflows at the open pit. At the beginning of winter, the pond will store enough water to supply the mill with process water during the winter. At the beginning of spring, the water level will be maintained at a low water level to preserve storage capacity to contain the design flood. Once the spring freshet ends, the excess of water will be treated and released to the environment. The Accumulation Pond will be equipped with 2 pump systems, one with 75 m^3/hr capacity to fulfill

process plant reclaim water demands, and one with 950 m³/hr capacity pumping towards the water treatment plant to manage the water level on the pond.

— **Collection ditches** - will mainly collect runoff from Waste Rock and tailings co-disposal facility, overburden and Ore stockpiles as well as roads and explosive storage area for a total of 20 collection ditches. Desing considered a Manning roughness coefficient of 0.033 and ditch trapezoidal section with 2H:1V side slopes.

The typical sections for ponds and collection ditches are presented in Figure 18.11 to Figure 18.13.

Figure 18.11: Ponds B1, B2, B3, B4 Typical Section

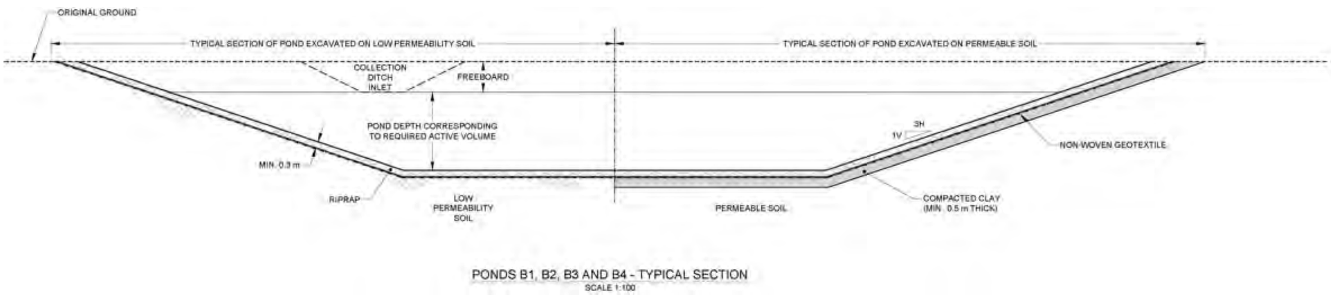


Figure 18.12: Accumulation Pond BA Typical Section

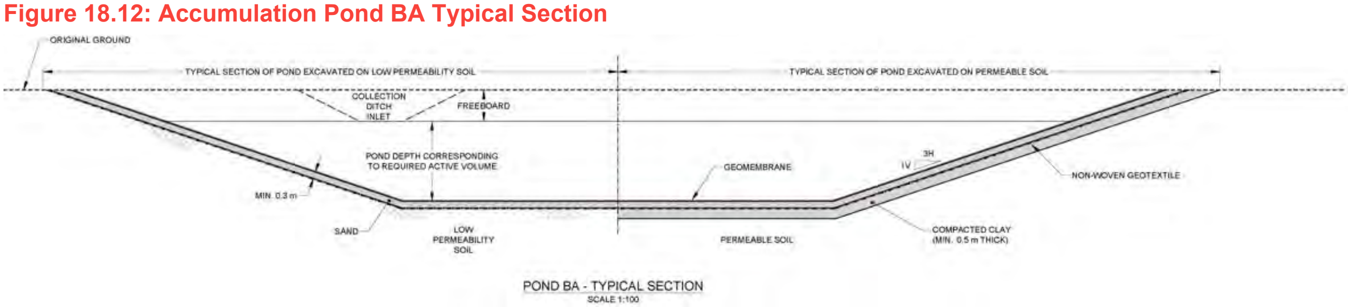
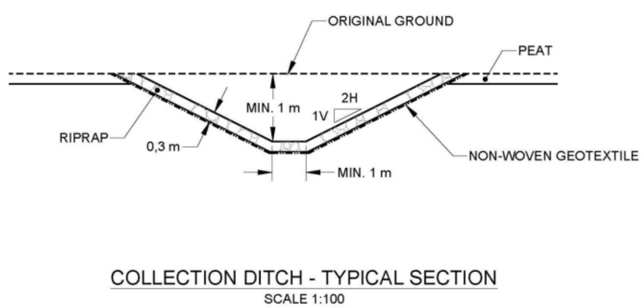


Figure 18.13: Collection Ditch Typical Section



18.13.3 Water Balance

The site-wide water balance was calculated for the full developed site layout. The objectives of the water-balance are:

- To estimate the required volumes to store the design flood without overflow of untreated water.
- To estimate the yearly excess water volumes that will need to be treated, for different climatic conditions.
- To establish and validate operational rules and target volumes required year-long to ensure safe containment or control of floods while also ensuring mill water supply.

The following assumptions were assumed for the water balance calculations:

- Snow and rain distribution is deduced from Climate Normal and was applied for the different climate conditions (average, wet and dry year).
- To evaluate operational procedures under design flood conditions, the rainfall plus snowmelt for the month of May is replaced by the design flood event, which is a combination of a 1:100-year, 24-hour spring rainfall and snowmelt from 1:100-years snow accumulation over 30 days.
- Monthly runoff volumes were estimated by means of volumetric runoff coefficients; the coefficients accounted implicitly for losses by retention in the surface depressions, by infiltration, and by evapotranspiration.

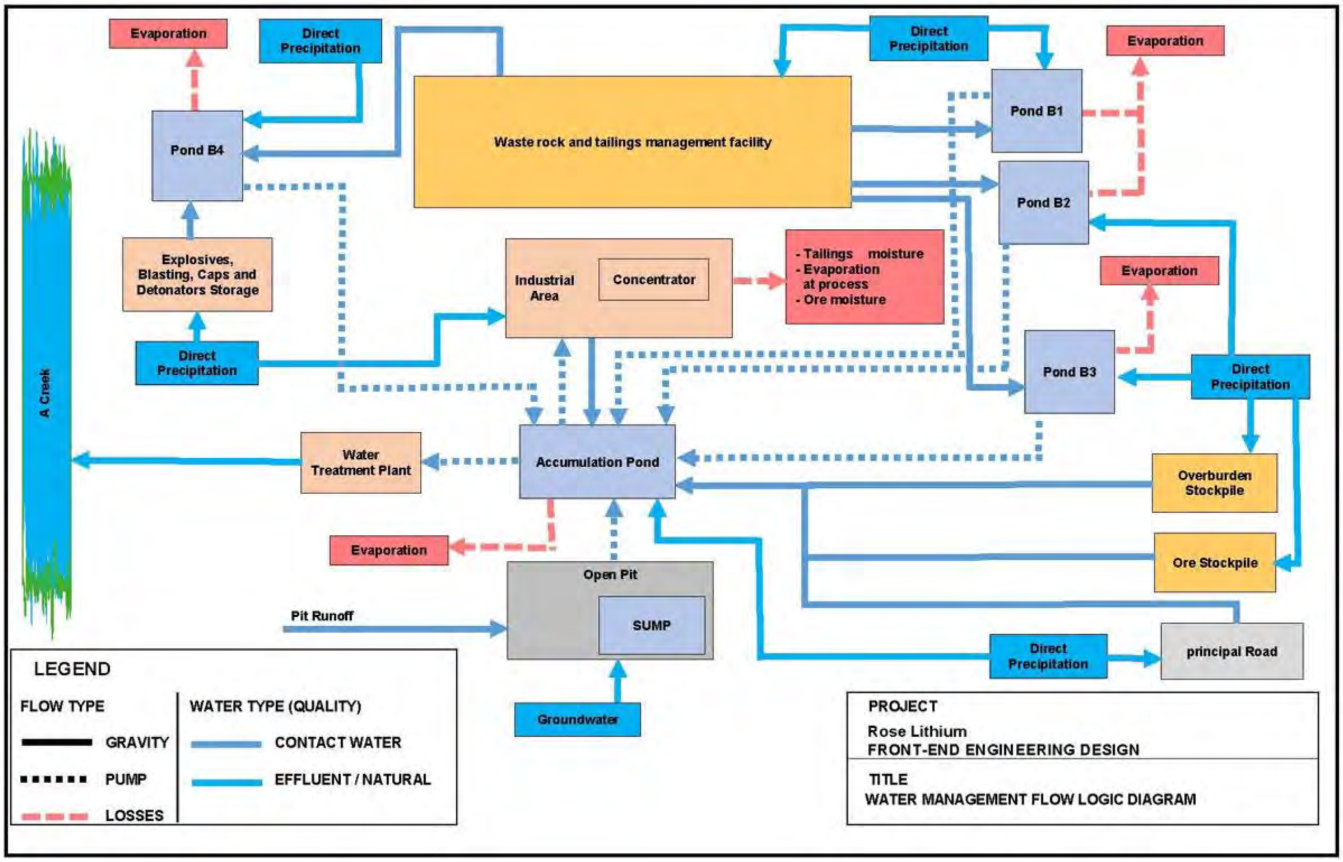
The results indicate that the site runoff and the groundwater inflows to the pit can supply the plant process water demand considering the final Project footprint, and that no uncontrolled overflow of contact water to the environment is expected under the analyzed climate conditions.

A flow logic diagram for surface water balance is presented in Figure 18.14 and ponds volumes and pumping rates are listed in Table 18.4.

Table 18.4: Volumes and Pumping Rates for Water Management Ponds

Pond	Catchment Area (ha)	Volumetric Runoff Coefficient (area-weighted)	100-year Rainfall Volume (m^3)	Required Pump Capacity (m^3/h)
Pond B1	77,8	0,71	53 400	190
Pond B2	61,3	0,71	34 800	160
Pond B3	40,0	0,70	52 300	110
Pond B4	60,7	0,68	79 500	160
Accumulation Pond BA	110,1	0,73	1 100 000	950

Figure 18.14: Surface Water Flow Logic Diagram



18.14 Spodumene Plant

18.14.1 Plant Buildings

The spodumene plant area is located on the south-west side of the open pit. The spodumene plant layout has been developed considering the minimum footprint requirement.

CRUSHER BUILDING

The crushing building is 18.6 m x 32.8 m in size and 19 m high. The crushing building houses the coarse ore bin, a rock breaker, a dust collector, a vibrating grizzly feeder, a jaw crusher, two cone crushers, a vibrating screen and belt conveyors. The total covered surface area will be approximately 610 m2.

TRANSFER HOUSE BUILDING

The transfer house building is 16 m x 16 m in size and 15 m high. This building houses a belt magnet, a vibrating screen, a dust collector and belt conveyors. The total covered surface area will be approximately 214 $m^{2.}$

CRUSHED ORE STORAGE DOME

The crushed ore from the transfer house building will be stockpiled in a storage dome. The dome has a base diameter of 50 m and overall height of 24 m. The total covered surface area will be approximately 1963 m^2.

PROCESS BUILDING

The process building houses grinding, magnetic separation, tantalum recovery, mica & spodumene flotation, dewatering and reagents equipment. The tantalum storage is installed inside the building. The spodumene and tailings storage facilities are located outside the process building. Office, laboratory, lunch room, control room and the change rooms and lockers for employees are located at the administration building close to the process plant.

The concentrator building is 5145 m^2 in size and 20/23 m high.

TAILINGS TRUCK FEEDING STATION

Tailings from the filtration equipment will be conveyed to the tailing's storage building. The building is 32 m x 40 m in size and 18 m high with storage capacity of 12 hours of production. Hauling trucks will be employed for dispatching the tailings to the waste rock facility for disposal. The total covered surface area will be approximately 1280 m2.

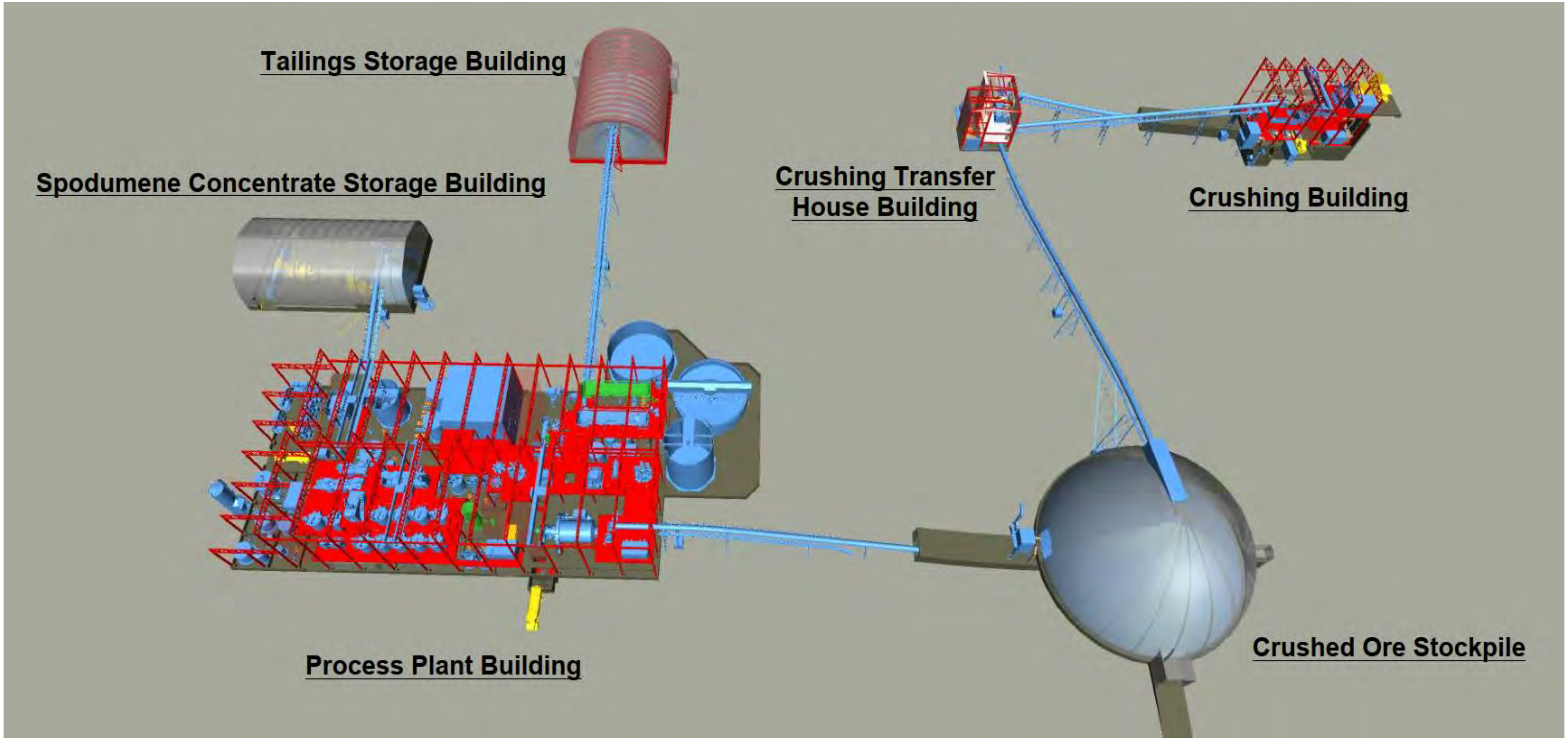
SPODUMENE STORAGE BUILDING

Spodumene concentrate from the filtration equipment will be conveyed to a final concentrate storage building. The building is 25 m x 48 m in size and 15 m high with storage capacity of 24 hours of production. Trailer trucks will be employed for the road transportation from the site to the transfer storage facility. The concentrate will be transported by rail to the port storage facility prior loading the vessel. The total covered surface area will be approximately 1200 m2.

The general arrangement drawing for the spodumene plant is shown on Figure 18.15.

The layout drawings for the spodument plant are presented in Appendix 18-A.

Figure 18.15: Spodumene Plant General Arrangement Building



18.14.2 Spodumene Plant Water Management

Most of the water required for the spodumene plant will be recycled from concentrate & tailings thickeners. Treated water, from the water treatment plant, will be required for make-up water for process, pumps gland seal water system, cooling system and reagents preparation. Treated water will also be required to fill the fire protection tank at the beginning of the operation. Furthermore, the potable water system will be supplied by fresh water from wells.

18.14.3 Spodumene Plant Power Supply and Distribution

Power demand for the Spodumene process plant was estimated at 8.21 MW. The estimation was based on data from the mechanical equipment list prepared for the Project, on the connected load, running load and load factors. A breakdown by area is presented in Table 18.5.

Table 18.5: Estimated Total Power Demand

Area	Power Demand (MW)
Crushing	1.03
Crushed ore stockpile and Grinding	3.86
Tantalum recovery	0.21
Mica flotation	0.37
Spodumene flotation	1.27
Tailings dewatering and dry stacking	0.53
Spodumene concentrate and dewatering	0.30
Reagents preparation and distribution	0.05
Services	0.59
TOTAL POWER DEMAND	**8.21**

The spodumene process plant will be powered from the main substation 315/25 kV. The power will be transported to the spodumene plant through a 25 kV overhead power line from this substation to the electrical rooms.

The transformers will step down the voltage from 25 kV to 4.16 kV. Using a 5kV switchgear installed in the spodumene process plant main substation, this voltage will be used as a distribution voltage to feed the prefabricated substations. The cable supplying the crusher buildings (E-House-003) will be partially installed on the conveyor.

All the electrical equipment will be installed in the prefabricated substation including dry type transformers 4.16/0.6 kV to step-down the voltage to 600 V to feed the low-voltage loads.

MV AND LV DISTRIBUTION LEVELS, SYSTEMS GROUNDING, AND LOAD RANGES

The proposed distribution voltage levels for equipment and the type of motors are defined as indicated in Table 18.6.

Table 18.6: Voltage and Loads

Voltage	Loads	Grounding
4.16 kV, 3 Ph,3 W	MV distribution	HRG

600 V, 3 Ph,3 W	Fixed speed and variable speed motors 575V	Solidly grounded
600V/347 V, 3 Ph,4 W	Large HVAC lighting in process area and welding receptacles	Solidly grounded
208 V/120 V, 3 Ph,4 W or 120V, 1 Ph	Lighting in buildings and small HVAC	Solidly grounded

EMERGENCY POWER

A 500 kVA emergency diesel generator will be provided as a standby source of power and installed in an outdoor prefabricated building to feed the critical loads at 600 V. It will mainly feed fire-fighting pump, communication and control equipment, thickeners racks and lighting.

MOTORS AND STARTING METHODS

All the LV motors will be Totally Enclosed, Fan Cooled (TEFC) induction motors. The starting methods retained are:

- Direct-on-line (DOL) starting used for all low voltage motors below 100 HP with fixed speed applications,
- Soft-Start (SS) starting used for all low-voltage motors over 100 HP with fixed speed applications;
- Variable Frequency Drives (VFD) for variable speed applications.

The ball-mill drive motor will be a 4.16 kV wound rotor induction motor started with an electrolytic starter (LRS). The auxiliary motors will be 600V.

SYSTEM GROUNDING

The neutral of the main spodumene process plant transformer 25/4.16 kV will be grounded through a resistance to limit damage due to arcing faults and provide a better protection to personnel and equipment.

The distribution transformers 4.16 kV/600 V will have a neutral directly grounded.

The grounding system will consist mainly of a network of copper conductors, provided for each process building and substation, and will be buried externally around each building with taps thermo-welded to every other column. The individual ground grids (substations, crushing building) will be tied together with interconnecting ground cables.

CABLES AND TRAYS

The power cables will consist of three conductors (a single conductor when needed) 1000 and 5000 V, copper, XLPE insulated, aluminum armour, PVC sheathed 90°C.

For cables with different voltage ratings, separate trays will be provided.

Cable trays will be ladder type, galvanized steel. Cable trays for instrument cables will have a separated section.

18.14.4 Spodumene Plant Control System

CONTROL SYSTEM PHILOSOPHY

Following industry practice for similar size plants, all process equipment installed in the concentrator and crushing buildings, as well as the electrical prefabricated substations, are controlled and supervised from a central control room equipped with a Supervisory Control and Data Acquisition (SCADA) control system and Programmable Logic Controller (PLC) system located in the ore processing plant. This architecture was selected for the plant-wide process control system. It is a reliable and low-cost approach.

Process Human Machine Interface (HMI) stations will be installed throughout the plant and will be located in the following areas: crusher, grinding, flotation, dewatering, and reagents.

For redundancy, in the control room, the SCADA system will include two SCADA servers, two SCADA operator stations, and one engineering station.

The plant process control system's PLC will act as a master controller and will control and coordinate the operations of the major equipment with other equipment of the process. Operation and alarm data will also be collected and archived. Where vendor packaged process control systems are not available, logic will be developed at plant PLC level for process control and monitoring.

FIBRE OPTIC NETWORK

A fibre optic ring type topology configuration will be implemented for the process control system and the Ethernet backbone network will be used throughout the plant. In ring topology, all the nodes are connected to each other in such a way that they make a closed loop. Each node is connected to two other components on either side, and it communicates with these two adjacent neighbours. This topology will insure a second route to transfer the data to the control room in case of a communication outage on one segment.

The fibre optic ring will link all the main areas of the plant such as SCADA, HMI, remote I/O cabinets, electrical stations, laboratory, and concentrator offices. It will also be used to connect the IP phone system, the camera and security video system, and the fire detection system. The different systems will use different fibres from the same cable.

SPODUMENE PLANT PIPING AND INSTRUMENTATION DIAGRAM

P&IDs will be developed for the Project. The major equipment will be provided by supplier as integrated packages including the necessary instruments, valves, and local control systems. The remaining necessary instruments and valves to be installed are shown on the drawing.

LOCAL CONTROL SYSTEM AND INSTRUMENTS

Local push button stations for all motors are included in the proposed control system.

The push button stations include a local start/stop station for all motor with selector switch manual/automatic in the field. Emergency stop buttons will be provided in each area and will be installed to be easily reachable.

All field switches and instruments (digital and analog) will be wired to local well located remote I/O cabinets with multi-conductor cables. Analog instruments will use 4-20 mA signals with Hart protocol as standard. They will be wired to analog inputs/outputs installed in the remote I/O cabinets using 4-20 mA loops.

Equipment embedded PLCs will be connected with Ethernet cables. The fibre optic ring will be used as a support for the communication between the local cabinets and the control room.

TELECOMMUNICATION SYSTEM AND RADIO SYSTEM

The spodumene process plant telecommunication systems will include mainly:

— IP (VoIP) phone system;
— Internet network;
— Radio communication system;

— Camera and security system.

Internet and IP phone systems will use the fibre optic ring as communication support and will be linked to the service provider.

The spodumene plant radio system will be used in the construction phase and the operation phase and will be a part of the site-wide system.

A camera system, with recorder and viewers will be installed in the control room. Cameras will be installed in the concentrator building, the crushing buildings for metallurgical process supervision purposes.

18.15 Spodumene Plant Infrastructure and Services

18.15.1 Concrete and Structure

Concrete will be prepared on site by a contractor operating a mobile plant for the duration of the construction. A total quantity of 12,000 m³ will be required for the Project. The steel structure will be prepared in a specialized shop and shipped to the site.

DESIGN CRITERIA

The following design criteria were used in the modelling of the concrete and structure:

— Slab on grade: 25 Mpa;
— Footings: 30 Mpa;
— Pilasters: 30 Mpa;
— Walls: 30 Mpa;
— Equipment bases: 30 Mpa;
— Lean concrete: 15 Mpa;
— Reinforcement steel: 400 Mpa;
— Anchor bolts: ASTM A325; and
— Formwork: Wood and Steel.

CRUSHING PLANT

The industrial steel structure of the primary crushing building is composed of heavy steel sections to support the following: jaw and cones crushers, vibrating screen, equipment laydown, rock breaker support, ore hopper support, feeders, and overhead bridge crane. Each floor is comprised of a steel beam framing supporting a steel deck and concrete floor. The truck discharge level consists of a slab on grade for a section, and steel grating platform for the other region.

The general arrangement used to complete the estimate was the structure supported at the rock level with minimal drilling and blasting for outgoing conveyors trench. This is a conservative assumption, and it is recommended in the detailed design to optimize the layout with geotechnical and hydrogeological studies. The actual design includes a concrete wall and structure bracing the wall. There is a Mechanically Stabilized Earth (MSE) wall outside of the primary crusher structure that has been estimated to retain the fill and allow a horizontal slope from the ramp.

The crushing transfer house building is comprised of a vibrating screen, belt magnet, transfer conveyor chutes, chute access platforms, conveyor access platforms, and a roof. The tower support of the conveyor galleries has been modelled, including the steel tower and concrete foundations.

Drilling and blasting may be necessary in some area to cast the concrete structure of the tunnel supporting the reclaim conveyors and crushed ore stockpile above it.

SPODUMENE PLANT AREA

The tunnel going to the ball mill area will require drilling and blasting in some specific areas in order to install the conveyor coming out of the reclaim tunnel and going to the ball mill area.

For the spodumene plant, engineered backfill is required for foundations and concrete slabs. For information, the concrete and structure models include:

- Excavation and backfill
- Concrete raft and monuments for the ball mill
- Bases for process equipment
- Spread footings on rock with pilasters supporting the equipment and operating floors
- Standard structural steel walkway and operating floors for operation and maintenance purposes
- Equipment structural steel supports
- Secondary steel structures
- Stairs
- Handrails
- Gratings
- Slab-on-grade
- Water stop
- Sump pits
- Wall and roof siding (insulated panels)
- Masonry walls
- Acoustic ceiling
- Man and garage doors
- Windows
- Floor finishes
- Dry walls
- Washroom facilities

18.15.2 Heating, Ventilation, and Air Conditioning

The inside design temperature for all building is 15°C. The main HVAC units of the Process Plant will be bi-energy (electricity / propane) to allow operation early during construction, before main electrical power be available. All peripherical heating will be done by electrical heaters.

BALL MILL AREA

According to health and safety regulations, the work areas of the process plant building must be ventilated considering a fresh air intake of three air changes per hour. To meet this standard, a make-up air unit with a capacity of 24,000 cfm will be installed for the area. A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the ball mill building work areas.

The make-up air unit will also regulate the ball mill building temperature to 15°C. Four extraction fans each consisting of 25% of the total ventilation flow will evacuate the contaminated air outside. For heating, three unit heaters (400,000 btu/h each) will be installed.

REAGENTS

To meet fresh air intake standards (two air changes per hour), a make-up air unit with a capacity of 7,000 cfm will be installed for the area.

A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 15°C. Two extraction fans each consisting of 50% of the total ventilation flow will evacuate the contaminated air outside. Three separate electrical heaters (300,000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

PROCESS PLANT AREA

According to health and safety regulations, the general work areas of the process plant building must be ventilated considering a fresh air intake of three air changes per hour and evacuation of 11,960 cfm with the dust collector. To meet this standard, four make-up air units, each of a capacity of 24,000 cfm, will be installed for the area.

A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 15°C. Eight extraction fans each consisting of 11% of the total ventilation flow and a dust collector of 12% will evacuate the contaminated air outside. Ten heaters (400,000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

SPODUMENE DEWATERING AREA

According to health and safety regulations, this work area of the building must be ventilated considering a fresh air intake of two air changes per hour and evacuation of 26,000 cfm with the dust collector. To meet this standard, two make-up air units with a capacity of 24,000 cfm and 18,000 cfm each will be installed for the area.

A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 15°C. Two extraction fans each consisting of 19% of the total ventilation flow and a dust collector of 62% will evacuate the contaminated air outside. Five separate heaters (400 000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

OFFICES, LOCKER ROOM, AND CONTROL ROOM

According to health and safety regulations, these areas must be ventilated considering a fresh air quantity for each worker. A ventilation heat exchanger and a cooling/heating roof top unit will heat and cool all areas of this section.

COMPRESSOR ROOMS

The ventilation of the compressor rooms will be used to control the room temperature. An intake damper will allow air from the outside for cooling when required. To reduce the heating load, an extraction fan will evacuate the hot air inside the process plant building during winter and outside during the summer.

ORE STORAGE DOME TUNNEL

The ventilation of the ore storage dome tunnel will be done by existing bin vents for 12,000 cfm and a fresh air make-up air unit of 12,000 cfm. A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 10°C. One heater (400,000 btu/h) will also be installed.

CRUSHING BUILDING

According to health and safety regulations, the work areas of the primary crusher building must be ventilated considering a fresh air intake of three air changes per hour and evacuation of 33,000 cfm with the dust collector. To meet this standard, two make-up air units with a capacity of 16,500 cfm each will be installed for the area. A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 10°C.

Three separated heaters (300,000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

18.15.3 Fire Protection

For the process plant, the building was classified as Group F Division 3. No sprinklers are required according to the national building code, but fire protection is planned for conveyor belts, hydraulic units, and electrical rooms, as they are expected to be required by insurers. Fireproofing of the staircase and safety egress is also required.

For fire water distribution, a dedicated volume is reserved in the freshwater tank and fire water is pumped through a buried piping network (one electrical pump and one diesel pump in backup).

19 MARKET STUDIES AND CONTRACTS

19.1 Introduction

WSP has reviewed and found acceptable an August 21, 2023, lithium market analysis that was prepared for Critical Elements by Gerrit Fuelling, an independent consultant. Mr. Fuelling is a specialist consultant from Taiwan with over 28 years of experience in the lithium industry and is an active consultant providing a variety of services such as sales and marketing, strategic management, and technical service. The analysis provided by Mr. Fuelling covers lithium market background, the forecast of demand and supply forecast, and the pricing of the lithium market. It mostly explains how the electric vehicle market affects the lithium industry and how it will keep growing in the future. The EV market is the major factor that will influence the demand of lithium in the future.

Considering the increasing demand for lithium as a component of EV batteries, the forecast prices provided by Critical Elements Lithium Corporation for use in the Economic Analysis of the Rose Lithium Project are deemed reasonable for the Rose Lithium Feasibility Study. The sensitivity analysis considered in the economic analysis provides sufficient variation to cover a conservative price while staying profitable.

19.2 Lithium Utilization History

Initial use of Lithium was for applications such as heat-resistant glass, enamel frits, greases, construction materials and organic lithium compounds. In the early 1990's, lithium became a fundamental component of high energy density batteries for portable electronics. Since approximately 2010, lithium became synonymous with the development of the electric vehicle (EV) making use of these high-energy-density-batteries. The EV market continues to grow with the government's drive to reduce air pollution, the greenhouse effect, and the high cost of fossil fuels. From now on, the demand for lithium batteries is seen to be directly related to the demand for EVs.

19.3 Chemical Grade Spodumene

19.3.1 Electric Vehicle Market

Forecasts are based on assumptions and therefore naturally have a degree of uncertainty. While the forecasts of the sources cited diverge, all sources forecast substantial growth in absolute of battery electric vehicles (BEVs) resulting in an increased demand for raw materials. The share of BEVs will depend on the overall number of cars being manufactured and sold. Any attempt to forecast how the industry will fare in the longer term will likely be viewed as doubtful, and anyone asserting what will happen further out into the future will be seen as either brave or foolish.

There are several factors supporting this growth. Such as EU-regulated limits on CO_2 emissions of the fleets of original equipment manufacturers (OEMs), direct government subsidies for BEVs as well as the fact that the European Union (EU) has undertaken to facilitating a large-scale roll-out of the charging infrastructure. In addition, EU-regulated limits on CO_2 emissions of the fleets of original equipment manufacturers (OEMs) support the growth of BEV sales, as do direct government subsidies for BEV purchases.

Furthermore, cost of Li-cells continue to decline. According to the news site 'electrive.net', Bloomberg estimated that the price for a battery pack for an electric car in 2021 was only 118 USD/kWh, and at the cell level it was less than 100 USD/kWh. The analysis by Bloomberg NEF revealed a cost of 97 USD/kWh for the cell level. Converted this is 116.60 Euros/kWh on market average, 104.20 Euros/kWh at pack level in an electric car and 85.70 Euros/kWh at cell level.

Aside from fuel economy tightening and a regulatory framework supporting the EV segment (by the of 2020, more than 20 countries had announced bans on the sales on the sales of conventional cars), numerous OEMs have publicly stated their ambition to have 50% to 100% of their sales be EVs by 2030, and many are no longer going to release new models of internal combustion engine vehicles. For example, VW stated iIn a n updated strategy publication, VW stated that it had set a BEV sales target for 2030 of 70% of all vehicles in Europe and 50% of total sales in the United States.

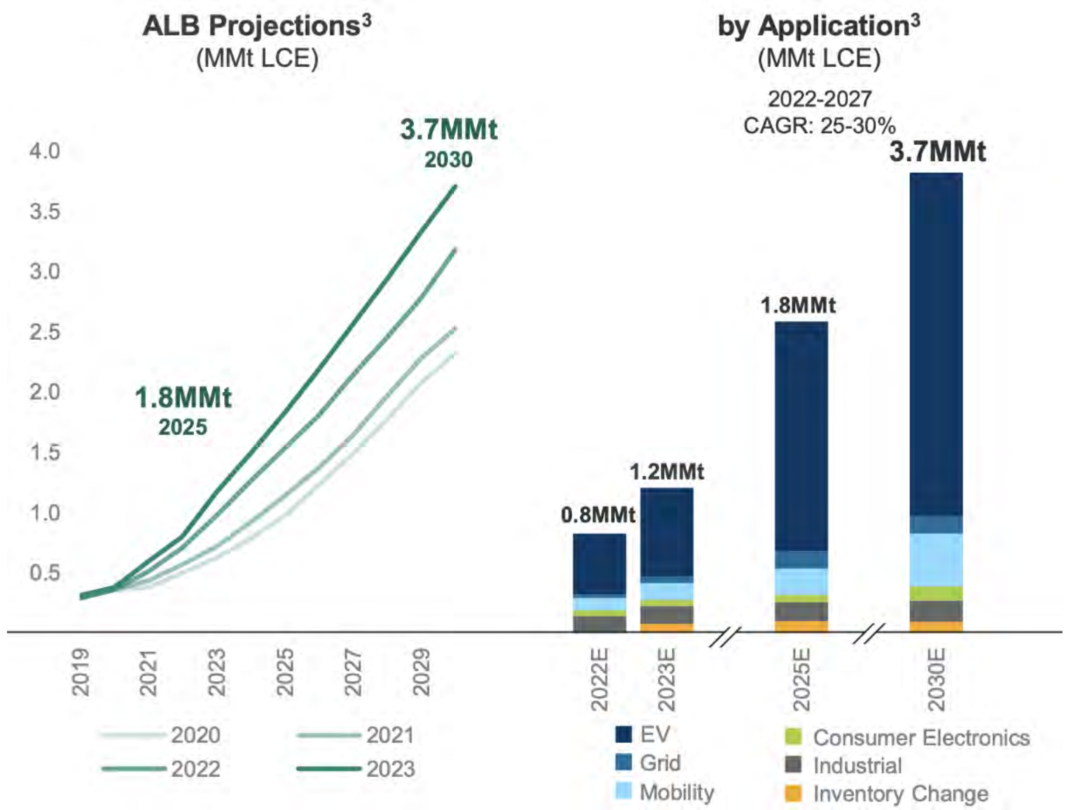
The year 2022 started with record sales of EVs. According to a LinkedIn post by ICCSINO the global sales of electric vehicles was 603,007 units, a year-on-year increase of 87.8% nd a month-on-month drop of 33.6%. Among them, pure electric vehicles increased by 94% year-on-year, and plug-in hybrids increased by 72% year-on-year, mainly due to the rapid growth of the Chinese market, which accounted for nearly two-thirds of the global market.

The market share of electric vehicles is is continuously increasing. getting higher and higher. In January 2022, electric vehicles accounted for 10% of the global auto market, which was higher than last year' 9% market share. It is expected that this year's market share will reach 15%.

What's more, considering about 100 million new cars per year by 2030, and assuming that 40% of them are battery electric vehicle equipped with an average 55-kWh battery, this market segment alone will require in excess of 1.5 million metric tons of LCE. In addition, this does not include other transport segments such as two/three-wheelers, light duty trucks, heavy duty trucks, electric stationary storage (ESS), etc.

In the last year the lithium market has seen some developments, in particular, related to pricing, though neither the overall market development did change nor the global forecasts indicating that demand continues to outpace the development of raw material supply capacity. Several lithium producers as well as the leading market analysts have increased their forecasts. Figure 19.1 displays the actual demand forecast as well as previous projections from Albemarle.

Figure 19.1: Lithium Demand Forecast for 2025 and 2030



19.4 Battery Grade LiOH-H_2O and Spodumene Price Predictions

19.4.1 Chemical Grade Spodumene

As the market faces a structural supply deficit for the remainder of this decade, prices are expected to exceed minimum price requirements. Benchmark Minerals and Fastmarkets both reported in Q2 2023 contractual prices exceeding US$45/kg for lithium hydroxide battery grade as well as about US$4,000/mt for spodumene 6.0%. Also, suppliers who are able to provide a higher quality chemical grade spodumene yielding lower conversion cost will also be able to achieve higher prices.

Consequently, Critical Elements is cautious about the average selling price of 5.5% Li2O Concentrate, Chemical Grade, which stands at USD 2,162/t.

19.4.2 Technical Grade Spodumene

The market for technical grade ("TG") Spodumene, with low iron content, is a specialty chemicals market, which addresses the specific needs for customers in the glass and ceramics industry. In these applications TG Spodumene can replace to a certain extent the use of Li-carbonate. Historically, prices have been reflecting the higher value of iron free spodumene like in lithium carbonate and specific properties of the crystalline material. Therefore, pricing for technical grade spodumene is directly linked to the lithium oxide content in lithium carbonate.

19.5 Tantalum Supply and Outlook

Tantalum is rarely found in its elemental form and is instead mined as a mineral such as columbite, tantalite, and wodginite. These minerals are composed of a mixture of elements most commonly containing tantalum, niobium, thorium, and uranium. These minerals often occur in deposits with other commercially valuable materials such as lithium, cobalt, and tin. Consequently, these minerals are often recovered as a co-product of mining these materials. Current estimates suggest that co-product recovery of tantalum could represent as much as 20% of the supply of tantalum by 2026.

There are a number of sources of supply for tantalum such as mining, recycling, tin slags (by-products of tin smelting), and synthetic concentrates. Roskill estimates that more than half of the world's supply of tantalum comes from mining operations. According to the United States Geologic Survey (USGS), the total production of tantalum from mining operations was approximately 2,100 tons in 2021 and 2022, up from 1,200 tons reported by the USGS in 2015. The largest producing mines in 2021 are in Brazil and the Democratic Republic of the Congo (DRC) in Central Africa with Rwanda and Nigeria effectively tied for third place. According to the USGS the top two from Brazil and DRC account for close to 56% of the total supply from global mining operations. (Rwanda is thought to only be a trader). Table 19.1 shows the global production for the last two years.

Table 19.1: Tantalum Global Mine Production 2021and 2022

Mine Production		
	2021	2022
United States	_	_
Australia	62	57
Bolivia	7	1
Brazil	470	370
Burundl	32	39
China	76	78
Congo (Kinshasa)	700	860
Ethiopia	52	34
Mozambique	43	34
Nigeria	260	110
Russia	39	39
Rwanda	270	350
Uganda	40	38
World Total	**2,051**	**2,076**

Source: USGS

It can be seen from Table 19.1 that there is no mine supplying Tantalum in North America at this time. The United States is 100% reliant on imports for its Tantalum uses.

19.6 Tantalum Pricing Forecast

In Gerrit Fuelling's prior analysis, he stated Roskill in 2016, indicated a price of at least $110-132/kg was seen as needed in order to sustain continued supply from artisanal and by-product sources. The information from the USGS can be seen to have prices throughout 2017 to 2021 that exceeded that 2016 forecast.

In that prior analysis, Roskill expected that in the long-term prices should increase to about $175/kg, driven mainly by the sustained growth of the end-markets, as well as by implementation of conflict minerals regulations.

For their tantalum selling price, Critical Elements has elected a more conservative $US150/kg of Ta_2O_3 contained in concentrate.

19.7 Market Analysis / Metal Pricing Use

WSP deems that the market analysis and prices provided by Critical Elements Lithium Corporation is acceptable to form the basis of an economic analysis for establishing whether a viable mining operation for Lithium and Tantalum products can be established in Northern Quebec. Sensitivity analysis presented as part of the economic analysis shows project viability is retained when a more conservative pricing structure is realized.

However, the market analysis and pricing information as presented does contain forward-looking information related to Lithium and Tantalum demand and price for the Project. The material factors that could cause actual results to differ materially from the conclusions, estimates, designs, forecasts, or projections in the forward-looking information include any significant differences from one or more of the following material factors or assumptions that were applied in drawing the conclusions or making the estimates, designs, forecasts or projections set forth in this Market Analysis:

- Prevailing economic conditions.
- Demand for Lithium and Tantalum Concentrates; and
- Prices as forecast over the Study period.

19.8 Current Contracts

Critical Elements does not have any current contracts.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

The following Item details the regulatory environment of the Project. It presents the applicable laws and regulations and lists the main permits that are needed in order to begin the mining operations. The final environmental impact assessment (EIA) was submitted to the governments of Canada and Québec in February 2019. Critical Elements has answered a series of questions from both government bodies (COMEX and CEAA).

In August 2021, Critical Elements announced that the Federal Minister of Environment and Climate Change had rendered a favourable decision in respect of the proposed Rose Project. In a Decision Statement, which included the conditions to be complied with by the Company, the Minister confirmed that the Project is not likely to cause significant adverse environmental effects when mitigation measures are taken into account.

In September 2022, the Environmental and Social Impact Review Committee (“COMEX”) has recommended that this project be authorized. Pursuant to the James Bay and Northern Quebec Agreement (JBNQA), the provincial environmental assessment was conducted jointly by the Cree Nation Government and the Government of Quebec under the COMEX. In Novembre 2022, the project received the Certificate of Authorization pursuant to section 164 of Québec’s *Environment Quality Act* from the Québec Minister of the Environment, the Fight against Climate Change, Wildlife and Parks.

Now that the project has been approved by government authorities, Critical Elements must obtain the various permits required to build and operate the mine. In addition, a new development has been added to the project: the workers' camp, previously planned 25 km to the north, will be set up some 4 km south of the mine site, under Critical Element's responsibility. It should be noted that this camp was initially presented in the 2017 impact study, but was no longer included in the revised 2019 impact study. A addendum will be presented to Comex in fall 2023 to include a permanent camp.

The mine rehabilitation and restoration plan was approved in May 2022 by the Québec Minister of Energy and Natural Resources. The approval of the rehabilitation and restoration plan is a prerequisite to the granting of the mining lease that will be necessary to move forward with the Project.

Critical Elements has been working since the beginning with the Eastmain Community, and the tallyman, on whose lands the Project lies. The Corporation has also maintained good relations with the Grand Council of the Cree and with the neighbouring Nation of Nemaska. Consultations have been ongoing and are planned throughout the life of the Project. In July 2019, Critical Elements entered into an impact and benefits agreement with the Cree Nation of Eastmain, the Grand Council of the Cree (Eeyou Istchee), and the Cree Nation Government called the Pihkuutaau Agreement.

The main results of the EIA and consultation process are documented in this Item.

20.1 Regulatory Context

The opening of a mine was subjected to the provincial environmental impact assessment and review procedure, under Section 153 of Chapter II of the Environment Quality Act (EQA; CQLR, chapter Q-2). It was also subjected to a federal environmental assessment, under the Canadian Environmental Assessment Act ("CEAA"), 2012 (S.C. 2012, c.19, s.52) in application of the Regulations Designating Physical Activities (DORS/2012-147), as the mine would produce about 4,500 tonnes of ore per day over a 17-year life span. The Project would last 26 years in total with the construction and restoration phases.

In conjunction to these legislations, the Project is located on the James Bay and Northern Québec Agreement ("JBNQA") territory. Chapter 22 of the JBNQA defines the environmental and social protection regime in relation to development activities affecting the territory. Appendix 1 of Chapter 22 (JBNQA) also lists projects submitted to the environmental assessment procedure, activities such as mine openings and relocation of power lines. As such, the environmental assessment process has been guided by the dispositions of this chapter and environmental evaluation committees (COMEX, COMEV, COFEX-South). These committees have ensured that the Cree people have been represented and involved.

In February 2019 an environmental impact (EI) statement was submitted to CEAA and COMEX.

Beyond the EIA, the Project design had to comply with the applicable provincial and federal regulations regarding planned equipment and infrastructure. Numerous laws, regulations, policies and directives are applicable to the Project, the most significant of which are detailed hereinafter.

20.1.1 Permitting Requirements

Throughout all stages of the Project (construction, operations, closure), activities conducted by Critical Elements will be required to comply with provincial and federal acts and regulations. The detailed engineering and operations will consider the conditions, mitigation measures and monitoring requirements associated with the global Certificate of Authorization (Québec) and the federal authorization. It shall also consider all applicable environmental standards included in other relevant provincial acts, regulations, guidelines, and policies. The most relevant ones are listed below. This list is non-exhaustive and is based on information known so far. Their applicability will have to be reviewed as the Project components are defined.

PROVINCIAL JURISDICTION

- Mining Act (M-13.1):
  - Regulation respecting mineral substances other than petroleum, natural gas and brine (M 13.1, r. 2)
- Environmental Quality Act (Q-2):
  - Regulation respecting the regulatory scheme applying to activities on the basis of their environmental impact (Q-2, r.17.1)
  - Regulation respecting activities in wetlands, bodies of water and sensitive areas (Q-2, r.01)
  - Clean Air Regulation (Q-2, r. 4.1)
  - Regulation respecting industrial depollution attestations (Q-2, r. 5)
  - Regulation respecting pits and quarries (Q-2, r. 7.1)
  - Regulation respecting compensation for adverse effects on wetlands and bodies of water (Q-2, r. 9.1)
  - Regulation respecting the declaration of water withdrawals (Q-2, r. 14)
  - Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (Q-2, r. 15)
  - Regulation respecting the burial of contaminated soils (Q-2, r. 18)
  - Regulation respecting the landfilling and incineration of residual materials (Q-2, r. 19);
  - Regulation respecting waste water disposal systems for isolated dwellings (Q-2, r. 22)
  - Regulation respecting halocarbons (Q-2, r. 29)
  - Regulation respecting hazardous materials (Q-2, r. 32)
  - Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains (Q-2, r.35)

  - Water Withdrawal and Protection Regulation (Q-2, r. 35.2)
  - Land Protection and Rehabilitation Regulation (Q-2, r. 37)
  - Regulation respecting the quality of the atmosphere (Q-2, r. 38)
  - Regulation respecting the quality of drinking water (Q-2, r. 40)
  - Regulation respecting the charges payable for the use of water (Q-2, r. 42.1)
- Threatened or Vulnerable Species Act (E-12.01):
  - Regulation respecting threatened or vulnerable wildlife species and their habitats (E 12.01, r.2)
  - Regulation respecting threatened or vulnerable plant species and their habitats (E-12.01, r.3)
- Watercourses Act (R-13):
  - Regulation respecting the water property in the domain of the State (R-13, r. 1)
- Sustainable Forest Development Act (A-18.1):
  - Regulation respecting the sustainable development of forests in the domain of the State (A-18.1, r. 0.01)
- Conservation and Development of Wildlife Act (C-61.1):
  - Regulation respecting wildlife habitats (C-61.1, r. 18)
- Lands in the Domain of the State Act (c. T-8.1)
- Building Act (c. B-1.1):
  - Construction Code (B-1.1, r. 2)
  - Safety Code (B-1.1, r. 3)
- Explosives Act (E-22):
  - Regulation under the Act respecting explosives (E-22, r. 1)
- Cultural Heritage Act (P-9.002)
- Highway Safety Code (C-24.2):
  - Transportation of Dangerous Substances Regulation (C-24.2, r. 43)
- Occupational Health and Safety Act (S-2.1):
  - Regulation respecting occupational health and safety in mines (S-2.1, r. 14)
- Dam Safety Act (S-3.1.01):
  - Dam Safety Regulation (S-3.1.01, r. 1)
- Directives and Guidelines:
  - Directive 019 sur l'industrie minière (2012)
  - Lignes directrices relatives à la valorisation des résidus miniers (2015)
  - Guidelines for preparing mine closure plans in Quebec (2017)
  - Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés (2019)
  - Guide de caractérisation des résidus miniers et du minerai (2020)

FEDERAL JURISDICTION

- Fisheries Act (R.S.C., 1985, c. F-14):
  - Metal and Diamond Mining Effluent Regulations (SOR/2002-222)
- Canadian Environmental Protection Act (S.C. 1999, c. 33):

  - PCB Regulations (SOR/2008-273)
  - Environmental Emergency Regulations (SOR/2003-307)
  - Federal Halocarbon Regulations (SOR/2003-289)
  - National Pollutant Release Inventory
- Species at Risk Act (S.C. 2002, c. 29)
- Canadian Navigable Waters Act RSC 1985, c. N-22
- Canada Wildlife Act (R.S.C., 1985, c. W-9):
  - Wildlife Area Regulations (C.R.C., c. 1609)
- Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22):
  - Migratory Birds Regulations (C.R.C., c. 1035)
- Nuclear Safety and Control Act (S.C. 1997, c. 9):
  - General Nuclear Safety and Control Regulations (SOR/2000-202)
  - Nuclear Substances and Radiation Devices Regulations (SOR/2000-207)
- Hazardous Products Act (R.S.C., 1985, c. H-3)
- Explosives Act (R.S.C., 1985, c. E-17)
- Transportation of Dangerous Goods Act (1992):
  - Transportation of Dangerous Goods Regulations (SOR/2001-286)
- Directives and Guidelines:
  - Environment Canada Environmental Code of Practice for Metal Mines (2009)
  - Guidelines for the Assessment of Alternatives for Mine Waste Disposal (2016)
  - Strategic climate change assessment (2020)

20.1.2 Approvals, Permits and Authorizations

Following acceptance of the Project by government authorities, Critical Elements will require several approvals, permits and authorizations to initiate the construction phase, operate and close the Project. In addition, Critical Elements will be required to comply with any other terms and conditions associated by both provincial and federals global authorizations.

PROVINCIAL JURISDICTION

For certain activities of the Project (e.g., waste rock pile, dykes, roads, water treatment plant, worker's camp, electrical sub-station, etc.), the Regulation respecting the regulatory scheme applying to activities on the basis of their environmental impact (Q-2, r. 17.1) clarifies the framework for activities subject to ministerial authorization under section 22 of the Environment Quality Act (EQA).

Specific permits will also be needed (non-exhaustive list):

- Authorization for groundwater catchment, water supply and water treatment plant under (RRAEQA, s. 32);
- Permit for explosives (Regulation under the Act respecting explosives, s.II);
- Permit for the use of high risks petroleum equipment (Safety Code, s.120 ; Construction Code, Chap. VIII, s.8.01);

- Industrial attestation under the Regulation respecting industrial depollution attestations (RRAEQA, s. 31.11);
- Land lease for mining waste (Mining Act, s. 239 and An Act respecting the lands in the domain of the State, s.47) (see 8.7.3);
- Authorization to deposit mining waste in the approved location (Mining Act, s. 241);
- Permit for tree clearing (Regulation respecting standards of forest management for forests in the domain of the State);
- Authorization for implementing dust collector (RRAEQA, s. 48).
- Exemption under the Canadian Navigable Waters Act (Section 23 (1) of the CNWA)

Also, Critical Elements must compensate for the loss of wetlands. Compensation programs will be developed in collaboration with the environmental authorities and Cree Nations.

FEDERAL JURISDICTION

The Project has been authorized by Environment and Climate Change Canada, but other authorizations are also required from:

- The Minister of Fisheries and Oceans may issue authorization(s) under paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*;
- The Minister of Natural Resources may issue a licence under subsection 7(1) of the *Explosives Act*; and
- The Minister of Transport may approve an application under subsection 10(1) of the *Canadian Navigable Waters Act*.

Critical Elements will also need to complete a declaration to the National Pollutant Release Inventory. Also, Critical Elements must compensate for the loss of fish habitats. Compensation programs, currently being finalized, is developed in collaboration with the environmental authorities and Cree Nations.

20.1.3 Land Leases

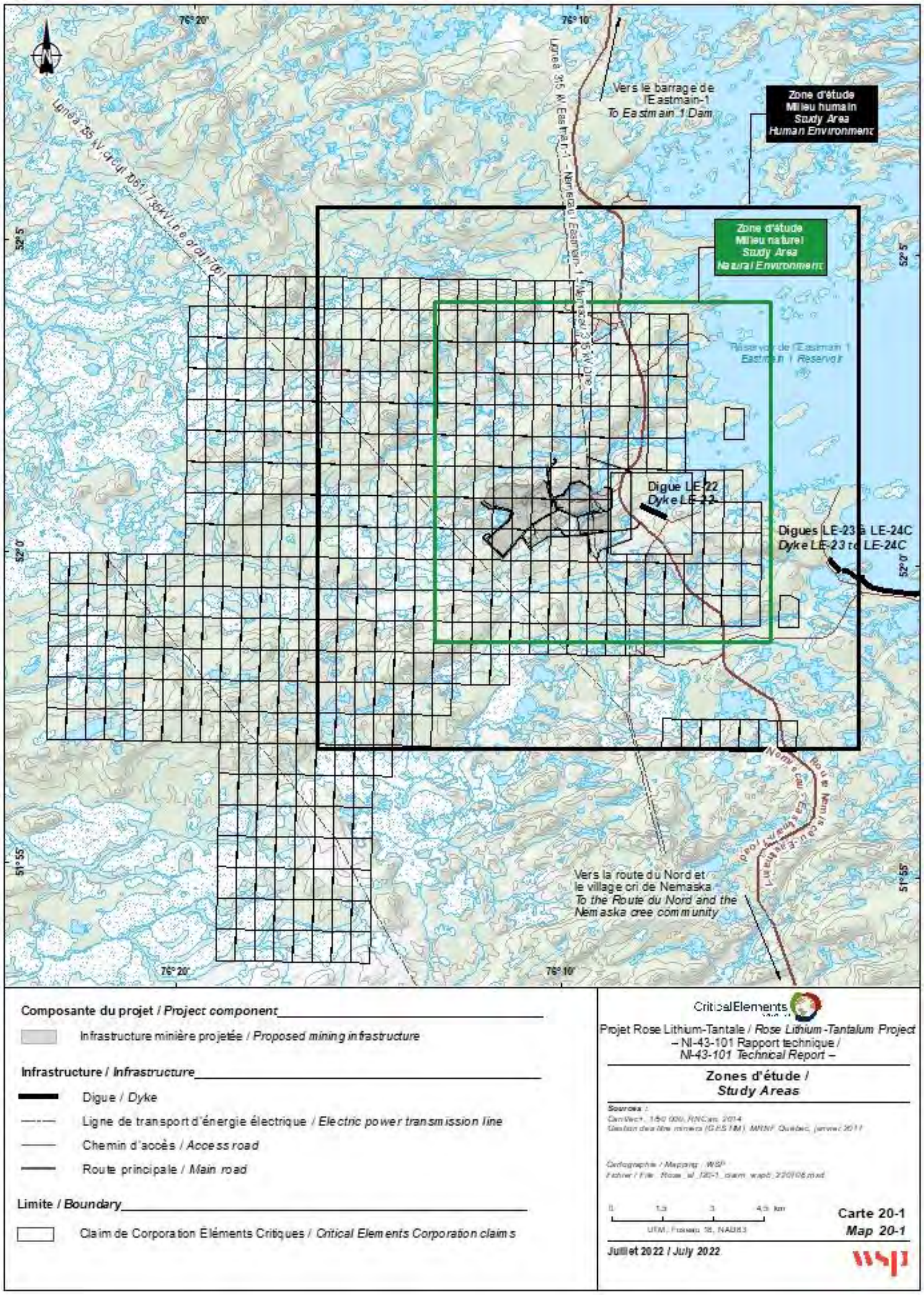
A land lease will need to be obtained from the provincial government (the custodian of the State lands). This will be applicable to all lands where construction work is needed. This land lease will need to be acquired before permit requests. As such, a land lease request was prepared and submitted to the MERN. The approval is pending and expected for Q4 2023.

20.2 Description and Effects on Environment

The Rose Mine property consists of 473 active claims spread over approximately 246.5 km^2 (24,650 ha) (see Figure 20.1). The claims are grouped into two blocks located on Québec public domain lands. The mining property is in the territory of Eeyou Istchee James Bay, more specifically within the community of Eastmain, on Category III lands. About 40 km to the south is the Cree village of Nemaska, which is located about 300 km northwest of Chibougamau. The site is accessible via the Route du Nord, which is accessible in all seasons from Chibougamau, or via Matagami, via Route 109 and the Route du Nord.

Two studies areas have been identified for the EIA and the associated environmental and baseline studies (Figure 20.1). The 'local study area' includes all of the areas likely to be directly physically impacted by the mine development (in regard of the infrastructure locations). The 'regional study area' is a larger area extending out of the Property and to which is potentially associated cumulative effects with other projects or infrastructures.

Figure 20.1: Environmental Baseline Study Areas



The following descriptions outline the major components of the biophysical and social environments, in addition to the expected residual impacts.

20.2.1 Physical Environment

GEOLOGY AND SEDIMENTS

Bedrock Geology

The study area is located in the northeastern part of the Canadian Shield, in the Superior geological province. The study site straddles three subprovinces: La Grande, Opinaca at the eastern end and Nemiscau at the southwestern end. These subprovinces form the Eastmain Greenbelt, which consists of metamorphosed volcanic and sedimentary rocks (Moukhsil et al., 2007). The Rose property is located in the southern portion of this belt, dominated by the Anatacau-Pivert Formation. Refer to Item 7 for details of bedrock geology.

Geomorphology

Over 25% of the study area is covered by basal or ablation till. Thin till (< 1 m) covers 7% of the study area. It is present on the tops and slopes of rocky hills where bedrock outcrops at bedrock outcrops in several locations. Thin till deposits are located to the north and west of the proposed facilities. More than 18% of the study area is covered with till more than one meter thick. Thick till is located in smaller proportions on hilltops and slopes, but is more present in flat areas. To the north of the study area, the till is tapered, indicating that it is a bottom till, shaped by the last glacier flows. of the glacier. There are no marine deposits in the study area. However, the waters of the Tyrrell Sea invaded a large area to the east of the study area because of lower altitudes. These are now flooded by the Eastmain-1 reservoir waters. Finally, more contemporary, alluvial, aeolian deposit and organic, have been implemented during the Holocene.

GEOCHEMISTRY

Critical Elements commissioned Lamont Inc. of Québec to compile and analyze the results of geochemical characterization tests performed on samples of rock waste taken from the projected footprint pit of the Project (Lamont Inc., 2017). The samples and the analytical test protocol were previously determined by Critical Elements.

The Lamont Inc. (2017) report shows the following:

- The Project deposit is located in the Superior Geological Province. The mineralization is contained in spodumene pegmatite dykes that are encased in gneiss, amphibolite, porphyry and metasedimentary units. These four lithologies represent all of the future tailings that will be extracted from the open pit, planned to be exploited for the Project. The lithologies of gneiss and porphyry represent about 85 % of the future tailings.
- The characterization program was undertaken to characterize 21 samples of waste rock: 11 gneiss, 6 amphibolite, 2 porphyry, and 2 metasediments. All samples were taken from exploration drill cores, by Critical Elements.
- The samples are mainly composed of SiO_2 and Al_2O_3. The amphibolite samples also show slightly higher concentrations in Fe_2O_3, MgO and CaO. The results obtained with the whole rock analysis clearly demonstrate the overall composition of the samples being silicates.
- The geochemical characterization tests were used to determine the potential of the samples to generate acidity. According to Directive 019 criterion, applicable in Québec, two samples out of 21 are considered to potentially be acid generators, with S_{total} concentrations of 0.314 % and 0.353 %. These values are very close to the 0.3 % S_{total} criterion. The majority of the samples have a S_{total}

concentration below 0.05 %. According to currently available information, either the majority of samples are NPAG, sulphur concentrations are low and that the presence of sulphides is marginal in the lithological units, it can be considered that all of the waste rock will be NPAG.

— The tests were also used to determine the leaching potential of metals. There are no samples with metal concentrations exceeding PPSRTC (P*olitique de protection des sols et de réhabilitation des terrains contaminés*) criterion C. Tailings are therefore not considered to be high-risk residues. Still, according to Directive 019 criterion, based on metal analysis and leachate test TCLP, 6 samples out of 21 are considered potentially leachable for copper. Copper exceedances are mainly observed in amphibolite samples. According to Critical Elements, this lithology could represent less than 11 % of the total amount of waste rock to be extracted.

Based on the information currently available, which is that: the majority of waste rock samples are NPAG, sulphur concentrations are low and sulphides are marginal in the lithological units, it can be considered that all waste rock will be the presence of sulphides is marginal in the lithological units, it can be considered that all the waste rock will be NPGA.

Based on the information currently available, that the tailings sample is that the sulphur concentration is very low, it can be considered that all the tailings will be NPAG.

There are no samples with metal concentrations in the TCLP leachate that exceed the PPSRTC RES criteria. The tailings are therefore considered to be the tailings are therefore considered to be non-leachable, and therefore will be low-risk tailings.

Kinetic tests in wet cells were subsequently performed (Lamont 2019, 2021). Kinetic tests were performed on 13 samples, to better understand the geochemical behavior of the waste rock and ore from the Rose project. Kinetic wet cell tests have demonstrated that the tested samples contain very few metals that are not readily leachable. The concentrations obtained in the leachates are regularly below the detection limits of laboratory analyses. The waste rock and ore are not very reactive and can be considered as quasi-inert materials. The calculated leaching rates are low. There was no significant variation identified in the chemical composition of the samples before and after the kinetic test.

Critical Elements has committed to carry out additionnal geochemical characterization of waste rock, tailings and ore during operation, to demonstrate that the chosen management method is consistent with the results of the geochemical characterization of the materials.

AIR QUALITY

A study of air quality was carried out as part of the Project and was incorporated into the EIA. In order to assess the impacts of air emissions from the mining work, modelling of the air dispersion covers the construction and operation and maintenance phases of the mine.

The Project could affect air quality by emitting contaminants into the atmosphere: dust, metals and metalloids, and gaseous compounds from combustion (exhaust gases). The Project could also affect air quality by emitting dust during road transportation and other mining activities or infrastructure, such as the operation of the ore processing plant, drilling, blasting, loading and unloading of mining materials and mining material storage sites. The transportation of mining materials on the unpaved roads of the future mine site would be the main source of dust.

However, in the construction and operation phases, all the standards and criteria considered are respected in the area of application, i.e., beyond 300 m from the infrastructures, and at sensitive receptors. Furthermore, with the application of mitigation measures, no exceedance of crystalline silica criteria is modeled at sensitive receptors, such as the worker's camp or Cree camp. In addition to applicable mitigation measures, a dust management plan will be implemented.

GREENHOUSE GAS

Legally, Critical Elements is annually required to report its air emissions, including GHGs, to the MELCCFP, in accordance with the Regulation respecting the mandatory reporting of certain emissions of contaminants into the atmosphere (RDOCÉCA).

The total annual emissions that would be generated by the maximum operating scenario of the mine would be in the range of 84.3 kilotonnes (84,300 tonnes) of carbon dioxide equivalent (CO_2 eq). This corresponds to approximately 0.12% of the total greenhouse gas emissions inventoried in Québec in 2017, and 0.012% of the total greenhouse gas emissions inventoried in Canada in 2018. The Project's total emissions would be in the order of 1,519 kilotonnes of CO_2 eq.

Various measures have been proposed to reduce the effects of the Project on GHG emissions, including: using electrical equipment wherever possible in mine operations; limiting engine idling; using the latest (Tier 4 certified) engine technology; using energy-efficient equipment, construction and design standards, procedures and operating practices; and providing eco-driving training to drivers of material hauling trucks.

NOISE

The study area to assess the effects on the noise environment is the footprint of the mine site and approximately 500 m around it. Since this zone is not very busy, its current noise level corresponds to that measured in the natural environment, which is less than 40 decibels. The increase in road traffic, the construction of the mine site's infrastructures and the use of explosives would cause an increase in ambient noise. truck traffic on off-site roads, such as the Nemiscau-Eastmain-1 road, would result in an average noise level of 40 decibels at 55 m from the road and 45 decibels at 37 m. During the operational phase, the average noise level would reach 40 decibels at 85 m from the road and 45 decibels at 55 m. The minimum distance that would be necessary to maintain between land users and the road to avoid an effect on speech and sleep disruption is 68 m in the operational phase. Currently, the camp closest to the road is located 80 m from the road, 2.5 km from mining activities and noise from mining activities will remain below permitted noise levels (50 dBA at night and 55 dBA during the day nearby sensitive receptors such as First Nations camps).

SOILS COMPOSITION AND QUALITY

No previous activity is likely to have affected the quality of the soil at the Project's site. Soil quality analysis was performed on samples taken from the trenches and boreholes. Thirty-five samples were analyzed by the laboratory. Chemical analysis results showed concentrations above the background levels established for the Upper Geological Province (generic "A" criteria) for three parameters: silver, cadmium and tin.

The Project could result in effects on soil quality, which could indirectly affect groundwater quality. The main source of effect on soil quality, namely the risk of contamination during accidental spills of hydrocarbons, solvents, or other hazardous liquids. Critical Elements will mitigate the risk of spills through the emergency measures plan.

HYDROGEOLOGY AND GROUND WATER QUALITY

The analysis of the available data allowed the identification of two main hydrostratigraphic units: a horizon of unconsolidated deposits divided into two units (glaciofluvial sediments and till and basal till); a rocky horizon composed of granite and granodiorite, tholeiitic basalt and a diabase dyke. The thickness of the till and fluvioglacial sediments varies between 0 and 5 m and the thickness of the basal till varies between 5 and 38.4 m.

In the majority of samples, exceedances of Québec's surface water resurgence criteria (SWR) were noted for the following metals: silver, copper, manganese, nickel, lead and zinc. Critical Elements plans a groundwater monitoring program consisting of 18 observation wells located upstream and downstream of the mining infrastructure.

HYDROLOGY AND HYDRAULIC

The environment into which the Project will be developed affects two water basins, the Eastmain River and the Pontax River watersheds. The proposed pit lies directly on the watershed limit of these two major river basins.

The Eastmain River basin originates in the Otish Mountains. Since 1980, its waters have been diverted to the Grande Rivière basin by means of dams located on the Eastmain River, on the Opinaca River and on the Petite Rivière Opinaca.

The Pontax River basin originates in Champion Lake on the outskirts of the Nemaska village. The Project is located at the head of the watershed, in a secondary branch that joins the Pontax River, 25 km east of the James Bay Road.

Given its topographic location, the study area is mainly composed of small lakes and low flow streams. All runoff from the site will be collected in a retention basin and discharged into Stream A after passing through a treatment unit, thereby increasing the quality of the water. The treatment unit discharge will increase the surface area of Stream A and modify the discharge pattern.

Modification of the hydrological regime (flow pattern, flows and water levels) and hydrogeological conditions will result in the loss of 42.3 hectares of aquatic habitat, i.e., 37.9 hectares in a lake environment and 4.4 hectares in a river environment. Lakes 1 and 2 (12.4 hectares) will be dewatered (pit site).

SURFACE WATER AND SEDIMENTS QUALITY

Generally, water and sediments quality is very good with respect to the criteria for the protection of aquatic life. Water is limpid, low in productivity, dimly mineralized and has a low buffering capacity. Results show that, as a whole, the different sampled waterbodies have not been affected by contaminants spreading. Apart from dissolved oxygen concentration and bacteriological analysis, there is no significant difference in water quality between sampling periods. Due to the low activity level occurring in the sector, the presence of fecal coliforms is very likely of natural origin.

Cadmium and zinc are present at a concentration exceeding the threshold concentration effect level in Lake 4, and exceeding measurements for threshold effects level have been noted for cadmium and zinc at Lake 4, and for copper at Lakes 2, 4, and 5.

The management of mine water could affect the quality of ground and surface water, the thermal regime and the dissolved oxygen concentration of water bodies and streams. The Project could emit suspended solids into the water that could clog spawning grounds.

During the operational phase, water accumulating in the pit (mine water), water from the ore concentrating process and runoff from the mine site could contain suspended solids, metals, nitrates or an acidity level (pH) in excess of applicable criteria. Critical Elements plans to build a plant to treat this water before discharging it to Watercourse A. According to the geochemical characterizations carried out, the waste rock, ore and mine tailings would not be likely to generate acid mine drainage (AMD).

ARTIFICIAL LIGHT AT NIGHT

The Project's site is located in an area where the clarity of the sky is almost optimal. A very much lesser clarity of the sky is present nearby the two main artificial light emitters: electrical substation Nemiscau, located south of the Project's site, and hydroelectric plant Eastmain-1, located north of the site. However, this effect quickly fades after a few kilometres and gives place to a sky-clarity of very good quality. Regarding intrusive light, there is no such source in the study area.

Project activities during the operation and maintenance phase represent ongoing sources of artificial nighttime light emissions that have the potential to locally alter sky clarity and disrupt nighttime landscapes nerby the Project.

20.2.2 Biological Environment

FLORA

The Project area is characterized by the presence of numerous hills and valleys. The mainly coniferous terrestrial stands, as well as peatlands, are the main vegetative groups of the territory. The density and composition of these stands vary mainly according to the fire regime (more or less recent slash and burning), the substrates, and drainages observed, as well as the exposure of these to the severity of the climate. Whether in wetlands or on land, heath plants dominate virtually all landscapes.

The Project would result in a total loss and direct disturbance of 427.4 ha of terrestrial stands and 173.55 ha of wetlands (0.08 ha of ponds, 11.96 ha of treed and shrub swamps, and 161.51 ha of ombrotrophic bog). ECCC is satisfied with the application of the "avoid-minimize-compensate" sequence that led Critical Elements to choose the location of the Project components in such a way as to limit the permanent loss of wetlands and their functions. A "wetland or watercourse compensation plan" has been presented to Government authorities.

Vegetation Groups

Terrestrial vegetation represents 64.0% of the study zone. In general, the area under study is largely dominated by coniferous stands, more particularly, the jack pine forest (51.3%). Those are mainly observed on the slopes and hilltops in rather xeric conditions, whether on sandy deposits or directly on the rock.

Apart from pine forests, spruce-moss and spruce-lichens stands are also observed in the Project area. These groups, however, are less numerous and often cover smaller areas than jack pine forests. The muscinal strata on which these spruces (mosses and / or lichens) grow varies according to the drainage of the soil; lichens are rather observed in areas with excessive drainage, while mosses are more present in more mesic conditions. The soil is almost entirely covered with hypnaceous mosses, sphagnum mosses, and lichens.

Although the stands are mainly composed of coniferous species, several small deciduous stands are also observed on the southern slopes of the mountains or in some sheltered areas of the hills. White birch is the most frequently observed species.

Wetlands

Wetlands represents 36.0% of the study zone. They are mainly composed of peatlands and some riparian environments. Peat bogs (bogs) are the largest and most frequent in the study area. In the development area of the Project, different types of ombrotrophic peatlands are present. These can be arborescent or shrubby. In all cases, they are characterized by a thick carpet of sphagnum sometimes accompanied by hypnaceous mosses and lichens.

Ecological Value

Among inventoried areas, four were attributed a high ecological value due to their ecological integrity, quality of their hydrological connections and their maturity: two emergent marsh, one treed marsh, and one open ombotrophic peatland. No plant of special status has been inventoried. However, an invasive exotic plant, the Reed Canarygrass, has been found at various places, although only on a few square metres for each observation. Thirty-two species of Cree's medicinal interest have been identified: six species of trees, twenty species of shrubs, five herbaceous species, and one group of mosses species.

FAUNA

Terrestrial Wildlife

Three species of large mammals are likely to frequent the study area. These include moose, black bear, and caribou, both woodland and migratory ecotypes. Also several species of small terrestrial fauna are likely to frequent the study area of the natural environment according to their range. As for the micromammals, there are 14 species potentially present in the study area, the presence of six species has been confirmed during the inventory carried out. No species with a special status has been recorded.

Moose

In general, the density of moose in Hunting Zone 22, of which the study area is part, is one of the lowest in Québec. It was estimated at 0.50 moose / 10 km2 between 1991 and 2012. Signs of presence (faeces and traces) of moose were observed during inventories carried out.

Black Bear

The presence of the black bear was confirmed within the study area from observations of some black bear traces and feces (summers 2012 and 2016).

Caribou

The study area for the Project is located in the area of distribution of woodland caribou and migratory caribou. Thus, individuals from these two ecotypes are likely to frequent the study area of the Project; migratory caribou are likely to frequent the study area only in winter, whereas woodland caribou may frequent the area on an annual basis. Current knowledge therefore indicates that woodland caribou of the Nottaway herd have scarcely used the study area over the past decade within a radius of approximately 25 km from the projected mine. The presence of migratory caribou in the area is considered to be marginal.

The habitat alteration caused by the Project would have no significant impact on woodland caribou. The current rate of disturbance (natural and anthropogenic) of caribou habitat is 60% in the study area and 99% within a 5-km radius. The Project would also have no significant effect on the connectivity between caribou habitats since the study area is already fragmented by roads and the power grid. The Project will not have a significant effect in terms of direct or functional loss of habitat for woodland caribou likely to frequent the area.

Chiropterans (bats)

Acoustic inventory of chiropterans (bats) confirmed the presence of five species within a 50-km radius of the future mine site. Among these species, the northern myotis and the little brown myotis are designated as endangered under SARA. Deforestation and the construction of mining infrastructures could destroy the chiropterans diurnal habitat or reduce its quality, causing the mortality of individuals or changes in their use of different types of habitats. No chiropteran maternity or hibernacula are known within a 10-km radius of the mining Project. The disappearance of wetlands would mean the loss of feeding sites, which would require the relocation of chiropterans to other sites. However, these wetlands are mainly bogs, which are not preferred feeding sites for chiropterans. During the construction phase, if the schedule permits, Critical Elements plans to conduct deforestation outside the chiropteran breeding period.

Wolverine

The presence of wolverine is unlikely in the area. For these reasons, no adverse effects of the Project on wolverine are expected. It is justified by the low probability of presence of this species, the extent of the territory it occupies, the small size of the Project's zone of influence and the intensity of current human occupation.

Avifauna

For avian wildlife, the various field surveys and opportunistic observations confirmed the presence of 87 species, both migratory and non-migratory, belonging to 30 families in the study area during the inventories carried out. The distribution and abundance of avifauna in the area varies according to seasons, ecological preferences and habitat availability for each of the groups, namely waterfowl and other aquatic birds, shorebirds, forest birds, diurnal raptors, and nocturnal raptors. Nesting status was confirmed for 9 species, while probable nesting status was assigned to 21 species and possible for 38 others. Some waterfowl species, such as Canada geese and snow geese, are valued by the Cree Nations.

At least 24 species of waterfowl, 27 species of aquatic birds and 61 species of land birds are likely to frequent the study area. There are seven species at risk protected under Species at Risk Act that have been inventoried in the study area or that are likely to frequent the study area.

Habitat loss would be the main negative effect caused by the Project on birds, but lost wetlands will be replaced by compensation projects.

Herpetofauna

For herpetofauna, the various field surveys and opportunistic observations confirmed the presence of 11 species potentially present in the study area, seven were identified in the study area: american toad, northern spring peeper (mink frog, green frog, wood frog, the common garter snake and the northern two-lined salamander. No species at risk were observed.

The loss of habitat is the main effect caused by the Project and the other probable effects are related to the presence of infrastructures (noise and risk of collision) as well as the risks of accidental spills.

Aquatic Fauna

The study area covers a surface of approximately 102 km² and is shared between two watersheds, namely the La Grande Rivière watershed, which includes the Eastmain 1 reservoir, and the Pontax river reservoir.

A total of fourteen species of fish were inventoried in this study area: white sucker, northern pike, yellow perch, lake whitefish, yellow walleye, brook trout, burbot, lake chub, pearl dace, longnose dace, mottled sculpin, slimy sculpin, brook stickleback and fallfish. No special-status fish species were captured during these inventories. According to the CBJNQ, lake sturgeon, white sucker, burbot and lake whitefish are strictly reserved to the First Nations use in this region.

The main effects of the Project on fish and their habitat are related to the loss of temporary and permanent habitat, the modification of the hydrological regime and the modification of the thermal regime. The modifications to the hydrological regime and the encroachment of mining infrastructure would be likely to deteriorate, destroy or disturb 42.3 ha of fish habitat, including 37.9 ha in a lake environment and 4.4 ha in a watercourse. Lost habitats will be replaced by compensation projects. Other potential effects may be caused by the risk of release of suspended solids into the water, the risk of spills and increased fishing pressure.

20.2.3 Social Environment

The Project is located within a trapline of the Cree Nation of Eastmain, near the Cree village of Nemaska, and also affecting a watershed on the Waskaganish First Nation's traplines. The Project could lead to environmental effects on health and socio-economic conditions, on the current use of land and resources for traditional purposes, on the natural and cultural heritage and on sites of archaeological significance for Cree Nations.

ARCHAEOLOGY

An archaeological potential study was conducted to identify areas of interest related to remains associated with ancient human presence. On a 83.4 km^2 study area, 12 archaeological sites corresponding to Native American occupation and prehistoric, modern and contemporary period are actually known following the research made as part of the Eastmain-1 hydroelectric project. Twenty-one archaeological potential sites have been identified. In the areas affected by the Project an archaeological inventory has been carried out to avoid archaeological and ethnological vestige destruction because of projected construction works. No archaeological finds were made and no evidence of ancient or recent human settlement was found in any of the areas visited.A protection program will be applied if an accidental discovery is made during construction work.

LANDSCAPE

The landscape appearance of the site is based on natural components. Anthropogenic changes to these components will compromise the integrity of the site's landscape. The planned remediation of the site will contribute to reshaping the site as much as possible with the surrounding landscape. The visual field of observers may be particularly modified by the presence of the waste rock and tailings co-disposal site because of its size and geometry. However, the landscape, which is a visually complex mosaic defined by an undulating topography and by vegetation that varies in height and density, favours the visual integration of the co-disposal stockpile and limits the effects on the visual fields of observers. There will be no significant effect on the landscape or on the visual fields of observers on the Nemiscau-Eastmain-1 Road. Additionally, the workers' camp will be imperceptible to road users, as a wooded strip will be preserved.

TRADITIONAL LAND USE

Land Use

The study area is located in the administrative region of Northern Québec, on the territory of the Regional Government of Eeyou Istchee James Bay. The legislative and legal context of Northern Québec is notably governed by the James Bay and Northern Québec Agreement (JBNQA), the Northeastern Québec Agreement and the Agreement Concerning a New Relationship between the Government of Québec and the Cree of Québec also called the "Peace of the braves". The territorial regime introduced by the JBNQA is a decisive element in the use of the territory. It provides for the division of the James Bay territory into Category I, II and III lands. The study area intersects Category II and III lands. On Category II lands, the Cree have exclusive rights to hunt, fish and trap, while on Category III lands they enjoy the exclusive right to trap fur animals and certain benefits in the field of outfitting, without having exclusive rights.

The Cree communities of Eastmain and Nemaska are the main involved in the Project. The study area overlaps four traplines linked to users of these communities: R10 (Waskaganish), RE1 (Eastmain), R19 and R16 (Nemaska). All of the Project's infrastructure and facilities are located on the RE1 site. The use of this territory is dominated by the hunting, fishing and trapping activities of tallymen and their families and other Cree users. No sacred or heritage sites, such as birthplaces or burial sites, were identified in the study area. However, many places remain culturally valued for traditional activities.

In terms of infrastructure, in addition to the road leading to the Eastmain-1 power plant and some secondary roads, the study area is crossed by two power transmission lines, one at 315 kV and the other at 735 kV. A technical study was conducted with Hydro-Québec for the relocation of some 315 kV tower pylons that would be required to operate the mine. This work will be conducted under the direction of Hydro-Québec.

The Project could result in residual effects on the current use of lands and resources for traditional purposes and, more specifically, on hunting, fishing and trapping activities practiced by the Cree Nations, by limiting access to the territory, and the use of resources for traditional purposes. However, these effects are not likely to be significant given the implementation of recommended mitigation measures.

In order to respond to the concerns of the Cree Nations, Critical Elements undertakes to modify its blasting and heavy trucking of ore during the annual goose and moose hunting periods, for a period of at least 14 consecutive days each time. However certain habits related to travelling on the road to access the camps could be modified for the Cree Nations affected by the Project. The camp on the mine site will be relocated to a location suitable for the users. With regard to the additional project-related traffic on the Nemiscau--Eastmain-1 Road, Critical Elements will make workers and carriers aware of the need to comply with safety regulations and, if necessary, take steps with the competent authorities to ensure the safety of users of the Nemiscau-Eastmain-1 road.

ECONOMIC BENEFITS

The Project will have a positive impact on employment, training and the economy of the Cree communities, particularly Eastmain. Bonus measures will encourage the participation of Cree workers and businesses in the Project.

The Mining Project will have significant economic benefits for regional businesses and will maintain or create many jobs. During the construction phase, local purchases in Quebec could amount over $250 million and annual operating expenses will be more than $100 million. The operation of the mine is expected to create 546 direct and indirect jobs, which could be filled by members of the regional communities. The proposed bonus measures will encourage the hiring of regional workers and the awarding of contracts to regional businesses. In addition, the governments of Quebec and Canada will receive more than $30 million and more than $10 million respectively in employee tax during the construction period and more than $15 million and more than $5 million per year during the operation of the mine.

HUMAN HEALTH

Several effects of the Project could affect the community well-being and human health of the Cree, including the integration of Cree workers into the mine work environment, increased social problems related to alcohol and drug use, feelings of loss and damage to their cultural identity, and concerns about health risks associated with possible environmental contamination. The proposed mitigation and enhancement measures and the firm commitment of Critical Elements to implement them will limit the potential effects on the Cree population. As such, there will be no significant effects on the community well-being and human health of most of the Cree population.

LAND USE

The project will require the relocation of a section of the 315-kV Eastmain-1–Nemiscau transmission line. The environmental effects associated with this relocation will be the subject of a specific assessment by

Hydro-Québec. The only apprehended effects on land use and infrastructure are associated with the increase in project-related heavy traffic on the Nemiscau-Eastmain-1 Road. Critical Elements will make workers and carriers aware of the need to respect safety rules and, if necessary, take action with the competent authorities to ensure the safety of users of this road. In addition, big game sport hunters will have to adapt their practice to the new environmental conditions. However, the harvest potential will not be affected. No effect is foreseen for sport fishing.

20.2.4 Cumulative Effects

The analysis of the cumulative effects on the six valued components leads to the conclusion that the Project will have only insignificant cumulative effects on the Cree communities of Eastmain and Nemaska, and on woodland caribou, migratory birds, bird species at risk, and chiropterans in the study area (spatial scope) and for the time periods selected (temporal scope). Consequently, no additional mitigation measures or environmental follow-up program is required.

PUBLIC INFORMATION AND CONSULTATION

Cree Communities

A multitude of meetings were held with the various communities between 2011 and 2022 to present the Project and its impacts, as well as to establish relationships of trust and reach agreements. Critical Elements signed an Impact and Benefits Agreement with the Cree Nation of Eastmain and the Cree Nation Government in July of 2019. Table 20.1 include the Cree stakeholders interviewed.

Table 20.1: Cree Stakeholders Interviewed (2011-2022)

Date	Location	Purpose
July 4, 2011	Val-d'Or	Presentation of the company
July 8, 2011	Val-d'Or	Presentation of the company
July 13 and 14, 2011	Eastmain	Presentation of the Project
July 20, 2011	Val-d'Or	Economic and social aspects related to the Project
September 13, 2011	Val-d'Or	Economic and social aspects related to the Project
November 12, 2012	Val-d'Or	Signature - Pre-Development Agreement
December 6, 2012	Montréal	IBA Negotiations
February 13, 2013	Montréal	IBA Negotiations
March 27, 2013	Val-d'Or	IBA Negotiations
June 26, 2013	Val-d'Or	IBA Negotiations
September 23, 2013	Montréal	IBA Negotiations
October 29, 2013	Montréal	IBA Negotiations
January 24, 2014	Montréal	IBA Negotiations
November 4, 2016	Eastmain	Community consultation
March 10, 2017	Chibougamau	Impact on the community and hiring of a liaison agent
June 2017	Eastmain	Hiring of the liaison agent
November 8, 2017	Montréal	IBA Negotiations
November 16, 2017	Montréal	IBA Negotiations
February 2, 2018	Val d'Or	Impact of the Project on the tallyman
February 16, 2018	Waskaganish	Impact of the Project on the tallyman

Date	Location	Purpose
February 21, 2018	Eastmain	Signing of the yellow sturgeon agreement
February 22, 2018	Eastmain	IBA Negotiations
April 23, 2018	Montréal	IBA Negotiations
June 20, 2018	Montréal	IBA Negotiations
July 9, 2018	Eastmain	Public consultation
July 20, 2018	Val d'Or	IBA Negotiations
August 1, 2018	Eastmain	Impact of the Project on the tallyman
August 29, 2018	Eastmain	Capacity study
September 19, 2018	Waskaganish	Capacity study
November 13, 2018	Montréal	Impact of the Project on communities
November 21, 2018	Montréal	Impact of the Project on the tallyman
November 26 to 28, 2018	Waskaganish	Public consultations
November 26, 2018	Waskaganish	Impact of the Project on the tallyman
November 27, 2018	Waskaganish	Impact of the Project on the community
November 28, 2018	Waskaganish	Impact of the Project on the community
November 30, 2018	Montréal	Collaboration with the CHRD
December 5, 2018	Nemaska	Impact of the Project on the tallyman
December 6, 2018	Nemaska	Collaboration with the CMC Nemaska
February 6, 2019	Eastmain	Presentation of the IBA to the community
February 15, 2019	Conference call	Collaboration with the CHRD
May 28, 2019	Eastmain	Resolution of the Council of the Cree Nation of Eastmain 2019-2020/05-28-002 - Approval of the Pihkuutaau Agreement.
July 2, 2019	Eastmain	Signing of the IBA
October 29, 2019	Waskaganish	Public consultations
December 3, 2019	Eastmain	Public consultations
January 28, 2020	Nemaska	Impact of the Project on the tallyman
January 28, 2020	Nemaska	Impact of the Project on the tallyman
January 29, 2020	Eastmain	Impact of the Project on the tallyman
COVID-19		
November 23, 2020	Conference call	Presentation of the IBA to the chief and council of Nemaska
July 6, 2021	Val d'Or	Impact of the Project on the tallyman
July 13, 2021	Gatineau	Impact of the Project on the community
August 24, 2021	Val d'Or	Impact of the Project on the communities
September 16, 2021	Nemaska	Presentation of the IBA to the community of Nemaska
March 25, 2022	Val-d'Or	Impact of the Project on the communities
May 24, 2023	Conference call	Project Update, Permanent camp and update on response for the conditions for COMEX
June 8, 2023	Montréal	Implementation Committee Meeting #3
July 11, 2023	Montréal	Project Update

20.2.4.1.1 Jamesian Community

Critical Elements began its public consultation approach in 2011. It organized meetings with the Jamésie municipal and socio-economic representatives. Public presentations of information on the Project were organized in the city of Chapais. Interviews were conducted in the city of Matagami with stakeholders from the municipal administration, economic development, land development and management, and natural resources management sectors of James Bay.

In the Jamesian community, interviews were conducted in Matagami in May 2012, with stakeholders from certain sections of the municipal administration, economic development, land management and planning, and natural resources management. These interviews identified the concerns and expectations of the Jamesians, regarding the Project and overall mining development on the territory. Community stakeholders expressed support for mining developments in their region, but all stressed the importance of developing conditions to ensure and to maximize the positive socio-economic benefits for the region.

GOVERNMENT CONSULTATIONS

COMEX

The COMEX invited Critical Elements to a public hearing to present the Project to the public. Hearings were held:

— Matagami, February 15, 2021;
— Eastmain, February 16, 2021;
— Nemaska, February 18, 2021.

The COMEX website includes recordings of the public sessions, as well as all documents filed as part of the impact assessment: https://comexqc.ca/en/fiches-de-projet/rose-lithium-tantalum-mining-project/

Impact Assessment Agency of Canada

IAAC invited the First Nations (Eastmain, Nemaska, Waskaganish and Waswanipi) to comment on the environmental assessment documents and also on its analysis of the Project:

— Summary of Critical Elements impact statement and related documents. Electronic consultation March 6 to April 5 2019. Consultation in person: Waskaganish (October 25 to 30, 2019), Eastmain (December 2 to 4, 2019), Nemaska (January 13 to 15, 2020), Waswanipi (by teleconference November 20, 2020 and January 29, 2021).
— Draft Environmental Assessment Report and Potential Conditions. Virtual and in person consultations (Eastmain, Nemaska, Waskaganish and Waswanipi, March 9, April 14 and April 15, 2021). Electronic consultation (March 17 to April 18, 2021; with extension to June 13 2021).

Project documents and stakeholder comments are available on the following website: https://iaac-aeic.gc.ca/050/evaluations/proj/80005?&culture=en-CA

20.3 Waste and Water Management

20.3.1 Waste Management

Activities on the mine site will produce some waste material to be handled and removed from site. It is planned for a specialized contractor to manage waste material on site, including the supply, handling, and transportation at periodic times of the containers to appropriate disposal and sorting center. A waste management plan for the mine and workers' camp activities, both construction and operational, is currently being finalized and will be presented to government authorities.

The Project Life Cycle is designed using the principle of reduce, reuse, recycle and recover ("4R") in order to reduce resource use. It includes recycling of industrial water within the process and maximum use of mine waste rock as a construction material. All waste on site will be sorted at source as to separate domestic waste, compostable goods, recycling material (wood, metal, papers, plastic, copper, etc.) and hazardous waste (oils, lubricants, adhesives, paints, reagents, solvents, batteries, etc.). Dedicated containers will be installed to collect waste and recycling materials from office or working areas bins. A composter will also be installed on site. Hazardous material will be collected in specific and clearly identified locations.

20.3.2 Waste Rock and Tailings Accumulation Area

Studies completed showed that the mining site’s waste rock and tailings (filtered residues) would not be potentially acid generating, thus confirming the relevance of a filtered tailings disposal mode to the proponent. Finally, given the above-mentioned characteristics, Critical Elements chose co-disposal of the waste rock and tailings in one and the same accumulation area, thus reducing the Project’s overall footprint.

20.3.3 Overburden Management

An overburden stockpile is planned to contain the material from the pit clearance and other infrastructure. Vegetal soils will be reused during progressive rehabilitation of the site.

20.3.4 Water Management

GENERAL

The water management plan considers minimizing the amount of water in contact with mining infrastructure and reusing treated water for the process plant fresh water intake. All runoff water generated by precipitation, which falls on areas impacted by mining activities, is considered as contact water. Contact water will be collected by perimeter ditches that drain to five ponds (B1, B2, B3, B4, and the Accumulation Pond BA). Water will be pumped from the previous ponds and the open pit to the Accumulation Pond, which is the main water management pond for the site. Collected contact water will be treated and quality monitored prior to its release to the environment.

WATER TREATMENT PLANT

The treatment plant will operate 24 hours / day for 365 days / year. It can operate as well in temperature conditions ranging from -45° C to 30° C. The plant will be located near the Accumulation Pond located around 100 m from the industrial pad. The water treatment plant is required to treat run-off from stockpiles, pads, roads, and open pit dewatering.

FINAL EFFLUENT

The final effluent will be directed to Creek A via a channel. This channel will have a width of 3 m at the base, a height of 2 m and a slope of 1.5H: 1V. To protect the channel from erosion and for the purpose of stabilizing it, a stonework of 0-400 mm stones is provided on the walls and the bottom of the ditch.

20.4 Closure Planning

The mine rehabilitation and restoration plan were approved in May 2022 by the Québec Minister of Energy and Natural Resources. The approval of the rehabilitation and restoration plan is a prerequisite to the granting of the mining lease that will be necessary to move forward with the Project.

The results of the geochemical characterizations demonstrate that the tailings and mine waste rock from the Rose Lithium-Tantalum Project are non-acid generating and non-leachable. The proposed program is based on the concept of progressive reclamation, as recommended in the "Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec" (MERN, 2017). The objective of progressive restoration is to ensure as quickly as possible the reintegration of the site into its environment and the reduction of the duration of impacts on the components of the environment. Progressive restoration is possible and even desirable, since the storage of tailings and mine waste rock will be done in a co-disposal manner, thus allowing the restoration of sectors that and reduce the footprint of the accumulation area.

At the end of operations, the buildings and infrastructure will be dismantled, unless a second use is identified. Machinery will be reused elsewhere, and most steel materials will be recovered or recycled off site. Foundation materials will be buried on site by covering them with soil (overburden) and then placed in vegetation. Demolition and waste materials will be disposed of in accordance with demolition materials and waste will be managed in accordance with Q-2, R.13 Solid Waste Regulation and the regulations in effect at the time of site closure. The pit will be secured, and the water level will rise to the static groundwater level. To facilitate the filling of the pit, the water management infrastructure will be re-profiled in the vicinity of the pit to direct some of the surface drainage into the pit. Also, a spillway will be installed.

The objectives of this restoration work are to return the site to a satisfactory state, that is to say:

- Eliminate unacceptable risks to health and ensure the safety of people;
- Limit the generation and spread of substances that may affect the receiving environment and, in the long term, aim to eliminate all forms of maintenance and monitoring;
- Restore the site to a visually acceptable condition for the community; and,
- Restore the infrastructure site to a condition compatible with future use.

The implementation of the environmental monitoring and follow-up program will verify and demonstrate the achievement of the remediation objectives and the return of the site to a state that is compatible with and safe for its users. Restoration work will continue for two years following the end of operations. The estimated cost of the work is $21,7M, including indirect costs and contingency.

20.5 Ongoing Activities

Following COMEX and IAAC approval of the project, Critical Elements must now obtain various authorizations and permits (see section 20.1). Critical Elements is in the process of finalizing various conditions to be presented to government authorities before work begins.

For the COMEX, Critical Elements must present various documents including environmental and social follow-up programs, impacts for the new workers' camp, an updated emergency measures plan and a list of commitments. These documents are currently being drafted and will be forwarded to the COMEX within the prescribed deadlines.

On the federal side, the IAAC has issued its decision statement, which includes various conditions, including monitoring and follow-up programs.

In addition to the IAAC, the following federal authorities will also be required to issue authorizations:

- The Minister of Fisheries and Oceans may issue authorization(s) under paragraphs 34.4(2)(b) and 35(2)(b) of the Fisheries Act;
- The Minister of Natural Resources may issue a licence under subsection 7(1) of the Explosives Act; and
- The Minister of Transport may approve an application under subsection 10(1) of the Canadian Navigable Waters Act.

It should be noted that no rivers or water bodies are required to be listed in Schedule 2 of the MDMER.

21 CAPITAL AND OPERATING COSTS

The capital and operating costs Item of the report is based on design criteria and engineering performed by the various QPs. Each QP contributed the cost information that is pertinent to their work.

All capital works and the associated capital costs are at the project proper.

Sources for the Capital costs include vendor quotations, historical data, similar projects, CostMine information, and empirical factors. Hourly rate costs for installation of equipment and for rental of construction equipment were based on local rates.

21.1 Capital Expenditures

21.1.1 Responsibility Matrix

Responsibility for the cost estimates has been divided amongst the study contributors as follows:

— WSP – General site infrastructures, including roads, earthworks, and buildings; power distribution; coordination with Hydro-Québec; surface water management Infrastructure; final effluent water treatment; process plant ancillary installations.

— Bumigeme – Spodumene process plant buildings including crushing section, tantalum recovery section including bagging system, spodumene recovery section, spodumene concentrate thickening and filtration, final tailings thickening, filtration and dry tailings.

— InnovExplo – All pre-production mining related activities, such as overburden removal, drilling and blasting, loadingand hauling of the rock material, as well as the purchase of the mining equipment.

21.1.2 Basis of Estimate

The purpose of the Basis of Estimate is to describe the methodology used in the development of the Capital Expenditures (CAPEX) estimate. The CAPEX estimate has been structured based on the Work Breakdown Structure (WBS). The CAPEX estimate has been designed to provide the details required to convert the estimate into a cost control budget for project control purposes upon an investment decision by the Project Owners. The Base Date of the CAPEX estimate is Q2 2023.

The accuracy of the estimate is ±15%, based on a global engineering completion of approximately 30% (Class 3 according to AACE 47r-11 recommended practice). Please refer to Table 21.1 for the maturity level of infrastructure deliverables.

The CAPEX estimate is assembled in Canadian dollars (CAN$) and all sales taxes are excluded from the estimate. No escalation factor was applied to equipment and material quotes received. For financial modelling purposes, estimates in local currencies have been time-phased separately for inclusion in the financial model, in order to be able to perform exchange rate sensitivities on the complete financial model.

Table 21.1: Maturity Level of Infrastructure Deliverables

Item	Suggested AACE Level	Actual Level
Work Breakdown Structure	Defined	Defined
Project Code of Accounts	Defined	Preliminary
Contracting Strategy	Preliminary	Preliminary
Mine (production equipment, pre-stripping, etc.)	Defined	Defined
Non-process Facilities (infrastructure, pipeline, etc.)	Defined	Defined
Block Flow Diagrams	Completed	Completed
Plot Plans	Preliminary	Preliminary
Process Flow Diagrams (PFDs)	Completed	Completed
Utility Flow Diagrams (UFDs)	Completed	Completed
Piping & Instrument Diagrams (P&IDs)	Completed	Completed
Heat & Material Balances	Completed	Completed
Process Equipment List	Completed	Completed
Utility Equipment List	Completed	Completed
Electrical Single-Line Drawings and Load List	Completed	Completed
Specifications & Datasheets	Preliminary / Completed	Completed (major)
General Equipment Arrangement Drawings	Completed	Completed
Spare Parts Listings	Preliminary	Started
Mechanical Discipline Drawings	Started/ Preliminary	Preliminary
Electrical Discipline Drawings	Started/ Preliminary	Preliminary
Instrumentation/Control Discipline Drawings	Started/ Preliminary	Started
Civil/Structural/Architectural Discipline Drawings	Started/ Preliminary	Started

21.1.3 Work Breakdown Structure

The Capex estimate and documentation has been structured on the Work Breakdown Structure (WBS) and the cost coding structure defined for the Project. Table 21.2 shows the Work Breakdown Structure used for the Project.

Table 21.2: Work Breakdown Structure – Level 1

Area	Description
1000	Mine open pit
3000	Stockpiles
5000	Infrastructure
6000	Process plant
7000	Auxiliary buildings and equipment
8000	Owner's costs
9000	Indirect costs

21.1.4 Direct Labour Rates

WSP requested quotations for onsite installation work from local general contractors located in the James Bay area, or the adjoining area, to supply a weighted labour rate for each trade, considering 84 hours per week, 14 days in / 14 days out schedule, supervisor/foreman, overtime, benefits, tools, individual protective equipment, transportation to site, premium, insurances, contractor's administrative fees and profit. A 20% indirect supervision factor was considered for the contractor's high-level project management team (construction supervisor, administrative clerk, procurement / logistics, HSSE agent, etc.).

The work schedule will be for the most part 70 hours per week (7 days x 10 hours per day) based on 14 days in / 14 days out rotations. the labour rates were established as per the Baie-James Industrial tables published by the Association de la Construction du Québec (ACQ) on January 1st, 2023. Adjustments were made for consumables, pickup trucks, and administration & profit. Estimates for site vehicles, cranes, scissor lifts, scaffolding, living allowances (pension), transport for non-locals, productivity, and contractor indirects were made separately and are excluded from the labour rates (they are included in Construction Indirects costs). It was decided to use decree nominal rates as crew rates, assuming that "foreman" higher rates will balance out with lower rates of "companion" workers. The nominal 70 hours per week rate was calculated by adding 5 hours at time and a half and 15 hours at double time to the first 50 hours which are paid at regular rate (excepted for Electrical trade which has no time and a half and 20 hours at double time).

Room and board, mobilization/demobilization, field site temporary facilities, temporary construction infrastructures (scaffolding, platform, etc.), consumables (fuel, lubricant, etc.) and winter conditions are not included in these weighted complete hourly rates. These costs are all included in the construction indirect costs.

21.1.5 Cost Summary – Initial – Pre-Production

Table 21.3: Cost Summary – Initial – Pre-Production

Major Area	Description	CAD M$	RESPONSIBILITY SIGN-OFF
1000	MINE OPEN PIT	7.6	InnovExplo
3000	STOCKPILES	7.0	WSP
5000	INFRASTRUCTURE	108.9	WSP
6000	PROCESS PLANT	166.8	Bumigeme
7000	AUXILIARY BUILDINGS AND EQUIPMENT	75.2	WSP
DIRECT COSTS		**365.5**	
8000	OWNER'S COSTS	77.7	WSP
9000	INDIRECT COST	111.4	WSP
DIRECT + INDIRECT COSTS		**554.6**	
9910	CONTINGENCY	55.5	WSP
CAPEX (INITIAL)		**610.1**	

21.1.6 Cost Summary – Sustaining

Table 21.4: Cost Summary – Sustaining

Major Area	Description	CAD M$	RESPONSIBILITY SIGN-OFF
1000	MINE OPEN PIT	207.5	InnovExplo
3000	STOCKPILES	19.2	WSP
5000	INFRASTRUCTURE	14.2	WSP
6000	PROCESS PLANT	10.4	Bumigeme
7000	AUXILIARY BUILDINGS AND EQUIPMENT	2.7	WSP
	DIRECT COSTS	**254.0**	
8000	OWNER'S COSTS	0	WSP
9000	INDIRECT COST	0.5	WSP
	DIRECT + INDIRECT COSTS	**0.5**	
9910	CONTINGENCY	25.4	WSP
	MINE REHABILITATION	21.7	WSP
	MINE REHABILITATION BOND COSTS	7.2	WSP
	CAPEX (SUSTAINING)	**308.9**	

21.1.7 Area 1000 – Mine Open Pit Capital Costs

Capital cost estimate for the pre-production period is $7.6M for the pre-production, and $207.5M in sustaining capital during the production period, for a total of $215.1M over the mine life. Mine Pit and explosive storage were estimated by WSP based on budgetary quotes for equipment. Table 21.5 presents the mining capital costs.

Table 21.5: Mining Capital Costs

Area	Mining Capital Cost Items ($M)	Pre-Production	Sustaining	Total
1200	Mine Pit	$4.3	$4.5	**$8.8**
1300	Explosives Storage	$3.1	$0	**$3.1**
1400	Mine Mobile Equipment	$0.2	$203.0	**$203.2**
	TOTAL	**$7.6**	**$207.5**	**$215.1**

Mine Mobile Equipment costs were estimated by InnovExplo. The total cost for the equipment $203.2M of which $0.2M is incurred in the pre-production period. This cost includes all the main mining equipment (i.e. trucks, drills, excavators, etc.) and all the support equipment (i.e. pick-up trucks, pumps, cables and sub-station for the electric front shovel, tower lights, etc.).

Table 21.6 presents the purchasing and replacement schedule for all the main mining equipment. The equipment purchases are incurred in the year the equipment is needed. These costs are not depreciated over time and do not consider a salvage value at the end of equipment life. No contingencies were considered for the purchase prices. During the negotiation process for the purchase of the equipment, it could be advantageous to consider a financing plan to spread out these costs over time.

Table 21.6: Main Mining Equipment Purchasing and Replacement Schedule

Equipment	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	LOM
Backhoe Excavator	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**2**
Electric Front Shovel	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Production Wheel Loader	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Haul Trucks ±65t	0	0	0	5	0	0	1	0	0	0	0	5	0	3	0	0	0	0	0	**14**
Haul Trucks ±135t	0	0	0	6	1	0	0	0	0	0	0	3	1	1	0	0	0	0	0	**12**
Rotary Drills	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
DTH Drills	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**2**
Bulldozer	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	**6**
Wheel dozer	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
Motor Grader	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	**4**
Auxiliary Excavator	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
Auxiliary Wheel Loader	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
Water/Sand Trucks	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**

New Purchase	Replacement

Given that the production period is defined as the start-up of the mill, no capitalized revenue is generated during the pre-production period.

21.1.8 Area 3000 – Stockpiles

Capital costs related to the Stockpiles were estimated by WSP. Capital cost estimates are based on budgetary quotes and similar projects data. The capital cost estimate for the pre-production period is $7.0M, and $19.2M for the production period, for a total of $26.2M over the mine life. Table 21.7 presents the Stockpile capital costs.

Table 21.7: Stockpiles Capital Costs

Area	Stockpiles Capital Cost Items ($M)	Pre-Production	Sustaining	Total
3100	Tailings & Waste Stockpiles	$1.6	$19.2	**$20.8**
3200	Overburden Stockpile	$0.5	$0	**$0.5**
3300	Ore Stockpile	$4.9	$0	**$4.9**
	TOTAL	**$7.0**	**$19.2**	**$26.2**

21.1.9 Area 5000 - Infrastructure

The infrastructure costs shown in the Table 21.8 were estimated by WSP based on budgetary quotes and similar projects data to cover earthworks, site preparation, buried services, surface water management and electrical distribution.

Table 21.8: Summary of Infrastructures Capital Costs

Area	Infrastructure Capital Cost Items ($M)	Pre-Production	Sustaining	Total
5100	Site Preparation, drainage and platforms	$26.9	$0	**$26.9**
5180	Solid Waste sorting / management	$0	$0.4	**$0.4**
5200	Underground Utilities	$4.4	$0	**$4.4**
5300	Water Management	$22.8	$0	**$22.8**
5300	Ditches & Ponds Expansion for co-disposal stockpile	$0	$10.8	**$10.8**
5310	Final Effluent water treatment plant expansion	$0	$1.1	**$1.1**
5340	Additional pumping for co-disposal stockpile	$0	$0.6	**$0.6**
5340	Additional electrical distribution for co-disposal stockpile	$0	$1.3	**$1.3**
5600	Power line (Hydro-Quebec)	$28.2	$0	**$28.2**
5700	Main Electrical Station	$19.4	$0	**$19.4**
5800	Site Electrical & Telecommunication Distribution	$7.3	$0	**$7.3**
	TOTAL	**$108.9**	**14.2**	**$123.1**

21.1.10 Area 6000 – Process Plant

The capital and operating costs for the process plant were estimated by Bumigeme. Capital cost estimate for the spodumene plant is based on the construction of milling facility at the Project site. The cost estimation is based on 1,610,000 tonnes of ore milled per year.

The process facilities include the primary and secondary crushing sections, crushed ore storage dome, the concentrator, and the storage dome for spodumene and tantalum concentrates. The office, laboratory including assay lab and bagging facility for tantalum concentrate are also included. Tailings will be sent out on a belt conveyor to storage dome and thereafter transported and disposed to the waste rock stockpile.

PROCESS EQUIPMENT

The costs for major process equipment were obtained from qualified suppliers and the remaining equipment costs were estimated from database or in-house estimation. Table 21.9 shows the capital cost estimate for the spodumene plant.

Table 21.9: Process Plant Capital Cost Estimate

Area	Process Plant Capital Cost Items ($M)	Pre-Production	Sustaining	Total
6100	Crushing Plant	$24.9	$0	**$24.9**
6200	Crushed Ore Storage	$9.4	$0	**$9.4**
6300	Grinding, Classification & Tantalite Circuit	$29.4	$5.5	**$34.9**
6400	Mica Flotation	$8.9	$2.2	**$11.1**
6500	Spodumene Flotation	$13.4	$2.6	**$16.0**
6600	Final Tailings dewatering & storage	$10.0	$0	**$10.0**
6700	Reagents storage, preparation and distribution	$8.0	$0	**$8.0**
6800	Spodumene concentrate dewatering, drying and storage	$11.3	$0	**$11.3**
6900	Process Plant Building	$51.6	$0	**$51.6**
	TOTAL	**$166.8**	**$10.4**	**$177.2**

21.1.11 Area 7000 – Auxiliary Buildings and Equipment

Capital costs directly related to the Auxiliary Building and Equipment were estimated by WSP. Capital cost estimates are based on budgetary quotes and similar projects data. The capital cost estimate for the pre-production period is $75.3M, and $2.7M for the production period, for a total of $78M over the mine life, as presented in Table 21.10.

Table 21.10: Auxiliary Building and Equipment Capital Costs

Area	Auxiliary Buildings and Equipment Capital Cost Items ($M)	Pre-Production	Ongoing	Total
7100	Site Camp	$33.4	$0.1	$33.5
7200	Administration Building, Dry & Gate	$11.4	$0	$11.4
7300	Warehouse & Garage	$17.9	$2.6	$20.5
7600	Fuel Depot	$0.9	$0	$0.9
7700	Auxiliary Mobile Equipment	$2.4	$0	$2.4
7800	Servers, Telecommunications, IT & OT	$9.3	$0	$9.3
7900	Off-Site Buildings	$0	$0	**$0**
	TOTAL	**$75.3**	**$2.7**	**$78.0**

21.1.12 Area 8000 – Owner's Cost

Capital costs directly related to the Owner's cost were estimated by Critical Elements and reviewed by WSP. Capital cost estimates are based on budgetary quotes and similar projects data. The capital cost estimate for the pre-production period is $77.7M, and $0M for the production period, for a total of $77.7M over the mine life. Table 21.11 presents the Owners's costs.

Table 21.11: Owner's cost Capital Costs

Area	Owner's cost Capital Cost Items ($M)	Pre-Production	Sustaining	Total
8100	Mine Pre-Production	$36.1	$0	**$36.1**
8200	Plant Pre-Production	$11.6	$0	**$11.6**
8300	Project Team Costs	$30.0	$0	**$30.0**
	TOTAL	**$77.7**	**$0**	**$77.7**

Mine Pre-Production cost includes the mobilization of a mining contractor to perform mining operations during the 20 months of pre-production, such as overburden removal, drilling and blasting, loading and hauling of all rock material, and all other auxiliary work.

Plant pre-Production cost includes Production employees' wages, supplies and consumables incurred up to start of commissioning.

Project Team costs includes IT, health, safety & environment, supply chain, of-site road maintenance, project management, construction, training, general liability and construction insurances, Office rental & supplies and travel & expenses.

21.1.13 Area 9000 – Indirect cost

SUMMARY OF INDIRECT CAPITAL COSTS

The indirect Capital cost covers for professional services, freight, construction indirect, Pre-operational Verification Support, First fills, Spare parts and consumables.

The provisions for indirect Capital costs were established by detailed cost estimation of the items based on requirements and budget proposals from qualified suppliers. Indirect Capital costs are summarized in Table 21.12.

Table 21.12: Summary of Indirect Capital Costs

Area	Indirect Capital Cost Items ($M)	Pre-Production	Ongoing	Total
9100	Professional Services	$21.4	$0	**$21.4**
9200	Freight, Handling & Duties	$9.8	$0	**$9.8**
9500	Construction Indirects - Plant	$75.9	$0	**$75.9**
9600	Pre-operational Verification Support	$0.8	$0	**$0.8**
9700	First Fill, Spares & consumables	$3.5	$0.5	**$4.0**
	TOTAL	**$111.4**	**$0.5**	**111.9**

SCOPE AND BASIS OF ESTIMATION FOR INDIRECT COSTS

Professional Services include the labour necessary for detailed engineering by engineering firms and other third party technical consultants to support architecture, water treatment, environment regulations follow-up, fire protection, geotechnical expertise, etc. Detailed engineering was estimated from budgetary quotes, and third party consultants were mostly estimated from historical data.

Freight, handling and duties are estimated at a detailed level based on the detailed equipment list and expected point of origin, to assess the expected number of truckloads for all equipment packages, truckloads for contract packages and expected warehousing needs. Adjustment factors were applied to account for shipment consolidation prior to transporting items to site.

Construction Indirects includes the costs to support construction site activities:

- Air transportation and workers travel time.
- Accomodation (camp & catering)
- Temporary facilities , utilities and roads
- Site services and maintenance
- Waste management
- Construction site vehicles
- Heating & hoarding
- Environment management during construction
- HSE & training
- Fuel & electricity for construction

These were estimated based on a combination of budgetary quotes and historical data.

Pre-operational verification support includes major equipment representatives and craft labour to support POV's. This was estimated using allowances.

First Fill, Spares & consumables were estimated using a combination of detailed bottom-up calculations, historical data and allowances.

21.1.14 Area 9000 – Special Cost

CONTINGENCY

A provision of $55.5M is included in the initial capital for contingency, based on the level of development stage of the Project and another 25.4M in sustaining capital.

To meet the budget established for the Project in this estimate, it is expected that sufficiently developed engineering, adequate project management, realistic construction schedule and appropriate cost controls will be implemented.

MINE REHABILITATION BOND

As well as the overall $81.9M contingency amounts for Pre-Production and Ongoing Capital, Table 21.11 shows the breakdown of the $21.7M rehabilitation amount items under Areas 2100, 2200, 2300, and 2400 that are applied at the conclusion of the project. According to the environmental regulations of the Province of Québec, 50% of this amount is to be paid to a reserve fund as one of the conditions to obtain the mining lease. The remaining 50% is to be paid to the fund in two instalments of 25% each.

In September 2022, a payment of the half of the rehabilitation amount was made in the form of a bond by an insurance company. In May 2023, another payment of 25% was made under the same terms. The final installment of 25% is due in May 2024. The Company provided the insurance company with a guarantee in the form of an irrevocable letter of credit from a Canadian bank, for an amount equal to 25% of the bonded amount, adjustable with each subsequent change to the bonded balance to ensure that it is at all times equal to at least 25% of the bonded amount.

Area 2550 represents the costs of the 2% bond cost applied against the $21.7M rehabilitation amount each year of the project from current day until conclusion of production. The annual bond cost from the third year onwards of $433K is applied up until the year of closure. With the first two payments included, these annual payments provide the $8.4M overall bond cost amount upon conclusion of mining.

Table 21.13: Special Cost Capital Costs

Area	Owner's cost Capital Cost Items ($M)	Pre-Production	Ongoing	Total
9910	Contingency	$55.5	25.4	**$81.9**
2100	Reclamation	$0	$14.1	**$14.1**
2200	Post Closure Monitoring	$0	$0.4	**$0.4**
2300	Engineering Cost	$0	$4.4	**$4.4**
2400	Contingency - 15%	$0	$2.8	**$2.8**
2550	Reclamation Bond Costs (2%)	$1.2	$7.2	**$8.4**
	TOTAL	**$56.7**	**$54.3**	**$111**

21.1.15 Estimate Exclusions

The following costs are not included in the CAPEX estimate:

- Pre-Feasibility study, Value Engineering, Feasibility and Feed phases sunk costs.
- Project Scope changes.
- Schedule delays and/or associated costs, such as those caused by:
  - Delay in obtaining project financing;
  - Changes in laws or regulations;
  - unexpected site conditions;
  - unidentified ground conditions;
  - labour disputes;
  - force majeure;
  - permit applications;
- Foreign currency changes from Project exchange rates.
- Economy factors/pressure on labour productivity (less skilled workforce).

21.2 Operating Costs

21.2.1 Mining Costs

The mining costs reflect the LOM plan prepared by InnovExplo and have been divided into the following categories:

- Loading
- Hauling
- Drilling
- Blasting
- Stockpile and road maintenance
- Mine services
- Engineering department
- Geology department
- Maintenance
- Overburden removal
- General and management

The total mining costs for the Project are $923.5M, or 4,29$/t mined. Table 21.14 presents the mining costs for each category for the Project. Table 21.15 presents the mining costs for each sub-category for the entire Project.

Table 21.14: Mine Operating Costs by Category

Mine Operating Cost Categories	Unit Cost ($/t mined)	Total Cost ($M)
Loading	$0.32	$68.8
Hauling	$1.25	$269.9
Drilling	$0.31	$67.2
Blasting	$0.68	$145.9
Stockpile & road maintenance	$0.22	$48.0
Mine services	$0.22	$46.6
Engineering department	$0.12	$26.3
Geology department	$0.14	$30.5
Maintenance	$0.57	$122.3
Overburden removal	$0.18	$37.7
General and management	$0.28	$60.3
TOTAL	**$4.29**	**$923.5**

Table 21.15: Mine Operating Costs by Sub-Category

Mine Operating Cost Sub-Categories	Unit Cost ($/t mined)	Total Cost ($M)
Salaries – hourly	$1.07	$230.0
Salaries - Staff	$0.36	$77.4
Benefits - hourly	$0.31	$65.7
Benefits - staff	$0.09	$19.8
Diesel	$0.77	$165.4
Electricity	$0.02	$4.8
Tires	$0.09	$18.7
Wear parts	$0.18	$38.9
Explosives	$0.39	$83.6
Explosive accessories	$0.05	$10.4
Crushed rock	$0.01	$1.4
Piping and accessories	$0.00	$0.9
Blast monitoring	$0.01	$2.2
Samples	$0.04	$8.1
Maintenance work	$0.12	$26.2
Personal protective equipment	$0.01	$2.6
Contractor fees	$0.73	$156.5
Other	$0.05	$10.8
TOTAL	**$4.29**	**$923.5**

- The Loading, Hauling, and Drilling categories are comprised mainly of the costs incurred for the operator's salaries and benefits, energy (fuel and electricity), and the main consumables (e.g. ground engaging tools, drill bits and rods, tires, etc.).
- The Blasting costs are comprised mainly of the management fees incurred for the explosive's contractor (which include supervision, rental of the explosives site, explosive truck operators, and blasters), the explosives, and the accessories. It should be noted that it is possible to purchase the explosives site plant from the supplier and reduce the operating costs over the mine life. However, this option requires an initial capital investment.
- The Stockpile and Road Maintenance category consists of the work related to the management of the waste and ore stockpiles, as well as the maintenance of the haul roads.
- The Mine Services category consists of all work related to clearing the area around the electric front shovel, pit dewatering, and other support work around the mine.
- The Engineering Department category consist mainly of the staff salaries and benefits.
- The Geology Department costs consist mainly of the staff salaries and benefits, the assays, and the blast movement technology related costs.
- The Maintenance category mainly includes the salaries and benefits for the maintenance staff (i.e. mechanics, helpers, welders and electricians), preventive maintenance costs and major components.
- The Overburden Removal category has been separated from the rest of the mining activities as it will be executed by a mining contractor with its own mining fleet and support staff.
- The General and Management category mainly include all supervision and management related salaries and benefits.

All categories also include other lesser costs, such as light vehicle repairs and registration, personal protective equipment, office supplies, etc.

A detailed list of the manpower requirements is presented in Table 21.16. This list does not include contractor personnel.

For the salaries and benefits, a northern allowance and a production bonus, each equivalent to 5% of the base salary, were considered as the Project is remote and employees will be lodged on site. The fringe benefits were estimated at 30% of the base salary to cover all health plans, while paid holidays were estimated at 6% of the base salary. Some overtime and yearly bonuses were also considered and vary based on the position. These salaries and benefits were compared to similar projects.

Table 21.16: Manpower Requirements by Department

Department	Type	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Loading	Hourly	0	0	0	16	16	16	12	16	20	16	12	12	12	16	16	16	12	8	4
Hauling	Hourly	0	0	0	44	48	48	48	44	56	60	52	52	52	60	60	56	32	12	0
Drilling	Hourly	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	0
Blasting	Hourly	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0
Stockpile and Road Maintenance	Hourly	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	4
Mine Services	Hourly	0	0	0	16	16	16	16	16	17	16	16	16	16	16	16	16	10	10	8
Engineering Department	Salaried	2	5	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	2
Geology Department	Salaried	2	4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	0
Maintenance	Hourly	0	0	15	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	14
	Salaried	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
General and Management	Salaried	1	1	4	22	22	22	22	22	22	22	22	22	22	22	22	22	22	16	0
TOTAL	Hourly	**0**	**0**	**15**	**150**	**154**	**154**	**150**	**150**	**166**	**166**	**154**	**154**	**154**	**166**	**166**	**162**	**128**	**104**	**22**
	Salaried	**5**	**11**	**20**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**38**	**31**	**2**
	TOTAL	**5**	**11**	**35**	**188**	**192**	**192**	**188**	**188**	**204**	**204**	**192**	**192**	**192**	**204**	**204**	**200**	**166**	**135**	**24**

21.2.2 Spodumene Plant Operating Costs

Annual and unit process operating costs for the spodumene plant were determined for an annual ore milling of 1,610,000 tonnes that will provide an average production from years 2 to 18 of approximately 203,765 tonnes of spodumene concentrate and 580 tonnes of tantalum concentrate at 20% Ta_2O_5 as a by-product per annum. The estimated operating costs for the spodumene plant are summarized in Table 21.17 and include manpower requirement for mill operation, electrical power cost, grinding media and reagents, dryer fuel consumption, consumables consumption, big bags for tantalum concentrate, spare parts, and miscellaneous. The total operating costs were estimated to be $42,615,902 per year or $26.47 per tonne of ore milled. The operating cost estimate of $208.53 per tonne includes both spodumene and tantalum concentrates production cost.

Table 21.17: Spodumene Plant Operating Costs

Description	Annual Costs ($)	Costs $/t milled	Costs $/t conc.	% of Total Costs
Manpower	14,478,201	8.99	71.05	34
Electrical power	3,214,835	2.00	15.78	7
Grinding media and reagents	16,143,333	10.03	79.23	38
Fuel	793,714	0.49	3.90	2
Major Equipment Wear Consumables	788,794	0.49	3.87	2
Big bags	310,046	0.19	1.52	1
G & A / Parts / Material Maintenance	5,981,400	3.72	29.35	14
Assay Laboratory	905,580	0.56	4.44	2
TOTAL OPERATING COST	**$42,615,902**	**$26.47**	**$209.14**	**100.0%**

Note: Total my not add up due to rounding

MANPOWER COSTS

The manpower requirement for the spodumene plant will be 103 persons (see Table 21.18 for details). There will be 21 salaries employees and 82 hourly will be working on shifts. These personnel will be required for proper operation of the spodumene plant. The manpower includes the area of mill operation including mill administration, maintenance, and metallurgy. Assay laboratory and environmental are included with the metallurgy area. The labour rates and benefits were based on the rates for similar job classifications in mining industry for Quebec province. The total manpower estimate is $14,478,201 per year, or $8.99 per tonne of ore milled.

Table 21.18: Spodumene Plant Manpower Costs

Area	Number of Persons	Total Cost ($/y)	Unit Cost ($/t)
Mill Operations	47	6,560,422	4.07
Mill Maintenance	33	4,939,360	3.07
Mill Metallurgy	23	2,978,419	1.85
TOTAL MANPOWER	**103**	14,478,201	8.99

Note: Total my not add up due to rounding

ELECTRICAL POWER COSTS

The electrical power costs were calculated using the total load of the spodumene plant milling operation. The cost breakdown by areas is shown in Table 21.19. The total power demand of the plant was estimated at 8.21 MW, which is equal to 58.45 MWh per year. The electrical power was estimated from Hydro-Québec tarif L rates, energy price of $0.055 per kW for estimating the energy consumed. The total electrical power cost is $3,214,835 per year, or $2.00 per tonne of ore milled.

Table 21.19: Spodumene Plant Electrical Power Cost

Process Area	Power		Cost	
	Power Demand MW	Consumption kWh/y	Total Cost $/y	Unit Cost $/t
Crushing	1.03	4,133,592	227,352	0.14
Crushed ore stockpile and grinding	3.86	30,662,328	1,686,427	1.05
Tantalite recovery	0.21	1,534,728	84,408	0.05
Mica Flotation	0.37	2,675,724	147,164	0.09
Spodumene flotation	1.27	9,168,168	504,252	0.31
Tailings dewatering and dry stacking	0.53	3,808,680	209,472	0.13
Spodumene conc. dewatering and drying	0.30	1,832,028	100,760	0.07
Reagents preparation and distribution	0.05	377,652	20,772	0.01
Services	0.59	4,258,656	234,228	0.15
TOTAL ELECTRICAL POWER COST	**8.21**	**58,451,556**	**$3,214,835**	**$2.00**

Note: Total my not add up due to rounding

GRINDING MEDIA AND REAGENTS COSTS

The total grinding media and spodumene reagents Operating costs presented in Table 21.20 were estimated at $16,139,823 per year, or $10.03 per tonne of ore milled. The grinding media cost was obtained from suppliers. Reagents quantities were estimated from SGS Lakefield spodumene concentrate production tests. The reagents costs were obtained from suppliers.

Table 21.20: Grinding Media and Reagents Costs

Description	Consumption kg/y	Price $/kg	Cost $/y	Cost $/t
Grinding Media				
Ball Mill Balls (75 mm)	1,610,000	2.30	3,703,000	2.30
Spodumene Plant Reagents				
Soda Ash	925,750	0.88	814,660	0.51
AERO 3030C	120,750	12.35	1,491,263	0.93
Pionera F220	402,500	4.50	1,810,445	1.12
Caustic Soda	483,000	0.98	473,340	0.29
Fatty Acid-2	1,147,930	6,63	7,610,776	4.73
Flocculant	43,451	5.52	239,850	0.15
Sub-total Reagents			12,437,624	7.79
TOTAL MEDIA AND REAGENTS COSTS			**$16,139,823**	**$10.03**

Note: Totals may not add up due to rounding.

FUEL COSTS

The fuel consumption cost will be $793,714 per year, or $3.88 per tonne of concentrate, or $0.49 per tonne of ore milled. The fuel consumption is based on the loading mobile equipment for the concentrate and the tailings management.

MAINTENANCE WEAR CONSUMABLES COSTS

The maintenance wear item costs per equipment is shown in Table 21.21. The total cost was estimated at $788,794, or $0.49 per tonne of ore milled. The consumable costs were obtained from mining operation having the same crushing and grinding configuration.

Table 21.21: Maintenance Wear Items Costs

Process Equipment Description	Cost	
	$/y	$/t
Jaw crusher wear parts	67,660	0.04
Secondary Cone crusher wear parts	165,640	0.10
Tertiary Cone crusher wear parts	195,494	0.12
Vibrating screen wear parts	60,000	0.04
Ball mill lifters and liners	300,000	0.19
TOTAL CONSUMABLES COST	**$788,794**	**$0,49**

Note: Totals may not add up due to rounding.

BIG BAGS

Big bags, or super sacks, will be used for shipping tantalite concentrates. The cost for the big bags was estimated at $310,046 per year, or $0.19 per tonne of ore milled.

G & A, PARTS & MATERIAL MAINTENANCE COSTS

The general maintenance items cost per processing ararea is shown in Table 21.22. The total cost was estimated at $5,981,400, or 3.72 per tonne of ore milled. The costs were obtained from mining operation having the same processing and auxiliary equipment.

Table 21.22: G & A, Parts & Material Maintenance Costs

Processing Area Description	Cost	
	$/y	$/t
Mill General (including thickening and filtration)	1,688,400	1,05
DCS & IT Networks	390,000	0.24
Crushing area	1,155,000	0.72
Grinding area	1,632,000	1.02
Flotation area	384,000	0.24
Reagents area	408,000	0,25
Water & Air Services area	324,000	0,20
TOTAL COST	**$5,981,400**	**$3,72**

Note: Totals may not add up due to rounding.

ASSAY LABORATORY OPERATION COSTS

The assay laboratory operation cost is shown in Table 21.23. The total cost excluding the labour was estimated at $905,580, or $0.56 per tonne of ore milled. The costs were obtained from assay laboratory in the local mining industry.

Table 21.23: Assay laboratory Operation Costs

Assay Laboratory Description	Cost	
	$/y	$/t
General & Administration	69,600	0.04
Sample Preparation	373,600	0.23
Assay	462,380	0.29
TOTAL COST	**$905,580**	**$0,56**

Note: Totals may not add up due to rounding

21.2.3 General and Administrative Costs

General and administrative costs (Table 21.24) include management, accounting, and health and safety labour necessary for the detailed engineering and construction period. It also includes such services as air and ground transportation, electricity, camp services, water management, site security, road maintenance, general liability and construction insurances, and purchase of service equipment. Cost estimation is based on requirements and proposed budget unit costs.

Table 21.24: General and Administrative Costs

Item	Average Annual Total (M CAN$)
Administration Manpower	10.9
Air Transportation	6.4
Ground Transportation - Buses	0.4
Electricity and Communications- Infrastructure	1.3
Camp operation	6.1
Surface Water Pumping	0.6
Water Treatment	1.1
Security	0.4
Garbage Disposal	0.8
Road Maintenance	1.4
Insurances	0.9
Miscellaneous Equipment	0.4
TOTAL GENERAL & ADMINISTRATIVE	**30.7**

21.2.4 Concentrate Transportation Costs

Transportation costs (Table 21.25) include trucking of concentrate containers to a rail loading location, shipment by rail to a boat loading facility and loading of the containers onto the boat.

Table 21.25: Transportation Concentrate Costs

Stage	Cost per tonne - concentrate
Transport between the mine and the Matagami transhipment yard	$72.33
Matagami Transhipment Yard	$15.00
Rail transportation via CN network to a port in Quebec	$88.80
Transfer from train to boat ("off the hook")	$24.00
Road Maintenance (HQ/MNRF)	$5.30
Escalation/Inflation 2% per year est. (2yrs)	$8.22
TOTAL	**$213.65**

Over the life of the project, it is projected that about 3.5M tonnes of concentrate will be shipped amounting to a total cost of $747.8M, which equates to $28.43/t ore milled.

The following logistical chain was assumed to develop costing:

1 The logistical chain starts at the mine where material loaded from the silo into a specially adapted container (e.g., a “rotainer” to be more specific). The material would stay within the same container until it is loaded unto a ship.

2 The containers would then be trucked from the mine to the rail yard via the road network.

3 Containers would then be unloaded from trucks, stored and then loaded onto rail cars. Empty containers would then be loaded unto trucks for the return trip to the mine.

4 Containers would then be transported by rail to a port facility.

5 Containers would be unloaded at the port facility and then stored until the next port call by the monthly ship.

6 Once the ship is at the port, containers would then be emptied into the ship’s hatches using ship-mounted or shore-based cranes. Empty containers would then be stored at the Port and loaded unto rail cars for the return trip.

7 The ship would then sail to its end client (not included in the costing).

22 ECONOMIC ANALYSIS

22.1 Introduction

An engineering economic model was prepared for the Project to estimate annual cash flows and assess sensitivities to certain economic parameters. The economic results of this report are based upon the engineering performed by WSP, Bumigeme., InnovExplo, and Critical Elements.

The Project includes an open pit mine, a spodumene plant for the recovery of spodumene concentrate and tantalum concentrate, surface infrastructure to support the mine and mill operations (maintenance and office facilities), water management features, and a tailings storage facility.

The Project indicates an after-tax cash flow of $5,147 million, after-tax NPV (8%) of $2,851 million and after-tax IRR of 65.7%. The project is most sensitive to Lithium concentrate commodity prices and currency exchange rates.

Table 22.1 summarizes the Economic Analysis results.

Table 22.1: Summary of Economic Analysis Results, Base Case

Item	Units	Value
Production		
Project life (from start of construction to closure)	years	19
Mine life	years	17
Total mill feed tonnage	M t	26.3
Average mill feed grade		
Li_2O	% Li_2O	0.87
Ta_2O_5	ppm Ta_2O_5	138
Lithium Concentrate Production		
% of Production, Chemical Grade	%	75
% of Production, Technical Grade	%	25
Mill recoveries		
Li_2O, Chemical Grade	%	87.4
Li_2O, Technical Grade	%	84.8
Ta_2O_5	%	54.4
Payable		
5.5% Li_2O Concentrate, Chemical Grade	t	2,681,000
6% Li_2O Concentrate, Technical Grade	t	783,000
Ta_2O_5 contained in concentrate	kg	1,971,000
Commodity Prices		
5.5% Li_2O Concentrate, Chemical Grade – LoOP Average	US$/t conc.	2,162
6% Li_2O Concentrate, Technical Grade – LoOP Average	US$/t conc.	4,699
Ta_2O_5 contained in concentrate	US$/kg contained	150
Exchange rate		1.00 US$: 1.30 CAN$
		0.77 US$: 1.00 CAN$
Project Costs		**CAN$**
Average Mining Cost	$/t milled	35.13
Average Milling Cost	$/t milled	27.00
Average General & Administrative Cost	$/t milled	20.70
Average Concentrate Transport Costs	$/t milled	22.76
Project Economics		**CAN$**

Item	Units	Value
Gross Revenue	$M	12,692
Total Selling Cost Estimate	$M	161
Total Operating Cost Estimate	$M	2,776
Total Sustaining Capital Cost Estimate	$M	310
Total Capital Cost Estimate	$M	611
Duties and Taxes	$M	3,688
Average Annual EBITDA	$M	599
Average Gross Profit Margin		78.8%
Pre-Tax Cash Flow	$M	8,835
After-Tax Cash Flow	$M	5,147
Effective Tax Rate		41.7%
Discount Rate		8%
Pre-Tax Net Present Value @ 8%	$M	5,048
Pre-Tax Internal Rate of Return		95.9%
Pre-Tax Payback Period	years	1.3
After-Tax Net Present Value @ 8%	$M	2,851
After-Tax Internal Rate of Return		65.7%
After-Tax payback period	years	1.8

Note:
* Average Annual EBITDA is defined as Average of (Revenue less Selling Cost, less Opex, less Mine Rehab Costs) for Years 1 through 16

22.2 Cautionary Statement

The results of the Economic Analysis are based on forward looking information that are subject to several known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

Forward-looking statements in this Item include, but are not limited to, statements with respect to:

— Future prices of spodumene and tantalum concentrates;
— Currency exchange rate fluctuations;
— Estimation of Mineral Reserves;
— Realization of Mineral Reserve estimates; and
— Estimated costs and timing of capital and operating expenditures.

22.3 Principal Assumptions

The cash flow estimate includes only revenue, costs, duties and taxes, and other factors applicable to the Project. Corporate obligations, financing costs, sunk costs, and taxes at the corporate level are excluded.

The model was prepared from mining schedules estimated on an annual basis. The cash flow model was based on the following:

— All costs are reported in Canadian dollars (CAN$) and referenced as '$', unless otherwise stated.
— One hundred percent (100%) equity basis.
— No cost escalation beyond 2023.
— No provision for effects of inflation.
— Constant 2023 dollar analysis.

- The economic analysis consists of the technical assumptions outlined in the previous Items, together with the economic assumptions and estimated Capital and Operating costs described in Item 21.
- The economic analysis is based on Critical Elements' preferred scenario of selling three products:
  - A chemical grade lithium concentrate with the following averages over the Life of Mine (LoM):
    - 75% of lithium production;
    - 87.4% recovery;
    - 5.56% Li_2O concentrate grade;
    - 2,162 US$/t concentrate selling price.
  - A technical grade lithium concentrate with the following averages over the Life of Operating Pl (LoOP)::
    - 25% of lithium production;
    - 84.8% recovery;
    - 6.16% Li_2O concentrate grade;
    - 4,699 US$/t concentrate selling price.
  - A tantalum concentrate with the following averages over the Life of Operating Plan (LoOP)::
    - 54.4% recovery;
    - 20% Ta_2O_5 concentrate grade;
    - 150 US$/kg Ta_2O_5 contained selling price.
- A constant exchange rate assumption of 1.00 US$: 1.30 CAN$ (1.00 CAN$: 0.77 US$) was used in the economic analysis.
- Exploration costs are deemed outside of the project.
- Any additional project study costs have not been included in the analysis.
- Reclamation costs and requirements for a reclamation bond have been estimated and included in the economic analysis. The bond would likely be secured with insurance or similar financial instrument at some annual cost. Costs of financing the bond have been estimated at annual costs of 2.0% of the remaining balance.

22.4 Taxes and Royalties

22.4.1 Duties and Taxes

The Project has been evaluated on an after-tax basis. It must be noted that there are many potential complex factors that affect the taxation of a mining project. The taxes, depletion, and depreciation calculations in the FS economic analysis are simplified and only intended to give a general indication of the potential tax implications.

The Project will be subject to the following taxes as they relate to the Project:

- A federal income tax rate of 15%.
- A provincial corporate income tax rate ranging from 11.8% (in 2022) to 11.5% (in 2025 and thereafter).
- A provincial mining tax rate from 16% to 28% depending on the profit margin of the year.

Processing Allowance

A company is entitled to deduct a processing allowance in the calculation of its mining profit. Basically, this deduction corresponds to 10% of the original value of an asset used in the ore processing.

Depreciation Allowance

A company may claim a depreciation allowance on an asset used in the mining operations at the declining rate of 30%.

22.4.2 Royalties

The Project royalties are described in Item 4. One percent (1%) will be purchased before the start of production and will be paid for with shares, therefore no cash disbursement. A 1% NSR royalty is included in the cash flow model.

22.5 Economic Results, Base Case

The results are derived from the Life-of-Mine schedule presented in Item 16 the recovery method are discussed in Item 17, and Capital and Operating costs are presented in Item 21. Table 22.2 summarizes the cost inputs for the Economic Analysis.

Figure 22.1 shows the cash flow model results. The cash flow is presented in Table 22.3.

Table 22.2: Summary of Cost Inputs

Cost Item / Description	Pre-Production M $	Production / Sustaining M $	Total M $	$/t milled	$/t conc. Li_2O & Ta_2O_5
Mining	0	923.5	923.5	35.13	266
Processing	0	709.7	709.7	27.00	205
General and Administration	0	544.3	544.3	20.70	157
Transportation Concentrate	0	598.2	598.2	22.76	173
1 - Total Operating Costs (Mining + Processing + GA + Transport)	**0**	**2,775.6**	**2,775.6**	**105.59**	**801**
SG&A	0	34.0	34.0	1.3	10
Royalties	0	126.9	126.9	4.8	37
2 - Subtotal Costs (Operating Costs + Selling Costs + Royalties)	**0**	**2,936.5**	**2,936.5**	**111.71**	**847**
Capital Cost Estimate					
OWNER'S COSTS	77.7	0.0	77.7		
MINE REHABILITATION	0.0	21.7	21.7		
MINE REHABILITATION BOND COSTS	1.2	7.2	8.4		
MINE OPEN PIT	7.6	207.5	215.1		
STOCKPILES	7.0	19.2	26.2		
INFRASTRUCTURE	108.9	14.2	123.0		
PROCESS PLANT	166.8	10.4	177.2		
AUXILIARY BUILDINGS AND EQUIPMENT	75.2	2.7	77.9		
INDIRECT COSTS	111.4	0.5	111.9		
CONTINGENCY	55.5	25.4	80.9		
Total Capital Costs with Contingency	**611.2**	**308.9**	**920.0**	**35.00**	**266**
Working Capital	46.3	-46.3	0.0		
3 - All-in Costs, Pre-Tax* (Operating Costs + Selling Costs + Royalties + Total Capital + Working Capital; excl. Tax)	**657.4**	**3199.1**	**3,856.5**	**146.71**	**1113**
Duties and Taxes	0	3,688.0	3,688.0	140.30	1065
4 - All-in Costs* (All estimated costs, incl. Tax)	**657.4**	**6,887.1**	**7,544.5**	**287.01**	**2178**

Note: Non-GAAP financial performance measures with no standardized definition

Figure 22.1: Cash Flow Model Results, Base Case

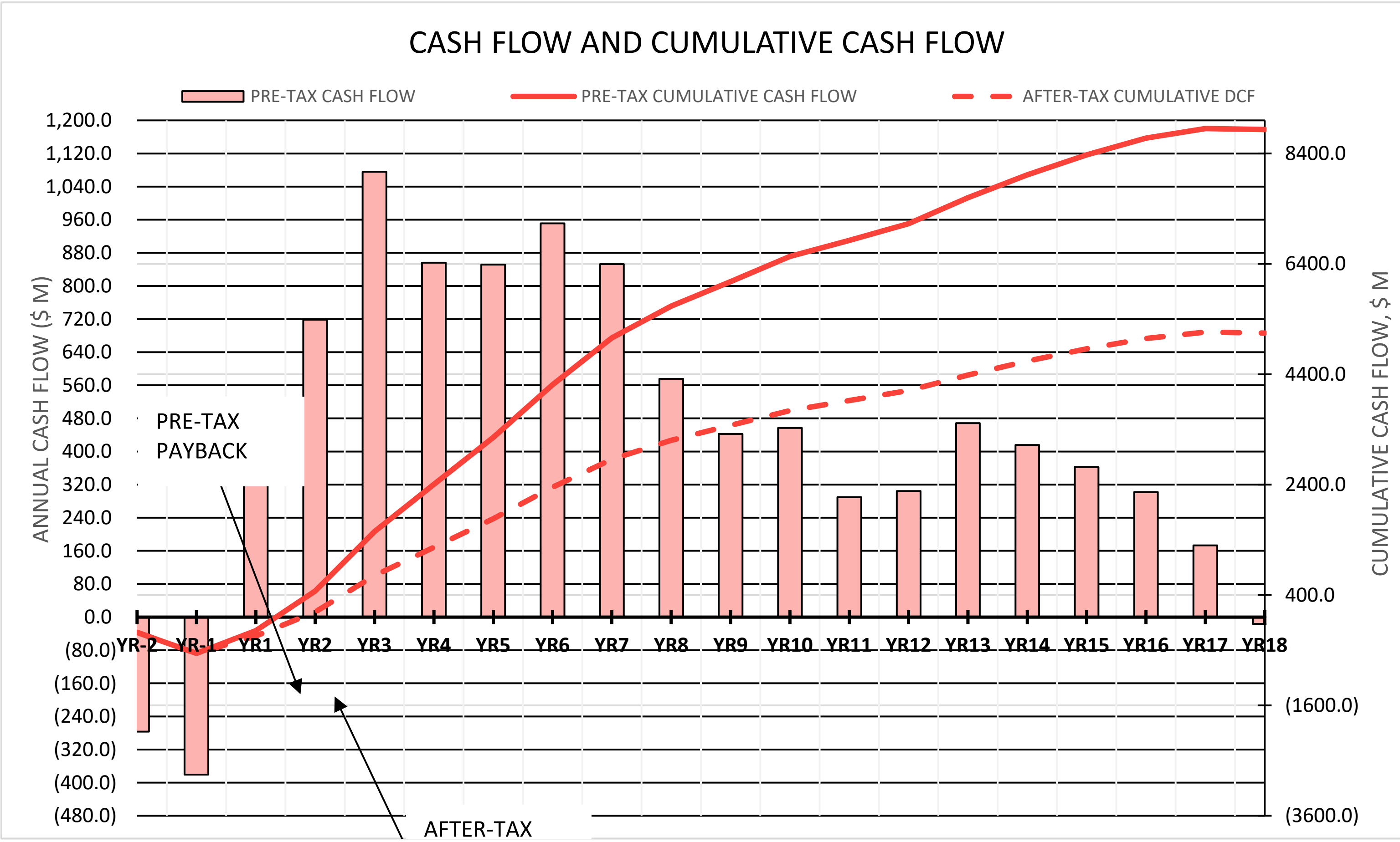


Table 22.3: Cash Flow Model, Base Case

			PRE-PRODUCTION		PRODUCTION																	CLOSURE
	Total	**Units**	**YR-2**	**YR-1**	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**	**YR6**	**YR7**	**YR8**	**YR9**	**YR10**	**YR11**	**YR12**	**YR13**	**YR14**	**YR15**	**YR16**	**YR17**	**YR18**
Mill feed production tonnage	26.3	M t	0.0	0.0	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	0.9	0.0
Mill feed head grades																						
Li_2O	0.87%	%	0.00%	0.00%	0.84%	0.93%	1.21%	1.03%	0.98%	1.06%	0.97%	0.85%	0.85%	0.87%	0.67%	0.72%	0.89%	0.81%	0.72%	0.61%	0.60%	0.00%
Ta_2O_5	138	ppm	0	0	167	175	162	149	153	143	163	104	113	145	161	163	106	100	107	111	124	0
Concentrate production																						
Li_2O Concentrate, Chemical Grade, 5.5%	2,681	k t	0	0	112	184	238	203	194	206	188	165	164	170	118	126	173	153	127	102	58	0
Li_2O Concentrate, Technical Grade, 6%	783	k t	0	0	34	54	70	60	57	60	54	48	48	49	34	36	50	44	36	30	17	0
Ta_2O_5 Contained in Concentrate	1,971	t	0	0	74	113	104	96	147	138	158	101	109	140	156	157	103	97	103	107	69	0
Assumptions																						
Commodity price																						
Li_2O Concentrate, Chemical Grade, 5.5%		US$/t $_{conc.}$	2,549	2,549	2,509	2,549	2,549	2,549	2,549	2,596	2,596	2,158	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,721	1,690
Li_2O Concentrate, Technical Grade, 6%		US$/t $_{conc.}$	5,303	5,303	5,226	5,303	5,303	5,303	5,303	5,524	5,524	4,734	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,788
Ta_2O_5 Contained in Concentrate		US$/kg $_{contained}$	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Exchange rate, 1 US$: CAN$			1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Gross Revenue	9,772.5	MUS$	0.0	0.0	280.0	469.3	607.9	516.7	494.3	536.0	487.2	356.5	282.7	292.0	203.2	217.7	297.9	262.9	219.1	175.1	99.6	0.0
	12,691.5	M$	0.0	0.0	609.1	1005.9	1294.8	1102.1	1065.2	1151.9	1053.3	776.7	632.2	658.3	466.6	498.0	663.8	586.8	490.7	404.4	231.6	0.0
Selling Costs	160.9	M$	0.0	0.0	8.1	12.1	14.9	13.0	12.7	13.5	12.5	9.8	8.3	8.6	6.7	7.0	8.6	7.9	6.9	6.0	4.3	0.0
Operating Costs	2,775.6	M$	0.0	0.0	185.1	183.7	191.9	184.9	186.5	186.0	179.5	176.4	174.5	165.9	159.8	162.7	181.2	162.5	125.1	101.7	68.4	0.0
Capital Costs (incl. Contingency)	611.2	M$	276.9	334.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sustaining Capital Costs (incl. Closure)	310.1	M$	0.8	0.4	4.5	89.7	14.0	47.5	14.5	2.9	9.6	15.3	8.9	28.6	9.6	19.2	10.2	10.1	1.8	2.9	2.8	16.7
Working Capital	0.0	M$	0.0	46.3	-0.3	2.0	-1.7	0.4	-0.1	-1.6	-0.8	-0.5	-2.2	-1.5	0.7	4.6	-4.7	-9.3	-5.9	-8.3	-17.1	0.0
Duties & Taxes	3,688.0	M$	0.0	0.0	98.2	283.2	415.6	343.6	334.6	379.8	345.8	231.2	172.5	188.1	109.8	122.6	186.4	163.1	140.8	115.1	57.6	0.0
Cash flow results																						
EBITDA		M$	-0.8	-0.4	415.5	809.7	1,087.5	903.7	865.6	952.0	860.9	590.1	449.0	483.4	299.7	327.9	473.6	416.0	358.2	293.8	156.1	-16.7
Pre-tax cash flow	8,835.0	M$	-276.9	-380.6	411.7	718.4	1,075.7	856.2	851.6	951.1	852.5	575.7	442.6	456.8	289.8	304.5	468.5	415.8	362.7	302.2	173.2	-16.7
Cumulative Pre-Tax Cash Flow		M$	-276.9	-657.4	-245.7	472.7	1,548.5	2,404.7	3,256.3	4,207.4	5,059.9	5,635.6	6,078.3	6,535.0	6,824.9	7,129.4	7,597.9	8,013.7	8,376.4	8,678.5	8,851.7	8,835.0
After-tax cash flow	5,147.0	M$	-276.9	-380.6	313.6	435.2	660.2	512.6	517.1	571.2	506.8	344.5	270.1	268.7	180.1	181.9	282.1	252.7	221.8	187.0	115.6	-16.7
Cumulative After-Tax Cash Flow		M$	-276.9	-657.4	-343.9	91.3	751.5	1,264.1	1,781.2	2,352.4	2,859.2	3,203.7	3,473.8	3,742.5	3,922.6	4,104.5	4,386.6	4,639.2	4,861.1	5,048.1	5,163.7	5,147.0
Gross Profit Margin	78.8%	%			73.1%	74.1%	85.8%	80.5%	83.1%	85.3%	84.2%	78.7%	75.6%	75.3%	70.1%	68.6%	76.6%	77.3%	81.2%	83.2%	87.4%	N.A.

Table 22.4 summarizes the economic indicators, both pre-tax and after-tax, for the estimated cash flow model in Table 22.3.

Table 22.4: Economic Indicators, Base Case

Economic Indicators	Units	Pre-Tax	After-Tax
Payback Period *(from start of production)*	years	1.3	1.8
Internal Rate of Return, IRR	%	95.9%	65.7%
Net Present Value @ 5%	M$	$6,137	$3,511
Net Present Value @ 8%	M$	$5,048	$2,851
Net Present Value @ 10%	M$	$4,467	$2,499

22.6 Sensitivity Analysis, Pre-Tax Basis

The pre-tax cash flow was evaluated for sensitivity to commodity prices, currency exchange rates, Capital expenditures, and Operating costs. All sensitivities were analyzed as mutually exclusive variations.

The project's pre-tax NPV was most sensitive to the factors impacting revenue, that is, Li_2O commodity pricing, Li_2O metal recovery, and currency exchange rate. Figure 22.2 and Figure 22.3 and Table 22.5 to Table 22.10 summarize the pre-tax sensitivity results.

Figure 22.2: Pre-Tax Sensitivity Analysis on NPV 8%

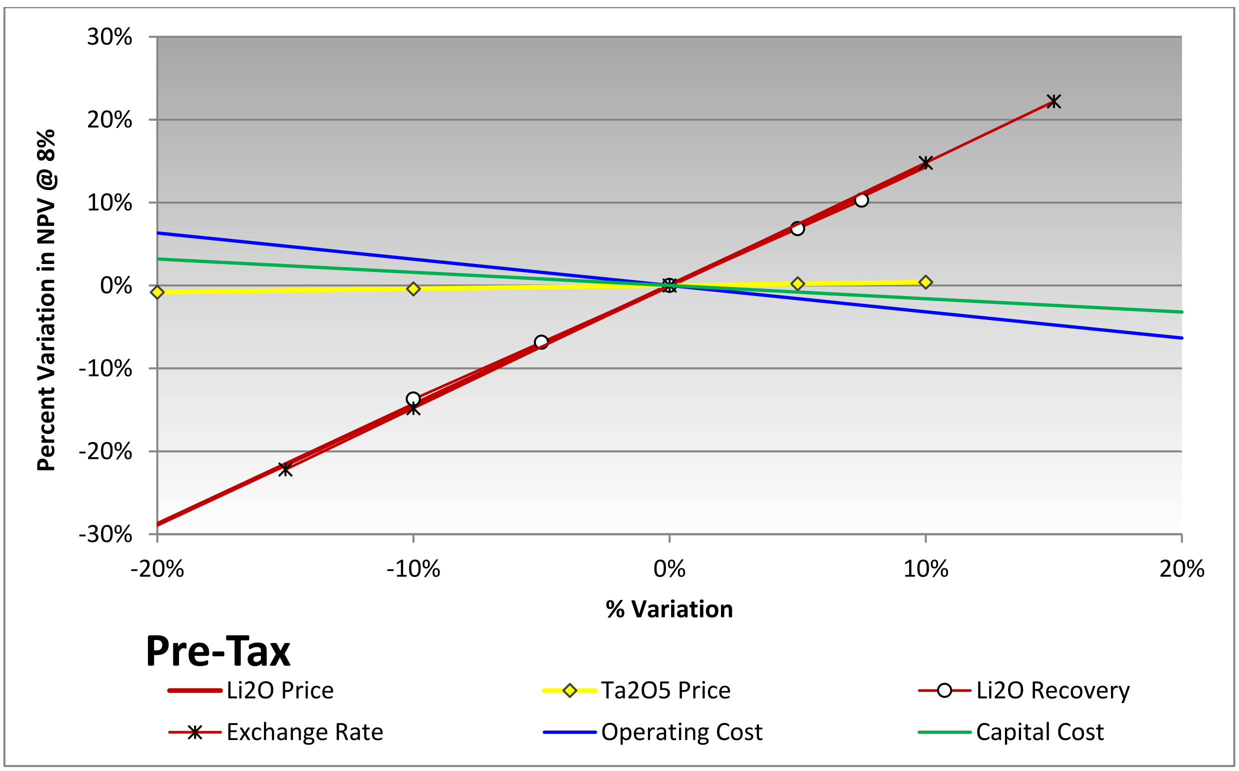


Figure 22.3: Pre-Tax Sensitivity Analysis on IRR

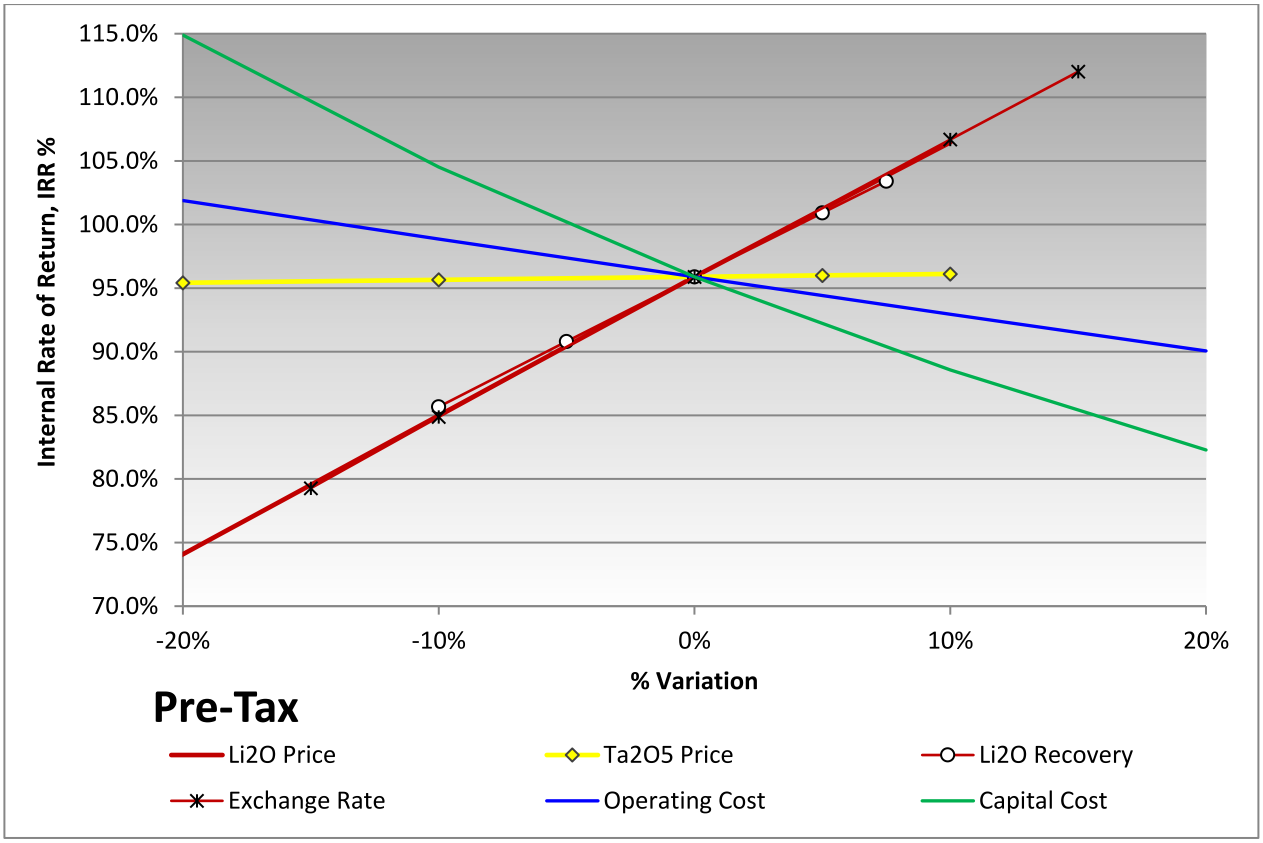


Table 22.5: Pre-Tax Sensitivity on Li_2O Metal Recovery

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-10%	-5%	**0%**	5%	7.5%
	Value – Chemical Grade	%	78.7%	83.0%	87.4%	91.8%	94.0%
	Value – Technical Grade	%	76.3%	80.5%	84.8%	89.0%	91.1%
Pre-tax							
Discount rate	0%	$M	7676.2	8255.6	**8835.0**	9414.4	9704.1
	5%	$M	5311.3	5724.3	**6137.3**	6550.2	6756.7
Discount rate	**8%**	**$M**	**4355.4**	**4701.5**	**5047.7**	**5393.8**	**5566.9**
	10%	$M	3845.5	4156.2	**4466.8**	4777.5	4932.8
	12%	$M	3413.9	3694.6	**3975.2**	4255.9	4396.2
Internal Rate of Return (IRR)		%	85.7%	90.8%	**95.9%**	100.9%	103.4%
Payback period		years	1.5	1.4	**1.3**	1.3	1.3

Table 22.6: Pre-Tax Sensitivity on Li_2O Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-40%	-20%	0%	5%	10%
	Value – Chemical Grade	US$/$t_{conc}$	1,297	1,73	2,162	2,27	2,379
	Value – Technical Grade	US$/$t_{conc}$	2,82	3,759	4,699	4,934	5,169
Pre-tax							
Discount rate	0%	$M	3961.2	6398.1	**8835.0**	9444.2	10053.4
	5%	$M	2666.7	4402.0	**6137.3**	6571.1	7004.9
	8%	**$M**	**2140.1**	**3593.9**	**5047.7**	**5411.1**	**5774.6**
	10%	$M	1858.2	3162.5	**4466.8**	4792.9	5119.0
	12%	$M	1618.8	2797.0	**3975.2**	4269.8	4564.3
Internal Rate of Return (IRR)		%	50.9%	74.1%	**95.9%**	101.2%	106.5%
Payback period		years	2.3	1.7	**1.3**	1.3	1.2

Table 22.7: Pre-Tax Sensitivity on Exchange Rate

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-15%	-10%	**0%**	10%	15%
	Value	1 US$: $	1.10	1.17	**1.30**	1.43	1.49
Pre-tax							
Discount rate	0%	$M	6950.3	7578.5	**8835.0**	10091.5	10719.7
	5%	$M	4798.0	5244.4	**6137.3**	7030.1	7476.5
	8%	**$M**	**3926.9**	**4300.5**	**5047.7**	**5794.9**	**6168.5**
	10%	$M	3461.9	3796.9	**4466.8**	5136.8	5471.8
	12%	$M	3068.0	3370.4	**3975.2**	4580.0	4882.5
Internal Rate of Return (IRR)		%	79.3%	84.9%	**95.9%**	106.7%	112.0%
Payback period		years	1.6	1.5	**1.3**	1.2	1.2

Table 22.8: Pre-Tax Sensitivity on Total Operating Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value	$M	3,331	3,053	**2,776**	2,498	2,22
Pre-tax							
Discount rate	0%	$M	8279.9	8557.4	**8835.0**	9112.6	9390.1
	5%	$M	5751.4	5944.3	**6137.3**	6330.2	6523.2
	8%	**$M**	**4727.8**	**4887.7**	**5047.7**	**5207.6**	**5367.6**
	10%	$M	4181.4	4324.1	**4466.8**	4609.6	4752.3
	12%	$M	3718.4	3846.8	**3975.2**	4103.6	4232.0
Internal Rate of Return (IRR)		%	90.1%	93.0%	**95.9%**	98.9%	101.9%
Payback period		years	1.4	1.4	**1.3**	1.3	1.3

Table 22.9: Pre-Tax Sensitivity on Total Capital Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value (including reclamation, sustaining capital, contingency)	$M	1,104	1,012	**920**	828	736
Pre-tax							
Discount rate	0%	$M	8651.0	8743.0	**8835.0**	8927.0	9019.0
	5%	$M	5969.4	6053.3	**6137.3**	6221.2	6305.1
	8%	**$M**	**4886.3**	**4967.0**	**5047.7**	**5128.4**	**5209.1**
	10%	$M	4308.9	4387.9	**4466.8**	4545.8	4624.8
	12%	$M	3820.2	3897.7	**3975.2**	4052.7	4130.2
Internal Rate of Return (IRR)		%	82.3%	88.6%	**95.9%**	104.5%	114.9%
Payback period		years	1.5	1.4	**1.3**	1.3	1.2

Table 22.10: Pre-Tax Sensitivity on Ta_2O_5 Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-20%	-10.0%	**0%**	5.0%	10.0%
	Value	US$/kg contained	120.0	135.0	**150.0**	157.5	165.0
Pre-tax							
Discount rate	0%	$M	8759.0	8797.0	**8835.0**	8854.0	8873.0
	5%	$M	6086.8	6112.0	**6137.3**	6149.9	6162.5
	8%	**$M**	**5007.0**	**5027.4**	**5047.7**	**5057.8**	**5068.0**
	10%	$M	4431.2	4449.0	**4466.8**	4475.7	4484.6
	12%	$M	3943.7	3959.5	**3975.2**	3983.1	3990.9
Internal Rate of Return (IRR)		%	95.4%	95.7%	**95.9%**	96.0%	96.1%
Payback period		years	1.3	1.3	**1.3**	1.3	1.3

22.7 Sensitivity Analysis, After-Tax Basis

The after-tax cash flow was evaluated for sensitivity to commodity prices, currency exchange rates, capital expenditures, and operating costs. All sensitivities were analyzed as mutually exclusive variations.

The project's after-tax NPV was also most sensitive to the factors impacting revenue, that is, Li_2O commodity pricing, Li_2O metal recovery, and currency exchange rate. Figure 22.4 and Figure 22.5 and Table 22.11 to Table 22.16 summarize the after-tax sensitivity results.

Figure 22.4: After-Tax Sensitivity Analysis on NPV 8%

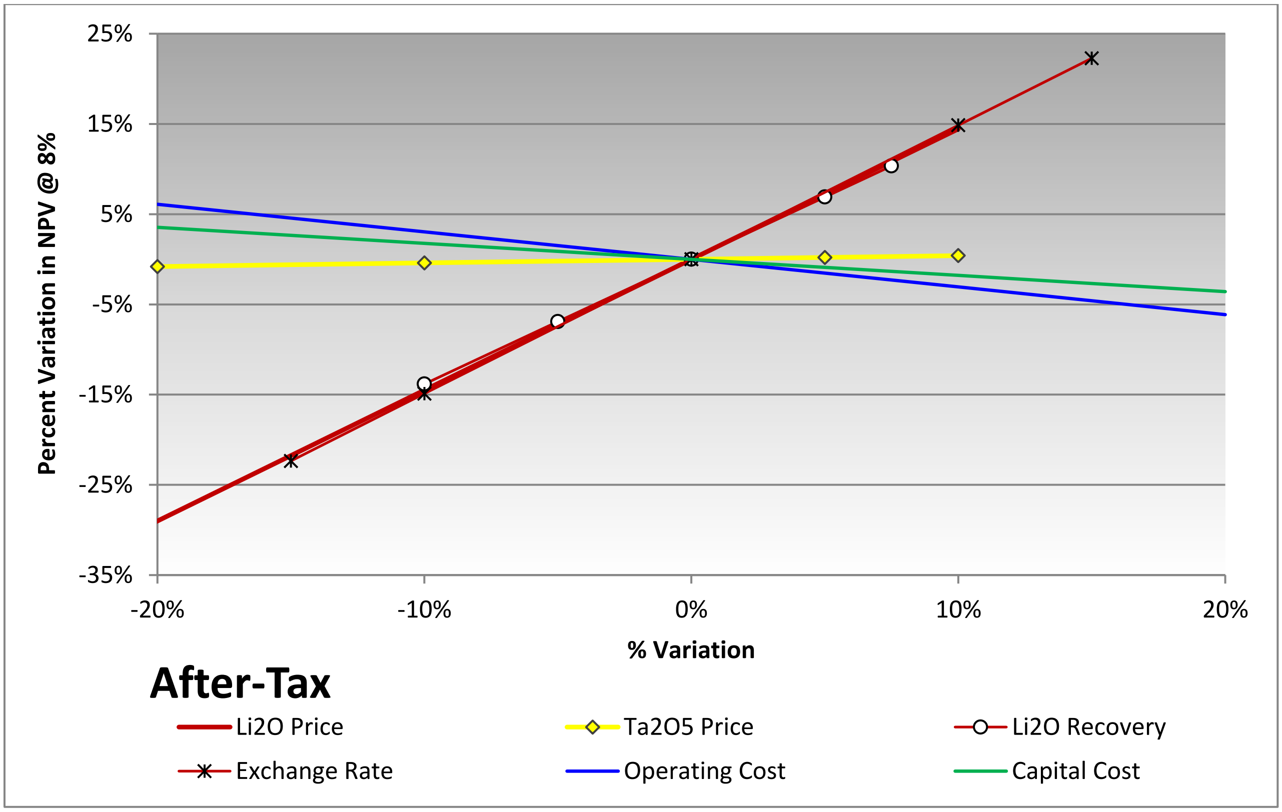


Figure 22.5: After-Tax Sensitivity Analysis on IRR

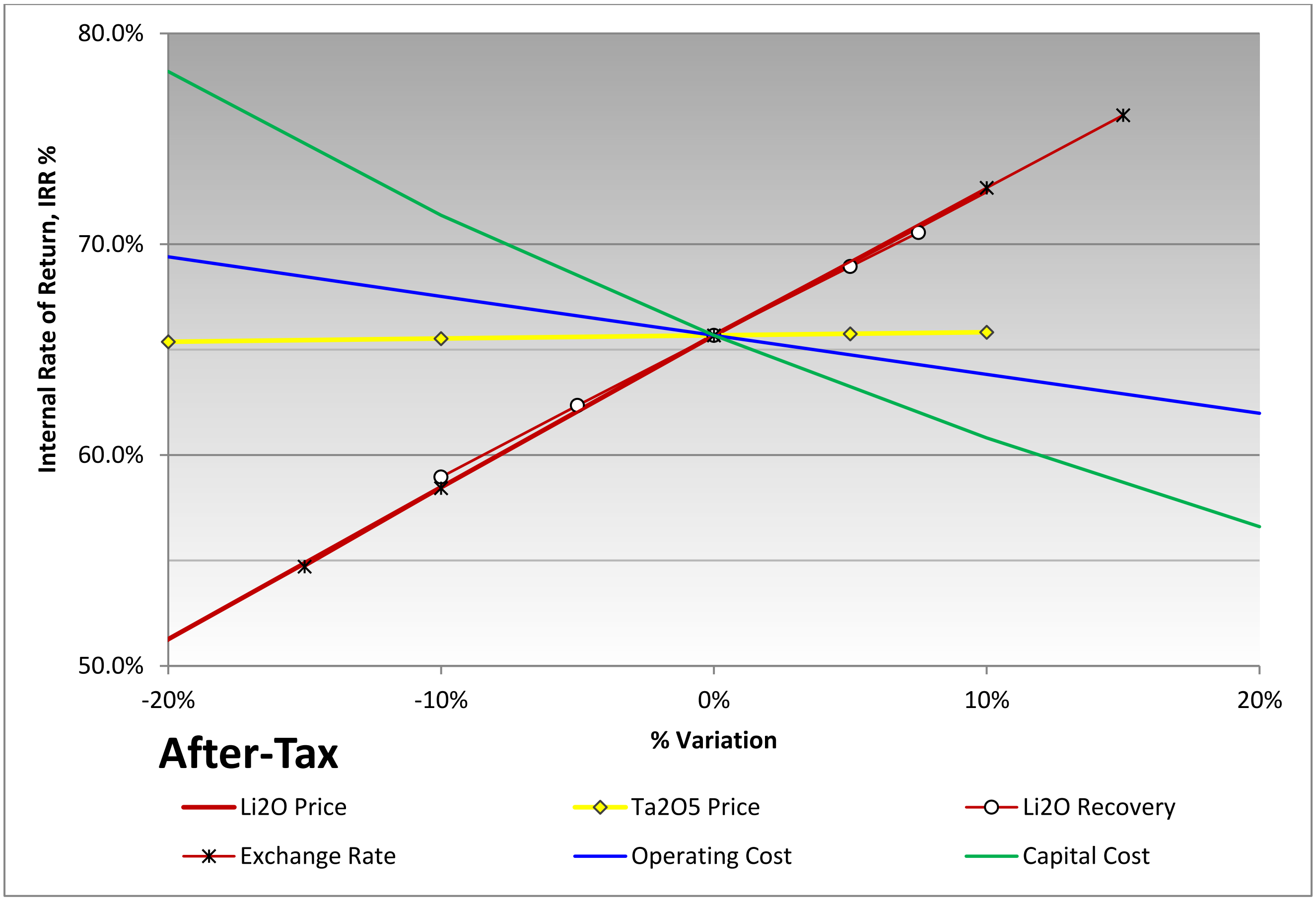


Table 22.11: After-Tax Sensitivity on Li_2O Metal Recovery

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-10%	-5%	**0%**	5%	7.5%
	Value – Chemical Grade	%	78.7%	83.0%	87.4%	91.8%	94.0%
	Value – Technical Grade	%	76.3%	80.5%	84.8%	89.0%	91.1%
After-tax							
Discount rate	0%	$M	4487.9	4817.7	**5147.0**	5476.0	5640.5
	5%	$M	3041.3	3276.6	**3511.4**	3746.0	3863.2
	8%	**$M**	**2456.8**	**2654.1**	**2851.0**	**3047.5**	**3145.8**
	10%	$M	2145.0	2322.1	**2498.8**	2675.3	2763.5
	12%	$M	1880.9	2041.1	**2200.8**	2360.2	2439.9
Internal Rate of Return (IRR)		%	59.0%	62.4%	**65.7%**	68.9%	70.6%
Payback period		years	2.0	1.9	**1.8**	1.7	1.7

Table 22.12: After-Tax Sensitivity on Li_2O Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-40%	-20%	0%	5%	10%
	Value – Chemical Grade	US$/$t_{conc}$	1,297	1,73	2,162	2,27	2,379
	Value – Technical Grade	US$/$t_{conc}$	2,82	3,759	4,699	4,934	5,169
After-tax							
Discount rate	0%	$M	2368.6	3763.5	**5147.0**	5491.9	5836.7
	5%	$M	1531.7	2525.1	**3511.4**	3757.1	4002.9
	8%	**$M**	**1191.5**	**2024.0**	**2851.0**	**3056.9**	**3262.9**
	10%	$M	1009.4	1756.5	**2498.8**	2683.7	2868.5
	12%	$M	854.7	1529.9	**2200.8**	2367.8	2534.8
Internal Rate of Return (IRR)		%	35.7%	51.3%	**65.7%**	69.1%	72.5%
Payback period		years	2.7	2.2	**1.8**	1.7	1.6

Table 22.13: After-Tax Sensitivity on Exchange Rate

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-15%	-10.0%	**0%**	10.0%	15.0%
	Value	1 US$: $	1.10	1.17	**1.30**	1.43	1.49
After-tax							
Discount rate	0%	$M	4077.7	4434.5	**5147.0**	5858.2	6213.8
	5%	$M	2750.6	3004.5	**3511.4**	4017.1	4270.0
	8%	**$M**	**2213.7**	**2426.4**	**2851.0**	**3274.4**	**3486.1**
	10%	$M	1927.2	2117.9	**2498.8**	2878.6	3068.4
	12%	$M	1684.4	1856.7	**2200.8**	2543.7	2715.1
Internal Rate of Return (IRR)		%	54.7%	58.4%	**65.7%**	72.7%	76.1%
Payback period		years	2.1	2.0	**1.8**	1.6	1.6

Table 22.14: After-Tax Sensitivity on Total Operating Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value	$M	3,331	3,053	**2,776**	2,498	2,22
After-tax							
Discount rate	0%	$M	4850.3	4999.0	**5147.0**	5294.7	5442.4
	5%	$M	3302.2	3407.1	**3511.4**	3615.4	3719.4
	8%	**$M**	**2676.1**	**2763.8**	**2851.0**	**2937.8**	**3024.7**
	10%	$M	2341.9	2420.6	**2498.8**	2576.7	2654.6
	12%	$M	2058.8	2130.0	**2200.8**	2271.2	2341.6
Internal Rate of Return (IRR)		%	62.0%	63.8%	**65.7%**	67.5%	69.4%
Payback period		years	1.9	1.8	**1.8**	1.7	1.7

Table 22.15: After-Tax Sensitivity on Total Capital Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value (including reclamation, sustaining capital, contingency)	$M	1,104	1,012	**920**	828	736
After-tax							
Discount rate	0%	$M	5051.7	5099.6	**5147.0**	5194.1	5241.1
	5%	$M	3411.4	3461.7	**3511.4**	3560.8	3610.2
	8%	**$M**	**2748.8**	**2800.1**	**2851.0**	**2901.5**	**2952.0**
	10%	$M	2395.5	2447.4	**2498.8**	2550.0	2601.1
	12%	$M	2096.3	2148.7	**2200.8**	2252.4	2304.1
Internal Rate of Return (IRR)		%	56.6%	60.8%	**65.7%**	71.4%	78.2%
Payback period		years	2.0	1.9	**1.8**	1.7	1.5

Table 22.16: After-Tax Sensitivity on Ta_2O_5 Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-20%	-10.0%	**0%**	5.0%	10.0%
	Value	US$/kg contained	120.0	135.0	**150.0**	157.5	165.0
After-tax							
Discount rate	0%	M	5104.0	5125.5	**5147.0**	5157.8	5168.5
	5%	$M	3482.9	3497.1	**3511.4**	3518.6	3525.7
	8%	**$M**	**2827.9**	**2839.4**	**2851.0**	**2856.7**	**2862.5**
	10%	$M	2478.7	2488.7	**2498.8**	2503.9	2508.9
	12%	$M	2182.9	2191.8	**2200.8**	2205.2	2209.7
Internal Rate of Return (IRR)		%	65.4%	65.5%	**65.7%**	65.8%	65.8%
Payback period		years	1.8	1.8	**1.8**	1.8	1.8

Table 22.17 tabulates the after-tax sensitivity on the NPV (8%) with respect to the Chemical Grade Li_2O price and exchange rate (Technical Grade price remained at base case assumption).

Table 22.17: After-Tax Sensitivity on Chemical Grade Li_2O Price

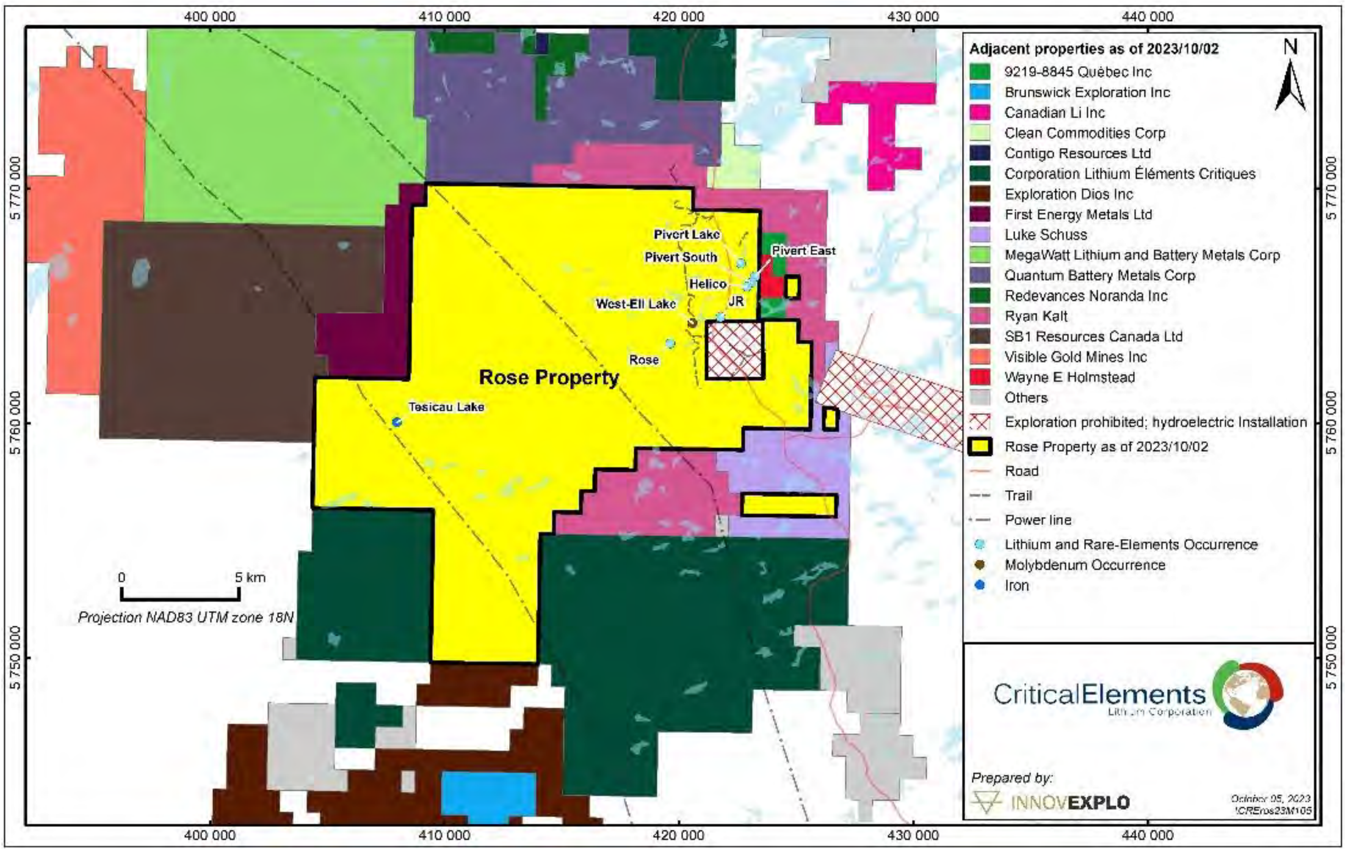
Exchange Rate USD/CAD	After-Tax NPV 8% Discount Rate - M CAN$				
	Li_2O Price - Chemical Grade US$/tonne				
	-40%	-20%	Base Case	5%	10%
-10%	927	1,681	2,426	2,612	2,798
Base Case	1,191	2,024	2,851	3,057	3,263
10%	1,454	2,367	3,274	3,501	3,727

23 ADJACENT PROPERTIES

Figure 23.1 presents the current owners of adjacent properties. There are no adjacent properties that are relevant to the technical report or to the progress of the issuer's Property.

The Property is almost completely surrounded by land held by companies or prospectors.

Figure 23.1: Current Owners of Adjacent Properties



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24 OTHER RELEVANT DATA AND INFORMATION

24.1 Implementation

The Project implementation schedule covers all the areas of the Project and includes the engineering, procurement, permitting, construction, and commissioning of the facilities, and pre-production excavations. The facilities include the main electrical station, the 315 kV power line displacement, the camp complex, the process plant, and site infrastructure.

The Project schedule assumes environmental certificates of authorization and the mining lease will be obtained in due time. The planned mill start-up is planned for Q4 2025. Figure 24.1 presents a summary of the Project Schedule.

The final environmental impact assessment (EIA) was submitted to the governments of Canada and Quebec in February 2019. Critical Elements has answered a series of questions from both government bodies (COMEX and CEAA). In August 2021, Critical Elements announced that the Federal Minister of Environment and Climate Change had rendered a favorable decision in respect of the proposed Rose Project. In September 2022, the Review Committee ("COMEX") has recommended that this project be authorized. Pursuant to the James Bay and Northern Quebec Agreement (JBNQA), the provincial environmental assessment was conducted jointly by the Cree Nation Government and the Government of Quebec, under the COMEX. In Novembre 2022, the project received the Certificate of Authorization pursuant to section 164 of Québec's *Environment Quality Act* from the Québec Minister of the Environment, the Fight against Climate Change, Wildlife and Parks. After receiving all governmental authorizations, the project will proceed to detailed engineering, to be ready when the environmental certificates of authorization will be required and in parallel Critical Elements will work on the development of construction mandates and the purchase of equipment required for the project. Detailed engineering will begin soon after the completion of the FS. Mine site construction work is scheduled to begin in Q3 2023. The mill start-up is scheduled for Q4 2025 and will ramp up over 6 months.

Critical Elements will have an Owner's team to manage the detailed engineering, procurement, and construction. It will contract consultants to conduct the detailed engineering for each discipline, as required.

The Project will require a camp of 575 rooms during the construction period and 300 rooms during operation. Camp and associated services will be provided locally, and negotiations are under way with local vendors. It is assumed that camp will be in place for the start of mine site construction. The camp complex will include dormitories, a kitchen and recreational area to accommodate the Project construction phase.

Hydro-Québec completed in 2018 its technical study for the relocation of the 315 kV power line section passing over the mine site and the supply of electrical power. Critical Elements will coordinate activities with Hydro-Quebec to provide power in time for mill commissioning or earlier. The construction work will be powered by diesel generators until electricity is available from the Hydro Québec power grid.

Delivery periods were requested from suppliers for major equipment. The delivery periods for such items as the crushers, the ball mill, conveyors, etc. ranged between 26 and 60 weeks. These deliveries were taken in consideration for the implementation schedule. Long lead items will be procured early to ensure delivery corresponds with the implementation schedule.

Mine construction priority will be given to site preparation and installation of temporary infrastructure to initiate the mill construction as early as possible. Temporary roads will be established using exploration roads, the industrial pad will be cleared and leveled, and excavation of waste material from the starter pit will be initiated early to provide aggregates for the infrastructure. When mill construction has begun, permanent roads and other items may be initiated.

The overburden and pre-work will be excavated by a contractor that will permit establishing a competent mining team prior to start production. As detailed in Item 18.5, the overburden will be stored in an overburden stockpile for later use for the restoration of the co-disposal stockpile area and the mine site.

Figure 24.1: Project Implementation Schedule

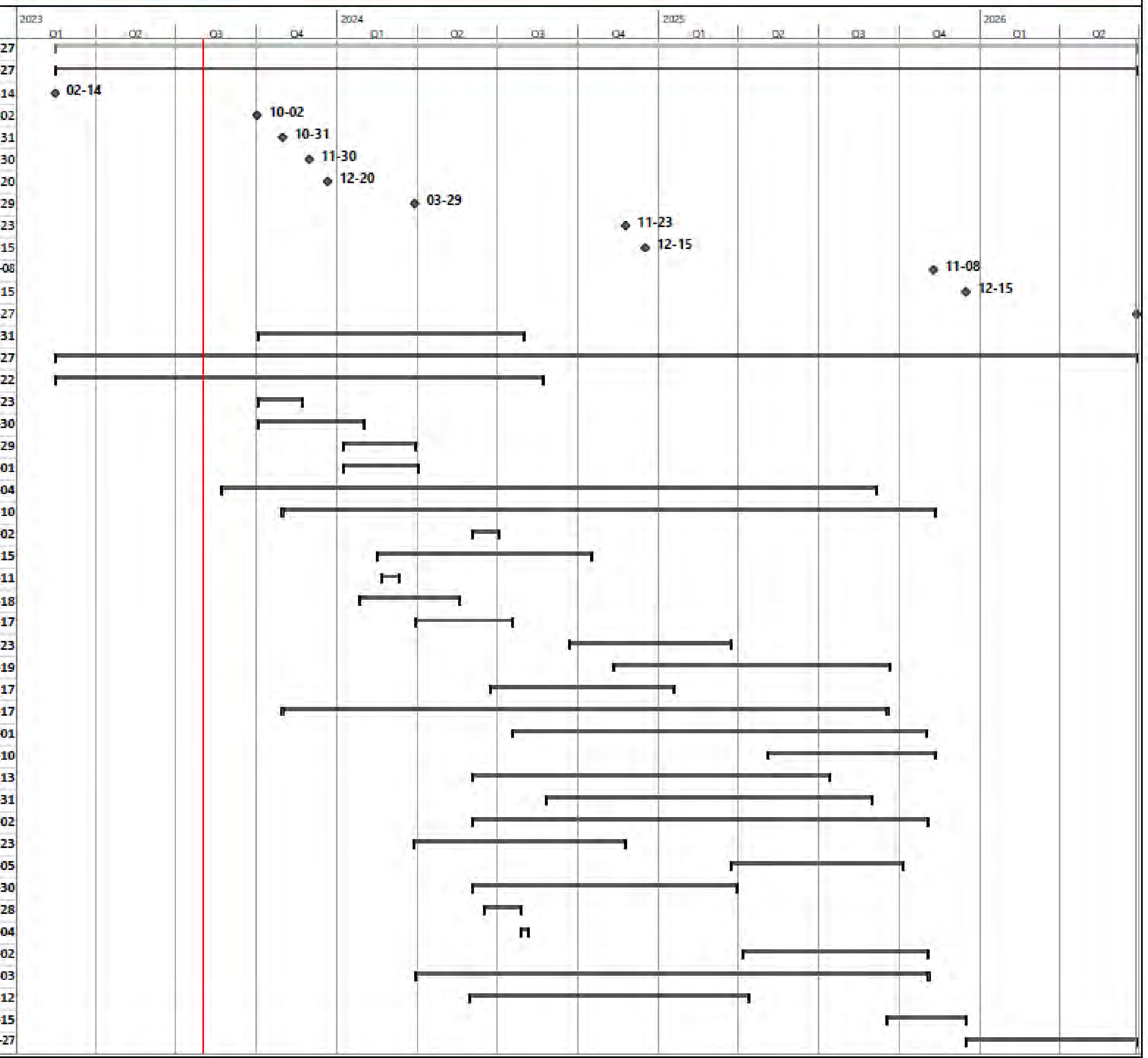
001 Rose Project - Master Project Schedule

WORK IN PROGRESS

Status Date: 2023-07-31

Camp capacity timeline

ID	Area	Task Name	Duration	Start	Finish
0		**001 ROSE - MASTER PROJECT SCHEDULE**	39,6mo	2023-02-14	2026-06-27
1		**PROJECT KEY MILESTONES**	39,6mo	2023-02-14	2026-06-27
2		Detail Engineering - Start	0d	2023-02-14	2023-02-14
3		Financing Approval for Exploration camp upgrade	0d	2023-10-02	2023-10-02
4		Financing Approval & Funds available → Official Project Execution Start	0d	2023-10-31	2023-10-31
5		Certificate of Authorisation updated (Global CA) including site camp	0d	2023-11-30	2023-11-30
6		Exploration camp upgrade operational - Capacity 80 rooms	0d	2023-12-20	2023-12-20
7		Pending receipt of Camp and Buildings authorizations	0d	2024-03-29	2024-03-29
8		Permanent camp operational - Maximum capacity 475 rooms	0d	2024-11-23	2024-11-23
9		Process Plant building closed (allow winter work inside)	0d	2024-12-15	2024-12-15
10		Main Electrical station - Operational	0d	2025-11-08	2025-11-08
11		Practical completion	0d	2025-12-15	2025-12-15
12		*Commissioning - Completed → Start commercial production*	0d	2026-06-27	2026-06-27
13		**PERMITTING (Critical only)**	5,33mo	2023-10-03	2024-07-31
28		**EXECUTION**	39,6mo	2023-02-14	2026-06-27
59		**DETAILED ENGINEERING**	10,08mo	2023-02-14	2024-08-22
65		**PROCUREMENT - EXPLORATION WORKS (Camp upgrade)**	1,67mo	2023-10-03	2023-11-23
76		**CONSTRUCTION - EXPLORATION WORKS (Camp upgrade)**	3,5mo	2023-10-03	2024-01-30
97		**PROCUREMENT - EARLY WORKS (Site prep.)**	2,73mo	2024-01-08	2024-03-29
101		**CONSTRUCTION - EARLY WORKS (Site prep.)**	2,83mo	2024-01-08	2024-04-01
136		**PROCUREMENT - STANDARD WORKS**	23,89mo	2023-08-22	2025-09-04
145		**CONSTRUCTION - STANDARD WORKS**	23,8mo	2023-10-31	2025-11-10
147	1300	Explosive storages	1mo	2024-06-03	2024-07-02
149	3100	Tailings & Waste Stockpiles	8,1mo	2024-02-16	2024-10-15
152	3200	Overburden Stockpile	0,67mo	2024-02-21	2024-03-11
154	3300	Ore Stockpile	3,77mo	2024-01-27	2024-05-18
157	5100	Roads & pads (Step1 - Critical work)	3,67mo	2024-03-30	2024-07-17
173	5140	Site Roads (Step2)	5,67mo	2024-09-21	2025-03-23
179	5140	Site Roads (Step3 - Finish surfaces)	10mo	2024-11-10	2025-09-19
181	5310	Final Effluent Water Treatment Plant	6,5mo	2024-06-23	2025-01-17
193	5600	Power Line Relocation (By Hydro-Quebec)	22mo	2023-10-31	2025-09-17
195	5700	Main Electrical Station	15,27mo	2024-07-18	2025-11-01
202	5800	Site Electrical & Telecommunication Distribution	6,33mo	2025-05-05	2025-11-10
213	6100	Crushing Plant (6100)	13,07mo	2024-06-03	2025-07-13
222	6200	Crushed Ore Storage (6200)	11,9mo	2024-08-26	2025-08-31
230	6900	Process Plant Building (6300 to 6900)	16,8mo	2024-06-03	2025-11-02
242	7100	Camp - Temporary & Permanent	8mo	2024-03-29	2024-11-23
259	7200	Administration Building, Dry & Gate	6,53mo	2025-03-24	2025-10-05
266	7300	Warehouse & Garage (to split each dome)	9,57mo	2024-06-03	2025-03-30
273	7620	Fuel Station & Depot	1,4mo	2024-06-17	2024-07-28
278	7610	Propane Storage & Distribution	0,23mo	2024-07-29	2024-08-04
280	7800	Servers, Telecommunications, IT & OT	7mo	2025-04-07	2025-11-02
282	8100	Mine Pre-Production	19mo	2024-03-30	2025-11-03
286	9508	Environment Management during Construction	10,1mo	2024-05-31	2025-04-12
296	9600	**PRE-OPERATIONAL VERIFICATIONS (9600)**	3mo	2025-09-17	2025-12-15
299	-	**COMMISSIONING (By Operations)**	6mo	2025-12-16	2026-06-27



001-CEC-30-0000-SCH-0001-AC Master Schedule L3

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24.2 Project Risks

As with all mining projects, there are technical risks that could affect the technical feasibility and economic outcome of the Project. At the feasibility stage, this Project has reasonably reduced the uncertainties and validated baseline assumptions. The remaining risks are manageable during the next phases of the Project. These risks are common to most mining projects, many of which can be mitigated with adequate engineering, planning, and pro-active management.

External risks are, to a certain extent, beyond the control of the Project proponents and are much more difficult to anticipate and mitigate, although, in many instances, some risk reduction can be achieved. External risks are things such as the political situation in the Project region, mineral price, exchange rate, and government legislation. These external risks are generally applicable to all mining projects. Negative variance to these items from the assumptions made in the economic model would reduce the profitability of the mine and the mineral resource estimates.

During the Feasibility Study, a risk identification template was submitted to all QPs to be filled in with three of their respective high-level critical risks. At that time, the risk register was compiled by the Project Integrator.

Since then, Detailed Engineering has started. The latest project risk analysis was conducted internally by Critical Elements in July of 2023. It reflects the latest available information and judgment from the project team. The outstanding risks with highest severity are listed below:

- Supply chain disruptions due to pandemic, war or other political reason.
- Delay in obtaining permit approval due to late submission and/or late approval.
- Inflation increase causing Capex and Opex significantly higher than FS when executing project.
- Overrun of the project cost / Estimate accuracy is erroneous beyond Contingency limits. Process flow sheet is not yet 100% finalized, there is a risk of additional equipment or modifications.
- Lack of skilled manpower resulting in bad, incomplete or low productivity construction work executed by contractors.
- The camp modules supplier cannot deliver the Camp on time to support master project schedule.
- Energy block availability delays by Hydro-Quebec could impact the master project schedule negatively.

The project risk register will be revisited, reviewed and updated at least twice a year going forward. Further, it is recommended that as the Project develops, additional risk workshops be held to access different levels of risk such as HAZOP and field risks.

25 INTERPRETATIONS AND CONCLUSIONS

25.1 Mineral Processing and Metallurgical Testing

The objective of achieving a spodumene concentrate with a minimum grade of 5.0% Li_2O was achieved during a series of metallurgical testing program at SGS Canada in Lakefield.

The spodumene plant is designed to process 1 610 000 tonnes of ore per year toproduce203,765 tonnes of spodumene concentrate with a chemical grade lithium concentrate averaging 5.56% Li_2O with a recovery averaging 87.4% or a technical grade lithium concentrate averaging 6.16% with a recovery averaging 84.8%.

An additional 580 tonnes per year of Tantalum concentrate will be recovered as a by-product.

The flowsheet selected includes three-stage conventional crushing, grinding, magnetic separation, mica flotation, spodumene flotation, spodumene concentrate and tantalum concentrate thickening, filtering, drying and spodumene and tantalum concentrates storage and shipping.

Bumigeme concludes that the Project is technically feasible as well as economically viable for moving it to the detailed engineering followed by construction.

25.2 Mineral Resource Estimate

The QP validated drilling procedures and sample preparation, including a QA/QC protocol, for 287 holes drilled by Critical Elements since 2009 at the Project as well as the assay results obtained by ALS Laboratory and found Critical Elements's database for the Project to be valid and reliable. A subset of 218 holes cut across the mineralized zones of the Rose deposit.

Given the density of the processed data, the search ellipse criteria, the drillhole density and the specific interpolation parameters, the QP is of the opinion that the current mineral resource estimate can be classified as Indicated and Inferred resources. The estimate was prepared in accordance with CIM's standards and guidelines for reporting mineral resources and reserves. This is the most recent Mineral Resources estimate for the Project and it comprises Indicated Mineral Resources of 30.6 Mt grading 0.93% Li_2O and 145 ppm Ta_2O_5 and Inferred Mineral Resources of 2.4 Mt grading 0.78% Li_2O and 129 ppm Ta_2O_5 using $31.4 NSR per tonne cut-off for the potential open-pit extraction scenario and $121.12 NSR cut-off for the potential underground extraction scenario.

The effective date of the estimate is August 1, 2023, based on compilation status, metal price parameters, and metallurgical recovery inputs.

25.3 Mineral Reserve Statement

The Mineral Reserves estimate (Table 25.1) for the Project was prepared by Mr. Simon Boudreau, P.Eng, an employee of InnovExplo Inc. and is effective as of August 1st, 2023. The Mineral Reserves estimate stated herein is consistent with the CIM Standards on Mineral Resources and Mineral Reserves and is suitable for public reporting. As such, the Mineral Reserves are based on Measured and Indicated Resources, and do not include any Inferred Resources. Measured and Indicated Resources are inclusive of Proven and Probable Reserves.

The FS Life-of-Mine plans and Mineral Reserves estimate were developed from the geological block model prepared by InnovExplo, with the exception that a constant mill recovery is used. The effects of using a constant recovery were found to not materially affect the results of the FS. As of the date of this report, the QP has not identified any risks, legal, political, or environmental, that would materially affect potential development of the Mineral Reserves.

Table 25.1: Mineral Reserve Estimate

Category	Tonnage (Mt)	NSR ($)	Li_2O_eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Probable	26.3	165	0.92	0.87	138
Total	26.3	165	0.92	0.87	138

Notes:

- The Independent and Qualified Person for the Mineral Reserve Estimate, as defined by NI 43 101, is Simon Boudreau, P.Eng, of InnovExplo Inc.
- The effective date of the Mineral Reserves estimate is May 27, 2022.
- The reserve estimate is based on the current resource estimate with the exception of a constant recovery of 85% Li2O. Metal prices are set at US$20,000/t Li2O and US$130$/kg Ta2O5 using an exchange rate of 1.3 CAN$:US$. Metallurgical recoveries set constant at 85% for Li2O and 64% for Ta2O5. The cut-off NSR value of CAN$36.92/t.
- The model includes 17 mineralized zones.
- Calculations used metric units (metres, tonnes and ppm).
- The number of metric tons was rounded to the nearest thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.
- InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing or other relevant issue that could materially affect the Mineral Reserve Estimate.

25.4 Mining Methods

The Rose deposit is made of stacked mineralized lenses oriented N296° with an average dip of 15° to the northeast (varying locally between 5° and 25°). The orebody is relatively flat and close to the surface, so the FS is based entirely on an open pit operation.

A conventional truck and shovel mining method is proposed to mine 219.6 Mt of material over the mine life, comprising 26.3 Mt of ore, 182.4 Mt of waste and 10.9 Mt of overburden, for an average stripping ratio of 7.35:1. This FS is based on a milling capacity of 4,600 tonnes of ore per day (tpd) and 350 operating days. To achieve these milling production targets, the yearly mining production rate will vary accordingly between 12 and 16 Mt of rock material. All overburden material will be mined by a contractor. The open pit mining schedule resulted in a LOM of approximately 19 years, starting with 19 months of pre-production, just over 16 years of production, and ending with 5 months of stockpile processing. The mine plan includes four different phases to delay overburden removal, to keep the ore extraction rate relatively constant, and to improve mill feed grade in the first years of the Project.

25.4.1 Geotechnical Considerations

The pit design for the Project is based on single benching with 10-m bench heights. This bench height was selected based on the loading and hauling equipment that would best suit the mining operation. The geotechnical report recommends an inter-ramp angle of 57° and an overall pit slope angle of 55°.

25.4.2 Final Pit Design

The final pit design is based on the selected optimized pit shell and geotechnical parameters. The pit design includes haulage ramp access to all benches, except for the final bench which will be excavated via a temporary ramp.

25.4.3 Mining Phase Design

Based on the Whittle pit shell optimizations, three nesting intermediate pit shells were used as guidelines to design the mining phases. By subdividing the ultimate pit into these four separate phases, the ore mining rate is kept relatively constant. The selection of these mining phases results in a low production rate for the pre-production period and improves the mill feed grade in the first years of the Project.

25.4.4 Mine Production Schedule

The life-of-mine plan (LOM) for the Project is based on an ore processing rate of 1,610,000 t per calendar year. The LOM plan was prepared to supply the required ore quantities to the mill while reducing the overall quantities of material to be mined, and to send higher grade ore to the mill in the first years of operation.

25.4.5 Waste Rock, Overburden, and Tailings Management

Two stockpiles have been designed to store mining waste. One large waste rock stockpile is located directly to the west of the pit and near the main ramp exit, and one overburden stockpile is located south of the pit.

The waste rock pile will be constructed in two phases. A co-deposition strategy will be used to store dry tailings from the mill and mined waste rock on the same pile.

25.4.6 Mining Equipment

Based on the production targets and operational constraints, the loading fleet comprise a 7.4 m^3 backhoe excavator for ore handling, a 15 m^3 electric hydraulic front shovel for waste rock handling, and a 13.8 m^3 production wheel loader for operational flexibility.

The ore mined from the pit will be hauled by a maximum of eight ±65t payload trucks while, while waste mining, dry tailings transport and reclaimed ore will be hauled by a maximum of seven ±135 t payload trucks.

Most production drilling will occur in waste rock.. Two high-capacity rotary diesel blasthole drills are dedicated to drilling waste panels, whereas drilling in ore panels will be performed by a down-the-hole drill rig. The down-the-hole drill is also suited to perform pre-splitting of the final walls.

During the pre-production period, this drill will also perform all drilling in waste panels.

25.4.7 Manpower

A total of 204 employees will be needed at the peak of mining operations, not including contractors. This manpower requirement is based on an operation that runs 24 hours per day, 7 days per week, and 350 days per year.

As the site is remotely located, the working schedule for all employees will be a fly-in/fly-out rotation of 2 working weeks and 2 rest weeks, for 12 hours each day.

25.5 Environment

The Environmental Impact Study has considered Environmental and Social Baseline and the Project Description to evaluate the impacts. Consultations were held with the First Nations, and Critical Elements enjoys ongoing good relationships with its stakeholders. Critical Elements has submitted its Impact Study to both provincial and federal authorities, and received questions and comments as part of the Environmental Evaluation Processes. The Federal Minister of Environment and Climate Change and COMEX had rendered favorable decisions in respect of the proposed Rose Project. Once the provincial and federal administrators have issued Authorizations for Project Development, final permits will be sought from the MELCCFP, DFO, MERN, and all relevant other authorities.

25.6 Economics

Based on the study results, the conclusions are as follows:

- The overall economic results indicate that the Project will have positive economic returns and generate approximately \$5,147 million net after-tax cash flow (\$8,835 million pre-tax) over the Project's 17-year mine life.
- Total capital requirements for the Project have been estimated at approximately \$611 million prior to the commencement of concentrate production and approximately \$310 million required as sustaining capital over the remaining life of the Project. These are inclusive of contingency.
- Total Operating expenses over the life of the mine are estimated to be approximately \$2,776 million or \$105.59 per tonne milled or \$801 per tonne of Li_2O and Ta_2O_5 concentrates.
- At the base case metal prices, the Project's post-tax net present value is estimated at approximately \$2,851 million at a discount rate of 8%. The post-tax IRR is estimated at 65.7% and payback has been calculated at 1.8 years.

26 RECOMMENDATIONS

26.1 Geological Setting and Mineralization

The QP recommends that Critical Element considers additional drilling on the JR, Pivert, Pivert-East, Pivert South and Helico showings, and perhaps West-Ell, to determine their potential. Drilling a stratigraphic fence NE and SW of the Rose deposit should also be considered in order to potentially identify other mineralized structures associated with Rose. The portion between the Rose area and the JR area should be prioritized as the QP believes the potential to fill this area with new zones is high. Apart from immediately drilling the known mineralized pegmatites, a creek-sediment geochemical survey and a visual satellite photo reconnaissance program covering the entire property could be the first step in determining which portions of the property should be investigated more closely. Based on the results, systematic geological survey grids should be established and geochemistry rock samples collected.

- **Regional survey ($650,000):** Systematic grids should be ground prospected on the large and relatively unexplored Property. Using a 100-m grid, samples of every outcropping intrusion should be assayed in order to identify their fertility. Every pegmatite should be sampled regardless of any pre-defined grid. Creek sediments could also be collected and assayed. It is estimated that a total of 35 days with four prospectors would be needed.
- **Drilling on showings other than Rose ($750,000)**: The objective of drilling on showings other than Rose is to continue to investigate their potential extensions laterally and at depth. Positive results from drilling will potentially lead to a resource estimate on these showings. A total of 5,000 m in approximately 50 holes is recommended at this stage for the best targets.
- **Drilling new regional exploration targets on the Property ($360,000):** Drilling should be considered for any new mineralization recognized during the regional survey presented above. The number of metres will be determined by the number of targets, but the QP estimates approximately 1,500 m in ±15 holes for drilling the best targets in a first Phase.

26.2 Mineral Processing and Metallurgical Testing

The process flowsheet selected for spodumene recovery is robust based on the results of bench scale metallurgical tests and proven technology. Lithium recovery of 90% at a chemical grade of 5.5% Li_2O or a technical grade lithium concentrate of 6.0% Li_2O with a recovery of 87% could be produced at a head grade of 0.85% Li_2O.

Bumigeme Inc. considers that the Project is technically and economically feasible and recommends that the Project move forward to the next engineering phase.

To improve tantalite grade up to 20% Ta with decent Ta recovery, more bench scale test work is necessary in this direction.

Further, the Project could become more viable economically by producing mica, feldspar, and silica as by-products.

26.3 Mining Operations

Although InnovExplo considers this FS complete and based on sufficient information, some aspects require further studies. While such information is not expected to have a significant impact on the Project, it will be needed for the detailed engineering phase. The main issues that need further investigation are the following.

- Several risks identified in the geotechnical study, including the fact that analyses conducted by Mine Design Engineering Inc. consider only dry pit slope conditions. Once a hydrogeological model for the site is completed, the results should be sent to the firm for re-assessment. Moreover, joint persistence should be investigated more thoroughly when excavating the mine.

- The 30-metre perimeter used as an exclusion zone around Lake #3 and whether it is sufficient to avoid water infiltrating the pit. Hydrogeological and geotechnical studies will be required.
- The operational efficiency and geotechnical stability of the co-deposition strategy to store both dry tailings and mine waste rock.
- The mine dewatering needs once the hydrogeological model of the site is completed.
- The thickness of the overburden over the entire pit area and any adjustments to the mine design that would arise from such findings.

26.4 Project Infrastructure

- The following actions and studies are recommended prior to or during the surface infrastructure detailed engineering mandate.
  - Reconfirm electricity supply contract and 315 kV line relocation contract with Hydro-Québec.
  - Supplemental geotechnical site investigation of collection ditches and ponds areas to characterize the foundation conditions.
  - Evaluate the water management infrastructures construction staging based on the site development schedule.
  - Conduct a specific investigation program to determine the nature and the properties to assess the volume of lakes 1 and 2 sediments.

26.5 Environment

- Continue the various steps involved in obtaining ministerial authorizations for construction and other permits.
- Continue discussions throughout the Project and aligning the different phases of the Project with the Aboriginal communities to understand their concerns and consider their comments in the Project.

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27.8 Environment

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— Hydro-Québec – TransÉnergie. 2004. Ligne biterne à 315 kV Eastmain-1 – Némiscau, poste de l'Eastmain-1 au poste de la Némiscau; Évaluation environnementale. 143 p. and appendices.
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— WSP. 2017. Projet minier Rose lithium-tantale. Climatologie et hydrologie. Rapport produit pour Corporation Éléments Critiques. 59 p. et annexes.
— WSP. 2017. Projet minier Rose lithium-tantale. Faune terrestre et aviaire. Rapport produit pour Corporation Éléments Critiques. 54 p. et annexes.
— WSP. 2017. Projet minier Rose lithium-tantale. Qualité de l'eau de surface et des sédiments. Rapport produit pour Corporation Éléments Critiques. 29 p. et annexes.
— WSP. 2017. Projet minier Rose lithium-tantale. Poisson et son habitat. Rapport produit pour Corporation Éléments Critiques. 59 p. et annexes.
— WSP. 2017. Projet minier Rose lithium-tantale. Ambiance lumineuse. Rapport produit pour Corporation Éléments Critiques. 19 p. et annexes.
— WSP. 2017. Projet minier Rose lithium-tantale. Étude du paysage. Rapport produit pour Corporation Éléments Critiques. 21 p. et annexes.

— WSP. 2017. Projet minier Rose lithium-tantale. Évaluation environnementale de site – Phase I. Rapport produit pour Corporation Éléments Critiques. 21 p. et annexes.
— WSP. 2017. Projet minier Rose lithium-tantale. Végétation et milieux humides. Rapport produit pour Corporation Éléments Critiques. 26 p. et annexes.
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27.9 Capital and Operating Costs

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— Centre de services partagés du Québec, 2016. *Taux de location de machinerie lourde avec opérateur*, 132p.
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27.10 Adjacent Properties

— Quebec's Ministry of Forests, Wildlife and Parks (MERN) document distribution site GESTIM https://gestim.mines.gouv.qc.ca/ftp/intro.asp

INNOVEXPLO

CERTIFICATE OF QUALIFIED PERSON

CARL PELLETIER

I, Carl Pelletier, state that:

(a) I am a co-president founder at:
InnovExplo Inc
560 3rd Avenue
Val-d'Or, Québec J9P 1S4

(b) This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: August 29, 2023 (the "Technical Report").

(c) I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Université du Québec à Montréal with a bachelor's degree in geology in 1992. I am a member of the Ordre des Géologues du Quebec (OGQ, No. 384), the Association of Professional Geoscientists of Ontario (PGO, No. 1713), the Association of Professional Engineers and Geoscientists of British Columbia (EGBC, No. 43167) and the Northwest Territories Association of Professional Engineers and Geoscientists (NAPEG, No. L4160).My relevant experience includes a total of 31 years since my graduation from university. My mining expertise has been acquired at the Silidor, Sleeping Giant, Bousquet II, Sigma-Lamaque and Beaufor mines. My exploration experience has been acquired with Cambior Inc. and McWatters Mining Inc. I have been a consulting geologist for InnovExplo Inc. since February 2004 where I contributes to multiple mandates of mineral resources estimation. I have relevant experience in various types of mineral deposits ((precious metals (Au, Ag), base metals (CU, Zn, Ni), industrial and high technology (graphite, Li, Be, Ta, U, Sc and REE)) as well as for different types of operation (underground and open pit mines).

(d) I have not visited the property.

(e) I am responsible for Item(s) 6 to 12, 14 and 23 and co-responsible of items 1 to 3 and 24 to 27 of the Technical Report.

(f) I am independent of the issuer as described in section 1.5 of NI 43-101.

(g) My prior involvement with the property that is the subject of the Technical Report is as follows: January 24, 2011: Technical Report on the Pivert-Rose Property and September 7, 2011: 43-101 Technical Report, Resource Estimate on the Pivert-Rose Property and July 26, 2022 Rose Lithium-Tantalum project feasibility study NI 43-101 Technical Report

(h) I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.

(i) At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Val-d'Or, Québec this 11th of October 2023.

(Original signed and stamped)

Carl Pelletier, P.Geo. (OGQ, No. 384)

InnovExplo Inc.

CERTIFICATE OF QUALIFIED PERSON

SIMON BOUDREAU, P.Eng

I, Simon Boudreau, P.Eng, state that:

(a) I am a Consulting Mining Engineer at:
InnovExplo Inc.
560, 3e Avenue
Val d'Or, Quebec, J9P 1S4

(b) This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: August 29, 2023 (the "Technical Report").

(c) I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Laval University with Mining Engineering degree, in 2003, and I'm a member of Ordre des ingénieurs du Québec (No: 132 338). My relevant experience after graduation and over 20 years for the purpose of the Technical Report includes mine engineering and production at Troilus mine for four (4) years, HRG Taparko mine for four (4) years, Dumas Contracting for three (3) years. I have also worked as independent consultant for the mining industry for five (5) years and with InnovExplo for three (4) year. As consultant I have been involved in many base metals projects.

(d) My most recent personal inspection of each property described in the Technical Report occurred on May 31st, 2022, and was for a duration of 1 day.

(d) I am responsible for Items 15, 16, 21.1.7. 21.2.1 and responsible for contribution to 1 to 3 and 24 to 27 of the Technical Report.

(e) I am independent of the issuer as described in Section 1.5 of NI 43-101.

(a) My prior involvement with the property that is the subject of the Technical Report is as follows: July 26, 2022, Rose Lithium-Tantalum project feasibility study NI 43-101 Technical Report

(g) I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.

(h) At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Trois-Rivieres, Québec this 11th of October

2023. *(Original signed and sealed)*

Simon Boudreau, P.Eng (OIQ: 132 338)
InnovExplo Inc.

CERTIFICATE OF QUALIFIED PERSON
Florent Baril

I, Florent Baril, state that:

(a) I am a professional engineer and president of:

Bumigeme Inc.

750-615 Blvd René-Lévesque West

Montreal, Quebec, H3B 1P5

(b) This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: August 29, 2023 (the "Technical Report").

(c) I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I graduated from Laval university in Metallurgical Engineering in 1954. I'm a member of the Ordre des Ingénieurs du Quebec and the Canadian Institute of Mining (Life Member). My relevant experience after graduation in 1954 for the purpose of the Technical Report includes responsibility of several NI 43-101 Feasibility Study on similar projects.

(d) The requirement for a site visit is not applicable to me.

(e) I am responsible for Items 13, 17, 18.14, 21.1.10, 21.2.2 and have collaborated to Items 1, 2, 24, 25, 26 and 27 of the Technical Report.

(f) I am independent of the issuer as described in Section 1.5 of NI 43-101.

(g) My prior involvement with the property that is the subject of the Technical Report is as follows:
December 10, 2011: Preliminary Economic Assessment Technical Report.
November 29, 2017: Rose Lithium-Tantalum Project Feasibility Study NI 43-101 Technical report.
July 26, 2022, Rose Lithium-Tantalum project feasibility study NI 43-101 Technical Report

(h) I have read NI 43-101 and the part of the Technical Report for which I'm responsible has been prepared in compliance with NI 43-101.

(i) At the effective date of the Technical Report, to the best of my knowledge, information, and belief of the parts of the Technical Report for which I'm responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Montréal, Québec this 11th of October 2023.

(*Original document signed and stamped*)

Florent Baril, P. Eng. (OIQ, No. 6972)
Bumigeme Inc.

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CERTIFICATE OF QUALIFIED PERSON

Paul Gauthier P.Eng.

I, Paul Gauthier, P.Eng. state that:

(a) I am a Senior Mining Engineer at:
WSP Canada Inc.
1135 Boulevard Lebourgneuf
Quebec, QC, G2K 0M5

(b) This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: August 29, 2023 (the "Technical Report").

(c) I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Université Laval with a Bachelor of Science in Mining Engineering (B.Sc. 1977). I am a member in good standing of Ordre des Ingénieur du Québec (OIQ) Licence Number 31178 and the Association of Professional Engineers of Ontario (PEO), License Number 100080984. My relevant experience includes 46 years of experience in mine engineering and operations, including long-range and short-range mine planning and the managing of projects from concept through to start-up. I worked at Canadian and United States of America mines holding positions as a Engineering Supervisor, Chief Mine Engineer, Superintendent Technical Services and Projects Manager. I have completed scoping studies, prefeasibility studies, feasibility studies, project evaluations, due diligences, technical reviews and economic analyses for copper and nickel sulphide deposits, narrow vein gold deposits, Polymetallic deposits, and diamond deposits. I am a "Qualified Person" for the purposes of National Instrument 43-101 (the "Instrument").

(d) I did not visit the site.

(e) I am responsible for Item(s) Items 19, 21.1.1 to 21.1.6, 21.1.12 to 21.1.15, 21.2.3, 21.2.4 and portions of Items 1, 2, 3, 24, 25, 26 and 27 that are based on those Items for the Technical Report.

(f) I have no prior involvement with the Property that is the subject of the Technical Report.

(g) I have read NI 43-101 and the sections of The Technical Report for which I am responsible have been prepared in compliance with NI 43-101.

(h) At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections of The Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Quebec, Quebec this 11th of October 2023.

(Original document signed and stamped)

Paul Gauthier, P. Eng. (OIQ No. 31178)
WSP Canada Inc.

CERTIFICATE OF QUALIFIED PERSON

Eric Poirier

I, Eric Poirier, state that:

(a) I am a Project Manager at:
WSP Canada Inc
1075, 3rd Avenue East
Val-d'Or, Québec, Canada J9P 0J7

(b) This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: August 29, 2023 (the "Technical Report").

(c) I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Université du Québec à Chicoutimi with Electrical Engineering degree (B.Sc., 1996). I am a member in good standing of the Ordre des Ingénieurs du Québec (OIQ No. 120063), Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG No. L2229), and Professional Engineers Ontario (PEO No. 100112909). I hold the credential of Project Management Professional (PMP) from the Project Management Institute (PMI No. 6115196). My relevant experience after graduation and over 25 years for the purpose of the Technical Report includes working as multi-disciplinary project manager and discipline lead for surface infrastructure, buildings, water management, electrical distribution, automation, and communications projects.

(d) My most recent personal inspection of the property described in the Technical Report occurred on November 16, 2016, for a duration of two days.

(e) I am responsible for Items 5 (excluding 5.2 to 5.4), 18 (excluding 18.14), 20.3.1, 21.1, 21.2, 21.3, 21.6.3, 21.6.4 and portions of Items 1, 2, 3, 24, 25, 26 and 27 of the Technical Report.

(f) I am independent of the issuer as described in section 1.5 of NI 43-101.

(g) My prior involvement with the property that is the subject of the Technical Report is as follows:
November 29, 2017: Rose Lithium-Tantalum Project Feasibility Study NI 43-101 Technical report.
July 26, 2022, Rose Lithium-Tantalum project feasibility study NI 43-101 Technical Report

(h) I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.

(i) At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Val-d'Or, Québec this 11th of October 2023.

(Original document signed and stamped)

Éric Poirier, P.Eng., PMP (OIQ, No. 120063)
WSP Canada Inc.

CERTIFICATE OF QUALIFIED PERSON

OLIVIER JOYAL

I, Olivier Joyal, P.Geo., state that:

(a) I am an Executive Vice President, Environment, at:
WSP Canada Inc.
1600, René-Lévesque Blvd W
Montréal, Québec, H3H 1P9

(b) This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: August 29, 2023 (the "Technical Report").

(c) I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of graduate of the Université du Québec à Montréal (UQÀM). I am a member in good standing of Ordre des Géologues du Québec (OGQ No. 825). My relevant experience after graduation for the purpose of the Technical Report includes 15 years of experience in exploration and operations, including all Environmental aspects.

(d) The requirement for a site visit is not applicable to me.

(e) I am responsible for Items 4, 5.2 to 5.4, 20 (excluding 20.3.1) and portions of Items 1, 2, 3, 24, 25, 26 and 27 of the Technical Report.

(f) I am independent of the issuer as described in Section 1.5 of NI 43-101.

(g) My prior involvement with the property that is the subject of the Technical Report is as follows:
November 29, 2017: Rose Lithium-Tantalum Project Feasibility Study NI 43-101 Technical report
July 26, 2022, Rose Lithium-Tantalum project feasibility study NI 43-101 Technical Report

(h) I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.

(i) At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Montréal, Québec this 11th of October 2023.

(Original signed and stamped)

Olivier Joyal, P.Geo. (OGQ, No. 825)
WSP Canada Inc.

Appendices

Rose Project Mining Titles

ROSE LITHIUM-TANTALUM PROJECT MINING TITLES

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2188276	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188277	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188278	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188279	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188280	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188281	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188282	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188283	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188284	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188285	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188286	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188287	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2188288	Active	2009-09-14	2024-09-13	Corporation Lithium Éléments Critiques
2193368	Active	2009-11-04	2024-11-03	Corporation Lithium Éléments Critiques
2193369	Active	2009-11-04	2024-11-03	Corporation Lithium Éléments Critiques
2193370	Active	2009-11-04	2024-11-03	Corporation Lithium Éléments Critiques
2193605	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193606	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193607	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193608	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193609	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193610	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193611	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193612	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193613	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193614	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193615	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193616	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193617	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193618	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193619	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193620	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193621	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193622	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193623	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193624	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193625	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193626	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193627	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193628	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193629	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193630	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193631	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193632	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193633	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2193634	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193635	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193636	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193637	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193638	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193639	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193640	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193641	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193642	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193643	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193644	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193645	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193646	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193647	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193648	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193649	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193650	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193651	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193652	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193653	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193654	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193655	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193656	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
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2193658	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
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2193661	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193662	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193663	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193664	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193665	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193666	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193667	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193668	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193669	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193670	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193671	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193672	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
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2193676	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193677	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193678	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193679	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193680	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2193681	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193682	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2193683	Active	2009-11-05	2024-11-04	Corporation Lithium Éléments Critiques
2219125	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219126	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219127	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219128	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219129	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219130	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219131	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219132	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219133	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219134	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219135	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219136	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219137	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219138	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219139	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219140	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219141	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219142	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219143	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219144	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219145	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219146	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219147	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219148	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219149	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219150	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219151	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219152	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219153	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219154	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219155	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219156	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219157	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219158	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219159	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219160	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219161	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219162	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219163	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219164	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219165	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219166	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219167	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219168	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2219169	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219170	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219171	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219172	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219173	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219174	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219175	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219176	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219177	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219178	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219179	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219180	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219181	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219182	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219183	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219184	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219185	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219186	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219187	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219188	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219189	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219190	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219191	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219192	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219193	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219194	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219195	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219196	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219197	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219198	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219199	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219200	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219201	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219202	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219203	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219204	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219205	Active	2010-04-22	2025-04-21	Corporation Lithium Éléments Critiques
2219853	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219854	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219855	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219856	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219857	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219858	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219859	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219860	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219861	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219862	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2219863	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219864	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219865	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219866	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219867	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219868	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219869	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219870	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219871	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219872	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219873	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219874	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219875	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219876	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219877	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219878	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219879	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219880	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219881	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2219882	Active	2010-04-23	2025-04-22	Corporation Lithium Éléments Critiques
2221268	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221269	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221270	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221271	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221272	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221273	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221274	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221275	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221276	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221277	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221278	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221279	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221280	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221281	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221282	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221283	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221284	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221285	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221286	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221287	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221288	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221289	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221290	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221291	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221292	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221293	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221294	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2221295	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2221296	Active	2010-04-26	2025-04-25	Corporation Lithium Éléments Critiques
2234761	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234762	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234763	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234764	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234765	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234766	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234767	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234768	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234769	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2234770	Active	2010-05-20	2025-05-19	Corporation Lithium Éléments Critiques
2235670	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235671	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235672	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235673	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235674	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235675	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235676	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235677	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235678	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235679	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235680	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235681	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235682	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2235683	Active	2010-05-31	2025-05-30	Corporation Lithium Éléments Critiques
2236704	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236705	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236706	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236707	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236708	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236709	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236710	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236711	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236712	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236713	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2236714	Active	2010-06-04	2025-06-03	Corporation Lithium Éléments Critiques
2242441	Active	2010-07-27	2025-07-26	Corporation Lithium Éléments Critiques
2242442	Active	2010-07-27	2025-07-26	Corporation Lithium Éléments Critiques
2242443	Active	2010-07-27	2025-07-26	Corporation Lithium Éléments Critiques
2244690	Active	2010-08-05	2025-08-04	Corporation Lithium Éléments Critiques
2244691	Active	2010-08-05	2025-08-04	Corporation Lithium Éléments Critiques
2244692	Active	2010-08-05	2025-08-04	Corporation Lithium Éléments Critiques
2248769	Active	2010-09-03	2023-09-02	Corporation Lithium Éléments Critiques
2251858	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251859	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251860	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2251861	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251862	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251863	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251864	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251865	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251866	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251867	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251868	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251869	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251870	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2327176	Active	2011-12-06	2024-12-05	Corporation Lithium Éléments Critiques
2327177	Active	2011-12-06	2024-12-05	Corporation Lithium Éléments Critiques
2328997	Active	2011-12-19	2024-12-18	Corporation Lithium Éléments Critiques
2360910	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360911	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360912	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360913	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360914	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360915	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360916	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360917	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360918	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360919	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360920	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360921	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360922	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360923	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360924	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360925	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360926	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360927	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360928	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360929	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360930	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360931	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360932	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360933	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360934	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360935	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360936	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360937	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360938	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360939	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360940	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360941	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360942	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360943	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2360944	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360945	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360946	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360947	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360948	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360949	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360950	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360951	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2360952	Active	2012-08-17	2025-08-16	Corporation Lithium Éléments Critiques
2446457	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446458	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446459	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446460	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446461	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446462	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446463	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446464	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446465	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446466	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446467	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
2446468	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques
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2446938	Active	2016-06-02	2025-06-01	Corporation Lithium Éléments Critiques

END OF APPENDIX 4-A

Process Design Criteria

	PROCESS DESIGN CRITERIA C20204 FS update Rose Lithium Tantalum Project - Quebec Spodumene Plant	Bureau mines, geologie et metallurgie
CriticalElements Corporation		**Revision:** D **Date:** September 22, 2023
Prepared by: M.Chevalier	**Approved by:** F. Baril	**Doc No:** C20204-00-SPC-100

REF.	ITEM		UNITS	CRITERIA	COMMENTS / REFERENCE
2,0	**GENERAL PROCESSING DESIGN CRITERIA**				
2.0.1	**General Design Base**				
	Design production rate (dry)		t/y	1 610 000	
	Daily processing facility rate (nominal)		t/d	4411	
	Operating days per year		d/y	365	
	Operating days per week		d/w	7	
	Operating hours per day		h/d	24	
	Ore Ressources				
	Zone 108		%	10	Mine Plan 2017
	Zone 112		%	19	Mine Plan 2017
	Zone 115		%	54	Mine Plan 2017
2,1	**Project Geography and Weather**				
2.1.1	**Property Location**				
	Plant location		Pivert-Rose Property, James Bay Area		
	Site Elevation		m AMSL	275	WSP email from Eric Poirier 20-12-2016
	Average latitude (UTM)		m E	409 700	InnovExplo Tech Report, Jan 2011
	Average longitude (UTM)		m N	5 761 000	InnovExplo Tech Report, Jan 2011
2.1.2	**Climate at**			Pivert-Rose Property	
	Minimum design temperature		^oC	-45	Le planificater Acontresens - Météo et Climat à Nemiscau au Canada
	Maximum design temperature		^oC	37	
	Average relative humidity		%	60,0%	Assumed
2,2	**Ore Characteristics**				
2.2.1	**Design Ore Grade**				
	Lithium content		% Li_2O	0,87	Average Grade (11,7% Dilution) - Ore Reserves 2022
	Tantalum content		Ta g/t	138	
2.2.2	**Ore Specifications**				
	Design ore dry specific gravity			2,71	InnovExplo (Meeting at WSP, 26-10-2016)
	ROM porosity factor		%	12%	Estimated
	Apparent density		t/m^3	2,42	Calculation
	ROM swell factor		%	56%	Estimated
	Dry bulk density		t/m^3	1,55	
	Moisture in ore (assumed)		% w/w	3,0%	Andy
	Wet bulk density		t/m^3	1,60	Estimated
	Angle of repose		deg	37,0	Estimated
2.2.4	**Ore Physical competency specifications and indices**				
	Zone 115				
	Abrasion index (Ai)		g	0,454	HAZEN Research / SGS testworks
	Crusher work index (CWi)	(percentile 50%)	kWh/t	8,19	SGS testworks
	Crusher work index (CWi)	(percentile 95%)	kWh/t	15,60	SGS testworks
	Rod Mill Work Index (RWi)	(percentile 95%)	kWh/t	10,34	HAZEN Research / SGS testworks
	Ball mill work index (BWi)	(percentile 90%)	kWh/t	15,36	Acmemet / HAZEN Research / SGS testworks
	Ball mill work index (BWi)	(percentile 95%)	kWh/t	16,18	Acmemet / HAZEN Research / SGS testworks

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2,3	**Processing Criteria**			
2.3.1	**General Processing Facility Design Criteria**			
	Daily processing facility rate (nominal)	t/d	4411	
	Daily processing facility rate (nominal with availability)	t/d	4 900	
	Crusher circuit operating percentage	%	50,0%	Email: Dave Buckley, 12-12-2016
	Concentrator operating percentage	%	90,0%	Bumigeme recommendation
	Hourly processing facility rate (nominal with availability)	t/h	204	
	Hourly processing facility rate (design)	t/h	227	
2.3.2	**Equipment Sizing Criteria**			
	Crushing plant equipment design factor	%	22%	Bumigeme Recommendation
	Concentrator plant equipment design factor	%	11%	Bumigeme Recommendation
2.3.3	**Crushers Area Criteria (Area 6100)**			
	Crusher circuit average hrs operating per day	h/d	12,0	Email: Dave Buckley, 12-12-2016
	Nominal crushing circuit rate (dry)	t/h	408	
	Design circuit feed throughput (dry)	t/h	498	
	ROM top size	mm	1 000	estimated
	ROM truck capacity (minimum)	tonnes	65	InnovExplo
	ROM truck capacity (maximum)	tonnes	135	InnovExplo
	Grizzly opening (600x 600)	mm	600	Critical Element
	Crusher feed hopper capacity	tonnes	200	Calculation (135 * 1,5)
	Crusher feed hopper capacity	m^3	125	Calculation (200 / 1,63)
	Jaw crusher - Feed Bypass	%	33,5%	Crushing Simulation
	Jaw crusher - Bypass size	mm	150	Crushing Simulation - Sandvik
	Jaw crusher - Feed F_{100}	mm	600	Critical Element
	Jaw crusher - Feed F_{80}	mm	425	Critical Element
	Jaw crusher - Feed F_{50}	mm	200	Critical Element
	Jaw crusher discharge P_{80}	mm	150	Crushing Simulation - Sandvik
	Vibrating Screen 100-VIS-002 Flowrate Inlet	t/h	671,0	Crushing Simulation - Sandvik
	Vibrating screen (1st deck) to secondary cone crusher	%	41,4	Crushing Simulation - Sandvik
	Vibrating screen (2nd deck) to secondary cone crusher	%	20,0	Crushing Simulation - Sandvik
	Vibrating screen (3rd deck) to tertiary cone crusher	%	38,6	Crushing Simulation - Sandvik
	Vibrating screen (fines)	%	1	Crushing Simulation - Sandvik
	Secondary cone crusher - Feed F_{100}	mm	237	Crushing Simulation - Sandvik
	Secondary cone crusher - Feed F_{80}	mm	186	Crushing Simulation - Sandvik
	Secondary cone crusher Product P_{80}	mm	39	Crushing Simulation - Sandvik
	Tertiary cone crusher - Feed F_{100}	mm	60	Crushing Simulation - Sandvik
	Tertiary cone crusher - Feed F_{80}	mm	46	Crushing Simulation - Sandvik
	Crushing circuit- Product P_{80}	mm	13,0	Crushing Simulation - Sandvik
2.3.4	**Crushed ore stockpile (Area 6200)**			
	Number of stockpile		1	
	Design live capacity	day	1	Critical Element
	Stockpile capacity (design)	tonnes	4 900	Calculation
	Stockpile volume	m^3	2 844	Provided by BBA
	Stockpile diameter	m	48	Provided by BBA
	Covered or open		Covered	
	Heated or not heated		Not heated	
2.3.5	**Concentrator Area Criteria**			
	Hourly processing facility rate (nominal with availability)	t/h	204	
	Hourly processing facility rate (design)	t/h	227	

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.3.6	**Grinding Circuit Criteria (Area 6200)**			
	Grinding - Ball Mill Feed F_{80}	mm	13,0	
	Ball Mill Circulating load percent[1]	%	250%	To be confirmed during detailed engineering
	Portion of flow going to Mill Cyclones Cluster 1st Stage u/f	%	72%	
	Grinding circuit - Product P_{80}	µm	200-225	SGS Report 14120-003 / 005, 2016 / 2017
	Ball Mill Feed % w/w	%	72%	Estimated
	Ball Mill Discharge % w/w	%	66%	Estimated
	Mill Cyclone Clusters u/f % w/w	%	75%	Estimated
	Mill Cyclone feed pump box solids	%w/w	56%	Estimated
	Feed to magnetic separators	%w/w	36%	Estimated
2.3.7	**Tantalum Recovery Circuit Criteria (Area 6300)**			
	Magnetic separation feed F_{100}	µm	300	SGS Report 14120-003, November 2016
	Rougher magnetic separation mass pull	%	0,526%	Estimate
	Scavenger magnetic separation mass pull	%	0,350%	Estimate
	Total magnetic rejects weight recovery[1]	%	0,9%	Test Result F3-F4, SGS 14120-003, November 2016
	Tantalite concentrate specific gravity		3,72	SGS Report 14120-003, November 2016
	Tantalite concentrate bulk density	t/m^3	1,35	Estimated - to be confirmed by testwork.
	Rougher magnetic concentrate	%w/w	0,166%	Estimated
	Scavenger magnetic concentrate	%w/w	0,166%	Estimated
	Water to Slims	m^3/h	35	Andy
	Water to Rougher Magnetic Separator	m^3/h	500	Andy
	Water to Scavenger Magnetic Separator	m^3/h	500	Andy
	Cooling water to each Heat Exchanger	m^3/h	20	Andy
	% Solid in clarifyer underflow	%w/w	65%	
	Rougher magnetic separators intensity	Gauss	5 000	SGS Report 14120-008, November 2017
	Scavenger magnetic separators intensity	Gauss	14 400	SGS Report 14120-008, November 2017
	Total slurry in magnetics vibrating screen	%w/w	40%	Estimated
	Screen fines solid specific gravity		2,600	Estimated
	Screen fines	%w/w	25%	Estimated
	Regrind Mill Circulating load percent	%	125%	Estimated
	Regrind Mill P_{80}	µm	150	Estimated
	Screen oversizes	%w/w	85%	Estimated
	Slurry in regrind mill	%w/w	72%	Estimated
	Regrind mill recirculation	%w/w	55%	Estimated
	Slurry in magnetics silo	%w/w	50%	Estimated
	Slurry to Concentrator & Wilfley Table	%w/w	40%	Estimated
	% Concentrate in Slurry at Wilfley Table	%	1,0%	Estimated
	% Middlings in Slurry at Wilfley Table	%	4,0%	Estimated
	% Tailings in Slurry at Wilfley Table	%	95%	Estimated
	Wilfley table concentrate product specific gravity		4,50	Estimated
	Wilfley table middling product specific gravity		4,00	Estimated
	Wilfley table tailings specific gravity		2,60	Estimated
	Wilfley table concentrate product	%w/w	30%	Estimated
	Wilfley table middling product	%w/w	25%	Estimated
	Wilfley table tailings	%w/w	20%	Estimated
	Middling to filter mass flowrate	t/h	0,30	Estimated
	Concentrate to filter mass flowrate	t/h	0,39	Estimated
	Middling product	%w/w	85%	Estimated
	Wet concentrate	%w/w	85%	
	Dry concentrate	%w/w	99%	
	Desliming1 stage			
	Desliming 1 cyclone overflow[1]	%	5,5%	
	Desliming 1 cyclone overflow	%w/w	4,0%	
	Desliming 1 cyclone overflow solid specific gravity		2,689	

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.3.8	**Mica Flotation Circuit Criteria (Area 6400)**			
	Mica rougher concentrate weight recovery[1]	%	5,0%	Test Result F3-F4, SGS 14120-003, November 2016
	Mica cleaner concentrate weight recovery[1]	%	2,7%	LCT2, SGS Report 14120-001, April 2015
	Mica rougher concentrate specific gravity		2,770	Estimated
	Mica cleaner concentrate specific gravity		2,760	SGS Report 14120-003, November 2016
	Average lithium losses[1]	%	2,00	Pilot Test
	Rougher concentrate	%w/w	65,0%	
	Cleaner concentrate	%w/w	60,0%	
	Mica Conditioning Tank Dilution	%w/w	44,0%	
	Mica Flotation Dilution Tank	%w/w	35,0%	Estimate
	Mica rougher concentrate pumpbox	%w/w	38,0%	
	Tailings thickener feed pumpbox	%w/w	50,0%	
	Dewatering 1 stage			
	Mica tailings dewatering cyclone overflow	%	2,0%	Estimated
	Desliming 2 cyclone overflow[1]	%	2,90%	Test result F3-F4, SGS 14120-003, Nov 2016
	Dewatering Cyclone o/f solid specific gravity		2,524	
	Dewatering Cyclone u/f	%w/w	75%	
	Mica flotation residence time	min	6	Test Result F3-F4, F5-F6, F7-F8, SGS 14120-003, November 2016
2.3.9	**Spodumene Flotation Circuit Criteria (Area 6500)**			
	Attrition scrubbing percent solids	%	63%	
	Flotation - Feed F_{80}	µm	200-225	SGS Report 14120-003 / 005, 2016 / 2017
	Rougher concentrate weight recovery[1]	%	15,5%	Estimated for 0,87 based on SGS 14120-008, November 2017
	Rougher concentrate specific gravity		3,00	Estimated, TBC by SGS testwork
	Scavenger concentrate weight recovery[1]	%	1,0%	Estimated based on Test Result F1-F2, SGS 14120-003, November 2016
	Scavenger concentrate specific gravity		2,956	Estimated, TBC by SGS testwork
	Scavenger tailings specific gravity		2,634	Estimated, TBC by SGS testwork
	Spodumene flotation residence time	min	15	2016
	Dewatering 2 stage			
	First cleaner weight recovery[1]	%	12,3%	Assumed for design purpose
	First cleaner concentrate specific gravity		3,030	Estimated, TBC by SGS testwork
	First cleaner tailings specific gravity		2,984	Estimated
	Second cleaner weight recovery[1]	%	12,2%	Outotec simulation, 28/07/2017
	Desliming Cyclone No.2 feed	%w/w	55%	Estimated
	Desliming Cyclone No.2 feed o/f solid specific gravity		2,650	Estimated
	Desliming Cyclone No.2 feed o/f solid	%w/w	5%	Estimated
	Second cleaner concentrate specific gravity		3,13	SGS Report 14120-003, November 2016
	Second cleaner tailings specific gravity		2,992	Estimated
	Spodumene Rougher HD Conditioning tank	%w/w	58%	Estimated
	Spodumene Rougher Dilution tank	%w/w	37%	Estimated
	Spodumene Rougher Concentrate solid specific gravity		3,100	Estimated
	Spodumene Rougher Concentrate	%w/w	60%	Estimated
	Diluted rougher concentrate - 1st launder	%w/w	25%	Estimated
	Diluted rougher concentrate - 2nd launder	%w/w	25%	Estimated
	Spodumene scavenger Concentrate	%w/w	40%	Estimated
	Diluted Spodumene Scavenger Concentrate	%w/w	25%	Estimated
	Spodumene 1st cleaner feed pump no.1	%w/w	25%	Estimated
	Spodumene 1st cleaner feed pump no.2	%w/w	20%	Estimated
	First cleaner concentrate	%w/w	50%	Estimated
	Diluted First cleaner concentrate	%w/w	45%	Estimated
	Second cleaner feed	%w/w	25%	Estimated
	Second cleaner concentrate	%w/w	50%	Estimated
	Diluted second cleaner concentrate	%w/w	45%	Estimated
	Concentrate Head Grade (<0.85%) :		5%@82% Rec	
	Concentrate Head Grade (0.85%-1.0%) :		5%@87% Rec	Critical Element - Analysis - Performance Métallurgiques
	Concentrate Head Grade (1.0%-1.2%) :		6%@87% Rec	

CriticalElements Corporation	**PROCESS DESIGN CRITERIA** **C20204** **FS update** **Rose Lithium Tantalum Project - Quebec** **Spodumene Plant**	BUMIGEME Bureau mines, geologie et metallurgie **Revision:** D **Date:** September 22, 2023 **Doc No:** C20204-00-SPC-100
Prepared by: M.Chevalier	**Approved by:** F. Baril	

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.3.10	**Final Tailings Dewatering Circuit Criteria (Area 6600)**			
	Tailings - P_{80}	µm	218	SGS Report 14120-003, November 2016
	Tailings specific gravity		2,65	SGS Report 14120-003, November 2016
	Tailings thickener underflow solids	%w/w	60%	SGS Report No. CALR-14120-003, March 2017
	Tailings in holding tank	%w/w	56%	
	Tailings belt filter cake moisture	%	15-18%	SGS Report 14120-005, 2017
	Belt filter filtrate	%	0,01%	Estimated
	Tailings for dry stacking	%w/w	85%	SGS Report 14120-005, 2017 (82-85%)
	Tailings filtrate solid specific gravity		2,665	Estimated
	Thickener Recirculation	%w/w	0%	
	Tailings storage (Area 6600)			
	Number of stockpiles		1	
	Stockpile capacity	tonnes	2 310	Provided by BBA
	Storage volume	m^3	1 090	Provided by BBA
	Covered or open		Covered	
	Heated or not heated		Not heated	
2.3.11	**Spodumene Concentrate Dewatering Circuit Criteria (Area 6610)**			
	Spodumene concentrate - P_{80}	µm	200	SGS Report 14120-003, November 2016
	Spodumene concentrate specific gravity		3,130	SGS Report 14120-003, November 2016
	Spodumene concentrate thickener underflow solids	%w/w	65%	SGS Report No. CALR-14120-003, March 2017
	Spodumene concentrate Press Filter cake moisture	%w/w	5%	Andy
	Press filter filtrate	%	0,01%	Estimated
	Thickener Feed	%w/w	13,0%	Estimated
	Thickener Recirculation	%w/w	0%	
2.3.12	**Tantalum Concentrate Dewatering Circuit Criteria (Area 6300)**			
	Tantalum concentrate filter cake moisture	%w/w	15%	Estimated
	Pan filter filtrate	%	0,01%	Estimated
2.3.13	**Tantalite Concentrate Dryer (Area 6300)**			
	Dryer feed percent solids	%w/w	85%	
	Dried concentrate percent solids	%w/w	99%	
2.3.16	**Spodumene Product Silo (Outside plant)**			
	Stockpile capacity	tonnes	1 210	
	Storage volume	m^3	712	

Critical Elements Corporation	PROCESS DESIGN CRITERIA C20204 FS update Rose Lithium Tantalum Project - Quebec Spodumene Plant	BUMIGEME Bureau mines, geologie et metallurgie
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REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2,4	**Utility Specifications (Area 6800)**			
2.4.1	**Water Requirements**			
	Raw (fresh) water source	Wells and/or water treatment plant		
	Average daily fresh water required	m^3/d	600	Calculated
	Fresh/Process water specific gravity		1,00	
	Fresh/Process water solids density	% w/w	0%	
	Process water recycling rate	%	102%	Calculated
	Utility station flowrate - Nominal	m^3/h	5	
	Utility station flowrate - Design	m^3/h	20	
	Quantity of utility stations in operation simultaneously		3	
2.4.2	**Air Requirements**			
	High pressure air pressure	Bar	6,9	
	High pressure air volume	Am^3/h	137	
	Low pressure air pressure	Bar	0,3	
	Low pressure air volume	Am^3/h	10 194	
	Nominal Flowrate to one utility station	Nm^3/h	170	
	Design Flowrate to one utility station	Nm^3/h	200	
	Quantity of utility stations in operation simultaneously		3	
	Flotation Air			
	Mica Rougher Flotation Machines	acfm	1 250	Westpro - FL500DO-3+2
	Mica Cleaner Flotation Machines	acfm	160	Westpro - FL100-2
	Spodumene Rougher-Scavenger Flotation Machine	acfm	2 750	Westpro - FL500-3+4+4
	Spodumene 1st, 2nd Cleaner Flotation Machines	acfm	880	Westpro - FL100-6+5
	Blowers pressure	psig	4	Westpro
2.4.3	**Electrical Requirements**			
	Power source		Hydro Quebec	
	Medium voltage	V	4 160	
	Low voltage	V	600	
	Phase	ph	3	
	Frequency	Hz	60	
2.4.4	**Reagent**			
	Aero 3030-C promoter	g/t	75	Test Result F3-F4, SGS 14120-003, November 2016
	Soda Ash	g/t	575	Pilot Test - 2017
	Fatty acid	g/t	713	Test Result F3-F4, SGS 14120-003, November 2016
	Sodium lignosulfonate	g/t	250	Pilot Test - 2017
	Sodium hydroxyde	g/t	300	Test Result F3-F4, SGS 14120-003, November 2016
	Grinding media	g/t	610	Test Result F3-F4, SGS 14120-003, November 2016
	Aero 3030-C promoter density	t/m3	1,03	Univar Solution
	Soda Ash density	t/m3	1,07	Univar Solution
	Fatty acid specific density	t/m3	0,89	Univar Solution
	Sodium lignosulfonate density	t/m3	0,56	Univar Solution
	Sodium hydroxyde 50% density	t/m3	1,53	Univar Solution
	Flocculant density		0,80	SNF Canada
	Aero 3030-C & frother solution strength	%	100%	
	Soda Ash solution strength	%	15%	
	Fatty acid solution strength	%	100%	
	Sodium lignosulfonate solution strength	%	10%	
	Sodium hydroxyde 50% solution strength	%	15%	
	Flocculant solution strength (1st dilution)	%	0,50%	
	Flocculant solution strength (2nd dilution)	%	0,05%	

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REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
	Soda ash to mica flotation conditioning tank	%	63%	Test Result F3-F4, SGS 14120-003, November 2016
	Soda ash to spod. rougher HD conditioning tk	%	31%	Test Result F3-F4, SGS 14120-003, November 2016
	Soda ash to spodumene cleaner 1	%	3%	Test Result F3-F4, SGS 14120-003, November 2016
	Soda ash to spodumene cleaner 2	%	3%	Test Result F3-F4, SGS 14120-003, November 2016
	Fatty acid to spod. scav. HD cond. Tk	%	39%	Test Result F3-F4, SGS 14120-003, November 2016
	Fatty acid to spod. rougher HD Cond. Tank	%	59%	Test Result F3-F4, SGS 14120-003, November 2016
	Fatty acid to spod. Cleaner 1	%	2%	Test Result F3-F4, SGS 14120-003, November 2016
	SLGN to attrition scrubber	%	38,5%	Test Result F3-F4, SGS 14120-003, November 2016
	SLGN to spodumene Cleaner 1	%	15%	Test Result F3-F4, SGS 14120-003, November 2016
	SLGN to spodumene Cleaner 2	%	7,7%	Test Result F3-F4, SGS 14120-003, November 2016
	SLGN to spod. rougher HD conditioning tk	%	38,5%	Test Result F3-F4, SGS 14120-003, November 2016
	Flocculant tailings thickener	g/t	30	Test Result F3-F4, SGS 14120-003, November 2016
	Flocculant spodumene thickener	g/t	7	Test Result F3-F4, SGS 14120-003, November 2016
	Soda ash unloading duration	hr	2	hypothesis
	Soda ash transfer to mixing tank duration	min	15	hypothesis
	Soda ash transfer to holding tank duration	min	15	hypothesis
	Fatty acid unloading duration	hr	2	hypothesis
	SLGN transfer to mixing tank duration	min	15	hypothesis
	SLGN transfer to holding tank duration	min	15	hypothesis
	NaOH unloading duration	hr	2	hypothesis
	NaOH transfer to holding tank duration	min	15	hypothesis
	Flocculant transfer to mixing tank duration	min	15	hypothesis
	Flocculant transfer to holding tank duration	min	15	hypothesis
	Dilution water - Soda ash	min	60	hypothesis
	Dilution water - SLGN	min	60	hypothesis
	Dilution water - NaOH	min	60	hypothesis
	Dilution water - Flocculant	min	60	hypothesis
	Reagents dilution water use in normal conditions	%	50%	Estimate

1 **Based on fresh feed**

Critical Elements Corporation

MASS BALANCE - NOMINAL
FS update
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

BUMIGEME Bureau mines, géologie et métallurgie

Revision: C

PREPARED BY	APPROVED BY	Date: July 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

Stream	Name	h/d	Solids t/d	Solids t/h	Solids m³/h	Solids SG	Water m^3/d	Water t/h	Water m³/h	Water SG	Slurry Total t/h	Slurry Total m³/h	Slurry Total % w/w	Slurry Total SG
	CRUSHING													
	Vibrating Grizzly Feeder													
101	Apron Feeder feed	12	**4900**	**408**	151	**2,71**	152	13	13	1	421	163	97%	2,58
	Vibrating feeder feed	12	4900	408	151	2,71	152	13	13	1	421	163	97%	2,58
103	Jaw crusher feed	12	3259	271,5	100	2,71	101	8	8	1	280	109	97%	2,58
104	Jaw crusher by-pass	12	**1642**	136,8	50	2,71	51	4	4	1	141	55	97%	2,58
	Jaw crusher product	12	**3259**	271,5	100	2,71	101	8	8	1	280	109	97%	2,58
	Vibrating Screens													
107	Vibrating Screen 100-VIS-001 Feed	12	**11500**	958	354	2,71	356	30	30	1	988	383	97%	2,58
	Vibrating Screen 100-VIS-002 Feed	12	**6600**	550	203	2,71	204	17	17	1	567	220	97%	2,58
							0							
	Screen deck #1 (to secondary cone crusher)	12	**2732**	228	84	2,71	85	7	7	1	235	91	97%	2,58
	Screen deck #2 (to secondary cone crusher)	12	**1318**	110	41	2,71	41	3	3	1	113	44	97%	2,58
	Screen deck #3 (to tertiary cone crusher)	12	**2548**	212	78	2,71	79	7	7	1	219	85	97%	2,58
	Secondary Crusher													
	Secondary crusher feed	12	4050	338	125	2,71	125	10	10	1	348	135	97%	2,58
105	Secondary crusher product	12	4050	338	125	2,71	125	10	10	1	348	135	97%	2,58
	Tertiary Crusher													
	Tertiary crusher feed	12	2548	212	78	2,71	79	7	7	1	219	85	97%	2,58
106	Tertiary crusher product	12	2548	212	78	2,71	79	7	7	1	219	85	97%	2,58
	Crushed Ore Stockpile													
	Vibrating Screen undersize	12	4900	408	151	2,71	152	13	13	1	421	163	97%	2,58
108	Crushed ore Stockpile	12	4900	408	151	2,71	152	13	13	1	421	163	97%	2,58
	GRINDING													
	Ball Mill													
201	Fresh feed from stockpile	24	4900	204	75	2,71	152	6,3	6,3	1	210	82	97%	2,58
202	Mill Cyclone Cluster underflow	24	**12250**	510	186	**2,74**	4083	170	170	1	681	357	**75%**	1,91
804	Ball mill feed water	24	0	0	0	0	2435	101	101	1	101	101	0%	1,00
	Total Ball mill feed	24	17150	715	262	**2,73**	6669	278	278	1	992	540	**72%**	1,84
805	Ball mill trommel water	24	0	0	0	0	2284	95	95	1	95	95	0%	1,00
	Ball mill discharge	24	17150	715	262	2,73	8954	373	373	1	1088	635	**66%**	1,71
	Ball Mill Cyclone	**24**												
806	Mill Cyclone feed dilution water	24	0	0	0	0	4521	188	188	1	188	188	0%	1,00
203	Mill Cyclone feed	24	17150	715	262	2,7	13475	561	561	1	1 276	823	**56%**	1,55
205	Mill Cyclone Cluster overflow	24	4900	204	75	2,7	9392	391	391	1	595	466	34%	1,28
	MAGNETIC SEPARATION - TANTALITE													
808	Rougher Magnetic Separator Pump Box water	24	0	0	0	0	0	0	0	1	0	0,0	0%	1,00
208	Feed to rougher magnetic separation	24	4900	204	75	2,73	9392	391	391	1	595	466	34%	1,28
	WATER TO SLIMS AND ROUGHER SEPARATOR	24	0	0	0	0	12840	535	535	1	535	535,0	0%	1,00
	TOTAL FEED TO ROUGHER SEPARATOR	24	4900	204	75	2,73	22232	926	926	1	1130	1001	18%	1,13
301	Rougher magnetic concentrate	24	**26**	1	0,29	3,72	15501	645,9	645,9	1	646,9	646,2	**0,2%**	1,00
	FRESH WATER (CWR from rougher)	24	0	0	0	0	480	20	20	1	20,0	20,0	0%	1,00
302	Rougher non-magnetics	24	4874	203	75	2,72	7211	300	300	1	504	375	40%	1,34
	WATER TO SCAVENGER SEPARATOR	24	0	0	0	0	12000	500	500	1	500	500,0	0%	1,00
303	Scavenger magnetic concentrate	24	**17**	0,7	0,2	**3,72**	10314	429,8	429,8	1	430,5	429,9	**0,2%**	1,00
304	Combined magnetic concentrate to clarifyer	24	43	1,8	0,5	**3,72**	25815	1075,6	1075,6	1	1077,4	1076,1	0,2%	1,00
305	Non-magnetics to desliming cyclone pump box	24	4857	202	74	2,72	8897	371	371	1	573	445	35%	1,29
	FRESH WATER (CWR from scavenger)	24	0	0	0	0	480	20	20	1	20,0	20,0	0%	1,00
306	Desliming cyclone feed	24	4857	202,4	74	2,72	9377	391	391	1	593,1	465,0	34%	1,28
307	Desliming I cyclone overflow	24	**267**	11	4	**2,69**	6411	267	267	1	278,3	271,3	**4%**	1,03
308	Desliming I cyclone underflow to Mica flotation	24	4590	191	70	2,72	2965	124	124	1	314,8	193,9	61%	1,62
	CLARIFYER OVERFLOW WATER	24	0	0	0	0	25815	1075	1075	1	1077	1076	0%	1,00
	SLURRY FROM CLARIFYER TO VIBRATING SCREEN	24	43	1,8	0,5	3,72	23	1	1	1	2,8	1,4	65%	1,91
811	Water to Screen (2 connections)	24	0	0	0	0	77,9	3,2	3,2	1	3,2	3,2	0%	1,00
-	Slurry in screen	24	97	4	1	3,72	145	6,0	6,0	1	10,1	7,1	**40%**	1,41
309	Screen Fines to Magnetics Silo	24	43	1,8	0	**2,60**	129	5,4	5,4	1	7,2	5,8	**25%**	1,22
310	Screen Oversize	24	**54**	2	1	3,72	9	0,4	0,4	1	2,6	1,0	**85%**	2,64
812	Water to Regrind	24	0	0	0	0,00	11	0,5	0,5	1	0,5	0,5	0%	1,00
-	Slurry in regrind mill	24	54	2	1	3,72	21	0,9	0,9	1	3,1	1,5	**72%**	2,11
814	Water to Trommel	24	0	0	0	0,00	23	1,0	1,0	1	1,0	1,0	0%	1,00
311	Regrind Recirc.	24	54	2	1	3,72	44	1,8	1,8	1	4,1	2,4	**55%**	1,67
-	Slurry in Magnetics Silo	24	43	2	0	2,60	43	1,8	1,8	1	3,6	2,3	**50%**	1,58

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M. CHEVALIER		F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m^3/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
	Water through O/F	24	0	0	0	0,00	86	3,6	3,6	1	3,6	3,6	0%	1,00

	MASS BALANCE - NOMINAL **FS update** **ROSE LITHIUM TANTALUM PROJECT - QUEBEC**	Revision: C
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			Solids				Water				Slurry Total			
Stream	**Name**	**h/d**	**t/d**	**t/h**	**m^3/h**	**SG**	**m^3/d**	**t/h**	**m^3/h**	**SG**	**t/h**	**m^3/h**	**% w/w**	**SG**
813	Water to Magnetics Silo	24	0	0	0	0,00	21	0,9	0,9	1	0,9	0,9	0%	1,00
-	Slurry to Concentrator/Wilfley	24	43	2	0	3,72	64	2,7	2,7	1	4,5	3,2	**40%**	1,41
856	Water to Wilfley Table & Knelson	24	0	0	0	0,00	105	4,4	4,4	1	4,4	4,4	0%	1,00
312	Wilfley Concentrate	24	**0**	0	0	**4,50**	1,0	0,04	0,04	1	0,1	0,0	**30%**	1,30
313	Wilfley Middling	24	**2**	0	0	**4,00**	5,2	0,2	0,2	1	0,3	0,2	**25%**	1,23
314	Wilfley Tailings	24	**41**	2	1	**2,60**	163	6,8	6,8	1	8,5	7,4	**20%**	1,14
-	Total out of Wilfley Table	24	43	1,8	0,7	*2,68*	169	7,1	7,1	1	8,8	7,7	*20%*	1,14
315	Tailings To tailings thickener	24	41	1,7	0,7	2,60	249	10	10	1	12,1	11,0	*14%*	1,09
845	Water to concentrate Silo	24	0	0	0	0	0	0	0	1	0	0,0	0%	1,00
855	Water to Middling Silo	24	0	0	0	0	-	-	-	1	0	0,0	0%	1,00
316	Middling to Filter	24	1,8	**0,30**	0,08	4,00	22	0,9	0,9	1	1,2	1,0	25%	1,23
317	Concentrate to Filter	24	2,1	**0,39**	0,09	4,50	22	0,9	0,9	1	1,3	1,0	30%	1,30
318	Middling Product	24	1,8	0,30	0,08	4,00	1,3	0,1	0,1	1	0,4	0,1	**85%**	2,76
319	Wet Concentrate	24	2,1	0,39	0,09	4,50	1,7	0,1	0,1	1	0,5	0,2	**85%**	2,95
320	Filtrate - Middling	24	0	0	0	0	20	0,8	0,8	1	0,8	0,8	0%	1,00
320	Filtrate - Concentrate	24	0	0	0	0	20	0,8	0,8	1	0,8	0,8	0%	1,00
321	Dry Concentrate	24	2,1	0,4	0,1	4,50	0,09	0,004	0,004	1	0,39	0,09	**99%**	4,35
-	Evaporation	24	0	0	0	0	1,6	0,06	0,06	1	0,06	0,06	0%	1,00
	MICA FLOTATION													
	Feed to conditioning tank	24	4590	191	70	2,72	2965	124	124	1,0	315	194	61%	1,62
815	Conditioning tank dilution water	24	0	0	0	0	2876	120	120	1	120	120	0%	1,00
401	Conditionning tank feed	24	4590	191	70	2,72	5842	243	243	1	435	314	**44%**	1,39
	Rougher Flotation													
816	Rougher feed dilution tank water	24	0	0	0	0	2682	112	112	1	112	112	0%	1,00
402	Rougher feed	24	4590	191	70	2,72	8524	355	355	1	546	425	**35%**	1,28
403	Rougher tails	24	4346	181	67	2,72	8393	350	350	1	531	416	34%	1,27
	Rougher concentrate	24	**244**	10	4	**2,77**	131	5	5	1	16	9	**65%**	1,71
818	Mica concentrate launder water	24	0	0	0	0	267	11	11	1	11	11	0%	1,00
404	Mica rougher concentrate	24	244	10	4	2,77	398	17	17	1	27	20	**38%**	1,32
	Cleaner Flotation													
817	Mica cleaner feed pump dilution water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
	Cleaner feed	24	244	10	4	2,77	398	17	17	1	27	20	38%	1,32
405	Cleaner tails	24	112	5	1,7	2,78	310	13	13	1	18	15	26%	1,20
	Cleaner concentrate	24	**132**	5,5	2,0	**2,76**	88	4	4	1	9	6	**60%**	1,62
820	Cleaner concentrate launder water	24	0	0	0	0	44	1,8	1,8	1	2	2	0%	1,00
821	Tailings thickener feed pump box water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
406	Cleaner concentrate	24	132	5,5	2	2,76	132	5,5	6	1	11	8	**50%**	1,47
	SPODUMENE FLOTATION													
	Dewatering -1 Cyclones													
819	Dewatering cyclones no.1 feed pump box water	24	0	0	0	0	-	-	-	1	0	0,0	0%	1,00
407	Cyclone feed	24	4458	186	68	2,72	8703	363	363	1	548	431	34%	1,27
408	Cyclone overflow	24	**89**	4	1	**2,52**	7246	302	302	1	306	303	1,2%	1,01
409	Cyclone underflow	24	4368	182	67	2,72	1456	61	61	1	243	128	**75%**	1,90
890	Attrition water addition	24	0	0	0	0	1109	46	46	1	46	46	0%	1,00
	Attrition scubber feed	24	4368	182	67	2,72	2566	107	107	1	289	174	**63%**	1,66
	Desliming II cyclones													
822	Cyclone feed pump box water	24	0	0	0	0	1009	42	42	1	42	42	0%	1,00
502	Cyclone feed	24	4368	182	67	2,7	3574	149	149	1	331	216	**55%**	1,53
503	Cyclone overflow	24	**142**	6	2	**2,65**	2700	112	112	1	118	115	**5%**	1,03
504	Cyclone underflow	24	4226	176	65	2,73	874	36	36	1	213	101	83%	2,10
823	Spodumene Rougher Conditioning tank water	24	0	0	0	0	2186	91	91	1	91	91	0%	1,00
505	HD conditioning tank discharge	24	4226	176	65	2,73	3060	128	128	1	304	192	**58%**	1,58
824	Spodumene Rougher Dilution tank water	24	0	0	0	0	4136	172	172	1	172	172	0%	1,00
520	Dilution Tank discharge	24	4226	176	65	2,73	7196	300	300	1	476	364	**37%**	1,31
	Spodumene Rougher Flotation													
514	Spodumene first cleaner tails	24	204	9	3	2,98	3036	126	126	1	135	129	6%	1,05
	Rougher feed	24	4431	185	67	2,74	10232	426	426	1	611	494	30%	1,24
827	Spodumene scavenger conditioning feed box water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
506	Rougher tails	24	3671	153	57	2,66	9726	405	405	1	558	463	27%	1,21
	Rougher total concentrate	24	**760**	32	10	**3,10**	506	21	21	1	53	31	**60%**	1,68
	Rougher concentrate	24	**760**	32	10	3,10	506	21	21	1	53	31	60%	1,68
825	Rougher concentrate water	24	0	0	0	0	1772	74	74	1	74	74	0%	1,00
507	Diluted rougher concentrate	24	760	32	10	3,10	2279	95	95	1	127	105	**25%**	1,20
828	Spod. Scavenger Conditioning tank water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
510	Spod. Scavener Conditioning tank discharge	24	3671	153	57	2,66	9726	405	405	1	558	463	27%	1,21
	Spodumene Scavenger Flotation													
510	Scavenger feed	24	3671	153	57	2,66	9726	405	405	1	558	463	27%	1,21
836	Scavenger tailings pump box dilution water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
511	Scavenger tails	24	3622	151	57	**2,63**	9652	402	402	1	553	459	27%	1,21
	Scavenger Concentrate	24	**49**	2,0	0,7	**2,96**	74	3	3	1	5	4	**40%**	1,36
834	Scavenger concentrate launder water	24	0	0	0	0	74	3	3	1	3	3	0%	1,00
835	Spodumene scavenger conc. Pump dilution water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00

MASS BALANCE - NOMINAL
FS update
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

Revision: C

PREPARED BY		APPROVED BY	Date: July 13 2023
M. CHEVALIER		F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m^3/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
512	Scavenger Concentrate	24	49	2,0	0,7	2,96	147	6	6	1	8	7	**25%**	1,20

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M. CHEVALIER		F. BARIL	DOC No.: C20204-00-SPC-101

Stream	Name	h/d	Solids t/d	Solids t/h	Solids m³/h	Solids SG	Water m³/d	Water t/h	Water m³/h	Water SG	Slurry Total t/h	Slurry Total m³/h	Slurry Total % w/w	Slurry Total SG
	Spodumene 1st cleaner feed pump													
507	Spodumene rougher concentrate to pump box no.1	24	760	32	10	3,10	2279	95	95	1	127	105	25%	1,20
826	First cleaner feed pump box water no.1	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
	Spodumene first cleaner flotation													
512	Scavenger Concentrate	24	49	2	1	2,96	147	6	6	1	8	7	25%	1,20
513	From rougher concentrate + water	24	760	32	10	3,10	2279	95	95	1	127	105	**25%**	1,20
	First cleaner total feed	24	809	34	11	3,09	2426	101	101	1	135	112	25%	1,20
830	Cleaner tailings pump box water	24	0	0	0	0,00	0	0	0	1	0	0	0%	1,00
514	First cleaner tails	24	204	9	3	**2,98**	3036	126	126	1	135	129	6%	1,05
	First cleaner concentrate	24	**604**	25	8	**3,03**	604	25	25	1	50	33	**50%**	1,50
829	First cleaner concentrate launder water	24	0	0	0	0,00	134	6	6	1	6	6	0%	1,00
515	First cleaner concentrate	24	604	25	8	2,98	738	31	31	1	56	39	**45%**	1,43
	Spodumene second cleaner flotation													
831	Second cleaner feed pump box water	24	0	0	0	0,00	1074	45	45	1	45	45	0%	1,00
516	Second cleaner feed	24	604	25	8	2,98	1813	76	76	1	101	84	**25%**	1,20
517	Second cleaner tails	24	6	0	0	**2,99**	1215	51	51	1	51	51	1%	1,00
	Second cleaner concentrate	24	**598**	25	8	**3,13**	598	25	24,9	1	50	33	**50%**	1,52
832	Second cleaner concentrate launder water	24	0	0	0	0	133	6	5,5	1	6	6	0%	1,00
833	Spodumene Conc. Thickener feed box water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
518	Second cleaner concentrate	24	598	25	8	3,13	731	30	30,5	1	55	38	**45%**	1,44
519	Cyclones Overflow total discharge	24	498	21	8	2,65	16358	682	682	1	702	689	4%	1,02
	DEWATERING - SPODUMENE CONCENTRATE													
611	Spodumene conc. from second cleaner	24	598	25	8	3,13	731	30	30	1	55	38	45%	1,44
	Spodumene concentrate thickener													
320	Tantalite area filtrate	24	0	0	0	0,00	20	0,8	0,8	1	0,8	0,8	0%	1
618	Spodumene conc. filtrate	24	0,06	0	0	3,13	291	12	12	1	12	0	0%	1
841	Spod. conc. Thickener feed dilution water	24	0	0	0	0	2622	109	109	1	109	109	0%	1
847	Inline flocculant mixer dilution water - spodumene	24	0	0	0	0	0	0,3	0,3	1	314	314	0	1
612	Spodumene conc. thickener feed	24	598	25	8	3,13	4003	167	167	1	192	175	**13%**	1,10
844	Spod.conc. thickener overflow to process water tank	24	0	0	0	0	3393	141	141	1	141	141	0%	1
842	Thickener u/f water connection	24	0	0	0	0	0	0	0	1	0	0	0%	1
613	Spodumene conc. thickener underflow	24	598	25	8	3,13	322	13	13	1	38	21	**65%**	1,79
	Spodumene Thickener underflow to holding tank	24	598	25	8	3,13	322	13	13	1	38	21	65%	1,79
617	Thickener Recirculation	24	**0**	0	0	3,13	0	0	0	1	0	0	65%	0,00
	Spodumene Concentrate filter													
843	Filter feed surge tank water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
614	spodumene conc. Filter feed	24	598	25	8	3,13	322	13	13	1	38	21	65%	1,79
	Filtrate Pressure Water	24	0	0	0	0	0	0	0	1	0	0,0	0%	1,00
	Cloth Wash Drain Feed	24	0	0	0	0	50,4	2,1	2,1	1	2	2	0%	1,00
	Manifold Flush Drain Feed	24	0	0	0	0	288,0	12,0	12,0	1	12	12	0%	1,00
	Total in filter	24	598	25	8	3,13	660	28	28	1	52	35	48%	1,48
	Cloth Wash Drain Outlet	24	0	0	0	0	50	2	2	1	2	2	0	1
	Manifold Flush Drain Outlet	24	0	0	0	0	288	12	12	1	12	12	0	1
618	Spodumene conc. filtrate	24	**0,06**	0,002	0,00	3,13	291	12	12	1	12	12	0,02%	1,00
615	Spodumene conc. to STOCKPILE	24	598	25	8	3,13	31	1,3	1,3	1	26	9	**95%**	2,83
	DEWATERING - TAILINGS													
511	Scavenger tails	24	3622	151	57	2,63	9652	402	402	1	553	459	27%	1,21
406	Cleaner concentrate	24	132	6	2	2,76	132	6	6	1	11	8	50%	1,47
519	Cyclones Overflow total discharge	24	498	21	8	2,65	16358	682	682	1	702	689	4%	1,02
607	Tailings filtrate to tailings thickener	24	0,5	0,02	0,01	2,67	2664	111	111	1	111	111	0%	1,00
315	Tailings To tailings thickener	24	41	1,7	0,7	2,60	249	10	10	1	12	11	14%	1,09
837	Thickener Dilution water	24	0	0	0	0	0	0	0	1	0,0	0,0	0%	1,00
606	Thickener Recirculation	24	0	0	0	2,64	0	0	0	1	0	0	60%	0,00
846	Inline flocculant mixer dilution water - tailings	24	0	0	0	0	0	10	10	1	9662	9662	0%	1
	WATER TREATMENT PLANT SLUDGE	24	0	0	0	0	384	16	16	1	16	16	0%	1
602	Tailings thickener feed (without recir.)	24	4294	179	68	2,64	29440	1236	1236	1	11068	10956	2%	1,01
602	Tailings thickener feed (with recir.)	24	4294	179	68	2,64	29440	1236	1236	1	11068	10956	2%	1,01
840	Tailings thickener overflow to process water tank	24	0	0	0	0	26577	1117	1117	1	1117	1117	0%	1,0
839	Thickener u/f water connection	24	0	0	0	0	0	0	0	1	0,0	0,0	0%	1,0
603	Tailings thickener underflow	24	4294	179	68	2,64	2863	119	119	1	298	187	**60%**	1,59
606	Thickener Recirculation	24	**0**	0	0	2,64	0	0,0	0,0	1	-	-	60%	0,00
	Tailings entering holding tank	24	4294	179	68	2,64	2863	119	119	1	298	187	60%	1,59
838	Tailings holding tank dilution water	24	0	0	0	0	511,2	21,3	21,3	1	21,3	21,3	0%	1,00
	Diluted Tailings in holding tank	24	4294	179	68	2,64	3374	141	141	1	320	208	**56%**	1,53
	Tailings filter													

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M. CHEVALIER			F. BARIL										DOC No.: C20204-00-SPC-101			
			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m³/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
604	Tailings filter feed	24	4294	179	68	2,64	3374	141	141	1	320	208	56%	1,53
848	Tailings belt filter wash water	24	0	0	0	0	48,0	2,0	2,0	1	2	2,0	0%	1,00

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BUMIGEME – Bureau mines, geologie et metallurgie

PREPARED BY	APPROVED BY	Revision: C
		Date: July 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m^3/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
	Total in filter	24	4294	179	68	2,64	3422	143	143	1	322	210	56%	1,53
607	Tailings filtrate to tailings thickener	24	**0,5**	0,0	0,0	**2,67**	2664	111	111	1	111	111	0%	1,00
605	Tailings for dry stacking	24	4294	179	68	2,64	758	32	32	1	210,5	99,4	**85%**	2,12

			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m^3/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
	RAW WATER													
800	Raw water from wells	24	0	0	0	0	1467	61	61	1	61	61	0%	1
801	Raw water to process water tank	24	0	0	0	0	0	0	0	1	0	0,0	0%	1
802	Raw water to gland water tank	24	0	0	0	0	507	21	21	1	21	21	0%	1
	PROCESS WATER													
859	Utility Stations	24	0	0	0	0	360	15	15	1	15	15,0	0%	1
803	Process water main distribution	24	0	0	0	0	55128	2297	2297	1	2297	2297	0%	1
897	Process water bleed	24	0	0	0	0	656	36	36	1	39	37	0%	1
	Process Water Return to Tank	24	0	0	0	0	55784	2333	2333	1	2336	2334	0%	1
	CLEAN WATER													
	Total reagent dilution water if was continuous	24	0	0	0	0	784	33	33	1	0	0	0%	
850	Reagents dilution water	24	0	0	0	0	392	16	16	1	0	0	0%	
	GLAND SEAL WATER													
860	Main Gland Water Line	24	0	0	0	0	449	18,72	18,7	1	19	18,7	0%	1
861	Gland water 200-SLP-001/002	24	0	0	0	0	86	3,6	3,60	1	4	3,6	0%	1
862	Gland water 200-SLP-005/006	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
863	Gland water 200-SLP-003/004	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
864	Gland water 300-SLP-001/002	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
865	Gland water 300-SLP-009/010	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
866	Gland water 300-SLP-003/004	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
869	Gland water 300-SLP-008	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
870	Gland water 400-SLP-001/002	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
871	Gland water 400-SLP-003/004	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
872	Gland water 400-SLP-005/006	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
873	Gland water 400-SLP-007/008	24	0	0	0	0	9	0,36	0,36	1	0	0,4	0%	1
874	Gland water 500-SLP-001/002	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
875	Gland water 500-SLP-003/004	24	0	0	0	0	13	0,54	0,54	1	1	0,5	0%	1
876	Gland water 500-SLP-005/006	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
877	Gland water 500-SLP-017/018	24	0	0	0	0	9	0,36	0,36	1	0	0,4	0%	1
878	Gland water 500-SLP-007/008	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
879	Gland water 500-SLP-019/020	24	0	0	0	0	9	0,36	0,36	1	0	0,4	0%	1
880	Gland water 500-SLP-009/010	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
881	Gland water 500-SLP-013/014	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
883	Gland water 500-SLP-015/016	24	0	0	0	0	17	0,72	0,72	1	1	0,7	0%	1
884	Gland water 600-SLP-003/004	24	0	0	0	0	13	0,54	0,54	1	1	0,5	0%	1
885	Gland water 600-SLP-005/007	24	0	0	0	0	13	0,54	0,54	1	1	0,5	0%	1
886	Gland water 610-SLP-003/004	24	0	0	0	0	9	0,36	0,36	1	0	0,4	0%	1
887	Gland water 610-SLP-005/007	24	0	0	0	0	9	0,36	0,36	1	0	0,4	0%	1
888	Gland water 610-SLP-006	24	0	0	0	0	9	0,36	0,36	1	0	0,4	0%	1
889	Gland water 600-SLP-006	24	0	0	0	0	13	0,54	0,54	1	1	0,5	0%	1
	Potable water													
950	Potable water main distribution	24	0	0	0	0		0-2.5	0-2.5	1	0-2.5	0-2.5	0%	1
951	Potable water to safety showers	24	0	0	0	0		0-4.5	0-4.5	1	0-4.5	0-4.5	0%	1
952	Potable water to sanitary use	24	0	0	0	0		0-2.5	0-2.5	1	0-2.5	0-2.5	0%	1

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Revision: C

PREPARED BY	APPROVED BY	Date: July 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	**Name**	**h/d**	**t/d**	**t/h**	**m³/h**	**SG**	**m³/d**	**t/h**	**m³/h**	**SG**	**t/h**	**m³/h**	**% w/w**	**SG**
	Reagent													

	AERO-3030-C		Delivered solid or solution				Water				Final solution			
Stream	**Name**	**h/d**	**t/d**	**kg/h**	**m³/h**	**SG**	**m³/d**	**kg/h**	**m³/h**	**SG**	**kg/h**	**m³/h**	**% w/w**	**SG**
701	AERO 3030-C distribution	24	0,33	14	0,01	1,03					14	14	100%	1,03

	FROTHER		Delivered solid or solution				Water				Final solution			
Stream	**Name**	**h/d**	**t/d**	**kg/h**	**m³/h**	**SG**	**m³/d**	**kg/h**	**m³/h**	**SG**	**kg/h**	**m³/h**	**% w/w**	**SG**
702	Frother to mica rougher flot cells	24	TBC	TBC	TBC	TBC					-	-	100%	
703	Frother to mica cleaner flotation cells	24	TBC	TBC	TBC	TBC					-	-	100%	
704	Frother to mica rougher flot cells	24	TBC	TBC	TBC	TBC					-	-	100%	
705	Frother to spod. scav. flot. cells	24	TBC	TBC	TBC	TBC					-	-	100%	
706	Frother to spod. 1st cleaner flot. cells	24	TBC	TBC	TBC	TBC					-	-	100%	
707	Frother to spod. 2nd cleaner flot. cells	24	TBC	TBC	TBC	TBC					-	-	100%	

	SODA ASH		Delivered solid or solution				Water				Final solution			
Stream	**Name**	**h/d**	**t/d**	**kg/h**	**m³/h**	**SG**	**m³/d**	**kg/h**	**m³/h**	**SG**	**kg/h**	**m³/h**	**% w/w**	**SG**
710	Soda ash unloading	24	**2,54**	16000	14,95	1,07							100%	0
711	Soda ash added to mixing tank	24	2,54	10145	9,48	1,07							100%	0
716	Soda ash transfered to holding tank	24	2,54	10145	9,48	1,07	1380	57489	57,5	1	67635	68	15%	1
712	Soda ash to mica flot. Cond. Tank	24	**1,60**	67	0,06	1,07	9	377	0,4	1	444	0,44	15%	1
713	Soda ash to spod. Rougher HD cond. tk	24	**0,79**	33	0,03	1,07	4	186	0,2	1	218	0,22	15%	1
714	Soda ash to spod. cleaner 1	24	**0,08**	3	0,00	1,07	0	18	0,02	1	21	0,021	15%	1
715	Soda ash to spod. cleaner 2	24	**0,08**	3	0,00	1,07	0	18	0,02	1	21	0,021	15%	1
851	Soda ash dilution water	24					345	14372	14	1			0%	

	FATTY ACID		Delivered solid or solution				Water				Final solution			
Stream	**Name**	**h/d**	**t/d**	**kg/h**	**m³/h**	**SG**	**m³/d**	**kg/h**	**m³/h**	**SG**	**kg/h**	**m³/h**	**% w/w**	**SG**
751	Fatty acid unloading	24	**3,1**	16000	18	0,89					0	0	100%	0,89
752	Fatty acid to spod. scav. HD cond. tk	24	**1,23**	51	0,06	0,89					51	0,06	100%	0,89
753	Fatty acid to rougher HD cond.	24	**1,86**	77	0,09	0,89					77	0,09	100%	0,89
754	Fatty acid to spod. cleaner 1	24	**0,06**	2	0,003	0,89					2	0,003	100%	0,89

	SLGN		Delivered solid or solution				Water				Final solution			
Stream	**Name**	**h/d**	**t/d**	**kg/h**	**m³/h**	**SG**	**m³/d**	**kg/h**	**m³/h**	**SG**	**kg/h**	**m³/h**	**% w/w**	**SG**
721	SLGN feed to mixing tank	24	**1,10**	1470	2,6	0,56							100%	
726	SLGN transfered to holding tank	24	1,10	1470	2,6	0,56	318	13233	13	1	14703	15	10%	1
722	SLGN to attrition	24	0,42	18	0,03	0,56	4	159	0,2	1	177	0,2	10%	1
723	SLGN to spod. Cleaner 1	24	0,17	7	0,01	0,56	1	62	0,1	1	69	0,1	10%	1
724	SLGN to spod. Cleaner 2	24	0,08	4	0,01	0,56	1	32	0,0	1	35	0,0	10%	1
725	SLGN to spod. rougher HD cond. tk	24	0,42	18	0,03	0,56	4	159	0,2	1	177	0,2	10%	1
852	SLGN dilution water	24					79	3308	3	1				1

	NaOH		Delivered solid or solution				Water				Final solution			
Stream	**Name**	**h/d**	**t/d**	**kg/h**	**m³/h**	**SG**	**m³/d**	**kg/h**	**m³/h**	**SG**	**kg/h**	**m³/h**	**% w/w**	**SG**
731	NaOH 50% unloading	24	**1,32**	55	0,04	1,53	-	-	-	1	19000	12	50%	1,53
732	NaOH 50% added to mixing tank	24	1,32	2647	1,7	1,53	64	2647	2,6	1	5293	3	50%	1,53
	NaOH 50% to attrition scubber	24	1,32	55	0,04	1,53	1	55	0,1	1	110,3	72,1	50%	1,53
733	NaOH 15% to attrition scubber	24	1,32	55	0,04	1,53	7	312	0,30	1	368	0,3	15%	1,1
853	NaOH dilution water	24					148	6175	6,2	1			0%	

	FLOCCULANT		Delivered solid or solution				Water				Final solution			
Stream	**Name**	**h/d**	**kg/d**	**kg/h**	**l/h**	**SG**	**m³/d**	**kg/h**	**l/h**	**SG**	**kg/h**	**l/h**	**% w/w**	**SG**
741	Dry flocculant	24	133,011048	177	222	0,80							100%	
742	Floc. transfer to holding tank (0.5%)	24	133	177	222	0,80	847014	35292	35292	1	35470	35470	0,5%	1
745	Floc. to tailings thick. (0.5%)	24	**129**	5,4	6,7	0,80	25636	1068	1068	1	1074	1074	0,5%	1
746	Floc. to tailings thick. (0.05%)	24	129	5,4	6,7	0,80	257520	10730	10730	1	10735	10735	0,05%	1
747	Floc. to spod. thick. (0.5%)	24	**4,2**	0,17	0,2	0,80	833	35	35	1	35	35	0,5%	1
748	Floc. to spod. thick. (0.05%)	24	4,2	0,17	0,2	0,80	8369	349	349	1	349	349	0,05%	1
854	Flocculant dilution water	24					212	8823	8823	1	8823	8823	0%	1
846	Inline flocculant mixer dilution water - tailings	24					232	9662	9662	1	9662	9662	0%	1
847	Inline flocculant mixer dilution water - spodumene	24					8	314	314	1	314	314	0%	1

MASS BALANCE - NOMINAL
FS update
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

Critical Elements Corporation

BUMIGEME – Bureau mines, geologie et metallurgie

Revision: C

PREPARED BY	APPROVED BY	Date: July 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m^3/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
			Gas											
Stream	Name	h/d	t/d	t/h	Am^3/h	kg/m^3	m^3/d	t/h	Am^3/h	SG	t/h	Am^3/h	% w/w	SG
	Air - Crusher													
900	Compressed air to crusher area	24	11	0,5	49	9,6								
901	Air to crusher area dust collector	24	TBC	TBC	TBC	9,6								
			Gas											
	Air - Concentrator													
902	Main plant compressor	24	23	0,9	99	9,6								
903	Main plant process air	24	17	0,7	74	9,6								
904	Process air distribution	24	17	0,7	74	9,6								
905	Main plant instrument air	24	6	0,2	25	9,6								
906	Flotation air distribution	24	329	14	8563	1,6								
907	Flotation air to mica roughers	24	82	3,4	2124	1,6								
908	Flotation air to mica cleaner	24	10	0,4	272	1,6								
909	Air to spodumene rougher flotation	24	114	4,8	2973	1,6								
910	Air to spodumene scavenger flotation	24	65	2,7	1699	1,6								
911	Air to spodumene 1st & 2nd cleaner flotation	24	57	2,4	1495	1,6								

MASS BALANCE -DESIGN
FS update
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

Revision: C

PREPARED BY	APPROVED BY	Date: JULY 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m^3/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
	CRUSHING													
	Vibrating Grizzly Feeder													
101	Apron Feeder feed	12	**5978**	**498**	184	**2,7**	185	15	15	1	514	199	97%	2,58
	Vibrating feeder feed	12	5978	498	184	2,7	185	15	15	1	514	199	97%	2,58
103	Jaw crusher feed	12	3975	331	122	2,7	123	10	10	1	342	132	97%	2,58
104	Jaw crusher by-pass	12	**2003**	167	62	2,7	62	5	5	1	172	67	97%	2,58
	Jaw crusher product	12	**3975**	331	122	2,7	123	10	10	1	342	132	97%	2,58
	Vibrating Screen													
107	Vibrating Screen 100-VIS-001 Feed	12	**14030**	1169	431	2,71	434	36	36	1	1205	468	97%	2,58
	Vibrating Screen 100-VIS-002 Feed	12	**8052**	671	248	2,7	249	21	21	1	692	268	97%	2,58
	Screen deck #1 (to secondary cone crusher)	12	**3334**	278	103	2,7	103	9	9	1	286	111	97%	2,58
	Screen deck #2 (to secondary cone crusher)	12	**1608**	134	49	2,7	50	4	4	1	138	54	97%	2,58
	Screen deck #3 (to tertiary cone crusher)	12	**3108**	259	96	2,7	96	8	8	1	267	104	97%	2,58
	Secondary Crusher													
	Secondary crusher feed	12	4942	412	152	2,7	153	13	13	1	425	165	97%	2,58
105	Secondary crusher product	12	4942	412	152	2,7	153	13	13	1	425	165	97%	2,58
	Tertiary Crusher													
	Tertiary crusher feed	12	3108	259	96	2,7	96	8	8	1	267	104	97%	2,58
106	Tertiary crusher product	12	3108	259	96	2,7	96	8	8	1	267	104	97%	2,58
	Crushed Ore Stockpile													
	Vibrating Screen undersize	12	5978	498	184	2,7	185	15	15	1	514	199	97%	2,58
108	Crushed ore Stockpile	12	5978	498	184	2,7	185	15	15	1	514	199	97%	2,58
	GRINDING													
	Ball Mill													
201	Fresh feed from stockpile	24	**5439**	227	84	2,7	168,2	7,0	7,0	1	233,6	90,6	97%	2,58
202	Mill Cyclone underflow	24	**13598**	567	207	**2,7**	4532,5	188,9	188,9	1	755,4	395,8	**75%**	1,91
804	Ball mill feed water	24	0	0	0	0	2702,4	113	113	1	112,6	112,6	0%	1,00
	Total Ball mill feed	24	19037	793	291	**2,7**	7403,1	308,5	308,5	1	1101,6	599,1	**72%**	1,84
805	Ball mill trommel water	24	0	0	0	0	2535,3	106	105,6	1	105,6	105,6	0%	1,00
	Ball mill discharge	24	19037	793	291	2,7	9938,4	414,1	414,1	1	1 207,3	704,7	**66%**	1,71
	Ball Mill Cyclone	**24**												
806	Mill cyclone feed dilution water	24	0	0	0	0	5019	209	209	1	209	209	0%	1,00
203	Mill Cyclone feed	24	19037	793	291	2,7	14957	623	623	1	1416	914	**56%**	1,55
205	Mill cyclone cluster overflow	24	5439	227	83	2,7	10425	434	434	1	661	517	34%	1,28

CriticalElements Corporation

MASS BALANCE -DESIGN

FS update

ROSE LITHIUM TANTALUM PROJECT - QUEBEC

BUMIGEME Bureau mines, géologie et métallurgie

Revision: C

PREPARED BY	APPROVED BY	Date: JULY 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

Stream	Name	h/d	Solids t/d	Solids t/h	Solids m³/h	Solids SG	Water m^3/d	Water t/h	Water m³/h	Water SG	Slurry Total t/h	Slurry Total m³/h	Slurry Total % w/w	Slurry Total SG
	MAGNETIC SEPARATION - TANTALITE													
808	Rougher Magnetic Separator Pump Box water	24	0	0	0	0	0	0	0	1	0	0,0	0%	1,00
208	Feed to rougher magnetic separation	24	5439	227	83	2,7	10425	434	434	1	661	517	34%	1,28
	WATER TO SLIMS AND ROUGHER SEPARATOR	24	0	0	0	0	14252	594	594	1	594	593,9	0%	1,00
	TOTAL FEED TO ROUGHER SEPARATOR	24	5439	227	83	2,7	24677	1028	1028	1	1255	1111	18%	1,13
301	Rougher magnetic concentrate	24	**29**	1	0	**3,7**	17206	716,9	716,9	1	718,1	717,2	**0,2%**	1,00
	FRESH WATER (CWR from rougher)	24	0	0	0	0	533	22	22	1	22,2	22,2	0%	1,00
302	Rougher non-magnetics	24	5410	225	83	2,7	8004	334	334	1	559	416	40%	1,34
	WATER TO SCAVENGER SEPARATOR	24	0	0	0	0	13320	555	555	1	555	555,0	0%	1,00
303	Scavenger magnetic concentrate	24	**19**	1	0	**3,7**	11449	477,0	477,0	1	477,8	477,2	**0,2%**	1,00
304	Combined magnetic concentrate to clarifyer	24	48	2	1	**3,7**	28655	1193,9	1193,9	1	1195,9	1194,5	0,2%	1,00
305	Non-magnetics to desliming cyclone pump box	24	5391	225	82	2,7	9875	411	411	1	636	494	35%	1,29
	FRESH WATER (CWR from scavenger)	24	0	0	0	0	533	22	22,2	1	22,2	22,2	0%	1,00
306	Desliming cyclone feed	24	5391	225	82	2,7	10408	434	434	1	658	516	34%	1,28
307	Desliming I cyclone overflow	24	**297**	12	5	**2,7**	7117	297	297	1	309	301	**4%**	1,03
308	Desliming I cyclone underflow to Mica flotation	24	5095	212	78	2,7	3292	137	137	1	349	215	61%	1,62
	CLARIFYER OVERFLOW WATER	24	0	0	0	0	28655	1193	1193	1	1196	1194	0%	1,00
	SLURRY FROM CLARIFYER TO VIBRATING SCREEN	24	48	2,0	0,5	3,72	26	1	1	1	3,1	1,6	65%	1,91
811	Water to Screen (2 connections)	24	0	0	0	0	86,4	3,6	3,6	1	3,6	3,6	0%	1,00
-	Slurry in screen	24	107	4	1	3,72	161	6,7	6,7	1	11,2	7,9	**40%**	1,41
309	Screen Fines to Magnetics Silo	24	48	2,0	1	**2,60**	143	6,0	6,0	1	7,9	6,5	**25%**	1,22
310	Screen Oversize	24	**59,6**	2,5	0,7	3,7	11	0,4	0,4	1	2,9	1,1	**85%**	2,64
812	Water to Regrind	24	0	0	0	0	13	0,5	0,5	1	0,5	0,5	0%	1,00
-	Slurry in regrind mill	24	59,6	2,5	0,7	3,7	23	1,0	1,0	1	3,4	1,6	**72%**	2,11
814	Water to Trommel	24	0	0	0	0	26	1,1	1,1	1	1,1	1,1	0%	1,00
311	Regrind Recirc.	24	59,6	2,5	0,7	3,7	49	2,0	2,0	1	4,5	2,7	**55%**	1,67
-	Slurry in Magnetics Silo	24	47,6	2,0	0,5	2,6	48	2,0	2,0	1	4,0	2,5	**50%**	1,58
	Water through O/F	24	0	0	0	0	95	4,0	4,0	1	4,0	4,0	0%	1,00
813	Water to Magnetics Silo	24	0	0	0	0	24	1,0	1,0	1	1,0	1,0	0%	1,00
-	Slurry to Concentrator/Wilfley	24	47,6	2,0	0,5	3,7	71	3,0	3,0	1	5,0	3,5	**40%**	1,41
856	Water to Wilfley Table & Knelson	24	0	0	0	0	116	4,9	4,9	1	4,9	4,9	0%	1,00
312	Wifley Concentrate	24	**0,5**	0,02	0,004	**4,5**	1,1	0,05	0,05	1	0,1	0,1	**30%**	1,30
313	Wifley Middling	24	**1,9**	0,08	0,020	**4,0**	5,7	0,24	0,24	1	0,3	0,3	**25%**	1,23
314	Wiffley Tailings	24	**45,3**	1,89	0,725	**2,6**	181	7,5	7,5	1	9,4	8,3	**20%**	1,14
-	Total out of Wifley Table	24	47,6	2,0	0,7	*2,7*	188	7,8	7,8	1	9,8	8,6	*20%*	1,14
315	Tailings To tailings thickener	24	45,3	1,9	0,7	2,6	276	11,5	11,5	1	13,4	12,2	*14%*	1,09
845	Water to concentrate Silo	24	0	0	0	0	-	0	0	1	0	0,0	0%	
855	Water to Middling Silo	24	0	0	0	0	-	0	0	1	0	0,0	0%	
316	Middling to Filter	24	2,0	**0,33**	0,08	4,0	24,0	1,0	1,0	1	1,33	1,1	25%	1,23
317	Concentrate to Filter	24	2,3	**0,43**	0,10	4,5	24,2	1,0	1,0	1	1,44	1,1	30%	1,30
318	Middling Product	24	2,0	0,33	0,08	4,0	1,4	0,1	0,1	1	0,39	0,1	**85%**	2,76
319	Wet Concentrate	24	2,3	0,43	0,10	4,5	1,8	0,1	0,1	1	0,51	0,2	**85%**	2,95
320	Filtrate - Middling	24	0	0,0	0	0	22,6	0,9	0,9	1	0,9	0,9	0%	1,00
320	Filtrate - Concentrate	24	0	0,0	0	0	22,4	0,9	0,9	1	0,9	0,9	0%	1,00
321	Dry Concentrate	24	2,3	0,43	0,10	4,5	0,10	0,004	0,004	1	0,44	0,101	**99%**	4,35
-	Evaporation	24	0	0	0	0	1,729	0,072	0,072	1	0,072	0,072	0%	1,00
	MICA FLOTATION													
	Feed to conditioning tank	24	5095	212	78	2,7	3292	137	137	1	349	215	61%	1,62
815	Conditioning tank dilution water	24	0	0	0	0	3193	133	133	1	133	133	0%	1,00
401	Conditionning tank feed	24	5095	212	78	2,72	6484	270	270	1	482	348	**44%**	1,39
	Rougher Flotation	**24**												
816	Rougher feed dilution tank water	24	0	0	0	0	2977	124	124	1	124	124	0%	1,00
402	Rougher feed	24	5095	212	78	2,72	9462	394	394	1	607	472	**35%**	1,28
403	Rougher tails	24	4824	201	74	2,7	9316	388	388	1	589	462	34%	1,28
	Rougher concentrate	24	**271**	11	4	**2,8**	146	6	6	1	17	10	**65%**	1,71
818	Mica concentrate launder water	24	0	0	0	0	296	12	12	1	12	12	0%	1,00
404	Mica rougher concentrate	24	271	11	4	2,8	442	18	18	1	30	22	**38%**	1,32
	Cleaner Flotation	**24**												
817	Mica cleaner feed pump dilution water	24	0	0	0	0	-	-	-	1	0	0,0	0%	1,00
	Cleaner feed	24	271	11	4	2,8	442	18	18	1	30	22	38%	1,32
405	Cleaner tails	24	124	5	2	2,8	344	14	14	1	19	16	26%	1,20
	Cleaner concentrate	24	**147**	6	2	**2,8**	98	4	4	1	10	6	**60%**	1,62
820	Cleaner concentrate launder water	24	0	0	0	0	49	2	2	1	2	2	0%	1,00
821	Tailings thickener feed pump box water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
406	Cleaner concentrate	24	147	6,1	2	2,8	147	6	6,1	1	12	8	**50%**	1,47

CriticalElements Corporation	**MASS BALANCE -DESIGN** **FS update** **ROSE LITHIUM TANTALUM PROJECT - QUEBEC**	BUMIGEME Bureau mines, géologie et métallurgie Revision: C
PREPARED BY	APPROVED BY	Date: JULY 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	**Name**	**h/d**	**t/d**	**t/h**	**m³/h**	**SG**	**m³/d**	**t/h**	**m³/h**	**SG**	**t/h**	**m³/h**	**% w/w**	**SG**
	SPODUMENE FLOTATION													
	Dewatering -1 Cyclones													
819	Dewatering cyclones no.1 feed pump box water	24	0	0	0	0	-	-	-	1	0	0,0	0%	1,00
407	Cyclone feed	24	4948	206	76	2,7	9660	402	402	1	609	478	34%	1,27
408	Cyclone overflow	24	**99**	4	2	**2,5**	8044	335	335	1	339	337	1%	1,01
409	Cyclone underflow	24	4849	202	74	2,7	1616	67	67	1	269	141	**75%**	1,91
890	Attrition water addition	24	0	0	0	0	1231	51	51	1	51	51	0%	1,00
	Attrition scubber feed	24	4849	202	74	2,7	2848	119	119	1	321	193	**63%**	1,66
	Desliming II cyclones													
822	Cyclone feed pump box water	24	0	0	0	0	1120	47	47	1	47	47	0%	1,00
502	Cyclone feed	24	4849	202	74	2,7	3967	165	165	1	367	239	**55%**	1,53
503	Cyclone overflow	24	**158**	7	2	**2,7**	2997	125	125	1	131	127	**5%**	1,03
504	Cyclone underflow	24	4691	195	72	2,7	970	40	40	1	236	112	83%	2,11
823	Spodumene Rougher Conditioning tank water	24	0	0	0	0	2427	101	101	1	101	101	0%	1,00
505	HD conditioning tank discharge	24	4691	195	72	2,7	3397	142	142	1	337	213	**58%**	1,58
824	Spodumene Rougher Dilution tank water	24	0	0	0	0	4591	191	191	1	191	191	0%	1,00
520	Dilution Tank discharge	24	4691	195	72	2,7	7988	333	333	1	528	404	**37%**	1,31
	Spodumene Rougher Flotation													
514	Spodumene first cleaner tails	24	227	9	3	3,0	3370	140	140	1	150	144	6%	1,05
	Rougher feed	24	4918	205	75	2,7	11358	473	473	1	678	548	30%	1,24
827	Spodumene scavenger conditioning feed box water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
506	Rougher tails	24	4075	170	63	2,7	10796	450	450	1	620	513	27%	1,21
	Rougher total concentrate	24	**843**	35	11	**3,1**	562	23	23	1	59	35	**60%**	1,68
	Rougher concentrate	24	**843**	35	11	3,1	562	23	23	1	59	35	60%	1,68
825	Rougher concentrate	24	0	0	0	0	1967	82	82	1	82	82	0%	1,00
507	Diluted rougher concentrate	24	843	35	11	3,1	2529	105	105	1	141	117	**25%**	1,20
828	Spod. Scavenger Conditioning tank water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
510	Spod. Scavener Conditioning tank discharge	24	4075	170	63	2,66	10796	450	450	1	620	513	27%	1,21
	Spodumene Scavenger Flotation													
510	Scavenger feed	24	4075	170	63	2,7	10796	450	450	1	620	513	27%	1,21
836	Scavenger tailings pump box dilution water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
511	Scavenger tails	24	4021	168	64	**2,6**	10714	446	446	1	614	509	27%	1,21
	Scavenger Concentrate	24	**54**	2	1	**3,0**	82	3	3	1	6	4	**40%**	1,36
834	Scavenger concentrate launder water	24	0	0	0	0	82	3	3	1	3	3	0%	1,00
835	Spodumene scavenger conc. Pump dilution water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
512	Scavenger Concentrate	24	54	2	1	3,0	163	7	7	1	9	8	**25%**	1,20
	Spodumene 1st cleaner feed pump													
507	Spodumene rougher concentrate to pump box no.1	24	843	35	11	3,1	2529	105	105	1,0	141	117	25%	1,20
826	First cleaner feed pump box water no.1	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
	Spodumene first cleaner flotation													
512	Scavenger Concentrate	24	54	2	1	3,0	163	7	7	1	9	8	25%	1,20
513	From rougher concentrate + water	24	843	35	11	3,1	2529	105	105	1	141	117	**25%**	1,20
	First cleaner total feed	24	897	37	12	3,1	2692	112	112	1	150	124	25%	1,20
830	Cleaner tailings pump box water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
514	First cleaner tails	24	227	9	3	**3,0**	3370	140	140	1	150	144	6%	1,05
	First cleaner concentrate	24	**671**	28	9	**3,0**	671	28	28	1	56	37	**50%**	1,50
829	First cleaner concentrate launder water	24	0	0	0	0	149	6	6	1	6	6	0%	1,00
515	First cleaner concentrate	24	671	28	9	3,0	820	34	34	1	62	43	**45%**	1,43
	Spodumene second cleaner flotation													
831	Second cleaner feed pump box water	24	0	0	0	0	1192	50	50	1	50	50	0%	1,00
516	Second cleaner feed	24	671	27,9	9,2	3,0	2012	84	84	1	112	93	**25%**	1,20
517	Second cleaner tails	24	7	0,3	0,4	**3,0**	1348	56,2	56,2	1	56	57	1%	1,00
	Second cleaner concentrate	24	**664**	28	9	**3,1**	664	28	28	1	55	36	**50%**	1,52
832	Second cleaner concentrate launder water	24	0	0	0	0	148	6	6	1	6	6	0%	1,00
833	Spodumene Conc. Thickener feed box water	24	0	0	0	0	-	-	-	1	0	0	0%	1,00
518	Second cleaner concentrate	24	664	28	9	3,1	811	34	34	1	61	43	**45%**	1,44
519	Cyclones Overflow total discharge	24	553	23	9	2,6	18157	757	757	1	780	765	4%	1,02

CriticalElements Corporation		MASS BALANCE -DESIGN FS update ROSE LITHIUM TANTALUM PROJECT - QUEBEC	BUMIGEME Revision: C
PREPARED BY		APPROVED BY	Date: JULY 13 2023
M. CHEVALIER		F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	**Name**	**h/d**	**t/d**	**t/h**	**m³/h**	**SG**	**m³/d**	**t/h**	**m³/h**	**SG**	**t/h**	**m³/h**	**% w/w**	**SG**
	DEWATERING - SPODUMENE CONCENTRATE													
611	Spodumene conc. from second cleaner	24	664	27,7	8,8	3,1	811,3	33,8	33,8	1	61,5	42,6	45%	1,44
	Spodumene concentrate thickener													
320	Tantalite area filtrate	24	0	0	0	0	22	0,9	0,9	1	0,9	0,9	0%	1,00
618	Spodumene conc. filtrate	24	0,07	0	0	3,1	323	13	13	1	13	0	0%	1,00
841	Spod. conc. Thickener feed dilution water	24	0	0	0	0	2903	121	121	1	121	121	0%	1,00
847	Inline flocculant mixer dilution water	24	0	0	0	0	8	0	0	1	0	0	0%	1,00
612	Spodumene conc. thickener feed	24	**664**	**28**	**9**	3,1	4443	185	185	1	213	194	**13%**	1,10
844	Spod.conc. thickener overflow to process water tar	24	0	0	0	0	3766	157	157	1	157	157	0%	1,00
842	Thickener u/f water connection	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
613	Spodumene conc. thickener underflow	24	664	28	9	3,1	357	15	15	1	43	24	**65%**	1,79
	Spodumene Thickener underflow to holding tank	24	664	28	9	3,1	358	15	15	1	43	24	65%	1,79
617	Thickener Recirculation	24	**0**	0	0	3,1	0	0	0	1	0	0	65%	0,00
	Spodumene Concentrate filter													
843	Filter feed surge tank water	24	0	0	0	0	0	0	0	1	0	0,0	0%	1,00
614	spodumene conc. Filter feed	24	664	28	9	3,1	358	15	15	1	43	24	65%	1,79
	Filtrate Pressure Water	24	0	0	0	0	0	0	0	1	0	0,0	0%	1,00
	Cloth Wash Drain Feed	24	0	0	0	0	56	2,3	2,3	1	2	2,3	0%	1,00
	Manifold Flush Drain Feed	24	0	0	0	0	320	13,3	13,3	1	13	13,3	0%	1,00
	Total in filter	24	664	28	9		413	17	17	1	45	26	62%	1,72
	Cloth Wash Drain Outlet	24	0	0	0	0	56	2	2	1	2	2	0	1
	Manifold Flush Drain Outlet	24	0	0	0	0	320	13	13	1	13	13	0	1
618	Spodumene conc. filtrate	24	**0,07**	0,003	0,001	3,13	323	13	13	1	13	13	0,02%	1,00
615	Spodumene conc. to STOCKPILE	24	664	28	9	3,1	35	1	1	1	29	10	**95%**	2,83
	DEWATERING - TAILINGS													
511	Scavenger tails	24	4021	168	64	2,6	10714	446	446	1	614	509	27%	1,21
406	Cleaner concentrate	24	147	6	2,2	2,8	147	6	6	1	12	8	50%	1,47
519	Cyclones Overflow total discharge	24	553	23	9	2,6	18157	757	757	1	780	765	4%	1,02
607	Tailings filtrate to tailings thickener	24	0,5	0,0	0,0	2,7	2957	123	123	1	123	123	0%	1,00
315	Tailings To tailings thickener	24	45,3	1,9	0,7	2,6	276,3	11,5	11,5	1	13,4	12,2	14%	1,1
837	Thickener Dilution water	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
606	Thickener Recirculation	24	0	0	0	2,6	0	0	0	1	0	0	60%	0,00
846	Inline flocculant mixer dilution water	24	0	0	0	0	257	11	11	1	11	11	0%	1,00
	WATER TREATMENT PLANT SLUDGE	24	0	0	0	0	384	16	16	1	16	16	0%	1
602	Tailings thickener feed (without recir.)	24	4767	199	75	2,6	32893	1371	1371	1	1569	1445	13%	1,09
602	Tailings thickener feed (with recir.)	24	4767	199	75	2,6	32893	1371	1371	1	1569	1445	13%	1,09
840	Tailings thickener overflow to process water tank	24	0	0	0	0	29715	1238	1238	1	1238	1238	0%	1,00
839	Thickener u/f water connection	24	0	0	0	0	0	0	0	1	0	0	0%	1,00
603	Tailings thickener underflow	24	4767	199	75	2,6	3178	132	132	1	331	208	**60%**	1,59
606	Thickener Recirculation	24	**0**	0	0	2,6	0	0,0	0,0	1	-	-	60%	0,00
	Tailings entering holding tank	24	4767	199	75	2,6	3178	132,4	132,4	1	331	208	60%	1,59
838	Tailings holding tank dilution water	24	0	0	0	0	567	24	24	1	24	24	0%	1,00
	Diluted Tailings in holding tank	24	4767	199	75	2,6	3745	156	156	1	355	231	**56%**	1,53
	Tailings filter													
604	Tailings filter feed	24	4767	199	75	2,6	3745	156	156	1	355	231	56%	1,53
848	Tailings belt filter wash water	24	0	0	0	0	53	2,2	2,2	1	2	2,2	0%	1,00
	Total in filter	24	4767	199	75		3798	158	158	1	357	234	56%	1,53
607	Tailings filtrate to tailings thickener	24	**0,5**	0,0	0,0	**2,7**	2957	123	123	1	123	123	0%	1,00
605	Tailings for dry stacking	24	4766	199	75	2,6	841	35	35	1	234	110	**85%**	2,12

			Solids				Water				Slurry Total			
Stream	**Name**	**h/d**	**t/d**	**t/h**	**m³/h**	**SG**	**m³/d**	**t/h**	**m³/h**	**SG**	**t/h**	**m³/h**	**% w/w**	**SG**
	RAW WATER													
800	Raw water from wells	24	0	0	0	0	1766	74	74	1	74	74	0%	1
801	Raw water to process water tank	24	0	0	0	0	138	6	6	1	6	6	0%	1
802	Raw water to gland water tank	24	0	0	0	0	563	23	23	1	23	23	0%	1
	PROCESS WATER													
859	Utility Stations	24	0	0	0	0	1440	60	60	1	60	60	0%	1
803	Process water main distribution	24	0	0	0	0	62248	2594	2594	1	2594	2593,7	0%	1
897	Process water bleed	24	0	0	0	0	0	0	0	1	0	0	0%	1
	Process Water Return to Tank	24	0	0	0	0	62136	2588	2588	1	2591	2590	0%	1

CriticalElements Corporation		**MASS BALANCE -DESIGN** **FS update** **ROSE LITHIUM TANTALUM PROJECT - QUEBEC**	BUMIGEME Bureau mines, geologie et metallurgie Revision: C
PREPARED BY		APPROVED BY	Date: JULY 13 2023
M. CHEVALIER		F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	**Name**	**h/d**	**t/d**	**t/h**	**m³/h**	**SG**	**m³/d**	**t/h**	**m³/h**	**SG**	**t/h**	**m³/h**	**% w/w**	**SG**
	CLEAN WATER													
	Total reagent dilution water if was continuous	24	0	0	0	0	871	36	36	1	0	0	0%	
850	Reagents dilution water	24	0	0	0	0	435	18	18	1	0	0	0%	
	GLAND SEAL WATER													
860	Main Gland Water Line	24	0	0	0	0	498,701	20,779	20,8	1	21	20,8	0%	1
861	Gland water 200-SLP-001/002	24	0	0	0	0	95,904	3,996	4,0	1	4	4,0	0%	1
862	Gland water 200-SLP-005/006	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
863	Gland water 200-SLP-003/004	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
864	Gland water 300-SLP-001/002	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
865	Gland water 300-SLP-009/010	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
866	Gland water 300-SLP-003/004	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
869	Gland water 300-SLP-008	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
870	Gland water 400-SLP-001/002	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
871	Gland water 400-SLP-003/004	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
872	Gland water 400-SLP-005/006	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
873	Gland water 400-SLP-007/008	24	0	0	0	0	9,5904	0,3996	0,4	1	0	0,4	0%	1
874	Gland water 500-SLP-001/002	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
875	Gland water 500-SLP-003/004	24	0	0	0	0	14,3856	0,5994	0,6	1	1	0,6	0%	1
876	Gland water 500-SLP-005/006	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
877	Gland water 500-SLP-017/018	24	0	0	0	0	9,5904	0,3996	0,4	1	0	0,4	0%	1
878	Gland water 500-SLP-007/008	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
879	Gland water 500-SLP-019/020	24	0	0	0	0	9,5904	0,3996	0,4	1	0	0,4	0%	1
880	Gland water 500-SLP-009/010	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
881	Gland water 500-SLP-013/014	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
883	Gland water 500-SLP-015/016	24	0	0	0	0	19,1808	0,7992	0,8	1	1	0,8	0%	1
884	Gland water 600-SLP-003/004	24	0	0	0	0	14,3856	0,5994	0,6	1	1	0,6	0%	1
885	Gland water 600-SLP-005/007	24	0	0	0	0	14,3856	0,5994	0,6	1	1	0,6	0%	1
886	Gland water 610-SLP-003/004	24	0	0	0	0	9,5904	0,3996	0,4	1	0	0,4	0%	1
887	Gland water 610-SLP-005/007	24	0	0	0	0	9,5904	0,3996	0,4	1	0	0,4	0%	1
888	Gland water 610-SLP-006	24	0	0	0	0	9,5904	0,3996	0,4	1	0	0,4	0%	1
889	Gland water 600-SLP-006	24	0	0	0	0	14,3856	0,5994	0,6	1	1	0,6	0%	1
	Potable water													
950	Potable water main distribution	24	0	0	0	0		6.0	6,0	1	6.0	6,0	0%	1
951	Potable water to safety showers	24	0	0	0	0		4.5	4.5	1	4.5	4.5	0%	1
952	Potable water to sanitary use	24	0	0	0	0		4,0	4,0	1	4	4,0	0%	1

MASS BALANCE -DESIGN
FS update
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

Revision: C

PREPARED BY	APPROVED BY	Date: JULY 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

Stream	Name	h/d	Solids t/d	Solids t/h	Solids m³/h	Solids SG	Water m³/d	Water t/h	Water m³/h	Water SG	Slurry Total t/h	Slurry Total m³/h	Slurry Total % w/w	Slurry Total SG
	Reagent													

AERO-3030-C

Stream	Name	h/d	Delivered solid or solution t/d	kg/h	m³/h	SG	Water m³/d	kg/h	m³/h	SG	Final solution kg/h	m³/h	% w/w	SG
701	AERO 3030-C distribution	24	0,37	15	0,01	1,03					15	15	100%	1,03

FROTHER

Stream	Name	h/d	Delivered solid or solution t/d	kg/h	m³/h	SG	Water m³/d	kg/h	m³/h	SG	Final solution kg/h	m³/h	% w/w	SG
702	Frother to mica rougher flot cells	24	TBC	TBC	TBC	TBC					-	-	100%	
703	Frother to mica cleaner flotation cells	24	TBC	TBC	TBC	TBC					-	-	100%	
704	Frother to mica rougher flot cells	24	TBC	TBC	TBC	TBC					-	-	100%	
705	Frother to spod. scav. flot. cells	24	TBC	TBC	TBC	TBC					-	-	100%	
706	Frother to spod. 1st cleaner flot. cells	24	TBC	TBC	TBC	TBC					-	-	100%	
707	Frother to spod. 2nd cleaner flot. cells	24	TBC	TBC	TBC	TBC					-	-	100%	

SODA ASH

Stream	Name	h/d	Delivered solid or solution t/d	kg/h	m³/h	SG	Water m³/d	kg/h	m³/h	SG	Final solution kg/h	m³/h	% w/w	SG
710	Soda ash unloading	24	**2,82**	17760	16,60	1,07							100%	0
711	Soda ash added to mixing tank	24	2,82	11261	10,52	1,07							100%	0
716	Soda ash transfered to holding tank	24	2,82	11261	10,52	1,07	1532	63813	63,8	1	75075	75	15%	1
712	Soda ash to mica flot. Cond. Tank	24	**1,77**	74	0,07	1,07	10	419	0,4	1	493	0,49	15%	1
713	Soda ash to spod. Rougher HD cond. tk	24	**0,87**	36	0,03	1,07	5	206	0,2	1	242	0,24	15%	1
714	Soda ash to spod. cleaner 1	24	**0,08**	4	0,00	1,07	0	20	0,02	1	23	0,023	15%	1
715	Soda ash to spod. cleaner 2	24	**0,08**	4	0,00	1,07	0	20	0,02	1	23	0,023	15%	1
851	Soda ash dilution water	24					383	15953	16	1			0%	

FATTY ACID

Stream	Name	h/d	Delivered solid or solution t/d	kg/h	m³/h	SG	Water m³/d	kg/h	m³/h	SG	Final solution kg/h	m³/h	% w/w	SG
751	Fatty acid unloading	24	**3,5**	17760	20	0,89					0	0	100%	0,89
752	Fatty acid to spod. scav. HD cond. tk	24	**1,36**	57	0,06	0,89					57	0,06	100%	0,89
753	Fatty acid to rougher HD cond.	24	**2,06**	86	0,10	0,89					86	0,10	100%	0,89
754	Fatty acid to spod. cleaner 1	24	**0,06**	3	0,003	0,89					3	0,003	100%	0,89

SLGN

Stream	Name	h/d	Delivered solid or solution t/d	kg/h	m³/h	SG	Water m³/d	kg/h	m³/h	SG	Final solution kg/h	m³/h	% w/w	SG
721	SLGN feed to mixing tank	24	**1,22**	1632	2,9	0,56							100%	
726	SLGN transfered to holding tank	24	1,22	1632	2,9	0,56	353	14688	15	1	16321	16	10%	1
722	SLGN to attrition	24	0,47	20	0,04	0,56	4	177	0,2	1	196	0,2	10%	1
723	SLGN to spod. Cleaner 1	24	0,18	8	0,01	0,56	2	69	0,1	1	77	0,1	10%	1
724	SLGN to spod. Cleaner 2	24	0,09	4	0,01	0,56	1	35	0,0	1	39	0,0	10%	1
725	SLGN to spod. rougher HD cond. tk	24	0,47	20	0,04	0,56	4	177	0,2	1	196	0,2	10%	1
852	SLGN dilution water	24					88	3672	4	1				1

NaOH

Stream	Name	h/d	Delivered solid or solution t/d	kg/h	m³/h	SG	Water m³/d	kg/h	m³/h	SG	Final solution kg/h	m³/h	% w/w	SG
731	NaOH 50% unloading	24	**1,47**	61	0,04	1,53	-	-	-	1	21090	14	50%	1,53
732	NaOH 50% added to mixing tank	24	1,47	2938	1,9	1,53	71	2938	2,9	1	5875	4	50%	1,53
	NaOH 50% to attrition scubber	24	1,47	61	0,04	1,53	1	61	0,1	1	122,4	80,0	50%	1,53
733	NaOH 15% to attrition scubber	24	1,47	61	0,04	1,53	8	347	0,33	1	408	0,4	15%	1,1
853	NaOH dilution water	24					165	6855	6,9	1			0%	

FLOCCULANT

Stream	Name	h/d	Delivered solid or solution kg/d	kg/h	l/h	SG	Water m³/d	kg/h	l/h	SG	Final solution kg/h	l/h	% w/w	SG
741	Dry flocculant	24	148	197	246	0,80							100%	
742	Floc. transfer to holding tank (0.5%)	24	148	197	246	0,80	940186	39174	39174	1	39371	39371	0,5%	1
745	Floc. to tailings thick. (0.5%)	24	**143**	6,0	7,4	0,80	28456	1186	1186	1	1192	1192	0,5%	1
746	Floc. to tailings thick. (0.05%)	24	143	6,0	7,4	0,80	285847	11910	11910	1	11916	11916	0,05%	1
747	Floc. to spod. thick. (0.5%)	24	**4,6**	0,19	0,2	0,80	925	39	39	1	39	39	0,5%	1
748	Floc. to spod. thick. (0.05%)	24	4,6	0,19	0,2	0,80	9290	387	387	1	387	387	0,05%	1
854	Flocculant dilution water	24					235	9794	9794	1			0%	1
846	Inline flocculant mixer dilution water - tailings	24					257	10725	10725	1			0%	1
847	Inline flocculant mixer dilution water - spodumene	24					8	349	349	1			0%	1

MASS BALANCE -DESIGN
FS update
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

Revision: C

PREPARED BY	APPROVED BY	Date: JULY 13 2023
M. CHEVALIER	F. BARIL	DOC No.: C20204-00-SPC-101

			Solids				Water				Slurry Total			
Stream	Name	h/d	t/d	t/h	m³/h	SG	m^3/d	t/h	m³/h	SG	t/h	m³/h	% w/w	SG
			Gas											
Stream	Name	h/d	t/d	t/h	Am^3/h	kg/m^3	m^3/d	t/h	Am^3/h	SG	t/h	Am^3/h	% w/w	SG
	Air - Crusher													
900	Compressed air to crusher area	24	13	0,6	58	9,6								
901	Air to crusher area dust collector	24	TBC	TBC	TBC	9,6								
	Air - Concentrator													
902	Main plant compressor	24	31	1,3	137	9,6								
903	Main plant process air	24	20	0,8	87	9,6								
904	Process air distribution	24	20	0,8	87	9,6								
905	Main plant instrument air	24	11	0,5	50	9,6								
906	Flotation air distribution	24	365	15	9505	1,6								
907	Flotation air to mica roughers	24	91	3,8	2357	1,6								
908	Flotation air to mica cleaner	24	12	0,5	302	1,6								
909	Air to spodumene rougher flotation	24	127	5,3	3300	1,6								
910	Air to spodumene scavenger flotation	24	72	3,0	1886	1,6								
911	Air to spodumene 1st & 2nd cleaner flotation	24	64	2,7	1660	1,6								

Critical Elements Corporation	PROCESS WATER MASS BALANCE C20204 FS update ROSE LITHIUM TANTALUM PROJECT Critical Elements Corp.	BUMIGEME Bureau mines, géologie et métallurgie
		Rev: C
		Date: JULY 13, 2023
		DOC C20204-00-SPC-101

RAW WATER

STREAM	AREA	VOLUMETRIC FLOW (m^3/h)		DESCRIPTION
		Nominal	Design	
800	800	61	73,6	Raw water from wells
801	800	0	5,7	Raw water to process water tank
802	800	21	23	Raw water to gland water tank
To 300-HXP-001	300	20	22,2	To 300-HXP-001
To 300-HXP-002	300	20	22,2	To 300-HXP-002

PROCESS WATER PER AREA

AREA	Nominal (m3/h)	Design (m3/h)
200	385	427
300	1045	1160
400	245	271
500	484	538
600	33	37
610	111	124
700		
800	15	60
TOTAL	2318	2617

PROCESS WATER

STREAM	AREA	VOLUMETRIC FLOW (m^3/h)		DESCRIPTION
		Nominal	Design	
804	200	101,4	113	Ball mill feed water
805	200	95,2	106	Ball mill trommel water
806	200	188,4	209	Mill Cyclone feed dilution water
808	200	0	0	Rougher Magnetic Separator Pump Box water
Water to SLIMS	300	35	39	Water to SLIMS
Water to Rougher	300	500	555	Water to Rougher
Water to Scavenger	300	500	555	Water to Scavenger
811	300	3,2	4	Water to Screen (2 connections)
812	300	0,5	1	Water to Regrind
813	300	0,9	1	Water to Magnetics Silo
814	300	1,0	1	Water to Trommel
815	400	119,8	133	Conditioning tank dilution water
816	400	111,8	124	Rougher feed dilution tank water
817	400	0,0	0	Mica cleaner feed pump dilution water
818	400	11,1	12	Mica concentrate launder water
819	400	0,0	0	Dewatering cyclones no.1 feed pump box water
820	400	1,8	2	Cleaner concentrate launder water
821	400	0,0	0	Tailings thickener feed pump box water
822	500	42,0	47	Cyclone feed pump box water
823	500	91,1	101	Spodumene Rougher Conditioning tank water
824	500	172,3	191	Spodumene Rougher Dilution tank water
825	500	73,8	82	Rougher concentrate water
826	500	0,0	0	First cleaner feed pump box water no.1
827	500	0,0	0	Spodumene scavenger conditioning feed box water
828	500	0,0	0	Spod. Scavenger Conditioning tank water
829	500	5,6	6	First cleaner concentrate launder water
830	500	0,0	0	Cleaner tailings pump box water
831	500	44,8	50	Second cleaner feed pump box water
832	500	5,5	6	Second cleaner concentrate launder water
833	500	0,0	0	Spodumene Conc. Thickener feed box water
834	500	3,1	3	Scavenger concentrate launder water
835	500	0,0	0	Spodumene scavenger conc. Pump dilution water
836	500	0,0	0	Scavenger tailings pump box dilution water
837	600	0,0	0	Thickener Dilution water
838	600	21,3	24	Tailings holding tank dilution water
839	600	0,0	0	Thickener u/f water connection
841	610	109,0	121	Spod. conc. Thickener feed dilution water
842	610	0,0	0	Thickener u/f water connection
843	610	0,0	0	Filter feed surge tank water
Cloth Wash Drain	610	2,1	2,3	Cloth Wash Drain
845	300	0	0	Water to concentrate Silo
846	600	9,7	11	Inline flocculant mixer dilution water - tailings
847	610	0,3	0,3	Inline flocculant mixer dilution water - spodumene
848	600	2,0	2	Tailings belt filter wash water
855	300	0	0	Water to Middling Silo
856	300	4,4	5	Water to Wilfley Table & Knelson
890	500	46,2	51	Attrition water addition
859	800	5,0	20	Utility Stations
TOTAL	**800**	**2318**	**2617**	**Process Water Pumps Discharge**
897	800	36,0	0,0	Process water bleed
803	800	2297	2594	Process water main distribution

2352	2354	2318
2614	2617	2617

STREAM	AREA	VOLUMETRIC FLOW (m^3/h)		DESCRIPTION
		Nominal	Design	
840	600	1117	1238	Tailings thickener overflow to process water tank
844	610	141	157	Spod.conc. thickener overflow to process water tank
From Clarifyer	300	1075	1193	From Clarifyer
TOTAL		2333	2588	Total recirculation to process water tank

CriticalElements Corporation	PROCESS WATER MASS BALANCE C20204 FS update ROSE LITHIUM TANTALUM PROJECT Critical Elements Corp.	BUMIGEME Bureau mines, geologie et metallurgie
		Rev: C
		Date: JULY 13, 2023
		DOC C20204-00-SPC-101

CLEAN WATER

STREAM	AREA	VOLUMETRIC FLOW (m^3/h)		DESCRIPTION
		Nominal	Design	
850	800	16,3	18,1	Reagents dilution water
851	700	14,4	16,0	Soda ash dilution water
852	700	3,3	3,7	SLGN dilution water
853	700	6,2	6,9	NaOH dilution water
854	700	8,8	9,8	Flocculant dilution water

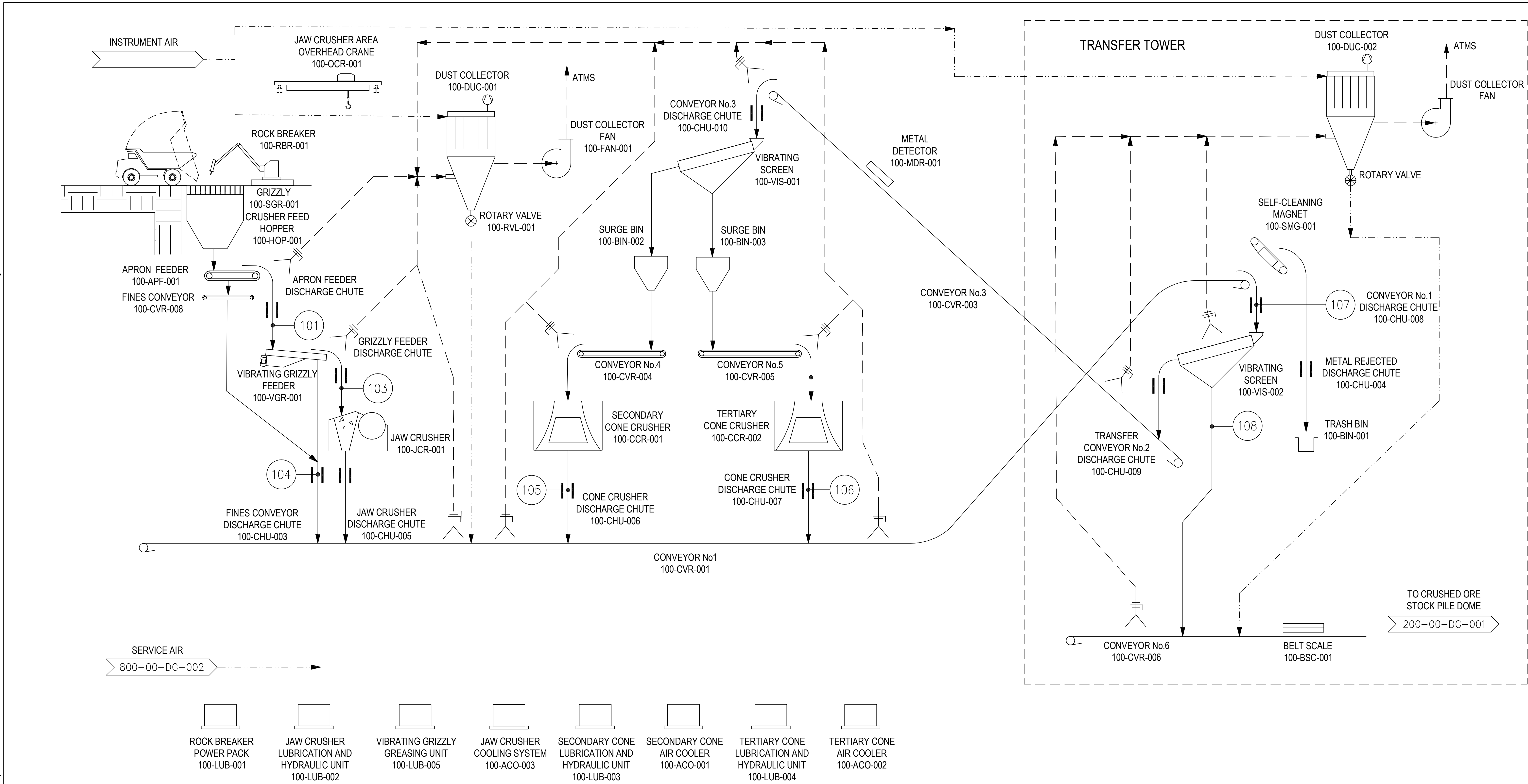
GLAND SEAL WATER

STREAM	AREA	VOLUMETRIC FLOW (m^3/h)		DESCRIPTION
		Nominal	Design	
860	800	18,7	20,78	Main Gland Water Line
861	200	3,60	4,00	Gland water 200-SLP-001/002
862	200	0,72	0,80	Gland water 200-SLP-005/006
863	200	0,72	0,80	Gland water 200-SLP-003/004
864	200	0,72	0,80	Gland water 300-SLP-001/002
865	200	0,72	0,80	Gland water 300-SLP-009/010
866	200	0,72	0,80	Gland water 300-SLP-003/004
869	300	0,72	0,80	Gland water 300-SLP-008
870	400	0,72	0,80	Gland water 400-SLP-001/002
871	400	0,72	0,80	Gland water 400-SLP-003/004
872	400	0,72	0,80	Gland water 400-SLP-005/006
873	400	0,36	0,40	Gland water 400-SLP-007/008
874	500	0,72	0,80	Gland water 500-SLP-001/002
875	500	0,54	0,60	Gland water 500-SLP-003/004
876	500	0,72	0,80	Gland water 500-SLP-005/006
877	500	0,36	0,40	Gland water 500-SLP-017/018
878	500	0,72	0,80	Gland water 500-SLP-007/008
879	500	0,36	0,40	Gland water 500-SLP-019/020
880	500	0,72	0,80	Gland water 500-SLP-009/010
881	500	0,72	0,80	Gland water 500-SLP-013/014
883	500	0,72	0,80	Gland water 500-SLP-015/016
884	600	0,54	0,60	Gland water 600-SLP-003/004
885	600	0,54	0,60	Gland water 600-SLP-005/007
886	610	0,36	0,40	Gland water 610-SLP-003/004
887	610	0,36	0,40	Gland water 610-SLP-005/007
888	610	0,36	0,40	Gland water 610-SLP-006
889	600	0,54	0,60	Gland water 600-SLP-006

POTABLE WATER

STREAM	AREA	VOLUMETRIC FLOW (m^3/h)		DESCRIPTION
		Nominal	Design	
950	800	0-2.5	6	Potable water main distribution
951	800	0-4.5	4.5	Potable water to safety showers
952	800	0-2.5	4	Potable water to sanitary use

Process Flow Diagrams (PFD)



Stream Description	Units	Apron Feeder feed		Jaw crusher feed		Jaw crusher by-pass		Secondary crusher product		Tertiary crusher product		Screen feed		Screen (fines)	
Stream No.		**101**		**103**		**104**		**105**		**106**		**107**		**108**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	408	498	272	331	137	167	362	442	250	305	1021	1245	408	498
Mass Solution	t/h	21	26	14	17	7	9	19	23	13	16	54	66	21	26
Mass Slurry	t/h	430	524	286	349	144	176	381	465	263	321	1075	1311	430	524
Volume Solution	m3/h	21	26	14	17	7	9	19	23	13	16	54	66	21	26
Volume Slurry	m3/h	172	210	114	140	58	70	153	186	105	129	430	525	172	210
Solids	Sp. Gr.	2,71		2,71		2,71		2,71		2,71		2,71		2,71	
Slurry	Sp. Gr.	2,50		2,50		2,50		2,50		2,50		2,50		2,50	
Percent solids	wt%	95%		95%		95%		95%		95%		95%		95%	
Pressure	kPag														
Temperature	°C														
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

NOT FOR CONSTRUCTION

AREA 6100

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

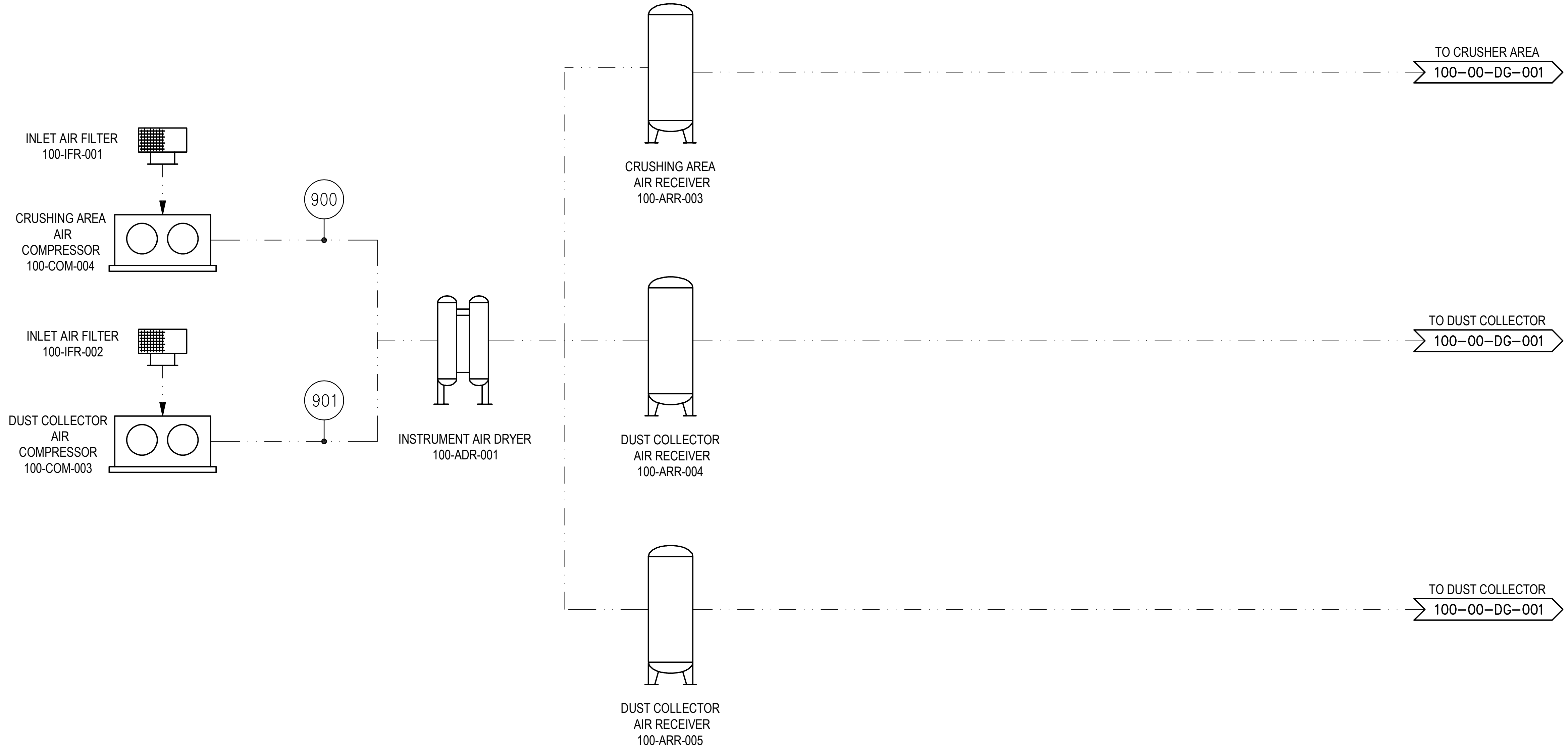
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
CRUSHING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/2

DRAWING NO.: C20204 (PROJECT) 100 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) D (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENIERIE\PROJETS EN COURS\CRITICAL ELEMENT – Rose\C20206 – FS 2022 update\Andy Fortin\PFD\PFD 04 JUILLET\FINAL PFD\PFDs Détaillés\6018012-GDO (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (20 SEPT).dwg



Stream Description	Units	Compressed air to crusher area		Air to crusher area dust collector	
Stream No.		**900**		**901**	
		Nom.	Des.	Nom.	Des.
Mass Air	t/h	0	0,6	TBC	TBC
Volume Air	Am3/h	49	58	TBC	TBC
Density	kg/m3	9,6		TBC	
Pressure	kPag	690		TBC	
Temperature	°C				
Notes		Intermittent		Continuous	

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS	
C	2023-02-24	FOR FEED	
B	2022-11-25	FOR FEED	MC
A	2022-10-24	FOR HAZOP	MC

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
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APPROVED:	F. BARIL, ing	2023-09-18

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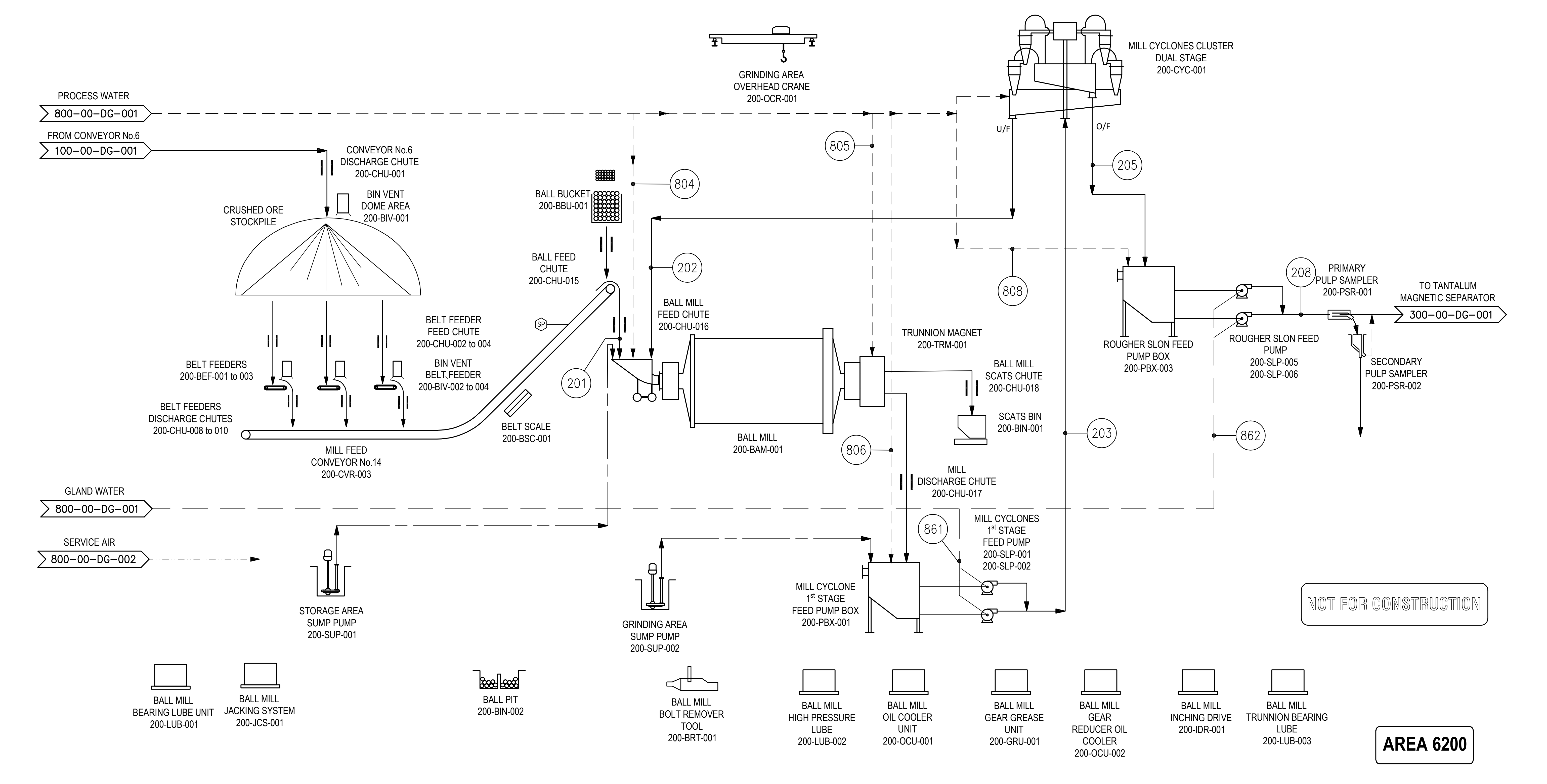
CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
CRUSHING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 2/2

DRAWING NO.: C20204 (PROJECT) | 100 (AREA) - 00 (DISC.) - DG (TYPE) - 002 (SEQ.) | D (REV.)



Stream Description	Units	Fresh feed from stockpile		Cyclone 2 underflow		Stage 1 Cyclone feed		Cyclone 1 underflow		Cyclone 1 overflow		Feed to rougher magnetic separation		Ball mill feed water	
Stream No.		**201**		**202**		**203**		**204**		**205**		**208**		**804**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	204	227	510	567	715	793	515	571	200	222	204	227		
Mass Solution	t/h	11	12	170	189	561	623	172	190	390	433	497	552	97	108
Mass Slurry	t/h	215	239	681	755	1276	1416	686	761	590	655	701	778		
Volume Solution	m3/h	11	12	170	189	561	623	172	190	390	433	497	552	97	108
Volume Slurry	m3/h	86	96	357	396	823	914	360	400	463	514	572	635		
Solids	Sp. Gr.	2,71		2,74		2,73		2,73		2,73		2,73			
Slurry	Sp. Gr.	2,50		1,91		1,55		1,91		1,27		1,23			
Percent solids	wt%	95%		75%		56%		75%		34%		29%			
Pressure	kPag														330
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

Stream Description	Units	Ball mill trommel water		Stage 1 cyclone feed dilution water		Stage 2 cyclone feed pump box dilution water		Rougher Magnetic Separator Pump Box		Gland water 200-SLP-001/002		Gland water 200-SLP-005/006		Gland water 200-SLP-003/004	
Stream No.		**805**		**806**		**807**		**808**		**861**		**862**		**863**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h														
Mass Solution	t/h	95	106	188	209	106	117	0	0	3,6	4,0	0,7	0,8	0,7	0,8
Mass Slurry	t/h														
Volume Solution	m3/h	95	106	188	209	106	117	0	0	3,6	4,0	0,7	0,8	0,7	0,8
Volume Slurry	m3/h														
Solids	Sp. Gr.														
Slurry	Sp. Gr.														
Percent solids	wt%														
Pressure	kPag		330		330		330		330		160		160		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Intermittent		Continuous		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

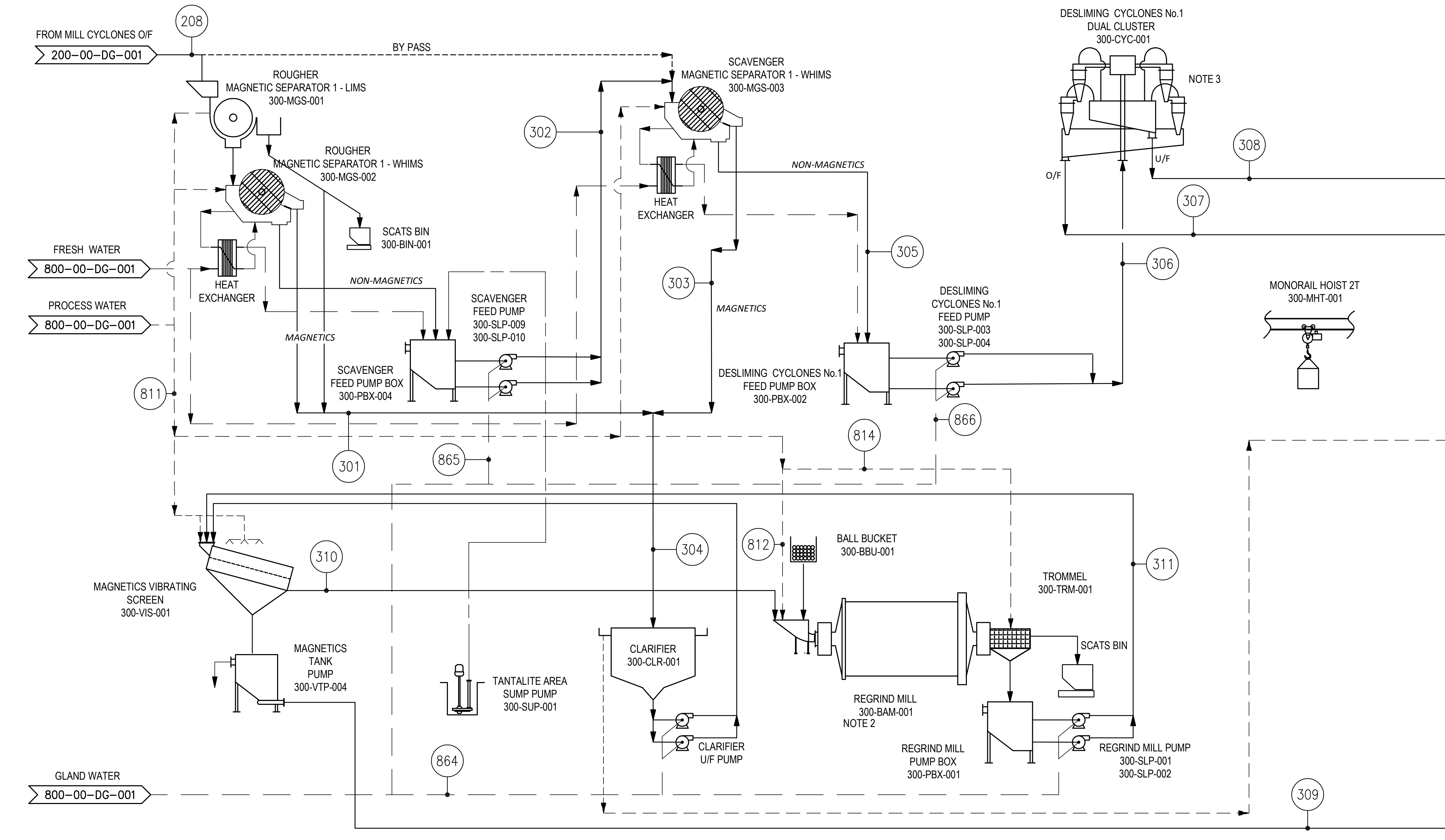
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
STORAGE AND GRINDING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

PROJECT	DRAWING No.: AREA	DISC.	TYPE	SEQ.	REV.
C20204	200	00	DG	001	D

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENIERIE\PROJETS EN COURS\CRITICAL ELEMENT – Rose\C20206 – FS 2022 update\Andy Fortin\PFD\PFD 04 JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (20 SEPT).dwg



NOTES :
1. WATER LINE FOR START-UP / SHUTDOWN. FLOW IS ZERO DURING NORMAL OPERATIONS
2. CIRCULATING LOAD IS 125%
3. TO BE CONFIRMED DURING DETAIL ENGINEERING IF ONE OR TWO STAGES CYCLONES ARE REQUIRED

AREA 6300

NOT FOR CONSTRUCTION

Stream Description	Units	Rougher magnetic concentrate		Rougher non-magnetics		Scavenger magnetic concentrate		Combined magnetic Tantalum concentrate		Non-magnetics to desliming cyclone pump		Desliming cyclone feed	
Stream No.		**301**		**302**		**303**		**304**		**305**		**306**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	1,1	1,2	203	225	0,7	0,8	1,8	2,0	202	225	202	225
Mass Solution	t/h	0,1	0,1	497	551	0,1	0,1	0,2	0,2	497	551	497	551
Mass Slurry	t/h	1,2	1,3	700	777	0,8	0,9	2,0	2,2	699	776	699	776
Volume Solution	m3/h	0	0	497	551	0	0	0	0	497	551	497	551
Volume Slurry	m3/h	0,4	0,5	571	634	0,3	0,3	0,7	0,8	571	634	571	634
Solids	Sp. Gr.	3,72		2,72		3,72		3,72		2,72		2,72	
Slurry	Sp. Gr.	2,92		1,23		2,92		2,92		1,22		1,22	
Percent solids	wt%	90%		29%		90%		90%		29%		29%	
Pressure	kPag				265								381
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

Stream Description	Units	Desliming I cyclone overflow		Desliming I cyclone underflow to Mica flotation		Screen Fines to Magnetics Silo		Screen Oversize		Regrind Recirc.		Water to Screen (2 connections)	
Stream No.		**307**		**308**		**309**		**310**		**311**		**811**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	11	12	191	212	2	2	2,2	2,5	2,2	2,5		
Mass Solution	t/h	267	297	230	255	5	6	0,4	0,4	1,8	2,0	4	4
Mass Slurry	t/h	278	309	421	467	7	8	2,6	2,9	4,1	4,5		
Volume Solution	m3/h	267	297	230	255	5	6	0	0	2	2	4	4
Volume Slurry	m3/h	271	301	300	333	6	6	1,0	1,1	2,4	2,7		
Solids	Sp. Gr.	2,69		2,72		2,60		3,72		3,72			
Slurry	Sp. Gr.	1,03		1,40		1,22		2,64		1,67			
Percent solids	wt%	4%		45%		25%		85%		55%			
Pressure	kPag						229				223		330
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

Stream Description	Units	Water to Regrind		Water to Trommel		Gland water 300-SLP-001/002		Gland water 300-SLP-009/010		Gland water 300-SLP-003/004	
Stream No.		**812**		**814**		**864**		**865**		**866**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h										
Mass Solution	t/h	0	1	1	1	0,7	0,8	0,7	0,8	0,7	0,8
Mass Slurry	t/h										
Volume Solution	m3/h	0	1	1	1	0,7	0,8	0,7	0,8	0,7	0,8
Volume Slurry	m3/h										
Solids	Sp. Gr.										
Slurry	Sp. Gr.										
Percent solids	wt%										
Pressure	kPag		330		330		160		160		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
E	2023-09-18	FOR FS					
D	2023-02-24	FOR FEED					
C	2022-12-09	FOR FEED	MC				
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

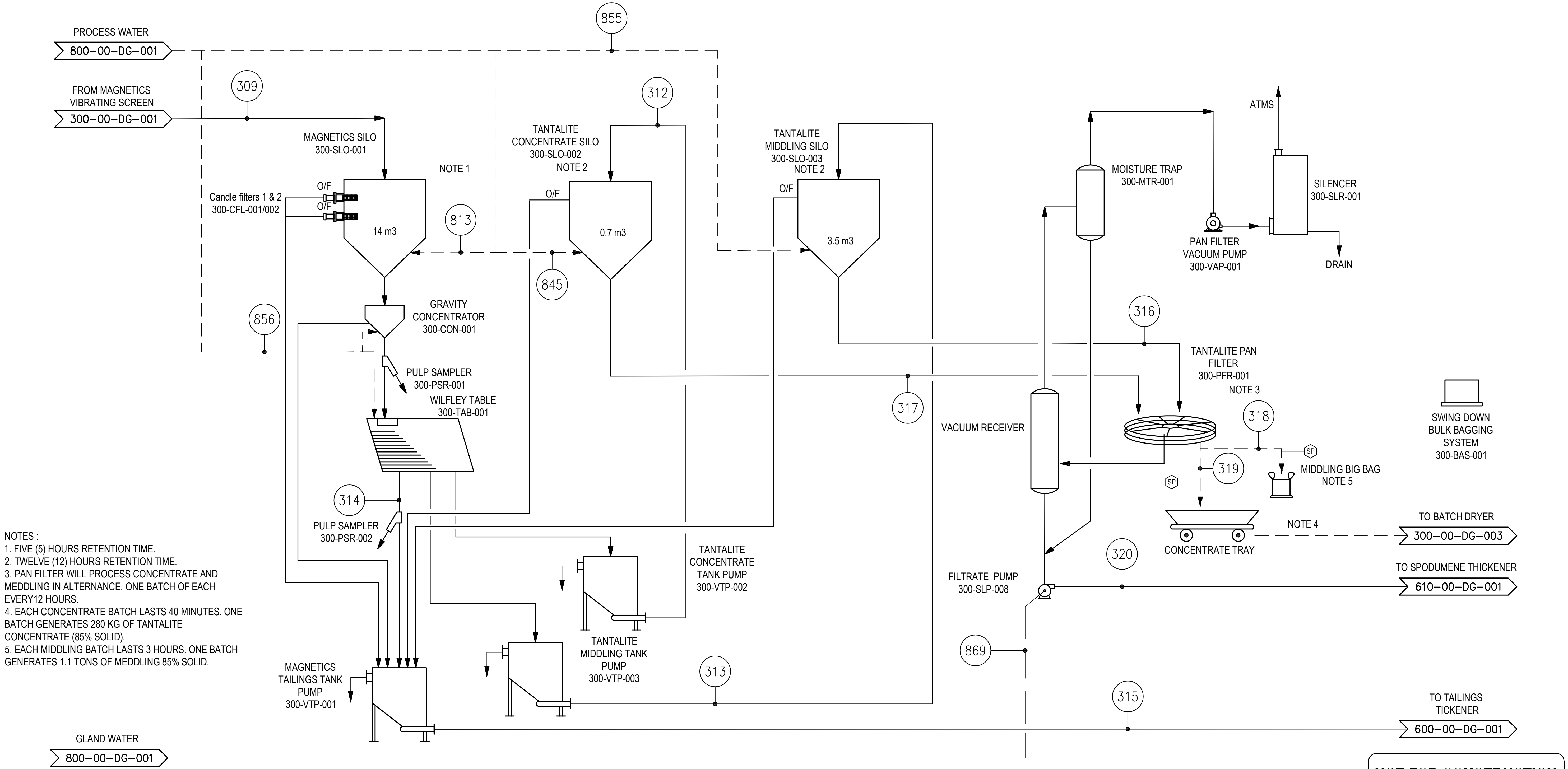
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM TANTALITE AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/3

DRAWING NO.: C20204 (PROJECT) 300 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) E (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20206 - FS 2022 update\Andy Fortin\PFD\PFD 04 JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (20 SEPT).dwg



NOTES :
1. FIVE (5) HOURS RETENTION TIME.
2. TWELVE (12) HOURS RETENTION TIME.
3. PAN FILTER WILL PROCESS CONCENTRATE AND MEDDLING IN ALTERNANCE. ONE BATCH OF EACH EVERY12 HOURS.
4. EACH CONCENTRATE BATCH LASTS 40 MINUTES. ONE BATCH GENERATES 280 KG OF TANTALITE CONCENTRATE (85% SOLID).
5. EACH MIDDLING BATCH LASTS 3 HOURS. ONE BATCH GENERATES 1.1 TONS OF MEDDLING 85% SOLID.

NOT FOR CONSTRUCTION

Stream Description	Units	Wilfley Concentrate		Wilfley Middling		Wilfley Tailings		Tailings To tailings thickener		Middling to Filter		Concentrate to Filter		Middling Product	
Stream No.		**312**		**313**		**314**		**315**		**316**		**317**		**318**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	0,02	0,02	0,1	0,1	1,7	1,9	2	2	0,3	0,3	0,4	0,4	0,3	0,3
Mass Solution	t/h	0,04	0,05	0,2	0,2	6,8	7,5	10	12	0,9	1,0	0,9	1,0	0,1	0,1
Mass Slurry	t/h	0,06	0,07	0,3	0,3	8,5	9,4	12	13	1,2	1,3	1,3	1,4	0,4	0,4
Volume Solution	m3/h	0	0	0	0	7	8	10	12	1	1	1	1	0	0
Volume Slurry	m3/h	0,05	0,05	0,2	0,3	7,4	8,3	11	12	1,0	1,1	1,0	1,1	0,1	0,1
Solids	Sp. Gr.	4,50		4,00		2,60		2,60		4,00		4,50		4,00	
Slurry	Sp. Gr.	1,30		1,23		1,14		1,09		1,23		1,30		2,76	
Percent solids	wt%	30%		25%		20%		14%		25%		30%		85%	
Pressure	kPag		222		194				237						
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Batch		Batch		Batch	

Stream Description	Units	Wet Concentrate		Filtrate - Middling		Water to Magnetics Silo		Water to concentrate Silo		Water to Middling Silo		Water to Wilfley Table & Knelson		Gland water 300-SLP-008	
Stream No.		**319**		**320**		**813**		**845**		**855**		**856**		**869**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	0,4	0,4	0,0	0,0										
Mass Solution	t/h	0,1	0,1	0,8	0,9	1	1	0	0	0	0	4	5	0,7	0,8
Mass Slurry	t/h	0,5	0,5	0,8	0,9										
Volume Solution	m3/h	0	0	1	1	1	1	0	0	0	0	4	5	0,7	0,8
Volume Slurry	m3/h	0,2	0,2	0,8	0,9										
Solids	Sp. Gr.	4,50		0,00											
Slurry	Sp. Gr.	2,95		1,00											
Percent solids	wt%	85%		0%											
Pressure	kPag						330		330		330		330		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Batch		Batch		Continuous		Intermittent		Intermittent		Continuous		Continuous	

AREA 6300

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
E	2023-09-18	FOR FS					
D	2023-02-24	FOR FEED					
C	2022-12-09	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

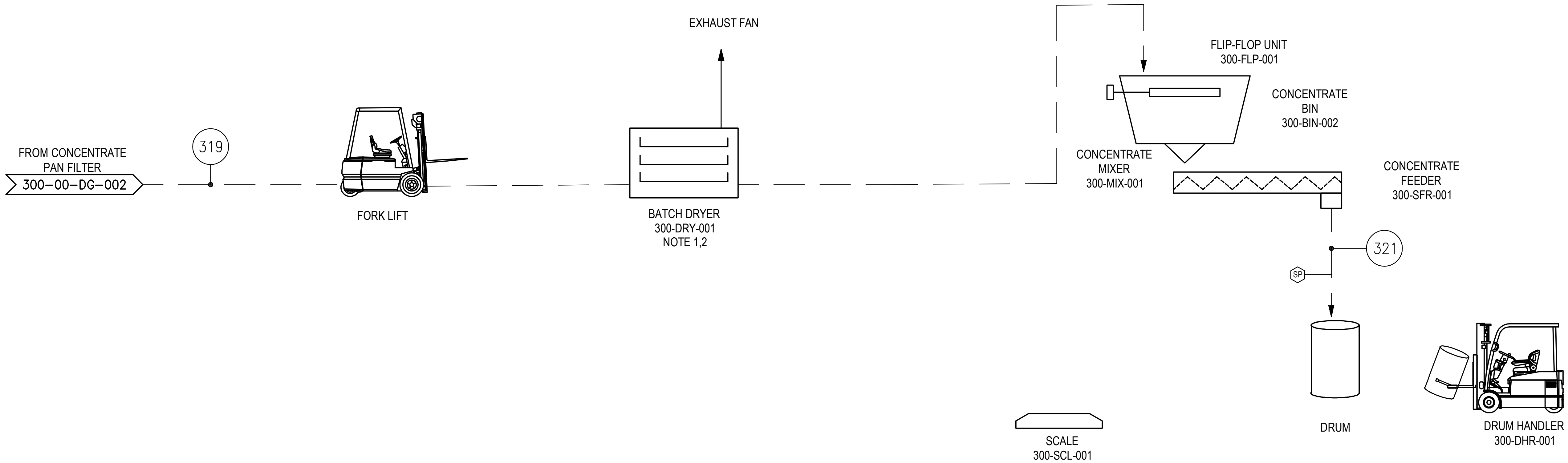
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
TANTALITE AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 2/3

DRAWING NO.: C20204 (PROJECT) 300 (AREA) - 00 (DISC.) - DG (TYPE) - 002 (SEQ.) E (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENIERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20206 - FS 2022 update\Andy Fortin\PFD\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD N43101- Rev.D (20 SEPT).dwg



NOTES :
1. TWO (2) BATCHES OR TRAYS PER DAY
2. ONE TRAY (OR ONE BATCH) OF WET CONCENTRATE IN THE DRYER PRODUCES 240 kg OF DRY CONCENTRATE (480 kg PER DAY).

AREA 6300

NOT FOR CONSTRUCTION

Stream Description		Pan filter concentrate outlet		Tantalite concentrate product to drum	
Stream No.		**319**		**321**	
Mass Solids	t/h	0.4	0.4	0.4	0.4
Mass Solution	t/h	0.06	0.07	0.004	0.004
Mass Slurry	t/h	0.41	0.46	0.4	0.4
Volume Solution	m3/h	0.06	0.07	0.004	0.004
Volume Slurry	m3/h	0.14	0.16	0.1	0.1
Solids	Sp. Gr.	4.5		4.5	
Slurry	Sp. Gr.	2.95		4.35	
Percent solids	wt%	85%		99%	
Pressure	kPag				
Temperature	°C				
Notes		Intermittent		Batch	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

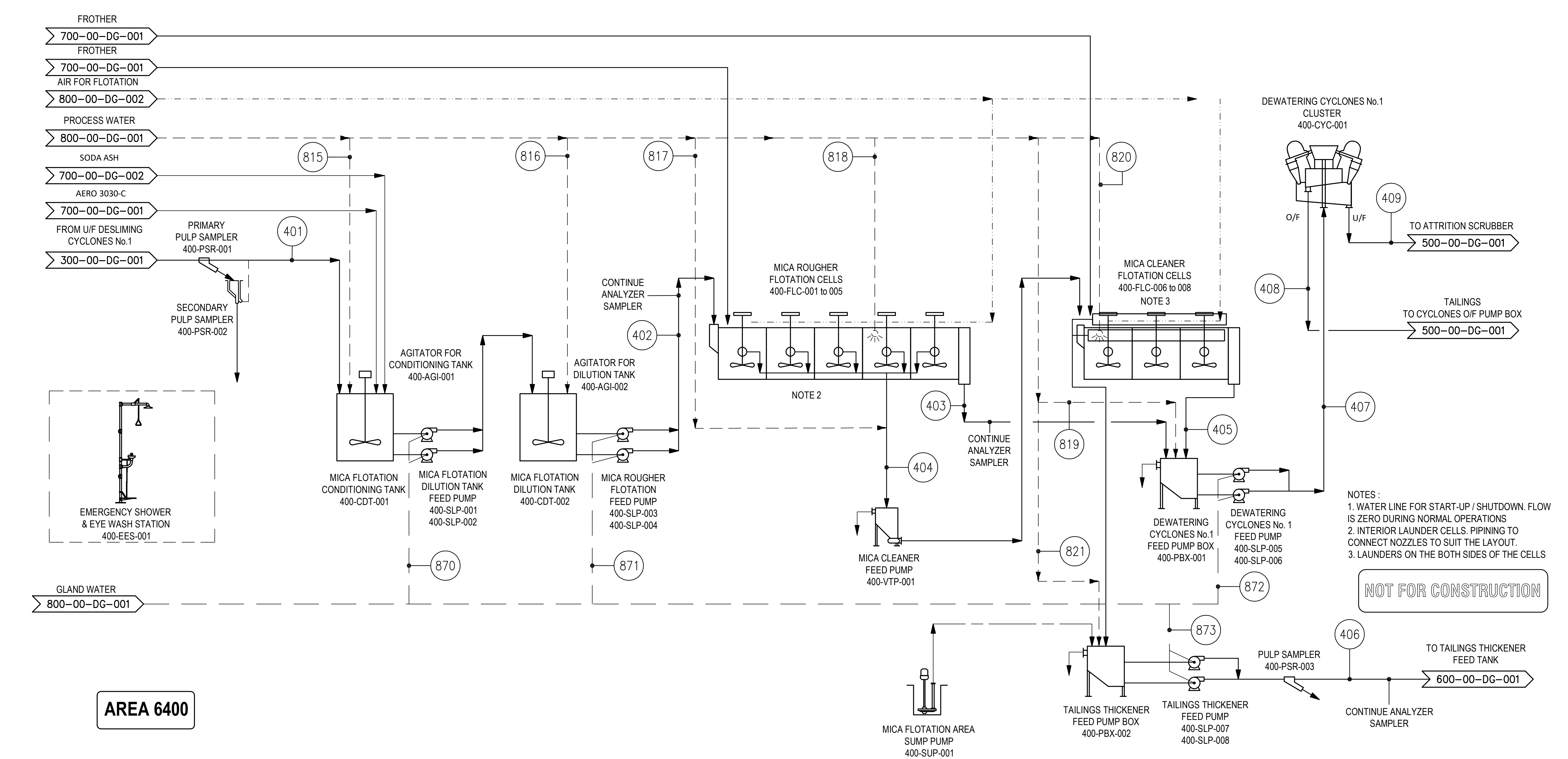
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
TANTALITE AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 3/3

DRAWING NO.: C20204 (PROJECT) 300 (AREA) - 00 (DISC.) - DG (TYPE) - 003 (SEQ.) D (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENIERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20206 - FS 2022 update\Andy Fortin\PFD\PFD 04_JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D [20 SEPT].dwg



Stream Description	Units	Conditionning tank feed		Rougher feed		Rougher tails		Mica rougher concentrate		Cleaner tails		Cleaner concentrate		Cyclone feed	
Stream No.		401		402		403		404		405		406		407	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	191	212	191	212	181	201	10	11	5	5	6	6	186	206
Mass Solution	t/h	230	255	355	394	350	388	17	18	13	14	6	6	363	402
Mass Slurry	t/h	421	467	546	607	531	589	27	30	18	19	11	12	548	609
Volume Solution	m3/h	230	255	355	394	350	388	17	18	13	14	6	6	363	402
Volume Slurry	m3/h	300	333	425	472	416	462	20	22	15	16	8	8	431	478
Solids	Sp. Gr.	2,72		2,72		2,72		2,77		2,78		2,76		2,72	
Slurry	Sp. Gr.	1,40		1,28		1,27		1,32		1,20		1,47		1,27	
Percent solids	wt%	45%		35%		34%		38%		26%		50%		34%	
Pressure	kPag												206		294
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

Stream Description	Units	Cyclone overflow		Cyclone underflow		Conditioning tank dilution water		Rougher feed dilution tank water		Mica cleaner feed pump dilution water		Mica concentrate launder water		Dewatering cyclones no.1 feed pump box water	
Stream No.		408		409		815		816		817		818		819	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	4	4	182	202										
Mass Solution	t/h	302	335	61	67	0	0	126	139	0	0	11	12	0	0
Mass Slurry	t/h	306	339	243	269										
Volume Solution	m3/h	302	335	61	67	0	0	126	139	0	0	11	12	0	0
Volume Slurry	m3/h	303	337	128	142										
Solids	Sp. Gr.	2,52		2,72											
Slurry	Sp. Gr.	1,01		1,90											
Percent solids	wt%	1%		75%											
Pressure	kPag						330		330		330		330		330
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Intermittent		Intermittent		Intermittent		Continuous		Intermittent	

Stream Description	Units	Cleaner concentrate launder water		Tailings thickener feed pump box water		Gland water 400-SLP-001/002		Gland water 400-SLP-003/004		Gland water 400-SLP-005/006		Gland water 400-SLP-007/008		Cyclone feed	
Stream No.		820		821		870		871		872		873		502	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h													182	202
Mass Solution	t/h	2	2	0	0	0,7	0,8	0,7	0,8	0,7	0,8	0,4	0,4	149	165
Mass Slurry	t/h													331	367
Volume Solution	m3/h	2	2	0	0	0,7	0,8	0,7	0,8	0,7	0,8	0,4	0,4	149	165
Volume Slurry	m3/h													216	239
Solids	Sp. Gr.													2,72	
Slurry	Sp. Gr.													1,53	
Percent solids	wt%													55%	
Pressure	kPag		330		330		160		160		160		160		407
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Intermittent		Continuous		Continuous		Continuous		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER ing.	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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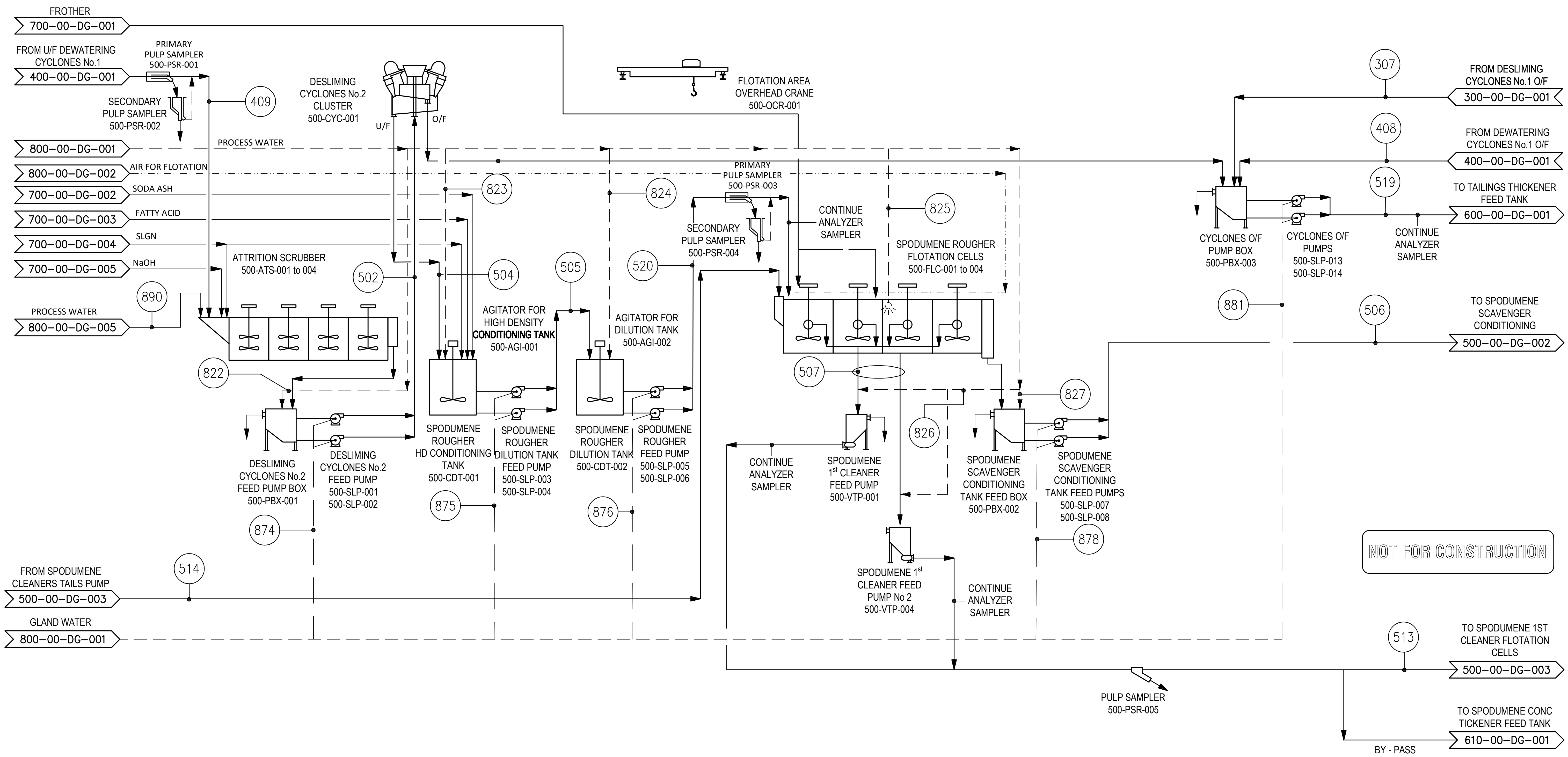
CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
MICA FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20204 (PROJECT) 400 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | D (REV.)



NOTES :
1. WATER LINE FOR START-UP / SHUTDOWN. FLOW IS ZERO DURING NORMAL OPERATIONS

Stream Description	Units	Cyclone feed		Cyclone overflow		Cyclone underflow		HD conditioning tank discharge		Rougher tails		Diluted rougher concentrate		From rougher concentrate + water	
Stream No.		**502**		**503**		**504**		**505**		**506**		**507**		**513**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	182	202	6	7	176	195	176	195	153	170	32	35	32	35
Mass Solution	t/h	149	165	112	125	36	40	128	142	405	450	95	105	95	105
Mass Slurry	t/h	331	367	118	131	213	236	304	337	558	620	127	141	127	141
Volume Solution	m3/h	149	165	112	125	36	40	128	142	405	450	95	105	95	105
Volume Slurry	m3/h	216	239	115	127	101	112	192	213	463	513	105	117	105	117
Solids	Sp. Gr.	2,72		2,65		2,73		2,73		2,66		3,10		3,10	
Slurry	Sp. Gr.	1,53		1,03		2,10		1,58		1,21		1,20		1,20	
Percent solids	wt%	55%		5%		83%		58%		27%		25%		25%	
Pressure	kPag		407						277		273				294
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

Stream Description	Units	Cyclones Overflow total discharge		Dilution Tank discharge		Cyclone feed pump box water		Spodumene Rougher Conditioning tank water		Spodumene Rougher Dilution tank water		Rougher concentrate water		First cleaner feed pump box water no.1	
Stream No.		**519**		**520**		**822**		**823**		**824**		**825**		**826**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	21	23	176	195	0	0								
Mass Solution	t/h	682	757	300	333	42	47	91	101	172	191	74	82	0	0
Mass Slurry	t/h	702	780	476	528	42	47								
Volume Solution	m3/h	682	757	300	333	42	47	91	101	172	191	74	82	0	0
Volume Slurry	m3/h	689	765	364	405	42	47								
Solids	Sp. Gr.	2,65		2,73		0,00									
Slurry	Sp. Gr.	1,02		1,31		1,00									
Percent solids	wt%	4%		37%		0%									
Pressure	kPag		239		330		330		330		330		330		330
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

Stream Description	Units	Spodumene scavenger conditioning feed box		Attrition water addition		Gland water 500-SLP-001/002		Gland water 500-SLP-003/004		Gland water 500-SLP-005/006		Gland water 500-SLP-007/008		Gland water 500-SLP-013/014	
Stream No.		**827**		**890**		**874**		**875**		**876**		**878**		**881**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h														
Mass Solution	t/h	0	0	46	51	0,7	0,8	0,5	0,6	0,7	0,8	0,7	0,8	0,7	0,8
Mass Slurry	t/h														
Volume Solution	m3/h	0	0	46	51	0,7	0,8	0,5	0,6	0,7	0,8	0,7	0,8	0,7	0,8
Volume Slurry	m3/h														
Solids	Sp. Gr.														
Slurry	Sp. Gr.														
Percent solids	wt%														
Pressure	kPag		330		330		160		160		160		160		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Intermittent		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

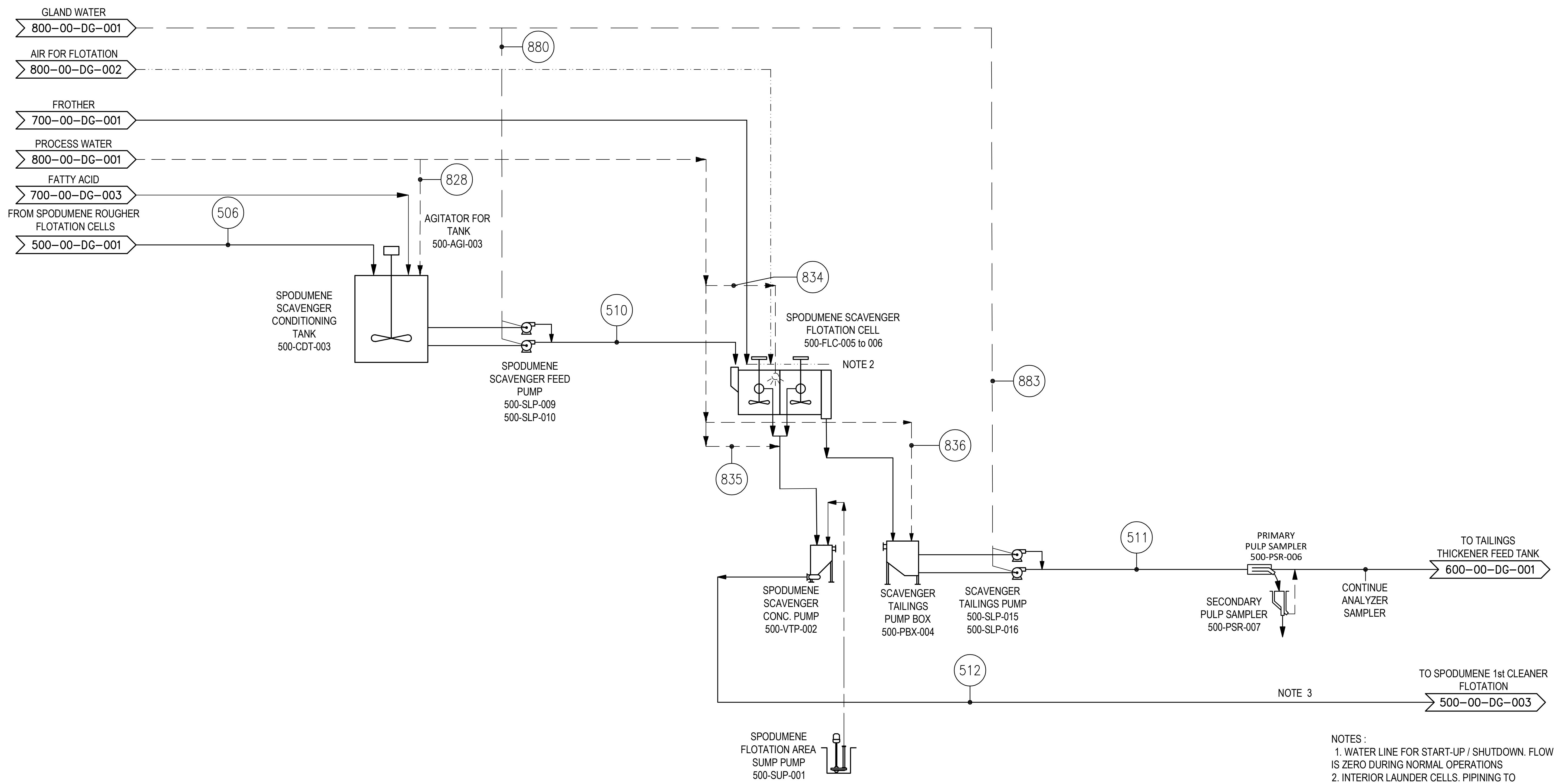
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
SPODUMENE FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/3

DRAWING NO.: C20204 (PROJECT) 500 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) D (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20206 - FS 2022 update\Andy Fortin\PFD\PFD 04 JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (20 SEPT).dwg



NOTES :
1. WATER LINE FOR START-UP / SHUTDOWN. FLOW IS ZERO DURING NORMAL OPERATIONS
2. INTERIOR LAUNDER CELLS. PIPINING TO CONNECT NOZZLES TO SUIT THE LAYOUT.
3. CONSIDER ADDING A BY- PASS TO ROUGHER FLOTATION

Stream Description	Units	Spod. Scavener Conditioning tank		Scavenger tails		Scavenger Concentrate		Spod. Scavenger Conditioning tank water		Scavenger concentrate launder water		Spodumene scavenger conc. Pump dilution water		Scavenger tailings pump box dilution water		Gland water 500-SLP-009/010		Gland water 500-SLP-015/016	
Stream No.		**510**		**511**		**512**		**828**		**834**		**835**		**836**		**880**		**883**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	153	170	151	168	2	2												
Mass Solution	t/h	405	450	402	446	6	7	0	0	3	3	0	0	0	0	0,7	0,8	0,7	0,8
Mass Slurry	t/h	558	620	553	614	8	9												
Volume Solution	m3/h	405	450	402	446	6	7	0	0	3	3	0	0	0	0	0,7	0,8	0,7	0,8
Volume Slurry	m3/h	463	513	459	509	7	8												
Solids	Sp. Gr.	2,66		2,63		2,96													
Slurry	Sp. Gr.	1,21		1,21		1,20													
Percent solids	wt%	27%		27%		25%													
Pressure	kPag		378		309		271		330		330		330		330		160		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Intermittent		Intermittent		Continuous		Continuous	

NOT FOR CONSTRUCTION

AREA 6500

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
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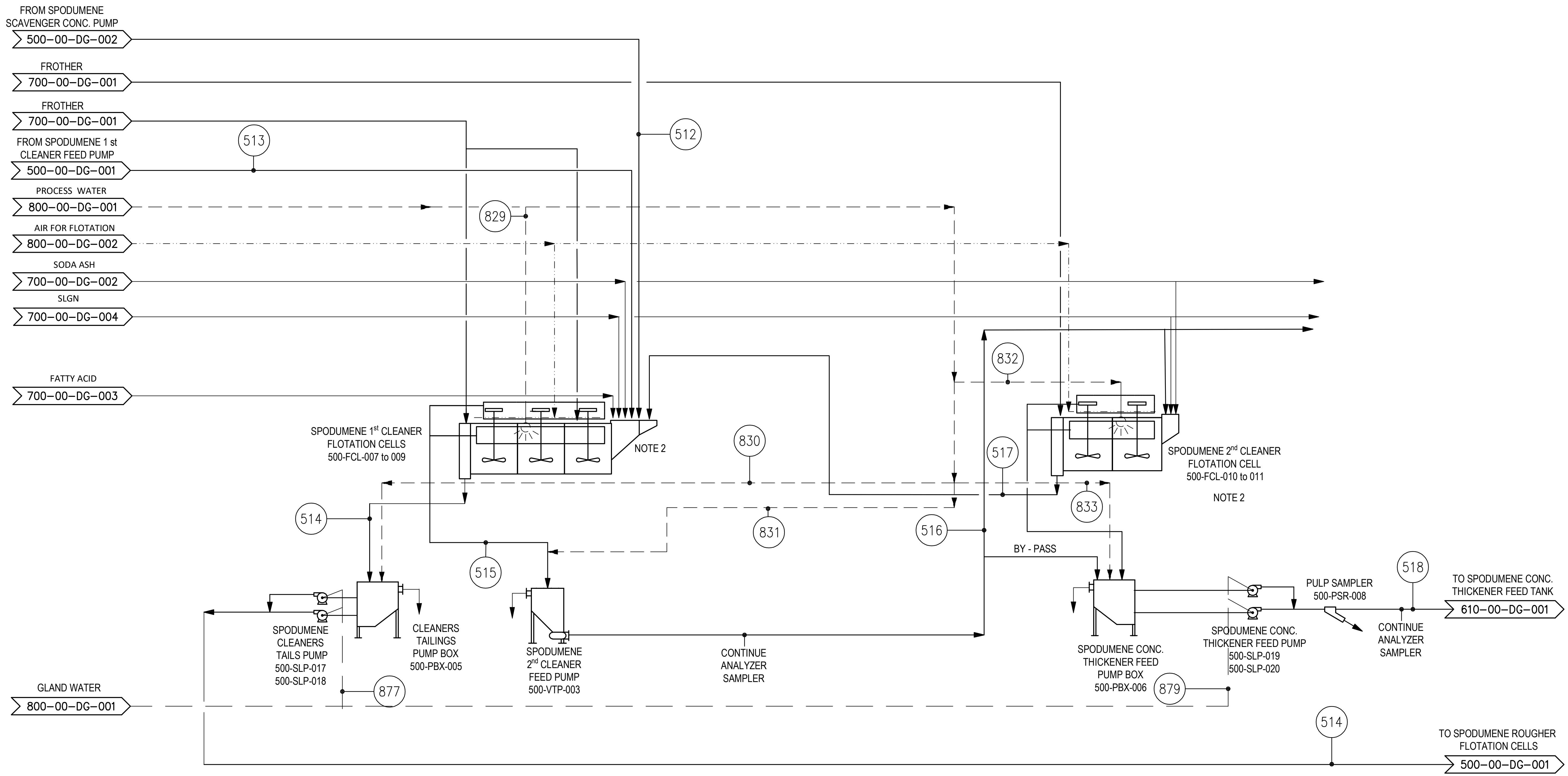
CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
SPODUMENE FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 2/3

DRAWING NO.: C20204 (PROJECT) 500 (AREA) - 00 (DISC.) - DG (TYPE) - 002 (SEQ.) D (REV.)



NOTES:
1. WATER LINE FOR START-UP/ SHUTDOWN. FLOW IS ZERO UNDER NORMAL OPERATIONS
2. LAUNDERS ON THE BOTH SIDES OF THE CELLS. PIPING TO CONNECT NOZZLES TO SUIT THE LAYOUT.

NOT FOR CONSTRUCTION

Stream Description	Units	Spodumene first cleaner tails		First cleaner concentrate		Second cleaner feed		Second cleaner tails		Second cleaner concentrate	
Stream No.		514		515		516		517		518	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	9	9	25	28	25	28	0	0	25	28
Mass Solution	t/h	126	140	31	34	76	84	51	56	30	34
Mass Slurry	t/h	135	150	56	62	101	112	51	56	55	61
Volume Solution	m3/h	126	140	31	34	76	84	51	56	30	34
Volume Slurry	m3/h	129	144	39	43	84	93	51	57	38	43
Solids	Sp. Gr.	2,98		2,98		2,98		2,99		3,13	
Slurry	Sp. Gr.	1,05		1,43		1,20		1,00		1,44	
Percent solids	wt%	6%		45%		25%		1%		45%	
Pressure	kPag						293				258
Temperature	°C		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous	

Stream Description	Units	First cleaner concentrate launder water		Cleaner tailings pump box water		Second cleaner feed pump box water		Second cleaner concentrate launder water		Spodumene Conc. Thickener feed box water		Gland water 500-SLP-017/018		Gland water 500-SLP-019/020	
Stream No.		829		830		831		832		833		877		879	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h														
Mass Solution	t/h	6	6	0	0	45	50	6	6	0	0	0,4	0,4	0,4	0,4
Mass Slurry	t/h														
Volume Solution	m3/h	6	6	0	0	45	50	6	6	0	0	0,4	0,4	0,4	0,4
Volume Slurry	m3/h														
Solids	Sp. Gr.														
Slurry	Sp. Gr.														
Percent solids	wt%														
Pressure	kPag		330		330		330		330		330		160		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Intermittent		Continuous		Continuous		Intermittent		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS	
C	2023-02-24	FOR FEED	
B	2022-11-25	FOR FEED	MC
A	2022-10-24	FOR HAZOP	MC

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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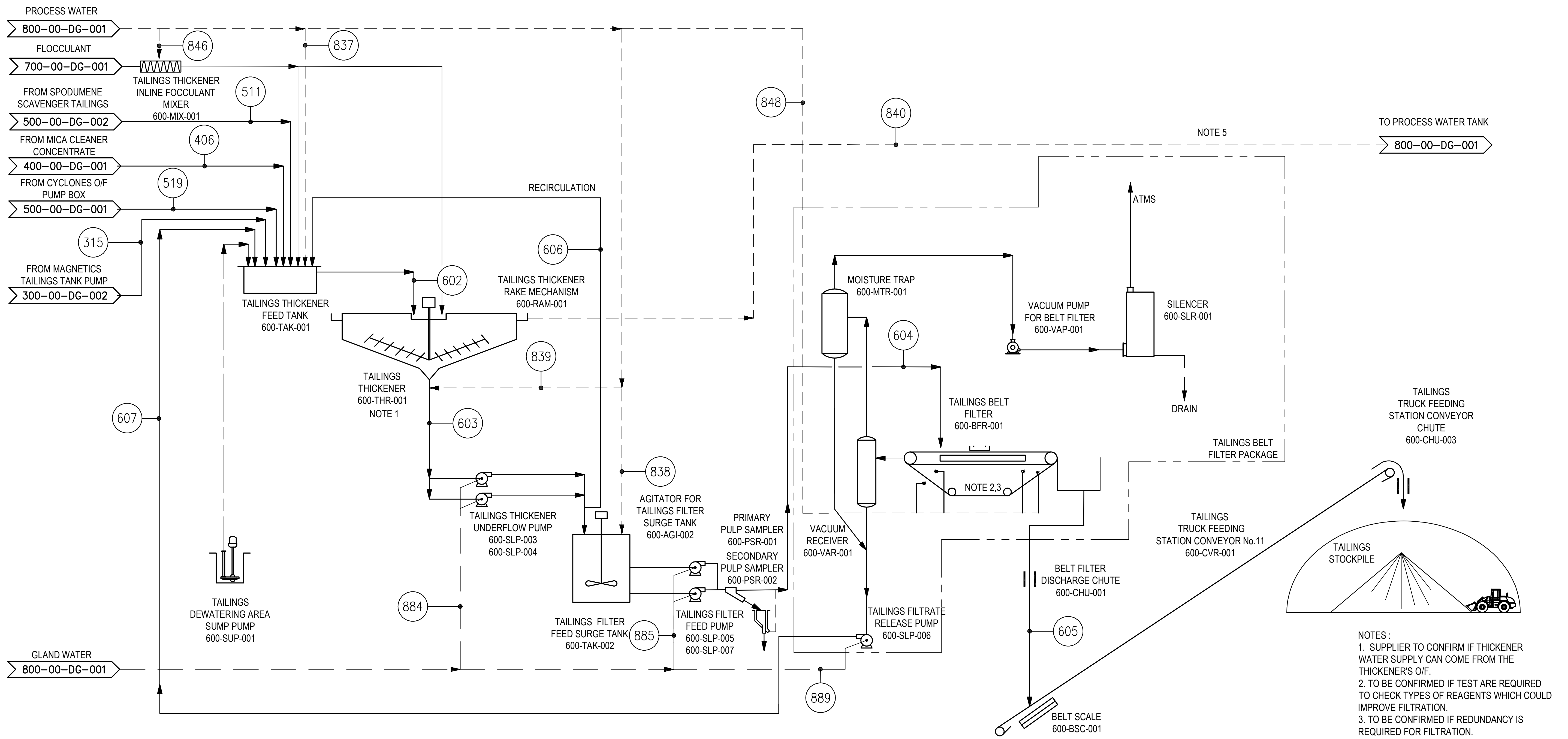
CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
SPODUMENE FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 3/3

DRAWING NO.: C20204 (PROJECT) 500 (AREA) - 00 (DISC.) - DG (TYPE) - 003 (SEQ.) | D (REV.)



NOTES :
1. SUPPLIER TO CONFIRM IF THICKENER WATER SUPPLY CAN COME FROM THE THICKENER'S O/F.
2. TO BE CONFIRMED IF TEST ARE REQUIRED TO CHECK TYPES OF REAGENTS WHICH COULD IMPROVE FILTRATION.
3. TO BE CONFIRMED IF REDUNDANCY IS REQUIRED FOR FILTRATION.
4. WATER LINE FOR START-UP / SHUTDOWN. FLOW IS ZERO UNDER NORMAL OPERATIONS.
5. NEED FOR COAGULANT AND/OR CLARIFIER TO BE CONFIRMED THROUGH TEST OR AFTER START UP.
6. LOCATION PLANNED FOR FUTURE ADDITIONAL BELT FILTER

Stream Description	Units	Tailings thickener feed (without recir.)		Tailings thickener underflow		Tailings filter feed		Tailings for dry stacking		Thickener Recirculation		Tailings filtrate to tailings thickener		Thickener Dilution water	
Stream No.		**602**		**603**		**604**		**605**		**606**		**607**		**837**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	179	199	179	199	179	199	179	199	0	0	0	0		
Mass Solution	t/h	1220	1355	119	132	141	156	32	35	0	0	111	123	0	0
Mass Slurry	t/h	1390	1553	298	331	320	355	210	234	0	0	111	123		
Volume Solution	m3/h	1220	1355	119	132	141	156	32	35	0	0	111	123	0	0
Volume Slurry	m3/h	1278	1429	187	208	208	231	99	110	0	0	111	123		
Solids	Sp. Gr.	2,64		2,64		2,64		2,64		2,64		2,67			
Slurry	Sp. Gr.	1,09		1,59		1,53		2,12		0,00		1,00			
Percent solids	wt%	13%		60%		56%		85%		60%		0%			
Pressure	kPag						312				312				330
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Intermittent		Continuous		Intermittent	

Stream Description	Units	Tailings holding tank dilution water		Thickener u/f water connection		Tailings thickener overflow to process water tank		Inline flocculant mixer dilution water - tailings		Tailings belt filter wash water		Gland water 600-SLP-003/004		Gland water 600-SLP-005/007		Gland water 600-SLP-006	
Stream No.		**838**		**839**		**840**		**846**		**848**		**884**		**885**		**889**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h																
Mass Solution	t/h	21	24	0	0	1101	1222	10	11	2	2	0,5	0,6	0,5	0,6	0,5	0,6
Mass Slurry	t/h																
Volume Solution	m3/h	21	24	0	0	1101	1222	10	11	2	2	0,5	0,6	0,5	0,6	0,5	0,6
Volume Slurry	m3/h																
Solids	Sp. Gr.																
Slurry	Sp. Gr.																
Percent solids	wt%																
Pressure	kPag		330		330		120		330		330		160		160		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Intermittent		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

AREA 6600

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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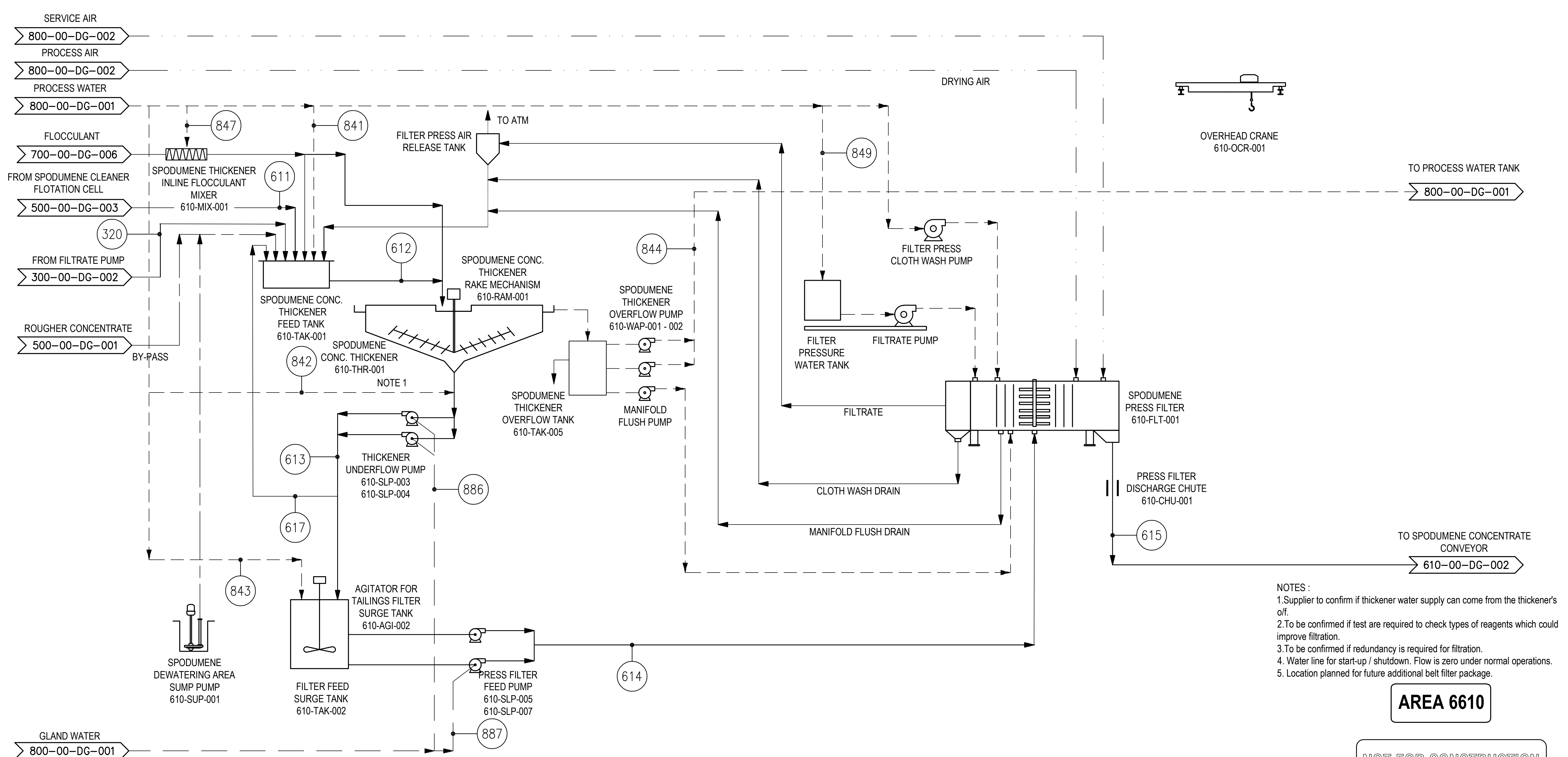
CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
TAILINGS DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20204 (PROJECT) 600 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) D (REV.)



NOTES :
1. Supplier to confirm if thickener water supply can come from the thickener's o/f.
2. To be confirmed if test are required to check types of reagents which could improve filtration.
3. To be confirmed if redundancy is required for filtration.
4. Water line for start-up / shutdown. Flow is zero under normal operations.
5. Location planned for future additional belt filter package.

AREA 6610

NOT FOR CONSTRUCTION

Stream Description	Units	Spodumene conc. from second cleaner		Spodumene conc. thickener feed		Spodumene conc. thickener underflow		spodumene conc. Filter feed		Spodumene conc. to dryer		Thickener Recirculation		Spodumene conc. filtrate	
Stream No.		**611**		**612**		**613**		**614**		**615**		**617**		**618**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h	25	28	25	28	25	28	25	28	25	28	0	0	0	0
Mass Solution	t/h	30	34	167	185	13	15	13	15	4	5	0	0	10	11
Mass Slurry	t/h	55	61	192	213	38	43	38	43	29	32	0	0	10	11
Volume Solution	m3/h	30	34	167	185	13	15	13	15	4	5	0	0	10	11
Volume Slurry	m3/h	38	43	175	194	21	24	21	24	12	13	0	0	0	0
Solids	Sp. Gr.	3,13		3,13		3,13		3,13		3,13		3,13		3,13	
Slurry	Sp. Gr.	1,44		1,10		1,79		1,79		2,41		0,00		1,00	
Percent solids	wt%	45%		13%		65%		65%		86%		65%		0%	
Pressure	kPag						360		326						
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Intermittent		Continuous	

Stream Description	Units	Spod. conc. Thickener feed dilution water		Thickener u/f water connection		Filter feed surge tank water		Spod.conc. thickener overflow to process water		Inline flocculant mixer dilution water - spodumene		Tailings belt filter wash water		Gland water 610-SLP-003/004		Gland water 610-SLP-005/007		Gland water 610-SLP-006	
Stream No.		**841**		**842**		**843**		**844**		**847**		**849**		**886**		**887**		**888**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solids	t/h																		
Mass Solution	t/h	125	139	0	0	0	0	153	170	0,3	0,3	1,0	1,1	0,4	0,4	0,4	0,4	0,4	0,4
Mass Slurry	t/h																		
Volume Solution	m3/h	125	139	0	0	0	0	153	170	0,3	0,3	1,0	1,1	0,4	0,4	0,4	0,4	0,4	0,4
Volume Slurry	m3/h																		
Solids	Sp. Gr.																		
Slurry	Sp. Gr.																		
Percent solids	wt%																		
Pressure	kPag		330		330		330		140		330		330		160		160		160
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Intermittent		Intermittent		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS	
C	2023-02-24	FOR FEED	
B	2022-11-25	FOR FEED	MC
A	2022-10-24	FOR HAZOP	MC

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

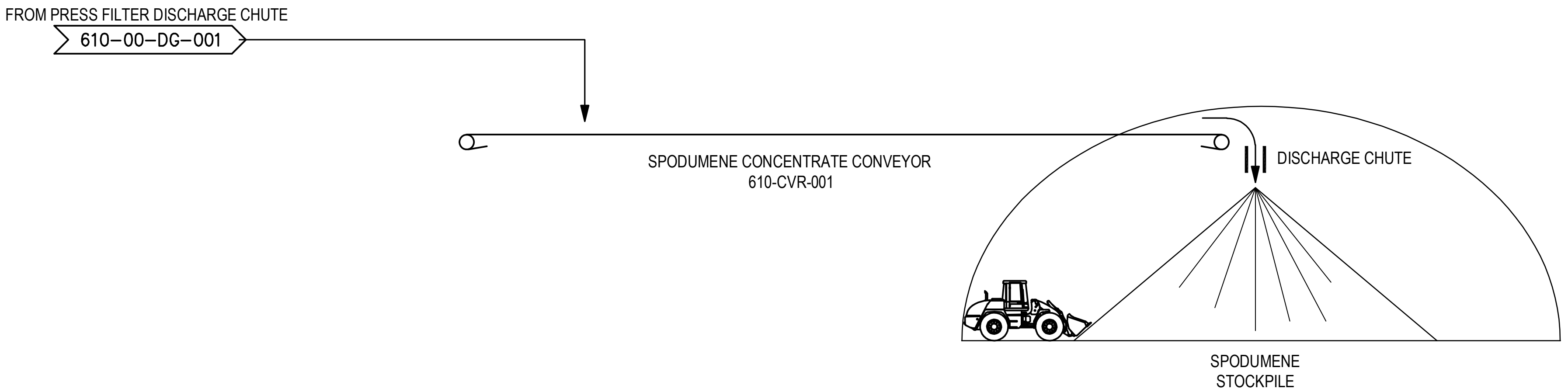
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
SPODUMENE DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/2

PROJECT: C20204 | DRAWING NO.: 610 - 00 - DG - 001 (AREA - DISC. - TYPE - SEQ.) | REV.: D

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENIERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20206 - FS 2022 update\Andy Forfin\PFD\PFD 04. JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (29 SEPT).dwg



AREA 6610

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: Critical Elements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
SPODUMENE DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 2/2

DRAWING NO.: C20204 (PROJECT) 610 (AREA) - 00 (DISC.) - DG (TYPE) - 002 (SEQ.) D (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
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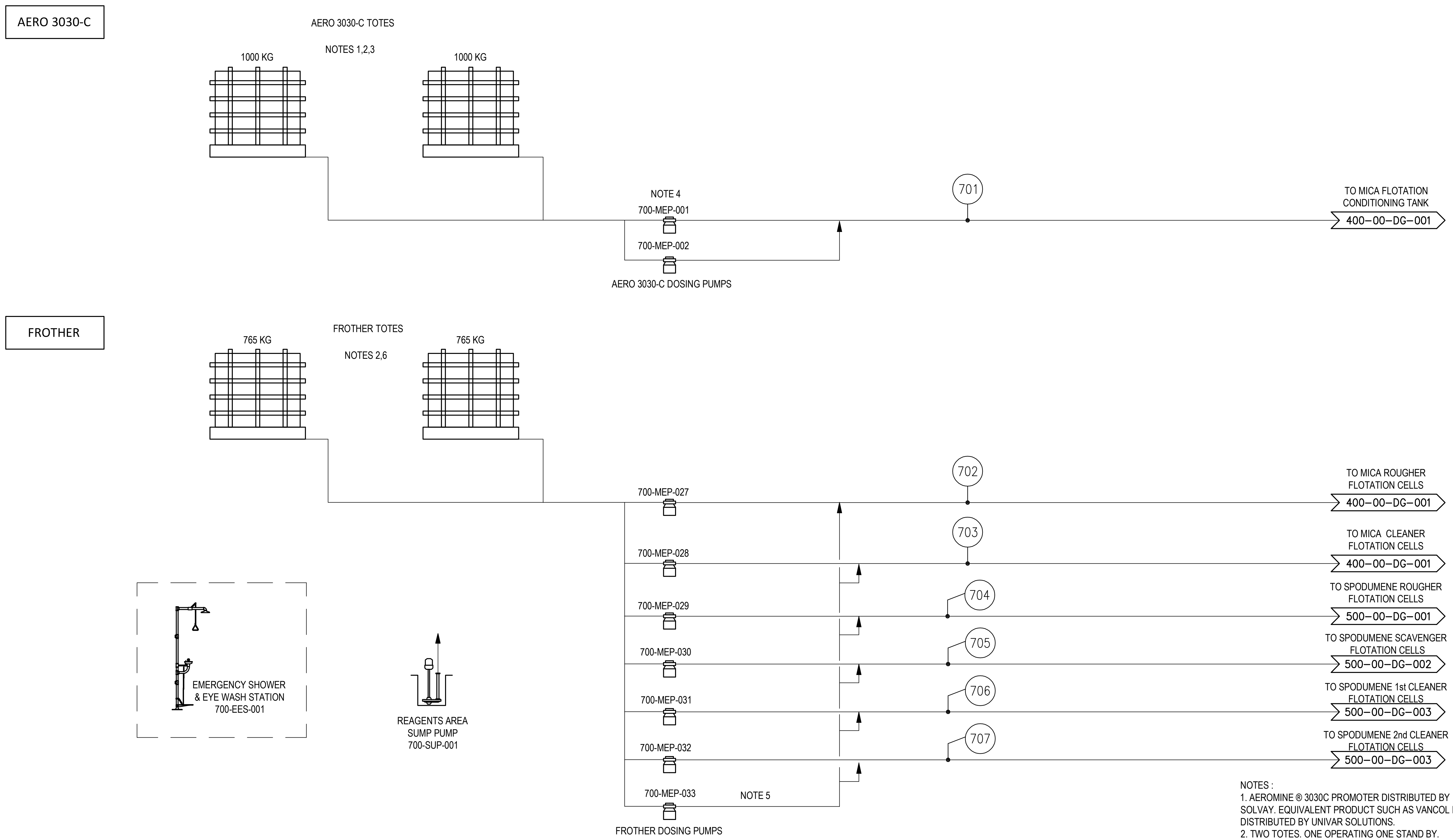

Stream Description	Units	AERO 3030-C distribution		Frother to mica rougher flot cells		Frother to mica cleaner flotation cells		Frother to mica rougher flot cells		Frother to spod. scav. flot. cells		Frother to spod. 1st cleaner flot. cells		Frother to spod. 2nd cleaner flot. cells	
Stream No.		**701**		**702**		**703**		**704**		**705**		**706**		**707**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	kg/h	14	15	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Volume Solution	m3/h	0,01	0	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Specific Gravity		1,03		TBC		TBC		TBC		TBC		TBC		TBC	
Concentration	%	100%		100%		100%		100%		100%		100%		100%	
Pressure	kPag														
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

NOT FOR CONSTRUCTION

NOTES :
1. AEROMINE ® 3030C PROMOTER DISTRIBUTED BY SOLVAY. EQUIVALENT PRODUCT SUCH AS VANCOL IS DISTRIBUTED BY UNIVAR SOLUTIONS.
2. TWO TOTES. ONE OPERATING ONE STAND BY.
3. ANNUAL CONSUMPTION IS 12x1000 KG TOTES.
4. ONE PUMP RUNNING, ONE STAND BY.
5. STAND-BY PUMP.
6.DESIGN BASED ON FROTHER METHYL ISOBUTYL CARBINOL DISTRIBUTED BY UNIVAR SOLUTIONS

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
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CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

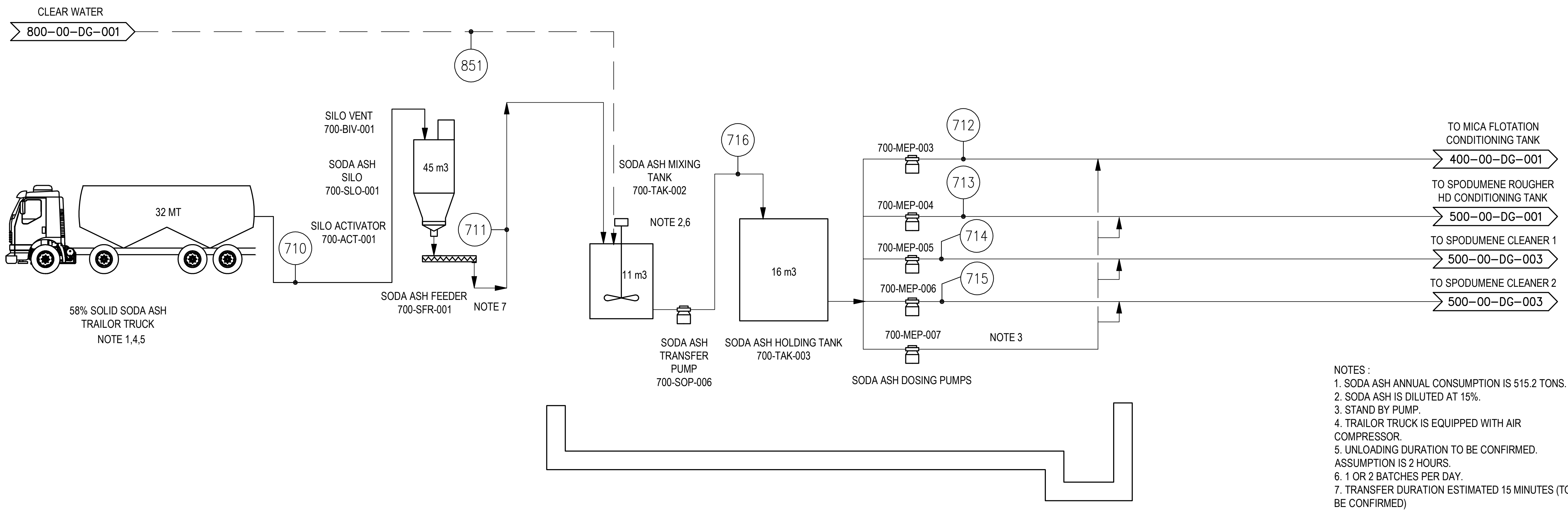
DESCRIPTION:
PROCESS FLOW DIAGRAM
REAGENTS PREPARATION

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/6

DRAWING NO.: C20204 (PROJECT) 700 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | D (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENIERIE\PROJETS EN COURS\CRITICAL ELEMENT – Rose\C20206 – FS 2022 update\Andy Fortin\PFD\PFD 04. JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (20 SEPT).dwg

SODA ASH



NOTES :
1. SODA ASH ANNUAL CONSUMPTION IS 515.2 TONS.
2. SODA ASH IS DILUTED AT 15%.
3. STAND BY PUMP.
4. TRAILOR TRUCK IS EQUIPPED WITH AIR COMPRESSOR.
5. UNLOADING DURATION TO BE CONFIRMED. ASSUMPTION IS 2 HOURS.
6. 1 OR 2 BATCHES PER DAY.
7. TRANSFER DURATION ESTIMATED 15 MINUTES (TO BE CONFIRMED)

NOT FOR CONSTRUCTION

CC	Units	Soda ash unloading		Soda ash added to mixing tank		Soda ash to mica flot. Cond. Tank		Soda ash to spod. Rougher HD cond. tk		Soda ash to spod. cleaner 1		Soda ash to spod. cleaner 2		Soda ash transfered to holding tank		Soda ash dilution water	
Stream No.		**710**		**711**		**712**		**713**		**714**		**715**		**716**		**851**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	kg/h	16000	17760	5646	6267	247	274	122	135	12	13	12	13	31994	35514	7999	8878
Volume Solution	m3/h	15	17	5	6	0,247	0	0,122	0	0,012	0	0,012	0	32	36	8	9
Specific Gravity		1,07		1,07		1		1		1		1		1,0		1,0	
Concentration	%	100%		100%		15%		15%		15%		15%		15%		0%	
Pressure	kPag																
Temperature	°C		-25/20		-25/20		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Intermittent		Intermittent		Continuous		Continuous		Continuous		Continuous		Intermittent		Intermittent	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
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CLIENT: CriticalElements Corporation

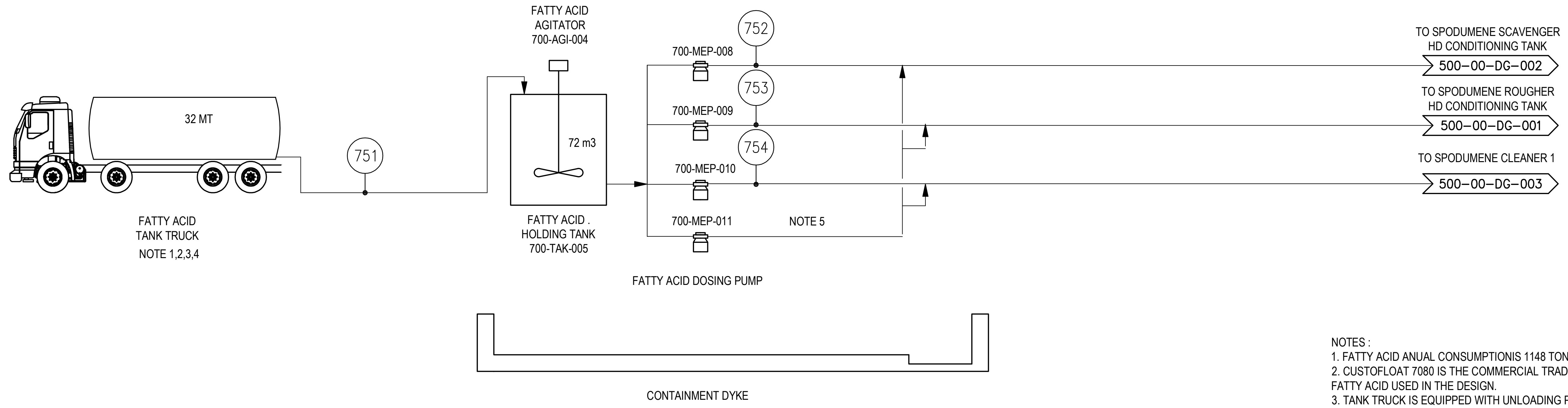
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
REAGENTS PREPARATION

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 2/6

DRAWING NO.: C20204 (PROJECT) 700 (AREA) - 00 (DISC.) - DG (TYPE) - 002 (SEQ.) D (REV.)

FATTY ACID



NOTES :
1. FATTY ACID ANUAL CONSUMPTIONIS 1148 TONS.
2. CUSTOFLOAT 7080 IS THE COMMERCIAL TRADEMARK OF THE FATTY ACID USED IN THE DESIGN.
3. TANK TRUCK IS EQUIPPED WITH UNLOADING PUMP OR WITH AN AIR COMPRESSOR.
4. UNLOADING DURATION TO BE CONFIRMED, ASSUMPTION IS 2 HOURS.
5. STAND BY PUMP.

NOT FOR CONSTRUCTION

Stream Description	Units	Fatty acid unloading		Fatty acid to spod. scav. HD cond. tk		Fatty acid to rougher HD cond.		Fatty acid to spod. cleaner 1	
Stream No.		**751**		**752**		**753**		**754**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	kg/h	16000	17760	51	57	77	86	2	3
Volume Solution	m3/h	18	20	0,06	0	0,09	0	0,003	0,003
Specific Gravity		0,89		0,89		0,89		0,89	
Concentration	%	100%		100%		100%		100%	
Pressure	kPag								
Temperature	°C		-25/20		AMB		AMB		AMB
Notes		Intermittent		Continuous		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: Critical Elements Corporation

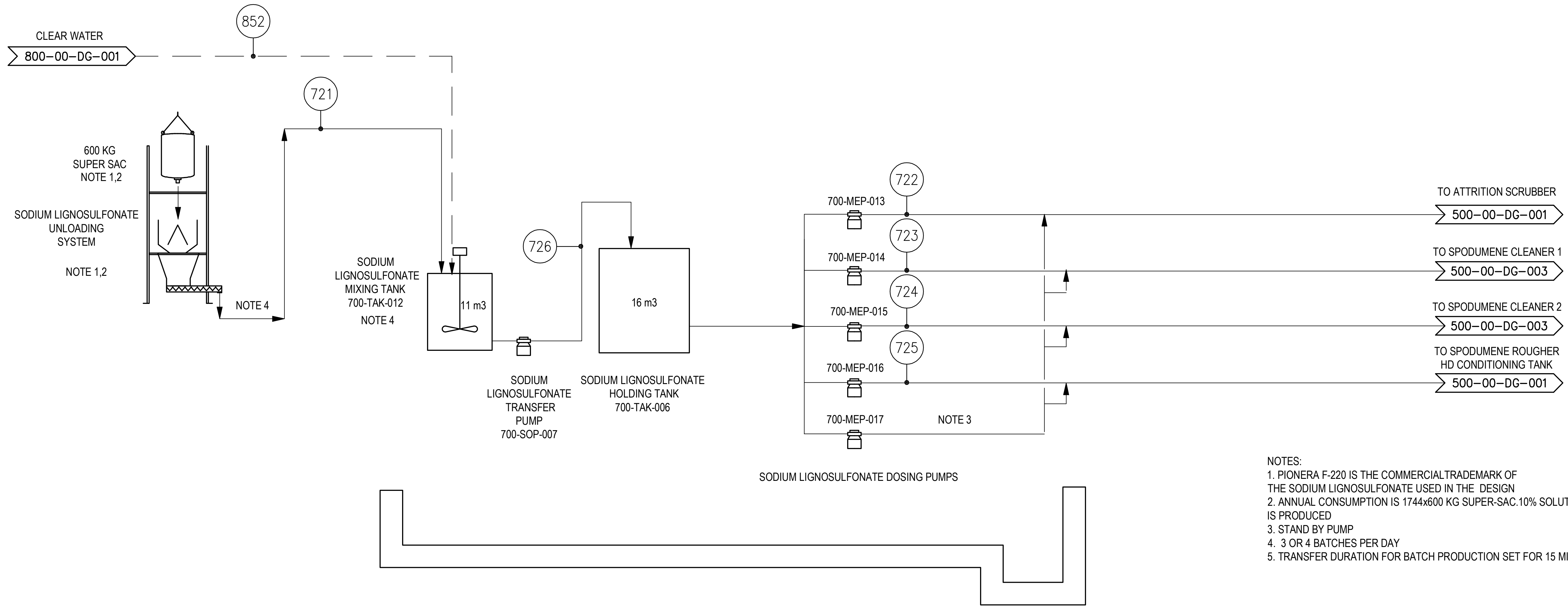
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
REAGENTS PREPARATION

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 3/6

DRAWING NO.: C20204 (PROJECT) 700 (AREA) - 00 (DISC.) - DG (TYPE) - 003 (SEQ.) D (REV.)

SLGN



NOTES:
1. PIONERA F-220 IS THE COMMERCIALTRADEMARK OF THE SODIUM LIGNOSULFONATE USED IN THE DESIGN
2. ANNUAL CONSUMPTION IS 1744x600 KG SUPER-SAC.10% SOLUTION IS PRODUCED
3. STAND BY PUMP
4. 3 OR 4 BATCHES PER DAY
5. TRANSFER DURATION FOR BATCH PRODUCTION SET FOR 15 MINUTES

Stream Description	Units	SLGN feed to mixing tank		SLGN to attrition		SLGN to spod. Cleaner 1		SLGN to spod. Cleaner 2		SLGN to spod. rougher HD cond. tk		SLGN transfered to holding tank		SLGN dilution water	
Stream No.		**721**		**722**		**723**		**724**		**725**		**726**		**852**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	kg/h	3823	4243	460	511	179	199	92	102	460	511	38228	42433	8601	9548
Volume Solution	m3/h	7	8	0,5	0,5	0,2	0,2	0,1	0,1	0,5	0,5	38,2	42	9	10
Specific Gravity		0,56		1		1		1		1		1		1	
Concentration	%	100%		10%		10%		10%		10%		10%		0%	
Pressure	kPag														
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Intermittent		Continuous		Continuous		Continuous		Continuous		Intermittent		Intermittent	

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
E	2023-09-18	FOR FS					
D	2023-02-24	FOR FEED					
C	2022-12-09	FOR FEED	MC				
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

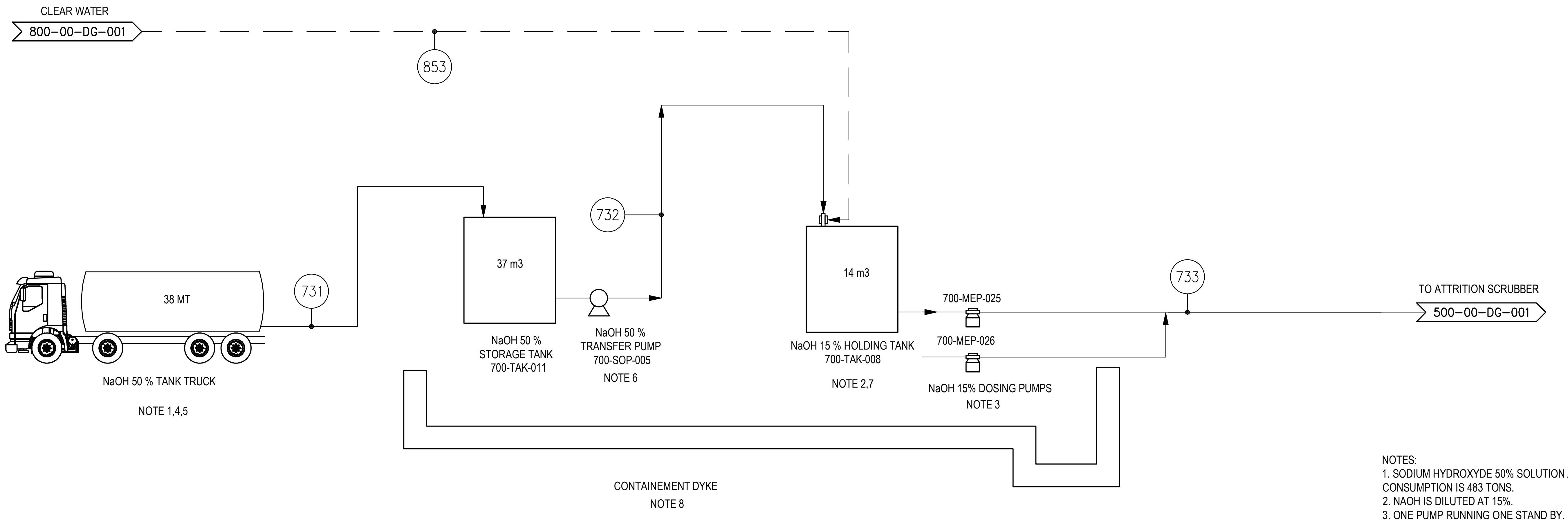
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
REAGENTS PREPARATION

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 4/6

DRAWING NO.: C20204 (PROJECT) 700 (AREA) - 00 (DISC.) - DG (TYPE) - 004 (SEQ.) | E (REV.)

NaOH



NOTES:
1. SODIUM HYDROXYDE 50% SOLUTION ANNUAL CONSUMPTION IS 483 TONS.
2. NAOH IS DILUTED AT 15%.
3. ONE PUMP RUNNING ONE STAND BY.
4. TANK TRUCK IS EQUIPPED WITH UNLOADING PUMP OR WITH AIR COMPRESSOR.
5. UNLOADING DURATION TO BE CONFIRMED ASSUMPTION IS 2 HOURS.
6. TRANSFER DURATION FOR BATCH PRODUCTION SET FOR 15 MINUTES.
7. 1 OR 2 BATCHES PER DAY.
8. DYKE TO BE SIZED TO CONTAIN 110% OF STORAGE TANK VOLUME AND FLOOR TO BE SLOPED TOWARD SUMP

Stream Description	Units	NaOH 50% unloading		NaOH 50% added to mixing tank		NaOH 15% to attrition scubber		NaOH dilution water	
Stream No.		**731**		**732**		**733**		**853**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	kg/h	19000	21090	5293	5875	368	408	6175	6855
Volume Solution	m3/h	12	14	3	4	0,3	0,4	6	7
Specific Gravity		1,53		1,53		1,10		1	
Concentration	%	50%		50%		15%		0%	
Pressure	kPag								
Temperature	°C		-25/20		AMB		AMB		AMB
Notes		Intermittent		Intermittent		Continuous		Intermittent	

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
VERIFY:	F. BARIL, ing	2023-09-18
APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

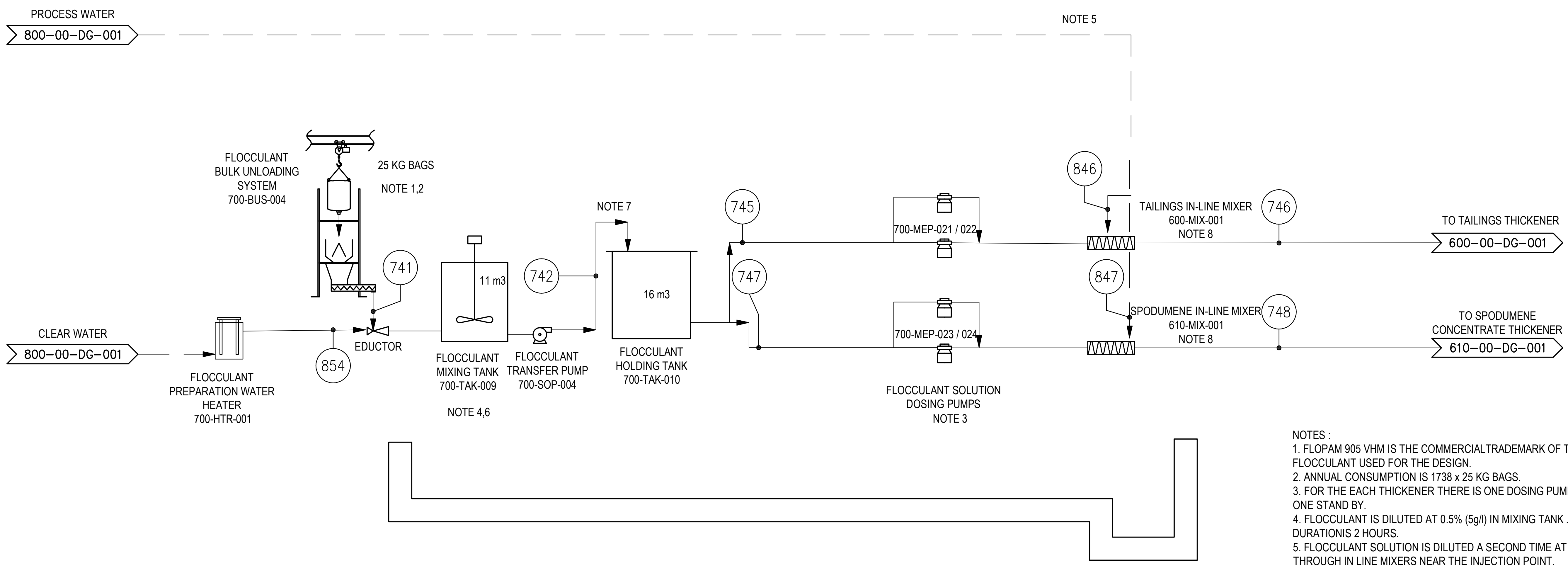
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
REAGENTS PREPARATION

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 5/6

DRAWING NO.: C20204 (PROJECT) 700 (AREA) - 00 (DISC.) - DG (TYPE) - 005 (SEQ.) D (REV.)

FLOCCULANT



NOTES :
1. FLOPAM 905 VHM IS THE COMMERCIALTRADEMARK OF THE FLOCCULANT USED FOR THE DESIGN.
2. ANNUAL CONSUMPTION IS 1738 x 25 KG BAGS.
3. FOR THE EACH THICKENER THERE IS ONE DOSING PUMP RUNNING ONE STAND BY.
4. FLOCCULANT IS DILUTED AT 0.5% (5g/l) IN MIXING TANK . MIXING DURATIONIS 2 HOURS.
5. FLOCCULANT SOLUTION IS DILUTED A SECOND TIME AT 0.05% (0.5g/l) THROUGH IN LINE MIXERS NEAR THE INJECTION POINT.
6. 3 OR 4 BATCHES PER DAY.
7. TRANSFER DURATION FOR BATCH PRODUCTION SET FOR 15 MINUTES.
8. IN-LINE MIXERS ALSO APPEAR ON PFD 600-00-DG-001 AND 610-00-DG-001.

NOT FOR CONSTRUCTION

Stream Description	Units	Dry flocculant		Floc. transfer to holding tank (0.5%)		Floc. to tailings thick. (0.5%)		Floc. to tailings thick. (0.05%)		Floc. to spod. thick. (0.5%)		Floc. to spod. thick. (0.05%)		Inline flocculant mixer dilution water - tailings		Inline flocculant mixer dilution water - spodumene		Flocculant dilution water	
Stream No.		**741**		**742**		**745**		**746**		**747**		**748**		**846**		**847**		**854**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	kg/h	177	197	35292	39175	1068	1186	10730	11910	35	39	349	387	9662	10725	314	349	8823	9794
Volume Solution	l/h	222	246	35292	39175	1068	1186	10730	11910	35	39	349	387	9662	10725	314	349	8823	9794
Specific Gravity		0,80		1		1		1		1		1		1		1		1	
Concentration	%	100%		0,50%		0,50%		0,05%		0,50%		0,05%		0%		0%		0%	
Pressure	kPag																		
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Intermittent		Intermittent		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Intermittent	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-09-18	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-09-18
DRAWN:	D.BOUCHENAK	2023-09-18
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APPROVED:	F. BARIL, ing	2023-09-18

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CLIENT: CriticalElements Corporation

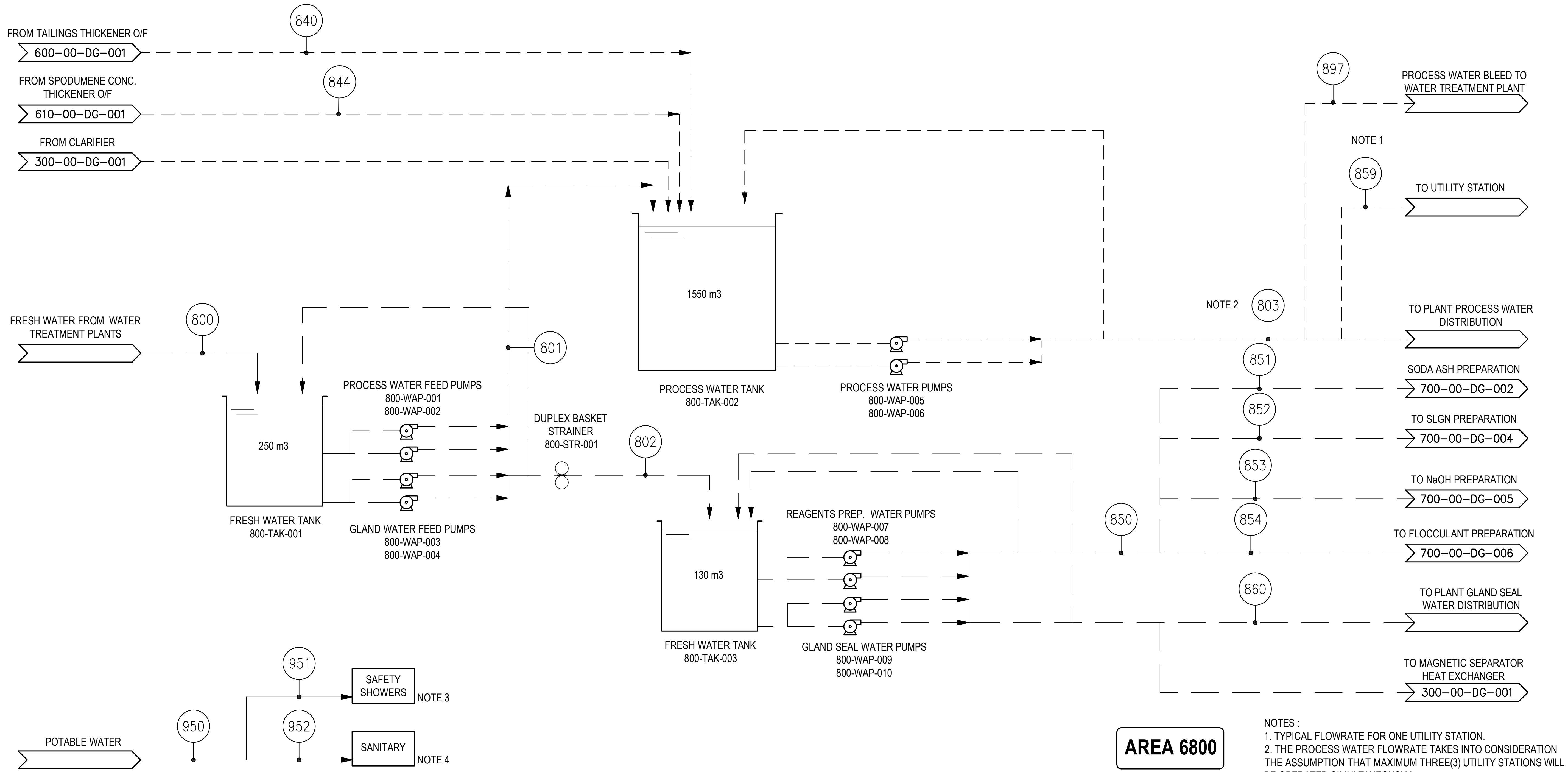
PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
REAGENTS PREPARATION

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 6/6

DRAWING NO.: C20204 (PROJECT) 700 (AREA) - 00 (DISC.) - DG (TYPE) - 006 (SEQ.) | D (REV.)

SAVED ON: 23-09-20 2:26 BY Utilisateur
PATH: Z:\INGENERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20206 - FS 2022 update\Andy Fortin\PFD\PFD 04 JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C2020-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (20 SEPT).dwg



AREA 6800

NOT FOR CONSTRUCTION

NOTES :
1. TYPICAL FLOWRATE FOR ONE UTILITY STATION.
2. THE PROCESS WATER FLOWRATE TAKES INTO CONSIDERATION THE ASSUMPTION THAT MAXIMUM THREE(3) UTILITY STATIONS WILL BE OPERATED SIMULTANEOUSLY.
3. AS PER ANSI 2358.1-1998, ONE SAFETY SHOWER SHALL DELIVER 20 GPM (75.7L/MIN) OR 4.5M3/H) DURING 15 MINUTES. A TOTAL VOLUME OF 1.1M3 OF TEMPERATE WATER MUST BE READILY AVAILABLE.
4. BASED ON 32 PEOPLE AT SITE AT 200 LITERS PER PERSON PER DAY (6400 LITERS/DAY)

Stream Description	Units	Raw water from wells		Raw water to process water tank		Raw water to gland water tank		Process water main distribution		Reagents dilution water		Soda ash dilution water		SLGN dilution water	
Stream No.		**800**		**801**		**802**		**803**		**850**		**851**		**852**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	t/h	25	44	18	20	22	24	1272	1456	16	18	8	9	9	10
Volume Solution	m3/h	25	44	18	20	22	24	1272	1456	16	18	8	9	9	10
Specific Gravity		1		1		1		1		1		1		1	
Pressure	kPag		90		70		70		330		140		140		140
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Continuous		Intermittent		Continuous		Continuous		Intermittent		Intermittent		Intermittent	

Stream Description	Units	NaOH dilution water		Flocculant dilution water		Utility Stations		Main Gland Water Line		Process water bleed		Potable water main distribution		Potable water to safety showers		Potable water to sanitary use	
Stream No.		**853**		**854**		**859**		**860**		**897**		**950**		**951**		**952**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Solution	t/h	6	7	9	10	15	60	19	21	0	0	0-2.5	6.0	0-4.5	4.5	0-2.5	4
Volume Solution	m3/h	6	7	9	10	15	60	19	21	0	0	0-2.5	6	0-4.5	4.5	0-2.5	4
Specific Gravity		1		1		1		1		0		1		1		1	
Pressure	kPag		140		140		330		900								
Temperature	°C		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB
Notes		Intermittent		Intermittent		Intermittent		Continuous		Intermittent		Continuous		Intermittent		Continuous	

REV	DATE	DESCRIPTION	BY
D	2023-07-07	FOR FS	
C	2023-02-24	FOR FEED	
B	2022-11-25	FOR FEED	MC
A	2022-10-24	FOR HAZOP	MC

REV	DATE	DESCRIPTION	BY

DESIGN:	M. CHEVALIER, ing	2023-07-07
DRAWN:	D.BOUCHENAK	2023-07-07
VERIFY:	F. BARIL, ing	2023-07-07
APPROVED:	F. BARIL, ing	2023-07-07

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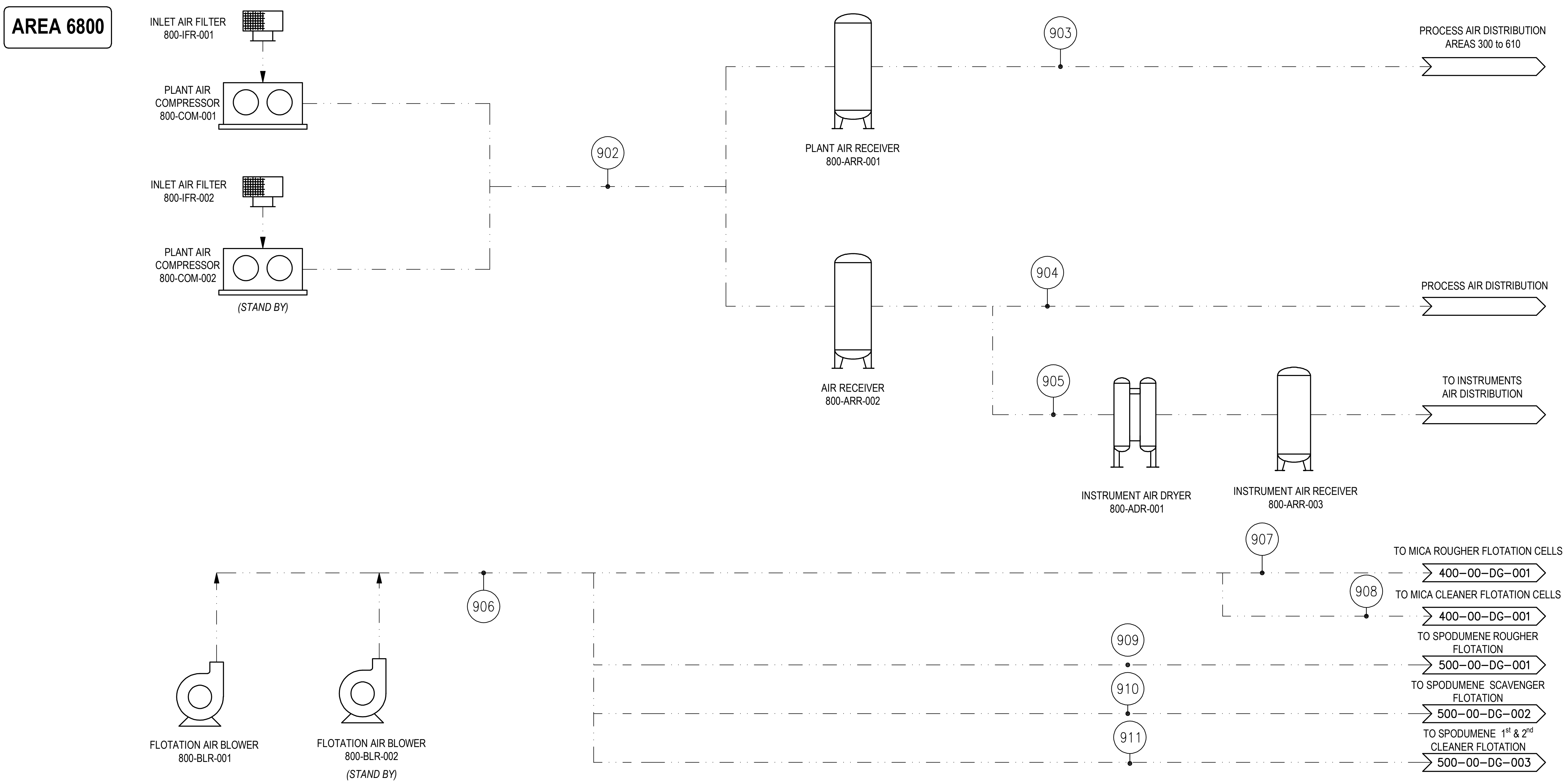
CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
WATER SERVICES

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/2

DRAWING NO.: C20204 (PROJECT) 800 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) D (REV.)



NOT FOR CONSTRUCTION

GENERAL NOTES :

1. Air flowrate based on assmuption that 3 utility stations could be operated simultaneously
2. Flowrate to one utility stations : 170 Nm3/h (normal), 200 Nm3/h (design).
3. Network pressure is 690 kPag (100 psig). Pressure reduced at 600 kPag at utility station.
4. Flowrates to be confirmed with vendor.
5. AIR DENSITY IS :
   1.292 kg/m3 at normal conditions;
   1.225 kg/m3 at standard conditions
   10 kg/m3 at actual conditions (690 kPa)

Stream Description	Units	Main plant compressor		Main plant process air		Process air distribution		Main plant instrument air		Flotation air distribution		Flotation air to mica roughers		Flotation air to mica cleaner		Air to spodumene rougher flotation		Air to spodumene scavenger flotation		Air to spodumene 1st & 2nd cleaner flotation	
Stream No.		**902**		**903**		**904**		**905**		**906**		**907**		**908**		**909**		**910**		**911**	
		Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.	Nom.	Des.
Mass Air	t/h	0,9	1,3	0,7	0,8	0,7	0,8	0	0	14	15	3	4	0	0	5	5	3	3	2	3
Volume Air	Am3/h	99	137	74	87	74	87	25	50	8563	9505	2124	2357	272	302	2973	3300	1699	1886	1495	1660
Density	kg/m3	10		10		10		10		1,6		1,6		1,6		1,6		1,6		1,6	
Pressure	kPag	690		690		690		690		27.6		27.6		27.6		27.6		27.6		27.6	
Temperature	°C	AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB		AMB	
Notes		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous		Continuous	

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
D	2023-07-07	FOR FS					
C	2023-02-24	FOR FEED					
B	2022-11-25	FOR FEED	MC				
A	2022-10-24	FOR HAZOP	MC				

DESIGN:	M. CHEVALIER, ing	2023-07-07
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APPROVED:	F. BARIL, ing	2023-07-07

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CLIENT: CriticalElements Corporation

PROJECT: FEASIBILITY STUDY UPDATE 2023
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
AIR SERVICES

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 2/2

DRAWING NO.: C20204 (PROJECT) 800 (AREA) - 00 (DISC.) - DG (TYPE) - 002 (SEQ.) D (REV.)

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PATH: Z:\INGENIERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20206 - FS 2022 update\Andy Fortin\PFD\PFD 04_JUILLET\FINAL PFD\PFDs Détaillés\6018012-GD0 (C20204-100-00-DG-001 - (Area 100-200-300-400-500-600-610-700-800) PFD NI43101- Rev.D (20 SEPT).dwg

Process Plant Equipment List

EQUIPMENT - CAPEX LIST

CriticalElements Corporation

BANKABLE FEASIBILITY STUDY UPDATE
ROSE LITHIUM TANTALUM PROJECT

BUMIGEME
Bureau mines, geologie et metallurgie

PROJECT NUMBER: C20204

Doc No.: C20204-00-RE-016

PREPARED BY: R. MANSOURI | VERIFIED BY: M. BARIL | APPROVED BY: F. Baril | REV. B | DATE: 09-18-2023

EQUIPMENT	MATERIAL	TIC
51 312 869	3 159 874	54 472 743

DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	Equipment Cost	Material Cost	2023 TIC [CAD]
Aerothermes 40 kW			25 961	-	25 961
Apron Feeder	100-APF-001	900mm x 7010mm	565 000	11 300	576 300
Belt Magnet - Metal Rejected Discharge Chute	100-CHU-004	TBD	43 928	-	43 928
Belt Scale	100-BSC-001	TBD	8 957	179	9 136
Cone Crusher Discharge Chute	100-CHU-006	TBD	22 500	450	22 950
Cone Crusher Discharge Chute	100-CHU-007	TBD	22 500	450	22 950
Conveyor No 1	100-CVR-001	1500mm x 90000mm	288 321	5 766	294 087
Conveyor No 1 Discharge Chute	100-CHU-008	TBD	20 000	400	20 400
Conveyor No 3	100-CVR-003	1500mm x 68000mm	120 339	2 407	122 746
Conveyor No 3 Dischage Chute	100-CHU-010	TBD	20 000	400	20 400
Conveyor No 4	100-CRV-004	1200mm x 8200mm	34 827	697	35 524
Conveyor No 5	100-CVR-005	1200mm x 8200mm	34 827	697	35 524
Crusher Feed Hopper	100-HOP-001	180 t capacity	845 000	16 900	861 900
Crushing Area Air Compressor	100-COM-004	AtlasCopco, GA75 A 125	105 500	2 110	107 610
Crushing Area Air Receiver	100-ARR-003	AtlasCopco C100898X	16 850	337	17 187
Duct collector	100-DUC-002	TBD	115 000	-	115 000
Dust Collector	100-DUC-001	Envisecure, 225- Mod-120	312 813	6 256	319 069
Dust Collector Air Compressor	100-COM-003	AtlasCopco A10131	8 225	165	8 390
Dust Collector Air Receiver	100-ARR-004	AtlasCopco A10340	16 863	337	17 200
Dust Collector Air Receiver	100-ARR-005	AtlasCopco A10340	16 863	337	17 200
Dust Collector Fan	100-FAN-001	Envisecure	-	-	-
Fines Conveyor	100-CVR-008	600mm x 5100mm	29 254	585	29 839
Fines Conveyor Discharge Chute	100-CHU-003	Sandvik	30 000	600	30 600
Hydraulic Rock Breaker	100-RBR-001	Sandvik, BB7500HD-HU37-BR2577i	433 120	8 662	441 782
Inlet Air Filter	100-IFR-001	AtlasCopco	-	-	-
Inlet Air Filter	100-IFR-002	AtlasCopco	-	-	-
Instrument Air Dryer	100-ADR-001	AtlasCopco, CD-250-40F	22 550	451	23 001
Jaw Crusher	100-JCR-001	Sandvik CJ613, 1170 x 1300 mm	733 110	20 000	753 110
Jaw Crusher Area Overhead Crane	100-OCR-001	Premium, TRDG 25,19,20C (25 Tonnes)	220 000	4 400	224 400
Jaw Crusher Cooling System	100-ACO-003	Sandvik	-	-	-
Jaw Crusher Discharge Chute	100-CHU-005	Sandvik	45 000	900	45 900
Jaw Crusher Lubrication and Hydraulic Unit	100-LUB-002	Sandvik	-	-	-
Metal Detector	100-MDR-001	Rocimpact	8 990	180	9 170
Rails + Hydraulics	N/A	TBD	125 000	-	125 000
Rock Braker Power Pack	100-LUB-001	Sandvik BR2577i	-	-	-
Rotary Valve	100-RVL-001	Envisecure	-	-	-
Screen U/S Discharge Chute 1	TBD	Sandvik	50 000	575	50 575
Screen U/S Discharge Chute 2	TBD	Techno-co	50 000	575	50 575
Secondary Cone Air Cooler	100-ACO-001	Sandvik	-	-	-
Secondary Cone Crusher	100-CCR-001	Sandvik, CH660	831 870	20 000	851 870
Secondary Cone Lubrication and Hydraulic Unit	100-LUB-003	Sandvik	-	-	-
Secondary Crusher Bin Chute	100-BIN-003	TBD	148 548	-	148 548
Self-Cleaning Magnet	100-SMG-001	Techno-co	49 400	988	50 388
Shop drawings for the Platework - WBS-6100			-	-	-
Stationary Grizzly	100-SGR-001	Rocimpact, 6m x 7m	200 000	4 000	204 000
Stockpile Feed Discharge Chute	200-CHU-001	TBD	175 960	-	175 960
Surge Bin No 1	TBD	Sandvik	5 000	100	5 100
Surge Bin No 2	TBD	Sandvik	5 000	100	5 100
Tertiary Cone Air Cooler	100-ACO-002	Sandvik	-	-	-
Tertiary Cone Crusher	100-CCR-002	Sandvik, CH660	831 870	20 000	851 870
Tertiary Cone Lubrication and hydraulic unit	100-LUB-004	Sandvik	-	-	-
Tertiary Crusher Bin Chute	100-BIN-002	TBD	210 198	-	210 198
Transfer Conveyor No 2 Discharge Chute	100-CHU-009	Rocimpact	20 000	400	20 400
Trash Bin	100-BIN-001	Uline.Ca, Trash Bin (6000 lbs. Capacity)	1 918	38	1 956
Unité aéraulique Concassage			213 414	-	213 414
Ventilateur de toit - Evacuation			40 825	-	40 825
Vibrating Grizzly Feeder	100-VGR-001	Sandvik SG1531, 1520 mm x 3000 mm	137 500	2 750	140 250
Vibrating Grizzly Greasing Unit	100-LUB-005	Sandvik	-	-	-

DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	EQUIPMENT 51 312 869 Equipment Cost	MATERIAL 3 159 874 Material Cost	TIC 54 472 743 2023 TIC [CAD]
Vibrating screen (Crusher building)	100-VIS-001		200 000	-	200 000
Vibrating screen at transfer tower (Double deck)	100-VIS-002	Sandvik SLK3073, 3m x 6,1m	525 180	10 504	535 684
Conveyor No 6	100-CVR-006	Rocimpact, 1500mm x 126000mm	361 800	7 236	369 036
Bin Vent Dome Area	200-BIV-001	Triodetec	-	-	-
Bin Vent Belt Feeder	200-BIV-002	Envisecure Inc, Cartridge Bin vent dust collector	56 230	1 125	57 355
Bin Vent Belt Feeder	200-BIV-003	Envisecure Inc, Cartridge Bin vent dust collector	56 230	1 125	57 355
Bin Vent Belt Feeder	200-BIV-004	Envisecure Inc, Cartridge Bin vent dust collector	56 230	1 125	57 355
Belt Conveyor No.6 Discharge Chute	200-CHU-001		-	-	-
Belt Feeder Feed Chute	200-CHU-002	Sandvik ,Neddle gate manually operated	20 000	400	20 400
Belt Feeder Feed Chute	200-CHU-003	Sandvik ,Neddle gate manually operated	20 000	400	20 400
Belt Feeder Feed Chute	200-CHU-004	Sandvik ,Neddle gate manually operated	20 000	400	20 400
Belt Feeder Discharge Chute	200-CHU-008	Sandvik ,Wear liners AR400 PL12, Hmax = 1000 mm	20 000	400	20 400
Belt Feeder Discharge Chute	200-CHU-009	Sandvik , Wear liners AR400 PL12, Hmax = 1000 mm	20 000	400	20 400
Belt Feeder Discharge Chute	200-CHU-010	Sandvik , Wear liners AR400 PL12, Hmax = 1000 mm	20 000	400	20 400
Belt feeder	200-BEF-001	TBD	139 000	2 780	141 780
Belt feeder	200-BEF-002	TBD	139 000	2 780	141 780
Belt feeder	200-BEF-003	TBD	139 000	2 780	141 780
Conveyor No 6	100-CVR-006	TBD	144 720	2 894	147 614
Tuyauterie et cabinet			-	220 041	220 041
Gicleurs - Convoyeur			-	687 629	687 629
Gicleurs - Unités hydraulique			-	68 763	68 763
Shop drawings for the Platework - WBS-6200			-	-	-
Ball Mill	200-BAM-001	FLSmidth Overflow, 5.2 m dia. x 8.8 m	6 662 500	21 783	6 684 283
Ball Bucket	200-BBU-001	Database	7 930	159	8 089
Scats Bin	200-BIN-001	Database, 4 m x 6 m x 4 m	72 000	1 440	73 440
Ball Pit	200-BIN-002	Database, 4 m x 6 m x 4 m	72 300	1 446	73 746
Ball Mill Bolt Remover Tool	200-BRT-001	Database	2 600	52	2 652
Belt Scale	200-BSC-001	Rocimpact	38 137	763	38 900
Ball Feed Chute	200-CHU-015	Database	58 000	1 160	59 160
Ball Mill Feed Chute	200-CHU-016	Outotec	-	-	-
Mill Discharge Chute	200-CHU-017	Database	24 400	488	24 888
Ball Mill Scats Chute	200-CHU-018	Database	36 200	724	36 924
Ball Mill Feed Conveyor No.14	200-CVR-003	Rocimpact , 900 mm wide x 84,8 m long	564 272	11 285	575 557
Ball Mill Gear Grease Unit	200-GRU-001	Outotec	-	-	-
Ball Mill Inching Drive	200-IDR-001	Outotec	-	-	-
Ball Mill Jacking System	200-JCS-001	Outotec	-	-	-
Ball Mill Bearing Lub Unit	200-LUB-001	Outotec	-	-	-
Ball Mill High Pressure Lube	200-LUB-002	Outotec	-	-	-
Ball Mill Trunion Bearing Lube	200-LUB-003	Outotec	-	-	-
Grinding Area Overhead Crane	200-OCR-001	Premium TRDG25, 25 t capacity	220 000	4 400	224 400
Ball Mill Oil Cooler	200-OCU-001	Outotec	-	-	-
Ball Mill Gear Reducer Oil Cooler	200-OCU-002	Outotec	-	-	-
Mill cyclones 1st Stage Feed Pump Box	200-PBX-001	Fournier, D=3 H=3.4	54 200	1 084	55 284
Rougher SLon Feed Pump Box	200-PBX-003	Fournier, D=2.5 H=2.9	47 000	940	47 940
Pulp sampler	200-PSR-001	Multotec 300/TIO-10	51 839	1 037	52 876
Pulp sampler	200-PSR-002	Multotec CP/2D	9 750	195	9 945
Mill cyclone 1st Stage Feed Pump	200-SLP-001	Weir, 200 MCR-FF-ZV 300Hp	118 240	2 365	120 605
Mill cyclone 1st Stage Feed Pump	200-SLP-002	Weir, 200 MCR-FF-ZV 300Hp	118 240	2 365	120 605
Rougher SLon Feed Pump	200-SLP-005	Weir , 8/6 AH-WRT-E-CV	53 728	1 075	54 802
Rougher SLon Feed Pump	200-SLP-006	Weir, 8/6 AH-WRT-E-CV	53 728	1 075	54 802
Storage area Sump Pump	200-SUP-001	Metso VS50 L150	15 756	315	16 071
Grinding Area Sump Pump	200-SUP-002	Weir, 40-SP-10 HP-1200	13 789	276	14 065
Trommel + Trunnion Magnetic	200-TRM-001		336 000	6 720	342 720
Regrind Mill	300-BAM-001	Sepro EXW, 1,05 x 1,4	233 500	4 670	238 170
Swing- Down Bulk Bagging System	300-BAS-001	Flexicon, 66'' x 14', 10 Bags/hour	158 633	3 173	161 805
Ball Bucket	300-BBU-001	Sepro	-	-	-
Scats Bin	300-BIN-001	Uline.Ca , Heavy duty steel dumping hopper (1 cu.yard)	1 918	38	1 956
Concentrate Bin	300-BIN-002		3 600	72	3 672
Candle Filter 1	300-CFL-001	CPE- Eng	-	-	-
Candle Filter 2	300-CFL-002	CPE- Eng	-	-	-
Gravity Concentrator	300-CON-001	Falcon C400	174 400	3 488	177 888
Drum Handler	300-DHR-001	Database	1 200	24	1 224
Batch Dryer	300-DRY-001	CPE- Eng	2 500	50	2 550
Pan Flip-Flop Unit	300-FLP-001	CPE- Eng	-	-	-
Monorail Hoist 2T	300-MHT-001	Prenium ST-2010, 2 Tonnes	19 000	380	19 380
Concentrate Mixer	300-MIX-001		5 200	104	5 304
Moisture Trap	300-MTR-001	CPE- Eng , 24" dia. x 72" long	-	-	-
Regrind Mill Pump Box	300-PBX-001	Fournier , D=1,0 H=1,2	22 300	446	22 746
Desliming Cyclones 1 Feed Pump Box	300-PBX-002	Fournier , D=1,0 H=1,0	47 000	940	47 940
Slon 2 Feed Pump Box	300-PBX-004	Fournier , D=2,5 H=2,9	47 000	940	47 940

			EQUIPMENT	MATERIAL	TIC
			51 312 869	3 159 874	54 472 743
DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	Equipment Cost	Material Cost	2023 TIC [CAD]
Tantalite Pan Filter	300-PFR-001	CPE- Eng , CEM 4300-RVPF-CS	562 100	11 242	573 342
Pulp Sampler	300-PSR-001	Multotec 50-TVS-1/10	18 044	361	18 405
Pulp Sampler	300-PSR-002	Multotec CP/2D	18 044	361	18 405
Scale	300-SCL-001	Testek Serie SE	2 282	46	2 327
Concentrate Feeder	300-SFR-001		12 600	252	12 852
Magnetic Silo	300-SLO-001	Fournier , D=2,5 H=3.5	47 000	940	47 940
Tantalite Concentrate Silo	300-SLO-002	Fournier , D=1,0 H=1,0	22 300	446	22 746
Tantalite Middling Silo	300-SLO-003	Fournier , D=2 H=2.5	36 000	720	36 720
Regrind Mill Pump	300-SLP-001	Weir 10" x 8" M-E-CV	48 313	966	49 279
Regrind Mill Pump	300-SLP-002	Weir , 10" x 8" M-E-CV	48 313	966	49 279
Desliming Cyclones 1 Feed Pump	300-SLP-003	Weir, 8" x 6" AH-WRT	57 652	1 153	58 805
Desliming Cyclones 1 Feed Pump	300-SLP-004	Weir, 8" x 6" AH-WRT	57 652	1 153	58 805
Filtrate pump	300-SLP-008	CPE- Eng , 1.5" x 1" AH	-	-	-
Scavenger SLon Feed Pump	300-SLP-009	Weir , 10" x 8" M-E-CV	52 267	1 045	53 312
Scavenger SLon Feed Pump	300-SLP-010	Weir, 10" x 8" M-E-CV	52 267	1 045	53 312
Silencer	300-SLR-001	CPE- Eng	-	-	-
Tantalite Area Sump Pump	300-SUP-001	Weir , 40-SP-10-1200	13 789	276	14 065
Wilfley Table	300-TAB-001	Wilfley HOL8000	64 580	1 292	65 872
Trommel	300-TRM-001	Sepro	-	-	-
Pan Filter Vacuum Pump	300-VAP-001	CPE- Eng, 900 m3/h@ 500 mm HG	-	-	-
Magnetics Vibrating Screen	300-VIS-001	VSM LC CL48S888	19 838	397	20 235
Magnetics Tailings Tank Pump	300-VTP-001	Weir, 40-SP-7.5 HP-1200	13 030	261	13 290
Tantalite Concentrate Tank Pump	300-VTP-002	Weir, 40-SP-7.5 HP-1200	12 888	258	13 146
Tantalite Middling Tank Pump	300-VTP-003	Weir, 40-SP-7.5 HP-1200	12 888	258	13 146
Magnetics Tank Pump	300-VTP-004	Weir, 40 SP-7.5 HP-900	12 888	258	13 146
Ball Mill Feed Conveyor No.14	200-CVR-003		-	-	-
Grinding Area Overhead Crane	200-OCR-001		154 000	3 080	157 080
Hydraulic unit & Gate Valve	TBD	N/A	250 000	-	250 000
Liner Bolt Removal	200-BRT-001	Recoilless Hammer - LRT85 - 850j	440 000	-	440 000
Mill Cyclone Cluster Dual Stage	200-CYC-001	Weir, 6 Cyclone Cluster 500-400 CVX DE	450 000	-	450 000
Rougher Magnetic Seperator 1 - WHIMS	300-MGS-002	Metso, SLon 3500 1.0T, 7300x5400x7400 mm	1 499 940	-	1 499 940
Scavenger Magnetic Seperator Slon 1 - WHIMS	300-MGS-003	Metso, SLon 3500 1.0T, 7300x5400x7400 mm	1 499 940	-	1 499 940
Rougher Magnetic Seperator - LIMS	300-MGS-001	Metso, Model WS1236CRHG	279 500	-	279 500
Desliming Cyclones Dual Cluster	300-CYC-001	Weir, 28 Cyclone Cluster 150-100 CVX6 DE	1 000 000	-	1 000 000
Shop drawings for the Platework - WBS-6300			-	-	-
Shop drawings for the Platework - WBS-6400			-	-	-
Shop drawings for the Platework - WBS-6500			-	-	-
Agitator for Mica Flotation Conditioning Tank	400-AGI-001	Sepro CMX-370, Agitator for 1,5 x 1.8 m tank	9 000	360	9 360
Agitator for Mica Flotation Dilution Tank	400-AGI-002	Sepro CMX-370, Agitator for 1,5 x 1.8 m tank	9 000	360	9 360
Mica Flotation Conditioning Tank	400-CDT-001	Fournier , D : 1.5 m . H : 1.8 m	23 800	476	24 276
Mica Flotation Dilution Tank	400-CDT-002	Fournier , D : 1.5 m . H : 1.8 m	23 800	476	24 276
Emergency shower & Eye Wash station	400-EES-001	EyewashD GFR3100, Guardian GFR3100 heated wash station	5 407	108	5 515
Mica Rougher Flotation Cell	400-FLC-001	Metso, TCe20, 20 m3	216 466	2 887	219 353
Mica Rougher Flotation Cell	400-FLC-002	Metso, TCe20, 20 m3	216 466	2 887	219 353
Mica Rougher Flotation Cell	400-FLC-003	Metso, TCe20, 20 m3	216 466	2 887	219 353
Dewatering Cyclones No.1 Feed Pump Box	400-PBX-001	Fournier , D : 2.5 m . H : 2.9 m	47 000	940	47 940
Tailings Thickener Feed pump Box	400-PBX-002	LM Manuten , D : 1.0 m . H : 1.2 m	22 300	446	22 746
Primary Pulp Sampler	400-PSR-001	Multoec , 300-TIO-10	51 839	1 037	52 876
Secondary Pulp Sampler	400-PSR-002	Multotec , CP/2D	9 750	195	9 945
Pulp Sampler	400-PSR-003	Multotec , 50-TV5-1	18 044	361	18 405
Mica Flotation Dilution Tank Feed Pump	400-SLP-001	Weir , 10"x 8" M-E-CV 75	48 313	966	49 279
Mica Flotation Dilution Tank Feed Pump	400-SLP-002	Weir , 10"x 8" M-E-CV 75	48 313	966	49 279
Mica Rougher Flotation Feed Pump	400-SLP-003	Weir , 10" x 8" M-E-CV 100	71 258	1 425	72 683
Mica Rougher Flotation Feed Pump	400-SLP-004	Weir , 10" x 8" M-E-CV 100	71 258	1 425	72 683
Dewatering Cyclones No.1 Feed Pump	400-SLP-005	Weir , 8"x 6" AH-WRT-E-CV-100	50 508	1 010	51 518
Dewatering Cyclones No.1 Feed Pump	400-SLP-006	Weir , 8"x 6" AH-WRT-E-CV-100	50 508	1 010	51 518
Tailings Thickener Feed Pump	400-SLP-007	Weir , 1.5" x 1" AH-B-CV-3	11 527	231	11 758
Tailings Thickener Feed Pump	400-SLP-008	Weir , 1.5" x 1" AH-B-CV-3	11 527	231	11 758
Mica Flotation Area Sump Pump	400-SUP-001	Weir , 40-SP-10-1200	13 789	276	14 065
Mica Cleaner Feed Pump (Sala Vertical)	400-VTP-001	Weir , 40-SP-15-1200	15 504	310	15 814
Elements (Li, Fe, Na, K, etc.) Analyzer	TBD	Metso, Courier 8X SL Analyzer	1 556 260	-	1 556 260
Dewatering Cyclones Cluster	400-CYC-001	Weir, 8 Cyclone Cluster 250CVX10	250 000	-	250 000
Shop drawings for the Platework - WBS-6600			-	-	-
Mica Rougher Flotation Cell	400-FLC-004	Metso, TCe20, 20 m3	216 466	2 887	219 353
Mica Rougher Flotation Cell	400-FLC-005	Metso, TCe20, 20 m3	216 466	2 887	219 353
Mica Cleaner Flotation cell	400-FLC-006	Metso, OK1.5, 1,5 m3	117 183	-	117 183
Mica Cleaner Flotation cell	400-FLC-007	Metso, OK1.5, 1,5 m3	117 183	-	117 183
Mica Cleaner Flotation cell	400-FLC-008	Metso, OK1.5, 1,5 m3	117 183	-	117 183
Agitator for High Density Conditioning Tank	500-AGI-001	Sepro CMX-920, Agitator for 2 x 2.3 m tank	14 000	280	14 280
Agitator for Dilution Tank	500-AGI-002	Sepro CMX-920, Agitator for 2.5 x 2.9 m tank	12 600	252	12 852

			EQUIPMENT	MATERIAL	TIC
			51 312 869	3 159 874	54 472 743
DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	Equipment Cost	Material Cost	2023 TIC [CAD]
Agitator for High Density Conditioning Tank	500-AGI-003	Sepro CMX-1500, Agitator for 3.0 x 3.5 m tank	27 500	1 100	28 600
Attrition Scrubber	500-ATS-001	Westpro AS96VBH, 19.3 m3	1 361 650	27 233	1 388 883
Attrition Scrubber	500-ATS-002	Westpro AS96VBH, 19.3 m3	-	-	-
Attrition Scrubber	500-ATS-003	Westpro AS96VBH, 19.3 m3	-	-	-
Attrition Scrubber	500-ATS-004	Westpro AS96VBH, 19.3 m3	-	-	-
Spodumene Rougher HD Conditioning Tank	500-CDT-001	Fournier , D : 2.0 m H : 2.3 m	36 300	726	37 026
Spodumene Rougher Dilution Tank	500-CDT-002	Fournier , D : 2.5 m H : 2.9 m	47 000	940	47 940
Spodumene Scavenger HD Conditioning Tank	500-CDT-003	Fournier , D : 3.0 m H : 3.5 m	54 200	1 084	55 284
Spodumene Rougher Flotation Cell	500-FLC-001	Metso, TCe20, 20 m3	221 420	6 772	228 192
Spodumene Rougher Flotation Cell	500-FLC-002	Metso, TCe20, 20 m3	221 420	6 772	228 192
Spodumene Rougher Flotation Cell	500-FLC-003	Metso, TCe20, 20 m3	221 420	6 772	228 192
Spodumene Rougher Flotation Cell	500-FLC-004	Metso, TCe20, 20 m3	221 420	6 772	228 192
Spodumene Scavenger Flotation Cell	500-FLC-005	Metso, TCe20, 20 m3	218 867	-	218 867
Spodumene Scavenger Flotation Cell	500-FLC-006	Metso, TCe20, 20 m3	218 867	-	218 867
Spodumene 1st Cleaner Flotation Cell	500-FLC-007	Metso, TCe10, 10 m3	179 546	3 906	183 452
Spodumene 1st Cleaner Flotation Cell	500-FLC-008	Metso, TCe10, 10 m3	179 546	3 906	183 452
Spodumene 1st Cleaner Flotation Cell	500-FLC-009	Metso, TCe10, 10 m3	179 546	3 906	183 452
Spodumene 2nd Cleaner Flotation Cell	500-FLC-010	Metso, TCe10, 10 m3	180 765	-	180 765
Spodumene 2nd Cleaner Flotation Cell	500-FLC-011	Metso, TCe10, 10 m3	180 765	-	180 765
Flotation Area Overhead Crane	500-OCR-001	Premium TRSG-15, 15 t crane	142 000	2 840	144 840
Desliming Cyclones No.2 Feed Pump Box	500-PBX-001	Fournier , D : 3.0 m H : 3.4 m	54 200	1 084	55 284
Spodumene Scavenger HD Conditioning Tank Feed Box	500-PBX-002	Fournier , D : 3.0 m H : 3,4 m	54 200	1 084	55 284
Cyclones O/F Pump Box	500-PBX-003	Fournier , D : 3.0 m H : 3,4 m	54 200	1 084	55 284
Scavenger Tailings Pump Box	500-PBX-004	Fournier , D : 2.0 m H : 2.3 m	36 300	726	37 026
Cleaner Tailings Pump Box	500-PBX-005	Fournier , D : 1.0 m H : 1.2 m	22 300	446	22 746
Spodumene Conc. Thickener Feed Pump Box	500-PBX-006	Founier , D : 1.0 m H : 1.2 m	22 300	446	22 746
Primary Pulp Sampler	500-PSR-001	Multotec , 200-TIO-10	44 675	894	45 569
Secondary Pulp Sampler	500-PSR-002	Multotec , CP/2D	9 750	195	9 945
Primary Pulp Sampler	500-PSR-003	Multotec , 200-TIO-10	44 675	894	45 569
Secondary Pulp Sampler	500-PSR-004	Multotec , CP/2D	9 750	195	9 945
Pulp Sampler	500-PSR-005	Multotec , 250-TIO-10	59 004	1 180	60 184
Primary Pulp Sampler	500-PSR-006	Multotec , 200-TIO-10	44 675	894	45 569
Secondary Pulp Sampler	500-PSR-007	Multotec , CP/2D	9 750	195	9 945
Pulp Sampler	500-PSR-008	Multotec , 100-TIO-10	49 647	993	50 640
Desliming Cyclones No.2 Feed Pump	500-SLP-001	Weir , 6/4 AH-WRT-E-CV-125	40 122	802	40 924
Desliming Cyclones No.2 Feed Pump	500-SLP-002	Weir, 6/4 AH-WRT-E-CV-125	40 122	802	40 924
Spodumene Rougher Dilution Tank Feed Pump	500-SLP-003	Weir , 6/4 AH-WRT-D-CV-30	27 594	552	28 146
Spodumene Rougher Dilution Tank Feed Pump	500-SLP-004	Weir , 6/4 AH-WRT-D-CV-30	27 594	552	28 146
Spodumene Rougher Feed Pump	500-SLP-005	Weir , 8/6 AH-WRT-E-CV-100	50 508	1 010	51 518
Spodumene Rougher Feed Pump	500-SLP-006	Weir , 8/6 AH-WRT-E-CV-100	50 508	1 010	51 518
Spodumene Scavenger HD Conditioning Tank Feed	500-SLP-007	Weir , 10/8 M-E-CV-100	52 267	1 045	53 312
Spodumene Scavenger HD Conditioning Tank Feed	500-SLP-008	Weir , 10/8 M-E-CV-100	52 267	1 045	53 312
Spodumene Scavenger Feed Pump	500-SLP-009	Weir , 8/6 AH-WRT-E-CV-125	53 728	1 075	54 802
Spodumene Scavenger Feed Pump	500-SLP-010	Weir , 8/6 AH-WRT-E-CV-125	53 728	1 075	54 802
Cyclones O/F Pump	500-SLP-013	Weir , 12/10 M--E-CV-125	57 067	1 141	58 209
Cyclones O/F Pump	500-SLP-014	Weir , 12/10 M--E-CV-125	57 067	1 141	58 209
Scavenger Tailings Pump	500-SLP-015	Weir , 8/6 AH-WRT-E-CV-75	53 728	1 075	54 802
Scavenger Tailings Pump	500-SLP-016	Weir , 8/6 AH-WRT-E-CV-75	53 728	1 075	54 802
Spodumene Cleaner Tailings Pump	500-SLP-017	Weir , 2/1,5 AH-B-CV-7.5	12 297	246	12 543
Spodumene Cleaner Tailings Pump	500-SLP-018	Weir , 2/1,5 AH-B-CV-7.5	12 297	246	12 543
Spodumene Conc. Thickener Feed Pump	500-SLP-019	Weir , 2/1,5 AH-B-CV-15	13 212	264	13 476
Spodumene Conc. Thickener Feed Pump	500-SLP-020	Weir , 2/1,5 AH-B-CV-15	13 212	264	13 476
Spodumene Flotation Area Sump Pump	500-SUP-001	Weir , 100-SP-10 HP-1500	23 283	466	23 749
Spodumene 1st Cleaner Feed Pump	500-VTP-001	Weir , 65-SP-25-25-1500	17 596	352	17 947
Spodumene Scavenger Conc. Pump	500-VTP-002	Weir , 100 SP-15 HP-2000	28 171	563	28 734
Spodumene 2nd Cleaner Feed Pump	500-VTP-003	Weir VT100 04, 65 SP-15 HP-1200	16 383	328	16 710
Desliming Cyclone No2 Cluster	500-CYC-001	Weir, 10 Cyclone Cluster 150CVX6	225 000	-	225 000
Shop drawings for the Platework - WBS-6700			-	-	-
Spodumene 1st Cleaner Feed Pump 2	500-VTP-004	Weir, 65-SP-25-25-1500	17 596	352	17 947
Agitator for Tailings Filter Feed Surge Tank	600-AGI-002	Sepro CMX 920, Agitator for 2 m dia. x 2.5 m tank	14 000	280	14 280
Tailing Belt Filter	600-BFR-001	Roytec , 18.2m x 4.4m	956 000	19 120	975 120
Tailings Belt Scale	600-BSC-001	Rocimpact	7 930	159	8 089
Belt Filter Discharge Chute	600-CHU-001		-	-	-
Tailings Truck Feeding Station Conveyor Chute	600-CHU-003		-	-	-
Tailings Truck Feeding Station Conveyor	600-CVR-001	Rocimpact , 900 mm wide x 52,30 m long	96 600	1 932	98 532
Tailing Thickener Inline Flocculant Mixer	600-MIX-001	Roytec	-	-	-
Moisture Trap	600-MTR-001	36" dia. x 72" long	-	-	-
Primary Pulp Sampler	600-PSR-001	Multotec 200-TIO-10	30 500	610	31 110
Secondary Pulp Sampler	600-PSR-002	Multotec CP/2D	30 500	610	31 110
Tailings Thickener Rake Mechanism	600-RAM-001	Roytec	-	-	-

			EQUIPMENT	MATERIAL	TIC
			51 312 869	3 159 874	54 472 743
DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	Equipment Cost	Material Cost	2023 TIC [CAD]
Tailings Thickener U/F Pump	600-SLP-003	Weir, 6" x 4" AH-WRT-D-CV-75	34 611	692	35 303
Tailings Thickener U/F Pump	600-SLP-004	Weir , 6" x 4" AH-WRT-D-CV-75	34 611	692	35 303
Tailings Filter Feed Pump	600-SLP-005	Weir, 6" x 4" AH-WRT-D-CV-15	23 881	478	24 359
Tailings Filtrate Release Pump	600-SLP-006	Weir , 2/1.5 AH-B-CV-3HP	9 023	180	9 203
Tailings Filter Feed Pump	600-SLP-007	Weir , 6" x 4" AH-WRT-D-CV-15	23 881	478	24 359
Silencer	600-SLR-001		-	-	-
Tailings Dewatering area Area Sump Pump	600-SUP-001	Weir , 100-SP-20-1500	24 817	496	25 313
Tailings Thickener Feed Tank	600-TAK-001	Fournier , D : 1.3 m H : 1.0 m	30 835	617	31 452
Tailings Filter Feed Surge Tank	600-TAK-002	Fournier , D : 12.0 m H : 8 m	179 300	3 586	182 886
Tailings Thickener	600-THR-001	Roytec , 20 m dia. high rate thickener	938 655	18 773	957 428
Vacuum Pump for Belt Filter and Filtrate Pump	600-VAP-001	3400 m3/h@ 500 mm HG	-	-	-
Vacuum receiver	600-VAR-001	36" dia. x 72" long	-	-	-
V-Plow system 1	TBD		150 000	-	150 000
V-Plow system 2	TBD		150 000	-	150 000
Tailings Filter Feed Surge Tank	600-TAK-002		35 860	717	36 577
Agitator for Tailings Filter Feed Surge Tank	600-AGI-002		2 800	56	2 856
Shop drawings for the Platework - WBS-6800			-	-	-
Silo Activator	700-ACT-001	ProProcess	-	-	-
Fatty Acid Agitator	700-AGI-004	ProProcess , D = 3,1m H = 1,5m	-	-	-
Silo Vent	700-BIV-001	ProProcess	-	-	-
Flocculant Bulk Unloading System	700-BUS-004	ProProcess	-	-	-
Emergency shower & Eye Wash station	700-EES-001	EyewashD , Guardian GFR3100 heated wash station	5 407	108	5 515
Flocculant Preparation Water Heater	700-HTR-001	M E C	-	-	-
AERO-C 3030 Dosing Pump	700-MEP-001	ProProcess, Aero 3030-c-Totes	43 737	875	44 612
AERO 3030-C Dosing Pump (Spare)	700-MEP-002	ProProcess	-	-	-
Soda Ash Dosing Pump	700-MEP-003	ProProcess	-	-	-
Soda Ash Dosing Pump	700-MEP-004	ProProcess	-	-	-
Soda Ash Dosing Pump	700-MEP-005	ProProcess	-	-	-
Soda Ash Dosing Pump	700-MEP-006	ProProcess	-	-	-
Soda Ash Dosing Pump (Spare)	700-MEP-007	ProProcess	-	-	-
Fatty Acid Dosing Pump	700-MEP-008	ProProcess	-	-	-
Fatty Acid Dosing Pump	700-MEP-009	ProProcess	-	-	-
Fatty Acid Dosing Pump	700-MEP-010	ProProcess	-	-	-
Fatty Acid Dosing Pump (Spare)	700-MEP-011	ProProcess	-	-	-
Sodium Lignosulfonate Dosing Pump	700-MEP-013	ProProcess	-	-	-
Sodium Lignosulfonate Dosing Pump	700-MEP-014	ProProcess	-	-	-
Sodium Lignosulfonate Dosing Pump	700-MEP-015	ProProcess	-	-	-
Sodium Lignosulfonate Dosing Pump	700-MEP-016	ProProcess	-	-	-
Sodium Lignosulfonate Dosing Pump (Spare)	700-MEP-017	ProProcess	-	-	-
Flocculant Dosing Pump	700-MEP-021	M E C	-	-	-
Flocculant Dosing Pump (Spare)	700-MEP-022	M E C	-	-	-
Flocculant Dosing Pump	700-MEP-023	M E C	-	-	-
Flocculant Dosing Pump (Spare)	700-MEP-024	M E C	-	-	-
NaOH 15% Dosing Pump	700-MEP-025	ProProcess	-	-	-
NaOH 15% Dosing Pump (Spare)	700-MEP-026	ProProcess	-	-	-
Frother Totes Dosing Pump	700-MEP-027	ProProcess	150 922	3 018	153 940
Frother Totes Dosing Pump	700-MEP-028	ProProcess	-	-	-
Frother Totes Dosing Pump	700-MEP-029	ProProcess	-	-	-
Frother Totes Dosing Pump	700-MEP-030	ProProcess	-	-	-
Frother Totes Dosing Pump (Spare)	700-MEP-031	ProProcess	-	-	-
Frother Totes Dosing Pump	700-MEP-032	ProProcess	-	-	-
Frother Totes Dosing Pump	700-MEP-033	ProProcess	-	-	-
Soda Ash Feeder	700-SFR-001	ProProcess	-	-	-
Soda Ash SILO	700-SLO-001	ProProcess	567 454	11 349	578 803
Flocculant Transfer Pump	700-SOP-004	M E C	-	-	-
NaOH 50% Transfer Pump	700-SOP-005	ProProcess	-	-	-
Soda Ash Transfer Pump	700-SOP-006	ProProcess	-	-	-
Sodium Lignosulfonate Transfer Pump	700-SOP-007	ProProcess	-	-	-
Reagent Preparation Area Sump Pump	700-SUP-001	Weir , 40-SP-10 HP-1200	13 789	276	14 065
Soda Ash Mixing Tank with Agitator	700-TAK-002	ProProcess , D = 3,1m H = 1,5m	-	-	-
Soda Ash Holding Tank	700-TAK-003	ProProcess , D = 3,2m H = 2,0m	-	-	-
Fatty Acid Holding Tank	700-TAK-005	ProProcess , D = 4,8m H = 4,0m	463 660	9 273	472 933
Sodium Lignosulfonate Holding Tank	700-TAK-006	ProProcess , D = 3,2m H = 2,0m	467 614	9 352	476 966
NaOH 15% Holding Tank	700-TAK-008	ProProcess , D = 3,1m H = 1,5m	-	-	-
Flocculant Mixing Tank with Agitator	700-TAK-009	Mainland , D = 3,1m H = 1,5m	-	-	-
Flocculant Holding Tank	700-TAK-010	Mainland , D = 3,2m H = 2,0m	260 185	5 204	265 389
NaOH 50% Storage Tank	700-TAK-011	ProProcess, D = 3,1m H = 1,5m	489 581	9 792	499 373
Sodium Lignosulfonate Mixing Tank with Agitator	700-TAK-012	ProProcess , D = 3,1m H = 1,5m	-	-	-
Shop drawings for the Platework - WBS-6900			-	-	-
Filter Press Ancilliaries	TBD	Pumps, Air Supply, etc…	1 401 400	-	1 401 400

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DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	EQUIPMENT 51 312 869 Equipment Cost	MATERIAL 3 159 874 Material Cost	TIC 54 472 743 2023 TIC [CAD]
Dust Collector	TBD	TBD	122 930	159	123 089
Agitator for Tailings Filter SurgeTank	610-AGI-002	Sepro CMX 3000, Agitator for 1 m dia. x 1 m tank	111 400	1 800	113 200
Press Filter Discharge Chute	610-CHU-001	Roytec	-	-	-
Spodumene Thickener Inline Flocculant Mixer	610-MIX-001	Roytec	-	-	-
Overhead Crane	610-OCR-001	Premium TRSG-15, 15 t 16m 28m carry	108 000	2 160	110 160
Spodumene Conc. Thickener Rake Mechanism	610-RAM-001	Roytec	-	-	-
Thickener U/F Pump	610-SLP-003	Weir 1,5/1 AH-B-CV, 1,5/1 AH-B-CV-20	13 706	274	13 980
Thickener U/F Pump	610-SLP-004	Weir 1,5/1 AH-B-CV, 1,5/1 AH-B-CV-20	13 706	274	13 980
Press Filter Feed Pump	610-SLP-005	Weir 1,5/1 AH-B-CV, 1,5/1 AH-B-CV-20	6 853	137	6 990
Press Filter Feed Pump	610-SLP-007	Weir 1,5/1 AH-B-CV, 1,5/1 AH-B-CV-20	6 853	137	6 990
Spodumene Dewatering Area Sump Pump	610-SUP-001	Weir, 100 SP-20-HP-1500	24 817	496	25 313
Spodumene Conc. Thickener Feed Tank	610-TAK-001	Fournier , D : 1.0 m H : 1.0 m	22 300	446	22 746
Filter Feed SurgeTank	610-TAK-002	Fournier , D : 7.0 m H : 8.0 m	178 000	3 560	181 560
Spodumene Thickener Overflow Tank	610-TAK-005	Fournier , D : 4.8 m H : 4.0 m	86 200	1 724	87 924
Spodumene Conc. Thickener	610-THR-001	Roytec , 8 m dia. high rate thickener	242 753	4 855	247 608
Spodumene Thickener O/F Pump	610-WAP-001	Weir, 6/4 AH-WRT-D-CV-20	20 644	413	21 057
Spodumene Thickener O/F Pump	610-WAP-002	Weir , 6/4 AH-WRT-D-CV-20	20 644	413	21 057
Filter Press	610-FLT-001	Metso, PF120/144M60	3 503 500	-	3 503 500
Spodumene Concentrate Conveyor	610-CVR-001	TBD	338 691	6 802	345 493
Transportation (mobilization et demobilization)	-	-	-	-	-
Instrument Air Dryer	800-ADR-001	Atlas Copco	-	-	-
Plant Air Receiver	800-ARR-001	Atlas Copco	-	-	-
Air Receiver	800-ARR-002	Atlas Copco	-	-	-
Instrument Air Receiver	800-ARR-003	Atlas Copco	-	-	-
Flotation Air Blower	800-BLR-001	JESS COOK 245SQ, 6000 acfm @4psig, multistage centrifugal	7 800	156	7 956
Flotation Air Blower	800-BLR-002	JESS COOK 245SQ, 6000 acfm @4psig, multistage centrifugal	7 800	156	7 956
Plant Air Compressor	800-COM-001	Atlas Copco GA75, Rotary screw compressor GA75+175 APC	186 850	3 737	190 587
Plant Air Compressor	800-COM-002	Atlas Copco GA75, Rotary screw compressor GA75+175 APC	186 850	3 737	190 587
Inlet Air Filter	800-IFR-001	Atlas Copco ,	-	-	-
Inlet Air Filter	800-IFR-002	Atlas Copco ,	-	-	-
Duplex Basket Strainer	800-STR-001	Grainger ,	4 184	84	4 268
Raw Water Tank	800-TAK-001	Fournier , 7 m dia. x 7 m h	179 000	3 580	182 580
Process Water Tank	800-TAK-002	Fournier , 12 m dia. x 14 m h	553 400	11 068	564 468
Gland Water Tank	800-TAK-003	Fournier , 5 m dia. x 6 m h	251 420	5 028	256 448
Process Water Feed Pump (3 Hp)	800-WAP-001	Weir 2/1,5 AH-B-CV, 6" x 4"	11 730	235	11 964
Process Water Feed Pump (3 Hp)	800-WAP-002	Weir 2/1,5 AH-B-CV, 6" x 4"	11 730	235	11 964
Gland Water Feed Pump (5 Hp)	800-WAP-003	Weir 3/4 AH-WRT-C-CV, 10" x 8"	14 294	286	14 579
Gland Water Feed Pump (5 Hp)	800-WAP-004	Weir 3/4 AH-WRT-C-CV, 10" x 8"	14 294	286	14 579
Process Water Pump (300 Hp)	800-WAP-005	Weir 300 L-FF-ZV, 12" x 12"	103 316	2 066	105 383
Process Water Pump (300 Hp)	800-WAP-006	Weir 300 L-FF-ZV, 12" x 12"	103 316	2 066	105 383
Reagent Prep. Water Pump (5 Hp)	800-WAP-007	Weir 3/2 AH-WRT-C-CV, 1.5" x 1"	13 527	271	13 797
Reagent Prep. Water Pump (5 Hp)	800-WAP-008	Weir 3/2 AH-WRT-C-CV, 1.5" x 1"	13 527	271	13 797
Gland Seal Water Pump (7 Hp)	800-WAP-009	Weir 3/2 AH-WRT-C-CV, 3" x 2"	13 931	279	14 209
Gland Seal Water Pump (7 Hp)	800-WAP-010	Weir 3/2 AH-WRT-C-CV, 3" x 2"	13 931	279	14 209
Vertical Clarifier	300-CLR-001	Mabarex, Model VCT 3900, 600-1000 m3/hr	900 000	-	900 000
Potable water treatment - Industrial Zone			595 006	-	595 006
Jaw Crusher Terminator JCT#1AL - TM Engineering		7.5 HP, 600 V, 3 ph, 60 Hz	16 790	-	16 790
Safety Hopper 10.5'' H			329	-	329
Dust Collecting Hopper / 4'' ducting			450	-	450
Environmental Enclosure / Jaw Crusher			1 428	-	1 428
Platform			478	-	478
JCT Kit #2			535	-	535
Safety switches (4)			650	-	650
Rotary Splitter Under Jaw Crusher		0.25 HP, 110 V, 1 ph, 60 Hz	8 475	-	8 475
Environmental Enclosure / Rotary Sample Divider			750	-	750
CSA Approval			475	-	475
TM/MAX2 Pulverizer		5 HP, 600 V, 3 ph, 60 Hz	18 970	-	18 970
Air hoist			2 990	-	2 990
Safety Interlock			1 210	-	1 210
Grinding Barrel 1KG Alloy-2 Complete			14 136	-	14 136
Work Station rubberized			9 000	-	9 000
Sample Drying Oven TM Engineering		600 V, 3 ph, 60 Hz + 2 HP	45 710	-	45 710
Sample Drying Carts			13 584	-	13 584
Stainless Steel Drying Pans			6 000	-	6 000
Atlas-Copco Screw Compressor		25 HP, 600 V 3 ph, 60 Hz	24 000	-	24 000
Dust Scrubbers 2,000 cfm - Capt-Air DFE2-4		30 HP, 600 V, 3 ph, 60 Hz	28 000	-	28 000
Screw Compressor 25 HP - Atlas-Copco		600 V, 3 ph, 60 Hz	21 000	-	21 000
Compressed Air Supply and Regulators			2 000	-	2 000
Jones Splitter Riffle 1/2" x 8" x 12" c/w pans			900	-	900
Sartorius Balance 35 Kg x 0.1 gram			6 330	-	6 330

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DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	Equipment Cost	Material Cost	2023 TIC [CAD]
			EQUIPMENT	MATERIAL	TIC
			51 312 869	3 159 874	54 472 743
Shop Vac 10 Gallons			400	-	400
Kraft Paper Dispenser 24''			180	-	180
Steel Table for Sorting Samples			1 200	-	1 200
Plywood Work Bench / Ventilation plenum			6 000	-	6 000
Shelves			1 500	-	1 500
Toolbox			500	-	500
Boot Cleaner			3 900	-	3 900
Muffle Furnace		220 V, Single phase	9 700	-	9 700
Hood Furnaces			3 400	-	3 400
Hood besides furnaces			5 000	-	5 000
Zirconium Crucibles 25 ml			111 120	-	111 120
Balance 210 x 0.0001gr			4 030	-	4 030
Marble Table			7 600	-	7 600
Spatulas 6 inches SS			300	-	300
Half Mask 3M-P100			264	-	264
Face Shield c/w Headgear			1 620	-	1 620
Crucible Support 15 places			3 600	-	3 600
Shelves for Crucibles			700	-	700
Weighing Block			1 800	-	1 800
Fume Scrubber 72 inches 1,300 cfm c/w recirculation		5 HP, 600 V, 3 ph, 60 Hz + 1 HP, 220V	105 891	-	105 891
UPS - 30 KW / Fume Hoods - Eaton Canada			40 000	-	40 000
Hotplate 18pox24po		230V, 1 ph, 60 Hz	4 800	-	4 800
pH Meter			1 540	-	1 540
Dispenser 1-10 ml			1 896	-	1 896
Dispenser 0.5-5 ml			1 896	-	1 896
Dispenser 2.5-25 ml			2 640	-	2 640
Dispenser 5-50 ml			2 716	-	2 716
Water Still 3LPH		30 Amp, 230V, 1 ph, 60 Hz	7 095	-	7 095
Distilled Water Storage Tank 114L			379	-	379
Balance Weights ASTM (50 gr x 1 mg)			2 500	-	2 500
Spatulas 4 inches SS			396	-	396
Magnetic Stirrer c/w bars			1 180	-	1 180
Emergency Shower			1 902	-	1 902
Acid Cabinet			1 720	-	1 720
Pipet Fillers Silicone			444	-	444
Pipets 1 ml (6)			177	-	177
Pipets 2ml (6)			177	-	177
Pipets 3 ml (6)			177	-	177
Pipets 4 ml (6)			177	-	177
Pipets 5 ml (6)			175	-	175
Pipets 10 ml (12)			293	-	293
Pipets 25 ml (6)			308	-	308
Pipets 50 ml (6)			406	-	406
Pipet Cleaning Rack			74	-	74
Volumetric Flask 100 ml c/w Glass Stopper (12/cs)			4 105	-	4 105
Volumetric Flask 250 ml c/w Glass Stopper (12/cs)			9 000	-	9 000
Volumetric Flask 500 ml c/w Glass Stopper (12/cs)			7 500	-	7 500
Utility Cart 60x90cm			920	-	920
Beakers 30 ml (12/cs)			354	-	354
Beakers 250 ml (12/cs)			1 440	-	1 440
Beakers 1000 ml (6/cs)			996	-	996
Wash Bottles 1L (12/cs)			324	-	324
Beaker Brush 41cm (12/cs)			1 209	-	1 209
Utility Clamps			108	-	108
Tube Connectors Straight 1/4'' (12/cs)			72	-	72
Tube Connectors T-Shape 1/4'' (12/cs)			73	-	73
Acid Neutralization Tank (360 USGallons)			810	-	810
Cabinets Work Bench - Ceramic Counter Top			6 000	-	6 000
Vacuum Pump and acessories (Suspended Solids)			2 500	-	2 500
Filtration apparatus			750	-	750
Separatory Funnel (1 L)			500	-	500
Atomic Absorption Spectrophotometer - Agilent		120V, 170 VA	48 000	-	48 000
Kit Blower Vent		0.7 Amps, 110V, 200 W	1 200	-	1 200
Installation Set-Up			7 800	-	7 800
Gas cage			1 200	-	1 200
Computers, Desk & Chairs			4 400	-	4 400
Laboratory Cabinets and Ceramic Countertops			10 000	-	10 000
Thermometers, Anemometers, etc.			2 400	-	2 400
Washing Machine and Dryer			1 200	-	1 200
Janitor Equipment c/w Table and Shelves			3 500	-	3 500

DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	EQUIPMENT 51 312 869 Equipment Cost	MATERIAL 3 159 874 Material Cost	TIC 54 472 743 2023 TIC [CAD]
Shelves for Storage Area			3 500	-	3 500
Make-Up Air (8-10 Tonnes)		220 V - 10 KW	18 000	-	18 000
Work Bench - Ceramic Counter Top / AAS			6 000	-	6 000
Safe 5.7 ft3 - Uline			892	-	892
Pulverizer TM/MAX-2KG		5 HP, 600 V, 3 ph, 60 Hz	9 485	-	9 485
Air Hoist to remove 1 and 4 KG Barrels			1 495	-	1 495
Variable Speed Drive			1 495	-	1 495
Grinding Barrel 2KG Alloy-2 Complete			2 490	-	2 490
Grinding Barrel 1KG Alloy-2 Complete			4 712	-	4 712
Sample Drying Oven 240 L VWR		230V, 60 Hz	5 785	-	5 785
Rotap 8''			8 016	-	8 016
Sieve Shaker Enclosure			2 270	-	2 270
Top 8''			120	-	120
Bottom 8''			192	-	192
Sieve 16 Mesh			498	-	498
Sieve 30 Mesh			498	-	498
Sieve 48 Mesh			498	-	498
Sieve 65 Mesh			498	-	498
Sieve 100 Mesh			498	-	498
Sieve 150 Mesh			552	-	552
Sieve 200 Mesh			2 016	-	2 016
Sieve 270 Mesh			918	-	918
Sieve 325 Mesh			954	-	954
Sieve 400 Mesh			2 628	-	2 628
Wet/Dry sieve shaker			650	-	650
Denver Flotation Machine			12 250	-	12 250
Heavy Liquid Separation using LST and HL cleaning			5 000	-	5 000
Separatory Funnels 1 L.			1 400	-	1 400
Buret Stand + Holders			2 400	-	2 400
Burets Autofill 25 ml, 50 ml			600	-	600
Beakers 30, 50, 100, 250, 600, 1000, 2000 ml			3 600	-	3 600
Dissolved Oxygen Meter			1 522	-	1 522
Dissolved Oxygen Meter Maintenance Kit			189	-	189
Hach Spectrometer DR9000			6 500	-	6 500
Batch Filter Pressure 3 gallons			7 350	-	7 350
Mill Jar 10''			4 380	-	4 380
Mill Drive Roll			7 500	-	7 500
pH meter			1 540	-	1 540
Conductivity meter			2 400	-	2 400
Moisture Analyzer			2 400	-	2 400
Balance 310 x 0.01gr			2 026	-	2 026
Bench Scale Balance 10 Kg x 0.001			2 028	-	2 028
Bench Scale Balance 50 Kg x 0.005			1 149	-	1 149
Hotplate 18pox24po			1 650	-	1 650
Beakers 250 ml (12/cs)			720	-	720
Beakers 1000 ml (6/cs)			999	-	999
Plastic Bottles Wide Mouth 1L (24/cs)			4 419	-	4 419
Plastic Bottles Narrow Mouth Amber 1L (24/cs)			392	-	392
Wash Bottle 500ml (24/cs)			186	-	186
Utility Buckets 12 Liter with Lid			475	-	475
Jugs 4L (6/cs)			1 710	-	1 710
Beaker Brush 41cm (12/cs)			806	-	806
Sieves Brush Nylon			144	-	144
Sieves Brush Brass			147	-	147
Ultrasonic Cleaner			2 528	-	2 528
Marcy Scale c/w 1L bowl			1 460	-	1 460
Work Station rubberized			4 360	-	4 360
Graduate Cylinder 10 ml (6/cs)			519	-	519
Graduate Cylinder 50 ml (6/cs)			561	-	561
Graduate Cylinder 100 ml (6/cs)			622	-	622
Graduate Cylinder 250 ml (4/cs)			450	-	450
Graduate Cylinder 1000 ml (2/cs)			972	-	972
Casserole Dish 140ml (12/cs)			1 440	-	1 440
Funnel Support 6 places			185	-	185
Support c/w Double Buret holder			350	-	350
Burets 25 ml Self Zeroing (4/cs)			2 766	-	2 766
Beakers 10 ml (48/cs)			534	-	534
Funnels 65mm x 58 degrees (48/cs)			672	-	672
Shop Vac 10 Gallons			500	-	500
Sampling cups 250 ml.			1 200	-	1 200

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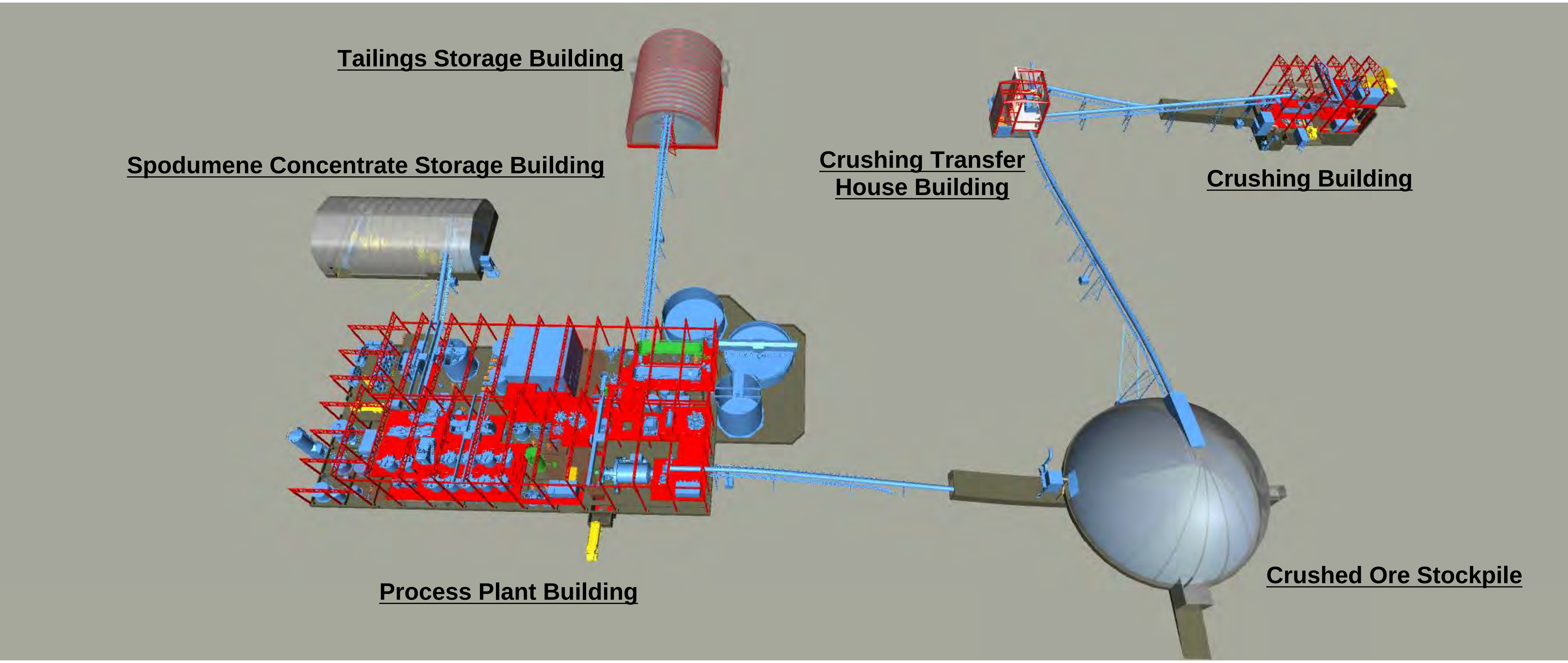
DESCRIPTION	EQ. TAG NUMBER	SPECIFICATION	Equipment Cost	Material Cost	2023 TIC [CAD]
			EQUIPMENT	MATERIAL	TIC
			51 312 869	3 159 874	54 472 743
Toolbox			500	-	500
Karcher 2000 psi Electric High Pressure Washer			350	-	350
Plywood Work Bench			1 500	-	1 500
Balance Weights ASTM (50 gr x 1 mg)			478	-	478
Vacuum Pump			1 600	-	1 600
Filtration Apparatus (TSS)			700	-	700
Davis Tube Tester & Crating			21 625	-	21 625
Unité aéraulique Broyage			213 414	-	213 414
Unité aéraulique Flottation			426 397	-	426 397
Ventilateur de toit - Evacuation			102 062	-	102 062
Aerothermes Epaississeur 40 kW			10 384	-	10 384
Aerothermes 40 kW			36 345	-	36 345
Tuyauterie et cabinet			-	110 021	110 021
Gicleurs - Convoyeur			-	343 814	343 814
Gicleurs - Unités hydraulique			-	137 526	137 526
Fire extinguishers - General site			-	6 217	6 217
Fire protection hydrants - Industrial Pad			-	151 370	151 370
Fire protection Mill Building taps (No sprinklers in Mill,			-	85 920	85 920
Fire pumps and accessories			-	699 532	699 532
Roof drains			-	94 271	94 271
Vertical Clarifier Ancilliaries	TBD		360 000	-	360 000

Process Plant Layouts

Rose Lithium - Tantalum Project

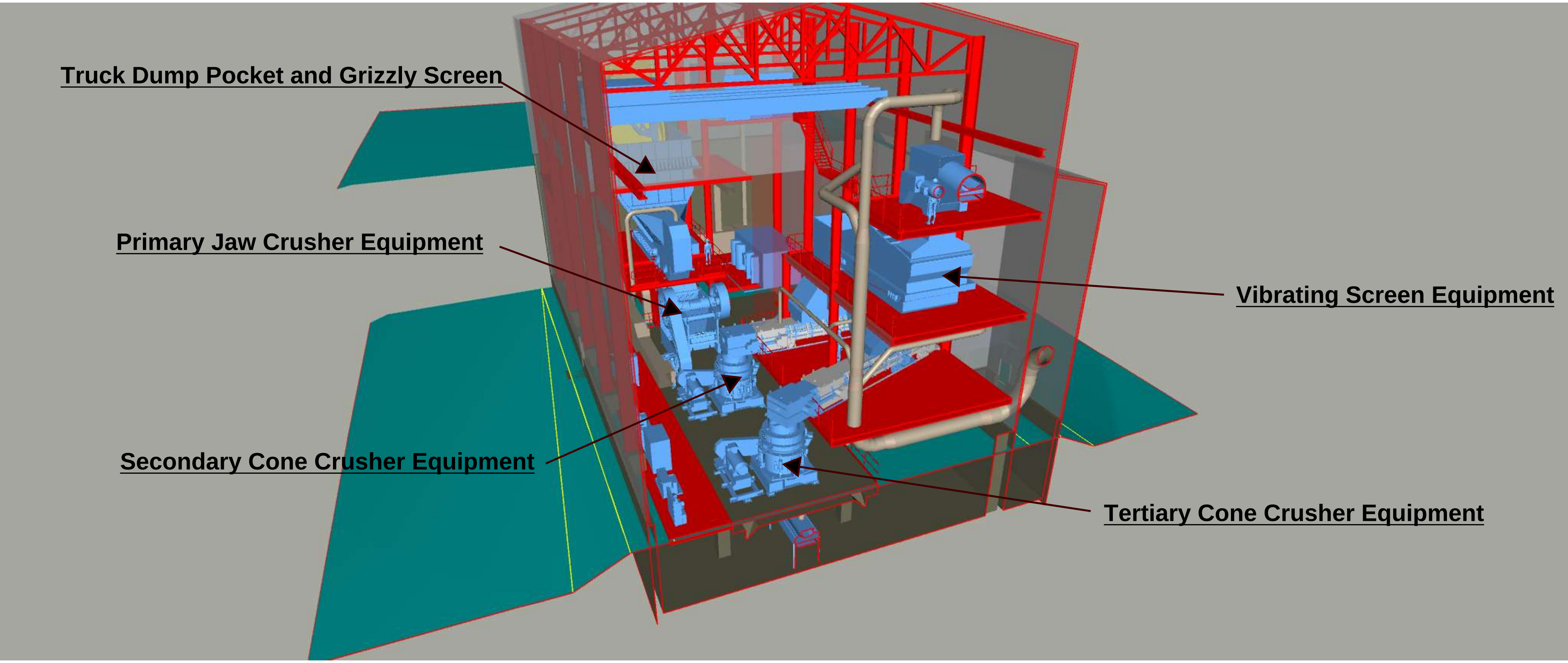
Process Plant 3D: Process Buildings - General & Arrangement



Issued For Feasibility Study

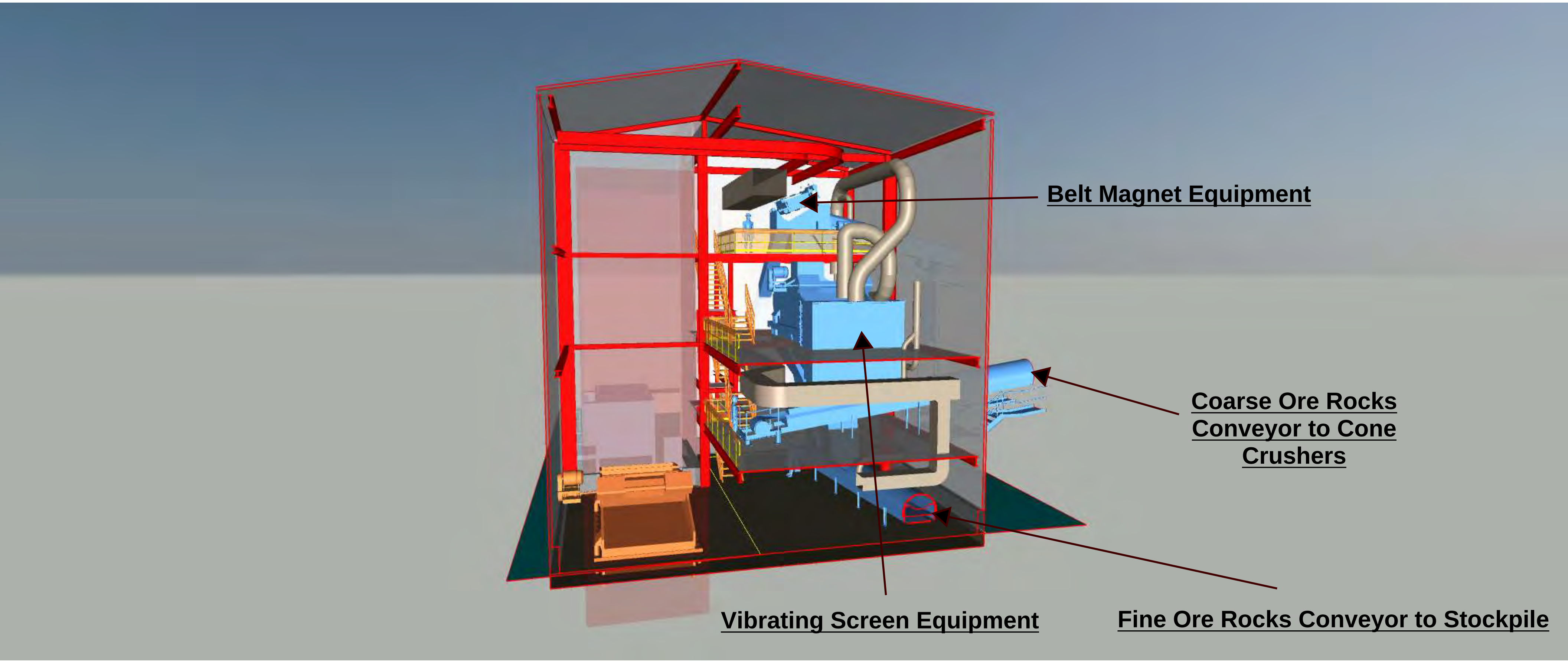
Process Plant 3D Section: Crushing Area

Rose Lithium - Tantalum Project



Issued For Feasibility Study

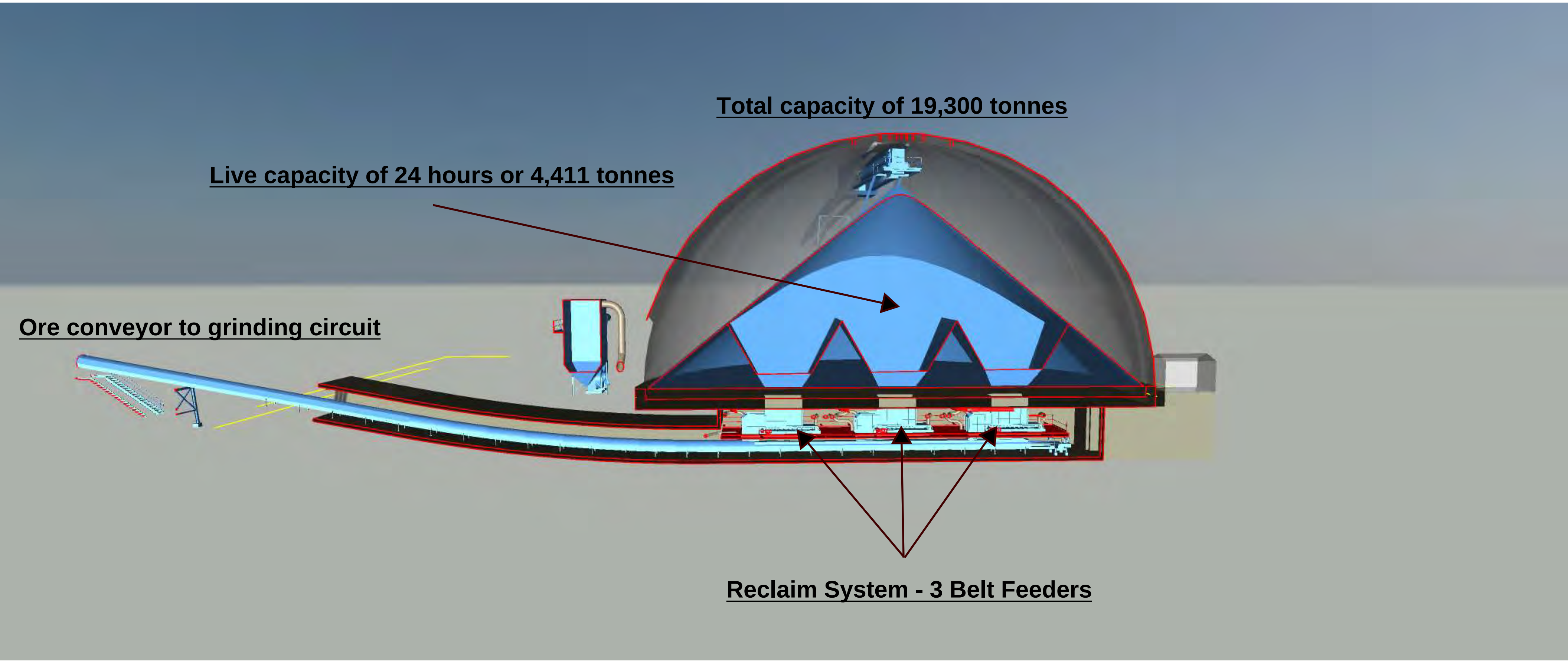
Process Plant 3D Section: Crushing Transfer House Area



Issued For Feasibility Study

Rose Lithium - Tantalum Project

Process Plant 3D Section: Crushed Ore Stockpile and Reclaim Area



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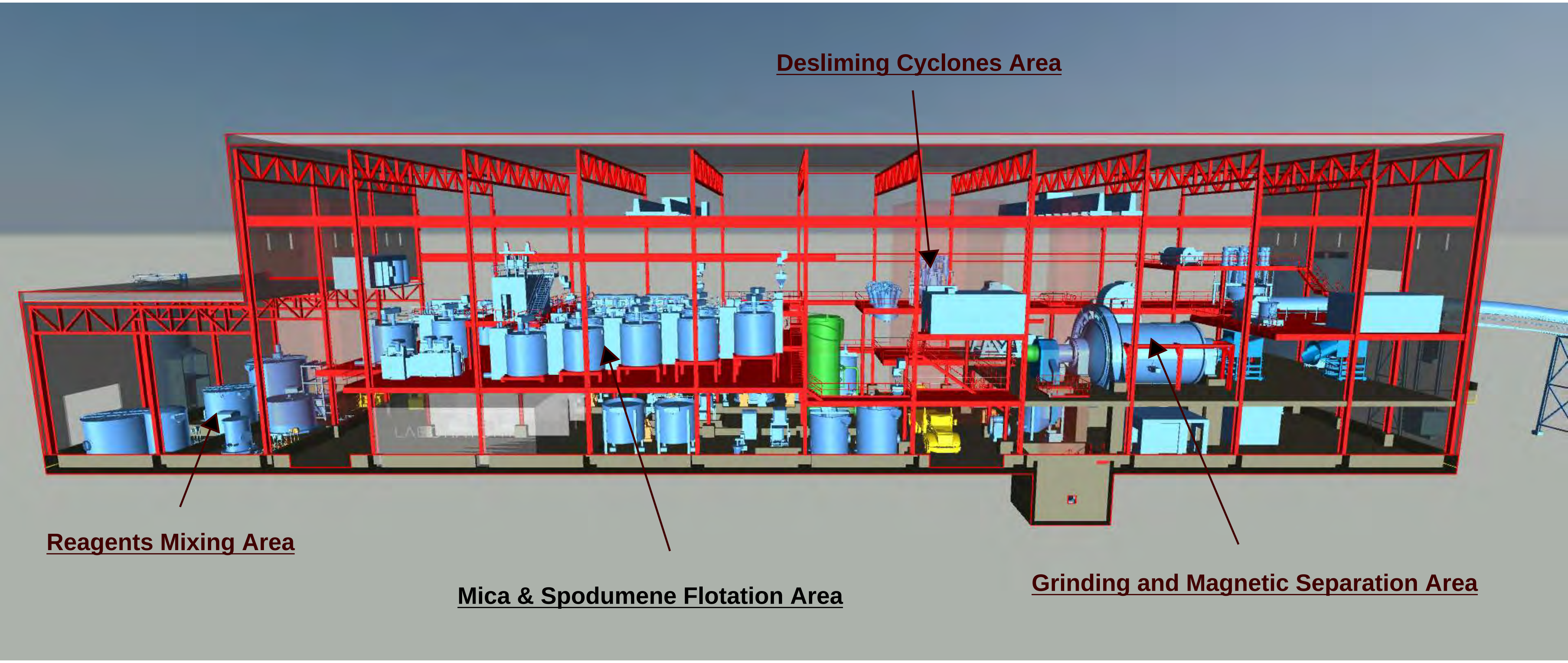
Rose Lithium - Tantalum Project

Process Plant 3D Section: Grinding and Main Flotation Area



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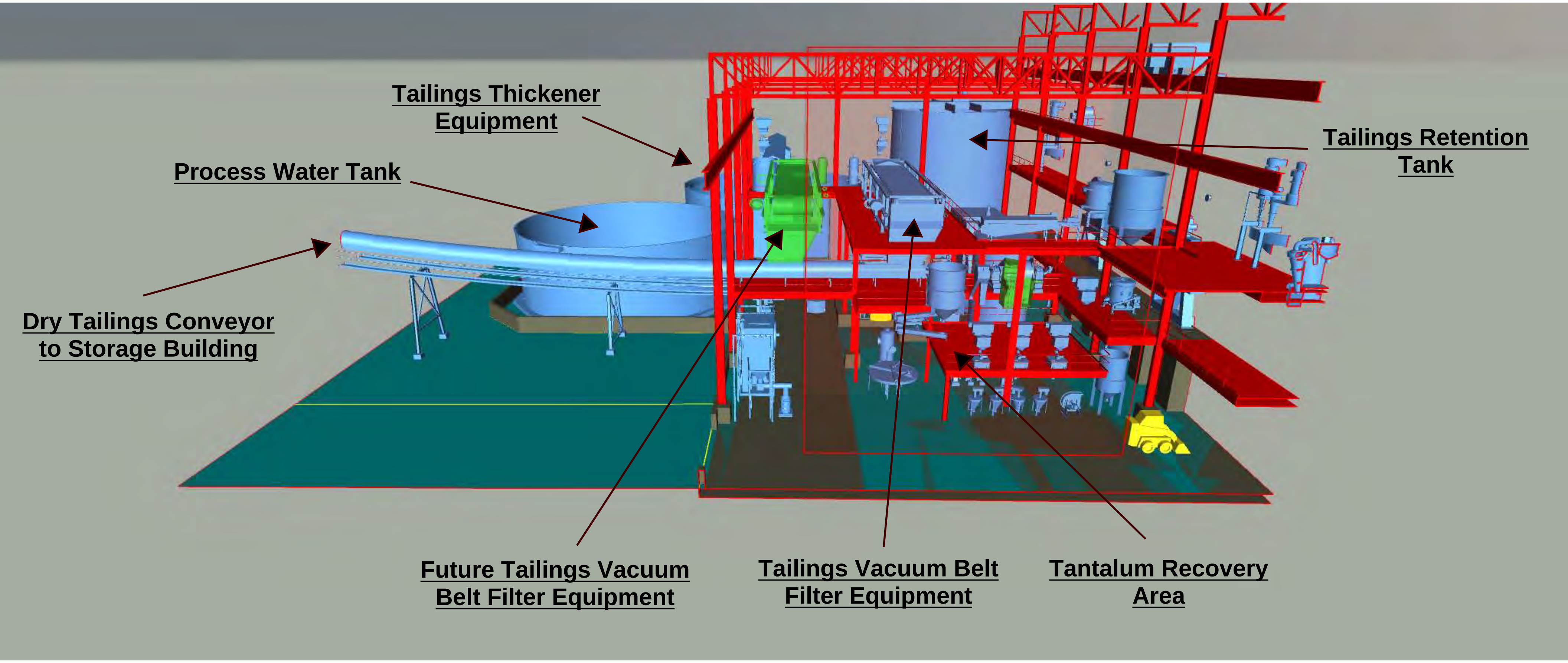
Rose Lithium - Tantalum Project

Process Plant 3D Section: Tailings Filtration and Tantalum Recovery Area



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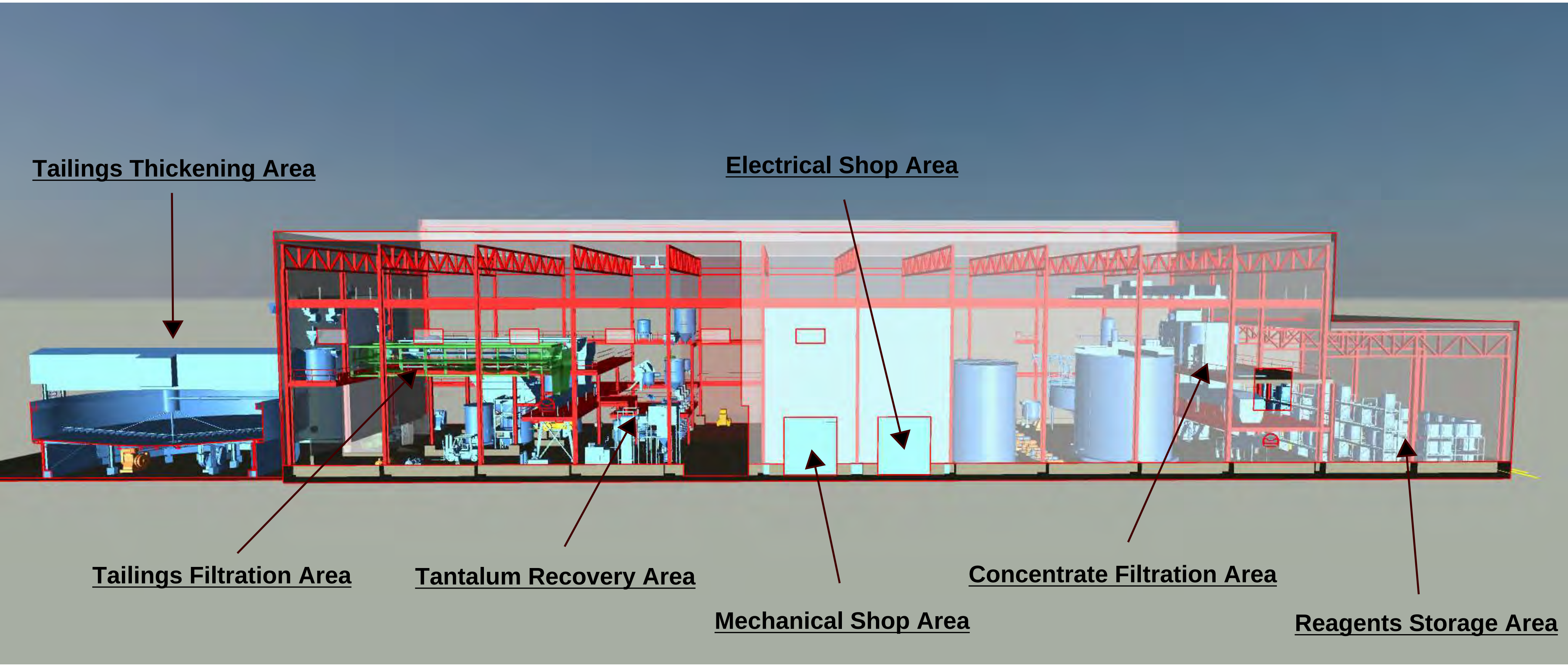
Rose Lithium - Tantalum Project

Process Plant 3D Section: Tailings and Concentrate Dewatering Area



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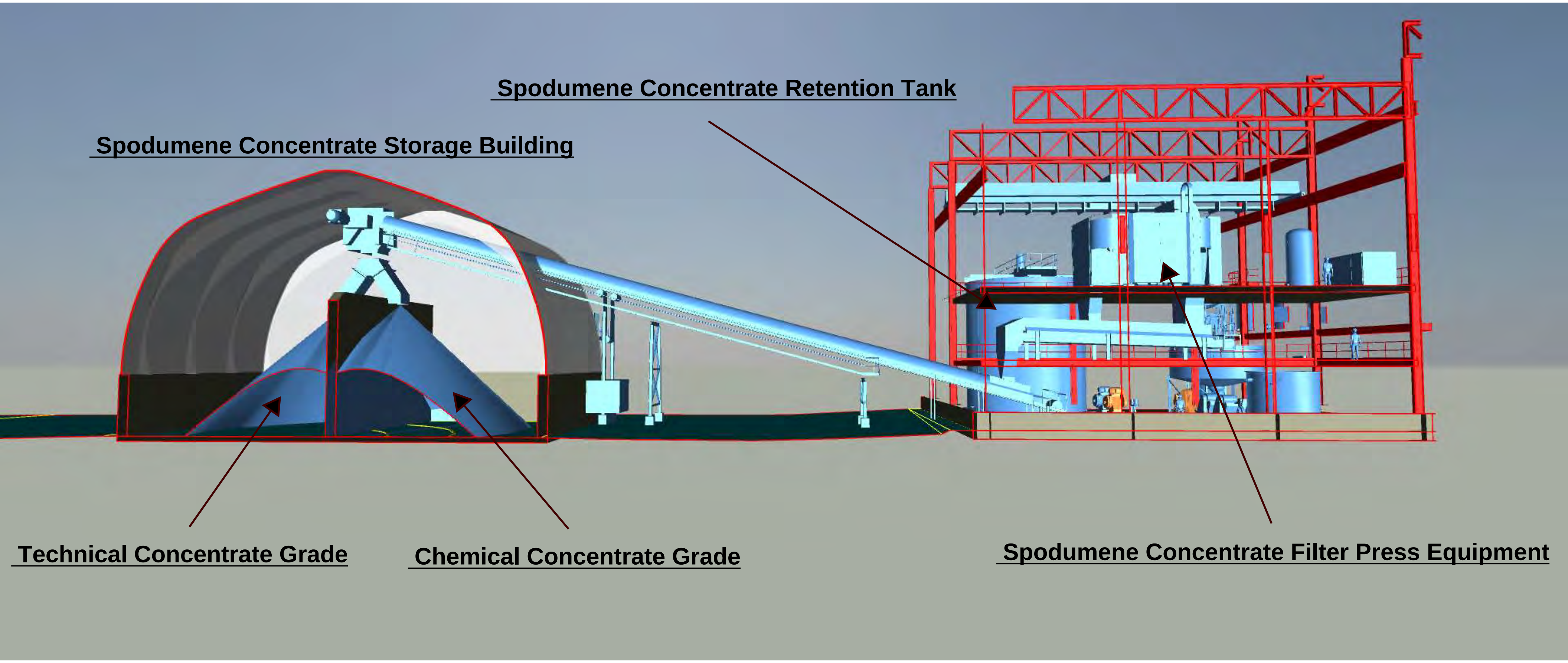
Rose Lithium - Tantalum Project

Process Plant 3D Section: Concentrate Dewatering and Storage Area



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