ROCA Mines Inc.

MAX Molybdenum Project

Preliminary Assessment

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Hatch

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ROCA Mines Inc.
MAX Molybdenum Project

Preliminary Assessment

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1. Summary

ROCA Mines Inc. (ROCA) a Toronto Stock Exchange (TSX) Venture Exchange traded exploration and development company has acquired 100% interest in a molybdenum deposit in south eastern British Columbia. The MAX Molybdenum (MAX) property is located approximately 86 kilometres by road, southeast of the town of Revelstoke, BC.

The property was previously owned by a joint venture of Newmont Mines Limited (Newmont) and Esso Minerals Canada and formerly called the Trout Lake Project. The joint venture explored a molybdenum mineralized system on the property by surface and underground diamond drilling and bulk sampling. From 1975 to 1982 work expenditure on exploration totalled CAD$15 million.

ROCA commissioned Hatch to conduct an engineering level Scoping study on the MAX Molybdenum deposit. Hatch was tasked with identifying mining methods and ore processing for two mutually exclusive and independent throughput scenarios, namely:

- Case 1 – 500 tonnes per day (tpd) throughput to process high grade material (at a 0.5% MoS_2 cutoff grade).
- Case 2 – 2,500 tpd throughput to process the lower grade material (at a 0.2% MoS_2 cutoff grade).

ROCA provided several recent reports and an archive list pertaining to historical information and completed exploration activities from previous owners of the MAX deposit. Hatch reviewed pertinent information available and prepared preliminary mine plans, general process design criteria, conceptual flowsheets and equipment arrangement drawings. This information was reviewed with ROCA prior to commencing capital and operating cost estimates.

Hatch has not visited the property but has performed the tasks with the level of detail required for a scoping level study. At this time, the underground workings are not accessible and this report is strictly a desktop exercise, which relies on public information available or as provided by ROCA.

The mineral resource for this study has been based on measured and indicated resources only, as outlined in the Technical Report prepared by Mr. T.N. Macauley, P.Eng, dated 20 September 2004. This technical report contained geological information and resource estimates prepared by an independent qualified geologist and are consistent with a scoping level study. The mine planning was based polygonal resource data and hand drawn sections. The sections and polygonal resource information was converted electronically to build a three-dimensional model of the deposit.

The mineral processing plant was designed using conventional crushing, grinding, flotation, thickening and dewatering unit operations. Capital and operating costs were based on conceptual designs and benchmarked to operations of similar capacities and nature. The MAX Molybdenum site will include infrastructure such as a portable crushing plant, mill building, tailings placement, support facilities and diesel generating power plant.

The capital and operating cost estimates for both Case 1 – 500 tpd and Case 2 – 2,500 tpd were incorporated into a simplified financial model. The metal pricing used in the financial model was based on information provided by an independent marketing consultant. Additional parameters were also used to measure the project sensitivity.

A summary of the capital costs is presented in Table 1-1 below.

Table 1-1: Capital Cost Summary

Case 1 – 500 tpd

CAPITAL COST AREA	TOTAL COST CAD $millions	TOTAL COST US $millions
Infrastructure	2.89	2.31
Mill	8.75	7.00
Mining	7.95	6.36
Tailings	1.66	1.33
Indirect Costs	4.25	3.40
Contingency	4.70	3.76
TOTAL PROJECT COSTS	**30.20**	**24.16**

Note: Numbers may not add up due to rounding. Exchange rate - CAD$1.25 = US$1.00

Case 2 – 2,500 tpd

CAPITAL COST AREA	TOTAL COST CAD $millions	TOTAL COST US $millions
Infrastructure	6.69	5.35
Mill	20.12	16.10
Mining	69.08	55.26
Tailings	5.11	4.08
Indirect Costs	11.07	8.86
Contingency	18.93	15.14
TOTAL PROJECT COSTS	**131.00**	**104.80**

Note: Numbers may not add up due to rounding. Exchange rate - CAD$1.25 = US$1.00

Operating costs for the mill operation are estimated to be CAD$25.80 / tonne of ore milled (Case 1 – 500 tpd) and CAD$13.32 / tonne of ore milled (Case 2 – 2,500 tpd). Consistent with a preliminary assessment and scoping level of engineering this estimate has been prepared with an accuracy range of $^{+}/_{-}$ 30%. It is therefore possible that the project operating cost could fall within a range between CAD$33.50/tonne and CAD$18.06 / tonne for Case 1 – 500 tpd and $17.32 / tonne and $9.32 / tonne for Case 2 – 2,500 tpd. The operating costs are based on the assessment of achievable mining and processing conditions as described in this report.

The operating cost breakdown is shown in Table 1-2 and Table 1-3 below.

Table 1-2: Operating Cost Summary Case 1 – 500 tpd

	Annual, CAD$/year	Unit, CAD$/t milled	Annual, US$/year	Unit, US$/t milled	Distribution, %
General and Administrative	1,140,692	6.25	912,554	5.00	24
Mineral Process Plant	3,559,563	19.50	2,847,650	15.60	76
Transport	8,438	0.05	6,750	0.04	0
TOTAL	**4,708,694**	**25.80**	**3,766,955**	**20.64**	**100**

Table 1-3: Operating Cost Summary Case 2 – 2,500 tpd

	Annual, CAD$/year	Unit, CAD$/t milled	Annual, US$/year	Unit, US$/t milled	Distribution, %
General and Administrative	2,243,980	2.46	1,795,184	1.96	18
Mineral Process Plant	9,871,432	10.82	7,897,146	8.66	81
Transport	42,192	0.05	33,754	0.04	0
TOTAL	**12,157,604**	**13.32**	**9,726,084**	**10.66**	**100**

Note: Numbers may not add up due to rounding. Exchange rate - CAD$1.25 = US$1.00

A simplified financial analysis of Case 1 and 2 was undertaken using a discounted cash flow model. Project capital and operating cost estimates for both mining and processing were included in the cash flow projection.

Economic rates of return for both Case 1 and 2 are sensitive to molybdenum prices, size and grade of the deposit and subject to change if new resources are added.

A sensitivity analysis was carried out for Case 1 – 500 tpd where three scenarios were run, using two variables (i.e. a range of molybdenum prices for new equipment and used process equipment at 90% of new equipment and infrastructure).

Details of the cash flow model for Case 1 – 500 tpd is shown in Table 1-4 below:

Table 1-4: Cash Flow Summary for Case 1 – 500 tpd

	Moly Price US$/lb	Internal rate of Return (IRR)	Net Present Value (Before Tax)	
			At 0% US$ millions	At 5% US $ millions
Scenario 1 – New Equipment	15 - 10	-5.8%	-2.87	-4.58
Scenario 1 – Used Equipment	15 - 10	-1.0%	-0.45	-2.34
Scenario 2 – New Equipment	20	59.5%	48.33	37.35
Scenario 2 – Used Equipment	20	67.1%	50.75	39.59
Scenario 3 – New Equipment	30	112.4%	110.47	88.71
Scenario 3 – Used Equipment	30	123.0%	112.89	90.95

Exchange rate - CAD$1.25 = US$1.00

This scoping study is the first in a series of development studies for the project that assesses the economic viability of the resource. This study is intended to quantify the project's cost parameters and to assist in directing additional mining studies and detailed engineering work that will define the optimal scale of the operation for further definitive studies.

Key recommendations to advance the project to the next phase include:

- Underground inspection
- Continue the diamond drilling program to obtain new drill cores and confirm resources
- Update metallurgy testwork using predicted head grades
- Geotechnical investigations at proposed plant site and infrastructure sites to characterize foundation conditions
- Conduct topographic (1 meter contours) and geological mapping
- Optimize tailings disposal options/location studies

2. Introduction

2.1 Terms of Reference

ROCA commissioned Hatch to conduct a Scoping Study for the MAX Molybdenum project on November 30, 2004. The study was to cover a smaller mine with nominal capacity of 500 tpd at start-up followed by expansion to 2,000 – 3,000 tpd if the commodity prices are sustained.

Hatch's scope of work was to include:

- Preliminary mine plan based on identified resources
- General Design Criteria
- Conceptual Flowsheets
- Typical process plant general layout drawings
- Typical overall project site layout drawing including infrastructure facilities
- Order of magnitude project capital cost estimates for 500 and 2,500 tpd
- Order of magnitude project operating cost estimates for 500 and 2,500 tpd
- Recommended activities to advance project to the next stage
- Report incorporating the above information.

A team approach was proposed and execution of the work included:

- Review available reports and summarize / comment on what has been documented.
- Engage a consultant to conduct metal market study to include statistical metal pricing and investigate toll treatment options.
- Develop mine outlines and sections, propose mining methods; define mining dilution and recovery.
- Propose preliminary process flowsheets and identify infrastructure requirements
- Prepare capital and operating cost estimates for the mine and mill.

Budget prices were sourced for major equipment; in-house cost data for other items were utilized and factors applied for piping, electrical and instrumentation disciplines.

This report contains conceptual flowsheets, arrangement/layout drawings, design criteria, process descriptions and equipment lists to support the cost estimates.

The cost estimates have been benchmarked and compared to similar sized mining and milling operations, as appropriate for this level of study.

Geology and resource estimates were performed independently and documented in a Technical Report on the MAX Molybdenum Property prepared by Mr. T.N. Macauley P.Eng dated 20 September 2004.

An independent metal market study addressed the following specific items:

- a "near-term" market price for a small, high grade mine (500 tpd)
- a long term price to support a larger 2500 tpd lower grade mine
- historical and forecast supply/demand of molybdenum
- molybdenum end-use and outlook of its end-use market
- roaster terms for molybdenite refining and applicable penalties

ROCA also requested Hatch conduct an economic evaluation for both cases. A simple before tax evaluation has been included in this report.

All costs in this Scoping Study are presented in first quarter 2005 Canadian Dollars (CAD$) and where applicable an exchange rate of CAD$1.25/US$1.00 was applied.

3. Project Background, Location and References

3.1 Background

ROCA acquired a 100% interest in the MAX Molybdenum property (formerly the Trout Lake Project) in January 2004. The MAX property was initially explored for molybdenum in 1969 by Scurry Rainbow Oil Ltd., in 1975 by Newmont Mining Corp. and 1976 to 1982 by a joint venture Newmont / Esso Minerals Canada Ltd. The joint venture explored a molybdenum mineralized system by surface and underground diamond drilling and bulk sampling.

Surface diamond drilling of 32 holes (15,747 m) from 1976 to 1979 was successful in expanding the molybdenite deposit and demonstrated better grade sections. This led to a decision to undertake underground exploration and bulk sampling. From 1979 to 1981 a total of 2,000 m of adit, crosscuts and drift development was made on 960 m level (approximately 500 m below the surface outcrop). Underground diamond drilling of 22,151 m in 87 holes detailed the mineral and explored adjacent areas. Bulk samples from 189 drift and crosscut blast rounds over a total length of 687 m were processed through a crushing plant and sampling tower established on site. Preliminary metallurgical laboratory testing was carried out on both drill core and bulk samples. No metallurgical work was done on any of the 22,151m of underground diamond drill core. Preliminary mining, environmental and socio-economic studies to obtain Preliminary Stage 1 Environmental Assessment were then completed. Work expenditure from 1975 to 1982 totaled CAD$15 million.

Further work was halted in late 1982 due to the decline in price and poor market outlook for molybdenum products. Remaining payments to property vendors were made and Newmont purchased Esso's 45% interest in the property during the early 1990's.

In 1997 claims in the central portion of the property covering the molybdenum deposit expired and were staked by Emerald Gold Mines Inc. (Emerald).

In April 2003 Rescan Environmental Services Ltd. (Rescan) was retained by Newmont to reclaim the Trout Lake exploration property. The reclamation work followed the Trout Lake Exploration Project Closure Plan prepared by Rescan and approved by the British Columbia Ministry of Energy and Mines in May 2003 through the amendment of Reclamation Permit #MX5-55. The reclamation project was completed in September 2003 and the reclamation report, Trout Lake Exploration Project Site Closure and Reclamation Report, was submitted to the British Columbia Ministry of Energy and Mines in January 2004.

A requirement originating from the original approval of the closure plan was annual environmental monitoring including a description of the site conditions, operation and flow rates of the portal drainage system, revegetation success and water quality sampling results.

On 16 January 2004, ROCA optioned the claims covering the deposit from Emerald. In May 2004, ROCA conducted a surface diamond drilling program comprising 2 holes (totaling 1,134 m) on the deposit to confirm former holes and obtain core samples as a due diligence exercise.

By agreement effective 6 August 2004, ROCA purchased all of Newmont's remaining property and the complete original data set documenting the work of the Newmont-Esso joint venture.

The acquisition enabled ROCA to plan an exploration program to confirm the potential of the known higher grade zones hosted within the main ore deposit. In March 2005 ROCA announced that a Mines Act Permit from British Columbia Ministry of Energy and Mines was obtained for an underground rehabilitation and infill diamond drilling program currently in progress.

3.2 Property Location and Accessibility

The MAX Molybdenum property is located 4 km west of the Trout Lake community, approximately 84 km southeast of Revelstoke by road in the southeastern region of British Columbia (see Figure 3-1). The site co-ordinates are UTM zone 5,610,500N and 458,700E and elevation 960m (longitude 117^o 36' W and latitude 50^o 38' N).

Rehabilitation of the mine access road for approximately 5 km was completed during the 2004 construction season. This has enabled unrestricted road access to the MAX Molybdenum property.

The closest towns are Revelstoke and Nakusp, BC with regular road maintenance and snow removal on all arterial roads. This enables year round site access for ROCA personnel.

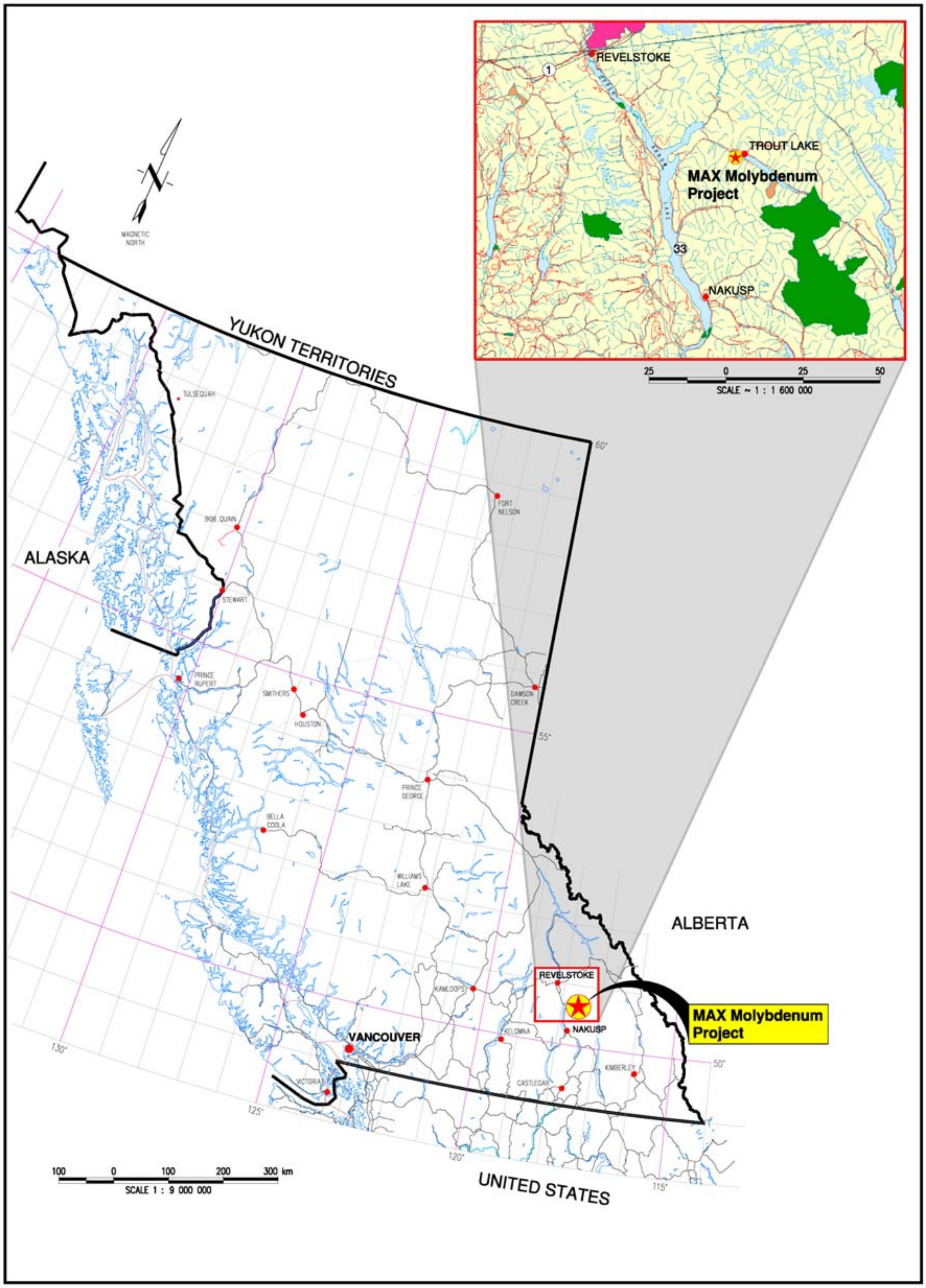
3.3 References

Table 3-1 below forms the basis of references for this report (including references to geological and ground conditions) and all conceptual processing and mine design. All the reports with the exception of Item 1 by Neil Seldon & Associates were provided to Hatch by ROCA:

Table 3-1: References

Item	Date	Author	Title
1	February 2005	Neil S. Seldon & Associates Ltd.	Marketing and Commercial Input into a Scoping Study for the MAX Moly Project
2	October 2004	Rescan	MAX Molybdenum Project – 2004 Site Inspection
3	September 2004	T.N. Macauley P.Eng	Technical Report on the MAX Molybdenum Property, Revelstoke Mining Division, BC Canada
4	January 2004	Rescan	Trout Lake Exploration Project Site Closure and Reclamation Report
5	31 December 1982	A. Gorken – Newmont Exploration	Plant Design Data
6	17 December 1982	S.W. Nabbs – Newmont Exploration	Summary of Metallurgical Test Work
7	14 June 1982	W.C. Hellyer – Newmont Exploration	Metallurgical Investigation of Samples of Bulk Sampling Program
8	March 1982	G. Wilkinson – Newmont Explorations	Hand drawn mining Sections – 04;05;06;07;08;09 and 10
9	6 May 1981	A. Gorken – Newmont Exploration	Metallurgical Testing of Horizontal Hole S 8-1 Composites from TL

Figure 3-1: General Location Map



4. Mining

4.1 Introduction

Mine planning for Case 1 – 500 tpd and Case 2 - 2,500 tpd options have been based on polygonal resource data and hand drawn sections provided by ROCA Mines Ltd. Both the sections and the polygonal resource information were converted into electronic files and relevant information from this data was used to build three-dimensional models of the deposit.

The mine planning information contained in this report could be considered preliminary to a scoping level of accuracy and cost data can be considered accurate to $^{+}/_{-}$ 30% based on the information provided.

Reproductions of the original hand drawn drill sections at 30m intervals are included in Appendix E - Mining with the mine plans superimposed. In addition, Appendix E includes a plan view of the adit where it intersects the MAX Deposit.

In Appendix F – Technical Report by Mr. T. N. Macauley P.Eng, Table 7 on page 30 summarizes the total mineral resources on the property at 0.10%, 0.20%, 0.50% and 1.00% MoS_2 cutoff respectively. Mine development was based on measured and indicated mineral resources only.

4.2 Mining Plan Case 1 – 500 tpd

A mine plan was developed for targeting the higher grade areas below the existing workings on the 965 Level (i.e. existing adit level) on Sections 07 and 08 of the resource. These sections are shown in Figure 4-1 with the higher grade areas shaded darker and outlined in blue.

The higher grade areas that can be readily accessed are restricted mostly to Sections 07 and 08 and are almost vertical. A ramp access has been designed on the NW side of the higher grade zones allowing for machinery to enter the end of each stope to muck with remote controlled LHDs.

Diesel machinery has been kept to a minimum in this design in order to reduce ventilation requirements until flow-through ventilation can be established. Calculations indicate that it would be possible to commence mining in the first few years with 2 x 5 yd LHDs and two trucks. The second truck would become operative as soon as flow-through ventilation is established. Preliminary calculations indicate the need for 60” rigid vent duct and a fan at the portal with more than 400 HP capacity. Ore and waste will be hauled to a portal dump using a 10 Ton battery powered locomotive with 8 x 4m³ ore cars. (The capacity of a train is estimated at 50 tonnes.)

Sublevel spacing has been set at 25 m and cost data for a longhole open stoping method has been compiled. To minimize infrastructure for the small tonnage operation it was assumed that stopes would not be backfilled after mining. A preliminary review of empirical stope design criteria has indicated that voids as large as 50 m high x 25 m along strike and 4 to 15 m wide could be mined assuming no major faults are encountered and that the schist is highly silicified.

Table 4-1 lists the assumptions used for building the mine plan.

In order to achieve production as quickly as possible it will be necessary to mine out the stopes from top to bottom as the decline is being advanced, uphole drilling and remote mucking of the stopes is indicated for the bottom 25 m of each block.

As shown in Figure 4-2, mining blocks have been designed 50m high with strike lengths of roughly 25 m and widths as shown. Between mining blocks, a rock sill pillar will be left in place, which could possibly be mined at a later date if it is decided to install a backfill plant. Sill pillar tonnes are estimated at 115,000 tonnes, 23% of the resource between the "A" Stopes shown in Figure 4-3.

Figure 4-1: Sections 07 and 08

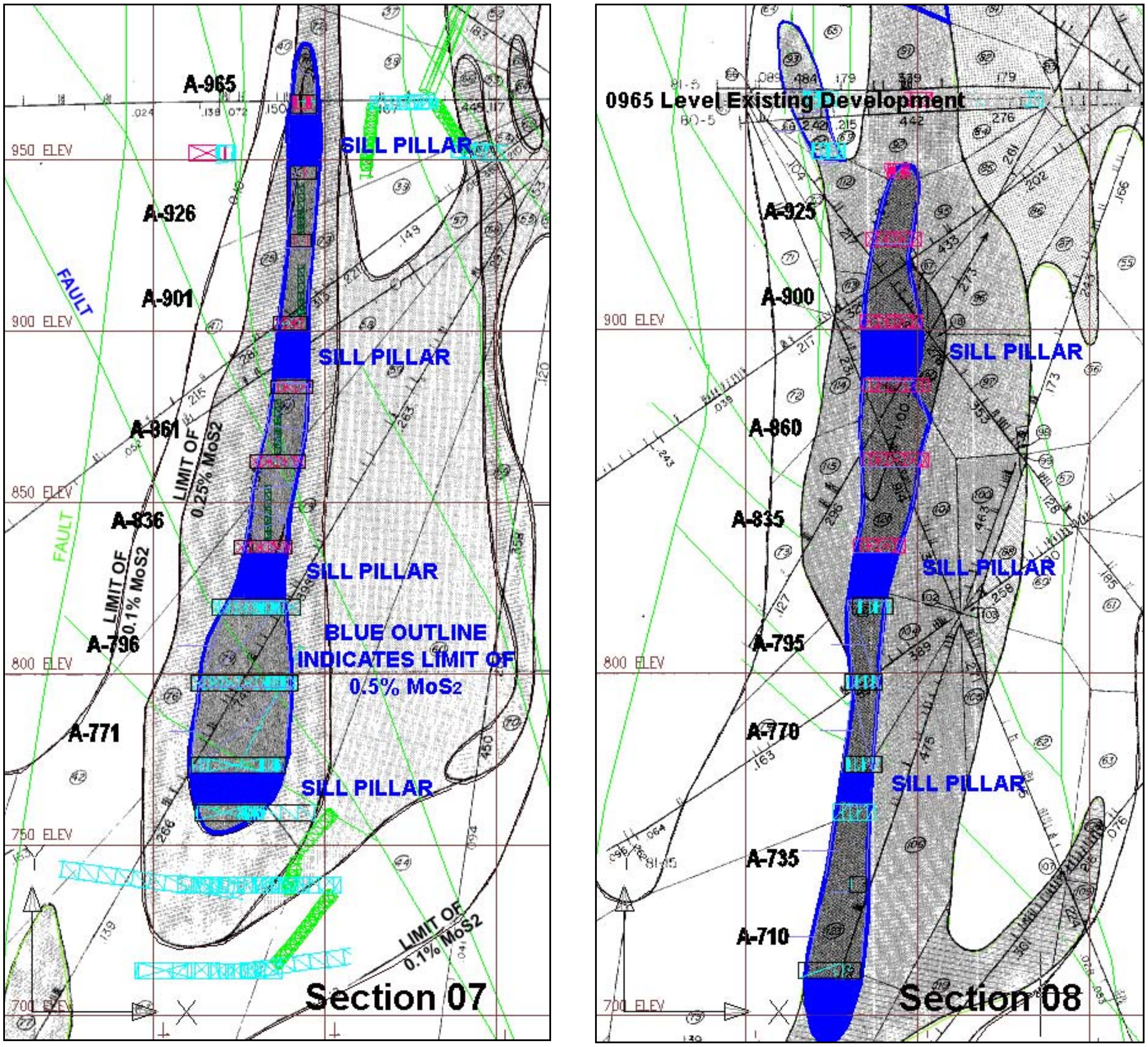
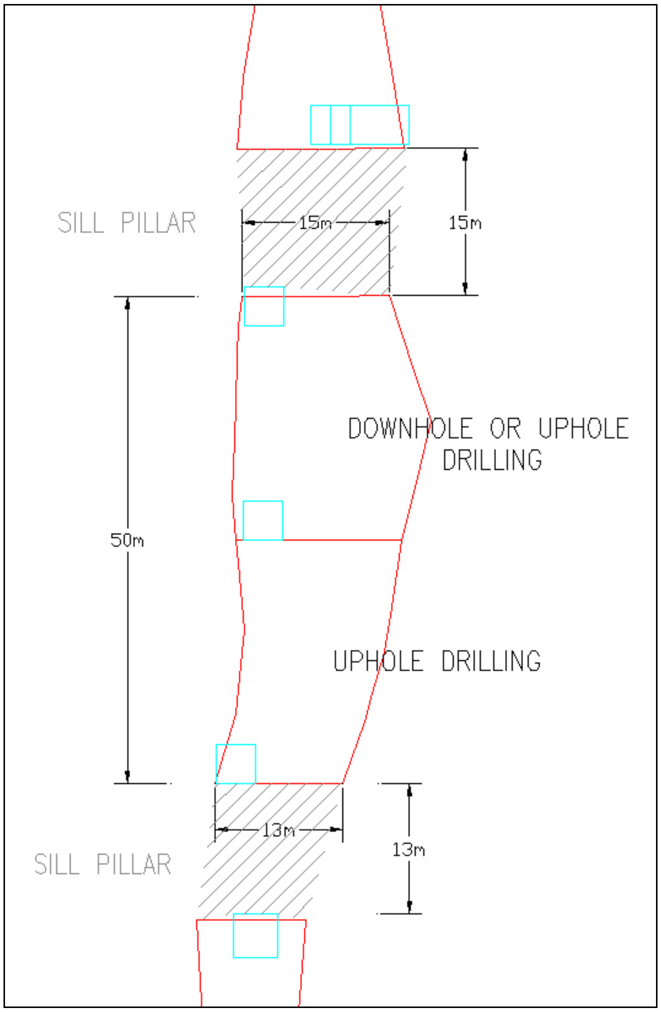


Figure 4-2: Stope Dimensions



4.2.1.1 Sequence of Work Case 1 - 500 tpd

Figure 4-3 shows a three dimensional view of the layout of ramps and stopes. The sequence of work leading to production at 500 tpd is outlined in Figure 4-4.

The first step is to re-establish access to the mine by repairing track, advancing air and water lines and installing the 60" diameter rigid vent duct for the 1400m access into the mine. It is assumed that the footwall faults will require some shotcrete and ground support. Once access to the mine has been re-established, and the adit has been fitted with ventilation, power, air and water, a truck shop will be built and the decline as well as the incline to a truck dump area can be started. Development will proceed at a slower pace at this time because the LHD will be loading directly onto a train.

As development proceeds up ramp toward the truck dump, the raises for the chutes can be started such that the truck dump bin raises are ready with arc gate chutes installed, when the truck dump access breaks through above. Development should proceed more rapidly once a grizzly has been installed and trucks can start dumping directly into the bins.

C-940 Stope is shown in Figure 4-3 just north of the truck dump area. It has been assumed that this stoping area might be useful as a repository for development waste and would serve also as a way of providing longhole muck between the stope cycles of the lower stoping blocks.

4.2.1.2 Ventilation and Mine Egress, Case 1 - 500 tpd

Preliminary calculations for the fan required at the portal indicate that the size of the fan must exceed 400 hp. A second fan estimated at 100 - 150 hp capacity, will be located in a bulkhead at the top of the vent raise system coming up from the lower levels.

As the decline is advanced and each level is accessed, ventilation raises will be driven between levels. This will allow the fan which feeds air to the face of the decline through flexible tubing to be moved from the level above and placed in a bulkhead close to the base of the raise between levels. By this means, fresh air is delivered to the lower levels. Vent raises below the 965 Level will be driven at 50°, 3m wide x 3m high to provide sufficient ventilation to the lower levels.

In case of an emergency, the fans at either end of the rigid vent duct could be reversed if deemed necessary, thereby reversing the flow of air in the mine.

The vent raises between levels will be fitted with ladders to provide an alternate means of egress from the mine. This series of connecting vent raises from the bottom of the mine to the adit elevation at 965 shown in Figure 4-3 will lead to the base of an Alimak raise to be driven between 965 and 1195 levels.

It is considered that the most cost effective means of establishing a secondary egress from the mine is to drive an Alimak raise 250 m long from the adit at Elevation 965 and connect it with a 490 m long decline from surface. Once the raise has broken through, the rail and cage can be left in place and the Alimak fitted as a type of elevator to evacuate workers in case of an emergency. A refuge station will nevertheless be needed and could be located at the base of the Alimak raise. An additional refuge station may also be needed at lower depths.

Figure 4-3: Design for a Mine Producing Case 1 - 500 tpd at a cut-off Grade of 0.5% MoS_2

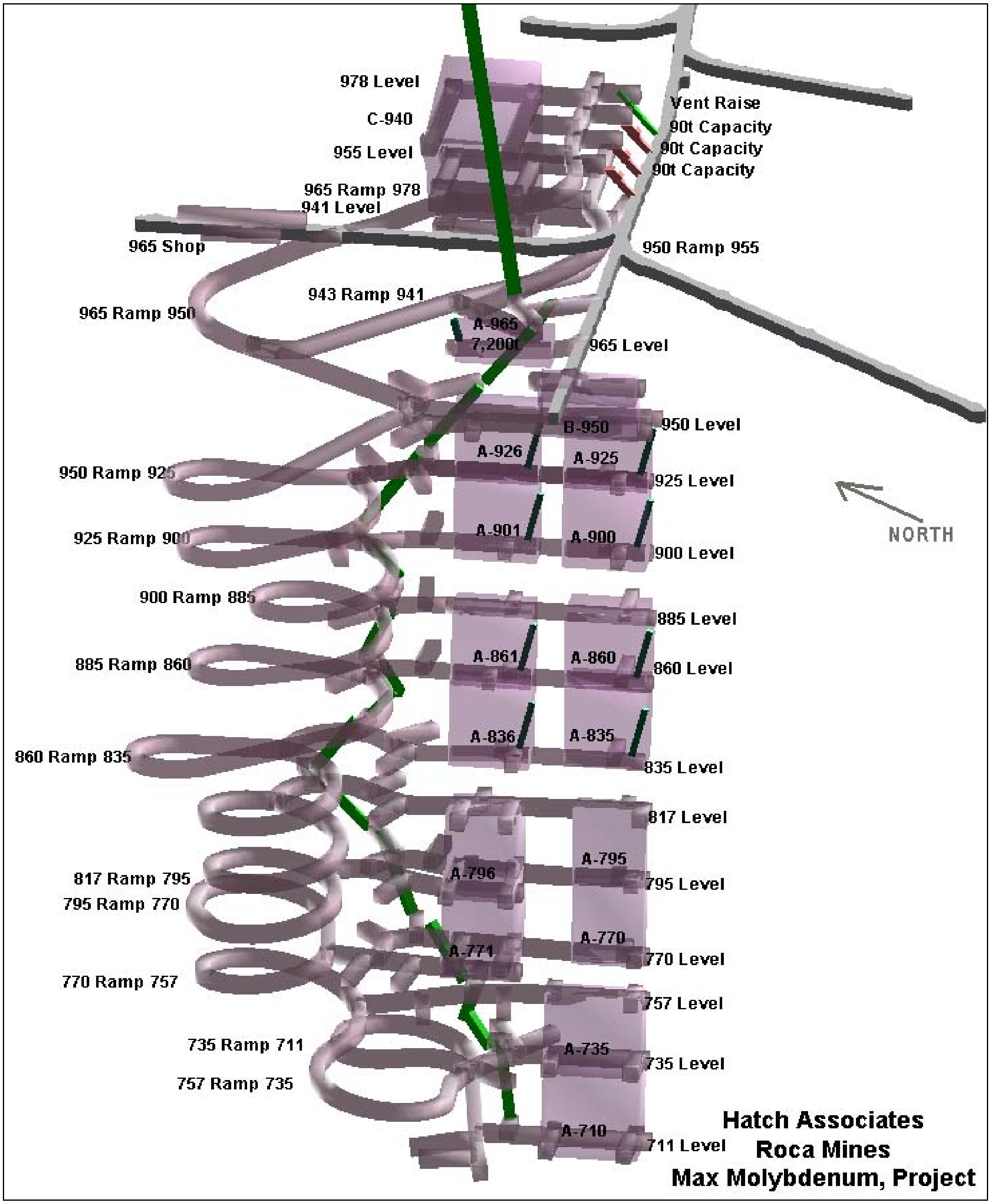


Table 4-1: Criteria for Design of Case 1 - 500 tpd Mine

Shifts		
Length of Shift	10 hrs	
Minutes worked per hour	50 minutes	
Lunch, coffee	50 minutes	
Time worked per shift	7.5 hours	
Shift rotation	2 weeks in 2 weeks out 183 days on site/year of which 85% effective work time	
Decline		
Dimensions	4.5 m wide x 4.5m high w/arched back	
Gradient	15% with flat sections at each level	
Advance rates including safety bays and remucks	100 m/mo	
Advance rate per jumbo	220 m/mo when faces are available	
Longhole Drilling	1800 m/mo per machine	
	7.5 tonnes/metre	
Longhole Charging	500 t/ms	
Train		
Ore Cars	140 ft^3	4.0m^3
Loaded capacity of cars 7.1 US Tons	6.4 t	
Number of ore cars	8	50 t per Train
Loci	Battery powered	
Size	10 Ton	
Cycle time for one trip	31 minutes	
Available time for tramming/shift	7 hours	Rest of the time taken up delivering workers face and supplies to trackless headings.
Possible trips per shift	9 trips	900 tons per day capacity
Transfer chutes	2 for ore and waste	
Capacity of each chute	3 trains	200 tonnes
Ventilation		
Principal fan at surface	400 hp	on concrete footing
Tubing	60 inch	rigid vent duct along adit
	48 inch	flexible tubing down decline
Booster fan at end of rigid vent duct	150 hp	
Booster fans for forcing air to face	75 hp	w/15m corrugated tubing
Vent direction	Forced air down decline. Vent raises are driven between levels as the decline advances. As each vent raise breaks through, fresh air will be forced down vent raise and delivered to the active work areas.	
Rock Mechanics		
Mean depth of mining from surface	590 metres	
Exposed hanging wall of stope		
Strike length	25 metres	
Height	50 metres	
Hydraulic radius of hanging wall exposure	8.3 metres	
Modified Mathews Span estimates. Favourable conditions assumed.		
UCS	50-100 Mpa	Upper end value assuming schist is heavily silicified
Rock mass rating	>60	Upper end value for schist
Q' value	>9	
Stress Factor 'A'	0.8	
Joint orientation factor 'B'	0.6	Assumes jointing at 50° to stope surface and no major faults bounding the stopes
Gravity adjustment factor 'C'	7	Inclination of stope surface 80°
Backfill		
No backfill		
Pillar Sizes		
Sill Pillar height	1:1	Same as mining width
Width of pillar between stopes along strike	1:1	Same as mining width
Dilution		
Internal	Included with grades	
Overbreak	10%	

Figure 4-4: Start-up Schedule Case 1 - 500 tpd

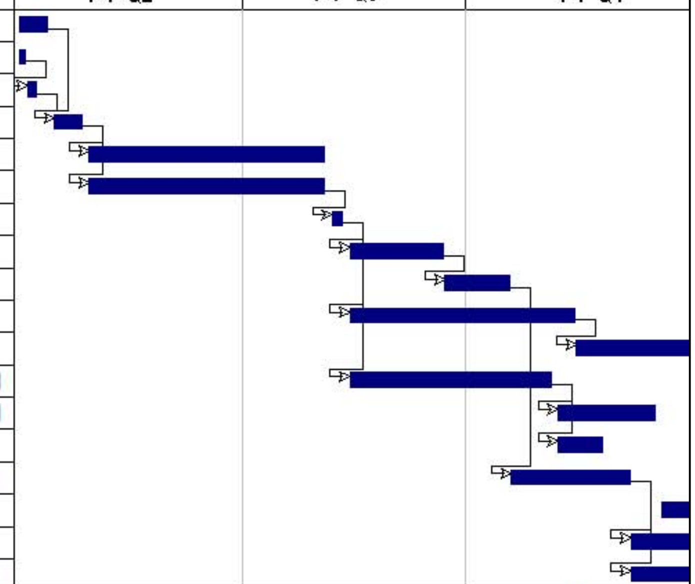
Hatch Associates

Roca Mines Max Molybdenum Project

Filtered on "Pre-Production" **Printed and Revised : 2005-03-30**

Name	Description	Ore Metres	Waste Metres	Raise Metres	Rate
Rehab Portal	Clean out Portal Access				
Fan Prep	Pour Base for Fan				
Fan Install	Install Fan by Portal, Rigid Duct into				
Rehab Track	Repair Track, 1400m				
Hang Air Water	Hang Air, Water Lines 1400m				
Hang Vent Duct	Hang Rigid Vent Duct 1400m				
Rehab at Fault	Rehab Fault Zone 10m				
965 Truck Shop	Backslash		40		30m/mo
965 Truck Shop	Slash		25		30m/mo
965Ramp980	Truck Dump Access		182		60m/mo
980 TruckDumps	Accesses to Grizzlies		60		30m/mo
965 OP 980	Truck Dump Orepasses			60	1Raise m/d
965 VR 980	Vent raise for truck dump			30	1Raise m/d
965 Chutes	Chute Installation				
965Ramp950			159		100m/mo
Collar Portal	Collar Portal at Elevation 1270				
950Level		105	148		60m/mo
950Ramp925			181		100m/mo

PRE - PRODUCTION (Y-1 Q2, Y-1 Q3, Y-1 Q4)



	Y-1 Q2	Y-1 Q3	Y-1 Q4
Ore Metres			21
Waste Metres		145	422
All Metres		145	443
Dev't Ore Tonnes			1156
Diluted Stope Tonnes			
All Ore Tonnes			1156
Diluted MoS2			1.720
Raise Metres		35	55

4.2.1.3 Capital Costs Case 1 – 500 tpd

Table 4-2 is a summary of costs for the pre-production period. Capital Costs for the pre production period are estimated at $8.4 million. It is assumed that underground equipment will be leased from a contractor and costs for leasing have been based on a payback period of five years. A schedule for the acquisition of mobile and stationary equipment during the pre-production Case is shown in Table 4-3.

Table 4-2: Capital Costs Case 1 - 500 tpd

	Y-1 Qtr2	Y-1 Qtr3	Y-1 Qtr4
		PRE-PRODUCTION	
Development/Production Schedule			
Waste Metres	-	145 m	422 m
Ore metres	-	-	21 m
All Metres	-	145 m	443 m
Dev't Ore Tonnes	-	-	1,156 t
Dilutes Stope Tonnes	-	-	-
All Ore Tonnes	-	-	1,156 t
Diluted MoS2	-	-	1.72%
Waste Tonnes	-	8,820 t	27,082 t
Raise Metres (excluding Alimak escapeway)	-	35 m	55 m
Summary of Costs (CAD$'000's)			
Stationary equipment for underground	$662	$501	$62
Mobile underground equipment leasing	$37	$299	$282
Direct labour (men on payroll)	$781	$747	$970
Mine management supervision technical	$300	$300	$300
Supplies	$35	$143	$426
Contractor drill blast longhole			-
Main contractor and Alimak costs	$325	$205	$319
Mechanical and other operating costs	$50	$175	$432
Services, power	$68	$83	$105
Indirect costs	$156	$152	$175
Diamond drilling		$109	$109
TOTAL	**$2,415**	**$2,715**	**$3,180**
		TOTAL CAPITAL	**$8,310**

Table 4-3: Equipment Acquisition Schedule Case 1 - 500 tpd

	Y-1 Qtr2	Y-1 Qtr3	Y-1 Qtr4
		PRE-PRODUCTION	
Underground Mobile and Leased Equipment Acquisition			
Muck cars		8	
Flat cars	10		
Locomotive 10 ton reconditioned		1	
Batteries for loci		2	
Jumbo 2 boom like Axera D06 226XL		1	
Scissor deck		1	
LHD with remote capability		1	
Truck			1
Alimak			1
Shotcrete machine and hoses			
ANFO loaders (cartridge loaders supplied by Contractor)	1	1	
Jacklegs	3		
Stopers	3		
Mine rescue equipment	5		
Pickup truck (surface)	1		
Van (surface)	1		
Stationary Equipment for Underground			
Air Compressors			
Fan 150 hp	1	-	-
Rigid vent duct 1450 m	1		
Rail 85 lb	1		
Rail switch	3		
Camel back		2	
Arc gate chute	1		
Shop equipment			1
Fan 100 hp	1	-	-
Fan 75 hp booster	-	1	1
Flygt pumps	-	1	-
Small grizzly	1		
Refuge station	-	1	-
Battery station	-	1	-
Refuge Station	-	-	-
Transformer	-	1	-

Table 4-4: Scoping Level Production and Operating Costs Case 1 - 500 tpd

Lease	Y1 Q1	Y1 Q2	Y1 Q3	Y1 Q4	Y2 Q1	Y2 Q2	Y2 Q3	Y2 Q4	Y3 Q1	Y3 Q2	Y3 Q3	Y3 Q4
						Production						
DEVELOPMENT / PRODUCTION SCHEDULE												
Waste Metres	865 m	803 m	518 m	354 m	160 m	317 m	299 m	390 m	293 m	91 m	-	-
Ore Metres	208 m	250 m	302 m	265 m	45 m	138 m	134 m	184 m	100 m	72 m	-	-
All Metres	1,072 m	1,053 m	820 m	619 m	205 m	455 m	432 m	574 m	393 m	163 m	-	-
Dev't Ore Tonnes	11,432 t	13,763 t	16,625 t	14,608 t	2,494 t	7,602 t	7,355 t	10,156 t	5,523 t	3,966 t	-	-
Diluted Stope Tonnes	5,719 t	23,018 t	28,087 t	25,471 t	51,434 t	35,323 t	38,800 t	34,649 t	39,167 t	34,330 t	44,434 t	21,098 t
All Ore Tonnes	17,151 t	36,781 t	44,712 t	40,079 t	53,928 t	42,925 t	46,155 t	44,805 t	44,691 t	38,296 t	44,434 t	21,098 t
Production Rate	**191 tpd**	**409 tpd**	**497 tpd**	**445 tpd**	**599 tpd**	**477 tpd**	**513 tpd**	**498 tpd**	**497 tpd**	**426 tpd**	**494 tpd**	**234 tpd**
Diluted MoS2	1.27 %	1.15 %	1.51 %	1.25 %	1.30 %	1.16 %	1.08 %	0.50 %	0.56 %	0.61 %	0.66 %	0.58 %
Waste Tonnes	51,850 t	49,367 t	34,081 t	22,830 t	9,925 t	19,184 t	18,334 t	23,840 t	18,415 t	5,691 t	91 t	-
Longhole Drilling	762 m	3,344 m	4,404 m	8,619 m	10,055 m	4,853 m	1,373 m	1,024 m	5,298 m	7,402 m	3,735 m	-
Raise Metres (excluding Alimak escapeway)	7 m	100 m	69 m	109 m	44 m	27 m	23 m	54 m	106 m	40 m	11 m	-
Alimak Metres		48 m	150 m	52 m								
SUMMARY OF COSTS												
Underground Mobile and Leased Equipment Acquisition	-	-	-	-	-	-	-	-	-	-	-	-
Stationary Equipment for Underground	$88	-	$233	-	$50	-	-	-	-	-	-	-
Mobile Underground Equipment Leasing	$160	$319	$209	$209	$209	$209	$209	$209	$209	$209	$209	$209
Direct Labour (Men on Payroll)	$1,455	$1,564	$1,418	$1,224	$825	$926	$934	$1,051	$930	$705	$610	$378
Mine Management Supervision Technical	$286	$286	$286	$286	$286	$286	$286	$286	$286	$286	$273	$170
Supplies	$1,018	$1,013	$789	$594	$262	$467	$452	$575	$420	$193	$60	$28
Contractor Drill Blast Longhole	$48	$192	$235	$213	$430	$295	$324	$290	$327	$287	$371	$176
Main Contractor and Alimak Costs	$561	$584	$500	$414	$257	$332	$330	$385	$347	$243	$195	$266
Mechanical and Other Operating Costs	$984	$1,030	$842	$658	$338	$537	$529	$653	$679	$438	$358	$196
Services, Power	$139	$139	$129	$121	$104	$114	$113	$119	$112	$102	$96	$58
Indirect Costs	$217	$243	$229	$216	$172	$170	$167	$181	$151	$125	$108	$67
Diamond Drilling	$109	$109										
TOTAL	**$5,064**	**$5,478**	**$4,869**	**$3,936**	**$2,934**	**$3,337**	**$3,344**	**$3,748**	**$3,460**	**$2,588**	**$2,282**	**$1,548**
Mine Operating Cost / Tonne **Average $101/t**	$295 /t	$149 /t	$109 /t	$98 /t	$54 /t	$78 /t	$72 /t	$84 /t	$77 /t	$68 /t	$51 /t	$73 /t
Underground Labour at Work During a Shift	14	16	15	14	10	10	10	11	9	6	5	3
Total Underground Labour on Payroll	57	66	61	56	42	41	40	44	34	25	20	12
Total Management, Supervision, Technical on Payroll	13	13	13	13	13	13	13	13	13	13	12	8
Total Workforce on Payroll	69	78	73	69	54	53	52	57	47	38	32	20

4.2.1.4 Operating Costs Case 1 - 500 tpd

Operating Costs summarized in Table 4-4 above, are higher at the start of production as the Alimak ventilation escapeway raise and the decline from surface are completed. After this time operating costs stabilize at roughly $73/tonne.

4.2.1.5 Stope Tonnes and Grade Case 1 - 500 tpd

Table 4-5 shows the tonnes and grade information for the stopes included in the mine plan.

Table 4-5: Stope Tonnes and Grade Case 1 - 500 tpd

	Undiluted Grade	Recovery	Grade of Dilution	Backfill Dilution (Waste/Ore)	Recovered Diluted Tonnes	Dilution (w/(o+w))	Final Stope Grade
A965	1.00	98%	0.29	-	7,784 t	10%	0.93
A926	1.49	98%	0.41	-	13,170 t	10%	1.38
A925	2.26	98%	0.35	-	15,246 t	10%	2.07
A901	2.28	98%	0.30	-	15,496 t	10%	2.08
A900	2.26	98%	0.36	-	25,884 t	10%	2.07
A861	1.93	98%	0.31	-	21,115 t	10%	1.77
A860	1.88	98%	0.29	-	33,274 T	10%	1.72
A836	2.12	98%	0.34	-	21,135 t	10%	1.95
A835	0.91	98%	0.41	-	26,492 t	10%	0.86
A796	0.74	98%	0.33		35,193 t	10%	0.70
A795	0.60	98%	0.32		15,196 t	10%	0.57
A71	0.74	98%	0.33		43,790 t	10%	0.70
A770	0.60	98%	0.25	-	13,356 t	10%	0.56
A735	0.57	98%	0.31	-	24,613 t	10%	0.54
A710	0.57	98%	0.31		31,975 t	10%	0.54
B950	0.48	98%	0.15	-	17,467 t	10%	0.45
C940	0.53	60%	0.19	15%	111,665 t	27%	0.44
TOTAL					**472,852 t**		**0.97**

4.3 Mining Plan Case 2 - 2,500 tpd

A scoping level mining plan was derived for a production rate of 2,500 tpd using a cut-off grade of 0.2% MoS_2 based on hand drawn spreadsheets of resource polygons and the scanned, hand-drawn sections provided by ROCA Mines Ltd. The outlines of the 0.2% cut-off were extended normal to the sections to create three-dimensional solids as shown in Figure 4-5 and Figure 4-6. The figures show mining of the higher grade zones below the adit elevation which are shown in red can likely be sequenced such that they are mined first as they are located close to the hanging wall of the deposit.

4.3.1.1 Tonnes and Grade Case 2 - 2,500 tpd

Table 4-9 shows general recovery and dilution factors applied to the resource at a 0.2% MoS_2 cut-off as derived from the hand written spreadsheets of the polygon and from the digitized, scanned sections. The outlier blocks mentioned in Table 4-9 are those areas, which are located beyond the focus of mining and have been excluded from the mining resource as it was considered that the costs to access them would be too high. The introduction of sill pillars would accelerate mining of some areas and a sill pillar volume equivalent to the volume of the resource between 965 and 940 Levels, or 7% of the resource was also excluded from the total.

Mining of the high grade zones below 965 Level would commence from the bottom level upward, backfilling as each stope is mined. This requires the decline from 965 to 690 Level to be driven as soon as flow through ventilation is made available. It is assumed that grades during the first two years of production could reach 0.4% MoS_2. Grades for the remaining years have been pro-rated to ensure that an overall average grade of 0.32% MoS_2 is reflected in the plan.

Ramps and sublevels have been designed at 4.5 m x 4.5 m to accommodate a 30T truck and 1.2 m diameter vent tubing. An allowance has been made for safety bays every 15m on the decline and if required, every 30 m on levels. Development metres have been capped at 5,000 m/year to provide consistent work for crews.

4.3.1.2 Sequence of Work Case 2 - 2,500 tpd

In order to prepare the mine for trackless equipment it will be necessary to establish a flow -through ventilation route. This will require collaring a new portal at El. 1270 and driving a 385 m long decline to connect with an Alimak raise driven from the existing mine workings on 965 Level. The decline can be used to access other mining areas. Due to the convergence of the Y and Z Faults with the Ethel Fault (see Plan View in Appendix E) it is considered that the mine access should be located northwest of the adit, away from these major faults.

Once flow through ventilation has been established, inclines and declines can be developed to access mining areas from both the 965 Level and from the 1270 Ramp. In order to obtain a higher grade mill feed at the start of mine life, it will be necessary to drive the ramp to the lower elevations as quickly as possible. Level accesses can then be driven from the ramp through the lower grade material into the higher grade areas so that these areas can be mined first

To maximize ore recovery, longhole mining using downholes with sublevel intervals of 25 m is indicated and extraction is planned starting at the bottom and retreating from the higher grade areas as each stope is mined. Hydraulic backfill will be pumped up to the 1270 Portal where it will flow by gravity to the working areas. An additional line may be required along the 965 adit but this has not been included in the capital cost estimate. During the time that the lower decline is being developed, it will also be possible to commence extraction of the stopes accessed from the 1270 Ramp.

4.3.1.3 Ventilation and Mine Egress Case 2 - 2,500 tpd

The mine plan indicates that an Alimak Raise must be driven first to connect with a decline from surface and if necessary, the Alimak can be left in place and used as an escapeway until an incline is driven from the 965 Level to the 1165 Level and a short raise is driven from this incline to connect with the decline from surface at the start of full production in Year 1.

Figure 4-7 shows a start-up schedule indicating that more than two years would be required to bring the mine to full production. During this time it should be possible to produce from some stopes off the upper decline from the 1270 Portal.

Figure 4-5: Design for a Mine producing Case 2 - 2,500 tpd at a Cut-off Grade of 0.2% MoS_2 (Looking Southwest)

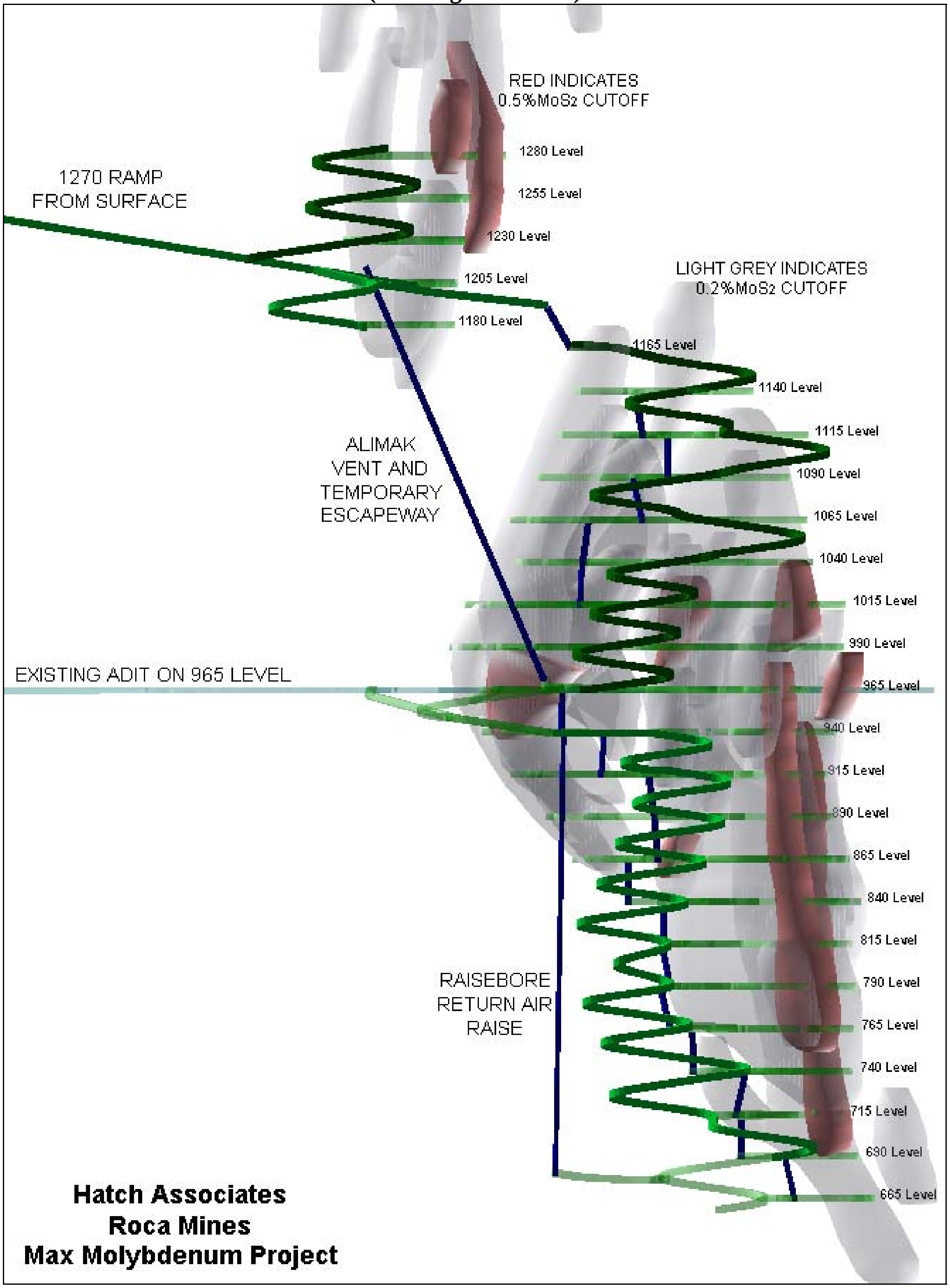


Figure 4-6: Design for a Mine producing Case 2 - 2,500 tpd at a Cut-off Grade of 0.2% MoS_2 (Looking Northwest)

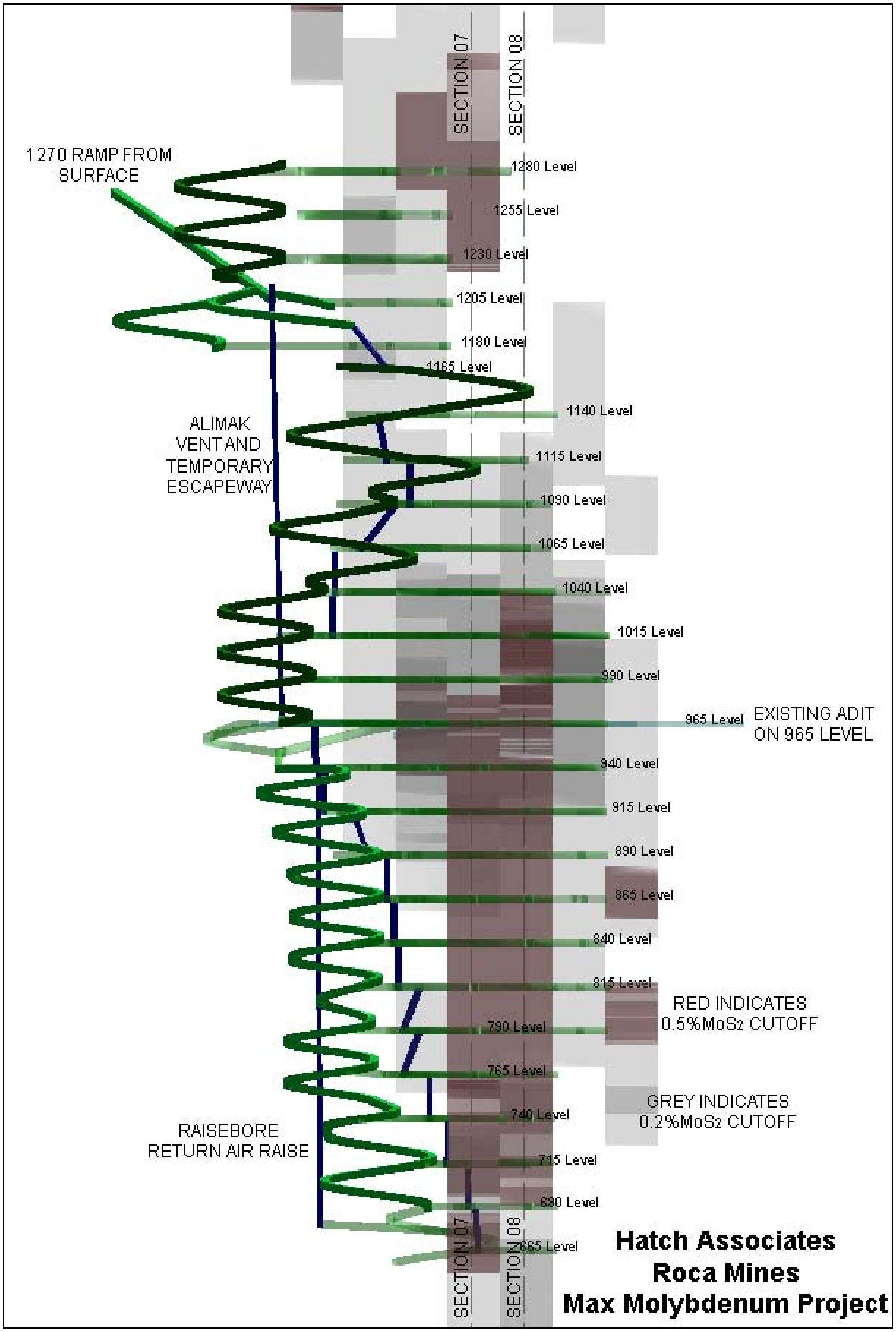


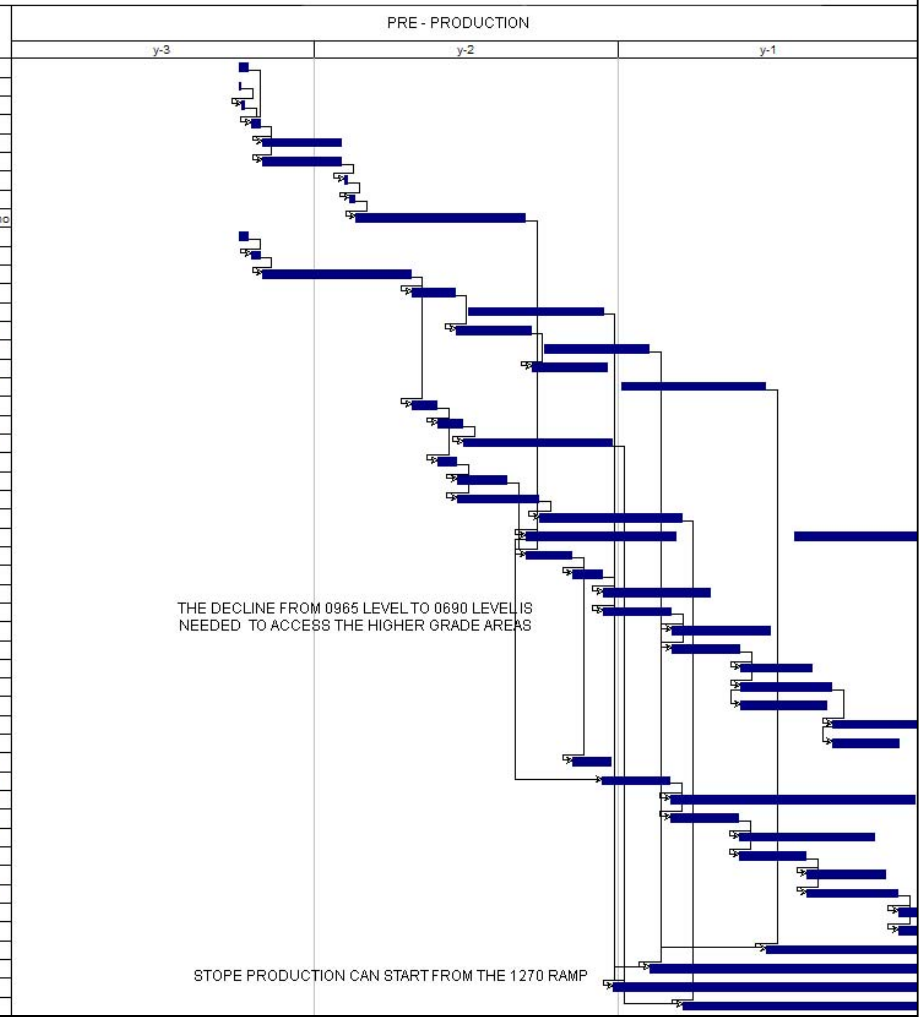
Figure 4-7: Start-up Schedule Case 2 - 2,500 tpd

Hatch Associates

Roca Mines Max Molybdenum Project

Filtered on "2500tpd Pre-Production" **Printed and Revised : 2005-03-31**

Name	Description	Development Metres	Raise Metres	Rate
Rehab Portal	Clean out Portal Access	0	0	
Fan Prep	Pour Base for Fan	0	0	
Fan Install	Install Fan by Portal, Rigid Duct into Po	0	0	
Remove Track	Remove Track, 1400m	0	0	
Hang Air Water	Hang Air, Water Lines 1400m	0	0	
Hang Vent Duct	Hang Rigid Vent Duct 1400m	0	0	
Rehab at Fault	Rehab Fault Zone 10m	0	0	
0965AlimakNest		25	0	100m/mo
0965Alimak1120	Vent exhaust and temporary escapeway	0	270	40Raise m/mo
0965Road 1270	Surface Road to 1270 Portal	0	0	
1270Portal	Collar Portal	0	0	
1270Ramp 1218	Drive Decline from Surface	475	0	80m/mo
1218Ramp 1230	Start Incline to Upper Levels	136	0	80m/mo
1230Level		432	0	80m/mo
1230Ramp 1255		241	0	80m/mo
1255Level		335	0	80m/mo
1255Ramp 1280		244	0	80m/mo
1280Level		346	0	60m/mo
1218Ramp 1212	Start Decline from Surface Ramp	77	0	80m/mo
1212Ramp 1205		86	0	80m/mo
1205Level		355	0	60m/mo
1212Ramp 1207		68	0	80m/mo
1207Ramp 1192		156	0	80m/mo
1207Ramp 1180		262	0	80m/mo
1180Level		336	0	60m/mo
0965Level		1,322	0	80m/mo
0965Ramp 950	Start Decline from 0965 Adit	149	0	80m/mo
0950Ramp 0940		96	0	80m/mo
0940Level		965	0	60m/mo
0940Ramp 0915		217	0	80m/mo
0915Level		898	0	60m/mo
0915Ramp 0890		217	0	80m/mo
0890Level		716	0	60m/mo
0890Ramp 0865		217	0	60m/mo
0865Level		706	0	60m/mo
0865Ramp 0840		217	0	60m/mo
0840Level		670	0	60m/mo
0950Ramp 0965	Start Incline up from 0965 Adit	121	0	80m/mo
0965Ramp 0990		217	0	80m/mo
0990Level		1,282	0	60m/mo
0990Ramp 1015		217	0	80m/mo
1015Level		1,404	0	60m/mo
1015Ramp 1040		217	0	80m/mo
1040Level		683	0	60m/mo
1040Ramp 1065		217	0	60m/mo
1065Level		612	0	60m/mo
1065Ramp 1090		217	0	60m/mo
1255Stope1280		0	0	400t/d
1230Stope1255		0	0	400t/d
1205Stope1230		0	0	400t/d
1180Stope1205		0	0	400t/d



4.3.1.4 Capital Costs Case 2 - 2,500 tpd

Table 4-6 shows a summary of capital costs for the pre-production phase. The mobile and stationary acquisition schedule for the pre-production period is shown in Table 4-7.

Table 4-6: Mine Capital Costs Case 2 - 2,500 tpd Mine

	Capital Quantities	Year –3	Year –2	Year -1
		PRE-PRODUCTION		
Development/Production Schedule				
Waste Metres	7,215 m	166 m	3,549 m	3,500 m
Ore metres	1,522 m	-	22 m	1,500 m
All Metres	8,737 m	166 m	3,571 m	5,000 m
Dev't Ore Tonnes	83,213 t	-	1,200 t	82,013 t
Diluted Stope Tonnes	20,000 t	-	-	20,000 t
All Ore Tonnes	332,797 t	-	1,200 t	331,597 t
Production rate				**900 tpd**
Diluted MoS2	0.32%	0.32%	0.32%	0.32%
Waste Tonnes	487,005 t	11,178 t	239,577 t	236,250 t
Longhole Drilling	2,667 m	-	-	2,667 m
Raise Metres (vent raises and ore passes only)	339 m	-	76 m	263 m
Alimak Metres	270 m		270 m	
Summary of Costs (CAD$'000's)	Total Capital			
Underground mobile and leased equipment acquisition	-	-	-	-
Stationary equipment for underground	$11,299	$1,884	$3,790	$5,625
Mobile underground equipment leasing	$3,338	$601	$1,177	$1,560
Direct labour	$15,540	$1,375	$5,615	$8,551
Mine management supervision technical	$6,853	$1,997	$2,318	$2,538
Supplies, drifting	$8,296	$192	$3,458	$4,646
Backfill: including cement, bulkheads and backfill line	$467	-	-	$467
Contractor drill blast longhole	$156	-	-	$156
Main contractor and Alimak costs	$6,593	$744	$2,365	$3,484
Mechanical and other operating costs	$12,265	$397	$4,373	$7,496
Services, power	$2,857	$358	$983	$1,516
Indirect costs	$507	$84	$177	$246
Diamond drilling	$1,086	$-	$543	$543
TOTAL		**$7,632**	**$24,797**	**$36,828**
			Cumulative Capital	**$69,000**

Table 4-7: Mine Capital Equipment Acquisition Schedule Case 2 - 2,500 tpd Mine

	Year –3	Year –2	Year –1
		PRE-PRODUCTION	
UNDERGROUND MOBILE AND LEASED EQUIPMENT ACQUISITION			
ıbo 2 boom like Axera D06 226XL	1	2	1
ssor Deck	1	2	2
D with remote capability	1	2	2
ıck 18m³ box size	1	1	3
FO Loaders (Cartridge Loaders supplied by Contractor)	5	5	-
klegs	5	5	5
pers	5	5	5
ıe Rescue Equipment	8	-	-
k-up Truck (surface)	2	2	-
ı (surface)	2	2	-
lter Like MacLean 946	2	2	1
sting Truck	1	-	-
vice Vehicles for Technical Staff	1	1	1
vice Vehicles for Mechanics	1	2	2
vice Vehicles for Miners	1	2	2
ıder	-	1	1
ıb	1	2	2
ɔtcrete Machine	1	1	-
TAL LEASING COSTS	**$601**	**$1,177**	**$1,560**
IONARY EQUIPMENT FOR UNDERGROUND			
ı 150 hp	2	2	1
;id Vent Duct 1450m	1	-	-
ɔp Equipment	-	-	1
ı 400 hp	1	-	-
ı 75 hp booster	-	3	7
gt Pumps	2	3	4
uge Station	-	1	-
tery Station	-	-	-
nsformer	1	2	3
;ale Value Set at			
TAL	**$1,884**	**$3,790**	**$5,625**

4.3.1.5 Operating Costs Case 2 - 2,500 tpd

Mine operating costs for full production are shown in Table 4-8. As development is completed, mine operating costs appear to stabilize at $38/tonne mined. Some additional development may be required throughout mine life, which has not been included in the estimate. As in Case 1 - 500 tpd, it has been assumed that equipment would be leased and that the payback period used to calculate rental is five years.

Table 4-8: Mine Operating Costs Case 2 - 2,500 tpd

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
					PRODUCTION					
DEVELOPMENT / PRODUCTION SCHEDULE										
Waste Metres	2,000 m	1,500 m	1,000 m	-	-	-	-	-	-	-
Ore Metres	2,500 m	2,500 m	2,500 m	1,000 m	300 m	-	-	-	-	-
All Metres	4,500 m	4,000 m	3,500 m	1,000 m	300 m	-	-	-	-	-
Dev't Ore Tonnes	136,688 t	136,688 t	136,688 t	54,675 t	16,403 t	-	-	-	-	-
Diluted Stope Tonnes	200,000 t	639,125 t	775,813 t	857,825 t	896,098 t	912,500 t	912,500 t	912,500 t	800,000 t	266,800 t
All Ore Tonnes	419,201 t	606,243 t	912,500 t	912,500 t	912,500 t	912,500 t	912,500 t	912,500 t	800,000 t	266,800 t
Production rate	1,100 tpd	1,700 tpd	2,500 tpd	2,500 tpd	2,500 tpd	2,500 tpd	2,500 tpd	2,500 tpd	2,200 tpd	700 tpd
Diluted MoS2	0.40 %	0.40 %	0.36 %	0.32 %	0.32 %	0.31 %	0.29 %	0.28 %	0.28 %	0.28 %
Waste Tonnes	135,000 t	101,250 t	67,500 t	-	-	-	-	-	-	-
Longhole Drilling	26,667 m	85,217 m	103,442 m	114,377 m	119,480 m	121,667 m	121,667 m	121,667 m	106,667 m	35,573 m
Raise Metres (Vent raises and Ore passes only)	244 m	290 m	168 m	-	-	-	-	-	-	-
Alimak Metres		-	-	-						
SUMMARY OF COSTS (in thousands of Canadian dollars)										
Underground mobile and leased equipment acquisition	-	-	-	-	-	-	-	-	-	-
Stationary Equipment for underground	$1,639	-	$333	-	$150	-	-	-	-	-
Mobile underground equipment leasing	$1,380	$1,468	$1,225	$1,225	$1,225	$1,225	$1,225	$1,225	$1,117	$760
Direct labour	$8,641	$10,063	$10,935	$8,928	$8,511	$8,332	$8,332	$8,332	$7,623	$4,264
Mine management supervision technical	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400
Supplies, drifting	$4,257	$4,358	$4,059	$1,969	$1,448	$1,223	$1,224	$1,223	$1,073	$357
Backfill: including cement, bulkheads and backfill lines	$1,319	$3,588	$4,060	$4,483	$4,681	$4,766	$4,766	$4,766	$4,185	$1,404
Contractor drill blast longhole	$1,560	$4,985	$6,051	$6,691	$6,990	$7,118	$7,118	$7,118	$6,240	$2,081
Main contractor and Alimak costs	$3,407	$3,682	$3,864	$2,928	$2,701	$2,603	$2,603	$2,603	$2,758	$1,544
Mechanical and other operating costs	$7,416	$7,728	$8,368	$6,223	$5,647	$5,400	$5,400	$5,400	$7,290	$3,274
Services, power	$1,760	$1,719	$1,690	$1,486	$1,439	$1,415	$1,415	$1,415	$1,415	$1,415
Indirect costs	$258	$309	$334	$308	$304	$302	$302	$302	$280	$190
Diamond drilling	$543	$543	-	-	-	-	-	-	-	-
TOTAL	**$34,580**	**$40,844**	**$43,319**	**$36,640**	**$35,495**	**$34,783**	**$34,785**	**$34,783**	**$34,381**	**$17,690**
Mine Operating Cost / Tonne: Average $46 /tonne	$82 /t	$67 /t	$47 /t	$40 /t	$39 /t	$38 /t	$38 /t	$38 /t	$43 /t	$66 /t
Underground Labour at Work During a Shift	27	34	37	33	33	33	33	33	30	17
Total Underground Labour on Payroll	104	132	146	132	129	128	128	128	116	67
Total Management, Supervision, Technical on Payroll	26	26	26	26	26	26	26	26	26	26
Total Workforce on Payroll	130	158	172	158	155	154	154	154	142	93

4.3.1.6 Tonnes and Grade Case 2 - 2,500 tpd

Table 4-9 shows the calculation of the resource at a cut-off grade of 0.2% MoS_2. The volumes were derived from the scanned and digitized resource sections. The grade was derived from the hand drawn spreadsheets and factors for recovery, overbreak and dilution were applied as shown. This results in a mining resource of 7.9 million tonnes at 0.32% MoS_2.

Table 4-9: Stope Tonnes and Grade Case 2 - 2,500 tpd

Section Reference	0.2% MoS_2 Outline from Scanned Sections	Resource after Outlier Blocks Discounted	85% Recovery of Remaining Resource Applied	Undiluted Grade MoS_2	Overbreak	Backfill Dilution	Grade of Dilution	Recovered Diluted Tonnes	Diluted Grade MoS_2
10	10,316m^3	-	-	0.36%	10%	3%	0.15%	-	-
10	61,033 m^3	-	-	0.36%				-	-
10	33,004 m^3	-	-	0.36%				-	-
10	7,892 m^3	-	-	0.36%				-	-
09	178,325 m^3	178,325 m^3	151,576 m^3	0.36%				462,460 t	0.32%
09	15,342 m^3	15,342 m^3	13,040 m^3	0.36%				39,786 t	0.32%
09	18,136 m^3	18,136 m^3	15,416 m^3	0.36%				47,033 t	0.32%
09	55,121 m^3	55,121 m^3	46,853 m^3	0.36%				142,948 t	0.32%
09	8,081 m^3	8,081 m^3	6,869 m^3	0.36%				20,956 t	0.32%
09	31,988 m^3	-	-	0.36%				-	-
09	52,615 m^3	-	-	0.36%				-	-
08	254,174 m^3	254,174 m^3	216,048 m^3	0.36%				659,163 t	0.32%
08	980,023 m^3	929,062 m^3	789,702 m^3	0.36%				2,409,382 t	0.32%
08	19,736 m^3	-	-	0.36%				-	-
08	67,905 m^3	-	-	0.36%				-	-
07	991,190 m^3	991,190 m^3	842,512 m^3	0.36%				2,570,503 t	0.32%
07	73,475 m^3	-	-	0.36%				-	-
07	35,321 m^3	-	-	0.36%				-	-
07	136,357 m^3	136,357 m^3	115,904 m^3	0.36%				353,622 t	0.32%
06	354,404 m^3	-	-	0.36%				-	-
06	28,719 m^3	28,719 m^3	24,411 m^3	0.36%				74,479 t	0.32%
06	27,245 m^3	27,245 m^3	23,158 m^3	0.36%				70,655 t	0.32%
06	41,521 m^3	41,521 m^3	35,293 m^3	0.36%				107,678 t	0.32%
06	155,651 m^3	77,825 m^3	66,152 m^3	0.36%				201,829 t	0.32%
06	31,513 m^3	31,513 m^3	26,786 m^3	0.36%				81,724 t	0.32%
05	296,074 m^3	296,074 m^3	251,662 m^3	0.36%				767,822 t	0.32%
05	168,437 m^3	109,484 m^3	93,062 m^3	0.36%				283,931 t	0.32%
05	50,942 m^3	50,942 m^3	43,301 m^3	0.36%				132,112 t	0.32%
04	45,966 m^3	45,966 m^3	39,071 m^3	0.36%				119,207 t	0.32%
	4,230,505 m^3	3,295,077 m^3	2,800,816 m^3						
Density	2.7 t/ m^3	2.7 t/ m^3	2.7 t/ m^3						
	11,400,000 t	**8,900,000 t**	**7,600,000 t**	**0.36%**				**8,550,000 t**	**0.32%**
							Sill pillars not recovered, 7% of the resource	-640,729 t	
							Resource Mined	**7,900,000 t**	**0.32%**

5. Mineral Process Plant

5.1 Introduction

Development of process for Case 1 – 500 tpd and Case 2 – 2,500 tpd plants were based on information available from historical reports and literature pertaining to similar molybdenite concentrators such as Endako and Henderson mines. All relevant parameters used in the size and designs of the plants are listed in the Process Design Criteria document in Appendix C.

The mined ore will be subject to a size reduction, including crushing and wet grinding in a closed circuit with classification systems. The slurry will flow through a froth flotation circuit, the final concentrate will be filtered and the filter cake will be dried. Molybdenite concentrate will finally be bagged and ready for transport to roasters.

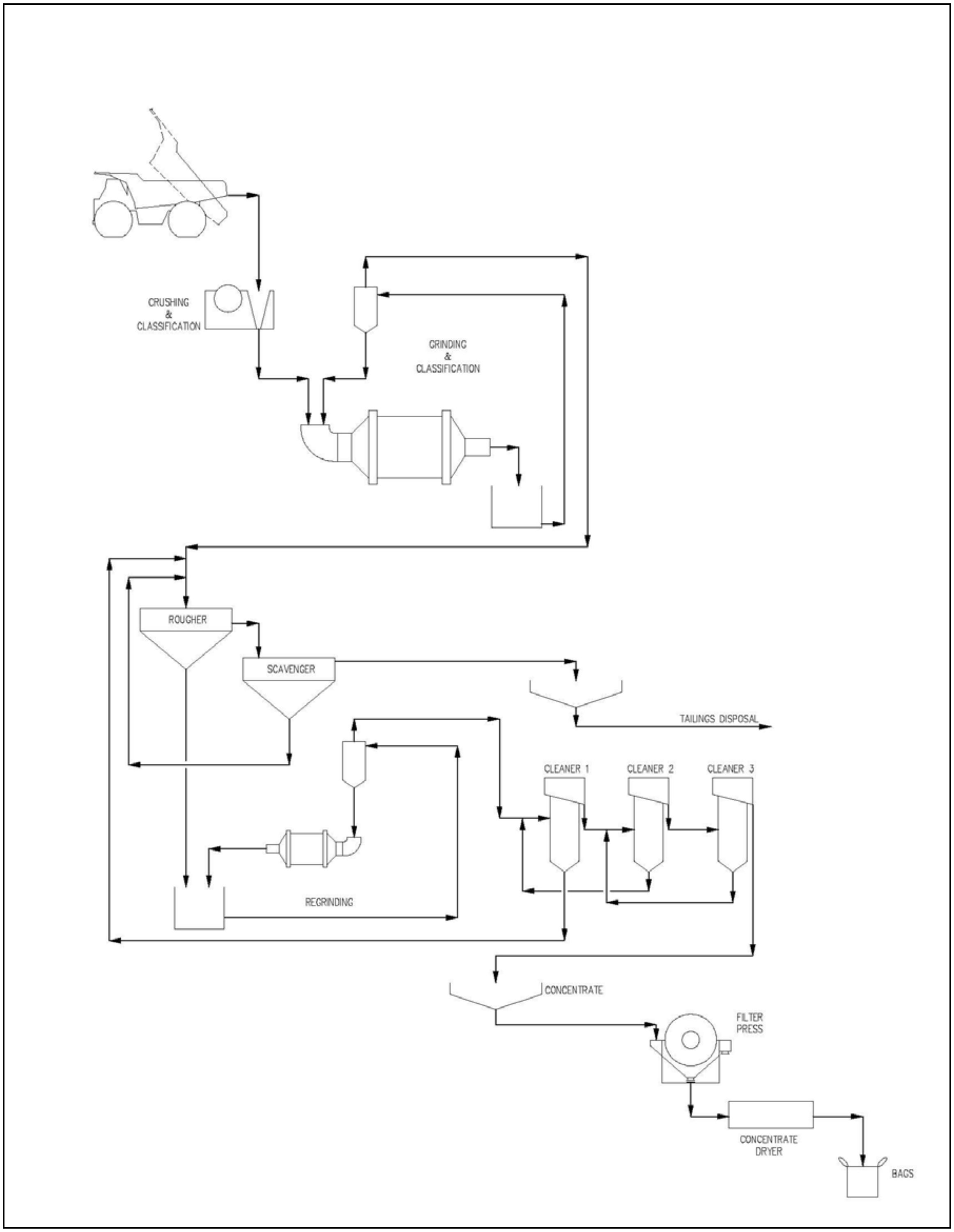
A simplified flowsheet of the process is presented in Figure 5-1 and molybdenite concentrate production is summarised as follows:

- Case 1 - 500 tpd operation will be able to process 182,500 tonnes per annum of ore with a head grade of 1.0% $MoS_{2.}$ Using the projected recoveries of 91% MoS_2 production will be 1,908 tonnes per annum of molybdenite concentrate with a grade of 52% Mo.

- Case 2 - 2,500 tpd the plant will be able to process 912,500 tonnes per annum of ore with a head grade of 0.5% $MoS_{2,}$ using the projected recoveries of 91% MoS_2 production will be 4,770 tonnes per annum of molybdenite concentrate with a grade of 52% Mo.

The process plant design development for the two cases as well as an estimate for manpower requirements are outlined below.

Figure 5-1: Simplified Flowsheet



5.2 Flowsheet Development

Conceptual process flowsheets were prepared to illustrate the design requirements necessary to produce a molybdenite concentrate. Flowsheets were developed for both Case 1- 500 tpd and Case 2 – 2,500 tpd and are included in Appendix C. The following design philosophy and assumptions adopted for each case are summarised below:

5.2.1 Case 1 – 500 tpd

- Primary and secondary stage crushing followed by ball milling.
- The flotation circuits have been based on typical molybdenum concentrators using conventional mechanical cells for roughing, scavenging and 1st, 2nd and 3rd stage cleaning operations.
- Rougher concentrates will be reground and conditioned in cleaner column cells.
- Concentrate dewatering will be accomplished with conventional thickeners followed by disc filter to obtain minimum cake moisture.
- Filtered concentrates will be dried in a conventional rotary dryer and bagged in super sacks.
- The mill tailings will be sent to the tailings thickener and the thickener underflow will discharge into the tailings dam for final disposal.

5.2.2 Case 2 – 2,500 tpd

- Primary and secondary stage crushing followed by SAG and ball milling.
- A two-stage grinding circuit has been selected for grinding efficiency.
- The SAG mill circuit includes a pebble crusher to address potential problems with critical size build-up.
- The flotation circuits have been based on typical molybdenum concentrators using conventional mechanical cells for roughing, scavenging and 1st, 2nd and 3rd stage cleaning operations.
- Rougher concentrates will be reground and conditioned in cleaner column cells.
- Concentrate dewatering will be accomplished with conventional thickeners followed by disc filter to obtain minimum cake moisture.
- Filtered concentrates will be dried using a conventional rotary dryer and fed to a concentrate stockpile.
- The mill tailings will be sent to the tailings thickener and the thickener underflow will discharge into the tailings dam for final disposal.

5.3 Process Description

5.3.1 General

The plant has been designed to process 182,500 tonnes per annum (Case 1 – 500 tpd) and 912,500 tonnes per annum (Case 2 – 2,500 tpd) of ore containing molybdenum.

Annual concentrate production based on grades and 91% recoveries are projected to be:

Table 5-1: Annual Concentrate Production Case 1 – 500 tpd

DESCRIPTION	ASSAY %MoS_2	TOTAL TONNES dmt/year	CONTAINED MoS_2 dmt/year
Mill Feed	1.0	182,500	1,825
Molybdenum Concentrate	87.0	1,908	1,660

Table 5-2: Annual Concentrate Production Case 2 – 2,500 tpd

DESCRIPTION	ASSAY %MoS_2	TOTAL TONNES dmt/year	CONTAINED MoS_2 dmt/year
Mill Feed	0.50	912,500	4,563
Molybdenum Concentrate	87.0	4,770	4,150

General arrangement drawings of the process facilities are presented in Appendix C.

In both Case 1 – 500 tpd and Case 2 – 2,500 tpd the plant will operate 24 hours per day, 365 days per year with scheduled downtime for maintenance of equipment.

Fine tailing solids from the tails thickener plant will be pumped to a tailings placement dam. Thickener overflow from the tailings thickener will be recycled to the process.

Selected process streams will be sampled and analyzed in an on-stream analytical system for operations monitoring and control purposes.

The plant will include facilities to produce a molybdenum disulphide flotation concentrate and will comprise the following unit operations:

5.3.2 Case 1 – 500 tpd

5.3.2.1 Crushing and Grinding

Underground ore will be transported by rail and dumped into coarse ore bins. A loader will feed the portable crushing plant and the material will be conveyed to the grinding circuit.

The grinding circuit will consist of a 2,500 mm diameter x 3,600 mm primary ball mill. The ball mill will have approximately 290 kW of installed power.

The grinding unit will operate in closed circuit with a 15” cyclopac. The product from the ball mill discharge will be pumped to the cyclones. The cyclone underflow will be recycled to the ball mill and the overflow will be directed to the molybdenite flotation circuit.

5.3.2.2 Flotation and Regrind

Cyclone overflow from the grinding circuit will be piped to the flotation conditioning tank where the slurry will be conditioned with fuel oil to enhance molybdenum flotation. From the conditioner tank, slurry will be piped to the rougher flotation circuit. The rougher concentrate will be pumped to a regrind ball mill operated in closed circuit with 6” cyclones

Rougher tails will be pumped to the scavenger flotation circuit and thereafter to the tailings thickener.

Regrind concentrate will be pumped to the first cleaner column cell. The cleaner flotation circuit consists of three, 2 cubic metre cells. The first cleaner underflow will be pumped to two further stages of column cleaning. Cleaner flotation tails will be recycled either to the preceding cleaning stage or return to the flotation-conditioning tank. Primary flotation reagents will include lime, collector and frother.

5.3.2.3 Dewatering, Tailings and Reclaim Water

The third cleaner flotation concentrate will be dewatered in a concentrate thickener followed by a concentrate storage tank and a disc filter that will discharge approximately 15% moisture cake, to be dried in a rotary kiln and finally bagged in supersacks. The bags will be stored in the mill building prior to being transported to roasters via trucks. The concentrate thickener has been sized at 3 m diameter.

Scavenger flotation tails will be pumped to the tails thickener. Underflow from the scavenger flotation will be pumped to the conditioning tank. Water reclaimed from the tailings and concentrate thickeners will be pumped to the process water tank.

5.3.3 Case 2 – 2,500 tpd

5.3.3.1 Crushing and Grinding

Underground ore will be transported by truck and dumped into a coarse ore bin. The coarse ore is conveyed to a stockpile using a coarse ore belt conveyor. The coarse ore will be reclaimed from the stockpile using feeders to the portable crushing plant and the material will then be conveyed to the grinding circuit.

The grinding circuit will consist of a 5,500 mm diameter x 2,400 mm primary semi-autogenous (SAG) and one 3,700 mm diameter x 4,900 mm secondary ball mill. The SAG mill will have 700 kW and the ball mill approximately 800 kW of installed power.

The SAG mill will operate in closed circuit with a trommel screen. The screen oversize will be processed through a pebble cone crusher prior to being recycled to the SAG mill feed chute. The screen undersize will discharge to the common SAG and ball mill sump.

The secondary grinding unit will operate in closed circuit with a cluster of 15” cyclopac. The combined product from the SAG mill screen undersize and ball mill discharge will be pumped to the cyclones. The cyclone underflow will be recycled to the ball mill and the overflow will be directed to the molybdenite flotation circuit.

5.3.3.2 Flotation and Regrind

Cyclone overflow from the grinding circuit will be piped to the flotation conditioning tank where the slurry will be conditioned with fuel oil to enhance molybdenum flotation. From the conditioner tank, slurry will be piped to the rougher flotation circuit. Rougher concentrate will be pumped to the regrind tower mill. The cyclone underflow will be recycled to the regrind tower mill operated in closed circuit with cyclones and the overflow will be directed to the first cleaner circuit. Rougher tails will be pumped to the scavenger flotation circuit.

The cleaner flotation circuit consists of three, 3 cubic metre cells. The first cleaner concentrate will be pumped to two further stages of column cleaning. Cleaner flotation tails will be recycled either to the preceding cleaning stage or to the conditioning tank. Primary flotation reagents will include lime, collector and frother.

5.3.3.3 Dewatering, Tailings and Reclaim Water

The third cleaner flotation concentrate will be dewatered in a concentrate thickener followed by a concentrate storage tank and a disc filter. The filtered concentrate will be dried to approximately 15 wt% moisture in a dryer and stockpiled. The stockpile will be stored in the mill building and transported by road. The concentrate thickener has been sized at 4.6 m diameter.

Scavenger flotation tails will be pumped to the tails thickener. Underflow from the thickener will be pumped to tailings disposal. Water reclaimed from the tailings and concentrate thickeners will be pumped to the process water distribution system.

5.4 Manpower Requirements

Mill crews will work 8 hour shifts. With this schedule, three operating crews will be required. There will be an operator controlling each of the major milling areas (grinding, flotation and dewatering) together with supervision for training and coordination.

It is anticipated that with a Mill Superintendent, General Foreman and Metallurgist that two of these three people will be on site at any one time for the technical supervision of the mill operation. There will also be a technician and a clerk.

The assay laboratory staffing will be adequate for routine mine and mill operation. The ability to carry out exploration assaying may be limited.

The proposed manning list is as follows:

Table 5-3: Proposed Manpower for Mill Case 1 – 500 tpd

	No. of personnel
MILL STAFF	
MILL OPS	
Mill Ops Superintendent	1
Mill Clerk	1
Sub Total	**2**
MILL MAINTENANCE	
Mill Mtce General Foreman	1
Planner	1
Sub Total	**2**
METALLURGY	
Metallurgist (Technical Advisor)	1
Sub Total	**1**
ASSAY LAB	
Senior Assayer	1
Assayer Assistant	1
Sub Total	**2**
SUB-TOTAL MILL STAFF	**7**
MILL HOURLY	
Maintenance	
Millwright	1
Lubeman / Maint Helper	1
Sub Total	**2**
Electrical	
Electrician	1
Sub Total	**1**
Operations	
Crushing Operator	1
Grinding/Flotation Senior Operator	3
Grinding/Flotation Operator	3
Mill Helper	1
Labourer	1
Sub Total	**9**
SUB-TOTAL MILL HOURLY	**12**
TOTAL MILL MANPOWER	**19**

Table 5-4: Proposed Manpower for Mill Case 2 – 2,500 tpd

	No. of personnel
MILL STAFF	
MILL OPS	
Mill Ops General Foreman	1
Mills Ops Foreman	3
Mill Clerk	1
Sub Total	**5**
MILL MAINTENANCE	
Mill Mtce General Foreman	1
Electrical General Foreman	1
Mill Mtce Foreman	1
Planner	1
Sub Total	**4**
METALLURGY	
Chief Metallurgist	1
Metallurgist	1
Sub Total	**2**
ASSAY LAB	
Senior Assayer	1
Assayers	2
Sub Total	**3**
SUB-TOTAL MILL STAFF	**14**
MILL HOURLY	
MATERIALS MANAGEMENT	
Warehouse Person	1
Sub Total	**1**
SITE SERVICES	
Carpenter - 1	1
Electrician - 1	1
Plumber/ Pipefitter - 1	1
Sub Total	**3**
Maintenance	
Millwright - 1	3
Lubeman / Maint Helper	2
Maintenance Helper	1
Sub Total	**6**
Operations	
Control Room Operator	1
Flotation/Grinding Operator	4
Crusher/Dewatering/Utility Operator	4
Sample Bucker	4
Mill Helper	4
Labourer	2
Sub Total	**19**
SUB-TOTAL MILL HOURLY	**29**
TOTAL MILL MANPOWER	**43**

6. Infrastructure

6.1 Introduction

The MAX Molybdenum project includes the underground mine, mill and all the necessary infrastructure for a stand-alone operation. Drawing numbers A0-G-001 and A0-G-101 in Appendix C, presents the general arrangements of the mill building for Case 1 – 500 tpd and Case 2 – 2,500 tpd. The infrastructure facilities are summarised as follows:

- Plant Site:
  - Portable crushing plant
  - Mill building including grinding, flotation, dewatering and concentrate drying
  - Tailings Placement and Reclaim Water Services
  - Water Supply
  - Support Facilities including:
    - Mine Dry/Assay Lab/Offices
    - Sewage tile field
- Power generation
- Plant roads
- Fuel Storage and Distribution

6.2 Plant Site Infrastructure

6.2.1 Portable crushing plant

Installation of a portable crushing plant for both Case 1 – 500 tpd and Case 2 – 2,500 tpd enables flexibility in the design of the site layout.

6.2.2 Mill building

The mill building enclosure is designed to accommodate all mill equipment for grinding, flotation, dewatering and concentrate drying. The mill building for Case 1 – 500 tpd comprises a temporary structure and enclosure for cost savings and accelerated installation schedule. In addition, the temporary structure can be removed with ease when Case 2 –2,500 tpd is implemented.

6.2.3 Tailings Placement and Reclaim Water Services

Preliminary design of the tailings dam including plant runoff and water reclaim lines for Case 1 – 500 tpd and Case 2 – 2,500 tpd was prepared by BGC Engineering Inc. and is outlined in Appendix D.

6.2.4 Support Facilities

Mining and milling operations will require support facilities to sustain the operations and these facilities are briefly described below, including:

- Warehouse and Truckshop

  The warehouse and truckshop will be located underground as part of the mining operation. There will be minimal storage of supplies as spares and equipment are obtained regularly year round from Revelstoke, BC.

  The truckshop will include heavy and light vehicle maintenance bays to accommodate the selected mining equipment fleet. The truckshop will include cranes, tools and washing equipment.

- Mine Dry

  The mine dry will include sufficient area for accommodating the mining and milling crew at site.

- Assay Lab and Offices

  An assay lab has been included that would provide metallurgical and environmental assays.

  Offices for senior management, geology, maintenance, engineering and administrative personnel have also been incorporated.

- Waste Treatment (Sewage) Plant

  A sanitary sewer tile field system will filter wastewater and effluent from the mine dry, assay lab, offices and other washroom facilities located in the mill building.

6.3 Power Generation

Diesel generated power will be used to provide electrical power for the MAX Molybdenum project. The powerhouse will consist of 2 MW of power for Case 1 – 500 tpd and 6 MW of power for Case 2 – 2,500 tpd. Based on conceptual power demand the powerhouse includes a standby genset. Exhaust heat from the diesel engines will be recovered by means of heat exchangers and will be used to heat the buildings.

Power will be distributed around the mine site on a power grid and overhead power lines that connects the mine and plant site.

6.4 Plant Roads

The plant site will include gravel plant roads connecting the mine to the mill operations.

6.5 Fuel Storage and Distribution

The powerhouse and mobile mining equipment operates on diesel fuel. Diesel fuel will be delivered to the site by tanker truck. Only minimal storage will be provided as site access is reliable.

Diesel fuel requirements for mine mobile equipment and powerhouse will be supplied from a diesel fuel storage tank located near the powerhouse. The diesel fuel storage tank will provide approximately 20,000 litres of fuel for Case 1 – 500 tpd and 70,000 litres of fuel for Case 2 – 2,500 tpd. This storage capacity represents in excess of one week's fuel requirements. The diesel tank will be erected with a lined containment area sized to contain 110% of the capacity of the storage tank.

Diesel fuel distribution will be limited to loading and unloading facilities and metering equipment at the diesel fuel tank.

Lubricants will be delivered to the site in drums. The drums will be stored in a secure area.

6.6 Fresh Water Distribution and Fire Protection

Fresh water will be drawn from the adit as run-off that is reported to flow year round. Water will be drawn from the run-off and will be pumped into a fresh water storage tank. This tank will store fresh water for potable water and reagent mixing with the majority being available for fire protection. Allowance for withdrawing ~30 litres/second (395 gpm) of water from the adit run-off has been included.

The potable water supply will be treated (chlorination or ultra-violet treatment) for consumption prior to distribution to the various locations in the mill building.

6.7 Communications

Telecommunications will be provided that will include fax lines and data lines for both telephones and data. A two-way radio network will provide for on site communications particularly for both the mining and milling operations.

7. Capital Cost Estimate

7.1 Summary

Capital cost estimates for Case 1 – 500 tpd and Case 2 – 2,500 tpd have been prepared with an intended level of accuracy of +/-30%, which is within the range of a Scoping study.

All costs herein are quoted in first quarter 2005 Canadian dollars (CAD$) and where applicable an exchange rate of US$1=CAD$1.25 has been applied.

A summary of the capital cost estimates for Case 1 – 500 tpd and Case 2 – 2,500 tpd are presented in Tables 7-1 and 7-2 below.

7.2 Basis of Estimate

7.2.1 Case 1 – 500 tpd

The capital cost estimate for Case 1 – 500 tpd is based on the following concepts:

- Preliminary process design criteria, based on information available from the metallurgical design.
- Preliminary process flowsheets.

- General arrangement drawings of plant site and concentrator.
- Preliminary sizing and selection of new major equipment.
- Budgetary quotations from vendors for a portable crushing plant and temporary mill enclosure.
- In-house database was used for new equipment costs.
- Factors were applied for piping, electrical and instrumentation, based on experience with similar projects.

7.2.2 Case 2 – 2,500 tpd

The capital cost estimate for Case 2 – 2,500 tpd is based on the following concepts:

- Preliminary process design criteria, based on information available from the metallurgical design.
- Preliminary process flowsheets.
- General arrangement drawings of plant site and concentrator.
- Preliminary sizing and selection of new major equipment.
- Budgetary quotations from vendors for a portable crushing plant.
- In-house cost database for mill building, infrastructure and new equipment.
- Factors applied for piping, electrical and instrumentation are based on experience with similar projects.

7.3 Capital Cost Estimate Detail

Detailed cost estimate schedules for Case 1 – 500 tpd and Case 2 – 2,500 tpd are presented in Appendix A.

7.3.1 Direct Costs

7.3.1.1 Case 1 – 500 tpd

The major estimating criteria for Case 1 – 500 tpd are listed as follows:

- Earthworks, concrete and steel allowances derived from costs applied to conceptual layout drawings and compared to similar plants of comparable size.
- Site locations and foundation estimates allowances selected from available photographs of the site as contained in reclamation reports. This information requires further geotechnical investigations and verification.
- Estimates for civil and structural quantities and costs are based on allowances for typical ground conditions. No provision is included for rock blasting and removal of unstable soil.

- Major process equipment was priced using in-house budgetary quotations.
- Vendor quotations were obtained for the cost of a portable crushing plant and temporary plant enclosure.
- Plant equipment and infrastructure costs were derived from in-house data applied on similar related projects.
- Power generation plant costs were estimated based on a recent mine and mill facility with a similar size power plant.

Table 7-1: Capital Cost Estimate Case 1 – 500 tpd

Cost Area	CAD$ millions	US$ millions
Plant site	0.20	0.16
Water Supply	0.03	0.02
Power supply	2.02	1.62
Communications	0.08	0.06
Truckshop / Warehouse	Incl. In Mining	
Mine Dry / Office / First Aid Facilities	0.17	0.14
Assay Lab	0.08	0.06
Crushing	1.88	1.50
Grinding	4.19	3.35
Flotation & Regrinding	2.02	1.62
Thickening – Filtration - Drying	0.59	0.47
Tailings & Reclaim Systems	1.66	1.33
Process & Fresh Water Services	0.07	0.06
Fuel Storage & Distribution	0.08	0.06
Mining	7.95	6.36
Mobile Equipment	0.23	0.18
TOTAL DIRECT COSTS	**21.25**	**17.00**
Engineering & Procurement	1.07	0.86
Construction Management	1.07	0.86
Contractor Indirect Costs	1.28	1.02
Freight	0.55	0.44
First Fill	0.01	0.01
Initial Inventory & Spare Parts	0.19	0.15
Vendor Reps	0.08	0.06
TOTAL INDIRECT COSTS	**4.25**	**3.40**
CONTINGENCY (20% Mill + 15% Mining)	4.70	3.76
TOTAL CONTINGENCY	**4.70**	**3.76**
TOTAL PROJECT COSTS	**30.20**	**24.16**

Note: Numbers may not add up due to rounding.

7.3.1.2 Case 2 – 2,500 tpd

The major capital cost estimating criteria for Case 2 – 2,500 tpd are listed as follows:

- Earthworks, concrete and steel quantity allowances were derived from general arrangement drawings.
- Site locations and foundation estimates allowances were selected from available photographs of the site incorporated in the reclamation reports. This information has not been verified in the field with geotechnical investigations.
- Allowances for average ground conditions have been provided for estimating civil and structural designs and costs.
- Major process equipment was priced using in-house budgetary quotations.
- A vendor quotation was obtained for the cost of a portable crushing plant.
- In-house data was used to develop allowances for plant equipment and infrastructure applied on similar related projects.
- Power generation plant costs were estimated based on a recent mine and mill facility with a similar size power plant.

Table 7-2: Capital Cost Estimate Case 2 – 2,500 tpd

Cost Area	CAD$ millions	US$ millions
Plant site	0.34	0.27
Water Supply	0.07	0.06
Power supply	4.10	3.28
Communications	0.10	0.08
Truckshop / Warehouse	Incl. In Mining	
Mine Dry / Office / First Aid Facilities	1.30	1.04
Assay Lab	0.08	0.06
Crushing	4.08	3.26
Grinding	10.91	8.73
Flotation & Regrinding	3.37	2.70
Thickening – Filtration - Drying	1.66	1.33
Concentrate Handling & Storage	0.09	0.07
Tailings & Reclaim Systems	5.11	4.09
Process & Fresh Water Services	0.29	0.23
Fuel Storage & Distribution	0.19	0.15
Mining	69.08	55.26
Mobile Equipment	0.23	0.18
TOTAL DIRECT COSTS	**101.00**	**80.80**
Engineering & Procurement	2.55	2.04
Construction Management	2.55	2.04
Contractor Indirect Costs	2.42	1.94
Freight	2.82	2.26
First Fill	0.09	0.07
Initial Inventory & Spare Parts	0.44	0.35
Vendor Reps	0.18	0.14
TOTAL INDIRECT COSTS	**11.07**	**8.85**
CONTINGENCY (20% Mill + 15% Mining)	18.93	15.14
TOTAL OTHER COSTS	**18.93**	**15.14**
TOTAL PROJECT COSTS	**131.00**	**104.80**

Note: Numbers may not add up due to rounding.

7.3.2 Mine

Order of magnitude capital costs for mine pre-production development and mining equipment is outlined above in Section 4 – Mining.

7.3.3 Indirect Costs

7.3.3.1 Case 1 – 500 tpd

The following provisions have been included in Case 1 – 500 tpd for indirect costs.

- Engineering and Procurement 8% of mill direct costs.
- Construction Management 8% of mill direct costs.

- Contractor Indirect Costs — 6% of mill direct costs + mining contractors accommodation costs at a local hotel.
- Freight — 5% of material and other costs excluding mining.
- First fill — allowance for grinding balls.
- Initial Inventory & Spare Parts — Allowance
- Vendor Reps: — Erection supervision – 1.5% of mill equipment
  Start-up – 0.5% of mill equipment

7.3.3.2 Case 2 – 2,500 tpd

The following provisions have been included in Case 2 – 2,500 tpd for indirect costs.

- Engineering and Procurement — 8% of mill direct costs.
- Construction Management — 8% of mill direct costs.
- Contractor Indirect Costs — 6% of mill direct costs + mining contractors accommodation costs at a local hotel.
- Freight — 5% of material costs + first fill and half of other mill costs, excluding mining.
- First fill — allowance for grinding balls.
- Initial Inventory & Spare Parts — 2.5% of material cost
- Vendor Reps: — Erection supervision – 1.5% of mill equipment
  Start-up – 0.5% of mill equipment

7.4 Contingency

Contingency is intended to cover inherent errors, omissions and undefined cost items, which are expected to be identified during the implementation phase. The project contingency does not include any allowance for change in scope of work or services. Contingency should be interpreted as an amount that will be spent.

The contingency allowance is evaluated for each area based on the perceived level of accuracy of the estimate. Generally, the level of uncertainty associated with costs for infrastructure and equipment costs is significant. In this Scoping Study, there is only preliminary and conceptual engineering associated with the process plant. Hatch considers a contingency level of 20% for the mill and 15% for mining to be appropriate for this level of work.

7.5 Capital Cost Exclusions

The following cost elements have been excluded from the scope of the capital cost estimate and are considered to be the owner's cost risk unless otherwise noted:

- Site Access Road
- Explosives plant
- Used mill equipment
- Pre-operations check-out, testing and commissioning
- Owners costs
- Applicable taxes (including both Provincial Sales Tax and General Sales Tax)
- Schedule acceleration costs
- Sunk costs
- License fees
- Environmental permitting

8. Operating Cost

8.1 Summary

The operating cost for the mill is summarized in Tables 8-1 and 8-2. The estimated costs include all elements to operate the mill facilities as described in sections of this report. Mining operating costs is specifically addressed under Section 4 Mining.

For Case 1 - 500 tpd the recurring annual operating expense of roughly CAD$4.7 million is based on the cost to mine and process 182,500 tonnes of ore per annum.

For Case 2 (2,500 tpd) the recurring annual operating expense of roughly CAD$12.2 million is based on the cost to mine and process 912,500 tonnes of ore per annum.

Detailed operating costs for Case 1 – 500 tpd and Case 2 – 2,500 tpd are presented in Appendix B.

Table 8-1: Operating Cost Estimate – Case 1 - 500 tpd

	Annual, CAD$/year	Unit, CAD$/t milled	Annual, US$/year	Unit, US$/t milled	Distribution, %
G&A					
Manpower	475,692	2.61	380,554	2.09	
Fixed Expenses	665,000	3.64	532,000	2.91	
Sub total	**1,140,692**	**6.25**	**912,554**	**5.00**	**24%**
PROCESS					
Manpower	1,483,909	8.13	1,187,127	6.50	
Consumables	239,329	1.31	191,463	1.05	
Power	1,836,325	10.06	1,469,060	8.05	
Sub total	**3,559,563**	**19.50**	**2,847,650**	**15.60**	**76%**
TRANSPORT					
Supplies	8,438	0.05	6,750	0.04	
Concentrate	-	-			
Sub total	**8,438**	**0.05**	**6,750**	**0.04**	**0%**
TOTAL MILL SITE	**4,708,694**	**25.80**	**3,766,954**	**20.64**	**100%**

Note: Numbers may not add up due to rounding.

Table 8-2: Operating Cost Estimate – Case 2 - 2,500 tpd

	Annual, CAD$/year	Unit, CAD$/t milled	Annual, US$/year	Unit, US$/t milled	Distribution, %
G&A					
Manpower	903,980	0.99	723,184	0.79	
Fixed Expenses	1,340,000	1.47	1,072,000	1.18	
Sub total	**2,243,980**	**2.46**	**1,795,184**	**1.97**	**18%**
PROCESS					
Manpower	3,379,431	3.70	2,703,545	2.96	
Consumables	1,233,713	1.35	986,970	1.08	
Power	5,258,288	5.76	4,206,630	4.61	
Sub total	**9,871,432**	**10.82**	**7,897,145**	**8.65**	**81%**
TRANSPORT					
Supplies	42,192	0.05	33,754	0.04	
Concentrate	-	-			
Sub total	**42,192**	**0.05**	**33,754**	**0.04**	**0%**
TOTAL MILL SITE	**12,157,604**	**13.32**	**9,726,083**	**10.66**	**100%**

Note: Numbers may not add up due to rounding.

8.2 Basis of estimate

Data for this operating cost estimate has been largely based on benchmark information from other similar operations.

8.2.1 General and Administrative Costs

These costs cover the administrative and senior technical positions, personnel transport, insurance costs, warehouse, security personnel and operation of surface vehicles. Key assumptions are:

- Personnel salaries and manning levels, consistent with current similar North American operations.
- Other direct cost elements commensurate with similar North American operations.

Table 8-3: General and Administration Manpower Case 1 – 500 tpd

G&A POSITION	#	UNIT SALARY CAD$	BENEFITS 40%. CAD$	ANNUAL SALARY CAD$	TOTAL SALARY CAD$	US$
ADMINISTRATION						
General Manager	1	150,000	60,000	210,000	210,000	168,000
Sub-Total	**1**				**210,000**	**168,000**
MATERIALS MANAGEMENT						
Buyer	1	65,000	26,000	91,000	91,000	72,800
Sub-Total	**1**				**91,000**	**72,800**
SAFETY						
Safety Supervisor	0.5	75,000	30,000	105,000	52,500	42,000
Security	1.8	47,850	19,140	66,990	122,192	97,754
Sub-Total	**2.3**				**174,692**	**139,754**
TOTAL	**4.3**				**475,692**	**380,554**

Note: Numbers may not add up due to rounding

Table 8-4: General and Administration Manpower Case 2 – 2,500 tpd

G&A POSITION	#	UNIT SALARY CAD$	BENEFITS 40%. CAD$	ANNUAL SALARY CAD$	TOTAL SALARY CAD$	US$
ADMINISTRATION						
General Manager	1	150,000	60,000	210,000	210,000	168,000
Accountant	1	75,000	30,000	105,000	105,000	84,000
General Clerk	1	45,500	18,200	63,700	59,640	47,712
Sub-Total	**3**				**378,700**	**302,960**
MATERIALS MANAGEMENT						
Buyer	1	65,000	26,000	91,000	91,000	72,800
Sub-Total	**1**				**91,000**	**72,800**
SAFETY						
Safety Supervisor	2	75,000	30,000	105,000	210,000	168,000
Security	1	47,850	19,140	66,990	66,990	53,592
Sub-Total	**3**				**276,990**	**221,592**
SITE SERVICES						
Supervisor	1	64,500	25,800	90,300	90,300	72,240
Sub-Total	**1**				**90,300**	**72,240**
ENVIRONMENTAL						
Technicians	1	47,850	19,140	66,990	66,990	53,592
Sub-Total	**1**				**66,990**	**53,592**
TOTAL	**9**				**903,980**	**723,184**

Table 8-5: General and Administration Fixed Expenses Case 1 – 500 tpd

COST AREA	ANNUAL COST (US$)	UNIT COST (US$/t ore)
Property Taxes	-	0.00
Business Travel	50,000	0.27
Road Maintenance, incl. snow clearing	100,000	0.55
Potable water supply	15,000	0.08
Small Vehicles	25,000	0.14
Mobile Equipment Rentals	50,000	0.27
Crew Transport Costs	50,000	0.27
Corporate Office Expenses	100,000	0.55
Safety Training Supplies	20,000	0.11
First Aid Supplies	10,000	0.05
Janitorial services	10,000	0.05
Outside laboratories	25,000	0.14
Communications	10,000	0.05
Consultants	50,000	0.27
Regulatory compliance	25,000	0.14
Legal fees/Insurance	125,000	0.68
TOTAL	**665,000**	**3.64**

Table 8-6: General and Administration Fixed Expenses Case 2 – 2,500 tpd

COST AREA	ANNUAL COST (US$)	UNIT COST (US$/t ore)
Property Taxes	-	0.00
Business Travel	50,000	0.05
Road Maintenance, incl. snow clearing	100,000	0.11
Potable water supply	50,000	0.05
Small Vehicles	75,000	0.08
Mobile Equipment Rentals	80,000	0.09
Crew Transport Costs	125,000	0.14
Corporate Office Expenses	100,000	0.11
Safety Training Supplies	50,000	0.05
First Aid Supplies	30,000	0.03
Janitorial services	30,000	0.03
Outside laboratories	50,000	0.05
Communications	20,000	0.02
Consultants	50,000	0.05
Technical Consultant	80,000	0.09
Regulatory compliance	100,000	0.11
Legal fees/Insurance	250,000	0.27
Recruiting/Relocation	100,000	0.11
TOTAL	**1,340,000**	**1.47**

8.2.2 Mine

Mine operating costs have been addressed under Section 4 - Mining of this report.

8.2.3 Process Plant

The process plant operating cost covers all unit operations. Manpower requirements are estimated to be 5 personnel for Case 1 – 500 tpd and 9 personnel for Case 2 – 2,500 tpd at the mill.

Processing costs include process consumables, operations and maintenance in the plant. In-house budgetary pricing for reagents were used for this report. Tables 8-7, 8-8, 8-9 and 8-10 show the process consumables and operations and maintenance costs for the respective plants.

Power costs were estimated based on CAD$0.80/liter of diesel fuel required to operate the diesel generating engines. The unit power cost is estimated at CAD$0.17/kWh Case 1 – 500 tpd and CAD$0.13/kWh Case 2 – 2,500 tpd.

A unit freight rate of CAD$50/mt has been used in the estimate for the transportation of reagent. Concentrate transport costs are **not** included in the estimate.

Table 8-7: Process Consumables Case 1 – 500 tpd

SUPPLIES	Consumption (kg/t ore)	Unit Cost (CAD$/kg)	Total Cost (CAD$/yr)	Unit Cost (CAD$/t ore)
Grinding				
Ball Mill Liners	0.024	$2.08	$8,976	$0.049
Ball Mill Balls, 64 mm	0.300	$0.75	$41,063	$0.225
Regrind Mill Balls, 25 mm	0.100	$1.00	$18,250	$0.100
Sub-Total Grinding			**$68,289**	**$0.374**
Reagents				
Quicklime	0.150	$0.25	$6,844	$0.038
Collector	0.025	$2.65	$12,091	$0.066
MIBC/DF250	0.025	$2.00	$9,125	$0.050
Fuel Oil	0.300	$0.30	$16,425	$0.090
Flocculant	0.0011	$7.75	$1,556	$0.009
Sub-Total Reagents			**$46,040**	**$0.252**
Supplies, maintenance			$50,000	$0.27
Supplies, operating			$25,000	$0.14
Contracts, other			$50,000	$0.27
TOTAL			**$239,329**	**$1.31**

Table 8-8: Process Consumables Case 2 – 2,500 tpd

SUPPLIES	Consumption (kg/t ore)	Unit Cost (CAD$/kg)	Total Cost (CAD$/yr)	Unit Cost (CAD$/t ore)
Grinding				
SAG Mill Liners	0.024	$2.08	$44,881	$0.049
SAG Mill Balls	0. 500	$0.75	$342,188	$0.375
Ball Mill Liners	0.024	$2.08	$44,881	$0.049
Ball Mill Balls, 64 mm	0.300	$0.75	$205,313	$0.225
Regrind Mill Balls, 25 mm	0.100	$1.00	$91,250	$0.100
Sub-Total Grinding			**$728,512**	**$0.798**
Reagents				
Quicklime	0.150	$0.25	$34,219	$0.038
Collector	0.025	$2.65	$60,453	$0.066
MIBC/DF250	0.025	$2.00	$45,625	$0.050
Fuel Oil	0.300	$0.30	$82,125	$0.090
Flocculant	0.0011	$7.75	$7,779	$0.009
Sub-Total Reagents			**$230,201**	**$0.252**
Supplies, maintenance			$100,000	$0.11
Supplies, operating			$75,000	$0.08
Contracts, other			$100,000	$0.11
TOTAL			**$1,233,713**	**$1.35**

Table 8-9: Mill Operations and Maintenance Operating Cost Case 1 – 500 tpd

	TOTAL	UNIT SALARY CAD$		BENEFITS 40% CAD$	ANNUAL SALARY CAD$	TOTAL SALARY CAD$
MILL STAFF						
MILL OPS						
Mill Ops Superintendent	1	90,000		36,000	126,000	126,000
Mill Clerk	1	45,500		18,200	63,700	63,700
Sub-Total	**2**					**189,700**
MILL MAINTENANCE						
Mill Mtce General Foreman	1	82,400		32,960	115,360	115,360
Planner	1	64,000		25,600	89,600	89,600
Sub-Total	**2**					**204,960**
METALLURGY						
Metallurgist (Technical Advisor)	1	69,000		27,600	96,600	96,600
Sub-Total	**1**					**96,600**
ASSAY LAB						
Senior Assayer	1	80,000		32,000	112,000	112,000
Assayer Assistant	1	40,000		16,000	56,000	56,000
Sub-Total	**2**					**168,000**
SUB-TOTAL MILL STAFF	**7**					**659,260**
MILL HOURLY						
Maintenance						
Millwright - 1	1	28.00	58,240	23,296	81,536	81,536
Lubeman / Maintenance Helper	1	26.00	54,080	21,632	75,712	75,712
Sub-Total	**8**					**157,248**
Electrical						
Electrician	1	28.00	58,240	23,296	81,536	81,536
Sub-Total	**4**					**81,536**
Operations						
Crushing Operator	1	23.00	47,840	19,136	66,976	66,976
Senior Grinding / Flotation Operator	3	26.00	54,080	21,632	75,712	227,136
Grinding / Flotation Operator	3	21.00	43,680	17,472	61,152	183,456
Mill Helper	1	19.00	39,520	15,808	55,328	55,328
Labourer	1	18.19	37,835	15,134	49,504	52,969
Sub-Total	**9**					**585,865**
SUB-TOTAL MILL HOURLY	**12**					**824,649**
TOTAL MILL MANPOWER	**19**					**1,483,909**

Table 8-10: Mill Operations and Maintenance Operating Cost Case 2 – 2,500 tpd

	TOTAL	UNIT SALARY CAD$		BENEFITS 40%	ANNUAL SALARY CAD$	TOTAL SALARY CAD$
MILL STAFF						
MILL OPS						
Mill Ops GF	1	90,000		36,000	126,000	126,000
Mills Ops Foreman	3	70,000		28,000	98,000	294,000
Mill Clerk	1	45,500		18,200	63,700	63,700
Sub-Total	**5**					**483,700**
MILL MAINTENANCE						
Mill Mtce General Foreman	1	82,400		32,960	115,360	115,360
Electrical General Foreman	1	82,400		32,960	115,360	115,360
Mill Mtce Foreman	1	66,500		26,600	93,100	93,100
Planner	1	64,000		25,600	89,600	89,600
Sub-Total	**4**					**413,420**
METALLURGY						
Chief Metallurgist	1	80,000		32,000	112,000	112,000
Metallurgist	1	69,000		27,600	96,600	96,600
Sub-Total	**2**					**208,600**
ASSAY LAB						
Senior Assayer	1	80,,000		32,000	112,000	112,000
Assayers	2	48,000		19,200	67,200	134,400
Sub-Total	**3**					**246,400**
SUB-TOTAL MILL STAFF	**14**					**1,352,120**
MILL HOURLY						
MATERIALS MANAGEMENT						
Warehouse Person	1	23.79	51,957	20,783	72,740	72,740
TOTAL MATERIALS MANAGEMENT	**1**					**72,740**
SITE SERVICES						
Carpenter - 1	1	26.79	58,509	23,404	81,913	81,913
Electrician – 1	1	26.79	58,509	23,404	81,913	81,913
Plumber/ Pipefitter - 1	1	26.79	58,509	23,404	81,913	81,913
TOTAL SITE SERVICES	**3**					**245,739**
Maintenance						
Millwright - 1	3	28.00	61,152	24,461	85,613	256,838
Lubeman	2	20.69	45,187	18,075	63,262	126,523
Maintenance Helper	1	20.69	45,187	18,075	63,262	63,262
Sub-Total	**6**					**446,624**
Operations						
Control Room Operator	1	25.79	56,325	22,530	78,856	78,856
Flotation Operator	4	24.59	53,705	21,482	75,186	300,746
Dewatering / Utility Operator	4	22.69	49,555	19,822	69,377	277,508
Sample Bucker	4	20.39	44,532	17,813	62,344	249,378
Mill Helper	4	19.99	43,658	17,463	61,121	244,486
Labourer	2	18.19	39,727	15,891	55,618	111,235
Sub-Total	**19**					**1,262,208**
SUB-TOTAL MILL HOURLY	**29**					**2,521,419**
TOTAL MILL MANPOWER	**43**					**3,379,431**

9. Financial Analysis

9.1 Cash Flow

A simplified financial analysis of Case 1 – 500 tpd and Case 2 – 2,500 tpd was undertaken using a discounted cash flow model. Project capital cost estimates including pre-production and sustaining capital costs have been included in the cash flow projection. Operating costs presented as April 2005 Canadian dollars remain constant over the mine life and no allowance for inflation has been included.

The financial analysis excludes considerations of alternate financing and is based on zero debt to present a base case before tax, cash flow analysis. Market related pricing was based on the marketing report in Appendix G. Details of the cash flow model are outlined in Appendix H.

A summary of the financial analysis for Case 1 – 500 tpd and Case 2 – 2,500 tpd is presented below:

Table 9-1: Project Cash Flow Analysis Summary Case 1 – 500 tpd

Project Data	Scoping Study
Life of Mine	3 years
Total Mo produced	6.1 million pounds
Total Ore Mined	476,211 tonnes
Total Material Mined (ore + waste)	765,721 tonnes
Capital Cost	CAD$30.20 million
Operating Cost - Mining	CAD$55.60 / tonne mined
Operating Cost - Mill	CAD$25.80 / tonne milled ore
Mo Price – Scenario 1	US$15 - 10 / lb
Mo Price – Scenario 2	US$20 / lb
Mo Price – Scenario 3	US$30 / lb

Table 9-2: Project Cash Flow Analysis Summary Case 2 – 2,500 tpd

Project Data	Scoping Study
Life of Mine	10 years
Total Mo produced	31.7 million pounds
Total Ore Mined	8,658,241 tonnes
Total Material Mined (ore + waste)	9,437,818 tonnes
Capital Cost	CAD$131 million
Operating Cost - Mining	CAD$36.8/ tonne mined
Operating Cost - Mill	CAD$13.3/ tonne milled ore
Mo Price – Base Scenario	US$20 - 10 / lb
Before Tax Net Present Value @0%	-CAD$21,521,210
Before Tax Net Present Value @5%	-CAD$36,653,020
Before Tax Internal Rate of Return	-4%

Negative values denoted as: –CAD$

9.2 Sensitivity Analysis

The following variables were considered in the sensitivity analysis of Case 1 - 500 tpd:

- Molybdenum price variation from US$10/lb to US$30/lb
- Used equipment including economical building techniques, resulting in a potential 10% cost reduction in the total capital cost estimate for new equipment.

Table 9-3: Sensitivity Analysis Summary Case 1 – 500 tpd

	New Equipment	Used Equipment
Scenario 1		
Molybdenum Price	US$15 - 10 / lb	US$15 - 10 / lb
Operating Cost - Mining	CAD$55.60 / tonne mined	CAD$55.60 / tonne mined
Operating Cost - Mill	CAD$25.80 / tonne milled ore	CAD$25.80 / tonne milled ore
Before Tax Net Present Value @ 0%	-CAD$3,588,851	-CAD$-568,851
Before Tax Net Present Value @ 5%	-$CAD5,725,866	-CAD$2,924,584
Before Tax Internal Rate of Return	-5.8%	-1.0%
Scenario 2		
Molybdenum Price	US$20 / lb	US$20 / lb
Operating Cost - Mining	CAD$55,60 / tonne mined	CAD$55,60 / tonne mined
Operating Cost - Mill	CAD$25.80 / tonne milled ore	CAD$25.80 / tonne milled ore
Before Tax Net Present Value @ 0%	CAD$60,421,645	CAD$63,441,645
Before Tax Net Present Value @ 5%	CAD$46,681,340	CAD$49,482,621
Before Tax Internal Rate of Return	59.5%	67.1%
Before Tax Payback Period	13 months	12 months
Scenario 3		
Molybdenum Price	US$30 / lb	US$30 / lb
Operating Cost - Mining	CAD$55.60 / tonne mined	CAD$55.60 / tonne mined
Operating Cost - Mill	CAD$25.80 / tonne milled ore	CAD$25.80 / tonne milled ore
Before Tax Net Present Value @ 0%	CAD$138,086,444	CAD$141,106,444
Before Tax Net Present Value @ 5%	CAD$110,883,644	CAD$113,684,926
Before Tax Internal Rate of Return	112.4%	123.0%
Before Tax Payback Period	7 months	6 months

Negative values denoted as: –CAD$

Economic rates of return for both Case 1 – 500 tpd and Case 2 – 2,500 tpd are sensitive to molybdenum prices, size and grade of the deposit and subject to change if additional ore is discovered.

An evaluation of Case 1 – 500 tpd indicates a break even internal rate of return for a selected Molybdenum market price of US$15/lb – year 1, US$11/lb for year 2 and US$10/lb for year 3, respectively.

The evaluation of Case 2 – 2,500 tpd indicates a break even internal rate of return for a selected Molybdenum market price range of US$20/lb for years 1 to year 6; US$15.50/lb - year 7; US$15/lb - year 8 and US$10/lb – years 9 and 10, respectively.

10. Recommended Activities

The following is a summary of key recommendations that should be addressed during future studies and design to advance the project permitting, improve the definition of the project scope, capital and operating cost estimates and construction methodology.

Geology, Mining, and Drilling

- *Diamond drilling program* – carry out an underground diamond drilling program to better define the medium and high grade material in B zone. In the High Grade Dyke (HG Zone), bring drill hole spacing to about 20 m on a staggered grid basis for the block between 860 m and 1,000 m elevations.
- *Drilling* **-** a series of test holes should be drilled beneath potential infrastructure sites to confirm that no mineable ore exists in these areas. In addition potential extensions to the ore zone should be evaluated.
- *Block modeling* – once new drilling is complete, the block model should be updated.
- *Metallurgy testwork* – test work is required to determine variability within the deposit, confirm grade versus recovery relationships, confirm variability, grade, size and recovery parameters.

Geotechnical

- *Plant Site* – core holes should be drilled at the proposed plant site to characterize the foundation conditions. These holes should also be logged and sampled.
- *Mining conditions* – additional geotechnical information such as rock mass or characteristics should be logged;

Optimization Studies

- *Production rate* – the optimal range of production rate for the project should be examined.
- *Project site evaluations* – As part of the engineering and regulatory process, more detailed evaluation of the facility locations, especially mill buildings, tailings, waste rock and ore storage, will be required by the regulatory agencies and should include alternative analysis of site infrastructure layouts, utilities supply, and avoidance of surface water impacts.

Tailings

- *Acid Base Accounting (ABA)* – a series of ABA tests should be undertaken to characterize the acid generating potential of the milled ore and waste rock.
- *Metals loadings* – metals concentrations in effluent stream should be evaluated.
- *Placement options* – additional studies should be conducted to continue tailings disposal options/location studies.

Infrastructure

- Alternate Structural Enclosures – investigate the alternate building structures to establish cost saving solutions.

- General arrangements – conduct topographic (1 m contours).

Marketing

- *Marketing* – review latest molybdenum concentrate information as it relates to marketability and update prices based on current market situation. Contact potential buyers and provide the molybdenum concentrate market with updated information for further dialogue.

Appendix A

Capital Cost Estimate

Case 1 – 500 tpd

Case 2 – 2,500 tpd

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Description	Labour MH	Labour Cost	Material Cost	Other Cost	Total Cost CAD
	AREA SUMMARY:					
105	SITE ACCESS ROAD					**NOT INCLUDED**
110	PLANT SITE	1,225	$81,000	$106,000	$17,000	$204,000
112	WATER SUPPLY	150	$10,000	$17,000	$0	$27,000
115	POWER SUPPLY	5,816	$378,000	$12,000	$1,625,000	$2,015,000
117	COMMUNICATIONS	0	$0	$0	$80,000	$80,000
120	TRUCKSHOP / WAREHOUSE					**INCLUDED IN MINING**
122	MINE DRY / OFFICE / FIRST AID FACILITIES	120	$8,000	$5,000	$157,000	$170,000
124	ASSAY LAB	35	$2,000	$1,000	$80,000	$83,000
200	CRUSHING	2,460	$160,000	$1,467,000	$257,000	$1,884,000
300	GRINDING	17,100	$1,111,000	$3,080,000	$1,000	$4,192,000
400	FLOTATION & REGRINDING	5,320	$347,000	$1,671,000	$0	$2,018,000
450	THICKENING - FILTRATION - DRYING	1,766	$117,000	$476,000	$0	$593,000
500	TAILINGS & RECLAIM SYSTEMS	830	$55,000	$483,000	$1,120,000	$1,658,000
550	PROCESS & FRESH WATER SERVICES	414	$29,000	$40,000	$0	$69,000
600	FUEL STORAGE & DISTRIBUTION	495	$32,000	$38,000	$12,000	$82,000
700	MINING	144	$10,000	$114,000	$7,825,000	$7,949,000
750	EXPLOSIVES PLANT					**NOT INCLUDED**
800	MOBILE EQUIPMENT	0	$0	$0	$225,000	$225,000
	TOTAL AREA DIRECT COST (CANADIAN DOLLARS)	**35,875 Hrs**	**$2,340,000**	**$7,510,000**	**$11,399,000**	**$21,249,000**
	INDIRECT COSTS					
S	ENGINEERING & PROCUREMENT (8% of Direct costs less Mining)			$0	$1,066,000	$1,066,000
N	CONSTRUCTION MANAGEMENT (8% of Direct costs less Mining)			$0	$1,066,000	$1,066,000
R	CONTRACTOR INDIRECT COSTS			$0	$1,282,000	$1,282,000
T	FREIGHT COSTS (5% of Material Costs)			$0	$554,000	$554,000
U	FIRST FILL (Grinding Balls)			$13,000	$0	$13,000
V	INITIAL INVENTORY & SPARE PARTS			$0	$188,000	$188,000
W	VENDOR REPS			$0	$83,000	$83,000
X	PRE-OPS CHECK-OUT/TEST					**NOT INCLUDED**
Y	OWNERS COST					**NOT INCLUDED**
	TAXES					**NOT INCLUDED**
	TOTAL INDIRECT COST BY COMMODITY (CANADIAN DOLLARS)			**$13,000**	**$4,239,000**	**$4,252,000**
Z	**CONTINGENCY - 20% of Direct + Indirect Cost (less Mining) + 15% of Mining Cost**				**$4,699,000**	**$4,699,000**
	TOTAL PROJECT COST (CANADIAN DOLLARS)					**$30,200,000**
	SUSTAINING CAPITAL - TAILINGS				**$688,000**	**$688,000**

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			COMMODITY SUMMARY:											
	A		SITE AND EARTHWORK				1,005		$ 66,000		$ 69,000		$ 66,000	$ 201,000
	B		FOUNDATIONS AND CONCRETE				4,125		$ 268,000		$ 314,000		$ 126,000	$ 708,000
	C		STRUCTURES AND BUILDINGS				4,555		$ 296,000		$ 714,000		$ 211,000	$ 1,221,000
	D		PLANT EQUIPMENT				13,320		$ 877,000		$ 4,126,000		$ 16,000	$ 5,019,000
	E		ELECTRICAL				7,925		$ 515,000		$ 522,000		$ 1,793,000	$ 2,830,000
	F		INSTRUMENTS AND CONTROLS				0		$ -		$ -		$ -	$ -
	G		PIPING				1,585		$ 103,000		$ 347,000		$ 106,000	$ 556,000
	H		PLATEWORK (BINS, TANKS, AND CHUTES)				1,590		$ 100,000		$ 699,000		$ -	$ 799,000
	I		ARCHITECTURAL				1,650		$ 107,000		$ 624,000		$ 75,000	$ 806,000
	J		MOBILE AND SERVICE EQUIPMENT				0		$ -		$ -		$ 225,000	$ 225,000
	K		MINING				120		$ 8,000		$ 95,000		$ 7,825,000	$ 7,928,000
	L		MAJOR EARTHWORK (DAMS AND ROADS)				0		$ -		$ -		$ 956,000	$ 956,000
	M		INSULATION				0		$ -		$ -		$ -	$ -
			TOTAL DIRECT COST BY COMMODITY (CANADIAN DOLLARS)				**35,875**	**Hrs**	**$2,340,000**		**$7,510,000**		**$11,399,000**	**$21,249,000**
			INDIRECT COSTS											
	S		ENGINEERING & PROCUREMENT (8% of Direct costs less Mining)								$0		$1,066,000	$1,066,000
	N		CONSTRUCTION MANAGEMENT (8% of Direct costs less Mining)								$0		$1,066,000	$1,066,000
	R		CONTRACTOR INDIRECT COSTS								$0		$1,282,000	$1,282,000
	T		FREIGHT COSTS (5% of Material Costs)								$0		$554,000	$554,000
	U		FIRST FILL								$13,000		$0	$13,000
	V		INITIAL INVENTORY & SPARE PARTS								$0		$188,000	$188,000
	W		VENDORS REPS (4% of Mill Direct Cost)								$0		$83,000	$83,000
	X		PRE-OPS CHECK-OUT/TEST											**NOT INCLUDED**
	Y		OWNERS COST											**NOT INCLUDED**
			TAXES											**NOT INCLUDED**
			TOTAL INDIRECT COST BY COMMODITY (CANADIAN DOLLARS)								**$13,000**		**$4,239,000**	**$4,252,000**
	Z		**CONTINGENCY - 20% of Direct + Indirect Cost (less Mining) + 15% of Mining Cost**										**$4,699,000**	**$4,699,000**
			TOTAL PROJECT COST (CANADIAN DOLLARS)											**$30,200,000**
			SUSTAINING CAPITAL - TAILINGS										**$688,000**	**$688,000**

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Commodity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			DIRECT COSTS											
105			**SITE ACCESS ROAD**											
	A		Main Access Road (rehabilitated and is fully operational)											**NOT INCLUDED**
110			**PLANTSITE**											
110	A		Clearing and Grubbing	1	Allow	125.00	125	$65.00	$8,000	$0	$0	$2,000	$2,000	$10,000
110	A		Stripping	1	Allow	250.00	250	$65.00	$16,000	$0	$0	$8,000	$8,000	$24,000
110	A		Fencing	1	Allow	350.00	350	$65.00	$23,000	$62,000	$62,000	$0	$0	$85,000
110	A		Surfacing	1	Allow	100.00	100	$65.00	$7,000	$0	$0	$4,000	$4,000	$11,000
110	A		Sewage Tile Field (allow for 30 persons)	1	Sum	100.00	100	$65.00	$7,000	$5,000	$5,000	$3,000	$3,000	$15,000
110	E		Area Lighting	1	Allow	300.00	300	$65.00	$20,000	$39,000	$39,000	$0	$0	$59,000
112			**WATER SUPPLY / DISTRIBUTION**											
112	G		Piping, Storage Tank and Pump (Allowance)	1	Sum	150.00	150	$65.00	$10,000	$17,000	$17,000	$0	$0	$27,000
115			**POWER SUPPLY**											
			Generators											
115	E		Power House (2MW)	1	Allow	5,616.00	5,616	$65.00	$365,000	$0	$0	$1,625,000	$1,625,000	$1,990,000
115	E		Overhead Power Line	1	Allow	200.00	200	$65.00	$13,000	$12,000	$12,000	$0	$0	$25,000
117			**COMMUNICATIONS**											
117	E		Telephone System	1	Allow	0	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
117	E		PC LAN System	1	Allow	0	0	$65.00	$0	$0	$0	$30,000	$30,000	$30,000
120			**TRUCKSHOP / WAREHOUSE BUILDING**											**INCLUDED IN MINING COST**
122			**MINE DRY / OFFICE / FIRST AID FACILITIES**											
			Trailers 4 units (size 3m x 13m = 39m2)											
			Mine Dry (1); Offices / Canteen (2); First Aid / Rescue (1)											
			Site Preparation											
122	A		Level and compact	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$3,000.00	$3,000	$3,000
			Trailers 4 units											
122	C		Trailers including hook up and connection to utilities	1	Sum	80.00	80	$65.00	$5,000	$0	$0	$128,600	$129,000	$134,000
122	C		Stairs, ramps including handrails	1	Sum	40.00	40	$65.00	$3,000	$5,000	$5,000	$0	$0	$8,000
			Architectural											
122	I		Lockers	1	Allow	0.00	0	$65.00	$0	$0	$0	$5,000	$5,000	$5,000
122	I		Furniture and equipment	1	Allow	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
122	I		First Aid equipment	1	Allow	0.00	0	$0.00	$0	$0	$0	$10,000	$10,000	$10,000
124			**ASSAY LAB**											
			Trailer unit (size 3m x 13m = 39m2)											
			Site Preparation											
124	A		Level and compact	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$3,000	$3,000	$3,000
			Trailer 1 unit											
124	C		Trailer including hook up and connection to utilities	1	Sum	20.00	20	$65.00	$1,000	$0	$0	$27,200	$27,000	$28,000
124	C		Stairs, ramps including handrails	1	Sum	15.00	15	$65.00	$1,000	$1,200	$1,000	$0	$0	$2,000

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Architectural											
124	I		Furniture	1	Allow	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
124	I		Assay lab equipment	1	Allow	0.00	0	$0.00	$0	$0	$0	$40,000	$40,000	$40,000
200			**CRUSHING**											
			Crusher											
			Civil / Structural - including:											
200	A		Excavation	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$32,000	$32,000	$32,000
200	A		Structural Backfill	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$10,000	$10,000	$10,000
200	B		Concrete Mat Foundation	1	Allow	0.00	0	$65.00	$0	$0	$0	$62,000	$62,000	$62,000
200	B		Ore + Waste Bins Walls	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$64,000	$64,000	$64,000
200	C		Structural Steel support for Granby Side Dumper	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$44,000	$44,000	$44,000
200	C		Rail track											**Included in Mining Cost**
200	D		Granby Side Dumper for rail cars											**Included in Mining Cost**
			Mechanical											
			Crushing Package - ELRUS quotation 11217 dated 31 Jan 05, including:											
200	D		Heavy duty 24 x 42 Primary Plant - Chassis; Overhead Eccentric Jaw Cr 48" discharge conveyor; Hopper module; 48" x 18' vibratory grizzly feeder; hydraulic leveling system; detachable bulkhead for ramp side; hydraulic side dumping grizzly + options	1	Sum	0.00	0	$65.00	$0	$443,825	$444,000	$4,000	$4,000	$448,000
200	D		Screen Plant (5 x 18 - 2 deck); 36" overhead conveyor; 48" underscreen conveyor; 30" cross conveyors	1	Sum	0.00	0	$65.00	$0	$221,250	$221,000	$4,000	$4,000	$225,000
200	D		Cone Chassis c/w Sandvik H2800 Hydrocone Crusher	1	Sum	0.00	0	$65.00	$0	$396,750	$397,000	$4,000	$4,000	$401,000
200	D		48' Control Trailer Package, including Control Tower (6' x 8'); electrical switch gear	1	Sum	0.00	0	$65.00	$0	$162,750	$163,000	$4,000	$4,000	$167,000
200	D		Dust Collection											**Included in Crusher Package**
200	D		Fine Ore Bin (500t)	1	Sum	1,000.00	1,000	$65.00	$65,000	$95,000	$95,000	$0	$0	$160,000
200	D	CV-006	Feeder - Crushed Ore Relaim	1	Sum	500.00	500	$65.00	$33,000	$115,000	$115,000	$0	$0	$148,000
200	D	CV-003	Conveyor - Ball Mill Feed (allow 32m long)	32	m	30.00	960	$65.00	$62,000	$1,000	$32,000	$0	$0	$94,000
			Piping											
200	G		Piping - Process/Fire/Service (2% Mechanical Costs)	1	Allow	0	0	$65.00	$0	$0	$0	$29,000	$29,000	$29,000
			Electrical/Instrumentation											
200	E		5kV Switchgear/Starter/Cabling											**Included in Crusher Package**
200	E		Electrical - Crusher											**Included in Crusher Package**
200	F		Instrumentation											**Included in Crusher Package**

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MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
300			**GRINDING**											
			Mill Building											
			Building size (71.6m long x 30.5m wide = 2,184m2)											
			Height at apex of building 13.11m, including;											
300	A		Earthworks	1	Allow	30.00	30	$65.00	$2,000	$0.00	$0	$1,000	$1,000	$3,000
300	B		Foundations and Concrete	1	Sum	4,000.00	4,000	$65.00	$260,000	$308,000	$308,000	$0	$0	$568,000
300	C		Structural	1	Sum	4,200.00	4,200	$65.00	$273,000	$678,000	$678,000	$0	$0	$951,000
300	D		HVAC	1	Sum	1,500.00	1,500	$65.00	$98,000	$257,000	$257,000	$0	$0	$355,000
300	I		Temporary Building Structure	1	Sum	1,650.00	1,650	$65.00	$107,000	$623,610.00	$624,000	$0	$0	$731,000
300	I		Mandoors											**Included in Temporary Structure**
300	I		Roll Up Doors											**Included in Temporary Structure**
			Mechanical											
300	D	ML-001	Ball Mill - 8' x 12' x 400 Hp	1	Lot	3,800.00	3,800	$65.00	$247,000	$715,000	$715,000	$0	$0	$962,000
			c/w Motor, Liners, Lube unit etc.											
300	H	PB-001	Pumpbox - Cyclone Feed	1	t	20.00	20	$65.00	$1,000	$5,520.00	$6,000	$0	$0	$7,000
300	D	PP-001	Sump Pump - Cyclone Feed , (22kW)	1	Each	80.00	80	$65.00	$5,000	$15,000	$15,000	$0	$0	$20,000
300	D	CY-001	Cyclopac - D-15 Cyclones - Ball Mill	1	Each	350.00	350	$65.00	$23,000	$147,000	$147,000	$0	$0	$170,000
300	D		Crane Overhead (10t)	1	Each	150.00	150	$65.00	$10,000	$50,000	$50,000	$0	$0	$60,000
			Piping											
300	G		Allowance For Process Pipe (12% Mechanical)	1	Lot	528	528	$65.00	$34,000	$111,960	$112,000	$0	$0	$146,000
			Electrical & Instrumentation - Mill											
300	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	792	792	$65.00	$51,000	$168,000	$168,000	$0	$0	$219,000
400			**FLOTATION**											
			Mechanical											
400	H	TK-010	Tank, Conditioning, Flotation Feed (1.6m dia x 2.5m high)	1.5	t	40.00	60	$65.00	$4,000	$3,740	$6,000	$0	$0	$10,000
400	D	AG-010	Agitator, Conditioning Tank 1Hp (1kW)	1	Each	20.00	20	$65.00	$1,000	$6,000	$6,000	$0	$0	$7,000
400	D	PP-010	Pump - Flotation Feed , (7.5kW)	1	Each	40.00	40	$65.00	$3,000	$10,000	$10,000	$0	$0	$13,000
			Rougher											
400	D	FC-011	Flotation Cells 1 to 4 (5m3) - Rougher (45kW)	1	Lot	320.00	320	$65.00	$21,000	$240,000	$240,000	$0	$0	$261,000
400	H	PB-011	Pumpbox - Rougher Tails	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-011	Pump - Rougher Tails, (7.5kW)	1	Each	40.00	40	$65.00	$3,000	$10,000	$10,000	$0	$0	$13,000
400	H	PB-012	Pumpbox - Rougher Conc.	1	t	20.00	20	$65.00	$1,000	$5,520.00	$6,000	$0	$0	$7,000
400	D	PP-012	Slurry Pump - Rougher Conc., (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Scavenger											
400	D	FC-020	Flotation Cells 1 to 4 (5m3) - Scavenger (45kW)	1	Lot	320.00	320	$65.00	$21,000	$240,000	$240,000	$0	$0	$261,000
400	H	PB-020	Pumpbox - Scavenger Conc.	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-020	Slurry Pump - Scavenger Conc., (2.2kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
400	H	PB-021	Pumpbox - Scavenger Tails	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-021	Slurry Pump - Scavenger Tails, (11kW)	1	Each	40.00	40	$65.00	$3,000	$10,000	$10,000	$0	$0	$13,000

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Regrinding											
400	D	ML-030	Regrind Ball Mill - 4' x 6' 15 Hp (11 kW)	1	Lot	2,340.00	2,340	$65.00	$152,000	$522,000	$522,000	$0	$0	$674,000
			c/w Motor, Liners, Lube unit etc.											
400	H	PB-030	Pumpbox - Regrind Cyclone Feed	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-030	Slurry Pump - Regrind Cyclone Feed , (2.2kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
400	D	CY-030	Cyclone - D-6 Regrind Ball Mill	1	Lot	150.00	150	$65.00	$10,000	$50,000	$50,000	$0	$0	$60,000
400	H	PB-031	Pumpbox - Regrind Conc.	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-031	Slurry Pump - Regrind Conc., (2.2kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Cleaner 1											
400	D	FC-040	Column Cell (0.7m dia x 4,5m high)	1	Sum	0.00	0	$65.00	$0	$20,000	$20,000	$0	$0	$20,000
400	H	PB-040	Pumpbox - First Cleaner Tails	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-040	Pump No. 1 - First Cleaner Tails, (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
400	H	PB-041	Pumpbox No. 1 - Cleaner Conc.	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-041	Pump No. 1 - Cleaner Conc., (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Cleaner 2											
400	D	FC-050	Column Cell (0.7m dia x 4,5m high)	1	Sum	0.00	0	$65.00	$0	$20,000	$20,000	$0	$0	$20,000
400	H	PB-050	Pumpbox - Second Cleaner Tails	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-050	Pump No. 2 - Second Cleaner Tails, (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
400	H	PB-051	Pumpbox No. 2 - Cleaner Conc.	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-051	Pump No. 2 - Cleaner Conc., (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Cleaner 3											
400	D	FC-060	Column Cell (0.7m dia x 4,5m high)	1	Sum	0.00	0	$65.00	$0	$20,000	$20,000	$0	$0	$20,000
400	H	PB-060	Pumpbox - Third Cleaner Tails	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-060	Pump No. 3 - Third Cleaner Tails, (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
400	H	PB-061	Pumpbox No. 3 - Cleaner Conc.	1	t	20.00	20	$65.00	$1,000	$5,520	$6,000	$0	$0	$7,000
400	D	PP-061	Pump No. 3 - Cleaner Conc., (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Piping											
400	G		Allowance For Process Pipe (16% Mechanical)	1	Allow	635.20	635	$65.00	$41,000	$154,320	$154,000	$0	$0	$195,000
			Electrical/Instrumentation											
400	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	714.60	715	$65.00	$46,000	$231,480	$231,000	$0	$0	$277,000
450			**THICKENING - FILTRATION - DRYING**											
			Mechanical											
			Thickening											
450	H	TH-070	Thickener, Concentrate size 10' dia (5kW)	1	Lot	200.00	200	$65.00	$13,000	$115,000	$115,000	$0	$0	$128,000
450	D	PP-070	Pump - Conc. Thickener Underflow, (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
450	D	PP-071	Pump - Conc. Thickener Overflow, (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$3,000	$3,000	$0	$0	$6,000
			Filtration											
450	H	TK-073	Tank, Concentrate (17m3)	3.5	t	40.00	140	$65.00	$9,000	$6,415	$22,000	$0	$0	$31,000
450	D	AG-073	Agitator, Concentrate Tank 4Hp (3kW)	1	Each	20.00	20	$65.00	$1,000	$14,000	$14,000	$0	$0	$15,000
450	D	PP-073	Pump - Filter Feed , (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$3,500	$4,000	$0	$0	$7,000
450	D	FL-070	Disc Filter, Concentrate Dewatering (3m2)	1	Each	100.00	100	$65.00	$7,000	$29,300	$29,000	$0	$0	$36,000
450	D	PP-072	Pump - Filtrate Water, (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$3,000	$3,000	$0	$0	$6,000
450	D	CV-007	Conveyor - Mo Conc.	20	m	30.00	600	$65.00	$39,000	$1,000	$20,000	$0	$0	$59,000
450	D	SC-001	Scale - Concentrate	1	Each	60.00	60	$65.00	$4,000	$6,100	$6,000	$0	$0	$10,000
450	D		Rotary Dryer	1	Sum	100.00	100	$65.00	$7,000	$150,000	$150,000	$0	$0	$157,000

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Piping											
450	G		Allowance For Process Pipe (10% Mechanical)	1	Allow	138.00	138	$65.00	$9,000	$37,200	$37,000	$0	$0	$46,000
			Electrical											
450	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	248.40	248	$65.00	$16,000	$66,960	$67,000	$0	$0	$83,000
500			**TAILINGS & WATER SERVICES**											
			Lower Dam Fill											
500	L		Compacted Till Core	4,700	m3	0.00	0	$65.00	$0	$0	$0	$10	$47,000	$47,000
500	L		Filter Sand	980	m3	0.00	0	$65.00	$0	$0	$0	$18	$18,000	$18,000
500	L		Sand and Gravel Shell	16,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$192,000	$192,000
			Upper Dam Fill											
500	L		Foundation Preparation	2.4	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$12,000	$12,000
500	L		Compacted Till Core	1,500	m3	0.00	0	$65.00	$0	$0	$0	$10	$15,000	$15,000
500	L		Filter Sand	410	m3	0.00	0	$65.00	$0	$0	$0	$18	$7,000	$7,000
500	L		Sand and Gravel Shell	3,500	m3	0.00	0	$65.00	$0	$0	$0	$12	$42,000	$42,000
			Reservoir											
500	L		Clearing	45	Ha	0.00	0	$65.00	$0	$0	$0	$1,000	$45,000	$45,000
			Emergency Spillway											
500	L		Excavation (16m3/m)	8,000	m3	0.00	0	$65.00	$0	$0	$0	$6	$48,000	$48,000
500	L		Gabion Mat	500	m3	0.00	0	$65.00	$0	$0	$0	$58	$29,000	$29,000
500	L		Slush Grout	100	m3	0.00	0	$65.00	$0	$0	$0	$500	$50,000	$50,000
			Seepage Recovery / Sediment Control											
500	L		Compacted Till Core	200	m3	0.00	0	$65.00	$0	$0	$0	$10	$2,000	$2,000
500	L		Filter Sand	100	m3	0.00	0	$65.00	$0	$0	$0	$18	$2,000	$2,000
500	L		Sand and Gravel Shell	1,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$12,000	$12,000
500	L		Pump Station	1	Lot	0.00	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
			Road Access											
500	L		Road Access	4	km	0.00	0	$65.00	$0	$0	$0	$10,000	$40,000	$40,000
			Diversion Ditches											
500	L		Perimeter (3.5m3/m)	18,000	m3	0.00	0	$65.00	$0	$0	$0	$5	$90,000	$90,000
			Tailings Distribution and Reclaim											
500	L		Tailings Pipeline	2,000	m	0.00	0	$65.00	$0	$0	$0	$50	$100,000	$100,000
500	L		Tailings Pump	1	Lot	0.00	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
500	L		Reclaim Barge and Pump	1	Lot	0.00	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
500	L		Reclaim Water Pipeline	1,100	m	0.00	0	$65.00	$0	$0	$0	$50	$55,000	$55,000
			Process											
500	H	TH-080	Thickener, Tails size 60' dia (11kW)	1	Lot	600.00	600	$65.00	$39,000	$440,000	$440,000	$0	$0	$479,000
500	C		Structural - Enclosure for Thickener	1	Allow	150.00	150	$65.00	$10,000	$30,000	$30,000	$0	$0	$40,000
500	D	PP-080	Pump - Final Tails, (15kW)	1	Each	40.00	40	$65.00	$3,000	$7,000	$7,000	$0	$0	$10,000
500	D	PP-081	Pump - Thickener Overflow, (2.2kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Piping											
500	G		Allowance For Piping (16% Mechanical)	1	Allow	0	0	$0.00	$0	$0	$0	$77,280	$77,000	$77,000
			Electrical											
500	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	0.00	0	$65.00	$0	$0	$0	$87,000	$87,000	$87,000

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
550			**PROCESS & FRESH WATER SERVICES**											
			Mechanical											
550	D	PP-090	Pump - Water Reclaim, (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$3,000	$3,000	$0	$0	$6,000
550	H	TK-091	Tank, Fresh Water (64m3)	2	t	40.00	80	$65.00	$5,000	$3,740	$7,000	$0	$0	$12,000
550	D	PP-091	Pump - Fresh Water Distribution, (2.2kW)	1	Each	40.00	40	$65.00	$3,000	$3,000	$3,000	$0	$0	$6,000
550	H	TK-092	Tank, Process Water (88m3)	2.5	t	40.00	100	$65.00	$7,000	$3,740	$9,000	$0	$0	$16,000
550	D	PP-092	Pump - Process Water Distribution, (11kW)	1	Each	40.00	40	$65.00	$3,000	$6,500	$7,000	$0	$0	$10,000
			Piping											
550	G		Allowance For Process Pipe (20% Mechanical)	1	Allow	60	60	$65.00	$4,000	$5,800	$6,000	$0	$0	$10,000
			Electrical											
550	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	54.00	54	$65.00	$4,000	$5,220	$5,000	$0	$0	$9,000
600			**FUEL STORAGE AND DISTRIBUTION**											
600	A		Earthworks	1	Allow	50.00	50	$65.00	$3,000	$2,000.00	$2,000	$0	$0	$5,000
600	B		Containment Slab and Curb	1	Allow	125.00	125	$65.00	$8,000	$6,000	$6,000	$0	$0	$14,000
600	H		Fuel Tank (20,000 liter capacity)	1	Allow	150.00	150	$65.00	$10,000	$22,000	$22,000	$0	$0	$32,000
600	C		Lubricant Storage - Trailer	1	Allow	50.00	50	$65.00	$3,000	$0	$0	$11,000	$11,000	$14,000
600	D		Mechanical	1	Allow	70.00	70	$65.00	$5,000	$6,000	$6,000	$0	$0	$11,000
600	G		Pipe	1	Allow	50.00	50	$65.00	$3,000	$2,000	$2,000	$0	$0	$5,000
600	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	0.00	0	$65.00	$0	$0	$0	$1,000	$1,000	$1,000
700			**MINING**											
700	K		Mining - Pre-production & development - Labour	1	Sum	0.00	0	$65.00	$0	$0	$0	$2,498,000	$2,498,000	$2,498,000
700	K		Mining - Pre-production & development - Supervision	1	Sum	0.00	0	$65.00	$0	$0	$0	$900,000	$900,000	$900,000
700	K		Mining - Supplies	1	Sum	0.00	0	$65.00	$0	$0	$0	$604,000	$604,000	$604,000
700	K		Mining - Contractor Drill Blast Longhole	1	Sum	0.00	0	$65.00	$0	$0	$0	$0	$0	$0
700	K		Contractor - Mob/De-mob Operating Costs, Services, Power	1	Sum	0.00	0	$65.00	$0	$0	$0	$1,762,000	$1,762,000	$1,762,000
700	K		Underground Mobile, Portable Equipment, including:	1	Sum	0.00	0	$65.00	$0	$0	$0	$1,225,000	$1,225,000	$1,225,000
			- Muck (8)and Flat (10) Rail Cars											
			- Locomotive (1 x 10t) - Reconditioned											
			- Batteries (2) for Locomotive											
			- Jumbo Drill (1) - 2 boom like Axera D06 226XL											
			- Scissor Deck (1)											
			- LHD incl. Remote capability (2)											
			- Truck (1)											
			- ANFO Loaders (2) - Contractor to supply Cartridge Loaders											
			- Jacklegs (3)											
			- Stopers (3)											
			- Mine Rescue Equipment (5)											
			- Pick-up Truck surface (1)											
			- Van surface (1)											

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
700	K		Underground Equipment, including:	1	Sum	0.00	0	$65.00	$0		$0	$618,000	$618,000	$618,000
			- Fan (1 x 150hp)											
			- Rigid Vent Ducting (1,450m)											
			- Rail Tracks #85lb (350m)											
			- Rail Switch (3)											
			- Camel Back (2)											
			- Arc Gate Chute (1)											
			- Shop Equipment											
			- Fan (1 x 100hp)											
			- Fan Booster (2 x 75hp)											
			- Flygt Pumps (1)											
			- Grizzly (1)											
			- Refuge Station (1)											
			- Battery Station (1)											
			- Transformer (1)											
700	K		Mining - Diamond Drilling	1	Sum	0.00	0	$65.00	$0	$0	$0	$218,000	$218,000	$218,000
700	K		Compressor, Rotary Screw Electric Air-Cooled (350hp)	1	Sum	120.00	120	$65.00	$8,000	$95,000	$95,000	$0	$0	$103,000
700	G		Allowance For Air Service Pipe (20% of Equipment)	1	Allow	24.00	24	$65.00	$2,000	$19,000	$19,000	$0	$0	$21,000
750			**<u>EXPLOSIVE PLANT</u>**											
750	K		Explosive Plant											**NOT INCLUDED**
800			**<u>MOBILE EQUIPMENT</u>**											
800	J		Allowance for Loader (1); Bobcat (1); Truck (1)	1	Allow	0.00	0	$65.00	$0	$0	$0	$225,000	$225,000	$225,000
			- Pick-up Truck (Included in Mining Cost)											
			- Van (Included in Mining Cost)											
			TOTAL PROJECT DIRECT COST (CANADIAN DOLLARS)				**35,875**		**$2,340,000**		**$7,510,000**		**$11,399,000**	**$21,249,000**

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			INDIRECT COSTS											
			ENGINEERING & PROCUREMENT											
	S		Engineering and Procurement (8% of Direct Costs less Mining)	1	Sum	1	1	$0	$0	$0	$0	$1,065,680	$1,066,000	$1,066,000
	S		Engineering and Procurement - Mining											**INCLUDED IN MINING COST**
			CONSTRUCTION MANAGEMENT											
	N		Construction Management (8% of Direct Costs less Mining)	1	Sum	1	1	$0	$0	$0	$0	$1,065,680	$1,066,000	$1,066,000
	N		Construction Management - Mining											**INCLUDED IN MINING COST**
			CONTRACTOR INDIRECT COSTS											
	R		Construction Indirects (6% of Direct Costs less Mining)	1	Sum	1	1	$0	$0	$0	$0	$799,260	$799,000	$799,000
	R		Construction Indirects - Mining											**INCLUDED IN MINING COST**
	R		Mining - Board and Lodging at local hotel	1	Sum	0	0	$0	$0	$0	$0	$483,000	$483,000	$483,000
			FREIGHT											
	T		Freight (5% of Material + (Other - Mining) Cost)	1	Sum	0	0	$0	$0	$0	$0	$554,000	$554,000	$554,000
			FIRST FILL (Grinding Balls)											
	U		1st Fill - Grinding Balls (BALL mills)	15	t	0	0	$0	$0	$850	$13,000	$0	$0	$13,000
			INITIAL INVENTORY & SPARE PARTS											
	V		Initial Inventory and Spare Parts (2.5% of material cost)	1	Allow	0	0	$0	$0	$0	$0	$188,000	$188,000	$188,000
			VENDOR REPS											
	W		Vendor Reps for Erection Supervision (1.5% Capital Equipment)	1	Sum	0	0	$0	$0	$0	$0	$61,890	$62,000	$62,000
	W		Vendor Reps for Start-up (0.5% Capital Equipment)	1	Sum	0	0	$0	$0	$0	$0	$20,630	$21,000	$21,000
			PRE-OP CHECK-OUT/TEST + COMMISSIONING											
	X		Pre-op Check-out / Test											**NOT INCLUDED**
	X		Commissioning & Ramp-up (Owners Cost)											**NOT INCLUDED**
			OWNERS COST (Excluded)											
	Y		Snow Clearing at Site (By Owner)											**NOT INCLUDED**
	Y		Snow Clearing - Access Road to Site (By Owner)											**NOT INCLUDED**
	Y		Watering Road & Sites - (Same as Above) (By Owner)											**NOT INCLUDED**
			TOTAL INDIRECTS (CANADIAN DOLLARS)				**3**		**$0**		**$13,000**		**$4,239,000**	**$4,252,000**

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 1 - 500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			SUSTAINING CAPITAL											
			TAILINGS - YEAR 2											
			Lower Dam Fill											
			Compacted Till Core	400	m3	0.00	0	$65.00	$0	$0	$0	$10	$4,000	$4,000
			Filter Sand	270	m3	0.00	0	$65.00	$0	$0	$0	$18	$5,000	$5,000
			Sand and Gravel Shell	4,600	m3	0.00	0	$65.00	$0	$0	$0	$12	$55,000	$55,000
			Upper Dam Fill											
			Compacted Till Core	300	m3	0.00	0	$65.00	$0	$0	$0	$10	$3,000	$3,000
			Filter Sand	250	m3	0.00	0	$65.00	$0	$0	$0	$18	$5,000	$5,000
			Sand and Gravel Shell	2,200	m3	0.00	0	$65.00	$0	$0	$0	$12	$26,000	$26,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - END OF MINE											
			Closure / Completion											
			Granular Cover	40,000	m3	0.00	0	$65.00	$0	$0	$0	$8	$300,000	$300,000
			Organic Cover	40,000	m3	0.00	0	$65.00	$0	$0	$0	$5	$180,000	$180,000
			Spillways	1	Lot	0.00	0	$65.00	$0	$0	$0	$100,000	$100,000	$100,000
			TOTAL - SUSTAINING CAPITAL						**$0**		**$0**		**$688,000**	**$688,000**
														$30,200,000

HATCH

May 26, 2005

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 2 - 2,500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Description	Labour MH	Labour Cost	Material Cost	Other Cost	Total Cost CAD
	AREA SUMMARY:					
105	SITE ACCESS ROAD					**NOT INCLUDED**
110	PLANT SITE	3,092	$201,000	$126,000	$13,000	$340,000
112	WATER SUPPLY	250	$16,000	$50,000	$0	$66,000
115	POWER SUPPLY	15,780	$1,026,000	$25,000	$3,049,000	$4,100,000
117	COMMUNICATIONS	0	$0	$0	$100,000	$100,000
120	TRUCKSHOP / WAREHOUSE					**INCLUDED IN MINING**
122	MINE DRY / OFFICE / FIRST AID FACILITIES	5,306	$347,000	$758,000	$194,000	$1,299,000
124	ASSAY LAB	33	$1,000	$2,000	$77,000	$80,000
200	CRUSHING	18,648	$1,188,000	$2,640,000	$255,000	$4,083,000
300	GRINDING	47,274	$3,075,000	$7,837,000	$2,000	$10,914,000
400	FLOTATION & REGRINDING	7,437	$491,000	$2,880,000	$0	$3,371,000
450	THICKENING - FILTRATION - DRYING	2,586	$169,000	$1,493,000	$0	$1,662,000
480	CONCENTRATE HANDLING & STORAGE	481	$31,000	$55,000	$0	$86,000
500	TAILINGS & RECLAIM SYSTEMS	2,080	$137,000	$1,002,000	$3,975,000	$5,114,000
550	PROCESS & FRESH WATER SERVICES	883	$59,000	$229,000	$0	$288,000
600	FUEL STORAGE & DISTRIBUTION	1,213	$81,000	$110,000	$0	$191,000
700	MINING	424	$28,000	$300,000	$68,752,000	$69,080,000
750	EXPLOSIVES PLANT					**NOT INCLUDED**
800	MOBILE EQUIPMENT	0	$0	$0	$225,000	$225,000
	TOTAL AREA DIRECT COST (CANADIAN DOLLARS)	**105,486 Hrs**	**$6,850,000**	**$17,507,000**	**$76,642,000**	**$100,999,000**
	INDIRECT COSTS					
S	ENGINEERING & PROCUREMENT (8% of Direct costs less Mining)	1	$0	$0	$2,554,000	$2,554,000
N	CONSTRUCTION MANAGEMENT (8% of Direct costs less Mining)	1	$0	$0	$2,554,000	$2,554,000
R	CONTRACTOR INDIRECT COSTS	1	$0	$0	$2,422,000	$2,422,000
T	FREIGHT COSTS (5% of material costs)	0	$0	$0	$2,822,000	$2,822,000
U	FIRST FILL (Grinding Balls)	0	$0	$94,000	$0	$94,000
V	INITIAL INVENTORY & SPARE PARTS (2.5% of material cost)	0	$0	$0	$438,000	$438,000
W	VENDOR REPS	0	$0	$0	$183,000	$183,000
X	PRE-OPS CHECK-OUT/TEST					**NOT INCLUDED**
Y	OWNERS COST					**NOT INCLUDED**
	TAXES					**NOT INCLUDED**
	TOTAL INDIRECT COST BY COMMODITY (CANADIAN DOLLARS)	**3 Hrs**	**$0**	**$94,000**	**$10,973,000**	**$11,067,000**
Z	**CONTINGENCY - 20% of Direct + Indirect Cost (less Mining) + 15% of Mining Cost**				**$18,934,000**	**$18,934,000**
	TOTAL PROJECT COST (CANADIAN DOLLARS)					**$131,000,000**
	SUSTAINING CAPITAL - TAILINGS				**$24,383,000**	**$24,383,000**

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 2 - 2,500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			COMMODITY SUMMARY:											
	A		SITE AND EARTHWORK				2,967		$ 193,000		$ 102,000		$ 83,000	$ 378,000
	B		FOUNDATIONS AND CONCRETE				10,224		$ 665,000		$ 1,677,000		$ 62,000	$ 2,404,000
	C		STRUCTURES AND BUILDINGS				15,319		$ 996,000		$ 1,744,000		$ 71,000	$ 2,811,000
	D		PLANT EQUIPMENT				35,733		$ 2,304,000		$ 9,138,000		$ 165,000	$ 11,607,000
	E		ELECTRICAL				22,825		$ 1,485,000		$ 1,560,000		$ 3,149,000	$ 6,194,000
	F		INSTRUMENTS AND CONTROLS				168		$ 11,000		$ 3,000		$ 15,000	$ 29,000
	G		PIPING				2,682		$ 176,000		$ 886,000		$ -	$ 1,062,000
	H		PLATEWORK (BINS, TANKS, AND CHUTES)				2,282		$ 154,000		$ 1,040,000		$ -	$ 1,194,000
	I		ARCHITECTURAL				13,286		$ 866,000		$ 1,357,000		$ 145,000	$ 2,368,000
	J		MOBILE AND SERVICE EQUIPMENT				0		$ -		$ -		$ 225,000	$ 225,000
	K		MINING				0		$ -		$ -		$ 68,752,000	$ 68,752,000
	L		MAJOR EARTHWORK (DAMS AND ROADS)				0		$ -		$ -		$ 3,975,000	$ 3,975,000
	M		INSULATION				0		$ -		$ -		$ -	$ -
			TOTAL DIRECT COST BY COMMODITY (CANADIAN DOLLARS)				**105,486**	**Hrs**	**$6,850,000**		**$17,507,000**		**$76,642,000**	**$100,999,000**
			INDIRECT COSTS											
	S		ENGINEERING & PROCUREMENT (8% of Direct costs less Mining)				1		$0		$0		$2,554,000	$2,554,000
	N		CONSTRUCTION MANAGEMENT (8% of Direct costs less Mining)				1		$0		$0		$2,554,000	$2,554,000
	R		CONTRACTOR INDIRECT COSTS				1		$0		$0		$2,422,000	$2,422,000
	T1		FREIGHT COSTS (5% of material costs)				0		$0		$0		$2,822,000	$2,822,000
	T2		OVERSEAS FREIGHT COSTS (Crusher/Mill/Filter)				0		$0		$0		$0	$0
	U		FIRST FILL (Grinding Balls - Use Existing)				0		$0		$94,000		$0	$94,000
	V		INITIAL INVENTORY & SPARE PARTS (2.5% of material cost)				0		$0		$0		$438,000	$438,000
	W		VENDOR REPS				0		$0		$0		$183,000	$183,000
	X		PRE-OPS CHECK-OUT/TEST				0		$0		$0		$0	$0
	Y		OWNERS COST											**NOT INCLUDED**
			TAXES											**NOT INCLUDED**
			TOTAL INDIRECT COST BY COMMODITY (CANADIAN DOLLARS)				**3**	**Hrs**	**$0**		**$94,000**		**$10,973,000**	**$11,067,000**
	Z		**CONTINGENCY - 20% of Direct + Indirect Cost (less Mining) + 15% of Mining Cost**										**$18,934,000**	**$18,934,000**
			TOTAL PROJECT COST (CANADIAN DOLLARS)											**$131,000,000**
			SUSTAINING CAPITAL - TAILINGS										**$24,383,000**	**$24,383,000**

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 2 - 2,500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
105			**SITE ACCESS ROAD**											
	A		Main Access Road (rehabilitated and is fully operational)											**NOT INCLUDED**
110			**PLANTSITE**											
110	A		Clearing and grubbing	1	Allow	250.00	250	$65.00	$16,000	$0	$0	$4,000	$4,000	$20,000
110	A		Stripping	1	Allow	524.00	524	$65.00	$34,000	$0	$0	$4,000	$4,000	$38,000
110	A		Fencing	1	Allow	1,100.00	1,100	$65.00	$72,000	$71,000	$71,000	$0	$0	$143,000
110	A		Surfacing	1	Allow	218.00	218	$65.00	$14,000	$5,000	$5,000	$0	$0	$19,000
110	A		Sewage Tile Field (allow for 60 persons)	1	Allow	200.00	200	$65.00	$13,000	$10,000	$10,000	$5,000	$5,000	$28,000
110	E		Area Lighting	1	Allow	800.00	800	$65.00	$52,000	$40,000	$40,000	$0	$0	$92,000
112			**WATER SUPPLY / DISTRIBUTION**											
112	G		Piping, storage tank and pump	1	Allow	250.00	250	$65.00	$16,000	$50,000	$50,000	$0	$0	$66,000
115			**POWER SUPPLY**											
			Generators											
115	E		Line Design/Survey/Clearing	1	Allow	0.00	0	$65.00	$0	$0	$0	$49,000	$49,000	$49,000
115	E		Power House (6 MW)	1	Allow	15,380.00	15,380	$65.00	$1,000,000	$0	$0	$3,000,000	$3,000,000	$4,000,000
115	E		Overhead Power Line	1	Allow	400.00	400	$65.00	$26,000	$25,000	$25,000	$0	$0	$51,000
117			**COMMUNICATIONS**											
117	E		Telephone System - allowance	1	Lot	0	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
117	E		PC LAN System - allowance	1	Lot	0	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
120			**TRUCKSHOP / WAREHOUSE FACILITY**											**INCLUDED IN MINING**
122			**MINE DRY / OFFICE / FIRST AID FACILITIES**											
			Building size: 33m x 16m = 528m2											
122	A		Earthworks	1	Allow	100.00	100	$65.00	$7,000	$0.00	$0	$10,000	$10,000	$17,000
122	B		Concrete	1	Allow	420.00	420	$65.00	$27,000	$71,000	$71,000	$0	$0	$98,000
122	D		HVAC	1	Allow	309.00	309	$65.00	$20,000	$0	$0	$74,000	$74,000	$94,000
			Architectural											
122	I		Building module	1	Allow	3,000.00	3,000	$65.00	$195,000	$555,000.00	$555,000	$0	$0	$750,000
122	I		Interior Finishes for offices	1	Allow	993.00	993	$65.00	$65,000	$114,000	$114,000	$0	$0	$179,000
122	I		Single Mandoors	1	Allow	60.00	60	$65.00	$4,000	$7,000	$7,000	$0	$0	$11,000
122	I		Roll Up Doors 12' x 16'	1	Allow	24.00	24	$65.00	$2,000	$11,000	$11,000	$0	$0	$13,000
122	I		Lockers and Benches	1	Allow	100.00	100	$65.00	$7,000	$0	$0	$25,000	$25,000	$32,000
122	I		Furniture and equipment	1	Allow	150.00	150	$65.00	$10,000	$0	$0	$50,000	$50,000	$60,000
122	I		First Aid equipment	1	Allow	0.00	0	$65.00	$0	$0	$0	$20,000	$20,000	$20,000
122	F		Electrical	1	Allow	150.00	150	$65.00	$10,000	$0	$0	$15,000	$15,000	$25,000

HATCH

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 2 - 2,500TPD
PROCESS AND INFRASTRUCTURE

Project No.: H-318273
Client: ROCA MINES INC.

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
124			**ASSAY LAB**											
			Trailer unit (size 3m x 13m = 39m2)											
			Site Preparation											
124	A		Level and compact	1	Allow	5.00	5	$65.00	$0	$1,500.00	$2,000	$0.00	$0	$2,000
			Trailer 1 unit											
124	C		Trailer including hook up and connection to utilities	1	Sum	20.00	20	$65.00	$1,000	$0	$0	$27,200	$27,000	$28,000
124	C		Stairs, ramps including handrails	1	Sum	8.00	8	$65.00						$0
			Architectural											
124	I		Furniture	1	Allow	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
124	I		Assay lab equipment	1	Allow	0.00	0	$0.00	$0	$0	$0	$40,000	$40,000	$40,000
200			**CRUSHING**											
			Crusher											
			Civil / Structural											
200	A		Excavation	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$32,000	$32,000	$32,000
200	A		Structural backfill	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$10,000	$10,000	$10,000
200	C		Structural steel retaining wall	1	Allow	0.00	0	$65.00	$0	$0.00	$0	$44,000	$44,000	$44,000
200	B		Concrete Mat Foundation	1	Allow	0.00	0	$65.00	$0	$0	$0	$62,000	$62,000	$62,000
			Mechanical											
			Crushing Package - ELRUS quotation 11217 dated 31 Jan 05, including:											
200	D		Heavy duty 24 x 42 Primary Plant - Chassis; Overhead Eccentric Jaw Cr 48" discharge conveyor; Hopper module; 48" x 18' vibratory grizzly feeder; hydraulic leveling system; detachable bulkhead for ramp side; hydraulic side dumping grizzly + options	1	Sum	0.00	0	$65.00	$0	$443,825	$444,000	$4,000	$4,000	$448,000
200	D		Screen Plant (5 x 18 - 2 deck); 36" overhead conveyor; 48" underscreen conveyor; 30" cross conveyors	1	Sum	0.00	0	$65.00	$0	$221,250	$221,000	$4,000	$4,000	$225,000
200	D		Cone Chassis c/w Sandvik H2800 Hydrocone Crusher	1	Sum	0.00	0	$65.00	$0	$396,750	$397,000	$4,000	$4,000	$401,000
200	D		48' Control Trailer Package, including Control Tower (6' x 8'); electrical switch gear	1	Sum	0.00	0	$65.00	$0	$162,750	$163,000	$4,000	$4,000	$167,000
200	D		Dust Collection											**Included in Crusher Package**
		SP-001	Stockpile - 2,500 / 12,500t											
200	A		Drainage at stockpile	1	Allow	150.00	150	$65.00	$10,000	$800.00	$1,000	$0	$0	$11,000
200	A		Earthworks	1	Allow	325.00	325	$65.00	$21,000	$9,000.00	$9,000	$16,000	$16,000	$46,000
200	B		Concrete	1	Allow	2,050.00	2,050	$65.00	$133,000	$323,000.00	$323,000	$0	$0	$456,000
200	C		Armco Tunnel Pipe - 1,800m wide x 15m long	1	Allow	210.00	210	$65.00	$14,000	$9,000.00	$9,000	$0.00	$0	$23,000
200	C		Structural Steel Support	1	Allow	740.00	740	$65.00	$48,000	$41,000.00	$41,000	$0	$0	$89,000
200	D		Sump Pump	1	Each	40.00	40	$65.00	$3,000	$3,500.00	$4,000	$0.00	$0	$7,000
200	C		Structural steel - openings embed	1	Allow	140.00	140	$65.00	$9,000	$18,000.00	$18,000	$0.00	$0	$27,000
200	D		Feed & Discharge Chutework	1	Allow	70.00	70	$65.00	$5,000	$19,000.00	$19,000	$0.00	$0	$24,000
200	D		Liners - Feed Chute & Discharge Chute	1	Allow	80.00	80	$65.00	$5,000	$22,000.00	$22,000	$0.00	$0	$27,000
200			Mechanical											
200	D	FE-002	Reclaim Feeder No. 1	1	Sum	350.00	350	$65.00	$23,000	$90,000	$90,000	$0	$0	$113,000
200	D	FE-003	Reclaim Feeder No. 2	1	Sum	350.00	350	$65.00	$23,000	$90,000	$90,000	$0	$0	$113,000
200	D	CV-001	Conveyor Coarse Ore 1,067 mm wide x 100m long	100	m	45.00	4,500	$65.00	$293,000	$2,000	$200,000	$0	$0	$493,000
200	D	CV-002	Conveyor SAG Mill Feed 1,067 mm wide x 150m long	150	m	45.00	6,750	$65.00	$439,000	$2,640	$396,000	$0	$0	$835,000
200	D		Dust Collection at stockpile	1	Allow	416.67	417	$0.00	$0	$0	$0	$75,000	$75,000	$75,000

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
200			Piping											
200	G		Fire Protection	1	Allow	100.00	100	$65.00	$7,000	$25,000	$25,000	$0	$0	$32,000
200	G		Piping - Water Supply	1	Allow	150.00	150	$65.00	$10,000	$27,500	$28,000	$0	$0	$38,000
200			Electrical											
200	E		Electrical - Crusher											**Included in Crusher Package**
200	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	2,226.00	2,226	$65.00	$145,000	$139,680	$140,000	$0	$0	$285,000
300			**GRINDING**											
			Mill Building											
			Building size:											
			Mill: 91m x 40m = 3,640m2											
300	A		Earthworks	1	Allow	25.00	25	$65.00	$2,000	$0.00	$0	$2,000	$2,000	$4,000
			Concrete											
300	B		Building	1	Allow	4,249.00	4,249	$65.00	$276,000	$639,668.00	$640,000	$0	$0	$916,000
300	B		Mill Mat Foundations and piers	1	Allow	3,150.00	3,150	$65.00	$205,000	$547,000.00	$547,000	$0	$0	$752,000
300	B		Miscellaneous Tank/Equipment Slabs	1	Allow	270.00	270	$65.00	$18,000	$73,000.00	$73,000	$0	$0	$91,000
			Structural											
300	C		Structural Steel	1	Allow	9,118.00	9,118	$65.00	$593,000	$955,072	$955,000	$0	$0	$1,548,000
300	C		Grating	1	Allow	2,250.00	2,250	$65.00	$146,000	$293,000	$293,000	$0	$0	$439,000
300	C		Checker Plate	1	Allow	54.00	54	$65.00	$4,000	$9,000	$9,000	$0	$0	$13,000
300	C		Miscellaneous steel	1	Allow	1,448.00	1,448	$65.00	$94,000	$222,000	$222,000	$0	$0	$316,000
			HVAC											
300	D		Mill building	1	Allow	2,127.00	2,127	$65.00	$138,000	$372,510	$373,000	$0.00	$0	$511,000
			Architectural											
300	I		Cladding c/w Liner & Insulation	1	Allow	4,433.00	4,433	$65.00	$288,000	$288,242.00	$288,000	$0	$0	$576,000
300	I		Roofing c/w Liner & Insulation	1	Allow	3,422.00	3,422	$65.00	$222,000	$222,477.00	$222,000	$0	$0	$444,000
300	I		Concrete Block Walls (200mm, 8")	1	Allow	118.00	118	$65.00	$8,000	$6,000	$6,000	$0	$0	$14,000
300	I		Interior Finishes, Offices	1	Allow	794.00	794	$65.00	$52,000	$91,000	$91,000	$0	$0	$143,000
300	I		Single Mandoors	12	Each	6.00	72	$65.00	$5,000	$707	$8,000	$0	$0	$13,000
300	I		Roll Up Doors 12' x 16'	5	Each	24.00	120	$65.00	$8,000	$11,000	$55,000	$0	$0	$63,000
			Mechanical											
300	D	ML-001	SAG Mill - 5.5m x 2.4m (664kW)	1	Sum	5,000.00	5,000	$65.00	$325,000	$1,682,000	$1,682,000	$0	$0	$2,007,000
			c/w Motor, Liners, Lube unit etc.											
300	D	ML-002	Ball Mill - 3.7m x 4.9m (810kW)	1	Sum	4,500.00	4,500	$65.00	$293,000	$1,040,500	$1,041,000	$0	$0	$1,334,000
			c/w Motor, Liners, Lube unit etc.											
300	H	PB-001	Sump Box - Cyclone Feed	1	Allow	72.00	72	$65.00	$5,000	$20,000.00	$20,000	$0	$0	$25,000
300	D	PP-001	Sump Pump - Hydrocyclone Feed (110kW)	1	Each	80.00	80	$65.00	$5,000	$44,000	$44,000	$0	$0	$49,000
300	D	CY-001	Cyclopac - D-15 Cyclones - Ball Mill	1	Each	350.00	350	$65.00	$23,000	$147,000	$147,000	$0	$0	$170,000
300	D	CR-002	Cone Crusher Symons SH 3' 22kW	1	Each	750.00	750	$65.00	$49,000	$150,000	$150,000	$0	$0	$199,000
300	D	CV-003	Conveyor Belt No. 1 - Pebble Handling	15	m	30.00	450	$65.00	$29,000	$750	$11,000	$0	$0	$40,000
300	D	CV-004	Conveyor Belt No. 2 - Pebble Handling	15	m	30.00	450	$65.00	$29,000	$750	$11,000	$0	$0	$40,000
300	D	CV-005	Conveyor Belt No. 3 - Pebble Handling	15	m	30.00	450	$65.00	$29,000	$750	$11,000	$0	$0	$40,000
300	D	CN-001	Crane Overhead (20t)	1	Sum	200.00	200	$65.00	$13,000	$75,000	$75,000	$0	$0	$88,000

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			Piping											
300	G		Process Pipe (5% Mechanical)	1	Allow	615.10	615	$65.00	$40,000	$159,600	$160,000	$0	$0	$200,000
300	G		Service Pipe (4% Mechanical), including:	1	Allow	492.08	492	$65.00	$32,000	$127,680	$128,000	$0	$0	$160,000
			- Air & Water Hose Stns & Fire Cabinets											
			Electrical & Instrumentation - Mill											
300	E		Electrical and Instrumentation (18% of Mechanical)	1	Sum	2,214.36	2,214	$65.00	$144,000	$574,560	$575,000	$0	$0	$719,000
400			**FLOTATION**											
			Mechanical											
400	H	TK-010	Tank, Conditioning, Flotation Feed (2.7m dia x 3m high)	1	Allow	140.00	140	$65.00	$9,000	$13,000	$13,000	$0	$0	$22,000
400	D	AG-010	Agitator, Conditioning Tank 1Hp (2kW)	1	Each	30.00	30	$65.00	$2,000	$9,000	$9,000	$0	$0	$11,000
400	D	PP-010	Pump - Flotation Feed (30kW)	1	Each	60.00	60	$65.00	$4,000	$18,000	$18,000	$0	$0	$22,000
400	D	CN-002	Crane Overhead (20t)	1	Sum	200.00	200	$65.00	$13,000	$75,000	$75,000	$0	$0	$88,000
			Rougher											
400	D	FC-011	Flotation Cells 1 to 6 (5m3) - Rougher	1	Lot	480.00	480	$65.00	$31,000	$360,000	$360,000	$0	$0	$391,000
400	D	FC-012	Flotation Cells 7 to 12 (5m3) - Rougher	1	Lot	480.00	480	$65.00	$31,000	$360,000	$360,000	$0	$0	$391,000
400	H	PB-011	Pumpbox No. 1 - Rougher Tails	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-011	Pump No.1 - Rougher Tails (30kW)	1	Each	60.00	60	$65.00	$4,000	$18,000	$18,000	$0	$0	$22,000
400	H	PB-012	Pumpbox - Rougher Conc.	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-012	Slurry Pump - Rougher Conc. (1.5kW)	1	Each	40.00	40	$65.00	$3,000	$7,500	$8,000	$0	$0	$11,000
			Scavenger											
400	D	FC-020	Flotation Cells 1 to 6 (5m3) - Scavenger	1	Lot	480.00	480	$65.00	$31,000	$360,000	$360,000	$0	$0	$391,000
400	D	FC-021	Flotation Cells 7 to 12 (5m3) - Scavenger	1	Lot	480.00	480	$65.00	$31,000	$360,000	$360,000	$0	$0	$391,000
400	H	PB-020	Pumpbox - Scavenger Conc.	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-020	Slurry Pump - Scavenger Conc. (7.5kW)	1	Each	60.00	60	$65.00	$4,000	$10,000	$10,000	$0	$0	$14,000
400	H	PB-021	Pumpbox No. 2 - Scavenger Tails	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-021	Slurry Pump No. 2 - Scavenger Tails (45kW)	1	Each	60.00	60	$65.00	$4,000	$20,000	$20,000	$0	$0	$24,000
			Regrinding											
400	D	ML-030	Tower Mill - (17kW)	1	Allow	2,000.00	2,000	$65.00	$130,000	$320,000	$320,000	$0	$0	$450,000
			c/w Motor, Liners, Lube unit etc.											
400	H	PB-030	Pumpbox - Regrind Cyclone Feed	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-030	Slurry Pump - Regrind Cyclone Feed (7.5kW)	1	Each	40.00	40	$65.00	$3,000	$6,750	$7,000	$0	$0	$10,000
400	D	CY-030	Cyclone - D-6 Regrind Tower Mill	1	Lot	200.00	200	$65.00	$13,000	$63,000	$63,000	$0	$0	$76,000
400	H	PB-031	Pumpbox - Regrind Concentrate	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-031	Slurry Pump - Regrind Concentrate (1.5kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Cleaner 1											
400	D	FC-040	Column Cell (0.8m dia x 5.1m high)	1	Allow	80.00	80	$65.00	$5,000	$25,000	$25,000	$0	$0	$30,000
400	H	PB-040	Pumpbox - First Cleaner Tails	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-040	Pump No. 1 - First Cleaner Tails (2.2kW)	1	Each	40.00	40	$65.00	$3,000	$6,450	$6,000	$0	$0	$9,000
400	H	PB-041	Pumpbox No. 1 - Cleaner Conc.	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-041	Pump No. 1 - Cleaner Conc. (1.5kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Cleaner 2											
400	D	FC-050	Column Cell (0.8m dia x 5.1m high)	1	Allow	80.00	80	$65.00	$5,000	$25,000	$25,000	$0	$0	$30,000
400	H	PB-050	Pumpbox - Second Cleaner Tails	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-050	Pump No. 2 - Second Cleaner Tails (4kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
400	H	PB-051	Pumpbox No. 2 - Cleaner Conc.	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-051	Pump No. 2 - Cleaner Conc. (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			Cleaner 3											
400	D	FC-060	Column Cell (0.8m dia x 5.1m high)	1	Allow	80.00	80	$65.00	$5,000	$25,000	$25,000	$0	$0	$30,000
400	H	PB-060	Pumpbox - Third Cleaner Tails	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-060	Pump No. 3 - Third Cleaner Tails (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
400	H	PB-061	Pumpbox No. 3 - Cleaner Conc.	1	Allow	40.00	40	$65.00	$3,000	$11,000	$11,000	$0	$0	$14,000
400	D	PP-061	Pump No. 3 - Cleaner Conc. (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
			Piping											
400	G		Process Pipe (10% Mechanical)	1	Allow	581	581	$65.00	$38,000	$225,000	$225,000	$0	$0	$263,000
			Electrical/Instrumentation											
400	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	1,045.80	1,046	$65.00	$68,000	$405,000	$405,000	$0	$0	$473,000
450			**THICKENING - FILTRATION - DRYING**											
			Mechanical											
			Thickening											
450	H	TH-070	Thickener, Concentrate size 4.6m dia (5kW)	1	Lot	250.00	250	$65.00	$16,000	$185,000	$185,000	$0	$0	$201,000
450	D	PP-070	Pump - Conc. Thickener Underflow (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
450	D	PP-071	Pump - Conc. Thickener Overflow (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$3,000	$3,000	$0	$0	$6,000
			Filtration											
450	H	TK-073	Tank, Concentrate	1	Allow	200.00	200	$65.00	$13,000	$25,000	$25,000	$0	$0	$38,000
450	D	AG-073	Agitator, Concentrate Tank 4Hp (3kW)	1	Each	20.00	20	$65.00	$1,000	$14,000	$14,000	$0	$0	$15,000
450	D	PP-073	Pump - Filter Feed (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$6,415	$6,000	$0	$0	$9,000
450	D	FL-070	Disc Filter, Concentrate Dewatering (6m2)	1	Each	450.00	450	$65.00	$29,000	$591,000	$591,000	$0	$0	$620,000
450	D	PP-072	Pump - Filtrate Water (0.75kW)	1	Each	40.00	40	$65.00	$3,000	$3,000	$3,000	$0	$0	$6,000
450	H	HP-070	Hopper - Concentrate Cake	1	Allow	80.00	80	$65.00	$5,000	$7,000	$7,000	$0	$0	$12,000
450	D	CV-007	Conveyor - Mo Conc.	20	m	30.00	600	$65.00	$39,000	$1,000	$20,000	$0	$0	$59,000
450	D	SC-001	Scale - Concentrate	1	Each	60.00	60	$65.00	$4,000	$6,100	$6,000	$0	$0	$10,000
450	D		Rotary Dryer	1	Sum	200.00	200	$65.00	$13,000	$300,000	$300,000	$0	$0	$313,000
			Piping											
450	G		Process Pipe (10% Mechanical)	1	Allow	202	202	$65.00	$13,000	$116,600	$117,000	$0	$0	$130,000
			Electrical											
450	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	363.60	364	$65.00	$24,000	$209,880	$210,000	$0	$0	$234,000
480			**CONCENTRATE HANDLING & STORAGE**											
			Structural											
480	C		Storehouse - Dry Conc. Storaging	1	Allow	231.00	231	$65.00	$15,000	$20,000	$20,000	$0	$0	$35,000
			Mechanical											
480	D	BM-080	Bagging Machine - Conc. Packaging	1	Each	250.00	250	$65.00	$16,000	$35,000	$35,000	$0	$0	$51,000

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
500			**TAILINGS & WATER SERVICES**											
			Lower Dam Fill											
500	L		Compacted Till Core	130,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$1,300,000	$1,300,000
500	L		Filter Sand	7400	m3	0.00	0	$65.00	$0	$0	$0	$18	$133,000	$133,000
500	L		Sand and Gravel Shell	131,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,572,000	$1,572,000
			Upper Dam Fill											
500	L		Foundation Preparation	3	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$15,000	$15,000
500	L		Compacted Till Core	10,600	m3	0.00	0	$65.00	$0	$0	$0	$10	$106,000	$106,000
500	L		Filter Sand	1300	m3	0.00	0	$65.00	$0	$0	$0	$18	$23,000	$23,000
500	L		Sand and Gravel Shell	17,100	m3	0.00	0	$65.00	$0	$0	$0	$12	$205,000	$205,000
			Reservoir											
500	L		Clearing	45	Ha	0.00	0	$65.00	$0	$0	$0	$1,000	$45,000	$45,000
			Emergency Spillway											
500	L		Excavation (16m3/m)	8,000	m3	0.00	0	$65.00	$0	$0	$0	$6	$48,000	$48,000
500	L		Gabion Mat	500	m3	0.00	0	$65.00	$0	$0	$0	$58	$29,000	$29,000
500	L		Slush Grout	100	m3	0.00	0	$65.00	$0	$0	$0	$500	$50,000	$50,000
			Seepage Recovery / Sediment Control											
500	L		Compacted Till Core	200	m3	0.00	0	$65.00	$0	$0	$0	$10	$2,000	$2,000
500	L		Filter Sand	100	m3	0.00	0	$65.00	$0	$0	$0	$18	$2,000	$2,000
500	L		Sand and Gravel Shell	1,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$12,000	$12,000
500	L		Pump Station	1	Lot	0.00	0	$65.00	$0	$0	$0	$0	$0	$0
			Road Access											
500	L		Road Access	4	km	0.00	0	$65.00	$0	$0	$0	$10,000	$40,000	$40,000
			Diversion Ditches											
500	L		Excavate in Till	19,000	m3	0.00	0	$65.00	$0	$0	$0	$5	$95,000	$95,000
			Tailings Distribution and Reclaim											
500	L		Tailings Pipeline	2,850	m	0.00	0	$65.00	$0	$0	$0	$50	$143,000	$143,000
500	L		Tailings Pump	1	Lot	0.00	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
500	L		Reclaim Barge and Pump	1	Lot	0.00	0	$65.00	$0	$0	$0	$50,000	$50,000	$50,000
500	L		Reclaim Water Pipeline	1,100	m	0.00	0	$65.00	$0	$0	$0	$50	$55,000	$55,000
			Structural											
500	C		Thickener - Enclosure	1	Allow	800.00	800	$65.00	$52,000	$148,000	$148,000	$0	$0	$200,000
			Mechanical											
500	H	TH-080	Thickener, Tails size 130' dia (15kW)	1	Lot	800.00	800	$65.00	$52,000	$620,000	$620,000	$0	$0	$672,000
500	H	PB-080	Standpipe, Thickener Underflow	2	t	20.00	40	$65.00	$3,000	$5,520	$11,000	$0	$0	$14,000
500	D	PP-080	Pump - Final Tails (45kW)	1	Each	60.00	60	$65.00	$4,000	$15,000	$15,000	$0	$0	$19,000
500	H	PB-081	Standpipe, Thickener Overflow	2	t	20.00	40	$65.00	$3,000	$5,520	$11,000	$0	$0	$14,000
500	D	PP-081	Pump - Thickener Overflow (7.5kW)	1	Each	60.00	60	$65.00	$4,000	$10,000	$10,000	$0	$0	$14,000
			Piping											
500	G		Piping (10% Mechanical)	1	Allow	100	100	$65.00	$7,000	$66,700	$67,000	$0	$0	$74,000
			Electrical											
500	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	180.00	180	$65.00	$12,000	$120,060	$120,000	$0	$0	$132,000

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
550			**PROCESS & FRESH WATER SERVICES**											
			Mechanical											
550	D	PP-090	Pump - Water Reclaim, (30kW)	1	Each	60.00	60	$65.00	$4,000	$10,500	$11,000	$0	$0	$15,000
550	H	TK-090	Tank, Fresh Water (64m3)	1	Allow	80.00	80	$65.00	$5,000	$7,000	$7,000	$0	$0	$12,000
550	D	PP-091	Pump - Water Reclaim (30kW)	1	Each	60.00	60	$65.00	$4,000	$10,500	$11,000	$0	$0	$15,000
550	H	TK-091	Tank, Process Water (88m3)	1	Allow	100.00	100	$65.00	$7,000	$9,000	$9,000	$0	$0	$16,000
550	D	PP-092	Pump - Water Reclaim	1	Each	60.00	60	$65.00	$4,000	$10,500	$11,000	$0	$0	$15,000
550	D	PP-093	Booster Pump - Water Reclaim (185kW)	1	Each	100.00	100	$65.00	$7,000	$52,000	$52,000	$0	$0	$59,000
550	D	PP-094	Booster Pump - Water Reclaim (185kW)	1	Each	100.00	100	$65.00	$7,000	$52,000	$52,000	$0	$0	$59,000
550	D	PP-095	Pump - Fresh Water Distribution (5.5kW)	1	Each	40.00	40	$65.00	$3,000	$6,400	$6,000	$0	$0	$9,000
550	D	PP-096	Pump - Process Water Distribution (30kW)	1	Each	40.00	40	$65.00	$3,000	$6,500	$7,000	$0	$0	$10,000
			Piping											
550	G		Process Pipe (20% Mechanical)	1	Allow	128	128	$65.00	$8,000	$33,200	$33,000	$0	$0	$41,000
			Electrical											
550	E		Electrical and Instrumentation (18% of Mechanical)	1	Allow	115.20	115	$65.00	$7,000	$29,880	$30,000	$0	$0	$37,000
600			**FUEL STORAGE AND DISTRIBUTION**											
600	A		Earthworks	1	Sum	50.00	50	$65.00	$3,000	$2,000.00	$2,000	$10	$0	$5,000
600	A		HDPE Liner - Fuel Storage	1	Allow	20.00	20	$65.00	$1,000	$2,000.00	$2,000	$0	$0	$3,000
600	B		Concrete	1	Sum	85.00	85	$65.00	$6,000	$23,000.00	$23,000	$10	$0	$29,000
			Structural											
600	D		Fuel Tanks (2 x 70,000 liter capacity) - Fuel Storage	1	Sum	500	500	$65.00	$33,000	$29,000	$29,000	$0	$0	$62,000
600	C		Trailer Lubricant Storage (Allowance)	1	Sum	100	100	$65.00	$7,000	$20,000	$20,000	$0	$0	$27,000
			Mechanical											
600	D		Pumps, Fuel Pump - Metering	1	Sum	100	100	$65.00	$7,000	$4,000	$4,000	$0	$0	$11,000
600	C		Metering Equipment	1	Sum	200	200	$65.00	$13,000	$9,000	$9,000	$0	$0	$22,000
			Piping											
600	G		Pipe - Pipe c/w Fittings - Fuel Storage	1	Allow	40.00	40	$65.00	$3,000	$3,000	$3,000	$0	$0	$6,000
			Electrical & Instrumentation											
600	E		Electrical	1	Sum	100.00	100	$65.00	$7,000	$15,000	$15,000	$0	$0	$22,000
600	F		Instrumentation (18% Area Electrical cost)	1	Allow	18.00	18	$65.00	$1,000	$2,700	$3,000	$0	$0	$4,000
700			**MINING**											
700	K		Mining - Pre-production & development - Labour	1	Sum	0.00	0	$65.00	$0	$0	$0	$15,541,000	$15,541,000	$15,541,000
700	K		Mining - Pre-production & development - Supervision	1	Sum	0.00	0	$65.00	$0	$0	$0	$6,853,000	$6,853,000	$6,853,000
700	K		Mining - Supplies	1	Sum	0.00	0	$65.00	$0	$0	$0	$8,296,000	$8,296,000	$8,296,000
700	K		Mining - Contractor Drill Blast Longhole	1	Sum	0.00	0	$65.00	$0	$0	$0	$156,000	$156,000	$156,000
700	K		Contractor - Mob/De-mob Operating Costs, Services, Power	1	Sum	0.00	0	$65.00	$0	$0	$0	$21,716,000	$21,716,000	$21,716,000
700	K		Underground Mobile, Portable Equipment, including:	1	Sum	0.00	0	$65.00	$0	$0	$0	$3,338,000	$3,338,000	$3,338,000
			- Jumbo Drill (4) - 2 boom like Axera D06 226XL											
			- Scissor Deck (5)											
			- LHD incl. Remote capability (5)											
			- Truck (5)											
			- ANFO Loaders (10)											
			- Jacklegs (15)											
			- Stopers (15)											
			- Mine Rescue Equipment (8)											
			- Jacklegs (3)											

HATCH

Project No.: H-318273
Client: ROCA MINES INC.

Area	Commodity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			- Stopers (3)											
			- Mine Rescue Equipment (5)											
			- Pick-up Truck surface (4)											
			- Van surface (4)											
			- Bolter MacLean 946 (5)											
			- Blasting Truck (1)											
			- Service Vehicles for Technical Staff (3)											
			- Service Vehicles for Miners (5)											
			- Service Vehicles for Mechanics (5)											
			- Grader (2)											
			- Hiab (5)											
			- Shotcrete Machine (2)											
700	K		Underground Equipment, including:	1	Sum	0.00	0	$65.00	$0		$0	$11,299,000	$11,299,000	$11,299,000
			- Fan (5 x 150hp)											
			- Rigid Vent Ducting (1,450m)											
			- Shop Equipment											
			- Fan (1 x 400hp)											
			- Fan Booster (10 x 75hp)											
			- Flygt Pumps (9)											
			- Refuge Station (1)											
			- Transformer (6)											
700	K		Backfill, including Cement, Bulkheads and Backfill Lines	1	Sum	0.00	0	$65.00	$0	$0	$0	$467,000	$467,000	$467,000
700	K		Mining - Diamond Drilling	1	Sum	0.00	0	$65.00	$0	$0	$0	$1,086,000	$1,086,000	$1,086,000
700	D		Compressor, Rotary Screw Electric Air-Cooled (350hp)	1	Sum	400.00	400	$65.00	$26,000	$250,000	$250,000	$0	$0	$276,000
700	G		Piping - Air Service Pipe (20% of Equipment)	1	Allow	24.00	24	$65.00	$2,000	$50,000	$50,000	$0	$0	$52,000
750			**EXPLOSIVE PLANT**											
750	K		Explosive Plant											**NOT INCLUDED**
800			**MOBILE EQUIPMENT**											
800	J		Allowance for Loader (1); Bobcat (1); Truck (1)	1	Allow	0.00	0	$65.00	$0	$0	$0	$225,000	$225,000	$225,000
			TOTAL PROJECT DIRECT COST (CANADIAN DOLLARS)				**105,486**		**$6,850,000**		**$17,507,000**		**$76,642,000**	**$100,999,000**

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			INDIRECT COSTS											
			ENGINEERING & PROCUREMENT											
	S		Construction Indirects (8% of Direct Costs less Mining)	1	Allow	1	1	$0	$0	$0	$0	$2,553,520	$2,554,000	$2,554,000
			CONSTRUCTION MANAGEMENT											
	N		Construction Indirects (8% of Direct Costs less Mining)	1	Allow	1	1	$0	$0	$0	$0	$2,553,520	$2,554,000	$2,554,000
			CONTRACTOR INDIRECT COSTS											
	R		Construction Indirects (6% of Direct Costs less Mining)	1	Allow	1	1	$0	$0	$0	$0	$1,915,140	$1,915,000	$1,915,000
	R		Construction Indirects - Mining											**INCLUDED IN MINING COST**
	R		Mining - Board and Lodging at local hotel	1	Sum	0	0	$0	$0	$0	$0	$507,000	$507,000	$507,000
			FREIGHT											
	T		Freight 5% of (Matl, Spares, First Fill & 1/2 of Other Costs)	1	Sum	0	0	$0	$0	$0	$0	$2,822,450	$2,822,000	$2,822,000
			FIRST FILL (Grinding Balls)											
	U		1st Fill - Grinding Balls (SAG mills)	1	Allow	0	0	$0	$0	$26,000	$26,000	$0	$0	$26,000
	U		1st Fill - Grinding Balls (BALL mills)	1	Allow	0	0	$0	$0	$68,000	$68,000	$0	$0	$68,000
			INITIAL INVENTORY & SPARE PARTS											
	V		Initial Inventory and Spare Parts (2.5% of material cost)	1	Sum	0	0	$0	$0	$0	$0	$437,675	$438,000	$438,000
			VENDOR REPS											
	W		Vendor Reps for Erection Supervision (1.5% Capital Equipment)	1	Sum	0	0	$0	$0	$0	$0	$137,070	$137,000	$137,000
	W		Vendor Reps for Start-up (0.5% Capital Equipment)	1	Sum	0	0	$0	$0	$0	$0	$45,690	$46,000	$46,000
			PRE-OP CHECK-OUT/TEST											
	X		(2) Commissioning Engineers & 6 Trades Men x 1 month											**NOT INCLUDED**
	X		COMMISSIONING & RAMP-UP (Owners Cost)											**NOT INCLUDED**
			OWNERS COST (Excluded)											
	Y		Snow Clearing at Site (By Owner)											**NOT INCLUDED**
	Y		Snow Clearing - Access Road to Site (By Owner)											**NOT INCLUDED**
	Y		Watering Road & Sites - (Same as Above) (By Owner)											**NOT INCLUDED**
			TOTAL INDIRECTS (CANADIAN DOLLARS)				**3**		**$0**		**$94,000**		**$10,973,000**	**$11,067,000**

HATCH

Project No.: H-318273
Client: ROCA MINES INC.

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 2 - 2,500TPD
PROCESS AND INFRASTRUCTURE

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			SUSTAINING CAPITAL											
			TAILINGS - YEAR 2											
			Lower Dam Fill											
			Compacted Till Core	34,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$340,000	$340,000
			Filter Sand	4,400	m3	0.00	0	$65.00	$0	$0	$0	$18	$79,000	$79,000
			Sand and Gravel Shell	94,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,128,000	$1,128,000
			Upper Dam Fill											
			Foundation Preparation	3	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$15,000	$15,000
			Compacted Till Core	2,200	m3	0.00	0	$65.00	$0	$0	$0	$10	$22,000	$22,000
			Filter Sand	700	m3	0.00	0	$65.00	$0	$0	$0	$18	$13,000	$13,000
			Sand and Gravel Shell	12,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$144,000	$144,000
			Emergency Spillway											
			Excavation (16m3/m)	8,000	m3	0.00	0	$65.00	$0	$0	$0	$6	$48,000	$48,000
			Gabion Mat	500	m3	0.00	0	$65.00	$0	$0	$0	$58	$29,000	$29,000
			Slush Grout	100	m3	0.00	0	$65.00	$0	$0	$0	$500	$50,000	$50,000
			Rockfill	30	m3	0.00	0	$65.00	$0	$0	$0	$30	$1,000	$1,000
			Gabion Basket for Cascade Spill (1m)	1	m3	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - YEAR 3											
			Lower Dam Fill											
			Compacted Till Core	31,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$310,000	$310,000
			Filter Sand	4,500	m3	0.00	0	$65.00	$0	$0	$0	$18	$81,000	$81,000
			Sand and Gravel Shell	85,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,020,000	$1,020,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	2,300	m3	0.00	0	$65.00	$0	$0	$0	$10	$23,000	$23,000
			Filter Sand	700	m3	0.00	0	$65.00	$0	$0	$0	$18	$13,000	$13,000
			Sand and Gravel Shell	14,500	m3	0.00	0	$65.00	$0	$0	$0	$12	$174,000	$174,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - YEAR 4											
			Lower Dam Fill											
			Compacted Till Core	27,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$270,000	$270,000
			Filter Sand	4,100	m3	0.00	0	$65.00	$0	$0	$0	$18	$74,000	$74,000
			Sand and Gravel Shell	81,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$972,000	$972,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	2,200	m3	0.00	0	$65.00	$0	$0	$0	$10	$22,000	$22,000
			Filter Sand	700	m3	0.00	0	$65.00	$0	$0	$0	$18	$13,000	$13,000
			Sand and Gravel Shell	15,800	m3	0.00	0	$65.00	$0	$0	$0	$12	$190,000	$190,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000

Project No.: H-318273
Client: ROCA MINES INC.

MAX MOLYBDENUM PROJECT
SCOPING STUDY - CASE 2 - 2,500TPD
PROCESS AND INFRASTRUCTURE

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			TAILINGS - YEAR 5											
			Lower Dam Fill											
			Compacted Till Core	22,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$220,000	$220,000
			Filter Sand	4,300	m3	0.00	0	$65.00	$0	$0	$0	$18	$77,000	$77,000
			Sand and Gravel Shell	115,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,380,000	$1,380,000
			Upper Dam Fill											
			Foundation Preparation	3	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$15,000	$15,000
			Compacted Till Core	2,400	m3	0.00	0	$65.00	$0	$0	$0	$10	$24,000	$24,000
			Filter Sand	800	m3	0.00	0	$65.00	$0	$0	$0	$18	$14,000	$14,000
			Sand and Gravel Shell	19,400	m3	0.00	0	$65.00	$0	$0	$0	$12	$233,000	$233,000
			Emergency Spillway											
			Excavation (16m3/m)	8,000	m3	0.00	0	$65.00	$0	$0	$0	$6	$48,000	$48,000
			Gabion Mat	500	m3	0.00	0	$65.00	$0	$0	$0	$58	$29,000	$29,000
			Slush Grout	100	m3	0.00	0	$65.00	$0	$0	$0	$500	$50,000	$50,000
			Rockfill	30	m3	0.00	0	$65.00	$0	$0	$0	$30	$1,000	$1,000
			Gabion Basket for Cascade Spill (1m)	1	m3	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - YEAR 6											
			Lower Dam Fill											
			Compacted Till Core	22,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$220,000	$220,000
			Filter Sand	4,400	m3	0.00	0	$65.00	$0	$0	$0	$18	$79,000	$79,000
			Sand and Gravel Shell	119,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,428,000	$1,428,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	2,600	m3	0.00	0	$65.00	$0	$0	$0	$10	$26,000	$26,000
			Filter Sand	800	m3	0.00	0	$65.00	$0	$0	$0	$18	$14,000	$14,000
			Sand and Gravel Shell	23,400	m3	0.00	0	$65.00	$0	$0	$0	$12	$281,000	$281,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - YEAR 7											
			Lower Dam Fill											
			Compacted Till Core	13,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$130,000	$130,000
			Filter Sand	3,700	m3	0.00	0	$65.00	$0	$0	$0	$18	$67,000	$67,000
			Sand and Gravel Shell	136,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,632,000	$1,632,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	2,400	m3	0.00	0	$65.00	$0	$0	$0	$10	$24,000	$24,000
			Filter Sand	700	m3	0.00	0	$65.00	$0	$0	$0	$18	$13,000	$13,000
			Sand and Gravel Shell	22,700	m3	0.00	0	$65.00	$0	$0	$0	$12	$272,000	$272,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			TAILINGS - YEAR 8											
			Lower Dam Fill											
			Compacted Till Core	13,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$130,000	$130,000
			Filter Sand	3,800	m3	0.00	0	$65.00	$0	$0	$0	$18	$68,000	$68,000
			Sand and Gravel Shell	138,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,656,000	$1,656,000
			Upper Dam Fill											
			Foundation Preparation	3	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$15,000	$15,000
			Compacted Till Core	2,500	m3	0.00	0	$65.00	$0	$0	$0	$10	$25,000	$25,000
			Filter Sand	800	m3	0.00	0	$65.00	$0	$0	$0	$18	$14,000	$14,000
			Sand and Gravel Shell	25,900	m3	0.00	0	$65.00	$0	$0	$0	$12	$311,000	$311,000
			Emergency Spillway											
			Excavation (16m3/m)	8,000	m3	0.00	0	$65.00	$0	$0	$0	$6	$48,000	$48,000
			Gabion Mat	500	m3	0.00	0	$65.00	$0	$0	$0	$58	$29,000	$29,000
			Slush Grout	100	m3	0.00	0	$65.00	$0	$0	$0	$500	$50,000	$50,000
			Rockfill	30	m3	0.00	0	$65.00	$0	$0	$0	$30	$1,000	$1,000
			Gabion Basket for Cascade Spill (1m)	1	m3	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - YEAR 9											
			Lower Dam Fill											
			Compacted Till Core	10,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$100,000	$100,000
			Filter Sand	3,100	m3	0.00	0	$65.00	$0	$0	$0	$18	$56,000	$56,000
			Sand and Gravel Shell	112,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,344,000	$1,344,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	2,200	m3	0.00	0	$65.00	$0	$0	$0	$10	$22,000	$22,000
			Filter Sand	700	m3	0.00	0	$65.00	$0	$0	$0	$18	$13,000	$13,000
			Sand and Gravel Shell	23,100	m3	0.00	0	$65.00	$0	$0	$0	$12	$277,000	$277,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - YEAR 10											
			Lower Dam Fill											
			Compacted Till Core	11,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$110,000	$110,000
			Filter Sand	3,200	m3	0.00	0	$65.00	$0	$0	$0	$18	$58,000	$58,000
			Sand and Gravel Shell	114,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,368,000	$1,368,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	2,300	m3	0.00	0	$65.00	$0	$0	$0	$10	$23,000	$23,000
			Filter Sand	700	m3	0.00	0	$65.00	$0	$0	$0	$18	$13,000	$13,000
			Sand and Gravel Shell	25,400	m3	0.00	0	$65.00	$0	$0	$0	$12	$305,000	$305,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000

Area	Commodity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			TAILINGS - YEAR 11											
			Lower Dam Fill											
			Compacted Till Core	6,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$60,000	$60,000
			Filter Sand	2,700	m3	0.00	0	$65.00	$0	$0	$0	$18	$49,000	$49,000
			Sand and Gravel Shell	143,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,716,000	$1,716,000
			Upper Dam Fill											
			Foundation Preparation	3	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$15,000	$15,000
			Compacted Till Core	2,400	m3	0.00	0	$65.00	$0	$0	$0	$10	$24,000	$24,000
			Filter Sand	700	m3	0.00	0	$65.00	$0	$0	$0	$18	$13,000	$13,000
			Sand and Gravel Shell	27,800	m3	0.00	0	$65.00	$0	$0	$0	$12	$334,000	$334,000
			Emergency Spillway											
			Excavation (16m3/m)	8,000	m3	0.00	0	$65.00	$0	$0	$0	$6	$48,000	$48,000
			Gabion Mat	500	m3	0.00	0	$65.00	$0	$0	$0	$58	$29,000	$29,000
			Slush Grout	100	m3	0.00	0	$65.00	$0	$0	$0	$500	$50,000	$50,000
			Rockfill	30	m3	0.00	0	$65.00	$0	$0	$0	$30	$1,000	$1,000
			Gabion Basket for Cascade Spill (1m)	1	m3	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - YEAR 12											
			Lower Dam Fill											
			Compacted Till Core	6,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$60,000	$60,000
			Filter Sand	2,700	m3	0.00	0	$65.00	$0	$0	$0	$18	$49,000	$49,000
			Sand and Gravel Shell	144,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,728,000	$1,728,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	2,500	m3	0.00	0	$65.00	$0	$0	$0	$10	$25,000	$25,000
			Filter Sand	800	m3	0.00	0	$65.00	$0	$0	$0	$18	$14,000	$14,000
			Sand and Gravel Shell	30,400	m3	0.00	0	$65.00	$0	$0	$0	$12	$365,000	$365,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000

Area	Com-mod-ity	Equipment No.	Description	Qty	UOM	Labour Unit MH	Labour MH	Labour Rate	Labour Cost	Material Unit Cost	Material Cost	Other Unit Cost	Other Cost	Total Cost CAD
			Detailed Costs											
			TAILINGS - YEAR 13											
			Lower Dam Fill											
			Compacted Till Core	5,000	m3	0.00	0	$65.00	$0	$0	$0	$10	$50,000	$50,000
			Filter Sand	2,100	m3	0.00	0	$65.00	$0	$0	$0	$18	$38,000	$38,000
			Sand and Gravel Shell	109,000	m3	0.00	0	$65.00	$0	$0	$0	$12	$1,308,000	$1,308,000
			Upper Dam Fill											
			Foundation Preparation	0	Ha	0.00	0	$65.00	$0	$0	$0	$5,000	$0	$0
			Compacted Till Core	1,900	m3	0.00	0	$65.00	$0	$0	$0	$10	$19,000	$19,000
			Filter Sand	600	m3	0.00	0	$65.00	$0	$0	$0	$18	$11,000	$11,000
			Sand and Gravel Shell	24,400	m3	0.00	0	$65.00	$0	$0	$0	$12	$293,000	$293,000
			Tailings Distribution and Reclaim											
			Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	1	Lot	0.00	0	$65.00	$0	$0	$0	$10,000	$10,000	$10,000
			TAILINGS - END OF MINE											
			Closure / Completion											
			Granular Cover	40,000	m3	0.00	0	$65.00	$0	$0	$0	$8	$300,000	$300,000
			Organic Cover	40,000	m3	0.00	0	$65.00	$0	$0	$0	$5	$180,000	$180,000
			Spillways	1	Lot	0.00	0	$65.00	$0	$0	$0	$100,000	$100,000	$100,000
			TOTAL - SUSTAINING CAPITAL						**$0**		**$0**		**$24,383,000**	**$24,383,000**

Appendix B

Operating Cost Estimate

Case 1 – 500 tpd

Case 2 – 2,500 tpd

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

Average daily throughput	**500**	tpd
Annual Throughput	182,500	tpa
Average availability	95%	

DESCRIPTION		**ANNUAL COST CAD$**	**UNIT COST CAD$/t ore**	**DISTRIBUTION**
G&A	manpower	475,692	2.61	
	fixed expenses	665,000	3.64	
	sub total	*1,140,692*	*6.25*	24%
Process	manpower	1,483,909	8.13	
	consumables	239,329	1.31	
	power	1,836,325	10.06	
	sub total	*3,559,563*	*19.50*	76%
Transport	Supplies	8,438	0.05	
	Concentrate	-	-	
	sub total	*8,438*	*0.05*	0%
TOTAL MINESITE		**4,708,694**	**25.80**	**100%**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

G&A MANPOWER
All Costs in CAD Dollars

Average daily throughput	**500**	tpd
Annual Throughput	182,500	tpa
Average availability	95%	

G&A POSITION POSITION	#	REGULAR SALARY CAD$	UNIT SALARY	BENEFITS 40%	ANNUAL SALARY	TOTAL ANNUAL SALARY
ADMINISTRATON						
General Manager	1	150,000	150,000	60,000	210,000	210,000
	1					210,000
MATERIALS MANAGEMENT						
Buyer/Warehouse	1	65,000	65,000	26,000	91,000	91,000
	1					91,000
SAFETY						
Safety Supervisor	0.5	75,000	75,000	30,000	105,000	52,500
Security	2	47,850	47,850	19,140	66,990	122,192
	2					174,692
TOTAL	**4**					**475,692**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

G&A EXPENSES
All Costs in CAD Dollars

Average daily throughput	**500**	tpd
Annual Throughput	182,500	tpa
Average availability	95%	

Cost Area	Annual Cost (US$)	Unit Cost (US$/t ore)
Property Taxes	-	0.00
Business Travel	50,000	0.27
Road Maintenance, incl snowclearing	100,000	0.55
Potable water supply	15,000	0.08
Small Vehicles	25,000	0.14
Mobile Equipment Rentals	50,000	0.27
Crew Transport Costs	50,000	0.27
Corporate Office Expenses	100,000	0.55
Safety Training Supplies	20,000	0.11
First Aid Supplies	10,000	0.05
Janitorial services	10,000	0.05
Outside laboratories	25,000	0.14
Communications	10,000	0.05
Consultants	50,000	0.27
Regulatory compliance	25,000	0.14
Legal fees/Insurance	125,000	0.68
Recruiting/Relocation	-	0.00
	665,000	**3.64**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

PROCESS MANPOWER
All Costs in CAD Dollars

Average daily throughput	**500**	tpd
Annual Throughput	182,500	tpa
Average availability	95%	

MILL STAFF POSITION	TOTAL #	MEN AT SITE	UNIT SALARY	BENEFITS 40%	ANNUAL SALARY	TOTAL SALARY
MILL OPS						
Mill Ops Superintendent	1	1	90,000	36,000	126,000	126,000
Mill Clerk	1	1	45,500	18,200	63,700	63,700
	2					189,700
MILL MAINTENANCE						
Mill Mtce General Foreman	1	1	82,400	32,960	115,360	115,360
Planner	1	1	64,000	25,600	89,600	89,600
	2					204,960
METALLURGY						
Metallurgist (Technical Advisor)	1	1	69,000	27,600	96,600	96,600
	1					96,600
ASSAY LAB						
Senior Assayer	1	1	80,000	32,000	112,000	112,000
Assayer Assistant	1	1	40,000	16,000	56,000	56,000
	2					168,000
SUB-TOTAL MILL STAFF	7	7				**659,260**

MILL HOURLY POSITION	TOTAL #	MEN AT SITE	HOURLY RATE	REGULAR	BENEFITS 43%	ANNUAL WAGES	TOTAL WAGES
Maintenance							
Millwright	1	1	28.00	58,240	23,296	81,536	81,536
Lubeman/Maint Helper	1	1	26.00	54,080	21,632	75,712	75,712
	2	2					**157,248**
Electrical							
Electrician	1	1	28.00	58,240	23,296	81,536	81,536
	1	**1**					**81,536**
Operations							
Crushing Operator	1	1	23.00	47,840	19,136	66,976	66,976
Grinding/Flotation Operator	3	1	26.00	54,080	21,632	75,712	227,136
Grinding/Flotation Assistant	3	1	21.00	43,680	17,472	61,152	183,456
Mill Helper	1	1	19.00	39,520	15,808	55,328	55,328
Labourer	1	1	18.19	37,835	15,134	52,969	52,969
	9	**5**					**585,865**
SUB-TOTAL MILL HOURLY	**12**	**8**					**824,649**

TOTAL MILL MANPOWER	**19**	**15**	**1,483,909**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

PROCESS CONSUMABLES
All Costs in CAD Dollars

Daily Throughput	**500** tpd		Daily tonnes milled	500
Annual Throughput	182,500 tpa		Mill availability	95%
			Annual operating days	365

PROCESS PLANT - Grinding media, reagents and operating & maintenance supplies
Basis : Industry benchmark consumptions plus Vendor Quotes

SUPPLIES	Consumption (kg/t ore)	Unit Cost ($/kg)	Total Cost ($/yr)	Unit Cost ($/t ore)
Grinding				
Ball Mill Liners	0.024	$2.08	$8,976	$0.049
Ball Mill Balls, 64 mm	0.300	$0.75	$41,063	$0.225
Regrind Mill Balls, 25 mm	0.100	$1.00	$18,250	$0.100
Sub-Total Grinding			**$68,289**	**$0.374**
Reagents				
Quicklime	0.150	$0.25	$6,844	$0.038
Collector	0.025	$2.65	$12,091	$0.066
MIBC/DF250	0.025	$2.00	$9,125	$0.050
Fuel Oil	0.300	$0.30	$16,425	$0.090
Flocculant	0.0011	$7.75	$1,556	$0.009
Sub-Total Reagents			**$46,040**	**$0.252**
Supplies,maintenance			$50,000	$0.27
Supplies, operating			$25,000	$0.14
Contracts,other			$50,000	$0.27
TOTAL			**$239,329**	**$1.31**

TRANSPORT	Unit	Qty	Unit Cost	Total Cost ($/yr)	Unit Cost ($/t ore)
Supplies	mt	169	$50	$8,438	$0.05
Concentrate Production	tpd	5			
	dmt/Q	468			
Concentrate Freight to Smelter		included in sale price of concentrate			
TOTAL FREIGHT				**$8,438**	**$0.05**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

ELECTRICAL POWER COST
All Costs in CAD Dollars

Daily Throughput	500 tpd	Mill Availability	95%
Annual Throughput	**182,500** tpa	Annual operating days	365

POWER COSTS

Area		Installed kW	Demand kW	Operating hours/yr	Annual kWh Consumption	Diesel (litres) Consumption	Annual Cost CAD$
Mill							
	Crushing & Grinding	616	493	8760	4,316,928	1,168,110	$934,488
	Flotation	152	122	8760	1,065,216	288,235	$230,588
	Thickening/Dewatering	11	9	8760	77,088	20,859	$16,687
	Tailings	42	34	8760	294,336	79,644	$63,715
	Reagents	43	34	8760	301,344	81,540	$65,232
Mine**	Overall Power	453	362	7300	2,645,520	n/a	n/a
Surface Facilities							
	Water Supply	0	0	8760	0	0	$0
	Water Treatment	0	0	8760	0	0	$0
	Admin Office/Lab	100	80	8760	700,800	189,628	$151,703
	Warehouse/Truckshop	150	120	8760	1,051,200	284,442	$227,554
	Lighting/Heating	50	40	8760	350,400	94,814	$75,851
	Security	30	24	8760	210,240	56,888	$45,511
Generator Sets	Lubricants					13,585	$24,996
	Total	1,647	1,318	103,660	11,013,072	2,264,161	$1,836,325

** Mine power costs are included in the mining operating cost summary

Diesel Fuel Cost per liter
Assumed average cost **0.80**

Lubricant Cost (CAD$/liter) 1.84

Unit power cost (CAD$/kWh) 0.17

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

Average daily throughput	**2,500**	tpd
Annual Throughput	912,500	tpa
Average availability	95%	

DESCRIPTION		**ANNUAL COST CAD$**	**UNIT COST CAD$/t ore**	**DISTRIBUTION**
G&A	manpower	903,980	0.99	
	fixed expenses	1,340,000	1.47	
	sub total	*2,243,980*	*2.46*	21%
Process	manpower	1,689,716	1.85	
	consumables	1,233,713	1.35	
	power	5,258,288	5.76	
	sub total	*8,181,717*	*8.97*	78%
Transport	Supplies	42,192	0.05	
	Concentrate	-	-	
	sub total	*42,192*	*0.05*	0%
TOTAL MINESITE		**10,467,888**	**11.47**	**100%**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

G&A MANPOWER
All Costs in CAD Dollars

Average daily throughput	**2,500**	tpd
Annual Throughput	912,500	tpa
Average availability	95%	

G&A POSITION POSITION	**#**	**REGULAR SALARY**	**UNIT SALARY**	**BENEFITS 40%**	**ANNUAL SALARY**	**TOTAL ANNUAL SALARY**
		CAD$				
ADMINISTRATON						
General Manager	1	150,000	150,000	60,000	210,000	210,000
Accountant	1	75,000	75,000	30,000	105,000	105,000
General Clerk	1	45,500	45,500	18,200	63,700	63,700
	3					378,700
INFORMATION SYSTEMS						
I.S. Manager	-	71,500	71,500	28,600	100,100	-
	-					-
MATERIALS MANAGEMENT						
Buyer	1	65,000	65,000	26,000	91,000	91,000
Warehouse Foreman	-	60,000	60,000	24,000	84,000	-
	1					91,000
HUMAN RESOURCES						
HR Recruiter	-	51,500	51,500	20,600	72,100	-
	-					-
SAFETY						
Safety Supervisor	2	75,000	75,000	30,000	105,000	210,000
Security	1	47,850	47,850	19,140	66,990	66,990
	3					276,990
SITE SERVICES						
Supervisor	1	64,500	64,500	25,800	90,300	90,300
	1					90,300
ENVIRONMENTAL						
Superintendent	-	85,000	85,000	34,000	119,000	-
Technicians	1	47,850	47,850	19,140	66,990	66,990
	1					66,990
TOTAL	**9**					**903,980**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

G&A EXPENSES
All Costs in CAD Dollars

Average daily throughput	**2,500**	tpd
Annual Throughput	912,500	tpa
Average availability	95%	

Cost Area	Annual Cost (US$)	Unit Cost (US$/t ore)
Property Taxes	-	0.00
Business Travel	50,000	0.05
Road Maintenance, incl snowclearing	100,000	0.11
Potable water supply	50,000	0.05
Camp costs	-	0.00
Small Vehicles	75,000	0.08
Mobile Equipment Rentals	80,000	0.09
Crew Transport Costs	125,000	0.14
Air Transport	-	0.00
Corporate Office Expenses	100,000	0.11
Safety Training Supplies	50,000	0.05
First Aid Supplies	30,000	0.03
Janitorial services	30,000	0.03
Outside laboratories	50,000	0.05
Communications	20,000	0.02
Consultants	50,000	0.05
Technical Consultant	80,000	0.09
Regulatory compliance	100,000	0.11
Legal fees/Insurance	250,000	0.27
Recruiting/Relocation	100,000	0.11
	1,340,000	**1.47**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

PROCESS MANPOWER
All Costs in CAD Dollars

Average daily throughput	**2,500**	tpd
Annual Throughput	912,500	tpa
Average availability	95%	

MILL STAFF POSITION	TOTAL #	MEN AT SITE	UNIT SALARY	BENEFITS 40%	ANNUAL SALARY	TOTAL SALARY
MILL OPS						
Mill Superintendent	1	1	90,000	36,000	126,000	126,000
Mills Ops Foreman	3	1	70,000	28,000	98,000	294,000
Mill Clerk	1	1	45,500	18,200	63,700	63,700
	5					483,700
MILL MAINTENANCE						
Mill Mtce General Foreman	1	1	82,400	32,960	115,360	115,360
Electrical General Foreman	1	1	82,400	32,960	115,360	115,360
Mill Mtce Foreman	1	1	66,500	26,600	93,100	93,100
Planner	1	1	64,000	25,600	89,600	89,600
	4					413,420
METALLURGY						
Chief Metallurgist	1	1	80,000	32,000	112,000	112,000
Metallurgist	1	1	69,000	27,600	96,600	96,600
	2					208,600
ASSAY LAB						
Senior Assayer	1	1	80,000	32,000	112,000	112,000
Assayers	2	1	48,000	19,200	67,200	134,400
	3					246,400
SUB-TOTAL MILL STAFF	14	11				**1,352,120**

MILL HOURLY POSITION	TOTAL #	MEN AT SITE	HOURLY RATE	REGULAR	BENEFITS 43%	ANNUAL WAGES	TOTAL WAGES
MATERIALS MANAGEMENT							
Warehouse Person	1	1	23.79	51,957	20,783	72,740	72,740
Warehouse Labourer	-	0	19.29	42,129	16,852	58,981	-
TOTAL MATERIALS MANAGEME	**1**	**1**					**72,740**
SITE SERVICES							
Carpenter - 1	1	1	26.79	58,509	23,404	81,913	81,913
Electrician - 1	1	1	26.79	58,509	23,404	81,913	81,913
Plumber/ Pipefitter - 1	1	1	26.79	58,509	23,404	81,913	81,913
TOTAL SITE SERVICES	**3**	3					**245,739**
Maintenance							
Millwright - 1	3	1	28.00	61,152	24,461	85,613	256,838
Millwright - Apprentice	-	1	21.39	46,716	18,686	65,402	-
Welder	-	1	26.79	58,509	23,404	81,913	-
Lubeman/Maint Helper	2	1	20.69	45,187	18,075	63,262	126,523
Maintenance Helper	1	1	20.69	45,187	18,075	63,262	63,262
	6	5					**446,624**
Electrical							
Electrician - 1	-	1	28.00	61,152	24,461	85,613	-
Electrician - Apprentice	-	1	21.39	46,716	18,686	65,402	-
Inst.Mechanic - 1	-	1	26.79	58,509	23,404	81,913	-
Inst Mechanic - Apprentice	-	1	22.79	49,773	19,909	69,683	-
	-	**4**					-
Operations							
Control Room Operator	1	1	25.79	56,325	22,530	78,856	78,856
Flotation/Grinding Operator	4	1	24.59	53,705	21,482	75,186	300,746
Crusher/Dewatering/Utility Operator	4	1	22.69	49,555	19,822	69,377	277,508
Sample Bucker	4	1	20.39	44,532	17,813	62,344	249,378
Mill Helper	4	1	19.99	43,658	17,463	61,121	244,486
Labourer	2	1	18.19	39,727	15,891	55,618	111,235
	19	**6**					**1,262,208**
SUB-TOTAL MILL HOURLY	**29**	**19**					**2,027,311**

TOTAL MILL MANPOWER	**43**	**30**	**3,379,431**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

PROCESS CONSUMABLES
All Costs in CAD Dollars

Daily Throughput	**2,500**	tpd	Daily tonnes milled	2,500
Annual Throughput	912,500	tpa	Mill availability	95%
			Annual operating days	365

PROCESS PLANT - Grinding media, reagents and operating & maintenance supplies
Basis : Industry benchmark consumptions plus Vendor Quotes

SUPPLIES	Consumption (kg/t ore)	Unit Cost ($/kg)	Total Cost ($/yr)	Unit Cost ($/t ore)
Grinding				
SAG Mill Liners	0.024	$2.08	$44,881	$0.049
SAG Mill Balls	0.500	$0.75	$342,188	$0.375
Ball Mill Liners	0.024	$2.08	$44,881	$0.049
Ball Mill Balls, 64 mm	0.300	$0.75	$205,313	$0.225
Regrind Mill Balls, 25 mm	0.100	$1.00	$91,250	$0.100
Sub-Total Grinding			**$728,512**	**$0.798**
Reagents				
Quicklime	0.150	$0.25	$34,219	$0.038
Collector	0.025	$2.65	$60,453	$0.066
MIBC/DF250	0.025	$2.00	$45,625	$0.050
Fuel Oil	0.300	$0.30	$82,125	$0.090
Flocculant	0.0011	$7.75	$7,779	$0.009
Sub-Total Reagents			**$230,201**	**$0.252**
Supplies,maintenance			$100,000	$0.11
Supplies, operating			$75,000	$0.08
Contracts,other			$100,000	$0.11
TOTAL			**$1,233,713**	**$1.35**

TRANSPORT	Unit	Qty	Unit Cost	Total Cost ($/yr)	Unit Cost ($/t ore)
Supplies	mt	844	$50	$42,192	$0.05
Concentrate Production	tpd	5			
	dmt/Q	468			
Concentrate Freight to Smelter		included in sale price of concentrate			
TOTAL FREIGHT				**$42,192**	**$0.05**

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX Molybdenum Project
OPERATING COST - REV 0

ELECTRICAL POWER COST
All Costs in CAD Dollars

Daily Throughput	2,500	tpd	Mill Availability	95%
Annual Throughput	**912,500**	tpa	Annual operating days	365

POWER COSTS

Area		**Installed kW**	**Demand kW**	**Operating hours/yr**	**Annual kWh Consumption**	**Diesel (litres) Consumption**	**Annual Cost CAD$**
Mill							
	Crushing & Grinding	1916	1533	8760	13,427,328	3,633,277	$2,906,622
	Flotation	342	274	8760	2,396,736	648,529	$518,823
	Thickening/Dewatering	20	16	8760	140,160	37,926	$30,341
	Tailings	68	54	8760	476,544	128,947	$103,158
	Reagents	473	378	8760	3,314,784	896,942	$717,553
Mine**	Overall Power	2800	2240	7300	16,352,000	n/a	n/a
Surface Facilities	Admin Office/Lab	350	280	8760	2,452,800	663,699	$530,959
	Warehouse/Truckshop	150	120	8760	1,051,200	284,442	$227,554
	Lighting/Heating	100	80	8760	700,800	189,628	$151,703
	Security	0	0	8760	0	0	$0
Generator Sets	Lubricants					38,900	$71,577
	Total	6,219	4,975	86,140	40,312,352	6,483,389	$5,258,288

** Mine power costs are included in the mining operating cost summary

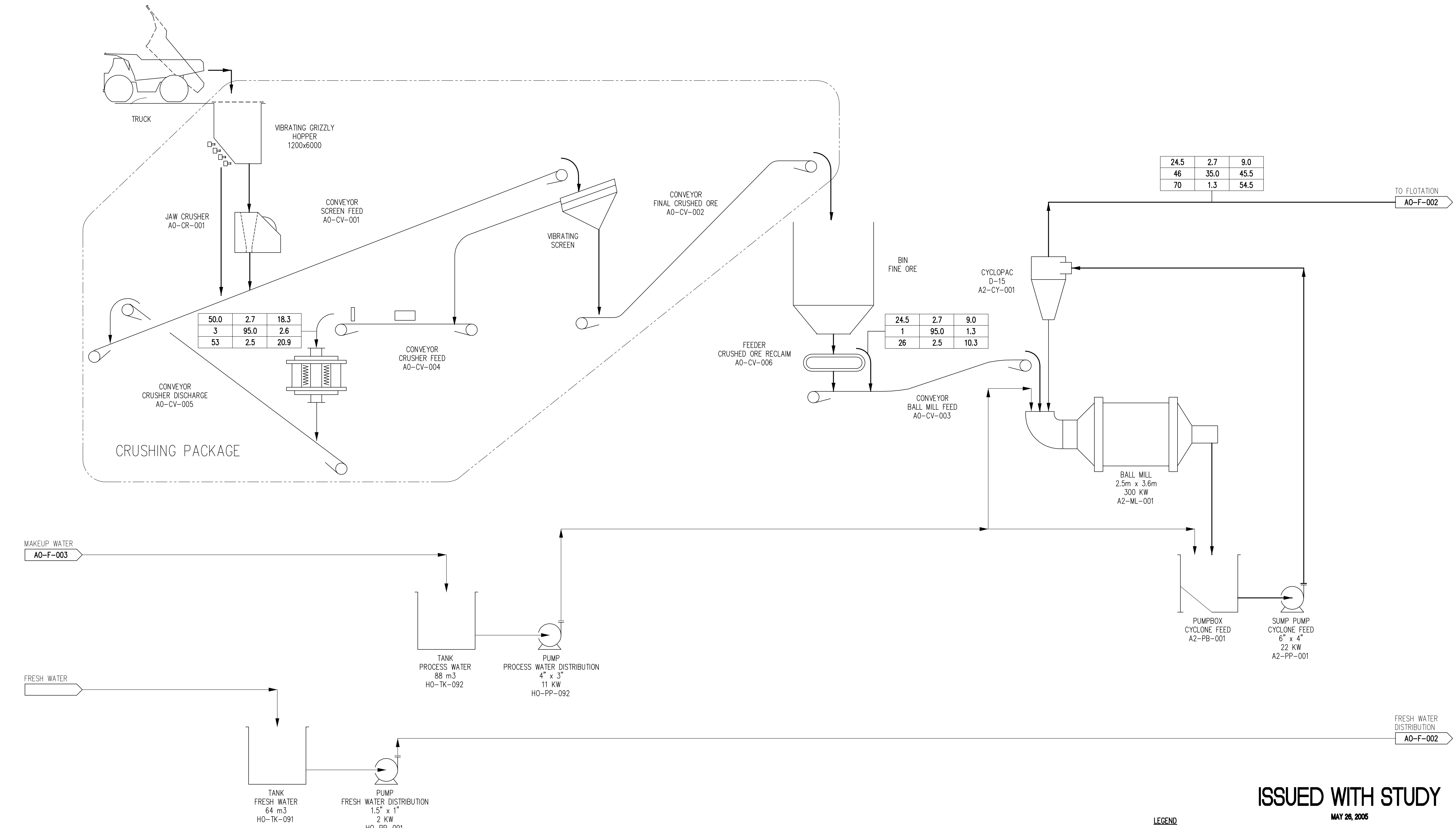
Diesel Fuel Cost per liter
Assumed average cost **0.80**

Lubricant Cost (CAD$/liter) 1.84

Unit power cost (CAD$/kWh) 0.13

Appendix C

Drawings, Flowsheets and Design Criteria



ISSUED WITH STUDY

MAY 26, 2005

WATER SOLUTIONS

t/HR~m³/HR

LEGEND

t/HR solids	S.G. solids	m³/HR solids
t/HR water	% solids	m³/HR water
t/HR pulp	S.G. pulp	m³/HR pulp

DWG. NO.	REFERENCE DRAWINGS

NO	DESCRIPTION	BY	DATE
	ISSUE		

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26
	REVISIONS		

PROJECT / PROCESS / CIVIL / MECH. / STRUCT. / PIPING / SERVICES / ELECT. / INSTR.

SECTION:	GENERAL	
SCALE:	NONE	DATE
DESIGN. BY	DS	JAN/05
DRAWN BY:	DH	JAN/05
CHECK. BY		
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Roca

HATCH™

CLIENT: ROCA MINES INC.
REVELSTOKE, BC

TITLE: MAX MOLYBDENUM PROJECT - SCOPING STUDY

PHASE 1 - 500 tpd
CRUSHING & GRINDING
FLOWSHEET NO. 1

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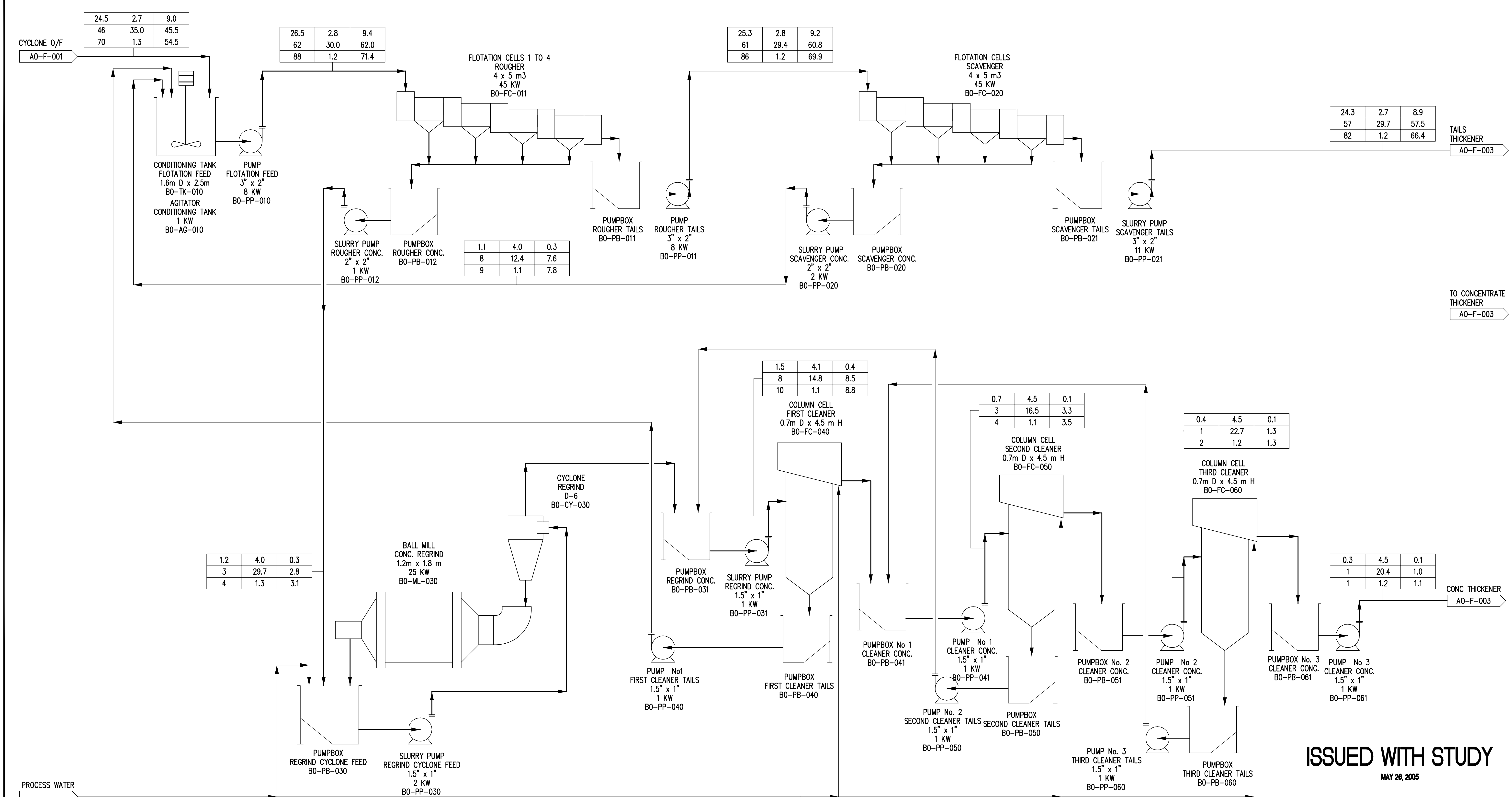
318273STDA.DWG
BDRREV-0



ISSUED WITH STUDY

MAY 26, 2005

LEGEND

t/HR solids	S.G. solids	m³/HR solids
t/HR water	% solids	m³/HR water
t/HR pulp	S.G. pulp	m³/HR pulp

WATER SOLUTIONS

t/HR~m³/HR

DWG. NO. | REFERENCE DRAWINGS

PROJECT / PROCESS / CIVIL / MECH. / STRUCT. / PIPING / SERVICES / ELECT. / INSTR. | NO | DESCRIPTION | BY | DATE — ISSUE

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26

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SECTION: GENERAL
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CLIENT: ROCA MINES INC. REVELSTOKE, BC

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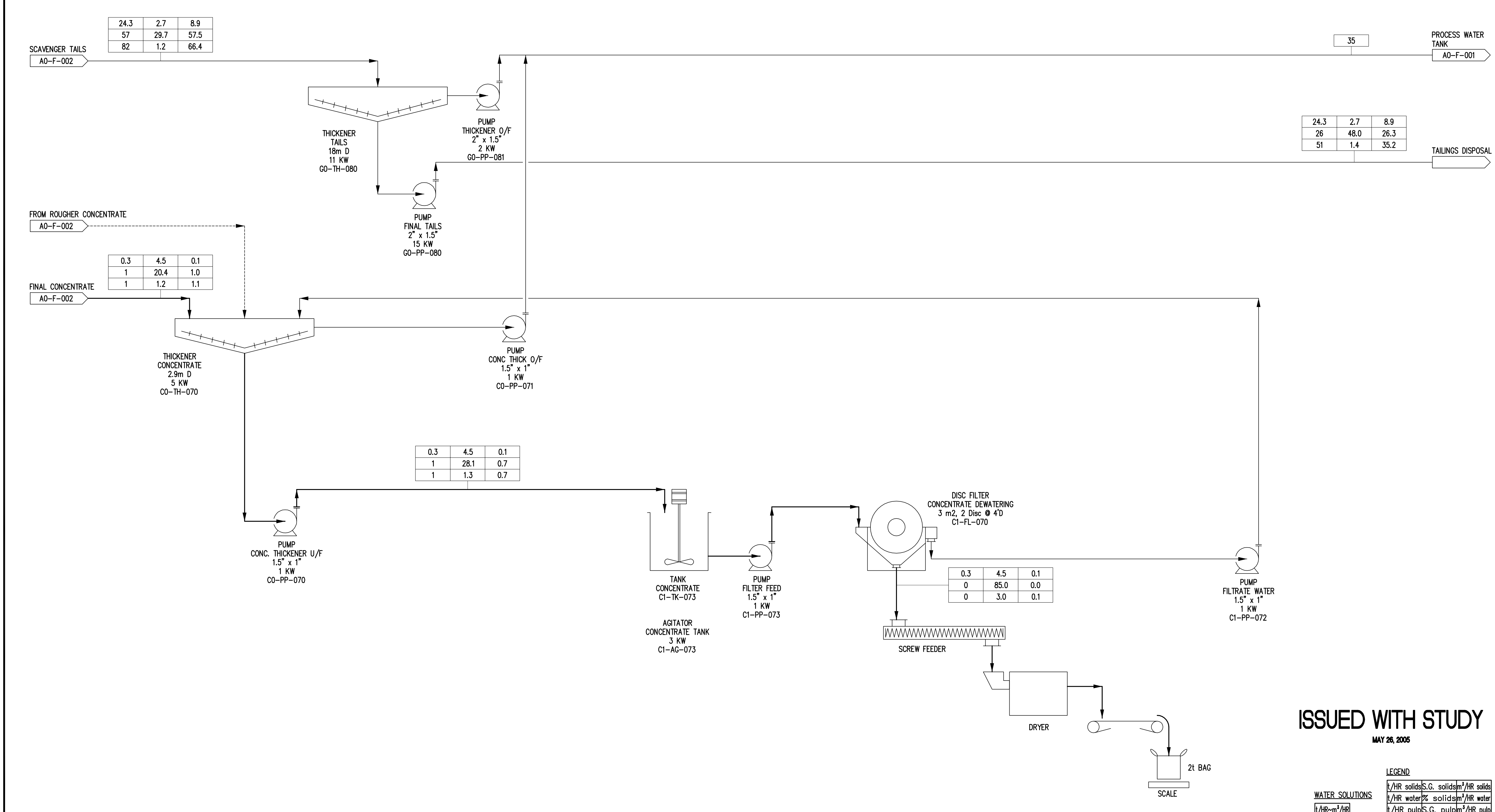
TITLE: MAX MOLYBDENUM PROJECT – SCOPING STUDY

PHASE 1 – 500 tpd
FLOTATION
FLOWSHEET NO. 2

FILENAME: A0F002.DWG | PROJECT NUMBER: 318273 | DRAWING NUMBER: AO-F-002 | REV. 0

318273STDA.DWG
BDRREV-0



ISSUED WITH STUDY

MAY 26, 2005

DWG. NO.	REFERENCE DRAWINGS

NO	DESCRIPTION	BY	DATE
	ISSUE		

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26
	REVISIONS		

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SECTION:	GENERAL	
SCALE:	NONE	DATE
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CLIENT: ROCA MINES INC. REVELSTOKE, BC

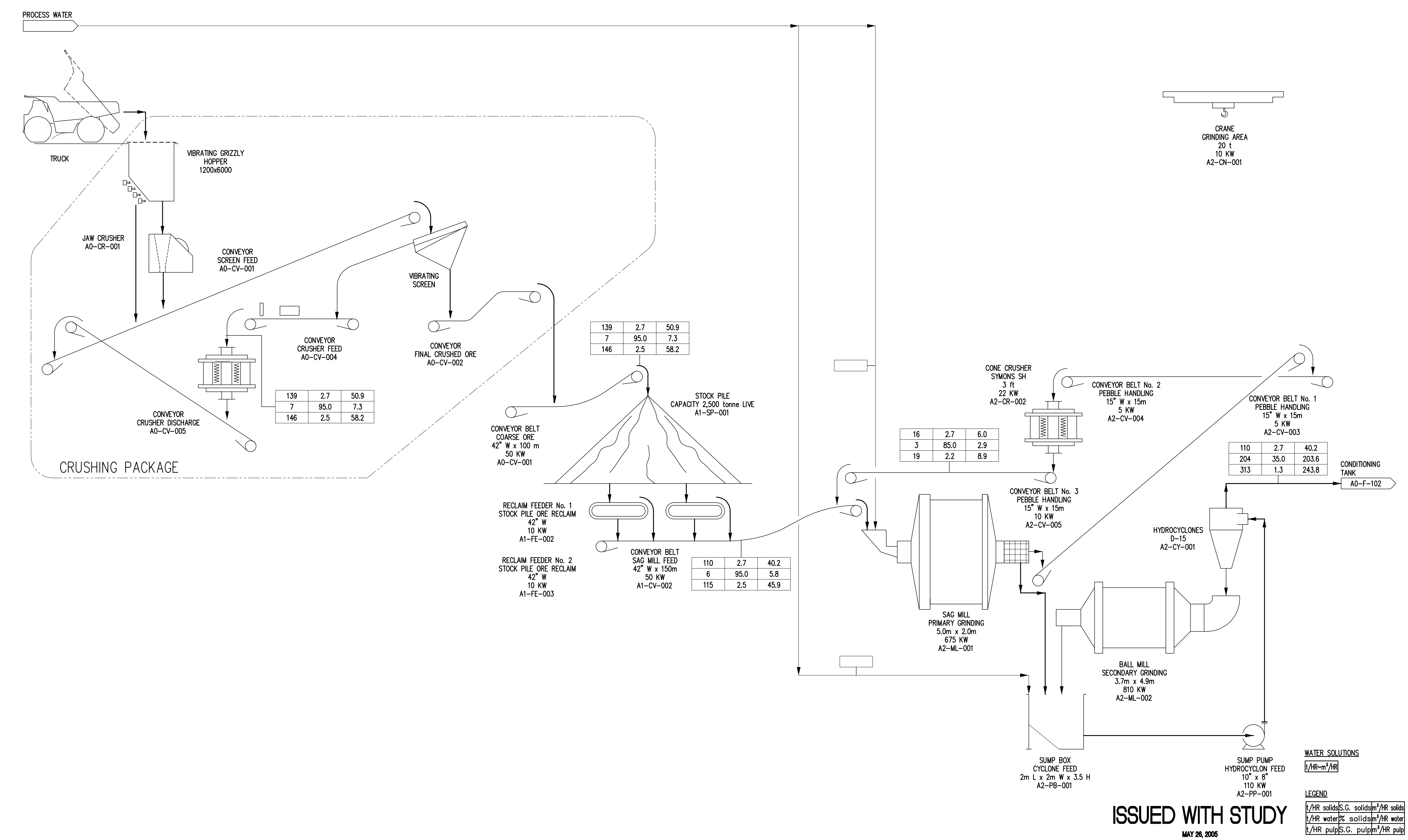
HATCH™

TITLE: MAX MOLYBDENUM PROJECT - SCOPING STUDY

PHASE 1 - 500 tpd
DEWATERING
FLOWSHEET NO. 3

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
A0F003.DWG	318273	A0-F-003	0

318273STDA.DWG
BDRREV-0



139	2.7	50.9
7	95.0	7.3
146	2.5	58.2

139	2.7	50.9
7	95.0	7.3
146	2.5	58.2

110	2.7	40.2
6	95.0	5.8
115	2.5	45.9

16	2.7	6.0
3	85.0	2.9
19	2.2	8.9

110	2.7	40.2
204	35.0	203.6
313	1.3	243.8

WATER SOLUTIONS

$t/HR \sim m^3/HR$

LEGEND

t/HR solids	S.G. solids	m^3/HR solids
t/HR water	% solids	m^3/HR water
t/HR pulp	S.G. pulp	m^3/HR pulp

ISSUED WITH STUDY

MAY 26, 2005

DWG. NO.	REFERENCE DRAWINGS

NO	DESCRIPTION	BY	DATE
	ISSUE		

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26
	REVISIONS		

PROJECT / PROCESS / CIVIL / MECH. / STRUCT. / PIPING / SERVICES / ELECT. / INSTR.

SECTION:	GENERAL	
SCALE:	NONE	DATE
DESIGN. BY	DS	JAN/05
DRAWN BY:	DH	JAN/05
CHECK. BY		
APP. BY:		

CLIENT: ROCA MINES INC. REVELSTOKE, BC

Roca

HATCH™

TITLE: MAX MOLYBDENUM PROJECT – SCOPING STUDY

PHASE 2 – 2500 tpd
CRUSHING & GRINDING
FLOWSHEET NO. 1

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
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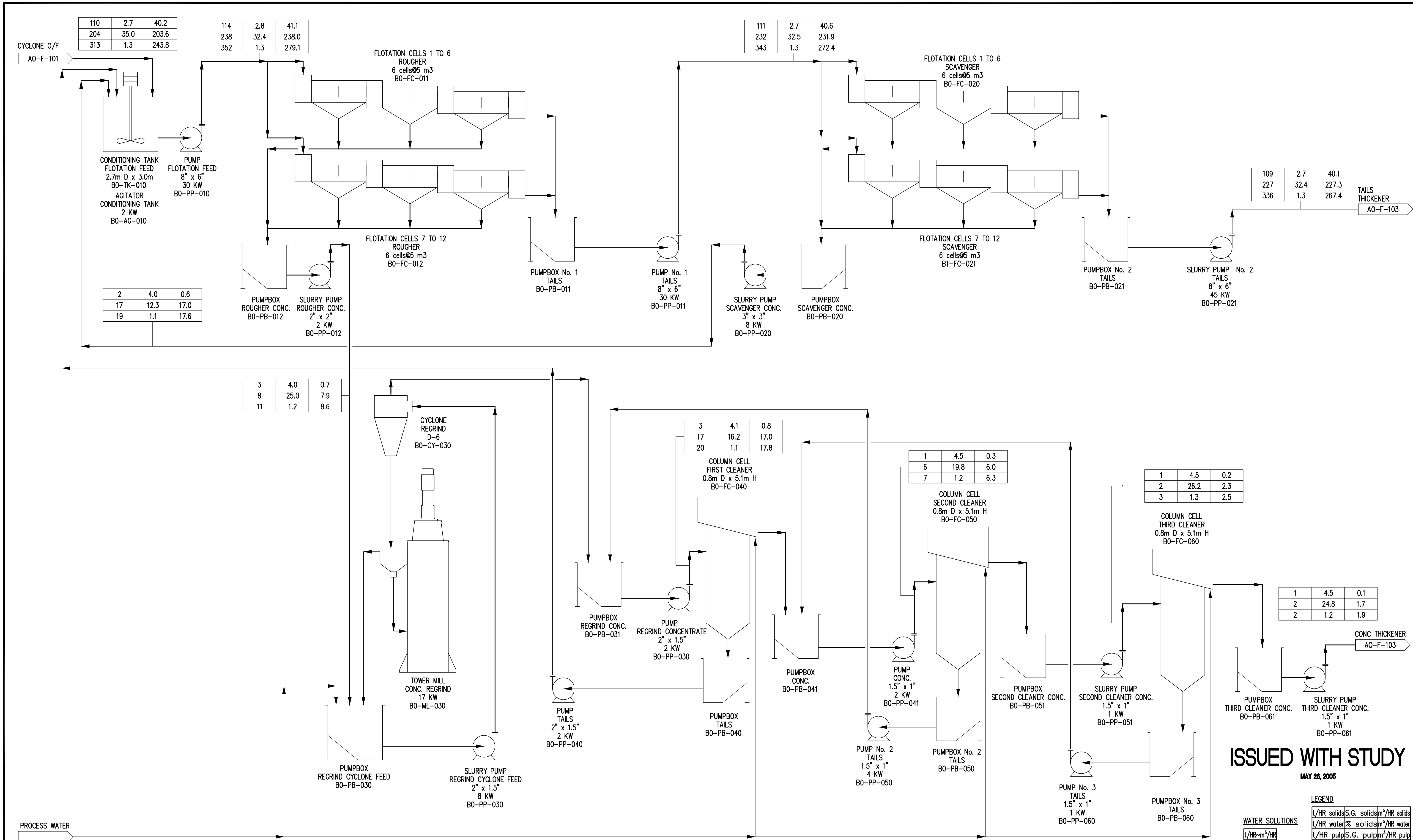
318273STDA.DWG
BDRREV-0



DWG. NO.	REFERENCE DRAWINGS

ISSUE

NO	DESCRIPTION	BY	DATE

REVISIONS

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26

PROJECT / PROCESS / CIVIL / MECH. / STRUCT. / PIPING / SERVICES / ELECT. / INSTR.

		DATE
SECTION:	GENERAL	
SCALE:	NONE	
DESIGN. BY	DS	JAN/05
DRAWN BY:	DH	JAN/05
CHECK. BY		
APP. BY:		

Roca

HATCH™

CLIENT
ROCA MINES INC.
REVELSTOKE, BC

TITLE
MAX MOLYBDENUM PROJECT – SCOPING STUDY

PHASE 2 – 2500 tpd FLOTATION FLOWSHEET NO. 2

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
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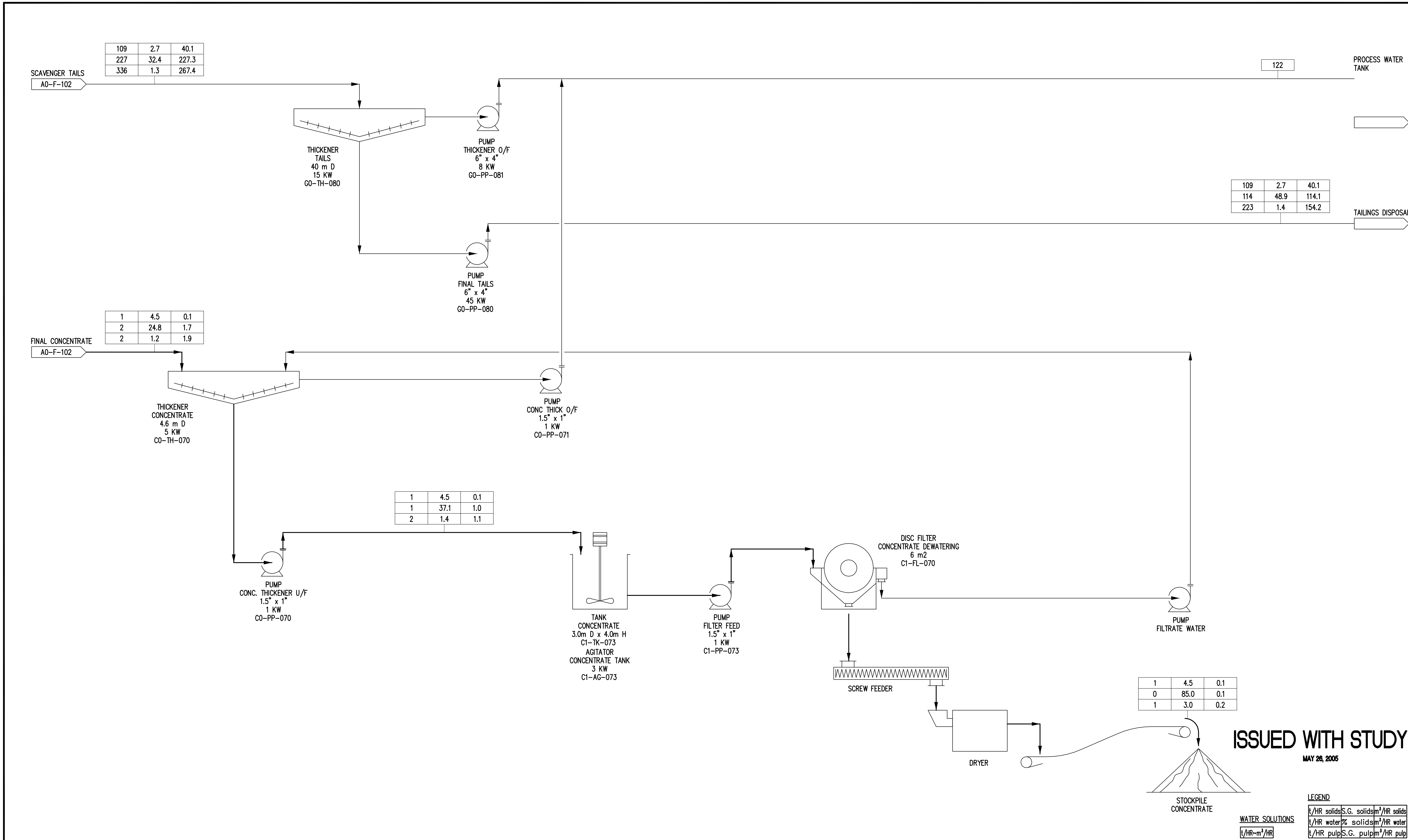
318273STDA.DWG
BDRREV-0



DWG. NO.	REFERENCE DRAWINGS

ISSUE

NO	DESCRIPTION	BY	DATE

REVISIONS

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26

SECTION:	GENERAL	
SCALE:	NONE	DATE
DESIGN. BY	DS	JAN/05
DRAWN BY:	DH	JAN/05
CHECK. BY		
APP. BY:		

CLIENT
ROCA MINES INC.
REVELSTOKE, BC

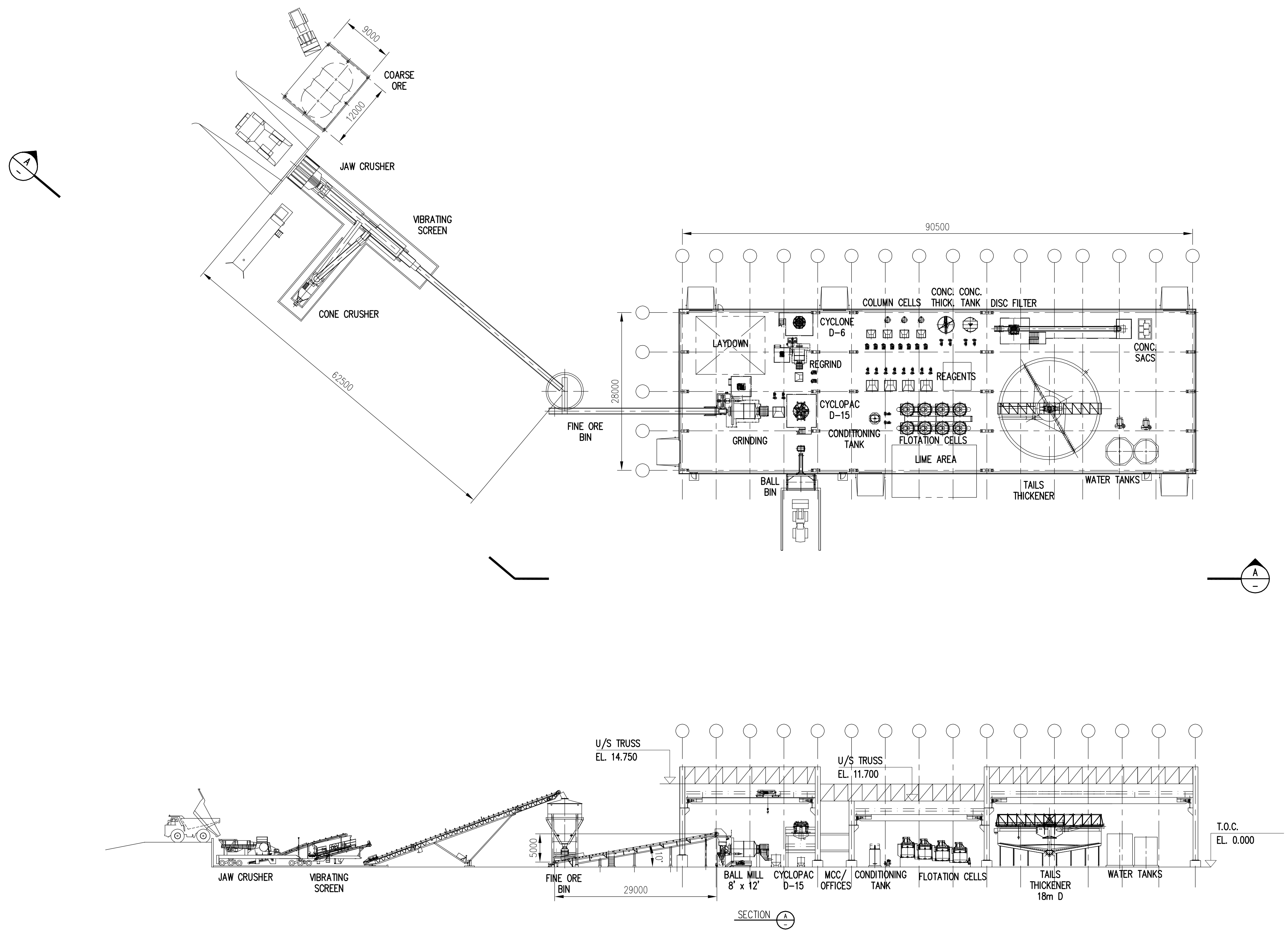
HATCH™

TITLE **MAX MOLYBDENUM PROJECT - SCOPING STUDY**

PHASE 2 – 2500 tpd
DEWATERING
FLOWSHEET NO. 3

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
A0F103.DWG	318273	A0-F-103	0

318273STDA.DWG
BDRREV-0



ISSUED WITH STUDY

MAY 26, 2005

8 0 8 16 24 32 40 m

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DWG. NO.	REFERENCE DRAWINGS

ISSUE

NO	DESCRIPTION	BY	DATE

REVISIONS

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26

PROJECT / PROCESS / CIVIL / MECH. / STRUCT. / PIPING / SERVICES / ELECT. / INSTR.

SECTION:	GENERAL	
SCALE:	1:400	DATE
DESIGN. BY	DS	JAN/05
DRAWN BY:	DH	JAN/05
CHECK. BY		
APP. BY:		

CLIENT: Roca — ROCA MINES INC. REVELSTOKE, BC

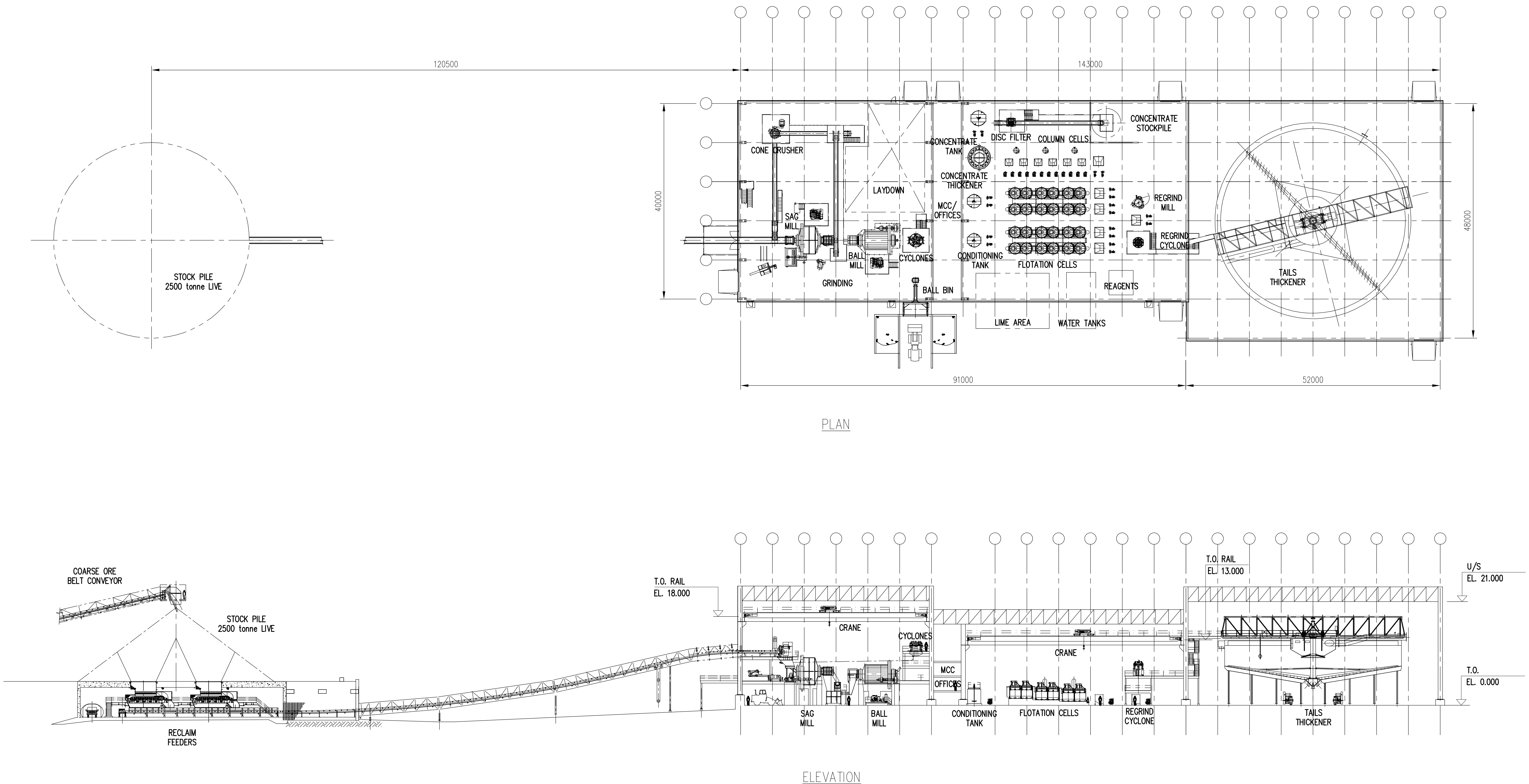
HATCH™

TITLE: MAX MOLYBDENUM PROJECT – SCOPING STUDY

PHASE 1 – 500 tpd
GENERAL LAYOUT
PLAN & SECTION

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
A0G001.DWG	318273	A0-G-001	0

318273STDA.DWG
BORREV-0



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NO	DESCRIPTION	BY	DATE

REVISIONS: PROJECT / PROCESS / CIVIL / MECH. / STRUCT. / PIPING / SERVICES / ELECT. / INSTR.

NO	DESCRIPTION	BY	DATE
0	ISSUED WITH SCOPING STUDY	PH	05/05/26

SECTION:	GENERAL	
SCALE:	1:400	DATE
DESIGN. BY	DS	JAN/05
DRAWN BY:	DH	JAN/05
CHECK. BY		
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Roca

CLIENT
ROCA MINES INC.
REVELSTOKE, BC

HATCH™

TITLE **MAX MOLYBDENUM PROJECT - SCOPING STUDY**

PHASE 2 - 2500 tpd
GENERAL LAYOUT
PLAN & SECTION

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
A0G101.DWG	318273	A0-G-101	0

318273STDA.DWG
BORREV-0

HATCH

SOURCE	
1	Client
2	Experience
3	Calculation
4	Mass Balance
5	Testwork
6	Prior Operation
7	Other Source

ROCA MINES INC.
MAX SCOPING STUDY
PROJECT # 318273
DESIGN CRITERIA
REVISION B
DATE: May 6, 2005

	Units	Case 1		Case 2	
		Value	Source	Value	Source
GENERAL					
Mill Throughput	t/d	500	1	2,500	1
Annual throughput	t	182,500	3, revB	912,500	3
Operating time	d/a	365.00	1, revB	365.00	2
Operating time	h/d	24.00	2	24.00	2
ORE CHARACTERISTICS					
Head grade	MoS_2	1.00%	1,2	0.50%	1
Moisture	w/w	5.0%	2	5.0%	2
Bulk density	t/m^3	1.94	1	1.94	1
S.G.		2.73	1	2.73	1
CRUSHING					
Primary					
ROM Ore	mm	1,000	2	1,000	2
Crusher type		Jaw	2	Jaw	2
Availability		41.7%	3	75.0%	2
Crushing plant product, D_{100}	µm	127,000	2, 7	127,000	2, 7
Crushing plant product, D_{80}	µm	70,000	2, 7	70,000	2, 7
Secondary					
Type		Symons Standard 3 ft			
Setting	mm	13			
Availability		41.7%			
Crushing plant product, D_{100}	µm	25,000	2, 7		
Crushing plant product, D_{80}	µm	16,000	2, 7		
GRINDING					
Primary grinding					
Mill type		Ball		Sag	
Work Index	kWh/t	12.0	1	12.0	1
Utilization		85.0%	2	95.0%	2
Mill discharge solids		70.0%	2	75.0%	2
Pebbles generation	% fresh feed	N/A		15.0%	2
Pebbles moisture	w/w	N/A		5.0%	2
Pebbles SG		N/A		2.70	2
Pebbles D_{80}	mm	N/A		12.70	2
Pebbles bulk density	t/m^3	N/A		1.70	2
Trommel water	m^3/h	N/A		5.00	2
Secondary grinding & classification					
Mill type		N/A		Ball	
Circulating load		250%	2	350%	2
Hydrocyclone O/F solids content		35.0%	2	35.0%	2
Overflow D_{80}	µm	106	1, 2	106	1, 2
Hydrocyclone U/F solids content		70.0%	2	75.0%	2
FLOTATION					
pH slurry		8.2-8.5	1	8.2-8.5	1
Flotation area pumps GSW	m^3/h	1.00	2	2.50	2
Conditioning		Agitated tank	2	Agitated tank	2
Flotation Global					
Molybdenum fresh feed grade	MoS_2	1.000%	1	0.500%	1
MoS_2 recovery, global	MoS_2	90.95%	1	90.95%	1
Final concentrate grade	MoS_2	87.0%	1	87.0%	1
Final concentrate grade	Mo	52.1%	3	52.1%	3
Final concentrate	t/d	5.2	3	13.1	3
Final concentrate SG		4.50	2	4.60	2
Total Flotation time	min	56.00	1	56.00	1
Rougher-Scavenger residence time	min	20.00	1	20.00	1
Cleaning residence time	min	36.00		36.00	1
Rougher					
Flotation time	min	10.00	1	10.00	1
Recovery	MoS_2	79.80%	2, 3	79.80%	2, 3
Concentrate grade	MoS_2	25.14%	1	25.14%	2, 3
Concentrate, solid SG		4.00	1	4.00	1
Flotation cell type		Conventional	2	Conventional	2
Flotation cell, required	m^3	3.7	3	4.6	3
Flotation cell, selected	m^3	5.0	2	5.0	2

HATCH

SOURCE	
1	Client
2	Experience
3	Calculation
4	Mass Balance
5	Testwork
6	Prior Operation
7	Other Source

ROCA MINES INC.
MAX SCOPING STUDY
PROJECT # 318273
DESIGN CRITERIA
REVISION B
DATE: May 6, 2005

	Units	Case 1		Case 2	
		Value	Source	Value	Source
Scavenger					
Flotation time	min	10.00	1	10.00	1
Concentrate, solids content	w/w	20.00%	1	20.00%	1
Concentrate solids content as diluted	w/w	13.00%	1	13.00%	1
Concentrate, solid SG		4.30	2	4.30	2
Flotation cell type		Conventional	2	Conventional	2
Flotation cell, required	m^3	3.6	3	4.5	3
Flotation cell, selected	m^3	5.0	2	5.0	2
First Cleaner					
Flotation time	min	16.00	1	16.00	1
Recovery	MoS_2	79.08%	2, 3	79.08%	2, 3
Concentrate	t/h	0.54	3	1.21	3
Concentrate grade	MoS_2	52.00%	2, 3	52.00%	2, 3
Concentrate, solids content	w/w	30.00%	2	30.00%	2
Concentrate, solid SG		4.50	2	4.50	2
Flotation cell type		Column	2	Column	2
Carrying capacity	$t/h/m^2$	1.50	2	1.50	2
Throughput	t/h	0.54	3	1.21	3
Column area selected	m^2	0.36	3	0.81	3
Regrinding					
Circulating load		150%	2	350%	2
Hydrocyclone O/F solids content		20.0%	2	20.0%	2
Overflow D_{80} (based on 90%-325#)	microns	35.00	1	35.00	1
Hydrocyclone U/F solids content		60.0%	1, 2	60.0%	1, 2
Second Cleaner					
Flotation time	min	10.00	1, 2	10.00	1, 2
Recovery	MoS_2	82.46%	2, 3	82.46%	2, 3
Concentrate	t/h	0.37	3	0.83	3
Concentrate grade	MoS_2	75.00%	2, 3	75.00%	2, 3
Concentrate, solids content	w/w	30.00%	2	30.00%	2
Concentrate, solid SG		4.60	2	4.60	2
Flotation cell type		Column	2	Column	2
Carrying capacity	$t/h/m^2$	1.50	2	1.50	2
Column area required	m^2	0.25	3	0.55	3
Column area selected	m^2	0.36	3	0.81	3
Third Cleaner					
Flotation time	min	10.00	1, 2	10.00	1, 2
Recovery	MoS_2	80.00%	2, 3	80.00%	2, 3
Concentrate	t/h	0.26	3	0.57	3
Concentrate grade	MoS_2	87.00%	1	87.00%	1
Concentrate, solids content	w/w	30.00%	2	30.00%	2
Concentrate, solid SG		4.60	2	4.60	2
Flotation cell type		Column	2	Column	2
Carrying capacity	$t/h/m^2$	1.50	2	1.50	2
Column area required	m^2	0.17	3	0.38	3
Column area selected	m^2	0.36	3	0.81	3
CONCENTRATE THICKENING, FILTRATION & DRYING					
Design Settling rate	m2/t/d	1.00	7	1.00	7
Thickener diameter	m	2.88	3	4.56	3
Thickening U/F solids		50.0%	2	50.0%	2
Filtration rate	$kg/m^2/h$	100	2	100	2
Solids to be filtered	t/h	0.26	3	0.57	3
Filtration area, required	m2	2.6	3	5.7	3
Filtration area, available	m2	3.0	7	6.0	7
Cake moisture	w/w	15.0%	2	15.0%	2
TAILS THICKENING					
Design SettIng Rate	m2/t/d	0.51	1	0.51	1
Thickener diameter	m	18.0	3	40	3
Thickener U/F	w/w	50.0%	2	50.0%	2
Total Tails	t/h	24	3	109	3

Appendix D

Tailings Report

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Suite 500 - 1045 Howe Street, Vancouver, British Columbia, Canada. V6Z 2A9
Phone (604) 684-5900 Fax (604) 684-5909

BGC Project Memorandum

To:	**Forty Two Metals Inc.**	**Fax No.:**	**Via email**
Attention:	**Scott Broughton, P.Eng.**	**CC:**	
From:	**Bill Burton (Ext. 136)**	**Date:**	**April 18, 2005**
Subject:	**Tailings Facility Capital and Sustaining Costs – 500 tpd / 2500 tpd options**		
No. of Pages (including this page):		**Project No:**	**0327-003**

Introduction

Forty Two Metals Inc. (42 Metals) a wholly owned subsidiary of Roca Mines Inc. (Roca) is currently conducting preliminary economic assessments of a high grade molybdenum resource at the MAX Property under a small mines permit. The property, previously called Trout Lake, is road accessible and is located approximately 60km south of Revelstoke in British Columbia. Extensive exploration programs at the MAX project were previously undertaken by Newmont Mines Ltd. and Esso Minerals during the period of 1979 To 1983. That work included the development of a production-size exploration adit, sampling, metallurgical testing, mine planning, base line environment assessment and preparation of conceptual waste management plans.

As part of the economic assessment, BGC Engineering Inc. (BGC) was retained to provide a review of tailings management options for the project. As part of this review, estimates of capital and sustaining costs for earthworks for two mine production scenarios were prepared and are detailed below. The dam design is based on limited site investigation and thus should be considered preliminary at this time.

Summary of Capital and Sustaining Costs

The estimated capital and sustaining costs for the tailings management system are outlined in the following sections. The estimated costs include earthworks, pipelines and some maintenance. The costs of operating the pumps are not included. Engineering and construction supervision costs are not included, although the estimated unit rates are inclusive of contractor direct costs and profit. No contingencies have been applied to the estimated costs, although the costs are generally considered to be conservative to reflect our current level of site specific information. The capital costs have been estimated as all pre-production costs. The sustaining costs reflect all costs after production has started, including some allowances for closure costs. Note that the sustaining costs begin in Year 2 after start-up as the initial tailings starter dam has been sized to store 2 years of tailings production. For the two scenarios considered the costs are as follows:

Scenario 1 – 500tpd, approximately 600,000 tonnes total
- Capital Cost (pre-production) = $ 956 000
- Sustaining Cost (year +2 onwards) = $ 688 000
- Total Cost = $ 1 644 000

Scenario 2 – 2500tpd, approximately 13 million tonnes total
- Capital Cost (pre-production) = $ 3 975 000
- Sustaining Cost (year +2 onwards) = $ 24 379 000
- Total Cost = $ 28 354 000

Tailings Facility Design

Mine Production

Tailings storage for two mine production scenarios was considered. In the first scenario, a processing rate of 500 tpd for a total tonnage of approximately 600,000 tonnes was considered. The second scenario considered a total tonnage of approximately 13 million tonnes processed at a rate of 2500 tpd.

Tailings Facility Layout

A natural gully at the base of the slope below the proposed mill site was considered for tailings storage. The proposed configuration of the tailings facility for the 600,000 tonne scenario is shown in Figure 1. For the 13 million tonne scenario a larger facility is required, as shown in Figure 2.

Storage Assumptions

The tailings facility was sized to store tailings solids and an operating pond. In addition, an allowance has been made for additional storage in case the water quality is not suitable and retention is required before discharge. The assumptions used in estimating the height of the starter dam and subsequent dam raises include:

General Assumptions

- Storage capacity estimated based on topography from BC Trim Maps 082K052, 53, 62, 63 with 20m contours.
- The starter dam will contain 2 years of tailings solids. Subsequent dam raises are sized to store 1 year of tailings solids. Providing additional storage for the starter dams allows for additional flexibility if unexpected tailings or water quality characteristics occur during start up.
- minimum freeboard of 1m
- dry density of tailings at 1.4t/cu.m
- assumed flat lying tailings surface
- runoff water will be diverted, process water and direct precipitation will result in a net excess of water being required

Assumptions for Scenario 1

- 500tpd, approximately 600,000 tonnes total resource
- starter dam stores 2 yrs of solids, subsequent raises store 1 yr of solids
- operating pond = 100,000 cu.m
- additional water storage for 1 year of excess water under average precipitation conditions = 100,000 cu.m
- 1.5m freeboard
- spillway sized to pass PMP

Assumptions for Scenario 2

- 2500tpd, approximately 13 million tonnes total resource
- starter dam stores 2 yrs of solids, subsequent raises store 1 yr of solids
- operating pond = 200,000 cu.m
- additional water storage for 1 year of excess water under average precipitation conditions = 230,000 cu.m
- 1.5m freeboard
- spillway sized to pass PMP

Dam Design

- slope angles of 2H:1V for both upstream and downstream faces
- both scenarios considered a zoned earthfill dam
- impermeable till or clay core supported by sand and gravel shells
- filter zone to protect core, 2m thick
- foundation preparation assumed to be minimal
- all dams are raised in the downstream construction
- crest width of 8m wide
- diversions on either side to minimize water handling
- emergency spillways will provide protection for the dams in the event of extreme precipitation events
- seepage recovery dam is 2m high

Dam Raising Schedule

The dam raising schedules for Scenario 1 and 2 are shown in Table 1 and Table 2, respectively.

Table 1 – Dam Raising Schedule for Scenario 1 (500 tpd, approx. 600,000 tonnes)

Construction Year	Crest Elev.	Upper Dam Height	Lower Dam Height
- 1	793	9	18
2	795	11	20

* dam height based on ground surface of elev. 775m for the Lower Dam and 784m for the Upper Dam

Table 2 – Dam Raising Schedule for Scenario 2 (2500tpd, approx. 13 million tonnes)

Construction Year	Tonnage to be stored	Crest Elev.	Upper Dam Height	Lower Dam Height
- 1	1,825,000	803	19	28
2	2,737,500	807	23	32
3	3,650,000	810.5	26.5	35.5
4	4,562,500	813.5	29.5	38.5
5	5,475,000	816.5	32.5	41.5
6	6,387,500	819.5	35.5	44.5
7	7,300,000	822	38	47
8	8,212,500	824.5	40.5	49.5
9	9,125,000	826.5	42.5	51.5
10	10,037,500	828.5	44.5	53.5
11	10,950,000	830.5	46.5	55.5
12	11,862,500	832.5	48.5	57.5
13	12,775,000	834	50	59

* dam height based on ground surface of elev. 775m for the Lower Dam and 784m for the Upper Dam

Cost Estimate

Cost assumptions
Based on the dam heights and dam cross-sections described above the estimated costs for the earthworks and apurtenant structures were estimated and are included in Tables 3 and 4 for the 500tpd, 600,000 tonne option and in Tables 5 and 6 for the 2500tpd, 13 million tonne option.

The following unit rates were assumed for the earthworks cost estimate:

- impervious till core - $10/cu.m
- sand and gravel shell - $12/cu.m
- granular filter - $18/cu.m

No contingencies have been applied to the estimated costs.

We trust the above satisfies your requirements at this time. Should you have any additional questions or concerns please do not hesitate to contact us.

Regards,

BGC Engineering Inc.
per

Bill Burton, M.Eng., P.Eng.
Project Engineer

Chris McKane, E.I.T.
Project Engineer

Iain Bruce, Ph.D., P.Eng.
Principal Consultant

Table 3. Tailings Starter Dam Costs for Scenario 1 (500tpd, 600,000t total)

v. 2005-04-11

Starter Dam Constructed in: Yr-1
Starter Dam Elev.: 793m

Item	Description	Unit	Unit Rate	Starter Dam quantity (yr-1)	cost	Subtotal
Lower Dam Fill	Compacted Till Core	m^3	$ 10.00	4 700	$ 47 000	
	Filter sand	m^3	$ 18.00	980	$ 17 640	
	Sand and Gravel Shell	m^3	$ 12.00	16 000	$ 192 000	
Upper Dam Fill	Compacted Till Core	m^3	$ 10.00	1 500	$ 15 000	
	Filter sand	m^3	$ 18.00	410	$ 7 380	
	Sand and Gravel Shell	m^3	$ 12.00	3 500	$ 42 000	
	Foundation Preparation	ha	$ 5,000.00	2	$ 12 000	
						$ 333 020
Reservoir	Clearing	ha	$ 1,000.00	45	$ 45 000	$ 45 000
Emergency Spillway	Excavation (16 m3/m)	m^3	$ 6.00	8 000	$ 48 000	
	Gabion Mat	m^2	$ 58.00	500	$ 29 000	
	Slush Grout	m^3	$ 500.00	100	$ 50 000	$ 127 000
Seepage Recovery / Sediment Control	Compacted Till Core	m^3	$ 10.00	200	$ 2 000	
	Filter sand	m^3	$ 18.00	100	$ 1 800	
	Sand and Gravel Shell	m^3	$ 12.00	1 000	$ 12 000	
	Pump Station	L.S.	$ 50,000.00	1	$ 50 000	$ 65 800
Road Access	Road Access	km	$ 10,000.00	4	$ 40 000	$ 40 000
Diversion ditches	Perimeter (3.5 m3/m)	m^3	$ 5.00	18 000	$ 90 000	
Tailings Distribution and Reclaim	Tailings Pipeline	m	$ 50.00	2 000	$ 100 000	
	Tailings Pump	L.S.	$ 50,000.00	1	$ 50 000	
	Reclaim Barge and Pump	L.S.	$ 50,000.00	1	$ 50 000	
	Reclaim Water Pipeline	m	$ 50.00	1 100	$ 55 000	$ 345 000
				Total Cost:	$ 955 820	

Table 4. Earthworks Sustaining Costs for Scenario 1 (500tpd, 600,000t total)

v. 2005-04-11

Operating Costs
Crest Elev. 793m-795m

				Incremental Quantities		Incremental Costs ($)		
Item	**Description**	**Unit**	**Unit Rate**	**Yr 2**	**End of Mine**	**Yr 2**	**End of Mine**	**Item Sub-total**
Lower Dam Fill	Compacted Till Core	m^3	$ 10.00	400	-	4 000	-	$ 4 000
	Filter sand	m^3	$ 18.00	270	-	4 860	-	$ 4 860
	Sand and Gravel Shell	m^3	$ 12.00	4600	-	55 200	-	$ 55 200
Upper Dam Fill	Compacted Till Core	m^3	$ 10.00	300		3 000		$ 3 000
	Filter sand	m^3	$ 18.00	250		4 500		$ 4 500
	Sand and Gravel Shell	m^3	$ 12.00	2 200		26 400		$ 26 400
	Foundation Preparation	ha	$ 5,000.00		-	-	-	-
Emergency Spillway	Excavation	m^3	$ 6.00		-	-	-	-
	Gabion Mat (0.3m)	m^2	$ 58.00		-	-	-	-
	Slush Grout	m^3	$ 500.00		-	-	-	-
	Rockfill	m^3	$ 30.00		-	-	-	-
	Gabion Basket for cascade spill (1m)	m^3	$ 10,000.00		-	-	-	-
Tailings Distribution and Reclaim	Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	L.S.	$ 10,000.00	1	-	10 000		$ 10 000
Closure / Completion	Granular Cover	m^2	$ 7.50		40 000	-	300 000	$ 300 000
	Organic Cover	m^2	$ 4.50	-	40 000	-	180 000	$ 180 000
	Spillways	L.S	$ 100,000.00	-	1	-	100 000	$ 100 000
					Annual Totals:	$ 107 960	$ 580 000	
							Total: $	**687 960**

Table 5. Tailings Starter Dam Costs for Scenario 2 (2,500tpd, 13Mt total)

v. 2005-04-14

Starter Dam Constructed in: Yr-1
Starter Dam Elev.: 803m

				Starter Dam		
Item	**Description**	**Unit**	**Unit Rate**	**quantity (yr-1)**	**cost**	**Subtotal**
Lower Dam Fill	Compacted Till Core	m^3	$ 10.00	130 000	$ 1 300 000	
	Filter sand	m^3	$ 18.00	7 400	$ 133 200	
	Sand and Gravel Shell	m^3	$ 12.00	131 000	$ 1 572 000	
Upper Dam Fill	Compacted Till Core	m^3	$ 10.00	10 600	$ 106 000	
	Filter sand	m^3	$ 18.00	1 300	$ 23 400	
	Sand and Gravel Shell	m^3	$ 12.00	17 100	$ 205 200	
	Foundation Preparation	ha	$ 5,000.00	3	$ 15 000	
						$ 3 354 800
Reservoir	Clearing	ha	$ 1,000.00	45	$ 45 000	$ 45 000
					$	
Emergency Spillway	Excavation	m^3	$ 6.00	8 000	$ 48 000	
	Gabion Mat	m^2	$ 58.00	500	$ 29 000	
	Slush Grout	m^3	$ 500.00	100	$ 50 000	$ 127 000
Seepage Recovery / Sediment Control	Compacted Till Core	m^3	$ 10.00	200	$ 2 000	
	Filter sand	m^3	$ 18.00	100	$ 1 800	
	Sand and Gravel Shell	m^3	$ 12.00	1 000	$ 12 000	
	Pump Station	L.S.	$ -		$	$ 15 800
Road Access	Road Access	km	$ 10,000.00	4	$ 40 000	$ 40 000
Diversion ditches	Excavate in Till	m	$ 5.00	19 000	$ 95 000	
Tailings Distribution and Reclaim	Tailings Pipeline	m	$ 50.00	2 850	$ 142 500	
	Tailings Pump	L.S.	$ 50,000.00	1	$ 50 000	
	Reclaim Barge and Pump	L.S.	$ 50,000.00	1	$ 50 000	
	Reclaim Water Pipeline	m	$ 50.00	1 100	$ 55 000	$ 392 500
				Total Cost:	$3,975,100	

Table 6. Earthworks Sustaining Costs for Scenario 2 (2,500tpd, 13Mt total)

v. 2005-04-14

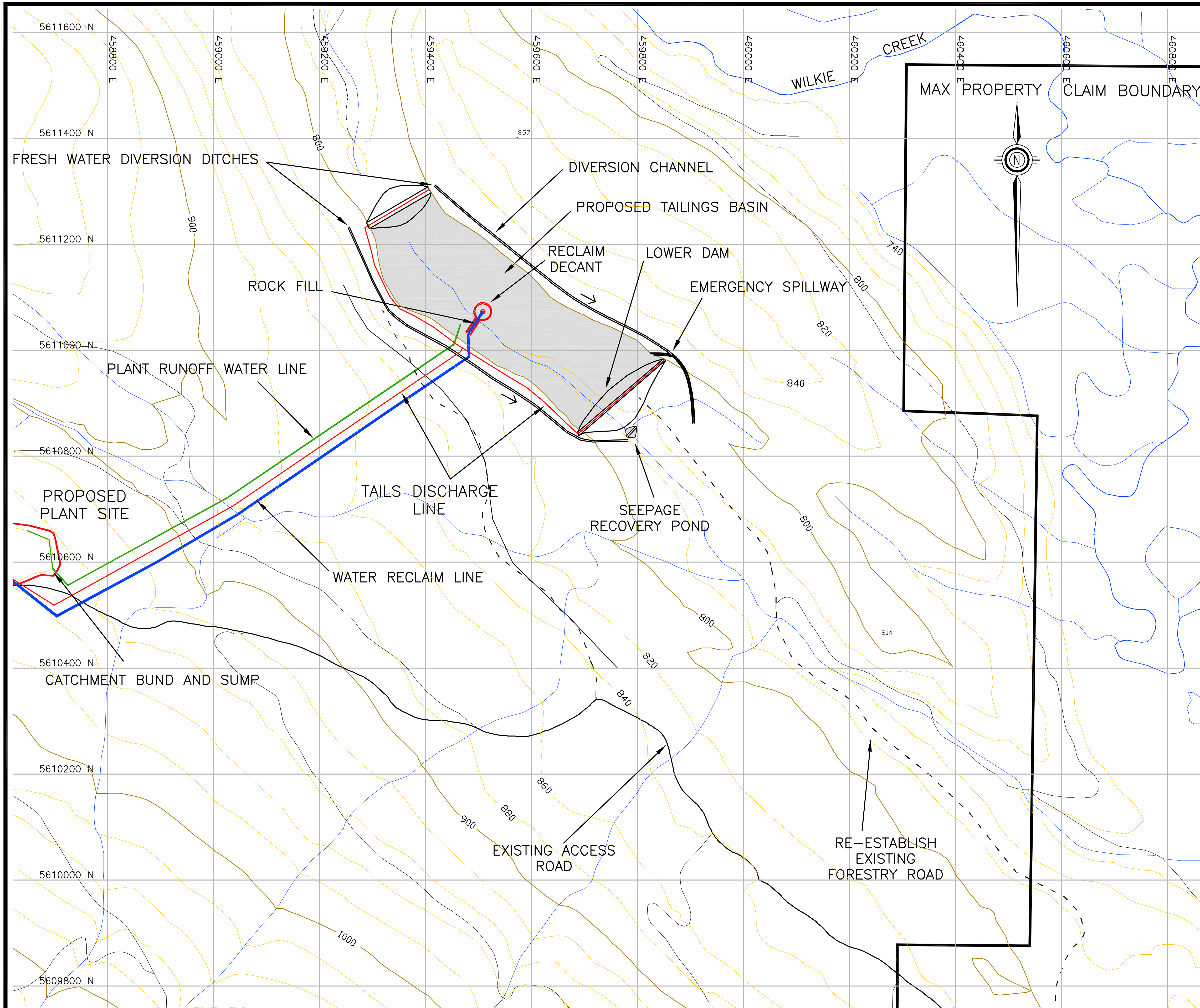
Operating Costs
Crest Elev. 803m-834m

Incremental Quantities

Item	Description	Unit	Unit Rate	Yr 2	3	4	5	6	7	8	9	10	11	12	13	End of Mine
Lower Dam Fill	Compacted Till Core	m^3	$ 10.00	34 000	31 000	27 000	22 000	22 000	13 000	13 000	10 000	11 000	6 000	6 000	5 000	-
	Filter sand	m^3	$ 18.00	4 400	4 500	4 100	4 300	4 400	3 700	3 800	3 100	3 200	2 700	2 700	2 100	-
	Sand and Gravel Shell	m^3	$ 12.00	94 000	85 000	81 000	115 000	119 000	136 000	138 000	112 000	114 000	143 000	144 000	109 000	-
Upper Dam Fill	Compacted Till Core	m^3	$ 10.00	2 200	2 300	2 200	2 400	2 600	2 400	2 500	2 200	2 300	2 400	2 500	1 900	
	Filter sand	m^3	$ 18.00	700	700	700	800	800	700	800	700	700	700	800	600	
	Sand and Gravel Shell	m^3	$ 12.00	12 000	14 500	15 800	19 400	23 400	22 700	25 900	23 100	25 400	27 800	30 400	24 400	
																-
	Foundation Preparation	ha	$ 5,000.00	3			3			3			3			-
Emergency Spillway	Excavation	m^3	$ 6.00	8 000			8 000			8 000			8 000			-
	Gabion Mat (0.3m)	m^2	$ 58.00	500			500			500			500			-
	Slush Grout	m^3	$ 500.00	100			100			100			100			-
	Rockfill	m^3	$ 30.00	30		-	30			30			30			-
	Gabion Basket for cascade spill (1m)	m^3	$ 10,000.00	1			1			1			1			-
Tailings Distribution and Reclaim	Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	L.S.	$ 10,000.00	1	1	1	1	1	1	1	1	1	1	1	1	-
Closure / Completion	Granular Cover	m^2	$ 7.50													40 000
	Organic Cover	m^2	$ 4.50	-												40 000
	Spillways	L.S.	$ 100,000.00													1

Incremental Costs

Item	Description	Unit	Unit Rate	Yr 2	3	4	5	6	7	8	9	10	11	12	13	End of Mine	Item Sub-total
Lower Dam Fill	Compacted Till Core	m^3	$ 10.00	$340,000	$310,000	$270,000	$220,000	$220,000	$130,000	$130,000	$100,000	$110,000	$60,000	$60,000	$50,000		$2,000,000
	Filter sand	m^3	$ 18.00	$79,200	$81,000	$73,800	$77,400	$79,200	$66,600	$68,400	$55,800	$57,600	$48,600	$48,600	$37,800		$774,000
	Sand and Gravel Shell	m^3	$ 12.00	$1,128,000	$1,020,000	$972,000	$1,380,000	$1,428,000	$1,632,000	$1,656,000	$1,344,000	$1,368,000	$1,716,000	$1,728,000	$1,308,000		$16,680,000
Upper Dam Fill	Compacted Till Core	m^3	$ 10.00	$22,000	$23,000	$22,000	$24,000	$26,000	$24,000	$25,000	$22,000	$23,000	$24,000	$25,000	$19,000		$279,000
	Filter sand	m^3	$ 18.00	$12,600	$12,600	$12,600	$14,400	$14,400	$12,600	$14,400	$12,600	$12,600	$12,600	$14,400	$10,800		$156,600
	Sand and Gravel Shell	m^3	$ 12.00	$144,000	$174,000	$189,600	$232,800	$280,800	$272,400	$310,800	$277,200	$304,800	$333,600	$364,800	$292,800		$3,177,600
																	$0
	Foundation Prep	L.S.	$ 5,000.00	$15,000			$15,000			$15,000			$15,000				$60,000
Emergency Spillway	Excavation	m^3	$ 6.00	$48,000			$48,000			$48,000			$48,000				$192,000
	Gabion Mat (0.3m)	m^2	$ 58.00	$29,000			$29,000			$29,000			$29,000				$116,000
	Slush Grout	m^3	$ 500.00	$50,000			$50,000			$50,000			$50,000				$200,000
	Rockfill	m^3	$ 30.00	$900			$900			$900			$900				$3,600
	Gabion Basket for cascade spill (1m)	m^3	$ 10,000.00	$10,000			$10,000			$10,000			$10,000				$40,000
Tailings Distribution and Reclaim	Tailings Pump Maintenance and Reclaim Barge and Pump Maintenance	L.S.	$ 10,000.00	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000		
Closure / Completion	Granular Cover	m^2	$ 7.50													$300,000	$300,000
	Organic Cover	m^2	$ 4.50													$180,000	$180,000
	Spillways	L.S	$ 100,000.00													$100,000	$100,000
			Annual Totals:	$1,888,700	$1,630,600	$1,550,000	$2,111,500	$2,058,400	$2,147,600	$2,367,500	$1,821,600	$1,886,000	$2,357,700	$2,250,800	$1,728,400	$580,000	
																Total:	**$24,378,800**



0327-003-01 Max Topo - dams Dsize.dwg

CLIENT:

FortyTwo Metals Inc.

150 0 150 300 450

1:7500

20m CONTOUR INTERVAL, NAD83 UTM ZONE 11N

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

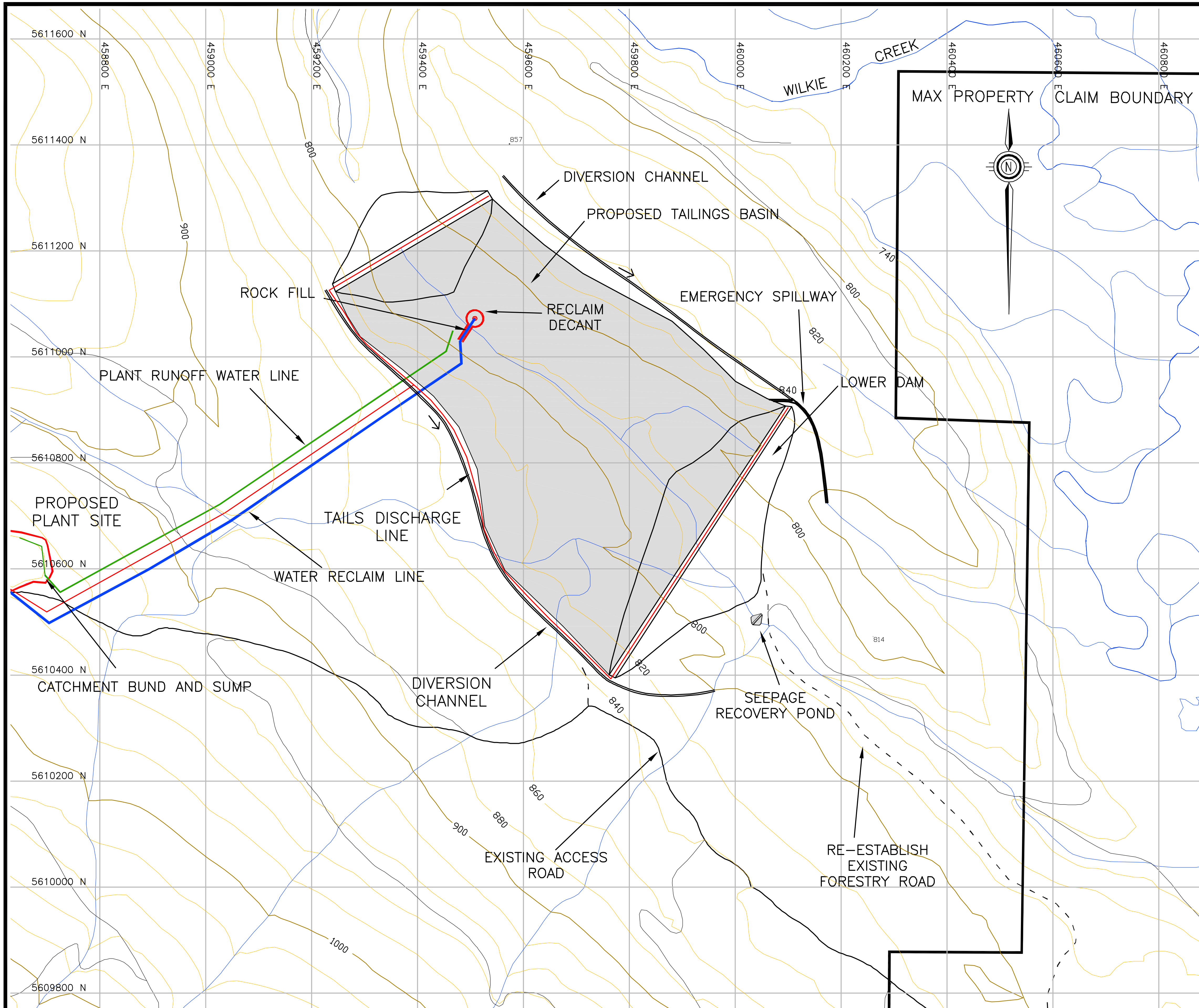
SCALE:	AS SHOWN
DATE:	APR 2005
DRAWN:	CJT
DESIGNED:	BB
CHECKED:	BB
APPROVED:	

PROJECT
MAX MOLYBDENUM PROJECT

TITLE
PROPOSED TAILINGS FACILITY ARRANGEMENT
FOR SCENARIO 1 (500 tpd, 1M tonnes)

PROJECT No.	FIG No.	REV.
0327-003-01	FIGURE 1	0

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC Phone: (604) 684 5900



0327–003–01 Max Topo – dams Dsize.dwg

CLIENT:

FortyTwo Metals Inc.

150 0 150 300 450

1:7500

20m CONTOUR INTERVAL, NAD83 UTM ZONE 11N

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	AS SHOWN
DATE:	APR 2005
DRAWN:	CJT
DESIGNED:	BB
CHECKED:	BB
APPROVED:	

PROJECT

MAX MOLYBDENUM PROJECT

TITLE

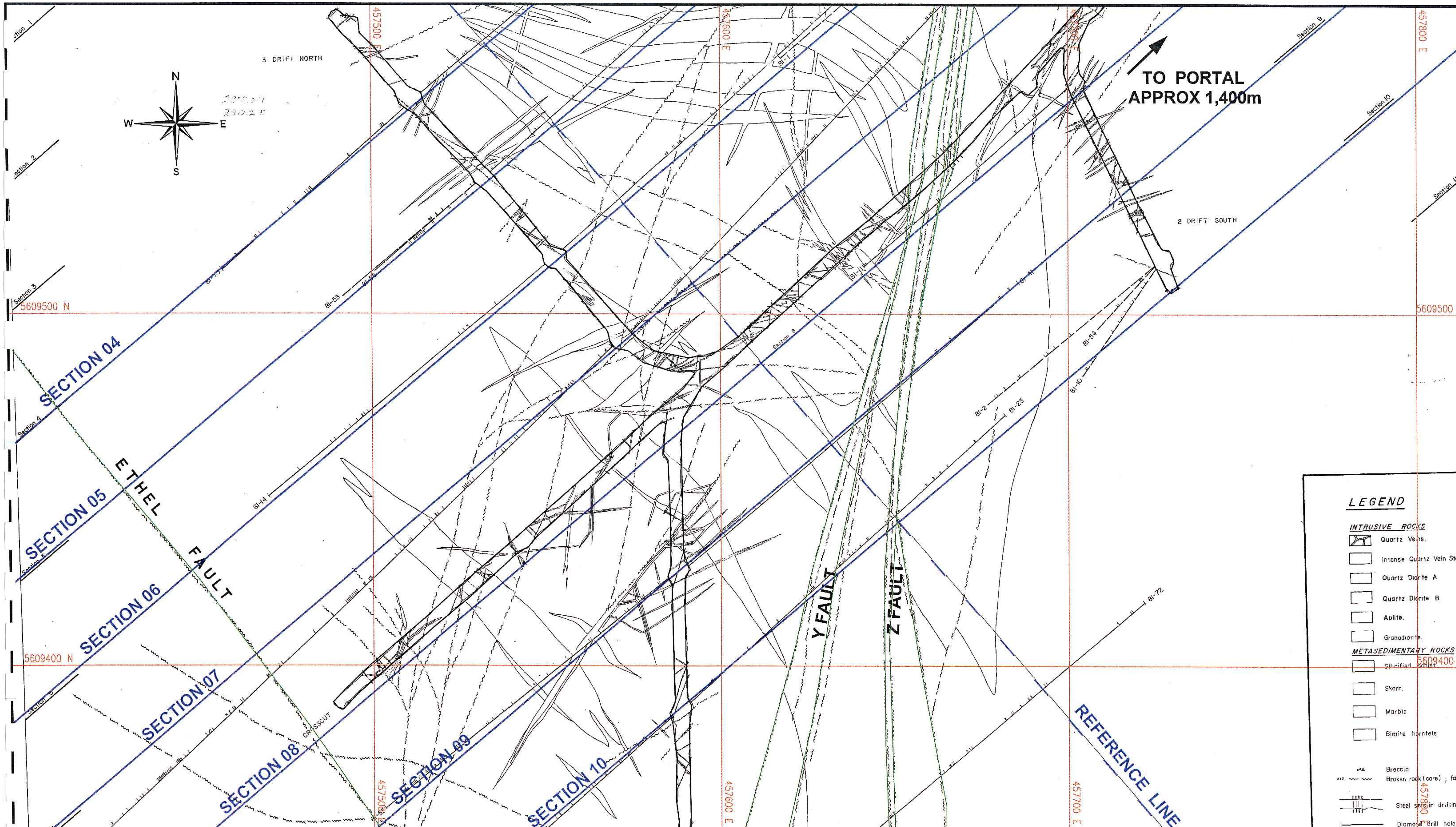
PROPOSED TAILINGS FACILITY ARRANGEMENT
FOR SCENARIO 2 (3000 tpd, 13M tonnes)

PROJECT No.	FIG No.	REV.
0327–003–01	FIGURE 2	0

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC Phone: (604) 684 5900

Appendix E

Mining



Roca

HATCH

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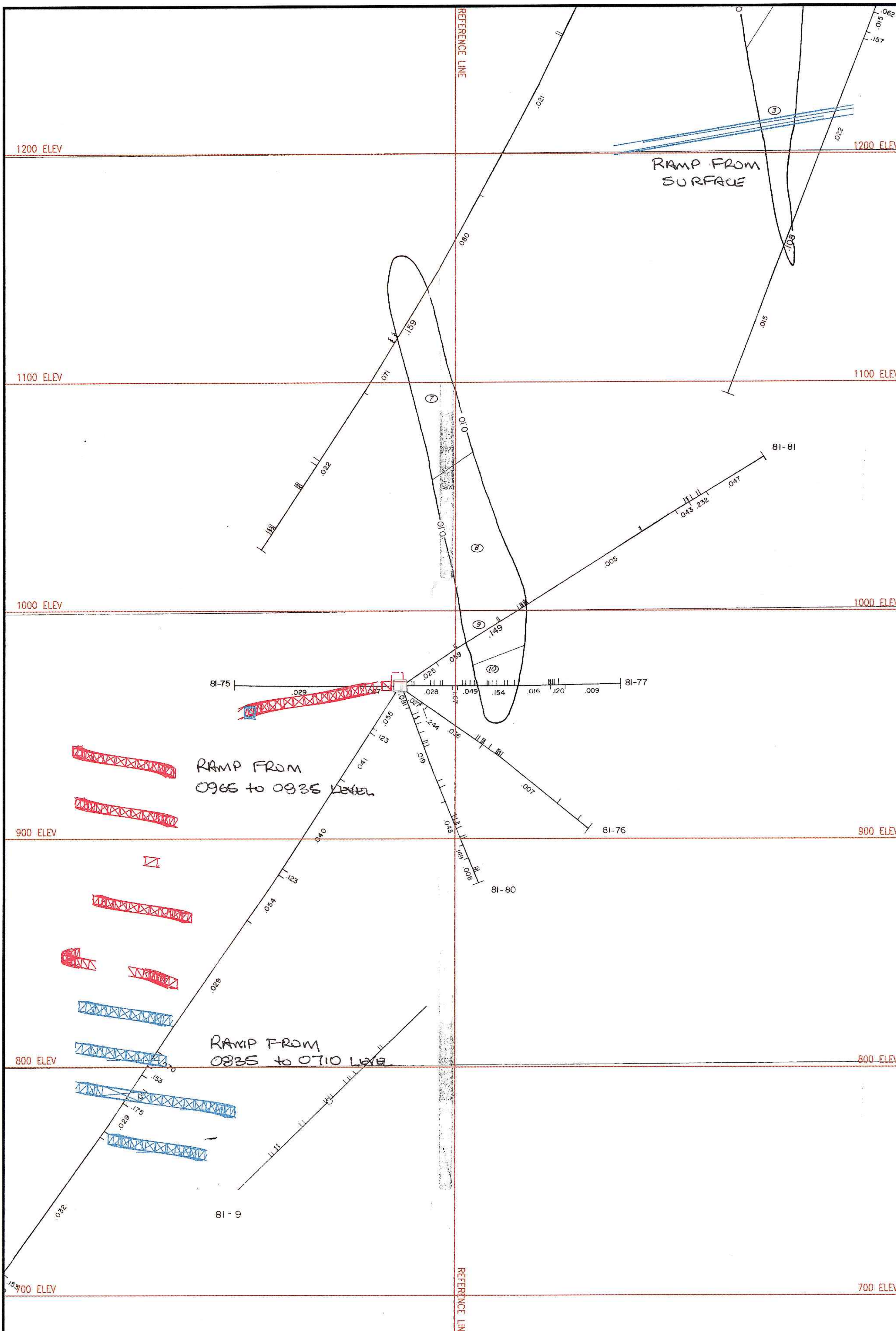
APPROVAL:	NO:
DATE: 2005-03-21	FILE: Roca 318273\Roca.dwg



Roca

HATCH™

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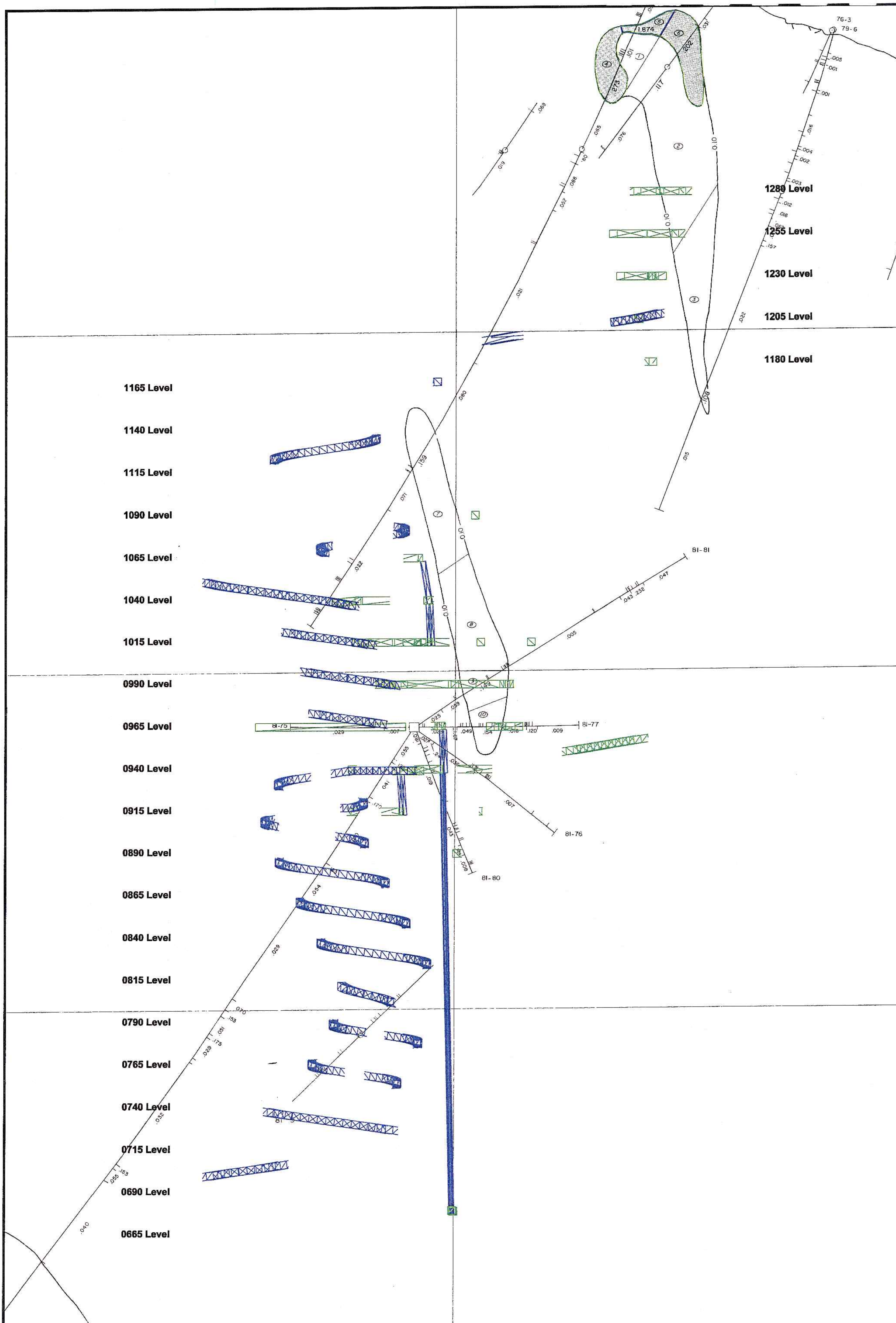

Roca

HATCH™

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APPROVAL:		NO:	
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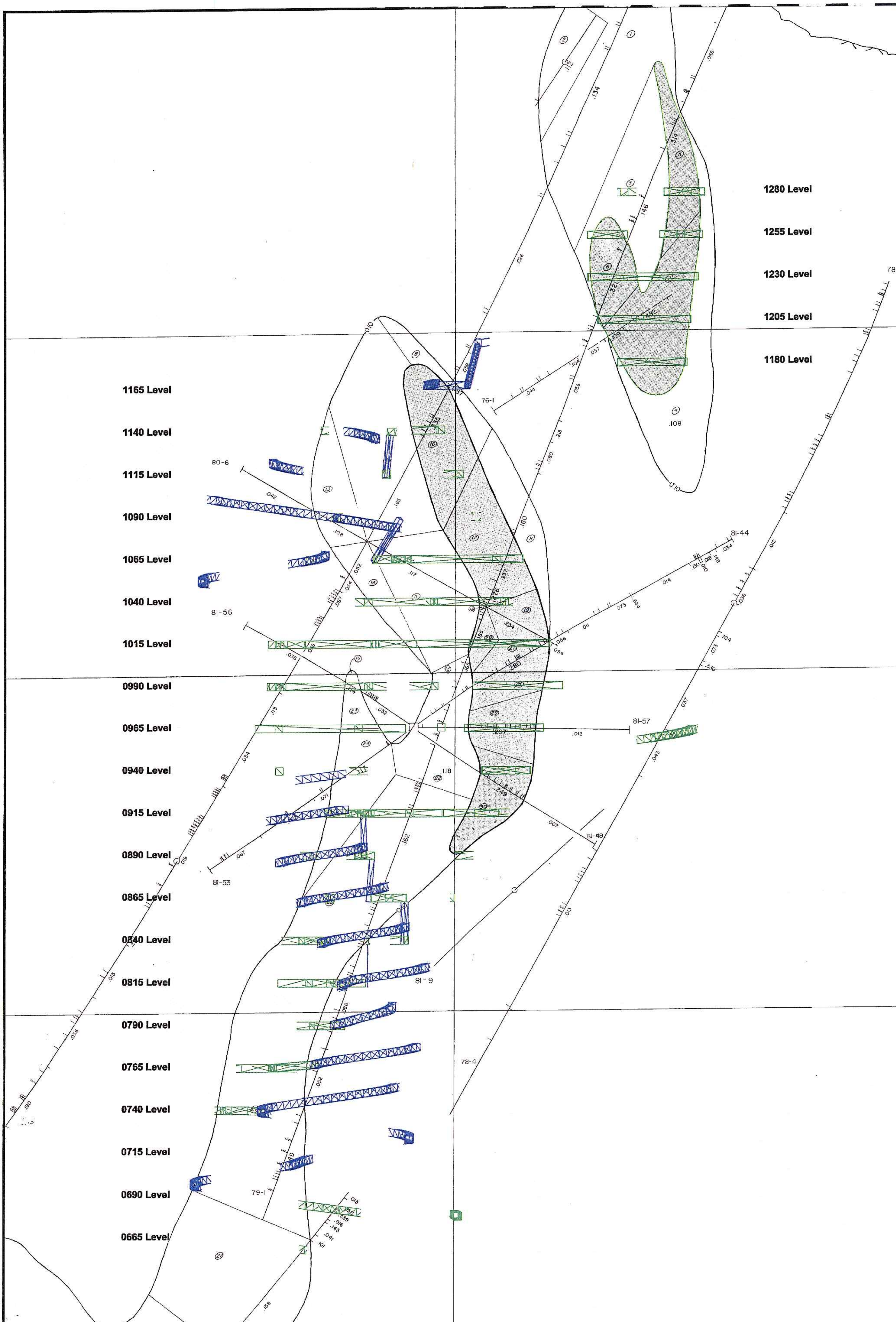

Roca

HATCH™

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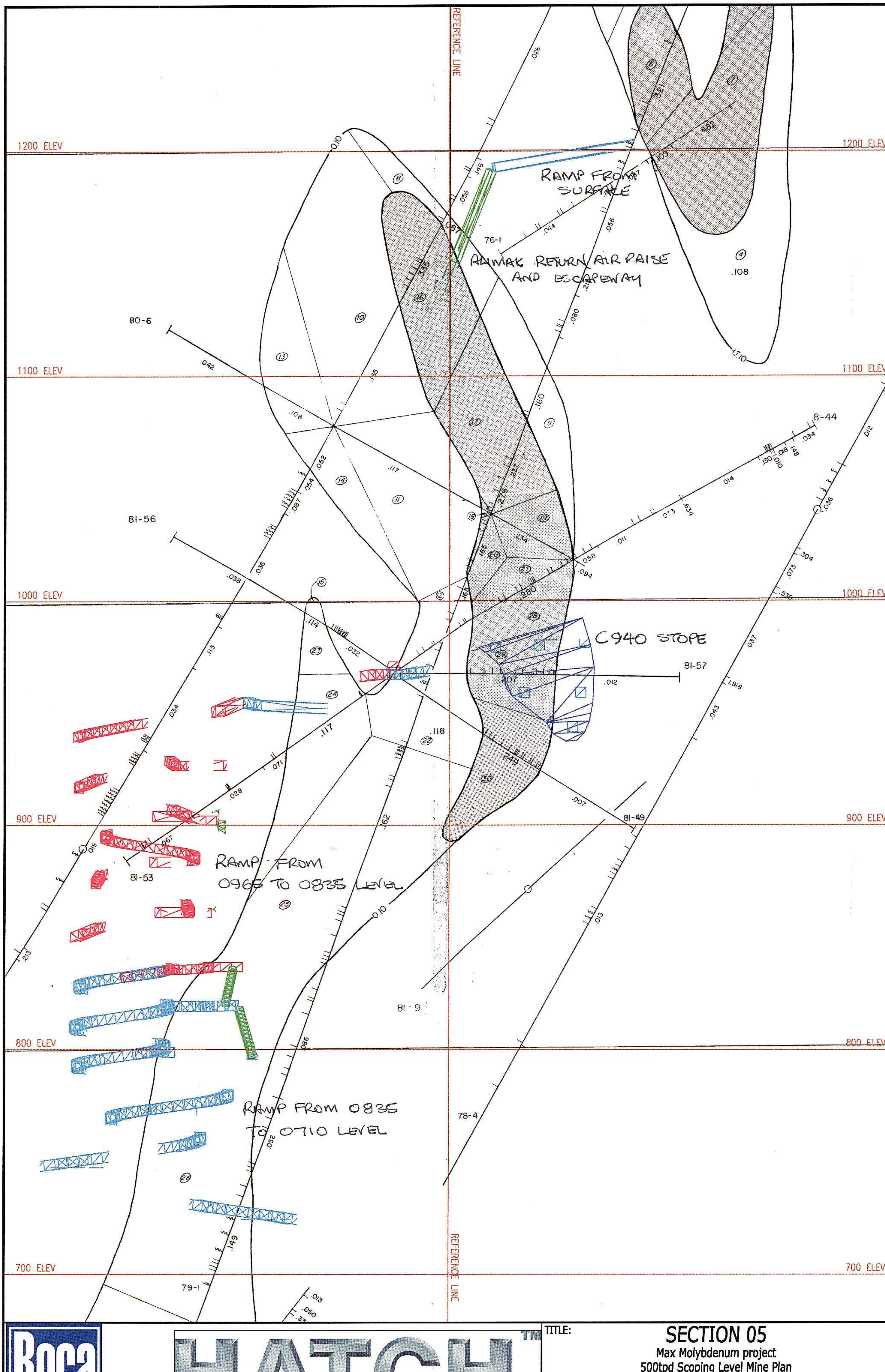

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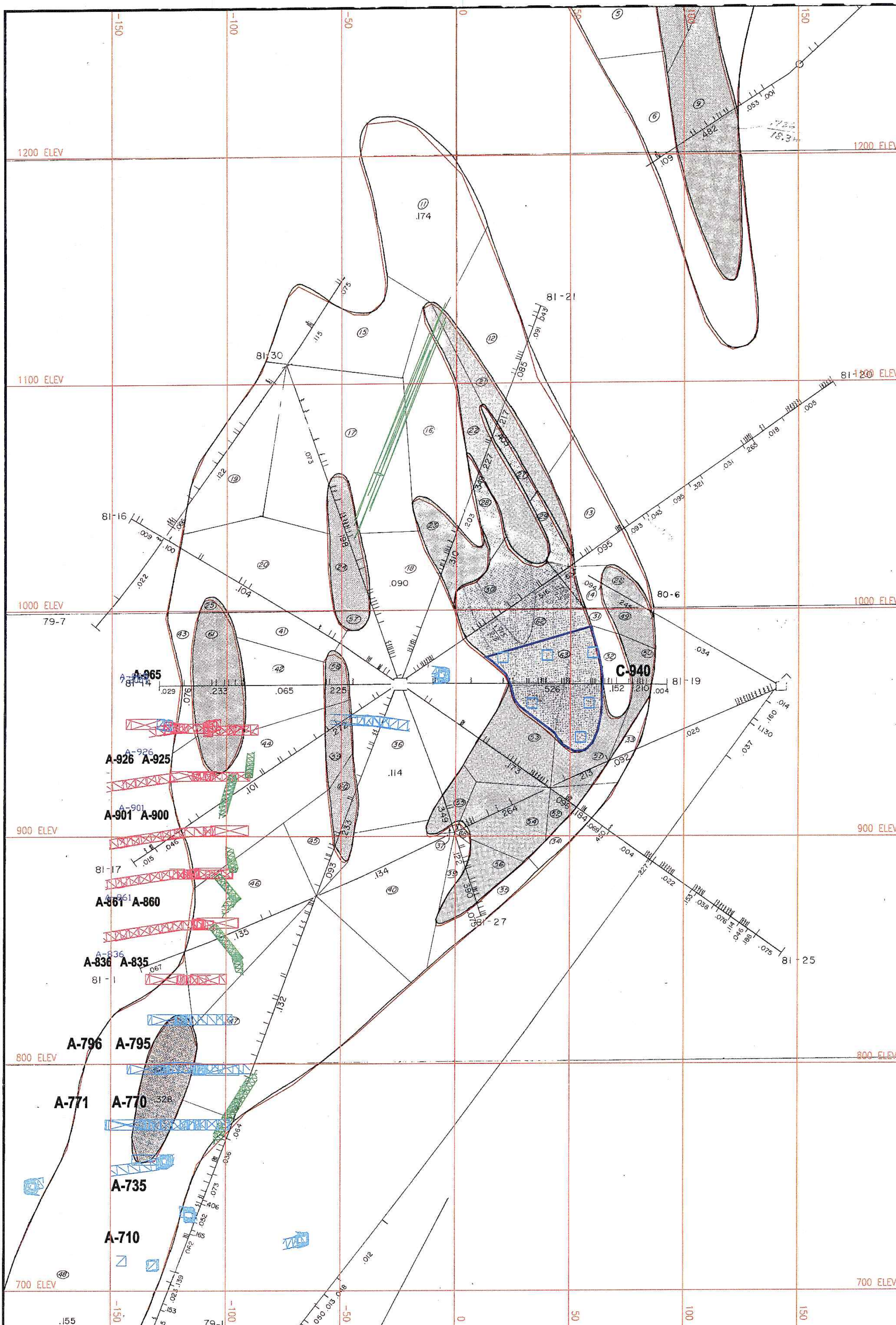

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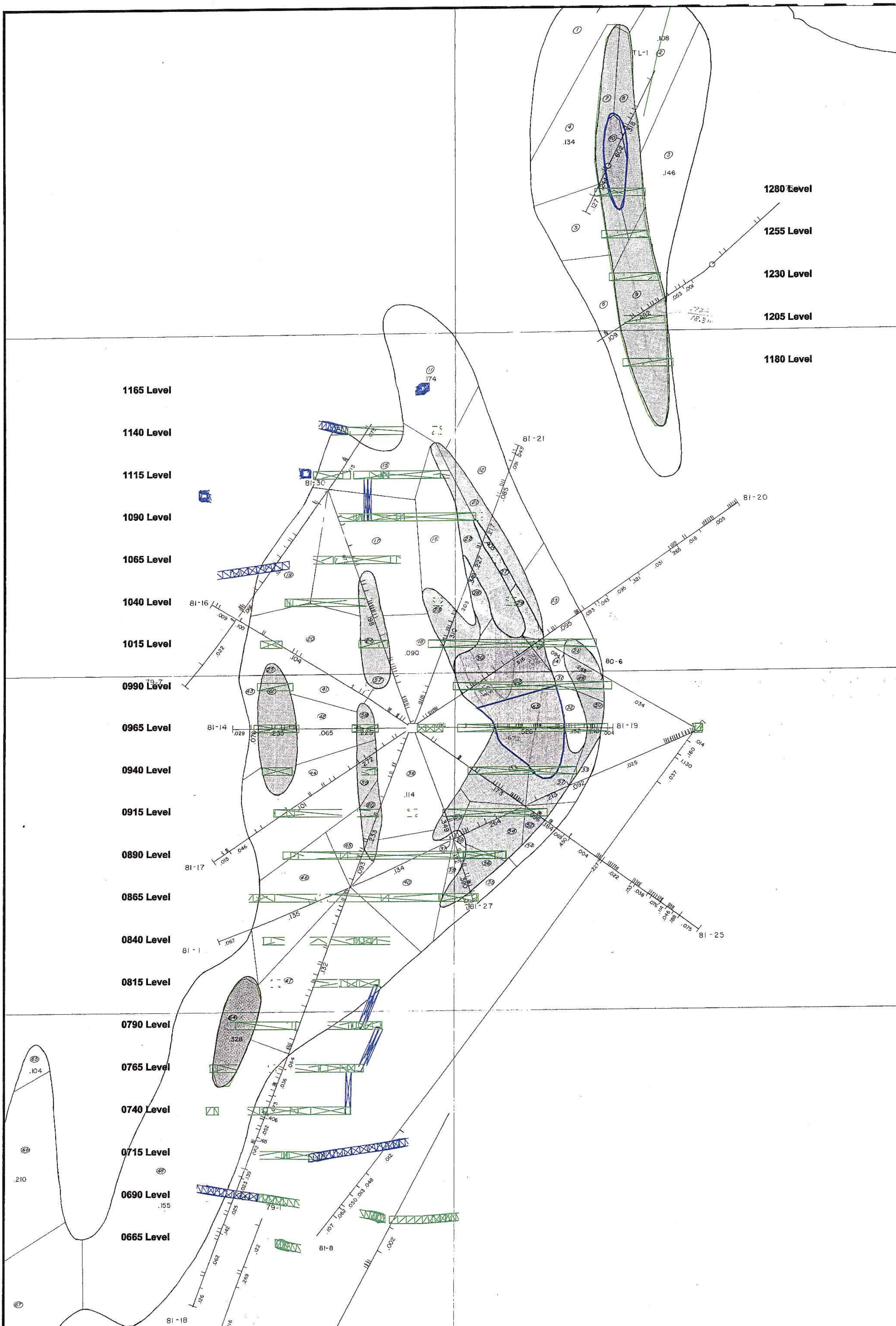
DATE: 2005/03/10	FILE : \Roca 318273\Roca.dwg

Roca

HATCH™



Roca

HATCH™

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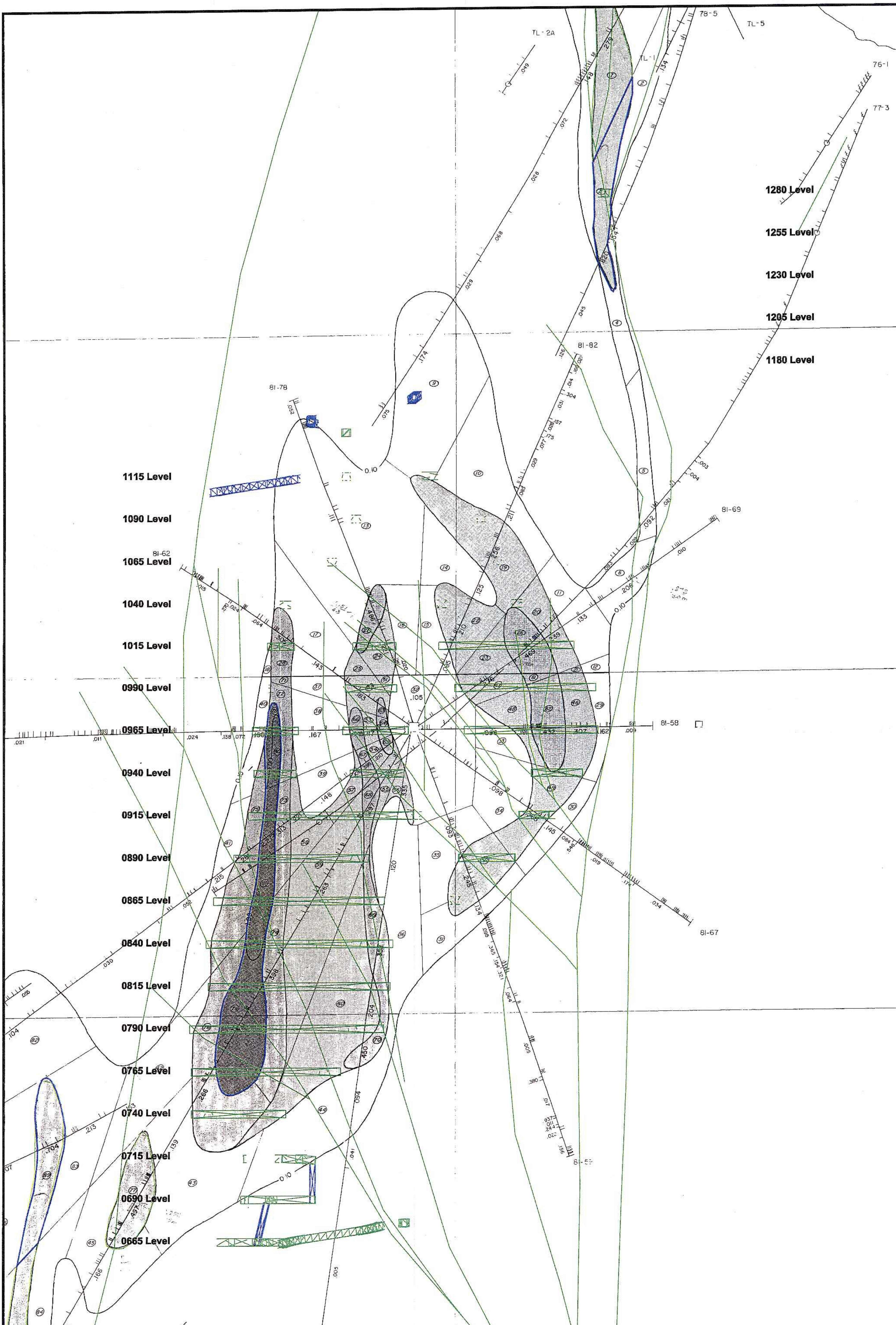

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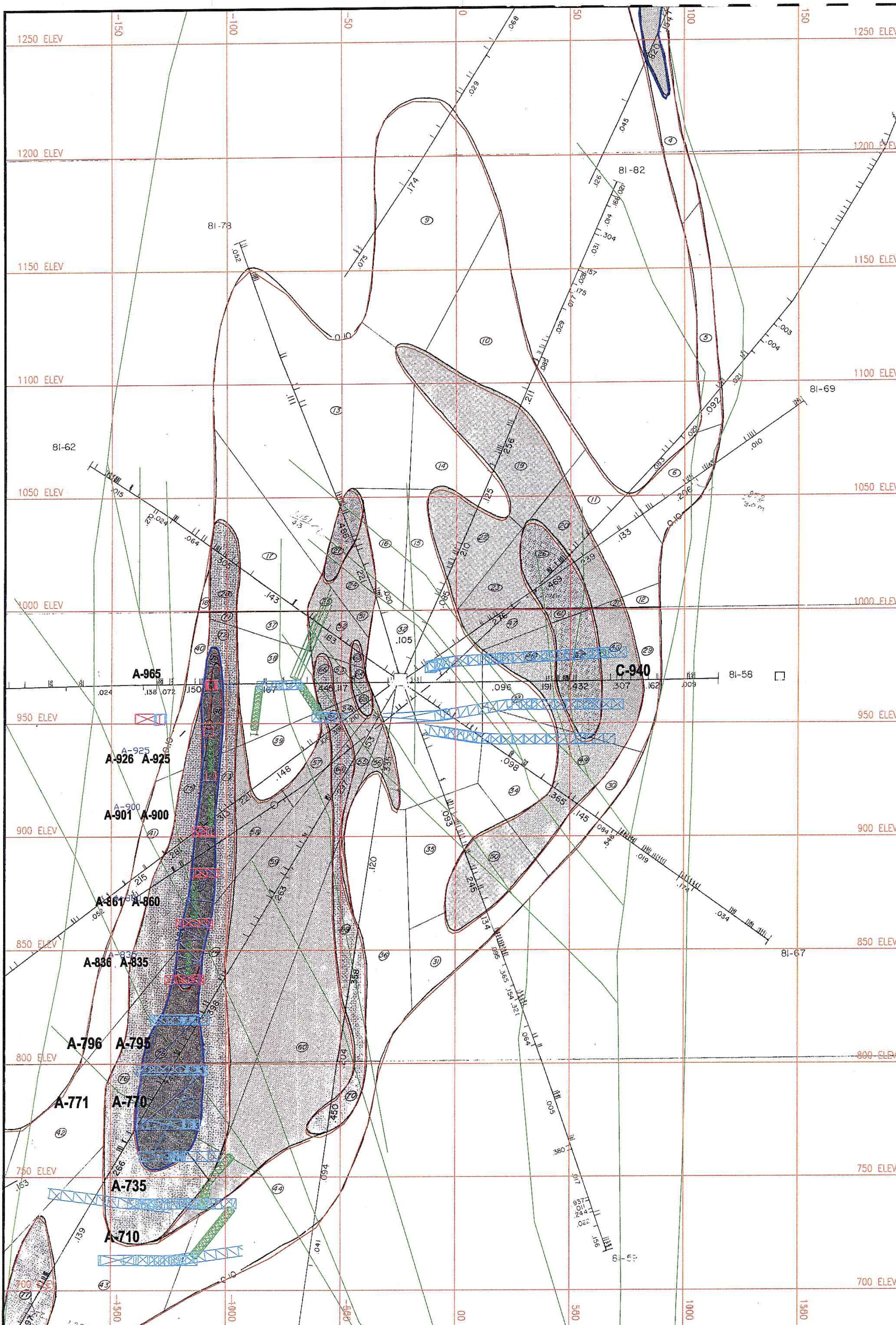

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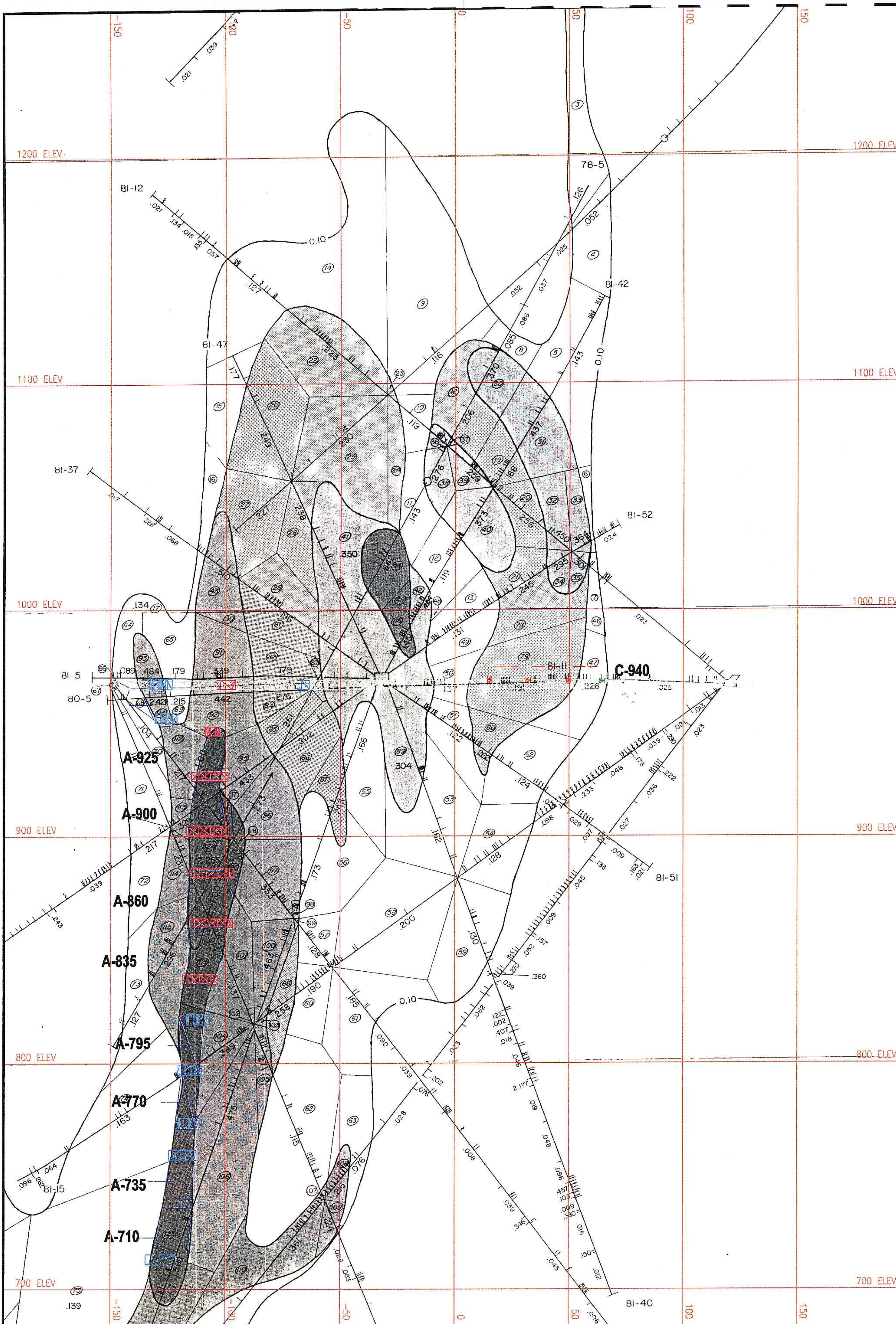

Roca | HATCH™

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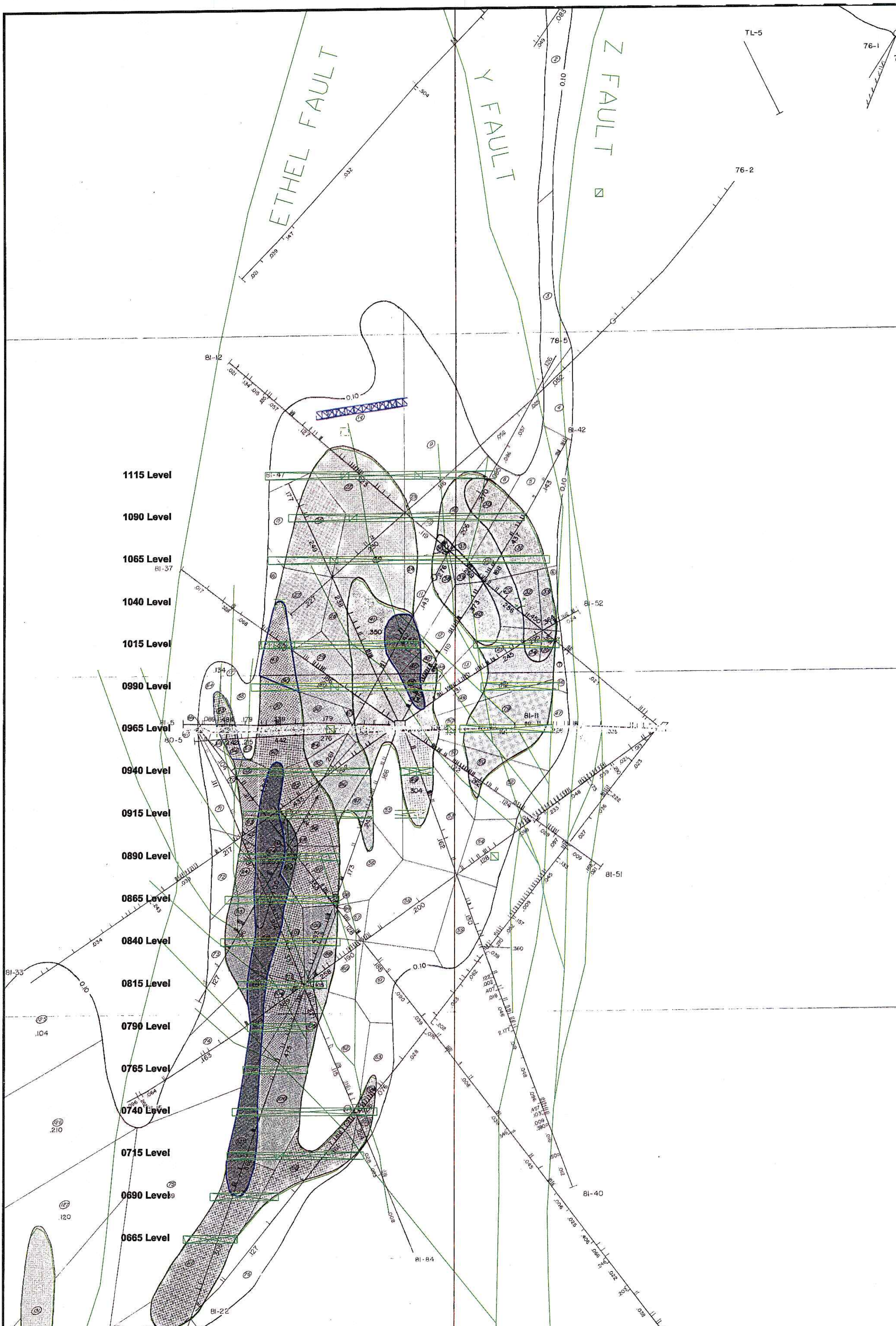

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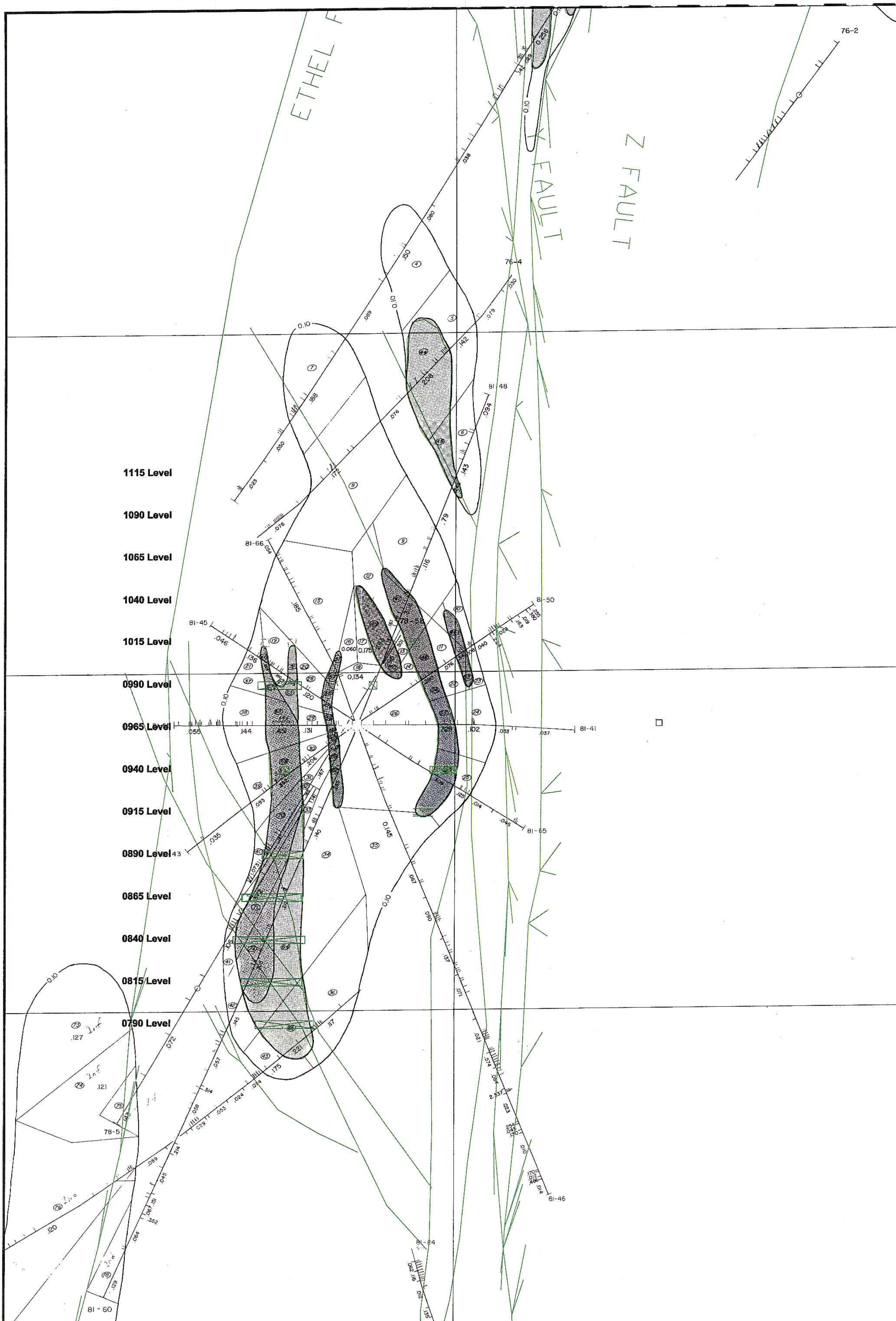

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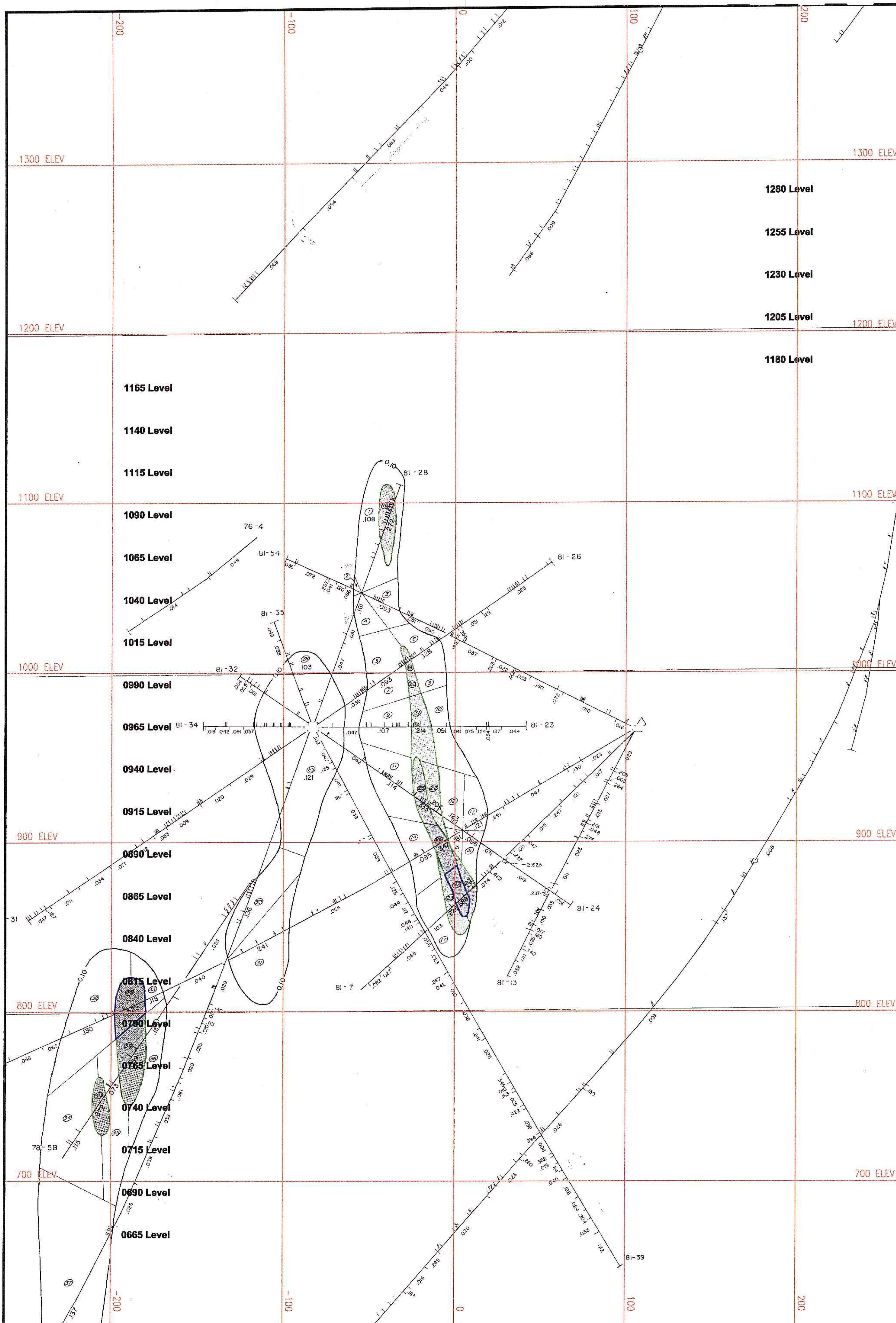

Roca

HATCH™

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APPROVAL:		NO:	
DATE:	2005/03/17	FILE:	Roca 2500tpd 2005-03-17.dw

Appendix F

Technical Report

TECHNICAL REPORT

on the

MAX MOLYBDENUM PROPERTY

Revelstoke Mining Division
British Columbia, Canada

Prepared for
ROCA MINES INC.

September 20, 2004
Vancouver, BC

T. N. Macauley, P.Eng.

EXECUTIVE SUMMARY

Roca Mines Inc. ('Roca') has acquired an option to earn a 100% interest in a property in southeastern British Columbia that contains a significant molybdenum deposit. Adjacent claims have been staked and purchased, so that Roca has now consolidated its control of the area of interest.

The MAX property was previously explored by a joint venture of Newmont Mines Limited ('Newmont') and Esso Minerals Canada ('Esso') in 1975 to 1982 as their Trout Lake Project. Work expenditure during that period totalled $14.9 million. Roca has recently purchased from Newmont the complete original data set documenting the results of that work.

Geologically, the property lies near the north end of the Kootenay Arc in tightly folded, strongly sheared metasedimentary rocks of Paleozoic age. On the MAX property these rocks are intruded by a small granodiorite stock of Cretaceous age, with which molybdenite mineralization is associated. A pipe-like mineralized body has been traced by extensive diamond drilling from its small surface exposure on a mountain ridge downward to where it swells out into a substantial deposit.

At 500 m below the surface showing, the Newmont-Esso joint venture drove a long adit to the deposit, and carried out drifting and crosscutting within it. Radiating diamond drill holes from underground delineated the central portion of the deposit, where its extent at that horizon is about 200 by 300 m. Deeper exploratory drilling showed the body developed a steep southwesterly plunge below the adit level. Mineralization was traced as deep as 1000 m below surface where it remains open to extension.

Molybdenite (MoS_2) is the only mineral of economic importance in this deposit. Along with pyrite and pyrrhotite, the total sulphide content is 1 to 2%, but runs as high as 10 to 15% in the higher grade zones. Molybdenite is mainly present along the margins of veins in a quartz stockwork. In the higher grade zones (>1% MoS_2) it is strongly disseminated in microfractured intrusive bodies accompanied by large quartz veins and intense quartz flooding. The vein stockwork is best developed in and around the margins of the intrusive and its dyke-like apophyses. The centre of the large granodiorite mass is virtually devoid of veining and mineralization. Faulting is evident in and around the deposit, some probably pre-mineralization. A strong post-mineral fault bounds the east side of the deposit.

Several long inclined diamond drill holes from surface into the central portion of the deposit produced exceptional results. For example, hole 77-3 averaged 0.408% MoS_2 over 271 m. Following that up, three more intersections in the same vicinity obtained averages of 0.225 to 0.443% over lengths of 276 to 349 m. Within these long intersections were a number of 10 to 30m lengths of better grade material in the 0.5 to 1.0% range plus a few high grade ones, the best of which was 23m of 3.077%. The latter contained the highest individual sample of

1.5m containing 7.19%. The later underground program showed these to be in the largest of the five zones comprising the deposit, where dyking, veining, faulting is most intense. The mineralization continues to depth to the southwest, but has not been drilled to the same degree because of the hole depths and inadequate drill positions.

The mineral resource estimate of the Newmont-Esso joint venture has been reviewed and modified by the author, as follows, to bring it into compliance with the CIM Standards stipulated by National Instrument 43-101 of the Canadian Securities Commissions.

MEASURED			INDICATED		MEASURED & INDICATED	
Cutoff % MoS^2	Tonnes	Grade % MoS_2	Tonnes	Grade % MoS_2	Tonnes	Grade % MoS_2
0.10	27,870,000	0.21	15,070,000	0.18	42,940,000	0.20
0.20	9,340,000	0.35	2,010,000	0.41	11,350,000	0.36
0.50	1,010,000	1.01	370,000	0.77	1,380,000	0.94
1.00	260,000	1.95	20,000	1.87	280,000	1.95

In addition to the above, inferred resources total 8,900,000 tonnes averaging 0.16% MoS_2 at the 0.10 cutoff, including 460,000 tonnes averaging 0.33% at the 0.20 cutoff. The resource was estimated manually by drawing grade contours at the 0.10, 0.20, 0.25, 0.50, 1.00% MoS_2 levels on the 30 m spaced sections, and then dividing the material bounded by the contours into polygons, generally based on one or several drill intercepts. Bulk sampling of the drift rounds confirmed the grades of diamond drill holes and grade contours in those areas. No allowances for mining losses or dilution are incorporated in these estimates.

Metallurgical testing of drill core composites recovered about 90% of the molybdenite in a concentrate assaying 90 to 92% MoS_2 in bench scale flotation tests. Testing of adit bulk sample composites detected a grade versus recovery relationship that warrants further investigation.

Environmental studies during the 1979 – 1982 period collected valuable information, and Newmont's consultants concluded that development of a molybdenite mine could likely be accomplished without serious detrimental effects to the existing environment of the area provided that mitigative measures were incorporated during all phases of development. Sites for a possible plant and tailings storage are conveniently located on the property below the adit portal.

Work on the project was suspended by the Newmont-Esso joint venture in 1982 due to a price decline and poor market projection for molybdenum products. After languishing in the US $2 to $4 per pound range for most of the time since then, the price of molybdenum in oxide form started to climb in 2003 and is currently trading at US $17.25 to $18.50 per pound.

It is concluded that the attributes of this project justify its economics being analysed at several grade/tonnage combinations. One of these should involve a mining plan for the resource at the 0.50% MoS_2 cutoff, which would not require a mill of large tonnage capacity. The study of the larger resource at the 0.20% cutoff should determine what additional drilling and studies are needed for an operational plan. It should likely include some drilling on the exploration targets that have been described.

The program being recommended here is to re-establish access to the adit, and then carry out 3000 m of detailed diamond drilling on the portion of the large B Zone known as the High Grade Dyke (HG Zone). At this locality, 706,000 tonnes averaging 1.07 % MoS_2 are estimated in a vertical body 60 to 90 m long, 235 to 335 m high and 7 to 28 m wide. The program consisting of about 23 holes would bring drill hole spacing in the upper portion of the zone to about a 20 m grid. This would permit development of a mining plan using ramp access from the existing adit. The estimated cost of the program is $975,000.

TABLE OF CONTENTS

TABLES

FIGURES

INTRODUCTION

Roca Mines Inc. ('Roca') has acquired an option to earn a 100% interest in certain mineral claims in southeastern British Columbia that contains a significant molybdenum deposit. Adjacent claims, crown grants and a mining lease have been staked and purchased, such that Roca has now consolidated its control of the area of interest.

The MAX property was previously explored by a joint venture of Newmont Mines Limited ('Newmont') and Esso Minerals Canada in 1975 to 1982 as their Trout Lake Project. Work expenditures during that period totalled CDN $14.9 million. Roca has recently purchased from Newmont Mines Limited the complete set of data documenting the results of that work.

The author of this report has been retained by Roca to conduct the following tasks:

- review the extensive data base of past work on this property;
- review and modify where necessary the historic mineral resource estimate;
- assess the potential of the mineral deposit in light of current conditions; and
- make recommendations on work to be done to further advance this project.

This technical report has been prepared in compliance with National Instrument 43-101 *Standards of Disclosure for Mineral Projects* and Form 43-101 F1 of the Canadian securities commissions. It is intended to be used for filing, if required, with the British Columbia Securities Commission and the TSX Venture Exchange.

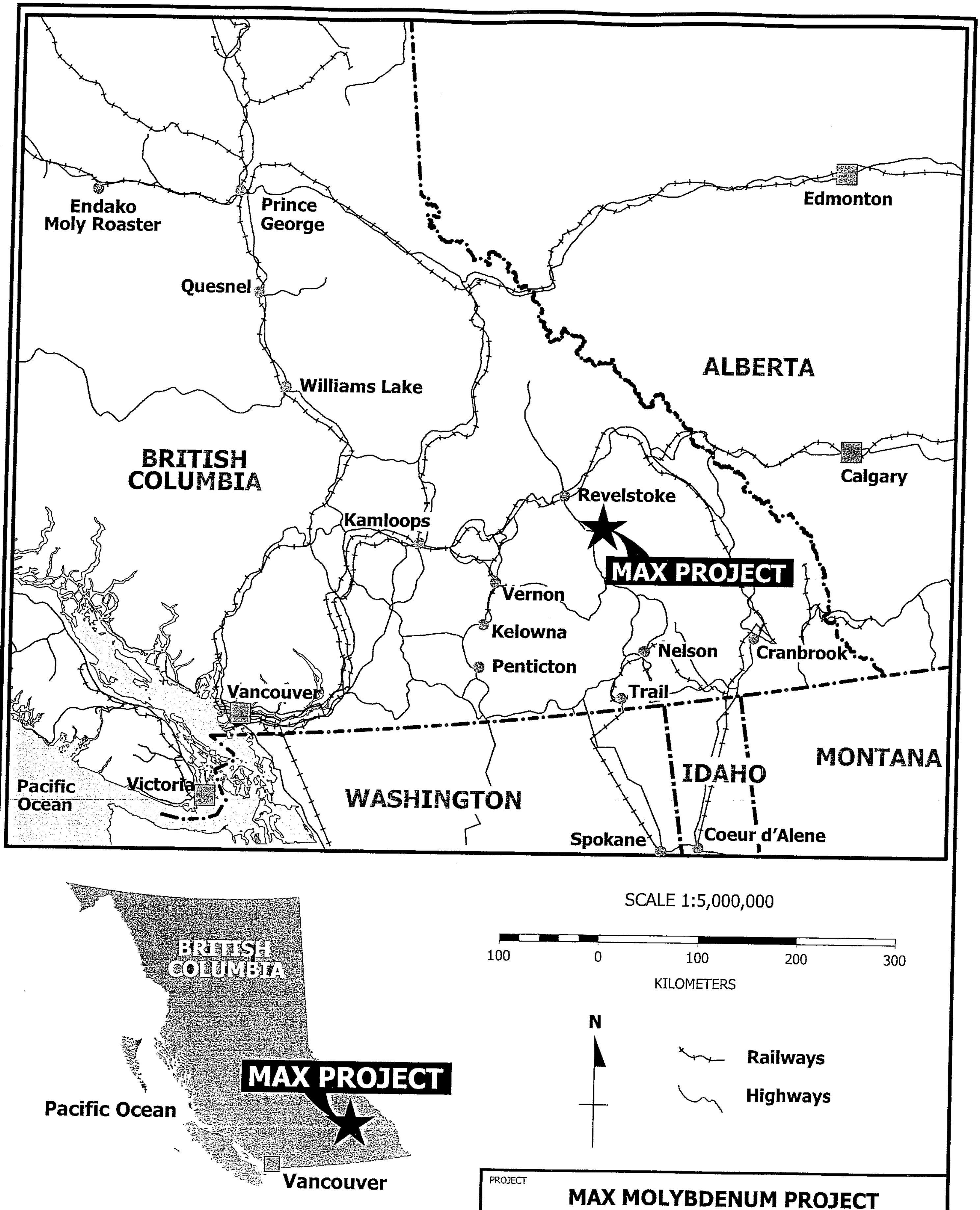
The sources of information used in the preparation of this report are principally the private reports, maps, drill logs, acquired from Newmont. The Final Report by Boyle & Parliament dated January 1983 summarizes all the facets of the project by Newmont staff and outside consultants. The main published sources are the papers by Boyle & Leitch (1983) and Linnen et al. (1995) in publications of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM).

The author's familiarity with this property derives from doing the initial geological mapping and geochemical survey in 1975 for Newmont Exploration of Canada, and then as exploration manager directing the exploration and data compilation in the 1976-1982 period. He last visited the property on August 20, 1991, in company with an environmental specialist, when he inspected the stockpiled mineralized rock, the adit portal area, an adjacent historic shaft known as the Lucky Boy and the condition of the stored drill core.

Monetary amounts referred to in this report are Canadian dollars unless otherwise specified.

PROPERTY DESCRIPTION AND LOCATION

The property is located in the Revelstoke Mining Division at longitude 117° 36' W and latitude 50° 38' N on National Topographic System map sheet 82K/12E as shown on Figure 1. Its area is approximately 45 square kilometres (27 square miles).



Roca Mines Inc.

PROJECT	MAX MOLYBDENUM PROJECT		
TITLE	LOCATION MAP		
DATE: AUGUST 2004	SCALE: 1:5,000,000	DRAWN: WKL	
PROJECT No.: 0327-003-01	FIGURE. No.: 1	REV.: 0	

0327-003-01 MAX Locatio

The property consists of 64 mineral titles, the particulars of which are listed in Table 1, and shown on Figure 2. The claims are contiguous. The five Crown Granted claims and one Mining Lease have been legally surveyed, and carry surface rights when used for mining purposes. They are maintained by paying the nominal land tax and lease payment annually. The others are located mineral claims carrying mineral rights only and must be kept in good standing by filing evidence of having done the required assessment work or paying cash in lieu thereof. Although not legally surveyed, their location shown on Figure 2 is believed to be accurate. In addition, the purchase from Newmont includes a Licence of Occupation No. 402602 for a portion of District Lot 7951.

Referring to Figure 2, it should be noted that the mineral deposit is centrally located within the property on claims CCM #1, CCM #2, CCM3, and CCM4, and the potential plant site and tailings storage area lie just downslope from the adit portal on claims CCM5 to CMM8 and portions of MAX 2 and 5.

Emerald Gold Mines Inc. ('Emerald') a private company qualified to do business in British Columbia, has granted Roca an option to acquire a 100% interest in the Emerald Property comprising several claims listed in Table 1, subject to a net smelter return royalty ('NSR'), by:

a) paying Emerald $200,000 in stages on or before January 1, 2007 ($50,000 paid), and

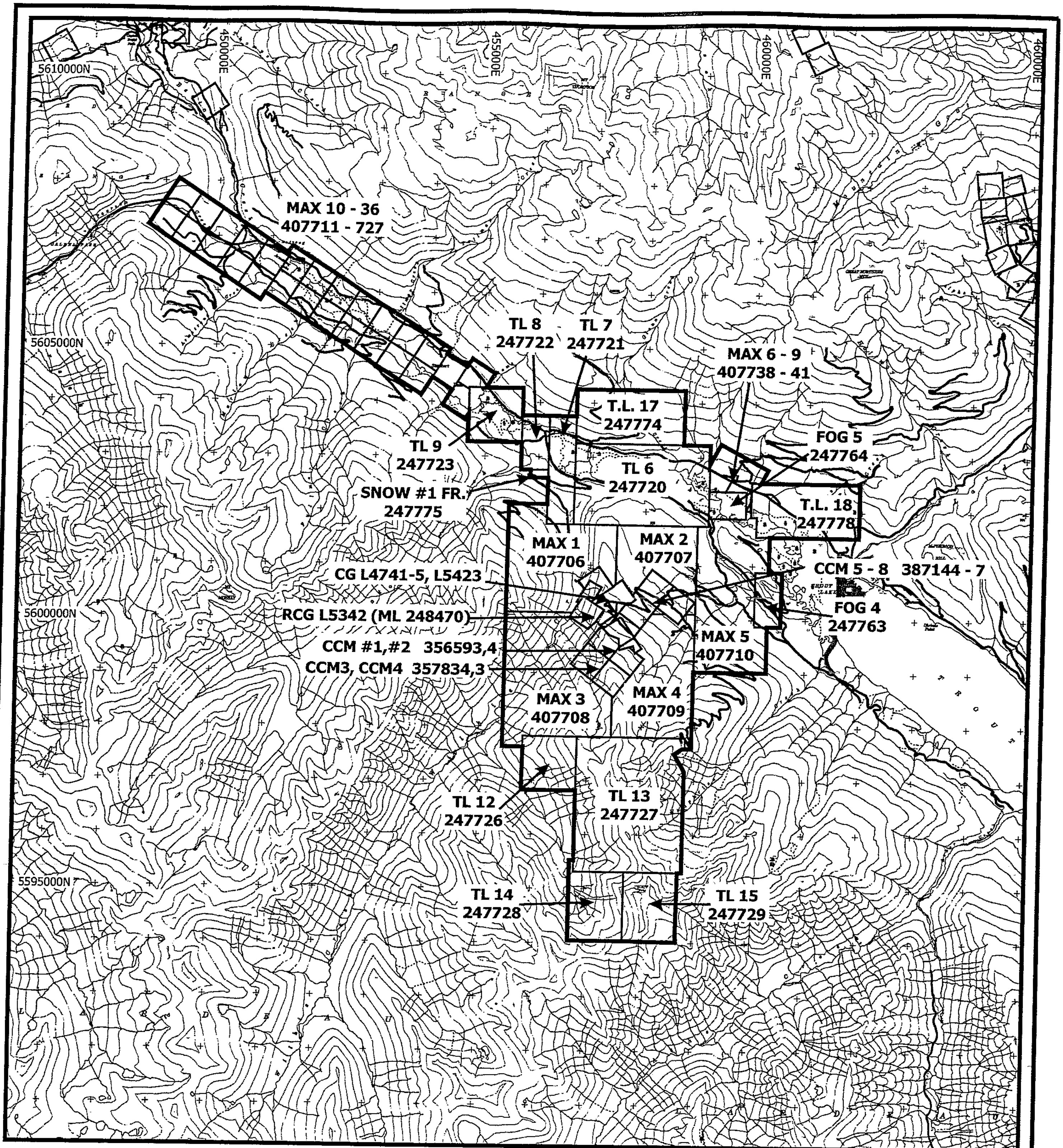
b) issuing to Emerald 400,000 shares in annual payments of 100,000 shares on or before January 16, 2007 (100,000 issued).

Subject to Exchange policies, Roca shall issue to Emerald a further 200,000 shares at commencement of commercial production. The NSR is at the rate of 2.5% and Roca has the right to purchase up to a 60% interest in NSR by paying $1,000,000 for each 30% interest. In addition to the Emerald claims, the NSR also applies to any production from other claims acquired by Roca after January 10, 2004 that are situated within 6 km of the perimeter of the Emerald claims.

With regard to the claims, crown grants and mining lease purchased from Newmont (the Newmont Property), Roca has granted Newmont a 2.5% NSR on any production from the Newmont Property, with such NSR being reduced to 1% by Roca paying to Newmont $2,000,000 prior to commencement of production, at Roca's option. Roca has also agreed to issue to Newmont 200,000 shares on making a production decision on the Newmont Property.

Roca has assumed the future liability of Newmont on the claims it has purchased from them, and also the ground formerly controlled by Newmont now held as the CCM and MAX claims. Roca has indemnified Newmont against third party claims of property damage or injury or death arising out of activities on the purchased claims subsequent to date of purchase, and on the former Newmont ground whether arising prior to or subsequent to the purchase date.

Roca has filed a Notice of Work with the BC Ministry of Energy and Mines ('BCMEM') to carry out the work program recommended in this report and a response is pending. Roca will have posted a bond with the BCMEM to cover continuation of water quality testing for three years that was Newmont's reclamation obligation, and will be posting another bond to cover reclamation arising from their own exploration activities.



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COMPILED FROM BRITISH COLUMBIA MINERAL TITLES
REFERENCE MAPS m082k052,053,062,063,072,073
NAD83 UTM ZONE 11N

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KILOMETERS

Roca

Roca Mines Inc.

PROJECT		
MAX MOLYBDENUM PROJECT		
TITLE: PROPERTY MAP		
DATE: AUGUST 2004	SCALE: 1:100,000	DRAWN: WKL
PROJECT No.: 0327-003-01	FIGURE. No.: 2	REV.: 0

0327-003-01 MAX Claim... ED.cdr

Table 1 – MAX Property Claims

Part 1 – The Emerald Property: Optioned from Emerald Gold Mines Inc.

Claim Name	Tenure No.	No. of Units	In Good Standing Until
CCM #1	356593	1	2005.09.29
CCM #2	356594	1	2005.09.29
CCM3	357834	1	2005.09.29
CCM4	357833	1	2005.09.29
CCM5	387144	1	2005.09.29
CCM6	387145	1	2005.09.29
CCM7	387146	1	2005.09.29
CCM8	387147	1	2005.09.29

Part 2 – The Newmont Property: Purchased from Newmont Mines Limited

Claim Name	Tenure No.	No. of Units	In Good Standing Until
TL 6	247720	15	2005.12.01
TL 7	247721	4	2005.12.01
TL 8	247722	2	2005.12.01
TL 9	247723	4	2005.12.01
TL 12	247726	4	2005.02.23
TL 13	247727	20	2005.02.23
TL 14	247728	6	2005.02.23
TL 15	247729	6	2005.02.23
TL 17	247774	8	2005.11.22
TL 18	247778	8	2005.02.21
Fog 4	247763	2	2005.07.31
Fog 5	247764	2	2005.10.12
Snow #1 Fr	247775	1	2005.12.19
Mining Lease (Horseshoe, Lot 5342)	248470	1	2005.08.23
Crown Grants	Lots 4741-4745,5423	6	2005.07.01

Part 3 – Claims staked by Roca Mines Inc.

Claim Name	Tenure No.	No. of Units	In Good Standing Until
MAX 1	407706	16	2005.09.29
MAX 2	407707	12	2005.09.29
MAX 3	407708	20	2005.09.29
MAX 4	407709	15	2005.09.29
MAX 5	407710	18	2005.01.14
MAX 6	407738	1	2005.01.12
MAX 7	407739	1	2005.01.12
MAX 8	407740	1	2005.01.12
MAX 9	407741	1	2005.01.12
MAX 10	407711	1	2005.01.12
MAX 11	407712	1	2005.01.12
MAX 12	407713	1	2005.01.14
MAX 13	407714	1	2005.01.12
MAX 14	407715	1	2005.01.12
MAX 15	407716	1	2005.01.12
MAX 16	407717	1	2005.01.12
MAX 17	407728	1	2005.01.12
MAX 18	407729	1	2005.01.12
MAX 19	407730	1	2005.01.12
MAX 20	407731	1	2005.01.12
MAX 21	407732	1	2005.01.13
MAX 22	407733	1	2005.01.13
MAX 23	407734	1	2005.01.13
MAX 24	407735	1	2005.01.13
MAX 25	407736	1	2005.01.13
MAX 26	407737	1	2005.01.13
MAX 27	407718	1	2005.01.13
MAX 28	407719	1	2005.01.13
MAX 29	407720	1	2005.01.13
MAX 30	407721	1	2005.01.13
MAX 31	407722	1	2005.01.12
MAX 32	407723	1	2005.01.12
MAX 33	407724	1	2005.01.12
MAX 34	407725	1	2005.01.12

MAX 35	407726	1	2005.01.12
MAX 36	407727	1	2005.01.12

ACCESS, INFRASTRUCTURE, PHYSIOGRAPHY

Access to the MAX property is via Highways 23 and 31 from the towns of Revelstoke (on Trans Canada Highway and CPR mainline) or Nakusp, with driving distance of 80 kilometres (km) to Trout Lake village, then 6 km of logging roads to the adit portal. The Trout Lake valley is sparsely populated and little infrastructure exists beyond road, telephone line and accommodation.

The property extends from the Trout Lake valley at elevation 760 metres (m) (2500 feet) on the north for 8 km south to the peak of Trout Mountain at elevation 2700 m (8800 feet). Slopes are moderate in the northeast portion of the property where most of the exploration has been done, but steep on the west side and the higher ground to the south. Mature hemlock and cedar forest occur below about 1800 m (6000 feet) elevation. Logging in recent years has taken place in the drilling area, and disrupted the former system of drill roads.

Mean annual precipitation in this area is about 500 millimetres (mm) rain (20 inches); snow 3300 mm (130 inches), for a total of 840 mm (33 inches). Mean daily temperatures range from –9°C in January to 15°C in July. The ideal time for surface exploration is May to October.

Various engineering studies by Newmont suggest that infrastructure development of a mine, including camp, mill and concentrator, and tailings storage could be readily accommodated on the MAX property, with arrangements to be made for surface rights as necessary.

HISTORY

The first claims staked in the MAX property area were the Lucky Boy and Copper Chief in 1897 and 1901, with early work focusing on silver bearing quartz veins. Shipments of sorted ore from the Lucky Boy were 450 tonnes (t), with a further 20 t of tungsten ore in 1942. In the early 1950's Major Explorations Limited carried out surface exploration on tungsten-bearing skarns. Although molybdenite was reported as early as 1917, it was not until 1969 that a subsidiary of Scurry Rainbow Oil Limited (Cascade Moly Mines Limited) optioned a claim group covering the area of interest from Mr. Alan Marlow. Later bulldozer trenching and six surface drill holes helped to extend the area of molybdenite mineralization from the small (few square metres) surface showing.

In 1975 Newmont Exploration of Canada Limited optioned Mr. Marlow's property and carried out prospecting, geological mapping and a geochemical survey (Macauley, 1975). In 1976 a joint venture with Esso Minerals Canada Limited ('Esso') was formed, (The Trout Lake Project), with Newmont being the operator. Surface diamond drilling of 32 holes (15,747 m) from 1976 to 1979 was successful in significantly expanding the molybdenite deposit and demonstrating some better grade sections.

This led to a decision to undertake an underground exploration and bulk sampling program. From 1979 to 1981, a total of 2,000 m of adit, crosscuts and drift development was made on one level (the 960 m level) approximately 500 m below the surface outcrop. Underground diamond drilling of 22,151 m in 87 holes detailed the mineralization and explored the adjacent areas. Bulk samples from 189 drift and crosscut blast rounds over a total length of 687 m were processed through a crushing plant and sampling tower on site. Metallurgical laboratory testing was carried out on both drill core and bulk samples. Preliminary mining, environmental and socio-economic studies sufficient to establish a database for a Preliminary Stage 1 Environmental Assessment, as required to obtain government approval, were then completed.

Following compilation of all data, Newmont staff estimated "geologic reserves" of 48.7 million tonnes averaging 0.193% MoS_2 at a 0.10% cut-off, within which was 11.7 million tonnes of 0.362% MoS_2 at a 0.20% cut-off, or 4.8 million tonnes of 0.481% MoS_2 at a 0.25% cut-off. The estimate was divided into "drill defined" and "drill indicated" categories (Boyle & Parliament, 1983). This estimate is not in compliance with the modern classification system defined by CIM Standards and stipulated by National Instrument 43-101. Those estimates have been reviewed and modified by the author and summaries are provided later in this report.

Further work on the project was halted in late 1982 due to a decline in price and poor market outlook for molybdenum products. Total costs from project inception in 1975 to December 31, 1982 were $14.9 million. Remaining payments to property vendors were made and Newmont purchased Esso's 45% interest in the property in the early 1990's.

In 1997 claims in the central portion of the property covering the molybdenum deposit expired and were immediately staked by Emerald.

In 2003, Newmont carried out a reclamation program on the Newmont Property and, acting as an agent for the province of British Columbia completed reclamation on the Emerald property. The reclamation work consisted mainly of constructing a water collection and drainage system at the adit portal, closing the adit by placing granular fill at the portal, collecting the mineralized stockpile material, drill core, and wood/metal waste and burying them in the existing concrete ore bins. Final reclamation of this material and the concrete bins included covering them with compacted soil, site grading and vegetating.

On January 16, 2004 Roca optioned the claims covering the deposit from Emerald. In May 2004, Roca conducted a surface diamond drilling program comprising two holes (totalling 1,134 m) on the deposit in an effort to confirm former holes and obtain core samples of representative mineralization as a due diligence exercise.

By agreement effective August 6, 2004, Roca purchased all of Newmont's remaining property and the complete original data set documenting the work of the Newmont-Esso joint venture.

GEOLOGICAL SETTING

Regional Geology

As summarized by Boyle and Leitch (1983) and shown on Figure 3, the property lies near the north end of the Kootenay Arc, a belt of highly deformed, heterogeneous sedimentary rocks bowed around the eastern margin of the Nelson and Kuskanax batholiths, at the south end of the Lower Jurassic Shuswap metamorphic terrace.

The oldest rocks of the district around the property are schists, phyllites, and quartzites, with minor greenstone, of the Lower Cambrian—Middle Devonian aged Lardeau Group. They have been tightly folded and strongly sheared in northwest-trending folds, which are broken into panels by northwest and north-trending faults. Unconformably overlying these rocks are conglomerate, limestone, and sandstone of the Upper Mississippian aged Milford Group. The Jurassic aged Kuskanax Batholith, a monzonite dated at 178 Ma, lies 5 km south of the property. A series of calc-alkaline stocks of Jurassic to Cretaceous age (150-74 Ma) includes the one on the property, which has been dated by K/Ar on biotite at 76.7 ± 2.9 Ma. Molybdenite (molybdenum disulphide or MoS_2) is associated with several of these stocks in the Kootenay – Upper Arrow Lake area.

Property Geology

The Lardeau Group rocks in the vicinity of the deposit are silicified chlorite sericite biotite schists, and lesser argillite, slate, quartzite and hornfels. Carbonate units interbedded with the clastics to the north and south of the deposit are limestone, dolostone, calc-silicate schist and skarn as shown on Figure 4. The latter includes a variety of rocks from calc-silicate hornfels to diopside garnet skarn, frequently with pyrrhotite and occasionally scheelite.

Intruding the above is the Trout Lake stock forming a network of intersecting dykes and irregular masses. There appears to be as many as four intrusive phases, with the earliest porphyritic granodiorite making up the bulk of the stock, followed by aplite dyking, and three varieties of granodiorite and quartz diorite. The dykes are inter-mineral, as they both cut off and are cut by mineralized quartz veins.

The stock measures about 50 to 100 m wide by 300 m long at surface; it has been traced by drilling to a depth of 1000 m where it broadens considerably, but its overall form is unknown.

Structure

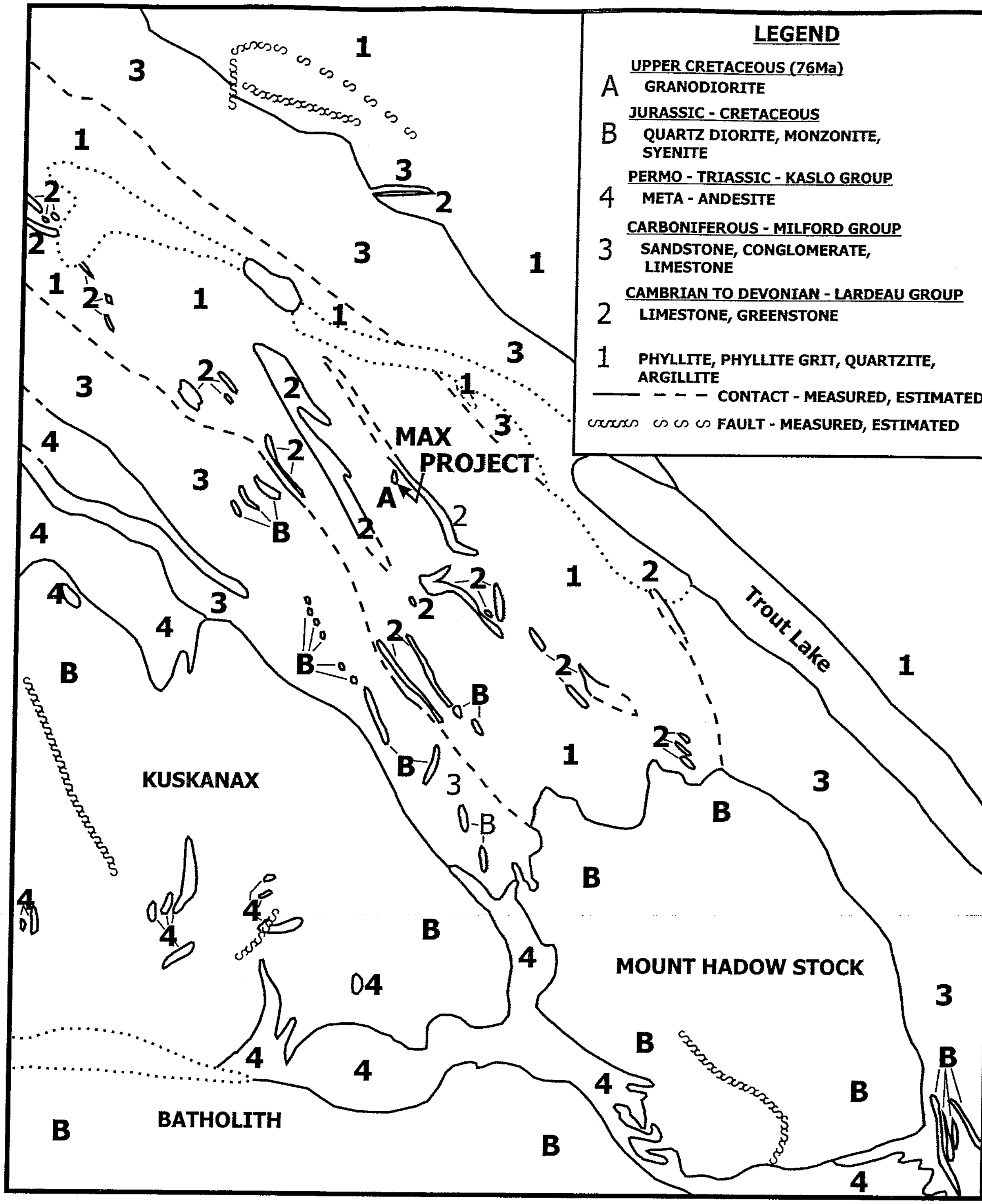
The meta-sediments strike northwest and dip 60-90° northeast. They are tightly folded with axes horizontal to moderately plunging. The strong, north-trending, vertical "Z" Fault bounds the stock on its east side and appears to have exerted a control on the location of the stock and subsequent mineralization. A post-mineral, east side down movement is indicated. Other northwest-southeast faults have been mapped or interpreted. Many small conjugate and splay faults cut the deposit underground, but displacements are generally less than 10 m.

Dyke and quartz vein orientation also form conjugate patterns, with northeast and northwest sets as well as north-south sets, shown on Figure 5, and lesser flat-dipping veins. Veining increases toward several centres associated with intrusive apophyses. Flat-dipping veins also become more prevalent along with randomly oriented veins to form a true stockwork (Boyle and Leitch, 1983).

Metamorphism & Alteration

Regional metamorphic grade increases from northeast to southwest approaching the Kuskanax Batholith. A 1.2 by 2 km contact metamorphic aureole about the stock has been recognised, exemplified by biotite hornfels in the pelitic rocks and an assemblage of muscovite – chlorite – tremolite – clinozoisite – plagioclase – k feldspar – quartz in the calc-silicates.

Hydrothermal alteration studies show a strong silica-potassic zone with MoS_2 present at the centre, outward to a quartz-sericite-pyrite (phyllic) zone, and possibly an outer zone where ankerite and chlorite are more prevalent. Molybdenite is strongly associated with alkali feldspars, but in detail is associated with incipient muscovite replacement of albite and K feldspar; veins that lack feldspars are typically barren of molybdenite. This topic is discussed in more detail in Boyle and Leitch (1983) and Linnen et al (1995).



SCALE 1 : 150,000

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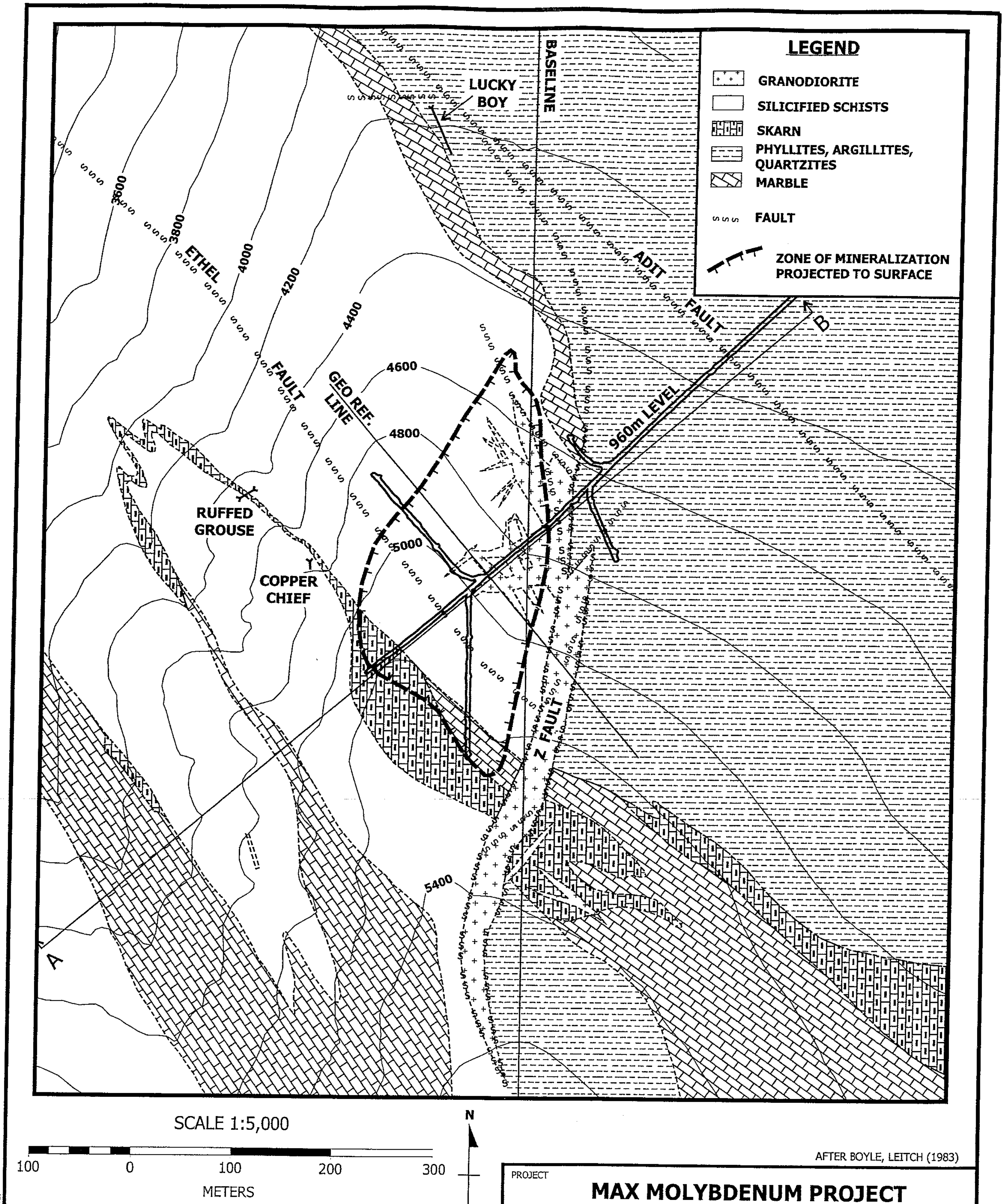
KILOMETERS

N

AFTER READ, WHEELER 1976 (GSC)

Roca Mines Inc.

PROJECT	**MAX MOLYBDENUM PROJECT**	
TITLE	REGIONAL GEOLOGY	
DATE: AUGUST 2004	SCALE: 1:150,000	DRAWN: WKL
PROJECT No.: 0327-003-01	FIGURE. No.: 3	REV.: 0



AFTER BOYLE, LEITCH (1983)

Roca Mines Inc.

PROJECT			
MAX MOLYBDENUM PROJECT			
TITLE: SURFACE GEOLOGY MAP			
DATE: AUGUST 2004	SCALE: 1:5,000	DRAWN: WKL	
PROJECT No.: 0327-003-01	FIGURE. No.: 4	REV.: 0	

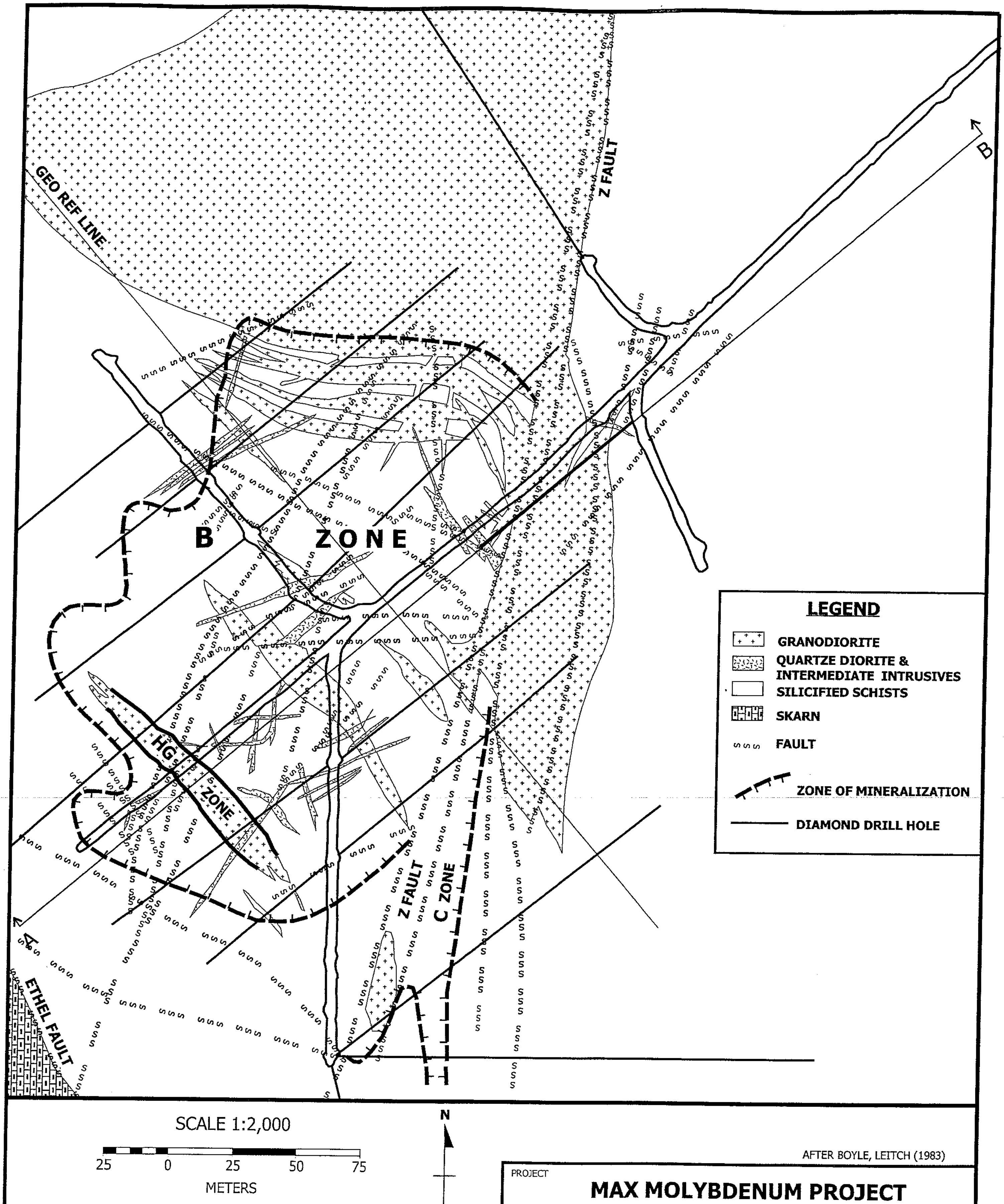
DEPOSIT TYPES

The MAX molybdenite deposit belongs to the general type of porphyry copper and/or molybdenum deposits, where mineralization is related to a granitic or granodioritic intrusive that may be either a distinct stock or a phase of a larger batholith. In this type, mineralization is broadly dispersed in the form of disseminations or fracture filling veinlets, with sulphide mineral content seldom exceeding several percent. Ground preparation in the form of fracturing, faulting and brecciation to allow access by mineralizing fluids is important. The mineralization of interest may be confined to the intrusive body or largely present in the country rock adjacent to the intrusive. Dyking of the country rock by contemporaneous or later phases of the intrusive may be common. Mineralized quartz veins are common in molybdenum deposits, and where prevalent enough in a criss-crossing network the deposit is termed a stockwork. Linnen (1995) and Westra & Keith (1981) discuss the characteristics of this type.

MINERALIZATION

Molybdenite mineralization has been intersected in drilling from surface to a depth of 1000 m at the MAX property. As shown on Figure 6, the 0.10% MoS_2 contour defines the deposit and reveals the following form; the smaller upper A Zone occurs along the west side of the Z Fault for a length of 250 m, tapering inward in width to a depth of 300 m at the 1100 m elevation. Separated from the A Zone by about 70 m of weak mineralization, B Zone extends from 1200 m down to 600 m elevation with a lateral extent of 200 m by 300 m at the adit level (960 m elevation). Adjoining B Zone at the southeast side, C Zone comprises the mineralization lying on the east side of the Z Fault. Below the adit level, the B Zone assumes a steep southwesterly plunge and links with the D Zone. The D Zone has been traced by drilling for a length of 270 m and extends from 840 m down to 500 m elevation. Further southwest beyond the D Zone, two holes have intersected the F Zone. Mineralization is not delimited at depth, and the few holes reaching the 500 m elevation have shown widespread weak mineralization with occasional better grade intercepts.

Molybdenite is the only mineral of economic importance in the MAX deposit. Some of its yellow oxidation product is seen in surface trenches, but does not persist downward to the drill intercepts. Minor pyrite and pyrrhotite accompany the molybdenite, with pyrite predominating on the margins of the deposit and pyrrhotite more abundant in the centre. Total sulphide content averages about 1 to 2% and runs as high as 10 to 15% in the higher grade zones. Very minor chalcopyite and rare traces of sphalerite, galena and scheelite have been noted in the mineralized zones, but have received exploration attention in the past where they occur in veins or skarns outside the molybdenite deposit.



AFTER BOYLE, LEITCH (1983)

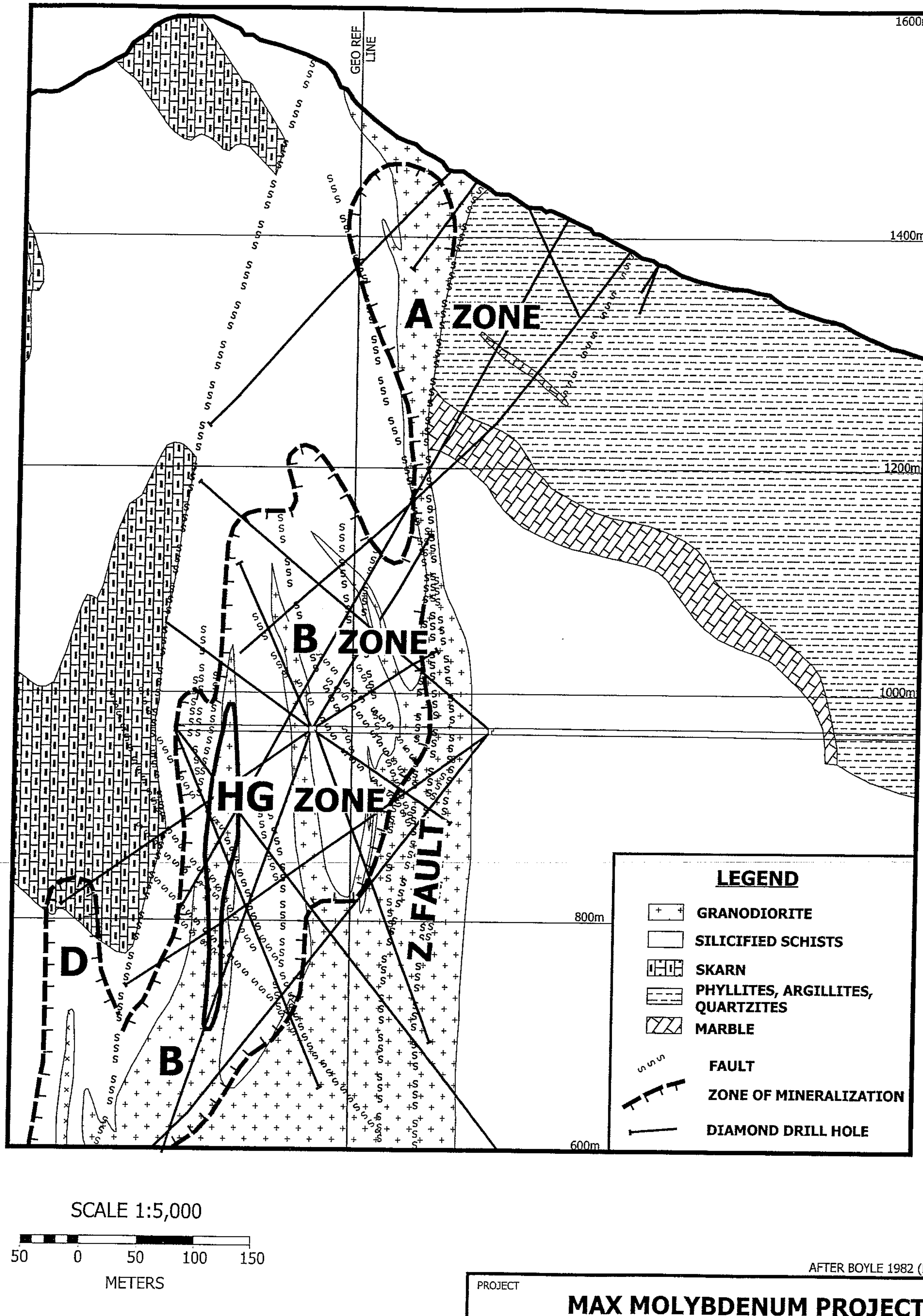
PROJECT	MAX MOLYBDENUM PROJECT	
TITLE	960 m LEVEL PLAN	
DATE: AUGUST 2004	SCALE: 1:2,000	DRAWN: WKL
PROJECT No.: 0327-003-01	FIGURE. No.: 5	REV.: 0

Roca Mines Inc.

0327-003-01 MAX 960 L

Molybdenite, as fine to medium flakes and rosettes accompanied by pyrite/pyrrhotite, is mainly present along the margins of veins in a quartz stockwork. In the higher grade zones (>1% MoS_2) it is strongly disseminated in microfractured intrusive bodies accompanied by large (>10 cm) quartz veins and intense quartz flooding. The vein stockwork is best developed in and around the margins of the intrusive and its dyke-like apophyses. Thus the major mineralization control is the location of the schist-intrusive contact; a lesser control is exerted by pre-mineral faults. The centre of the large granodioirite mass is virtually devoid of veining and mineralization. Post mineral faults have been observed in core to cut off good grade mineralization, but in underground exposure the displacements are seen to be only minor adjustments between blocks. The inter-relationships of cross-cutting, veining and faulting show a suitably complex style of repeated opening of fractures and regeneration of mineralizing fluids as an intrusive differentiated at depth (Boyle & Leitch, 1983).

With regard to continuity of mineralization, the 0.10% MoS_2 grade contour was used to outline the deposit on plan and sections. As can be appreciated in this type of deposit, material below this grade can occur within that contour and some isolated drill intersections at a higher grade can occur beyond the 0.10 shell. Within the 0.10 outline, grade contours were developed at the 0.20, 0.25 and 0.50% MoS_2 levels. Where drill hole density was sufficient, the better grade material showed reasonably good continuity in most cases. Above the 0.50% cutoff level the extent is less certain, with the important exception of the High Grade Dyke (HG Zone) exposed near the southwest end of the adit. Elsewhere within the deposit, intersections several metres long grading more than 1% MoS_2 generally are of unknown orientation and extent.



AFTER BOYLE 1982 (NEWMONT)

Roca Mines Inc.

PROJECT	**MAX MOLYBDENUM PROJECT**				
TITLE	SECTION A - B				
DATE	AUGUST 2004	SCALE	1:5,000	DRAWN	WKL
PROJECT No.	0327-003-01	FIGURE. No.	6	REV.	0

0327-003-01 MAX Secti

EXPLORATION

The only recent exploration work done was a limited surface drilling program by Roca discussed in the next chapter. The following is drawn from the work of the two former operators: Scurry Rainbow Oil (1969) and the Newmont-Esso joint venture (1975-1982).

Geological Work

Basic prospecting was instrumentational in finding the small molybdenite occurrences and tracing the train of mineralized float along the slope. Bulldozed drill roads and trenches enlarged the area of mineralization and traced the Z Fault, with its strong quartz veining, upslope to the south.

Mapping done by staff and consultants coincident with drilling developed a better understanding of the Lardeau Group host rocks and complex structure. Alteration, trace element zonation and petrographic studies were carried out by Newmont staff (Hausen 1977, 1981). Linnen's 1995 paper and earlier studies investigated wall rock alteration and hydrothermal evaluation.

Geochemistry and Geophysics

A geochemical anomaly of B-horizon soils, defined by the 100 parts per million (ppm) molybdenum contour, extends 1000 m southeast from the A Zone along the side of the valley as a result of glacial smearing. The 20 ppm molybdenum contour indicates some downslope migration to the northeast and northwest, as well as lesser bedrock sources up the ridge to the south. A more extensive tungsten anomaly (500 x 2000 m at the 120 ppm contour) overlaps with that of molybdenum and probably originates from the scheelite bearing skarns adjacent to the molybdenite deposit.

The magnetometer survey showed only a few scattered anomalies related to pyrrhotite in the skarns; the granodiorite stock could not be outlined magnetically.

Underground Exploration Program

After five seasons of surface work by the Newmont-Esso joint venture, including four seasons of diamond drilling, a significant molybdenite deposit extending to considerable depths had been indicated. The joint venture then decided to undertake an underground program to define the mineralization sufficiently for preliminary mine planning, clarify zones with limited drill information, test new areas too deep to be drilled from surface, and carry out bulk sampling through the heart of the known deposit.

An adit at the 960 m Level elevation was driven in a southwest direction for 1,276 m to the edge of the area of interest. Its size was 12 x 15 feet to allow for future use as a haulage way and as such is larger than most exploration adits. Beyond that point the adit profile was reduced to 10 x 12 feet, and it continued as a crosscut through the known deposit. Four drifts were driven to provide diamond drill stations; two of them through the deposit were also bulk sampled. Total length of adit and drifts is 2000 m.

Mining conditions contrasted strongly between the approach to the deposit and the drifting within it. Prior to reaching the Z Fault on the east side of the deposit, progress was impeded by numerous water bearing fracture zones. Ground support was required at 13 locations, but outside those zones rock was competent and stood up well. West of the Z Fault in the mineralization and adjacent areas, water inflow was minimal and backs needed no support.

At conclusion of the program, the rail, water and air lines, and ventilation ducting were left installed and their current condition is unknown.

Bulk sampling is described in the chapter “Sampling Method and Approach”.

DRILLING

Table 2 – Summary of Diamond Drilling

Year	Operator	Holes	No.	Length (m)
1970	Cascade Moly Mines	TL-1 TO TL-6	6	992
1976	Newmont-Esso	76-1 TO 76-7	7	2,772
1977	Newmont-Esso	77-1 to 77-3	3	1,712
1978	Newmont-Esso	78-1 to 78-5B	7	4,280
1979	Newmont-Esso	79-1 to 79-15	15	6,983
1980-81	Newmont-Esso underground	80-5, 80-6, 81-1 to 81-85	87	22,151
2004	Roca Mines	MM04-01 to 02	2	1,134
Total			**127**	**40,024**

The above drilling is in inclined holes, plus flat holes on the adit level, designed to more or less cut across the presumed trend of mineralization. Core size was a mixture of NQ and BQ. Some surface holes were started at HQ, and reduced in stages to penetrate areas of difficult drilling.

Down-the-hole surveys of long surface holes drilled west showed that they deviated to the southwest and flattened somewhat, tending to get perpendicular to the schistosity.

Therefore, the underground drill sections were laid out in the 50° – 230° azimuth orientation to approximate the trend of the surface holes. In the underground program, drill holes over 250 m in length were surveyed with the Atlas Copco Fotobar system that was not susceptible to magnetic attraction; for shorter holes acid dip tests alone were sufficient.

Surface and underground drill holes were plotted on a set of sections with 30 m spacing, numbered one through twelve from northwest to southeast. The segments of the curving holes appearing on each section are those parts of the holes lying within 15 m of either side of the section.

Drill core logging on this project collected more information than simple descriptive and sampling data. Quantitative estimates were made for alteration types (chlorite, sericite, silica (quartz veining), biotite), fracture intensity and total sulphide amount. A graphic log showed lithology and structure. Drill hole survey and assay data were computerized, but inputting the geologic and alteration information turned out to be a terribly time consuming task that was far from complete when the project was suspended. Thus the drill logs, and the plans and sections derived from them, are the basic record for the geology of this deposit.

Surface hole 77-3 on section 7, started at a 65° dip to southwest and finishing at 35° at its bottom at 660 m, yielded a very significant intercept in the B Zone of 0.408% MoS_2 over 271 m. Following this up, 78-5 about 42 m to the southeast on sections 8 and 9, obtained 0.329% MoS_2 over 305 m. To try to assess the lateral extent of this good grade material without the uncertainties of starting new holes from surface, holes were wedged to the right (78-5A) and left (78-5B) from 78-5, achieving separations up to 15 m in 78-5A and 21 m in 78-5B. Two more excellent intersections resulted: 0.443% MoS_2 over 349 m, and 0.225% MoS_2 over 276 m. Within these four long intersections were a number of 10 to 30 m lengths of better grade material in the 0.5 to 1.0% range, plus a few high grade ones, the best of which was 23 m of 3.077% in 78-5A. The latter contained the highest individual sample of 1.5 m containing 7.19%. Underground drilling on the B Zone later confirmed that the best grade material was largely on sections 7 and 8, that the size and grade lessened in a northwest direction on sections 5 and 4, and in a southeast direction on sections 9 through 12. Furthermore, as the B Zone assumed a steep southwest plunge below the adit level ultimately appearing to merge into the D Zone, the long, southwest trending, inclined holes from surface and underground were intersecting it at oblique angles.

Due Diligence Surface Drilling by Roca Mines Inc.

Roca has drilled two NQ holes from surface in the vicinity of previous holes as a due diligence exercise. They have been located by Global Positioning System to UTM co-ordinates, but have not been tied to the property survey system. It is unknown whether the old survey control in this area can be found. The holes were drilled on the same section 65 m apart. Hole MM04-01 ended when it apparently broke into the adit. Both holes encountered silicified sericitic and biotitic phyllite cut by 5 granodionite dykes west of the Z Fault. Molybdenite occurs as concentrations and disseminations in quartz-feldspar veins and veinlets, as fracture fillings in granodiorite and phyllite, and less so as fine disseminations proximal to 5-30 m lengths of granodiorite.

A total 712 core samples, mostly 1.5 m long, from these two holes have been marked for sampling and will be accompanied by blanks and standards. A total of 32 samples have been analysed to date for 23 elements by ICP-MS at ACME Labs using an aqua regia digestion on a one gram sub-sample. Gold analysed on 15 gram sub-samples ranged from 0.5 to 33 ppb. Molybdenum was the only element of economic importance. Results are as follows:

Table 3 – Analyses of Roca Drill Core

Hole No.	UTM Co-ordinates	Azimuth	Dip	Length
MM04-01	457468E 5609721N	215°	-70°	488.7 m
MM04-02	457505E 5609775N	210°	-60°	645.7 m

Hole MM04-02 Intercepts

From	To	Length (m)	No. of Samples	% Mo	% MoS_2
141.5	143.4	1.9	1	0.036	0.060
143.4	155.5	12.1	8	0.390	0.650
160.0	161.5	1.5	1	0.706	1.177
164.5	166.0	1.5	1	0.186	0.310
170.5	172.0	1.5	1	0.358	0.597
397.0	424.5	27.5	18	0.345	0.575

SAMPLING METHOD AND APPROACH

Diamond Drilling

A total of 14,889 diamond drill core samples in the Newmont-Esso program were taken for assay, comprising 4,951 from surface drill holes and 9,938 from underground holes. Sample lengths were generally 2m in mineralization and 3m in very week mineralization, with the standard length being modified where abrupt changes in grade or geologic boundaries were evident.

Virtually all core from within the broadest outline of the mineralized zone was sampled. Prior to sampling, core from the underground program was photographed. Core splitting of surface drill holes was done by chisel splitter; for the underground holes by diamond saw. Underground core size was a combination of NQ and BQ. Where BQ holes alternated with NQ ones in the ring drilling, it was deemed unnecessary to keep split core and the BQ core (comprising 24% of the 21,657m sampled) was sampled whole.

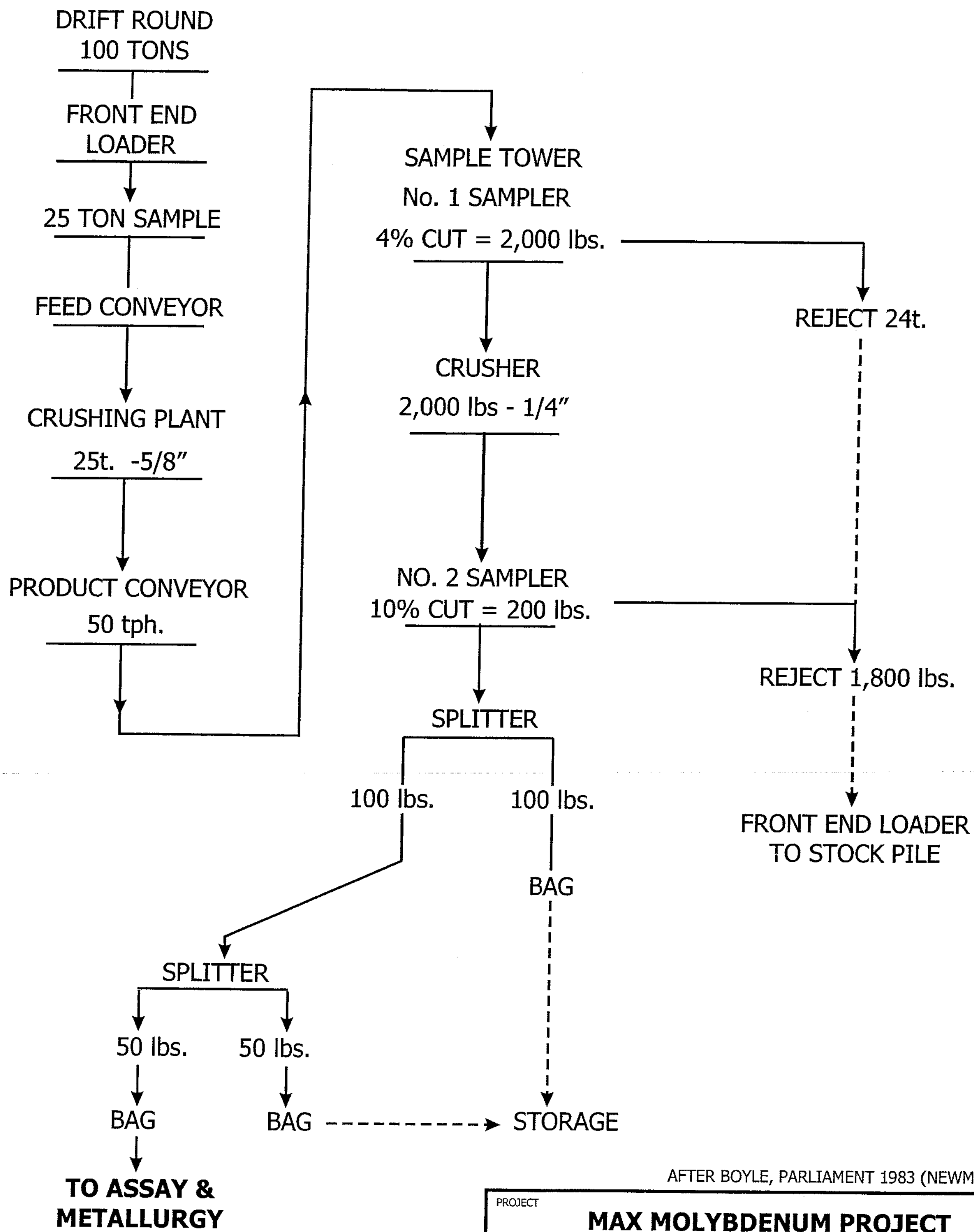
Core recovery in the mineralized area was good, averaging 93% in the underground program. Drill core was retained on the property; some of it was lost in the collapse of the core shed after the project became inactive and the remainder was destroyed in the 2003 reclamation program.

Bulk Sampling

A bulk sampling program was also carried out during the Newmont-Esso program a comparison to the drilling results, and also provide material for metallurgical testing. Individual rounds from the adit, comprising about 90 tonnes, were segregated into concrete bins, then stored in a prepared stockpile area with assigned lot numbers identifying the round's location on the underground plan. A total of 189 bulk samples were stored. A total of 227 samples were processed through the crushing plant and sampling tower, comprising one from each round, plus 38 check samples from 24 of those rounds. See Figure 7 for the processing flowsheet. No stockpiled or drummed mineralized material remains after it was collected and buried in the reclamation program.

Of the 189 rounds excavated, 128 had a pilot diamond drill hole through them. Compared round by round, the bulk sample grades varied from 85 to 137% of the DDH grades calculated for the same 3m intervals as the drift rounds. It is noteworthy that the sample size ratio for these two types is 12,000 to 1. The arithmetic average grade for the bulk samples was 0.222% MoS_2 versus 0.205% for the DDH's, or 8.3% higher. In a lognormal analysis the difference is 1.4% higher (0.217 versus 0.214% MoS_2).

BULK SAMPLING DESIGN FLOW SHEET



AFTER BOYLE, PARLIAMENT 1983 (NEWMONT)

Roca Mines Inc.

PROJECT: **MAX MOLYBDENUM PROJECT**		
TITLE: BULK SAMPLE FLOW SHEET		
DATE: AUGUST 2004	SCALE: –	DRAWN: WKL
PROJECT No.: 0327-003-01	FIGURE. No.: 7	REV.: 0

0327-003-01 MAX Bulk S...

SAMPLE PREPARATION, ANALYSES, SECURITY

Sampling of the diamond drill core from the Newmont-Esso work was done on-site by Newmont employees. Samples were sent by commercial transport to Chemex Labs in North Vancouver for assay. Their procedure was to crush each sample to ¼ inch, then split to about 250 grams (g) for pulverization. Following the 1978 program, a finer crushing to 1/8 inch was specified to produce a more homogenous sample prior to splitting. For the underground (UG) drill hole samples, a three stage crushing procedure was employed. A 2 g sub-sample of pulp was digested in hot perchloric citric acid mixture, diluted to a specified volume, buffered with aluminium chloride, and the quantitative determination made by atomic absorption spectrophotometry against prepared standards.

The bulk samples and pilot diamond drill holes were assayed in the Newmont research lab at Danbury, Connecticut, because that is where the subsequent metallurgical testing was to be carried out. The differences in procedure from Chemex involved using a 1g sub-sample instead of 2g, and digestion with a mixture of nitric, perchoric, hydrochloric and hydrofluoric acids. The above labs utilized industry standard quality control procedures, but certification by standards associations was not in place at that time.

A check assay program was carried out utilizing about 1% of the surface and UG drill samples selected to cover a grade range of 0.05 to 4% MoS_2. To check sample preparation, resplits of the crushed rejects from the 1976-1979 surface drilling showed a rather high 35% of the assays disagreed by more than 20% with the original assay. This caused the decision to go to a finer crush, resulting in a more acceptable 9% of the UG samples deviating by more than 20% from the original. Re-assays of the original pulps showed 6% of the surface drilling samples and 0% of the UG samples deviating by more than 20% from the original. A small proportion of these samples were also run at two other commercial labs. All sample pulps from the Newmont-Esso work have been discarded.

The check program did not involve introduction of blanks and standards into the sample stream, but was considered sufficient to identify any sampling/assaying problems. As for security, Newmont supervisory staff lived on-site during the work periods and were regularly involved in training and checking on employees and contractors.

DATA VERIFICATION

During the seven year period that the Newmont-Esso data was being generated and compiled, the author frequently reviewed results and met with project geologist Craig Boyle, P.Eng., who carried out or supervised the core logging, assay entry and assay averaging. Property visits included core examination with comparison to assay results. Spot checks by the author and others were made on assay entry, processing and interpretation, with thorough discussion and resolution of any differences that were identified. It is the opinion of the author that the work from this period, comprising the vast majority of total work on the molybdenite deposit, has produced a reliable set of data that can be utilized in advancement of this project.

Regarding the recent diamond drilling by Roca carried out for due diligence purposes shortly after acquiring the property option, the author has examined the assay certificate and cross-section, but concludes that it is premature to include this information into the data set because of incomplete sampling and the imprecise location of the holes with respect to the earlier drilling in that area.

MINERAL PROCESSING & METALLURGICAL TESTING

Test work carried out at the Newmont facility in Danbury, Connecticut, was done on five composites of drill core from 1978 – 79 holes and a more extensive bench-scale investigation of bulk samples from the adit and its horizontal pilot holes.

Testing of the five core composites (Table 4) indicated that a simple flowsheet incorporating primary grinding to –65 mesh, rougher and scavenger flotation of molybdenite with frother only, regrinding of the rougher concentrate and multiple cleaning stages would recover above 90% of the molybdenite in a concentrate assaying 90-92% MoS_2. The final concentrate contained up to 0.5% Cu, which could be detrimental in selling this product. A small addition of sodium cyanide, not more than 0.01 lbs per ton of original feed added to the cleaner stage, reduced the copper content to less than 0.05%, a threshold limit generally applied to molybdenum oxide product.

Table 4 – Summary of Metallurgical Results 1979 – 1980

Composite No.	Zone	Hole No.	Interval	Sodium Cyanide	Assay Head & MoS_2	Final Concentrate			MoS_2
						% MoS_2	% Cu	% Fe	% Recovery
1	B	78-5	61 ft from 1,075 ft to 1,150ft	No	0.366	96.91	0.028	0.22	86.9
2	B	78-5A	97 ft from 1,750 ft to 1,860 ft	No	0.274	93.55	0.33	1.02	91.0
				Yes	0.274	94.87	0.01	1.04	90.6
3	B	79-1	103 ft from 1,477 ft to 1,580 ft	No	0.150	92.15	0.30	0.79	81.8
				Yes	0.150	92.14	0.01	0.49	82.4
4	A	79-1	142 ft from 498 ft to 640 ft	No	0.286	89.3	0.46	0.87	91.6
				Yes	0.286	91.9	0.02	0.48	89.9
5	A	79-4	140 ft from 230 ft to 370 ft	No	0.178	91.3	0.23	0.70	90.3

Table 5 – Summary of Results – Adit Samples – 960 Level

Sample Description	Assay Head % MoS_2	Final Concentrate			MoS_2
		% MoS_2	% Cu	% Fe	% Recovery
Master composite of drill core (80-5)	0.37	85.46	0.46	3.76	90.8
Master composite of drill core (80-5)	0.37	90.89	0.44	2.22	83.3
Master composite of drill core (80-5)	0.37	91.62	0.35	2.2	64.9
Granodiorite quartz diorite (bulk sampling)	0.175	93.90	0.45	1.7	89.7
Quartz veining/stockwork + granodiorite quartz diorite (bulk sampling)	0.438	91.35	0.69	2.0	94.0
Silicified schist (bulk sampling)	0.19	81.49	0.59	3.8	92.2
Silicified schist (bulk sampling)	0.19	85.29	0.59	3.2	90.2
Silicified schist (bulk sampling)	0.19	87.68	0.54	3.2	84.0
Silicified schist (bulk sampling)	0.19	91.91	0.45	1.5	67.3
Silicified schist + granodiorite quartz diorite (bulk sampling)	0.45	85.89	0.39	2.8	88.8
Silicified schist + granodiorite quartz diorite (bulk sampling)	0.45	89.35	0.41	2.8	80.5
Master composite* (bulk sampling)	0.23	79.16	0.59	4.7	89.0
Master composite* (bulk sampling)	0.23	83.92	0.52	2.85	88.3

* Master composite = <u>% Wt</u>

74.3 Silicified Schist
13.9 Granodiorite Quartz Diorite
10.4 Silicified Schist + Granodiorite Quartz Diorite
1.4 Quartz Veining/Stockwork

Testing of the adit pilot hole 80 – 5 (Table 5) revealed a wide range of MoS_2 recoveries from 90.8 to 64.9%. Testing of individual rock type composites of the adit bulk samples identified silicified schist as the major cause of the problem. Microscopic examination of concentrates identified the major dilutent as non-opaque gangue with fine coatings of molybdenite. Appreciable amounts of such material were detected in the silicified schist, but little in the other rock types. While such middling can be produced in grinding, the investigator stated that the major portion in the silicified schist is of geologic origin. The Master Composite, made up on a weighted basis of silicified schist, granodiorite, quartz diorite, and quartz vein/stockwork ore grade intersections, gave similar results as obtained from the Silicified Schist alone. Further investigation was planned using underground drill core, but testing was halted when the project was shelved.

When Roca wishes to follow this up, one or several large samples could be taken from the adit walls of mineralised silicified schist. The east wall of No. 4 Drift South at Section 8 drill station would be on appropriate locality. Alternatively, the crushed rejects of this rock type from the definition drilling could be used.

MINERAL RESOURCE ESTIMATE

In 1982 after all drilling results were in and data compiled, a resource estimate was made by Newmont staff members Craig Boyle, P.Eng., geological engineer, and Trevor Hancock, P.Eng., mining engineer, under the overall direction of the author. The results are documented in Boyle and Parliament (1983). In 2004, the author was retained to review this estimate, modify it where appropriate, and make further estimates at higher cutoff grades if possible. Table 6 presents the detailed compilation of the mineral resource by zone, category and four cutoff grades. Table 7 states the total resource after rounding and combining according to the CIM Standards, in the form suitable for public disclosure.

As required by NI 43-101, it is stated that the economic viability of mineral resources are not demonstrated. This cannot be determined until a prefeasibility or feasibility study has been done.

Estimation Method

The resource estimate is based on drill holes plotted on sections 3 to 13, with 30 m spacing between sections. Grade contours were developed based on drill hole assays, continuity from hole to hole and conformity to the geological interpretation. They were drawn at 0.10, 0.20, 0.25, 0.50 and 1.00% MoS_2 level. Then the outlined zones were divided into polygons, for the most part based on individual hole intercepts falling between two grade contours. In areas around drill stations where hole density is high, a weighted average grade for the polygon was calculated. Other exceptions are cases where the polygon is defined by a drill hole(s) on an adjacent section(s) on either or both sides. Extensions of geologic trends are also used to define the polygons. An example is shown on Figure 8.

Volumes for each polygon were generated by planimetering each polygon to measure the area in square metres, and then multiplying that by 30 metres (15 m to each side) to obtain the volume in cubic metres. The volume was then multiplied by the specific gravity to obtain the tonnage in metric tonnes. The specific gravity used was 2.72, determined from the average of three representative samples of drill core. Confirmation of this value was obtained from bulk sampling composites.

A standard 15 m projection on either side of the section plane was used instead of trying to adjust the projection length to account for details of the contoured zones. As a check, tonnages were also calculated based on level plans at 50 m intervals. For the largest and most thoroughly drilled B Zone, the tonnage calculated from the two methods to the 0.10 contour agreed to within 3%, but the poorly understood F Zone with only two drill holes had a discrepancy of 53%. Likewise, the small zones of plus 0.25% MoS_2 gave wider variations, pointing to the uncertainty with which they are defined.

The 0.10% MoS_2 cutoff was originally selected as appropriate for a large tonnage deposit with potential for lower cost bulk mining methods. It was also close to that used at other well-known deposits and operating mines. It was recognised, as it is today, that this deposit lends itself to the study of applying higher cutoff grades producing higher grade/lower tonnage resource estimates. These can then be utilized in analyzing a variety of operating scenarios.

No allowances for dilution or mining losses have been incorporated into these estimates. No trench or adit bulk samples were used, with the exception in this new study of combining bulk sample and pilot drill hole grades for two polygons on Section 8 for the plus 0.50% calculation.

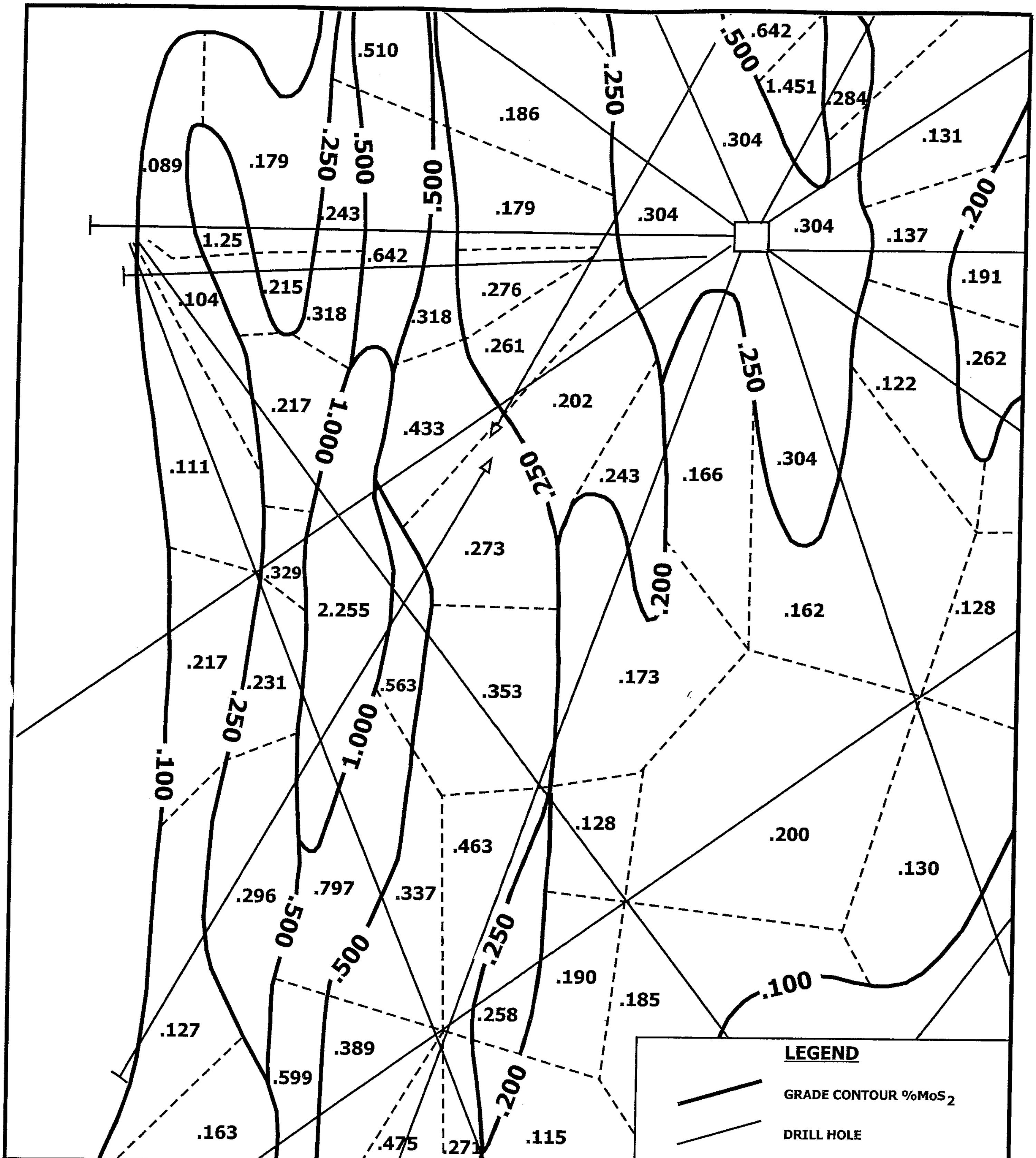
The 1982 estimate showed 0.50 and 1.00% grade contours on Sections 7 and 8, but did not present tonnages at those cutoffs in its compilation table. The present study has segregated additional plus 0.50% material in B Zone on Sections 6 to 9. The most significant is the HG Zone (within the B) on Sections 7, 8 and 9 where 13 polygons contain 706,000 tonnes averaging 1.067% MoS_2 in a vertical body 60 to 90 m long, 235 to 335 m high and 7 to 28 m wide. At the 1.00% cutoff, seven polygons containing 280,000 tonnes averaging 1.946% are present in various places, nearly all in the B. They cannot be considered as mineable on their own without more detailed drilling/drifting/raising in their vicinity. A number of drill intercepts at the plus 0.50 and plus 1.00% grades, up to 5 m long, are of unknown orientation and extent. They have not been segregated from the lower grade material, but offer potential for narrow good-grade mining if detailed exploration can demonstrate continuity.

Table 6 - MAX Property – Mineral Resources By Zone

		MEASURED			INDICATED			INFERRED		
Zone	Cutoff	Tonnes	Grade % MoS_2	Tonnes x Grade	Tonnes	Grade % MoS_2	Tonnes x Grade	Tonnes	Grade % MoS_2	Tonnes x Grade
A	0.10				5,191,150	0.202	1,046,155			
	0.20				1,355,948	0.414	560,697			
	0.50				239,497	0.791	189,486			
	1.00				18,197	1.874	34,101			
B	0.10	26,599,345	0.211	5,609,629	2,866,045	0.172	494,011			
	0.20	9,142,725	0.354	3,235,719	186,293	0.414	77,211			
	0.50	1,007,760	1.007	1,015,057						
	1.00	261,529	1.951	510,255						
C	0.10	1,267,249	0.153	193,904	2,961,999	0.143	422,759			
	0.20	201,305	0.305	61,404						
	0.50									
	1.00									
D	0.10				4,053,332	0.178	722,876	6,466,966	0.162	1,045,965
	0.20				467,813	0.403	188,702	456,144	0.329	150,213
	0.50				131,213	0.726	95,258			
	1.00									
F	0.10							2,437,311	0.150	365,179
Total	0.10	27,866,594	0.208	5,803,533	15,072,526	0.178	2,685,801	8,904,277	0.158	1,411,144
	0.20	9,344,030	0.353	3,297,123	2,010,054	0.411	826,610	456,144	0.329	150,213
	0.50	1,007,760	1.007	1,015,057	370,710	0.768	284,744			
	1.00	261,529	1.951	510,255	18,197	1.874	34,101			

Table 7 – MAX Property – Total Mineral Resources

	MEASURED		INDICATED		MEASURED & INDICATED		INFERRED	
Cutoff % MoS_2	Tonnes	Grade % MoS_2	Tonnes	Grade % MoS_2	Tonnes	Grade % MoS_2	Tonnes	Grade % MoS_2
0.10	27,870,000	0.21	15,070,000	0.18	42,940,000	0.20	8,900,000	0.16
0.20	9,340,000	0.35	2,010,000	0.41	11,350,000	0.36	460,000	0.33
0.50	1,010,000	1.01	370,000	0.77	1,380,000	0.94		
1.00	260,000	1.95	20,000	1.87	280,000	1.95		



SCALE 1 : 1,000

20 0 20 40 60

METERS

Roca

Roca Mines Inc.

PROJECT	**MAX MOLYBDENUM PROJECT**
TITLE	RESOURCE POLYGONS - SECTION 8

DATE	SCALE	DRAWN
AUGUST 2004	1:1,000	WKL

PROJECT No.	FIGURE. No.	REV.
0327-003-01	8	0

0327-003-01 MAX Reso... s.cdr

The present review has also added new polygons of material in the 0.10 to 0.20% grade range, with 20 to 60 m widths, based on drill intersections not considered in the 1982 estimate. They are mainly in the D Zone, plus two above the B Zone.

Resource Categorization

In the 1982 estimate, a polygon was classified as "drill-defined" if it had a drill hole through it and was supported by similar intercepts in surrounding holes or by well established geologic trends. "Drill-indicated" polygons were those drawn from single drill holes with no firmly established geologic controls for guides, or with no drill holes within them and based solely on the extension of trends derived from the geologic interpretation. In a few instances, where the trends were strong, it was justified to include in the defined category a polygon without a drill hole intercept.

In the present review, the following changes have been made in resource categorization of the 1982 estimate to conform to the definitions in the CIM Standards (2000) required by National Instrument 43-101. For the B and C Zones, the "drill-defined" tonnage (comprising most of these zones) becomes the "measured" category and the small amount of "drill-indicated" becomes "indicated". The grade contours derived from the underground holes (and to a lesser extent surface holes) have been confirmed in the comparison to bulk sample drift-round grades, demonstrating continuity of mineralization between drilled sections. For the A Zone, lacking bulk sampling and close regularly spaced drill holes, the "drill-defined" and "drill-indicated" tonnages have been combined into the "indicated" category. In the D Zone, with less drilling and less precise hole location, the "drill-defined" has been placed in the "indicated" category, and the "drill-indicated" becomes "inferred". The F Zone, with only two drill holes, moves from "drill-indicated" to "inferred".

MINING STUDY

In 1982 following completion of the resource estimate, Newmont engineering staff carried out a preliminary mining study. The mining method considered was open stoping with delayed cemented backfill, using adit and ramp above the existing 960 m Level and shaft and secondary ramp below the Level. Another adit at the 1250 m elevation would be required for development of the higher A Zone and ventilation. Main line haulage on the 960 m Level would be by an electric trolley rail system.

Mining was based on the estimated "geological reserve" of 11,736,000 tonnes of 0.362 % MoS_2 at the 0.20 % cutoff. This was adjusted to include 15% dilution at a grade of 0.14% MoS_2. After fitting the proposed stoping panels to the mineralized outlines and allowing for sill and crown pillars (some of which occur in high grade areas) the estimated recoverable ore was reduced to 8,189,000 tonnes. Two cases were studied: milling rates of 3,000 and 1500 tonnes per day. Following a rough economic analysis, it was concluded that development of the property was not economically attractive at the then prevailing or prospective price of molybdenum. Further investigation of tonnage – grade combinations at various cutoffs are mentioned in the Boyle & Parliament (1983) report, but the project was shelved before that could be done.

ENVIRONMENTAL CONSIDERATIONS

Between 1979-82 the Trout Lake joint venture retained a number of consulting firms to carry out environmental and socio-economic studies. Beak Consultants concluded that "development of a molybdenum mine...can likely be accomplished without serious detrimental effects to the existing environment of the area. Construction and operation of the mine and concentrator will undoubtedly result in changes, but providing mitigative measures are incorporated during all phases of development, environmental impacts should be kept to a minimum."

The marshes, wetlands and streams in the valley bottom in the north part of the property, referred to as the Wilkie Creek lowlands, support diverse communities of flora and fauna, including an essential spawning area for sport fish. Beak emphasizes that any development in the area should avoid disturbances to these lowlands. Field surveys gathered valuable information on fish, wildlife and birds. Regular water sampling form October 1978 to May 1982 showed no appreciable difference in heavy metal content in water draining the adit compared to stations upstream and downstream of the confluence of this water with Wilkie Creek. The adit water and streams in the area are slightly alkaline with pH between 7 and 8, and no evidence of acid rock drainage has been found.

Roca has acquired detailed reports of the recent reclamation work done by Rescan Environmental Services for Newmont. They contain extensive analytical information that will be reviewed along with the older data by Roca's environmental consultants.

With regard to tailings storage, Klohn Leonoff Engineers identified a site immediately downslope from the adit portal and possible plant site. The storage area would be created by constructing dams at each end of the elongated depression between a ridge and the SW valley slope. The underlying material appears suitable for dam foundations, but a strict control of seepage would necessitate an investigation of the permeability of the site.

INTERPRETATION AND CONCLUSIONS

General

Drilling has traced molybdenite mineralization from surface to a depth of 1,000m and over an area of 400 x 500m. Within that block of ground a resource has been defined in several zones over a range of grades. The better grade mineralization is surrounded by medium and lower grade material, offering the flexibility for mine planning and economic analyses to study a variety of operating scenarios. With the current strong market for molybdenum products, after years of oversupply, it is concluded that this is the ideal time to re-evaluate this project. Producer/dealer prices of molybdenum in oxide form are US $17.25 - 18.50 per lb of Mo (Northern Miner, August 31/04), after languishing in the US $2 to 4 range for most of the time since work on this project stopped in 1982.

Roca has acquired an important molybdenum deposit, consolidated the land position, and purchased complete documentation of the exploration/mining/metallurgical/environmental studies, all done at reasonable cost. It is concluded that the project warrants proceeding on two fronts. The near term potential should be assessed by carrying out definition drilling on the High Grade Dyke area of the B Zone, called the HG Zone. At the same time, assessing the potential of the resource at a 0.20% MoS_2 cutoff can start with some drilling to better define it in certain areas, followed by exploration drilling to see if this resource can be expanded.

Exploration Targets

Three areas with potential for adding to the resource were not adequately tested by the drilling that concluded in late 1981. They are situated well within the property boundaries at and below 600 m elevation (adit level is 960 m). They lie to the NW, the SW and E of the known deposit.

The **northwest area** in the D Zone on Sections 4 and 5 has only two holes (81-61 and 81-8) about 100 m apart carrying long sections in the 0.1 to 0.2% MoS_2 range, but within that the deeper hole (81-8) has a 40 m length of 0.40%. The mineralization continues from the metasediments well into a highly altered and veined granodiorite, suggesting a source at depth not yet penetrated by any drill hole.

The **southwest area** is the F Zone on sections 6 and 7 where DDHs 81-15 and 81-63 obtained long intersections averaging 0.2 and 0.1%. More definition is needed, which may result in some better grade material. The occurrence of additional, though small, high grade dykes deeper and to the SW of the High Grade Dyke in the B Zone suggests a continuation in this SW direction. Also the fracturing, veining and alteration in these two holes, particularly in the skarny altered portions, is finer, more closely spaced and more intense than usually seen in the B Zone.

The **east area** exhibits potential on the east side of the Z Fault on sections 7 to 12 and 500 m or more below the adit level. Holes 81-29 and 81-39 on sections 8 to 10 both penetrated granodiorite east of the Z Fault along with well altered silicified schist containing short sections of significant molybdenite. These intersections are sometimes similar in appearance to those above the High Grade Dykes. Considered with the surface drilling, there is a clear increase downwards in the area of alteration and of the extent and grade of mineralization. DDH 81-84 on sections 8 and 9 never got out of the intrusive, and encountered intense sericitization and pyritization with finely disseminated moly flakes and quartz veins with up to 0.7% MoS_2. The similarity of this hole to surface hole 76-3 suggests the possibility of a 1,000 m down – drop on the east side of the Z Fault, and the possibility of a mineralized zone similar to the B below 81-29, possibly by some 200 m.

RECOMMENDATIONS

1. Complete the sampling and assaying of Roca's two diamond drill holes. When possible, survey their collars to the property coordinate system.

2. Restore road access to the adit portal by replacing culverts removed in the reclamation program, removing drainage barriers, gravel and grading.

3. Restore access to the adit, inspect all underground workings, carry out the necessary rehabilitation and provision of services for diamond drilling.

4. Carry out an underground diamond drill program to better define the medium (> 0.2% MoS_2) and high grade (> 0.5% MoS_2) material in the B Zone. In the High Grade Dyke (HG Zone), bring drill hole spacing to about 20 m on a staggered grid basis for the block between 860 m and 1,000 m elevations.

5. Review the draft environmental impact assessment and supporting studies done for Newmont in 1979-82, and determine what additional work may be necessary to meet current regulations. Determine at what time such additional work should be done.

Cost Estimate

Diamond drilling 3000 m in about 23 holes at $100/m	$300,000.00
Underground rehabilitation and equipment	$194,400.00
Labour	$24,000.00
Road rehabilitation/maintenance/plowing	$80,000.00
Fuel and storage	$120,000.00
Transportation	$10,000.00
Assays and shipping	$30,000.00
Room and board	$45,000.00
Mobilization and demob	$15,000.00
Environmental, engineering, bond	$20,000.00
Consulting and management	$33,000.00
Overhead	$15,000.00
Sub total	$886,400.00
Contingency at 10%	$88,600.00
TOTAL	$975,000.00

September 20, 2004
Vancouver, BC

"signed" T. N. Macauley, P.Eng.

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CERTIFICATE OF AUTHOR

I, Terrance N. Macauley, do hereby certify that:

1. I am a consulting geological engineer with residence and business address at 1057 West 49th Avenue, Vancouver, British Columbia, V6M 2P7.

2. I am a graduate in geological engineering from Queen's University, Kingston, Ontario (B.Sc. 1958), and Michigan Technological University, Houghton, Michigan (M.Sc. 1962).

3. I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia. I am a Fellow of the Geological Association of Canada and a member of the Canadian Institute of Mining Metallurgy and Petroleum.

4. I have practised my profession of mining and exploration geology continuously since graduation.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the preparation of the Technical Report on the MAX Molybdenum Property dated September 20, 2004. I visited the property frequently during its period of exploration from 1975 to 1982, and last visited it on August 20, 1991.

7. I am independent of the issuer applying the tests set out in section 1.5 of NI 43-101.

8. My prior involvement with this property was doing the initial geological mapping and geochemical survey in 1975, and then as exploration manager for Newmont Exploration of Canada, directing the exploration programs in the 1976 to 1982 period.

9. I am not aware of any material fact or material change with respect to the subject matter of this technical report, which is not reflected in the report, the omission to disclose which makes the report misleading.

10. I have read National Instrument 43-101 and Form 43-101 F1, and this report has been prepared in compliance with them.

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication of the Report by them for regulatory purposes,

including electronic publication in the public company files on their websites accessible by the public.

Dated at Vancouver, British Columbia, this ___20___ day of September 2004.

"signed" T. N. Macauley, P.Eng.

Appendix G

Marketing and Commercial Report

MARKETING AND COMMERCIAL INPUT INTO A SCOPING STUDY FOR THE MAX MOLY PROJECT

PREPARED FOR

HATCH ASSOCIATES LTD ON BEHALF ROCA MINES

FEBRUARY 2005

BY

NEIL S. SELDON & ASSOCIATES LTD.

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INTRODUCTION AND SCOPE

Neil S Seldon & Associates Ltd. (NSA) has been engaged by Hatch Associates Ltd. (Hatch) on behalf of Roca Mines Inc to provide certain marketing and commercial input into a Scoping Study for the Max project.

The objective is to provide and/ or discuss assumptions as to the prices and markets as they relate to quality and marketability.

All references herein are to US dollars, whether or not specifically stated. References to tonnes or dmt or wmt are based on metric tonnes of 2204.62 pounds.

Comments are derived in general from NSA knowledge of the market with input from W.G. Cook Ltd., a molybdenum specialist and buyer. Supply demand background information have been provided by Roskill Information Services Ltd and where included, is appended. ***This latter work is Copyright ©, but is reproduced herein with their permission for use in this report only.***

This report is an overview only and is not intended to constitute a full marketing study. Information provided herein is for internal use and is not to be divulged to third parties without permission.

Scope

The Scope for the Report is to provide inter alia:

- A "near-term" molybdenum market price for a small, high grade mine (500 tonnes per day) that could be producing, say by early 2006.
- A long term molybdenum price to support a larger (2500 tonnes per day) lower grade mine
- Historic and forecast supply/demand of molybdenum
- Molybdenum end-use and outlook of its end-use market
- Terms for molybdenite refining and applicable penalties
- Sale options e.g. toll treatment, direct concentrate sale or molybdenite ore sale options?

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SUMMARY

Some of the key points that play a major role in the molybdenum industry include the following factors:

- The percentage of molybdenum supply as a "by-product" of copper is around 75% of world production and by-product production costs are typically $1.00 - 2.00 per pound of molybdenum. In economic terms, this supply is price inelastic and will be produced regardless of the molybdenum price. This creates a scenario that results in a boom/bust market.

- The balance of world supply is in the form of "primary" production. The production costs for "primary producers" are in the range of $3.00 – $4.00 per pound. As a result of these higher production costs primary producers must assume the role of "swing producers". In order to stabilize the price they must increase or decrease production to meet demand.

- Another key factor in the industry is the level of "producer inventories". It is generally assumed that about three and a half months of supply is necessary to keep the pipeline full between the time when molybdenum comes out of the flotation circuit, is transported to a roaster, is roasted/transported to the sellers warehouse, is converted to Ferro-molybdenum or briquettes and then ultimately sold and delivered to the end user. This time lag often plays a significant role in pricing.

- Historically the molybdenum price has correlated very closely with increases and decreases in "producer inventories". When the inventories start to move below three and a half months of supply then a squeeze develops in the market with resulting price spikes. When inventories start to move above three and a half months of supply then a surplus develops resulting in declining prices.

- In forecasting future molybdenum prices one must look at the production costs for the primary producers, currently around $3.00 - $4.00 per pound of molybdenum (this does not include conversion losses, roasting fees or transportation).

- With their low copper content, primary concentrate producers are an important factor in the molybdenum market by providing a blend for the higher copper by-product material.

- In addition, history and changes that have taken places in the market in recent years must be considered.

- There are no terminal markets for molybdenum so it cannot be hedged. End users are therefore totally exposed to unexpected price movement.

There have been three major price spikes in molybdenum over the past 25 years (see below):

- **The first** was in 1979/80 when prices briefly spiked to $33. Strong demand from the oil sector combined with a prolonged strike at Endako created a significant shortfall in supply and panic buying. Once the Endako strike was over and additional supply was introduced to the market (mostly as by-product production) prices very quickly collapsed.

- **The second** run-up in prices was in 1994/95 when a perceived shortage was created due to a lack a supply. Most of the by-product producers had cut back production due to low prices and inventories were drawn down to lower levels. Traders held back material from the market and a short-term squeeze resulted. Not surprisingly prices could not be sustained and the market collapsed.

- **The present** run-up in prices however is different in that it is demand driven and as a result is being sustained. Several factors in recent years have changed the dynamics of the molybdenum market. As is the case with many other metals, there has been a significant reduction in the number of suppliers and roasters in the molybdenum market.

    - Cyprus and Climax (who at the time were the world's two largest suppliers) merged and then were taken over by Phelps Dodge.

    - Climax in particular had always acted to maintain stable molybdenum prices for its customers by carrying a large inventory if needed and would also quickly increase production from one of their idled mines if prices started to move up too rapidly.

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- Phelps Dodge had a very different strategy and immediately sold off all Climax excess inventories at the time of the take-over and has not re-started any idled capacity despite prices at the $30 plus level.

- In 1997 Placer Dome sold Endako to Thompson Creek and this, again reduced the number of primary producers. Around the same time Molymet purchased the Sadaci roaster. As an end result, the number of primary producers was reduced from four to two and the number of roasting entities reduced from five to three.

- However, perhaps the most dramatic change to market fundamentals has been the emergence of "China Inc". Throughout the 1990's, Chinese molybdenum production and their exports to the West steadily increased. However, poor quality, delayed shipments and cancellation of contracts all led to a two-tiered market for molybdenum (Chinese and Western Grade).

- China was an "albatross around the neck" of the Western suppliers and molybdenum prices moved down to the mid two-dollar range. However over the past year China's economy has bloomed and as their steel industry matures and advances from crude steel to more value-added steels, Chinese domestic consumption has increased significantly. As a result the constant pressure of low priced Chinese exports to the West sharply declined as Chinese domestic prices exceeded what could be attained for export.

- The emerging of China as a major molybdenum consumer is expected to continue well into the Olympic year in 2008.

The resulting change in these market fundamentals combined with the weaker US Dollar should increase the long-term price outlook for molybdenum. Prior to 2004, a consensus long-term price was $3.00 – 4.00, but with the changes in the market, using a $6.00 price as a ten-year price now seems more appropriate. It must be remembered that historically, any spike in molybdenum prices has been followed by a prolonged slump.

However, this time it is reasonable to expect that the decline will be somewhat slower and may not be to levels as low as has been seen in the past. With this in mind, shorter time prices may likely, be well above longer-term expectations. We suggest for the second half of 2005 an average in the range of $10 to $15 is used and that for 2006 this is reduced to an average in the range of $5 to $10.

The future outlook for "roasting" fees will very much depend on molybdenum prices and roaster availability at the time of any negotiation. As an example, with long-term price for molybdenum of $6.00, it would be reasonable to assume that a total off-site roasting fee of $1.50 would apply (plus a 1% conversion loss). The terms of sale for the mine would be FOB Truck with all transportation costs for the account of the Buyer.

Any discussion of molybdenum prices as has been seen needs to take into account supply demand as well as historic price behaviour. Overriding this is the fact that not all production is integrated and some operations must rely on custom roasting, which today is a bottleneck.

The major integrated produces generally handle their own marketing as indeed do some of the major non-integrated producers. However, a substantial part of molybdenum is sold through traders or merchants who buy and sell for their own account.

One interesting feature of the present run-up in prices is that it seems to have caught many in the market including traders, by surprise with low inventories.

Indeed, many other commodity markets in this cycle were in a similar position. The major steel raw materials iron ore and coal jumped in prices as did most major non-ferrous metals. While strictly not a commodity, ocean freight rates skyrocketed in the face of a shortage of ships and major import demands from China.

Excess price surges and slumps invariably result in an opposite movement. In the face of high prices, demand may fall through substitution where a buyer has the choice or the economy slows. Production increases as producers take advantage of such high prices and stocks rebuild and prices inevitably fall. The opposite scenario is also true.

Molybdenum as has been seen experienced this price surge and slump twice before in relatively recent years. At the time of finishing this report, prices have fallen from the recent peak and market sentiment, for now, has turned less optimistic. Time will tell.

The following table illustrates prices over the period 1980 to 2004.

Max Project Prices

Moly Price Analysis
(Metals Week Dealer Oxide Price)

	US$/lb mo	2 yr avg	3 yr avg	5 yr avg
2004*	16.34	10.88	8.53	6.10
2003	5.41	4.63	3.87	3.36
2002	3.84	3.10	2.92	2.97
2001	2.35	2.46	2.52	3.06
2000	2.56	2.61	2.88	3.35
1999	2.65	3.04	3.46	4.44
1998	3.43	3.87	3.84	4.83
1997	4.31	4.05	5.38	4.61
1996	3.79	5.91	5.47	4.19
1995	8.04	6.32	4.98	3.91
1994	4.59	3.46	3.04	2.87
1993	2.32	2.27	2.30	2.63
1992	2.21	2.30	2.48	2.86
1991	2.38	2.62	2.88	3.01
1990	2.85	3.13	3.24	3.11
1989	3.40	3.44	3.28	3.20
1988	3.48	3.22	3.10	3.25
1987	2.95	2.91	3.05	3.31
1986	2.86	3.10	3.28	3.58
1985	3.33	3.49	3.59	4.34
1984	3.64	3.72	3.90	5.63
1983	3.79	4.03	4.91	
1982	4.26	5.47	6.91	
1981	6.67	8.24		
1980	9.80			
Avg	**4.40**			

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One of the anomalies in molybdenum is that the price benchmark is either the Metals Week Dealers Metal Oxide Price or the Price for Molybdenum Oxide published by the Metal Bulletin in London. These price benchmarks are derived from reporting prices supplied by traders as opposed to being producer consumer driven.

In the middle of a price spike bull market, press reports range from the extremes of an ever-lasting bull market to imminent collapse. It is of interest in examining where the market is and where it is going to look at some recent such reports. A selection of recent reports follows this Section. (

However, for planning purposes one should be pragmatic. There is evidence that Industrial Production (IP) has peaked in this cycle and demand is slowing. However, with world oil prices seeming to be stabilizing it is now expected the world economies will bottom out later in 2005 and recovery to commence in 2006.

We quote from CHR Metals Limited (one of NSA associates in the UK) January IPWATCH Report

- *In undertaking a thorough review of our near and long-term forecasts for global industrial production, we have brought forward, by approximately 6 months, the intermediate cycle trough in growth rates. This means that, while H1 2005 is expected still to be characterized by slower growth, there will be a turnaround in Q3 with more rapid growth than previously forecast in 2006.*

? A key assumption underlying our revised forecast is that oil prices stabilize during H1 2005 at levels somewhat lower than were seen during the final quarter of 2004. In addition, we believe that some stability in the international value of the US dollar is a necessary condition for a significant improvement in business confidence. However, the dollar probably still has further to fall, perhaps another 10-20% from current values, before markets accept that a floor has been reached.

Many metal commodity prices appear to be topping out as supply increases and in many cases, stocks will start to re-build by the end of 2005.

In the summary above prices were discussed and the market consensus is that this is a price spike, but how long will it last?

The following is quoted from Roskill

"'Despite official production and consumption statistics implying that demand exceeds supply, some industry sources claim that supply is actually greater than demand but that irregularities in shipments from China and bottlenecks in the supply chain have prevented molybdenum units reaching the market at a suitable rate to meet current demand. Fluctuations in shipments from China reportedly began to correct in the last quarter of 2004 and this is likely to continue. However, because of capacity restraints in the supply chain this material will not become available to the market until Easter 2005, at which point prices may start to moderate."

NSA suggests that for the purpose of the Scoping Study, the volatile nature of the price must be recognized and that while, many commodities prices look to stay relatively firm during the first half of 2005, thereafter there is the real likelihood of correction towards historic levels but with adjustment to reflect the dollar value against its major world counterparts.

Accordingly, the following is suggested, all in "10 year" Constant Dollars

Second half of 2005:	an average in the range of US$10 to US$15/lb of contained molybdenum
2006:	an average in the range of US$5 to US$10/lb of contained molybdenum.
Long-term:	US$6/lb of contained molybdenum.

The following comments **on the Outlook for future price trends** are quoted from Roskill with whom the "market has been discussed and were taken into account in deriving the forecasts herein.

- *Current high prices are not sustainable and should start to fall but industry sources made similar predictions during 2004 yet prices continued to rise.*

- *Prices are unlikely to return to the US$2-4/lb level that was typical of the period between 1999 and the first half of 2002.*

- *The last moly price forecast worked on was a confidential study last summer, when the price was around USD16/lb for oxide. A large number of producers and consumers from the industry were spoken to and all were reluctant to be tied down on future price and in almost all cases the view was that the price was unsustainable and would start to fall, perhaps by the end of 2004, leaving prices in 2005 at around USD6-9/lb and approaching base level in 2006, about USD5-7/lb.*

- *Of course, as has since seen, the prices did exactly the opposite and continued to rise, hitting USD31-34/lb by Jan 2005. Only one of the industry sources spoken to suggested that prices could rise to this sort of level and his view was that this could mean moly remaining expensive for 2-3 years. Quite what expensive means is open to debate but the overall consensus was that prices would not return to the USD2-4/lb level that existed before prices started their increase in 2002.*

- *Overall, we think a price decline, when it takes place, will ultimately lead to a base level of USD5-9/lb, probably at the lower end of this range, but the key factor is when. We are hearing suggestions that the price is cooling now, having dropped from its peak of USD34/lb, but this has happened before in the past year and was only temporary on these occasions. One insider reported that rejuvenated moly supply that has been held up in China and elsewhere due to bottlenecking etc. could start to reach the market and ease the situation as early as Easter 2005, but then similar predictions were made by the same observer last year when prices were forecast to moderate by January 2005.*

- *It all hinges on material reaching the western spot market in time for the various rounds of purchasing exercised by those steel companies (and other consumers) who regularly buy from traders operating in that market. If trader stocks cannot be increased, and demand stays on trend, then prices will remain high.*

SOME RECENT PRESS COMMENTS AND REPORTS

Molymet plans 50% molybdenum roasting capacity increase

London 16 December 2004 12:33
Chilean molybdenum producer Molibdenos y Metales SA (Molymet) plans to increase its molybdenum processing capacity to 150 million pounds by 2007, according to sources in the molybdenum market. Molymet made an official announcement, they said, undertaking to raise capacity to 150 million pounds from its current level of 100 million pounds.

Molymet buys concentrates from Codelco and other copper producers in Mexico and Peru, and converts them to molybdenum oxide at its plants in Chile, Mexico and Belgium. The company's Belgian plant, Sadaci, also converts molybdenum oxide to Ferro-molybdenum. Though prices of molybdenum oxide and Ferro-molybdenum are extremely high — Western material is being bought at $88-91 per kg in Europe — as a result of a shortage of material coupled with strong demand from the steel sector, the announcement is not expected to have an immediate impact on price.

“2007 is far away from 2004 — in 2007, it will be a completely different world. There will be no anti-dumping [on Chinese Ferro-molybdenum entering the EU] and the steel boom will have come to an end. It will have no effect on price now,” said a European molybdenum trader. The difference between capacity and actual production was also noted by another trader, who pointed out that Molymet will have to source the additional concentrate from mine production. “They always claim to be the biggest, but in reality they have no mines, they have to buy [concentrates], and there’s no 50 million lb in new mine capacity. But if it were used, it would make a difference.”

Mo shortage seen by 2010

FLORIDA (Metal-Pages) 29-Oct-04. China's growing appetite for molybdenum containing steel coupled with a lack of investment in new molybdenum production could lead to a shortage of molybdenum by the end of the decade, an industry meeting has been warned. Terry Adams, managing director of Adams Metals, was speaking to delegates at the Ryan's Notes Ferro alloys conference in Florida. Since 1985/6 demand for molybdenum has outstripped the ability of western producers to supply, and while some of this shortfall has been made up by material from the CIS the majority has been from growing Chinese exports which now account for 30% of western supply.

Chinese steel production is forecast to rise at 15% per annum up until the end of the decade, which, assuming that Chinese current mine production is running at capacity, will lead to a reduction of 5% per annum in the amount of molybdenum that China has to export. Projecting this forward Adams believes that there could be a reduction in the availability of molybdenum that China has to export from nearly 100m lbs last year to around 60m lbs by 2010.

Taking a conservative view on world demand growth of 3.5% (the long term average is around 5%, but high prices may lead to a slowing of demand) this suggests that within two to three years existing western primary mines will have to increase production to meet demand and that by 2009 all currently operating mines will be at capacity. By 2010 it will be necessary to have new mining operations and/or to reactivate the mothballed Climax mine in order to satisfy demand.

This analysis does not take into account additional molybdenum units coming into the market as a by-product of copper production (it is conceivable that today's copper prices will result in a rise in copper production leading to additional molybdenum units being made available) nor the possibility of additional supplies from China and the CIS.

However, with the possibility that growth in demand could maintain its historical 5% level and with by-product supply uncertain as it is dictated by the vagaries of the copper market and with supply from China and the CIS an unknown quantity it does post a warning to the molybdenum market that there could be supply disruptions and further price volatility in the future.

Molybdenum oxide price hits all-time high source Macquarie

According to Platt's Metals Week, the molybdenum oxide ("moly") price hit an all-time high quote of $31.50-33.25/lb last week, the highest ever price recorded for this commodity. This is a massive boost to the by-product earnings of many copper producers around the world and will largely offset any cost pressures coming from high-energy prices.

Those of us who have followed this commodity over the years never thought that it would be possible to get back to the previous price peak of $31.63/lb (in June 1979) in the absence of a major supply catastrophe (such as happened in 1979 with a prolonged strike at a major primary producing mine).

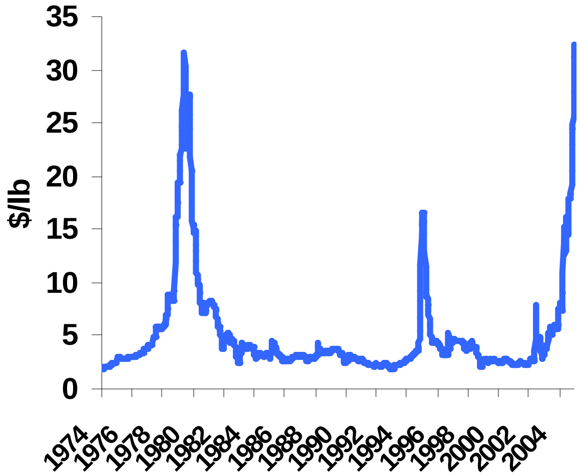
This time around the bottleneck appears to be molybdenum roasting capacity (to convert the mined product into moly oxide), not mining capacity, which is likely to expand rapidly in 2005.

A recent Japanese steel industry study revealed that at roughly 300m lbs/year, global roasting capacity is 20-60m lbs/year short of demand. The Japanese government has been asked to help fiancé the building of new capacity but no specific projects have been put forward.

It seems that the moly shortage could be with us for a while…already, it is reported that some miners are having trouble placing product in 2005.

The last time prices spiked this high, a massive substitution away from molybdenum was triggered in low alloy steels and over 30% of demand was lost (much of it permanently). This remains a risk this time around.

Weekly molybdenum prices since 1974 – this is what we call a bull market! ($/lb)



Source: Platt's Metals Week

Lower-priced Chinese moly may turn US market
Pittsburgh 21 January 2005 14:33

The US Ferro-molybdenum market appears to be at a turning point, with the recent run of escalating prices threatened by reported low offers from China. One importer of Chinese Ferro-molybdenum received offers this week at $32 per lb, he claimed, which he said would allow him to undercut recent US prices of $38-39 per lb. "I've been offered at $32 and I'd be a seller at $35," the trader said, although he did not say whether he had made any sales at lower prices. A second trader has indirectly heard of lower Chinese offers but has not received them himself, he said. "The last offer I got a few days ago was $35.50," he said. But traders not overly surprised at the lower-priced offers, they said. "They're getting rid of inventory before the Chinese New Year [in early February]," a trader said.

Ferro-molybdenum prices traditionally decrease as the New Year approaches in China, a third trader said, adding that, historically, prices do not rebound strongly once the holiday is over. “Once it starts going down it keeps going, even after the New Year,” he said. But he has seen no sign of lower prices, he added, and reported small-quantity sales at more than $40 per lb.
But the high prices are beginning to take a toll on demand, he added. “Foundries are alloying out of moly,” he said. “They’re persuading their customers to take non-moly-bearing grades instead.”
Stainless steel alloys such as Type 316, which contain 2.5-3 percent molybdenum, have become so expensive that consumers are shifting in some cases to castings made from Type 304 stainless, an austenitic grade that contains no molybdenum, the trader said.

Noranda plans big molybdenum boost
Santiago 04 February 2005 15:13
Noranda is boosting molybdenum production at its operations in Chile and Peru to 27,000 tpy from 5,000 tpy to take advantage of prices above $70 per kg. Subsidiary Falconbridge will begin construction of a new molybdenum plant at the Collahuasi mine in Chile’s Region I in which it has a 44 percent state during the first quarter. The plant will be capable of producing 12,000 tpy of concentrates and will cost $42 million to build, of which Falconbridge will contribute $18 million. Production will begin by the end of the year with 4,000 tonnes due to be produced in 2006.
“The project has a very high rate of return at prices much lower than the current prices,” Derek Pannell, Noranda's president and ceo, said. Noranda will also convert a copper roaster at its Altonorte smelter near Antofagasta in Chile’s Region II to produce up to 11,600 tpy of molybdenum concentrate. At the Antamina copper-zinc mine in Peru’s Ancash department, in which Noranda has a 33.75 percent stake, production of molybdenum concentrate jumped almost Sixfold in 2004 to 3,585 tonnes compared with the previous year, said Teck Cominco. This will be further increased by 60-70 percent a Noranda spokeswoman told MB. Antamina’s molybdenum recovery circuit will also be upgraded to produce bismuth as attention turns towards maximising the recovery of byproduct metals.
“The circuit that produces molybdenum eliminates bismuth and lead. Molybdenum was not the first priority at Antamina but now we are looking to

improve its recovery and install pipes so that we can produce bismuth," Pannell said.
Molybdenum concentrates at all operations will be supplied to local processor Molibdenos y Metales (Molymet) which has a $78 million expansion project to increase its production capacity at its Nos plant in Chile.

MolyMet to boost moly capacity to 68,000 tonnes
Santiago 04 February 2005 14:50
Chilean molybdenum producer Molibdenos y Metales (MolyMet) plans to increase production by 50 percent during 2007 via a $106 million expansion project.
The company will boost output to more than 68,000 tpy from 45,500 tpy, Carlos Letelier, vp of operations, told MB.
It will spend around $78 million on the Nos plant in Chile to increase capacity by 70 percent (18,000 tonnes) and $28 million in Belgium to increase capacity by 4,500 tonnes. Around 60 percent of expenditure will be on environmental aspects. MolyMet also operates a plant in Mexico.
The capacity expansion will take advantage of increased molybdenum concentrate production by Chile's copper producers — molybdenum is produced as a by-product — such as Noranda and its affiliate Falconbridge. Both are are stepping up molybdenum recoveries now that prices have jumped to more than $70 a kg.
MolyMet receives molybdenum concentrates from many copper miners in Chile and the region including Codelco, Antofagasta Minerals, Southern Peru and Minera Sur Andes.
Additional concentrates will be supplied as new copper mining projects come on stream in Chile.
The decision to expand followed the signing of a five-year take-off contract with the Collahuasi mine (44 percent owned by Noranda/Falconbridge, 44 percent by Anglo American and 12 percent by a Japanese consortium) for the concentrates it will produce from a new flotation plant.
Molybdenum is used in the production of stainless steel and special steels and is sold globally in market in which MolyMet claims a 30 percent market share.

QUALITY

W G Cook Limited ("WGC") advises that based on the information presently on hand the forecast quality for the MAX moly concentrate looks to be very good and will not incur any penalties. Concentrates with over 0.5% Copper are definitely saleable, but they will be subject to a penalty. At current prices the penalty is not significant.

On the other hand concentrates with copper < 0.02% would likely command a premium. In some cases, mines need to install a cyanide leach circuit to reduce the copper. The question is then, what are the fixed and operating costs of the cyanide leach circuit versus the premium. Are there any environmental problems or potential reclamation liabilities arising from such a leach circuit?

Most mines only leach (using either cyanide or ferric-chloride) as a last resort. For example a by-product producer such as Highland Valley Copper opts for higher molybdenum recoveries in their flotation circuit and then leaches. The grade of Copper in their concentrates pre-leach is about 2.5% copper.
After leaching the material through the ferric-chloride circuit the concentrates grades about 0.2% Cu.

With the ROCA MAX project being a vein type primary producer, high recovery is expected with low copper and the problems of a by-product producer are absent.

While the price on which concentrates are sold is universal - in North America the Metals Week Dealer Oxide Price - the return to the mine will depend on a number of factors.

- Concentrates have to be moved to the market and this is a deduction from the price
- Concentrates need to be roasted
- There is a conversion loss
- Payment timing
- Quotational Period

Over and above this, it must be recognized that terms are market driven and unlike many other commodities where certain terms are standard and future term guidelines are often quoted, buyers are reluctant to quote today for delivery tomorrow, so to speak, in view of the nature of the market.

This has been discussed with WGC, whom NSA were pleased to have introduced to Roca Mines as a potential buyer of MAX concentrates

WGC has forwarded to Roca Mines a standard contract and for easy reference this is appended.

Sales terms have been discussed with several sources and the indications herein are unrelated to any bid that WGC may or may not give in the future and are intended to provide a basis of assumptions for the Scoping Study now ongoing.

Among the off-site costs, roasting fees are price and supply/demand related and may vary from around say plus/minus $0.75 per pound of molybdenum contained up to say plus/minus $4 depending on the price and market.

Transportation costs are location and market dependent and are likely to range from 25/30 cents up to say 35/40 cents or per pound of contained moly.

Conversion costs (losses) are1% in Europe and can be 2.5% in China (contained moly)

What is the bottom line consideration to the mine?

Given the mix of price relationship and market conditions, it is almost impossible to show this as a price percentage. Accordingly it is suggested that for simplicity the following is assumed. (Per lb of contained Mo)

At $6 assume offsite costs of say $1.25 to $1.50

At $10 assume offsite costs of say $2 to $2.50

At $15 assume offsite costs of say $3 to $3.50

The trader in many commodities has traditionally played an important role as stockholders and a market last resort either as buyers or sellers. This is particularly true in the moly market where traders in molybdenum are very active due to the large percentage of off-grade by-product material that is produced.

In North America WGC represents Derek Raphael & Co Ltd (DRC) the world's leading moly trader. DRC has a forty-year history in the molybdenum business and are very well established in the industry. Currently they have contracts with Huckleberry, Gibraltar, Ashdown, Highland Valley, Antamina, SPCC and others worldwide.

Roca Mines will be well advised to sell, FCA mine and allow the buyer to handle all inland freight, storage, ocean freight, roasting and delivery to ultimate consumer.

World production overview by Roskill Information Services Ltd ©

Supply

World reserves of molybdenum are estimated at around 8.6Mt (contained), of which all but 15% are located in China, the USA and South America. Mine capacity stands at about 186,000tpy (409Mlb/y) and around two-thirds of this was utilised in 2002. Copper porphyries are the main source of molybdenum and mines exploiting these deposits accounted for about 70% of world molybdenum production in 2002. Most of these co-product operations are located in North and South America. In contrast, primary mine capacity is mostly concentrated in China and the USA. The principal molybdenum producers in 2002 were Phelps Dodge/Climax in the USA, Codelco in Chile and JDC in China, and between them, these three companies accounted for around 40% of world production in that year.

There are two types of molybdenum supply:

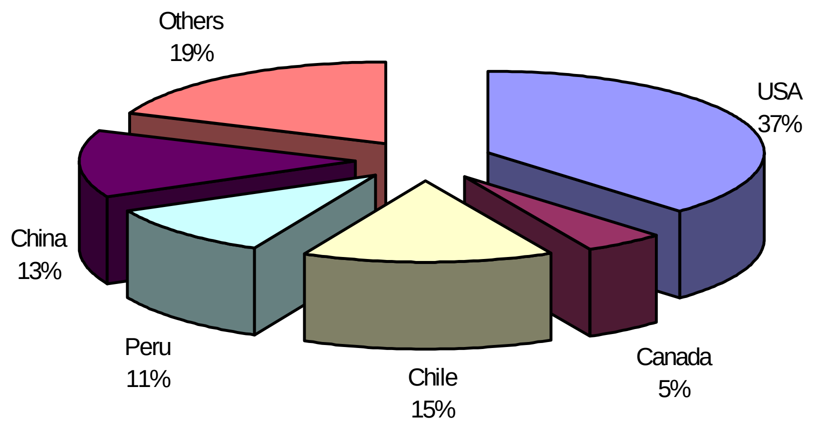
- *Primary molybdenum mines, where molybdenum production is the only source of revenue. During processing, the ore is concentrated by flotation to yield concentrates containing 90-94% molybdenite (molybdenum disulphide, MoS_2), which is equivalent to around 55% of contained metal.*
- *Copper-molybdenum mines, where molybdenum is produced as a by- or co-product of copper. In these operations, molybdenite is first reduced to a bulk flotation product along with the copper, which is then separated by further flotation in several stages. By-product molybdenum concentrates usually grade between 70-80% molybdenite, which is equivalent to a metal content of about 45%.*

Production capacity

A little over two thirds of molybdenum production capacity is located in North and South America, with a further 13% situated in China. Copper mines have been the main source of molybdenum supply for much of the past 15 years, and they account for about two thirds of world molybdenum capacity at present). In terms of capacity, most of these operations are located in the Americas and in 2002, *copper mines produced 70% of the world's molybdenum output. In contrast, primary mine capacity is mostly concentrated in China and the USA.*

World production consumption by Roskill Information Services Ltd

World: Molybdenum mine capacity by country, 2002



Mine production

World mine production of molybdenum, which is generally measured in terms of the metal content of concentrates produced, increased almost continuously from around 15,000t in 1950 to a peak of 110,000t in 1980. Output was relatively unaffected by the recession of the mid-1970s caused by the first major OPEC oil price increases. In contrast, strong demand in the late 1970s could not be met from existing mine capacity, and with stocks falling and prices rising, mining companies were encouraged to expand their existing mines and develop new deposits.

World: Production of molybdenum by major producing country, 1987 to 2002 (000t contained)

	Canada	Chile	China	[1]CIS	Mexico	Peru	USA	[2]Other	Total	*Mlb*
1990	12.2	13.6	15.7	17.0	2.0	2.5	61.6	2.5	127.1	*280*
1991	11.4	14.4	13.2	16.0	1.7	3.0	53.4	2.3	115.5	*254*
1992	8.9	14.5	46.6	13.2	1.5	5.6	49.7	2.9	143.3	*316*
1993	10.3	14.9	45.3	12.1	1.7	4.8	36.8	2.8	129.3	*285*
1994	9.8	15.9	48.4	5.1	3.2	4.6	46.8	2.7	136.5	*301*
1995	9.1	17.9	33.0	5.0	4.1	3.6	60.9	2.4	136.0	*300*
1996	8.8	17.4	29.6	4.4	4.2	4.0	56.0	2.8	127.2	*280*
1997	7.6	21.3	33.3	4.4	4.8	4.3	60.1	2.6	139.0	*306*
1998	8.1	25.3	30.0	5.9	6.0	4.4	53.3	5.5	138.2	*304*
1999	6.3	27.3	27.7	6.6	8.0	5.5	42.4	[3]8.8	132.6	*292*
2000	7.0	33.6	31.8	7.5	6.9	7.2	41.1	[3]7.9	143.0	*315*
2001	8.2	33.7	[4]23.9	8.7	5.5	9.5	37.6	[3]9.3	136.4	*298*
2002	8.0	29.1	[4]38.1	9.1	3.4	9.0	32.4	[3]8.4	137.5	*303*
2003	8.6	33.8	[4]39.3	10.9	3.5	9.6	33.8	[3]9.0	148.5	*327*
2004[5]	8.1	33.4	[4]38.8	11.0	3.8	9.4	40.0	[3]8.9	153.4	*338*

Source: IMOA; Nissho Iwai; Company reports; national statistics (eg, USGS)

Notes: For 1998-2001, the world totals listed fall between the estimates reported by the USGS and the IMOA.

1-Armenia, Kazakhstan, Kyrgyzstan, Russia and Uzbekistan

2-Chiefly Mongolia, Iran, Bulgaria and Poland (since 1998)

3-Includes recycled molybdenum from spent catalysts (approximately 3,000-5,000tpy)

4-Roskill estimates

5-Forecast

World production consumption by Roskill Information Services Ltd

World: Molybdenum supply by company and mine, 2000 to 2004 (t contained)

Majority shareholder	Mine (ownership %)	Country	2001	2002	2003	[1]2004
Phelps Dodge	Bagdad, Chino, Morenci & Sierrita (100%)	USA	16,758	11,099	13,505	13,430
	Henderson (100%)[2]	USA	8,446	9,315	10,100	12,266
	Sub-total		*25,204*	*20,414*	*23,605*	*25,696*
Codelco	Chuquicamata (100%)	Chile	15,219	11,620	16,435	…
	El Teniente (100%)	Chile	4,720	3,905	3,496	…
	Andina (100%)	Chile	2,724	2,172	2,043	…
	El Salvador (100%)	Chile	1,575	1,600	1,180	…
	Sub-total		*24,238*	*19,297*	*23,154*	*24,000*
JDC	Huaxian (100%)	China	14,100	[3]13,800	[e]14,000	14,000
Grupo Minero Mexico[4]	La Caridad (100%)	Mexico	5,518	3,248	3,501	3,772
	Cuajone[5] (100%)	Peru	4,257	4,107	4,867	4,500
	Toquepala[5] (100%)	Peru	4,102	4,219	4,153	4,300
	Continental (49.9%)[6]	USA	-	-	-	3,200
	Sub-total		*13,877*	*11,574*	*12,521*	*15,772*
Thompson Creek	Thompson Creek (100%)	USA	3,087	3,496	3,904	4,500
	Endako (100%)	Canada	5,539	4,812	5,130	4,750
	Sub-total		*8,626*	*8,308*	*9,034*	*9,250*
Antofagasta	Los Pelambres (60%)	Chile	6,900	7,800	8,700	7,400
Rio Tinto	Bingham Canyon (100%)	USA	8,100	6,100	4,600	5,000
Luoyang Luanchuan Moly. Co.	Lengshui/Majuan (100%)	China	2,890	4,050	…	…
Teck Cominco Ltd[7]	Highland Valley (63.9%)	Canada	1,853	2,463	3,314	3,350
Anglo American/Las Condes	Los Bronces (100%)	Chile	2,600	2,000	[e]2,000	2,000
NICICO Sar	Cheshmeh (100%)	Iran	1,816	1,498	1,952	1,950
Molycorp Inc	Questa (100%)	USA	1,360	1,800	1,589	1,600
Erdenet Corp.	Erdenet (100%)	Mongolia	1,423	1,590	1,816	1,816
BHP Billiton/Noranda[8]	Antamina (67.5%)	Peru	1,149	702	537	550
Imperial Metals Corp.	Huckleberry (50%)	Canada	889	507	145	500
Other China			6,910	20,250	25,300	24,800
Russia CIS			7,737	8,574	10,896	11,000
Spent catalyst (IMOA)			4,994	3,723	4,086	4,250
Total listed			**134,666**	**134,450**	**147,249**	**152,934**
Reported world total			*136,400*	*137,500*	*148,500*	*153,400*

Sources: Company literature; The Economics of Molybdenum (8th edition) 2003 (Roskill)

Notes: 1-Roskill forecast based on part year production figures in 2004 2-Operated by Climax Molybdenum Co., a Phelps Dodge subsidiary since October 1999 3-January to November 4-Part of Americas Mining Corp., the mining business of Grupo Mexico SA de CV 5-Operated by Southern Peru Copper Corp., a Grupo Mexico subsidiary 6-Majority owned by Montana Resources Inc. (51.1%) with Asarco (49.9%), the Grupo Mexico subsidiary 7-Joint-owned with BHP Billiton (33.6%) 8-Joint-owned with Teck Cominco (22.5%)

Outlook for future trends in mine production Ó

- *As at August 2004, Antofagasta was progressing with the expansion of its Los Pelambres mine in central Chile*
- *Continental Mine, at Butte, re-opened at the start of 2004*
- *In October 2004, Taseko Mines' Gibralter mine in Canada restarted production at a rate of 445tpy contained molybdenum.*
- *As at November 2004, molybdenum output at Teck cominco's highland Valley mine is expected to fall by 50% in 205 to around 2,300t*
- *As at December 2004, Molymet (Chile) planned to increase its molybdenum processing capacity from 45,00t to 68,000t by 2007*

Reported supply interruptions at molybdenum operations during 2003-2004 include:

- *Fire at JSC Molibden (Sorsk mine), Russia (Dec. 2003)*
- *Strike at Andina (Codelco), Chile (Dec. 2003)*
- *Closure of dressing plants in China (Dec 2003)*
- *Equipment failure at Climax, Stowmarket, UK (Feb. 2004)*
- *Treibacher FeMo plant working below capacity (April 2004)*
- *Closure of Ferro-Alloys FeMo plant in Glossop, UK (April 2004)*
- *Strike at La Caridad, Mexico (July, 2004)*
- *Problems with a tailings dam at JDC, China (July 2004)*
- *Strike at SPCC, Peru (August-September 2004)*

New molybdenum projects likely to come on stream since 2002:

- Amerigo Resources Ltd. – tailings operation at Minera Valle Central operation treats tailings from Codelco's El Teniente mine and recovers copper, although the company has recently received a prefeasibility study for the extraction of molybdenum. This proposal is expected to proceed to the feasibility and production is expected in March 2005.
- Minera Collahausi (Anglo American and Falconbridge) received environomental approval for a new molybdenum concentrates plant at Collahausi copper mine, Chile. The plant should be completed by the end of 2006 and could produce 7,300tpy contained molybdenum

- As at December 2004, Eureka Mining announced that its Shorskoye molybdenum project in Kazakhstan could come into production during the second half of 2005. The current feasibility study is examining a 750,000tpy operation, producing 1,725tpy of molybdenum.
- Golden Phoenix Mineral were scheduled to start producing molybdenum as early as December 2004 in a pilot scheme at its Ashdown Au-Mo property in Nevada, USA.
- Roca Mines expects to have its Max molybdenum project BC, Canada, producing around 1,000tpy contained molybdenum by the second half of 2005.

World: Potential molybdenum mines of the future

Deposit	Country	Type	Estimated reserves	Notes
Agua Rica	Argentina	Cu-Mo	750Mt @ 0.037% Mo	To advance
El Pachon	Argentina	Cu-Mo	3,000tpy over 20yrs	Decision due 2005
Magistral	Peru	Cu-Mo	105Mt @ 0.052% Mo	Bankable feasibility by 2006
Mt. Hope	USA	Mo	205Mt @ 0.11% Mo	Pre-feasibility
Oyo Tolgai	Mongolia	Cu-Au-Mo	…	…
Pebble	USA	Cu-Au-Mo	141Mt @ 0.019% Mo	…
Petaquilla	Panama	Cu-Mo-Au	60,000t Mo	Production decision in 2005
Quellaveco	Peru	Cu-Mo	966Mt @ 0.02% Mo	…
Reko Diq	Pakistan	Cu-Mo-Au	…	…
Shorskoye	Kazakhstan	Mo	315Mt @ 0.24% Mo	Pre-feas. end 2003
Sungun	Iran	Cu-Mo	384Mt @ 0.1% Mo	Development in 2004
Tekhut	Armenia	Cu-Mo	460Mt @ 0.22% Mo	Due 2010-2015

Source: The Economics of Molybdenum (8th edition) 2003 (Roskill)

World production consumption by Roskill Information Services Ltd

Historically, the USA is the world's dominant producer of molybdenum, although with the recent cuts in output, there was relatively little difference between production rates in the USA, China and Chile in 2002. These three countries are the main molybdenum producers, accounting for around 75% of world production in 2002.

Most molybdenum production in China and a large proportion of that in the USA comes from primary mining operations and, therefore, fluctuates according to price and perceived demand. In the recent period of oversupply, this has been particularly true of the primary mines in the USA where output has been cut in order to constrain the build up of inventory. Some of the smaller copper-molybdenum operations have closed down since 1999 but US supply is firmly underpinned by production at the porphyries of Bingham Canyon, Sierrita and Bagdad. In China, molybdenum mining was initially not affected by normal economic pressures, and enjoyed a competitive cost base and strong domestic demand from a fast-growing steel industry. However, the prolonged period of low prices eventually forced China to address the problem, although national mine production has not fallen greatly since 1998. In addition, the imposition by the EU of anti-dumping duties on Chinese ferromolybdenum helped to limit the volume of low cost material in the market, although this was partly countered by many Chinese producers changing their focus to molybdenum oxide exports.

In Chile and the rest of Latin America, however, molybdenum is produced solely as a by-product of copper mining and is, therefore, dependent on the economic state of the copper market. For copper miners, such as Codelco, the added value of molybdenum credits is an important bonus to the economics of their core operations. For this reason, molybdenum output in Chile, the world leader in copper production, actually rose by 11%pa between 1995 and 2001 before the decline in the copper market enforced a 14% reduction in output in 2002.

Supply from the CIS dropped markedly in the period following the break-up of the former Soviet Union and the resulting loss of state subsidies as well as the main regional customer, the Soviet defence industry. However, production in Russia and Armenia has recovered since 1997 and operations in both countries were increasing capacity utilisation in 2002.

Since 1998, consolidation in the copper mining sector has led to two major changes in the corporate control of molybdenum mining activities. At the end of

1999, Asarco (together with its interest in Southern Peru Copper) was taken over by Grupo Mexico, making Grupo Mexico the third largest western producer of molybdenum at that time. In a similar agreement, Phelps Dodge merged with Cyprus Amax, to become the world's largest producer of copper and molybdenum in 1999. As a result, a relatively small number of companies control a large share of world production. In 2002, the six largest world producers, Phelps Dodge, Codelco, JDC, Grupo Mexico, Thompson Creek and Antofagasta accounted for 66% of world production, all of which was located in North or South America apart from the JDC operations in China.

In terms of output in 2002, the biggest individual mining operations are:

- *Huaxian (JDC), China*
- *Chuquicamata (Codelco), Chile*
- *Henderson (Climax/Phelps Dodge), USA*
- *Los Pelambres (Antofagasta), Chile*
- *Bingham Canyon (Kennecott/Rio Tinto), USA*

Molybdenum Products Ó

Commercial molybdenum products

Although molybdenum ore (molybdenite) beneficiation at a mine produces concentrates that can be sold on without further processing, many mine operations are integrated with a roasting facility for the conversion of raw concentrates to technical-grade molybdenum oxide (molybdic oxide, MoO_3), or TMO. Those operations without roasters transfer untreated concentrates to roasting facilities elsewhere in the world, as TMO is the starting material for all forms of downstream molybdenum processing.

In terms of the global molybdenum market, most molybdenum is traded in the form of TMO (often under the name of roasted concentrates) or ferromolybdenum, which reflects the demands of the iron and steel industry as the dominant end-user of the metal. However, there are also smaller markets for molybdenum in other forms, such as refined metal powder or ingots, ammonium, calcium and sodium molybdates, purified molybdenum disulphide and various other chemical compounds.

Roasted concentrates

World: Molybdenum roasting capacity, 2003[1] (tpy concs.)			
Country	Company	Location	Capacity
Integrated roasting divisions			
Canada	Thompson Creek	Endako	6,000
Chile	Codelco	Chuquicamata	[e]22,800
China	Jinduicheng Molybdenum (JDC)	Shaanxi	[2]15,000
	Luoyang Luanchuan (LLM)	Luanchuan	[3]3,000
Netherlands	Climax/Phelps Dodge	Rotterdam[4]	…
Russia	JSC Molibden	Sorsk[5]	…
USA	Climax/Phelps Dodge	Ft. Madison, IA[2]	17,200
	Phelps Dodge	Sierrita[2]	…
	Molycorp	Washington, PA[6]	-
	Thompson Creek	Langeloth, PA[2]	[7]15,000
Uzbekistan	Uzmetall/Almalyk	Chirchik	600
Independent toll-roasting companies			
Belgium	Sadaci[8]	Ghent	[2]16,700
Chile	Molymet	San Bernardo	43,000
Mexico	Molymex	Cumobabi, Sonora	18,500
Total listed			**157,800**

Source: Industry reports and company websites

Notes: 1-Excludes many operations in China and companies that roast concentrates for their own captive use

2-Oxide capacity (tpy) 3-Target oxide production in 2002

4-Integrated plant that also carries out roasting for third parties

5-Planned 6-Closed 7-Contained molybdenum

8-Acquired by Molymet in January 2003 and future as a toll roaster remains uncertain

Molybdenum concentrates are roasted in a multiple hearth furnace at temperatures of up to 650°C to produce TMO typically having 90% purity (for 60% Mo content) and no more than 0.1% sulphur. TMO is the raw material for the preparation of most other molybdenum products, and it can be added directly to steel, cast iron and other metal alloys. It can be produced as a powder or as briquettes by compacting TMO with ammonia, which is then driven off in the drying process.

Many of the roasting facilities that are integrated within molybdenum mine companies also toll-roast concentrates from other producers. The supply of roasted material from these operations to the global market is further boosted by toll-roasting carried out by three independent companies that do not have their own mines - Molymet, Molymex and Sadaci). A number of other companies also have roasting plants but these are generally for captive use, perhaps as an intermediate stage in the further processing of molybdenum to other products, and are not associated with the onward sale of TMO.

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Overview of world consumption of molybdenum *Ó*

Molybdenum demand remained relatively high at around 140,000t in 2001 and 2002 despite the cutback in production at the copper producers. This contributed towards a tighter market.

Improvement in the world's economy during 2003, particularly in the USA in the final quarter, helped to push up worldwide consumption to 154,000t in 2003, and an estimated 160,000t in 2004. Consequently, growth in demand continued to exceed growth in supply despite recovery in molybdenum production at the world's copper operations.

Industry sources predict that demand is expected to grow by around 4%pa

The growing steel sector in China is another factor that may affect China's molybdenum trade balance as steel consumes progressively greater amounts of domestic molybdenum each year. However, it seems that current expansion in the steel industry is not focused on steel grades that contain molybdenum as these grades are thought to be largely imported by Chinese consumers. Consequently, there is a long way to go before domestic molybdenum consumption in China exceeds domestic production.

The steel industry is the main consumer of molybdenum, principally in stainless and full alloy steels. Estimates of the volume of molybdenum consumed in different end uses varies but the relative proportions of the market accounted for by each sector tend to be more consistent:

Iron and steel	*81%*
Super alloys	*4%*
Molybdenum metal	*5%*
Catalysts	*7%*
Other non-metallurgical	*3%*

Stainless steel production is expected to grow by 4-5%pa from 2004 through to 2009. World production in 2003 stood at 18.4Mt

Growth in molybdenum demand for the period 1999-2004 is 4.4%pa, which is higher than average growth since 1995 (3.1%pa).

World: Consumption of molybdenum by region, 1990 to 2004 (000t contained)

Year	USA	W. Europe	Japan	China	Other	Total	*Total (Mlb)*
1990	[1]23.6	38.6	16.8	…	[2]8.6	87.6	*193*
1991	[1]22.2	34.0	17.6	…	[2]9.1	82.9	*183*
1992	[1]24.0	33.1	15.4	…	[2]9.1	81.6	*180*
1993	[1]25.4	33.6	15.9	…	[2]9.5	84.4	*186*
1994	[1]29.1	39.6	16.7	…	[2]11.0	96.4	*212*
1995[3]	30.9	46.3	18.1	7.7	14.5	117.6	*259*
1996[3]	31.3	41.8	18.6	7.7	15.4	114.9	*253*
1997[3]	34.5	44.5	21.3	8.2	16.8	125.3	*276*
1998[3]	[4]34.0	45.9	21.8	8.6	17.3	127.6	*281*
1999	[4]31.8	48.1	18.6	8.6	21.8	128.9	*284*
2000	[4]34.1	51.3	22.2	8.6	24.5	140.7	*310*
2001	[4]31.8	51.3	22.2	8.6	26.8	140.7	*310*
2002	[4]30.4	50.8	22.2	9.1	28.1	140.7	*310*
2003	30.4	55.4	24.5	11.3	32.7	154.3	*340*
2004[5]	32.0	58.0	25.4	11.3	34.0	160.5	*354*

Sources: Former Climax Molybdenum Co. (up to 1992), IMOA (from 1995; converted from Mlb)

Notes: 1-Includes Canada

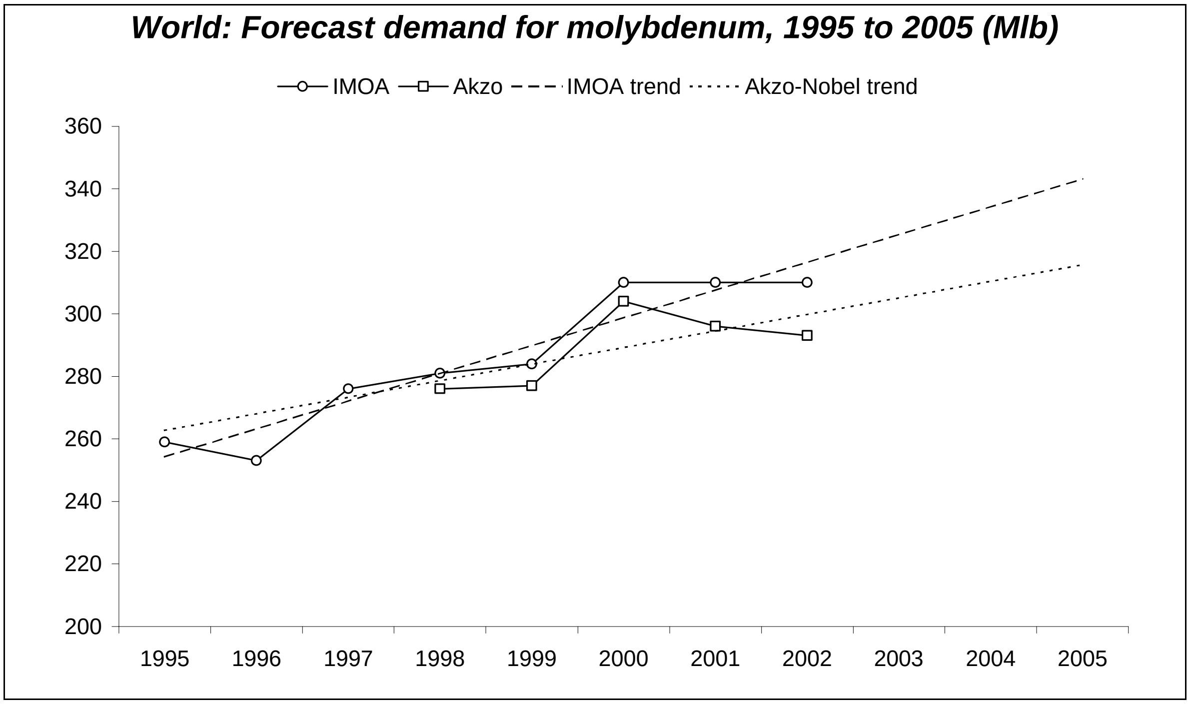
2-Western countries only

3-Excludes data for CIS countries. Estimates of production and consumption in the CIS have varied so much that no figures have been included for 1995-1998. In 1999-2002, data from CIS sources corroborated by estimates from IMOA members has been included

4-Similar figures quoted by the USGS are for concentrates roasted to TMO.

5-Roskill estimate assuming growth in molybdenum demand of 4%

World production consumption by Roskill Information Services Ltd



Source: Catalysts Courier (Sept. 2002), Akzo-Nobel (www.akzonobel-catalysts.com)

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Consumption of molybdenum by end-use

Background to molybdenum demand from the iron and steel industry

The iron and steel industry remains by far the largest end-use for molybdenum. Stainless and full-alloy steels are the major market segments, followed by tool steels, high-strength low-alloy (HSLA) steels and carbon steels. Molybdenum is easy to add to molten steel and losses are minimal regardless of whether it is added as oxide, ferromolybdenum or as molybdenum-bearing scrap. Molybdenum is added to steels to:

- *minimise the cooling rate needed to obtain a hard martensite structure, thereby increasing strength, toughness and hardness in large sections*
- *reduce temper embrittlement*
- *resist hydrogen attack*
- *resist sulphide stress cracking*
- *increase elevated temperature strength*
- *improve resistance of stainless steels to a wide variety of corrosive processes, such as chloride pitting*
- *improve weldability, especially in HSLA steels.*

The impact of steel industry demand on the molybdenum sector relates to the trend in crude steel production), which generally reflects production patterns of the various steel types. Asia is the largest producer of crude steel accounting for more than 40% of the world total, followed by Europe, North America and the CIS China (181Mt in 2002), Japan (108Mt) and the USA (92Mt), the world's three largest steel producers, accounted for 42% of global crude steel output in 2001.

Steel alloys

Stainless steels

Although stainless steels accounts for only 2% of global crude steel production, they consume more molybdenum than any other sector of the iron and steel industry and are the main source of molybdenum demand. The largest markets for stainless steels are in the manufacture of tubes and pipes, in construction, *automotive applications and in the chemical and petrochemical industries. An important growth area for stainless steel in the 1990s was in environmental protection and clean-up operations.*

Steel microstructure, which depends on its basic composition and the nature of heat treatment, determines the steel's properties of strength, toughness and corrosion resistance. The three main stainless steel types have austenitic, martensitic and ferritic microstructures. However, modifications to the composition of stainless steels in order to suit specific applications and to keep stainless steel competitive with other materials, have resulted in the development of modified microstructural types, termed super-austenitic, super-ferritic, duplex and super-duplex stainless steels.

Use of molybdenum in stainless steel

The addition of molybdenum to stainless steel enhances its resistance to corrosion by strengthening the protective surface layer (which is present due to chromium), and speeds up the repair of this film if it is breached. Stainless steel containing molybdenum is much more resistant to stress corrosion cracking, pitting corrosion and attack by acids, particularly hydrochloric acid, sulphuric acid and salt/sea-water. Resistance to corrosion improves with increased molybdenum content up to a level of about 7% Mo, above which not all the molybdenum will remain in solid solution after heat treatment or welding.

Molybdenum is not a constituent of all stainless steels but is commonly present in 15-20% of all stainless steels produced, including austenitic, super-ferritic, duplex, casting, and heat-resisting types. Additions of molybdenum tend to be in the 1-6% range and type 316 (2-3%) is the most commonly used grade. Applications include power plant condensers, offshore piping and nuclear power plants.

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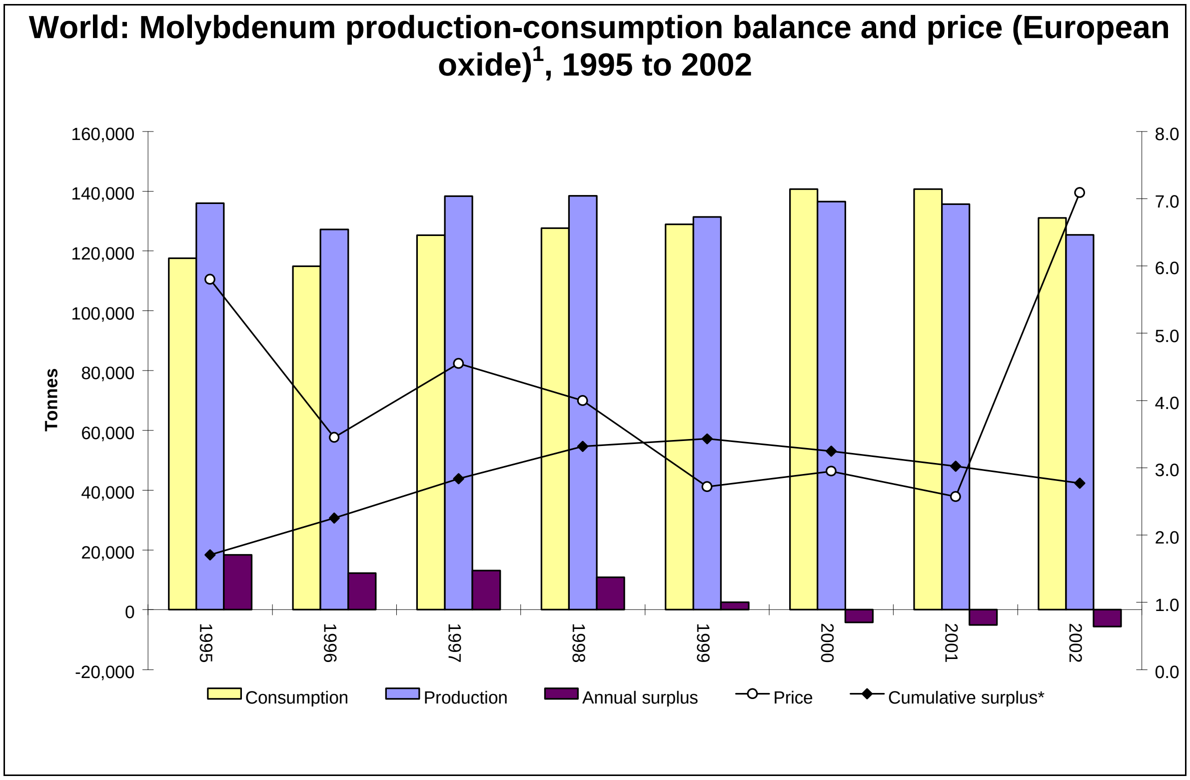
Supply/demand balance



Note: *Since 1995
1-End June price for each year

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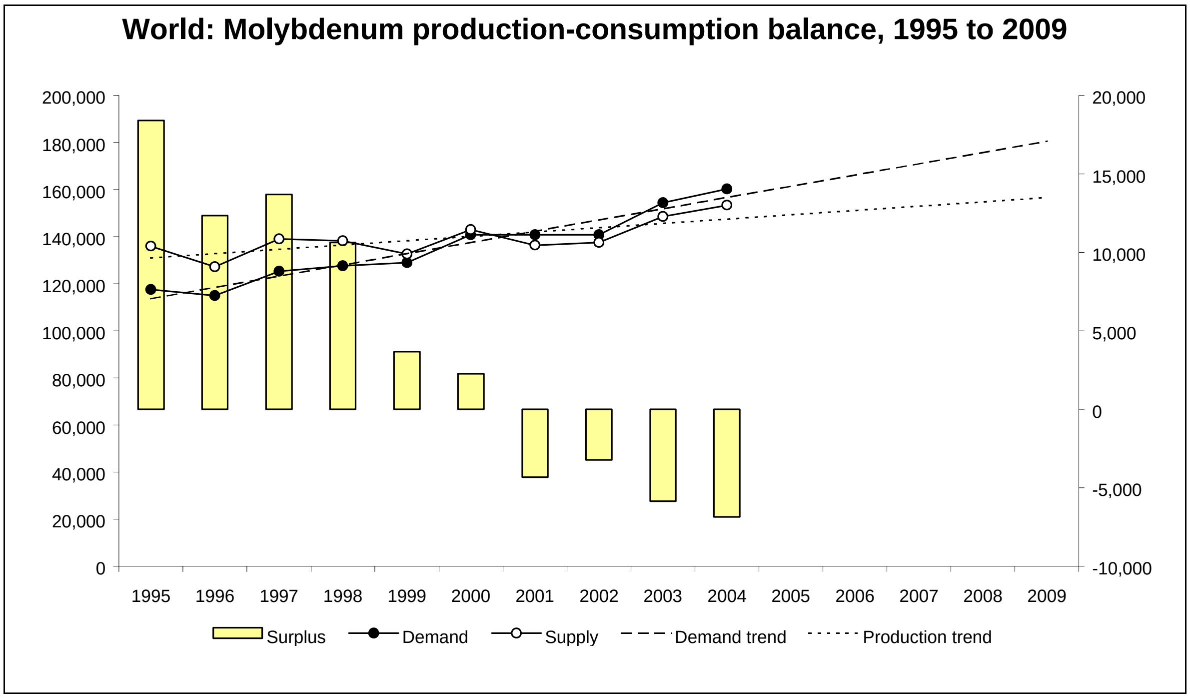
Max Project
World production consumption by Roskill Information Services Ltd



Note: Excludes any surplus that may have existed prior to 1995

Max Project
World production consumption by Roskill Information Services Ltd

International trade in molybdenum *Ó*

The most commonly traded forms of molybdenum are unroasted and roasted ores and concentrates (including technical molybdenum oxide, TMO), and ferromolybdenum.

There are two important reservations related to the figures summarised in the tables that follow. The first lies in the difference between gross tonnages and net metal content as bases for reporting volumes of trade. The figures shown are assumed to be gross tonnage basis, except where the reporting agency has explicitly declared them to be net metal content. As the molybdenum content of concentrates, ferromolybdenum and the various chemical compounds can range anywhere between 40-70%, the unwitting inclusion of improperly defined figures can distort the overall picture considerably.

The second reservation relates to the definitions of the various forms of molybdenum. Some reporting agencies describe TMO as roasted concentrates, and higher purity chemical grade oxides simply as 'oxides', and this can give a misleading impression of the profile of a country's molybdenum trade. In some cases, a country's trade in unroasted and roasted concentrates has been reported under a single heading of 'concentrates'. Care has been taken in these instances to estimate the split in a country's trade between unroasted concentrates and technical-grade oxides, based on data available for other years. Where appropriate, trade reported under 'oxides' has been assumed to represent chemical-grade rather than technical-grade material.

Similarly, some trade reported under the general heading of 'metal' appears to include unwrought molybdenum metal as well as other forms, such as powder and/or wrought products. Where a country's trade in metal appears to have been over-reported in some years, an estimate has been made based on available data for other years.

Unroasted molybdenum concentrates

Trade in unroasted concentrates is dominated by shipments from North and South American producers to the roasting facilities of Climax, Molymet, Thompson Creek (Langeloth) and Sadaci. Hence, the USA and Chile are major

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destinations in North America whereas the Netherlands and Belgium are the main importers in western Europe. In contrast, movement of unroasted concentrates produced in the CIS and China tends to be restricted to the east European and Asian regions, at least partly because of the availability of roasting capacity in China. However, most Russian concentrates were sent to either the Netherlands or Chile in 2002.

The volume of trade in unroasted concentrates declined between 1997 and 1999, perhaps in response to market oversupply at that time and attempted cut-backs in primary production by some companies.

Recovery in 2000, particularly in South America where copper operations in Peru and Chile expanded, was apparently followed by a second decrease in 2002 in response to the decline in the copper market. This resulted in the major copper producers reducing output and was a major factor in creating a relatively tight molybdenum supply at that time.

Chile, Peru and the USA were the main exporters of unroasted concentrates in 2001, accounting for 23%, 22% and 20% respectively of the world total. However, this pattern changed in 2002 with the cut-backs in copper operations in the USA and Chile and the resultant fall in molybdenum concentrates production, leaving Peru as the main exporter in 2002, although the figure for Chilean exports of unroasted concentrates is not given.

In addition, the volume of unroasted material exported by the Netherlands increased from 861t in 2000 to 11,297t in 2002. Most of this went to Chinese producers for roasting and was probably blended with their lower grade concentrates before being re-exported. Anti-dumping duties imposed by the EU on Chinese ferromolybdenum prompted many Chinese producers to increased their exports of roasted concentrates (oxide) in 2002.

Roasted molybdenum concentrates (TMO)

Exports of roasted concentrates rose by an average of 11%pa in the 1997-2002 period. This includes the following increases in trade in 2002:

- *a 67% increase in exports from the Netherlands to other EU countries, particularly to the UK, Belgium, Germany and Austria.*
- *a 50% increase in Chinese exports including a doubling of shipments to the Netherlands. This was prompted by EU anti-dumping duties on Chinese ferromolybdenum forcing many producers to switch output to TMO.*

Apart form the Netherlands and China, the other main exporting countries are those with roasting facilities, specifically Chile (Molymet), which accounts for nearly a third of world exports of roasted concentrates, Belgium (Sadaci), USA (Climax/Phelps Dodge and Thompson Creek), Canada (also Thompson Creek) and Mexico (Molymex). Exports of roasted concentrates from China increased by 70%pa between 1997 and 2001 as Chinese companies took advantage of low extraction and labour costs.

The principal importing region is western Europe, largely because of demand from the steel industry but also because of the regional molybdenum processing divisions of Climax. Many of the imported concentrates come from Chile and the USA with most of the rest being obtained from the Sadaci and Climax operations in Belgium and the Netherlands, respectively. However, some Russian concentrates were shipped to the Netherlands in 2002 and the main origin for UK imports of roasted concentrates in that year was China.

Japan is the principal importing country, due to demand from the domestic steel industry, with Chile, Mexico and Canada being the main sources of material.

Molybdenum prices

Molybdenum is not traded on any terminal market but merchants throughout the world trade molybdenum concentrates, molybdenum oxide and ferromolybdenum on both spot and forward bases. Prices from these markets, whose levels of liquidity can vary greatly, are published regularly by specialist trade journals such as Metal Bulletin, Platt's Metals Week and American Metal Market.

Both molybdenum oxide and ferromolybdenum are priced in US dollars per pound in all markets, with the exception of the European price for ferromolybdenum, which is priced in dollars per kilogramme. Ferromolybdenum normally commands a price premium over oxide to reflect conversion costs, while both oxide and alloy of Western origin normally command a quality premium over Chinese material. The prices quoted below are all for western origins cif major ports.

The figures below show prices for molybdenum concentrates, oxide and ferromolybdenum (the data from which these figures are derived are given in Appendix B). Some producers publish list prices for their molybdenum products, while much trade is negotiated directly between producers and consumers on a quarterly basis. It is also worth pointing out that the premium of US oxide prices over those in Europe is due to US steel makers' preference for oxide as a feed rather than ferromolybdenum.

Factors that are likely to have contributed towards the recent high molybdenum prices include:

- *Sustained period of high demand coinciding with a period of reduced mine supply, especially in Europe*
- *Surge in demand from the USA in the final quarter of 2003 may have been particularly significant for the sudden increase in price in March 2004.*
- *Recovery in mine production during 2003 and 2004 has not caught up with demand.*
- *Possible interruptions to production at Chinese mines (mainly weather driven)*

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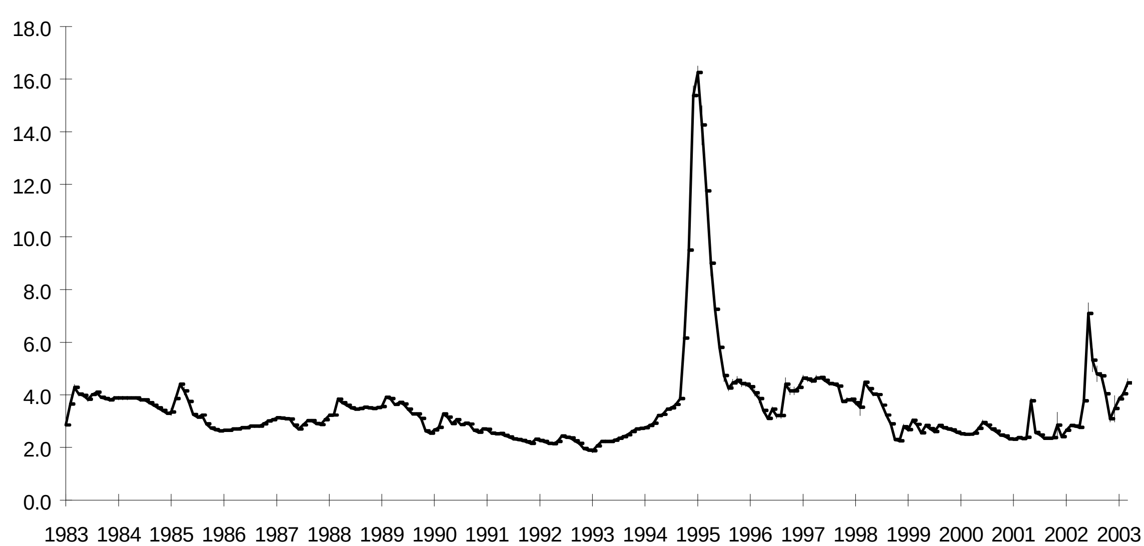
- Supply of molybdenum from China to the western spot market has been irregular. Since June 2003, monthly shipments from China have generally been below average levels of the previous 18 months, and lower availability at start of 2004 may have been critical for the sudden price increase that took place in March of that year

- Shipments from Chile and USA also dropped sharply in first quarter of 2004

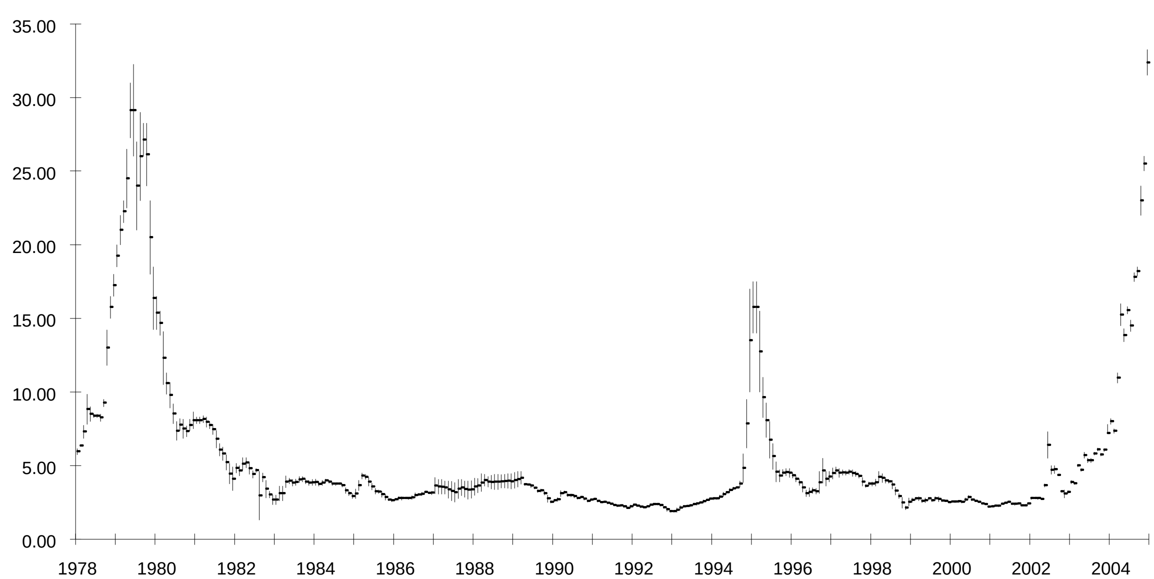
Europe: Prices[1] for molybdenum oxide, 1983 to 2003 (US$/lb Mo)



Source: The above prices are copyright of the Metal Bulletin plc and are reproduced with its permission
Note: 1-End of month high/low price, drummed oxide in warehouse

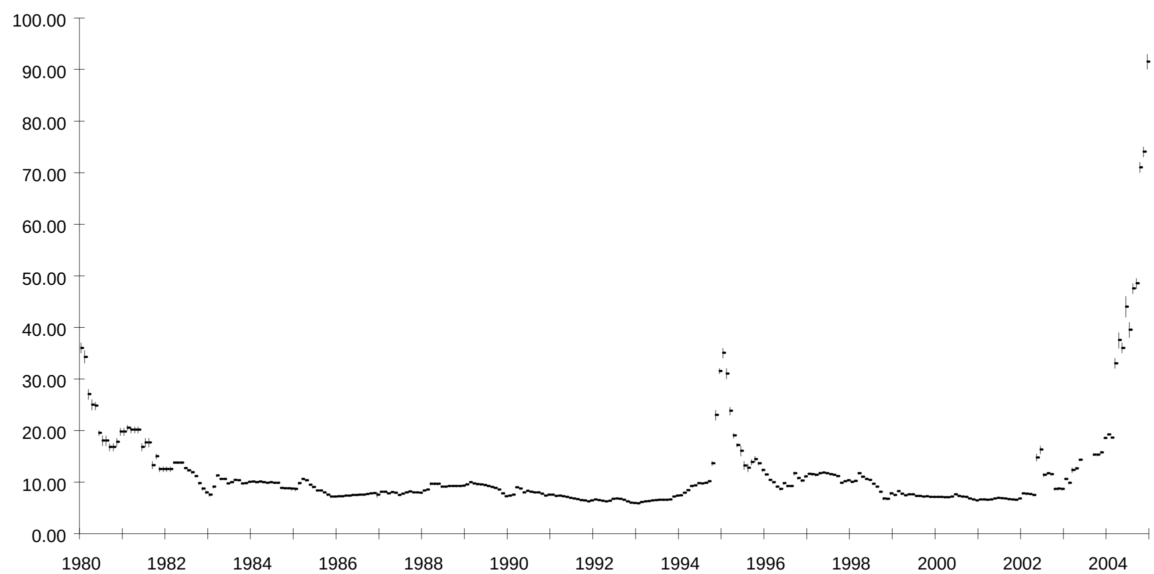
- When prices started to rise in March 2004, steel companies regularly buying from the western spot market delayed purchasing in anticipation that prices would recede. When this did not happen, there was a rush to buy and this drove the price up further. Repetition of this sequence of events may have contributed to further increases in price during 2004 that has left European molybdenum oxide at around US$31/lb by the end of the year. The absence of 'nearby' material has drawn material into the market leaving few traders with any stocks.

USA: Prices[1] for molybdenum oxide, 1978 to 2004 (US$/lb)



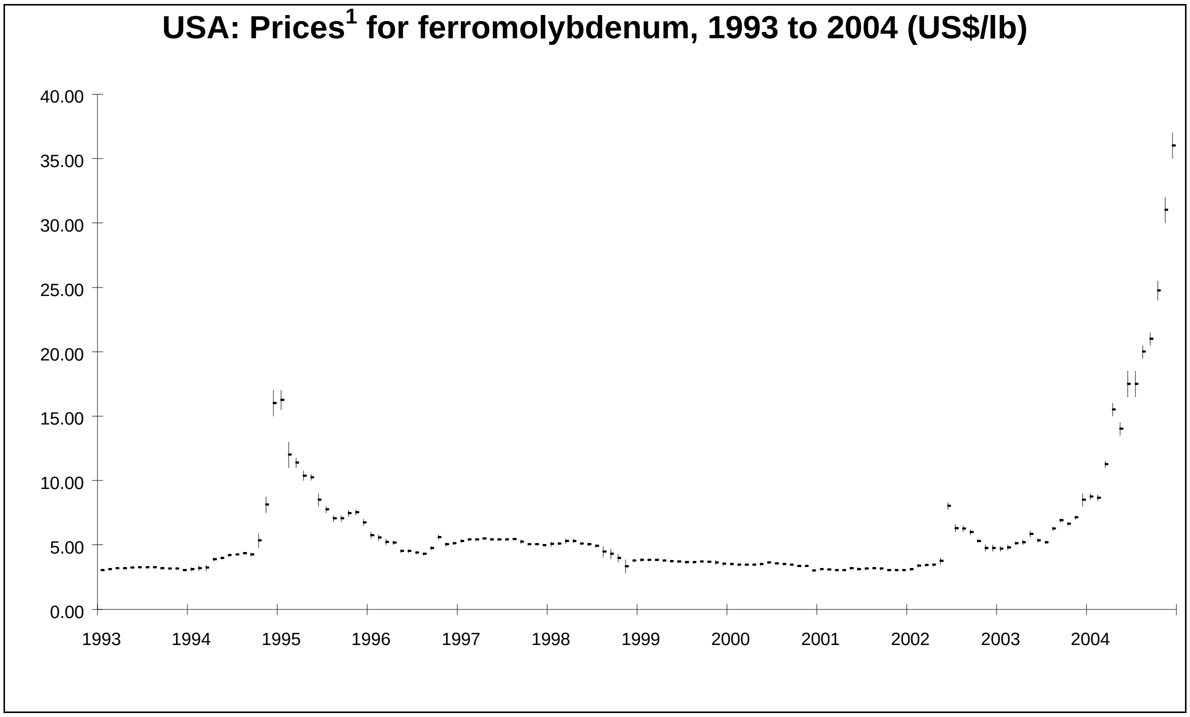
Source: Metals Week
Note: 1-End of month high/low price, dealer cif New York

Europe: Prices[1] for ferromolybdenum, 1980 to 2004 (US$/kg Mo)



Source: The above prices are copyright of the Metal Bulletin plc and are reproduced by permission

Note: 1- End of month high/low price, basis 65-70% Mo, delivered consumers' works, major European destinations



Source: Metals Week
Note: 1-End of month high/low price, basis 65-70% Mo

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____
____
____

January 22, 2005

Purchase Confirmation No.

Dear Sirs,

Re: Unroasted Molybdenum Concentrates

We herewith confirm that we have bought from you and you have sold to us through W. G. Cook Ltd: -

Material	Unroasted Molybdenum Concentrates produced by the _______ mine in _____________, Canada.
Quantity	100% of the production of the __________ Mine, which is currently foreseen annually as ____________ million lbs Mo contained and to be increased in future years in conjunction with development of the orebody and construction of a permanent mill.
Packing	In bulk bags on pallets
Time of delivery:	Shall be for the entire mine life of the ________ Mine - To be shipped in monthly quantities evenly spread throughout the course of each year. First shipments are expected during ______________ and are to continue throughout the life of the mine.
Delivered:	FOB truck, _________ minesite.
Price	99% of the Metals Week Monthly Average Dealer Oxide price as published once a month in the Platts Metals Week for the quotational period less the applicable discount. The applicable discount for each Calendar Year shall be mutually

	agreed upon between Buyer and Seller no later than October 1st of the preceding year.
Quotational Period:	The month after the month of delivery
Payment	Payment will be made against Original Provisional Documents with remittance by telegraphic transfer 30 days after receipt of documents. For Provisional Invoicing purposes the average of the last two known Metals Week weekly prices shall be used for pricing Final settlement will be made after determination of final prices, weights and assays.
Quality	Mo 50 % min Zn 0.05 % max Pb 0.05 % max Insol 3.5 % max Oil + H2O 8.0 % max Ca 0.5% max Bi 0.05 % max P 0.05 % max As 0.05 % max W 0.05 % max Sb 0.05 % max
Documentation	1. Minesite delivery note and weight list 2. Provisional Commercial Invoice 3. Sellers Weight/Analysis Certificate 4. Certificate of Origin (if required by Buyer)
Weight, Sampling, Moisture and Oil Determination, Mo determination	To be determined at destination works. These operations to be carried out by the receiving works. These results are to be considered as final, but Seller has the right to dispute the findings, in which case a mutually agreeable independent surveyor will be nominated to re-do these operations, with the costs for the loser's account. Assays for Mo content shall follow standard practices, recognized by the industry throughout the world, on a dry de-oiled basis.
Title and Risk of Loss:	**Title to and risk of loss of concentrates shall pass from Seller to Buyer upon completion of the loading of concentrates on board truck at the ________ minesite.**
Jurisdiction:	This agreement shall be construed in accordance with and governed by the laws of __________.
Hardship Clause	**If, due to adverse economic conditions either Buyer or Seller endures unexpected hardship for a period of six months or**

	more, they have the right to mutually agree to renegotiate relevant terms of the contract. The Hardship must be clearly demonstrated to the other party that it is not economic to continue with the contract.
Change of Ownership:	In the event that there is a friendly or hostile takeover of __________ or any other event that results in a change of ownership, this Contract shall remain in full force and effect for the duration of the _________ mine life.

For and on behalf of
Derek Raphael and Company Limited

Andrew D Raphael

Appendix H

Cash Flows

Case 1 – 500 tpd

Case 2 – 2,500 tpd

MAX MOLYBDENUM PROJECT
CASE 1 - 500TPD
PRE-TAX CASHFLOW

HATCH

SCENARIO 1 - NEW EQUIPMENT

Project No.: 318273
Client: ROCA Mines Inc.

Simple Mine Cash Flow	Unit/Value		-2	-1	1	2	3	4
Tonnage								
Ore Mined	t			1,156	138,723	187,813	148,519	
Waste Mined	t			35,902	158,128	71,283	24,197	
Ore Milled	t				139,879	187,813	148,519	
Production & Sales								
Ore Grades								
MoS2 - %	%				1.31	1.02	0.91	
Contained MoS2	t				1,817	1,916	1,352	
Contained Mo	t				1,089	1,148	810	
Ore Recovery								
MoS2 Recovery	%				91%	91%	91%	
Conc Grade - %MoS2	%				87%	87%	87%	
Conc produced	dmt				1,901	2,004	1,414	
Conc moisture	12%				2,160	2,004	1,414	
Conc produced	wmt							
Conc - contained Mo	t				991	1045	737	
Payable Metal in Concentrates								
Contained Mo	lb				2,184,688	2,303,009	1,624,775	-
Sales Revenue - US$								
Mo Price		US$/lb			15	10	10	
Offsite Costs	Included				-	0	0	
Transport	Included				-	-	-	
Conversion Losses	Included				-	-	-	
Mo Revenue		US$/annum			32,770,325	23,030,085	16,247,746	-
Exchange Rate		CAD/US			0.80	0.78	0.78	-
Total Sales Revenue - CAD$					**40,962,906**	**29,525,750**	**20,830,444**	
					-	**-**	**-**	
Operating Costs - CAD$								
Mining		$		-	19,347,000	13,363,000	9,878,000	
Milling + Supply Transport	19.55	$/t milled ore			2,734,634	3,671,744	2,903,546	
G&A	6.25	$/t milled ore			874,244	1,173,831	928,244	
Total				**-**	**22,955,878**	**18,208,575**	**13,709,790**	**-**
Operating Cash Flow				**-**	**18,007,028**	**11,317,175**	**7,120,654**	**-**
Capital Investment - CAD$								
Access & Power			1,860,800	465,200				
Processing/Tails			4,800,150	5,866,850				
Mobile Equipment/Fuel			307,000	-				
Mining			3,598,650	4,398,350				
Construction/overheads			3,116,050	5,786,950				
Sustaining - Tailings						688,000		
Working capital (2mths of OPEX)			-	-	3,825,980	3,034,763	2,284,965	
Total			**13,682,650**	**16,517,350**	**3,825,980**	**3,722,763**	**2,284,965**	**-**
Net Pre-tax cash flow			(13,682,650)	(16,517,350)	14,181,048	7,594,412	4,835,689	-

Pre-tax IRR		-5.8%
Pre-tax NPV@0%	CAD	($3,588,851)
Pre-tax NPV@5%	CAD	($5,725,866)

	-2	-1	1	2	3	4
Revenues	-	-	40,962,906	29,525,750	20,830,444	-
Operating Costs	-	-	22,955,878	18,208,575	13,709,790	-
Capital Costs	13,682,650	16,517,350	3,825,980	3,722,763	2,284,965	-
Pre-tax cash flow	(13,682,650)	(16,517,350)	14,181,048	7,594,412	4,835,689	-

MAX MOLYBDENUM PROJECT
CASE 1 - 500TPD
PRE-TAX CASHFLOW

HATCH

SCENARIO 2 - NEW EQUIPMENT

Project No.: 318273
Client: ROCA Mines Inc.

Simple Mine Cash Flow	Unit/Value		-2	-1	1	2	3	4
Tonnage								
Ore Mined	t			1,156	138,723	187,813	148,519	
Waste Mined	t			35,902	158,128	71,283	24,197	
Ore Milled	t				139,879	187,813	148,519	
Production & Sales								
Ore Grades								
MoS2 - %	%				1.31	1.02	0.91	
Contained MoS2	t				1,817	1,916	1,352	
Contained Mo	t				1,089	1,148	810	
Ore Recovery								
MoS2 Recovery	%				91%	91%	91%	
Conc Grade - %MoS2	%				87%	87%	87%	
Conc produced	dmt				1,901	2,004	1,414	
Conc moisture	12%				2,160	2,004	1,414	
Conc produced	wmt							
Conc - contained Mo	t				991	1045	737	
Payable Metal in Concentrates								
Contained Mo	lb				2,184,688	2,303,009	1,624,775	-
Sales Revenue - US$								
Mo Price		US$/lb			20	20	20	
Offsite Costs	Included				-	0	0	
Transport	Included				-	-	-	
Conversion Losses	Included				-	-	-	
Mo Revenue		US$/annum			43,693,767	46,060,170	32,495,493	-
Exchange Rate		CAD/US			0.80	0.78	0.78	-
Total Sales Revenue - CAD$					**54,617,208**	**59,051,500**	**41,660,888**	
					-	**-**	**-**	
Operating Costs - CAD$								
Mining		$		-	19,347,000	13,363,000	9,878,000	
Milling + Supply Transport	19.55	$/t milled ore			2,734,634	3,671,744	2,903,546	
G&A	6.25	$/t milled ore			874,244	1,173,831	928,244	
Total				**-**	**22,955,878**	**18,208,575**	**13,709,790**	**-**
Operating Cash Flow				**-**	**31,661,330**	**40,842,925**	**27,951,098**	**-**
Capital Investment - CAD$								
Access & Power			1,860,800	465,200				
Processing/Tails			4,800,150	5,866,850				
Mobile Equipment/Fuel			307,000	-				
Mining			3,598,650	4,398,350				
Construction/overheads			3,116,050	5,786,950				
Sustaining - Tailings						688,000		
Working capital (2mths of OPEX)			-	-	3,825,980	3,034,763	2,284,965	
Total			**13,682,650**	**16,517,350**	**3,825,980**	**3,722,763**	**2,284,965**	**-**
Net Pre-tax cash flow			(13,682,650)	(16,517,350)	27,835,350	37,120,162	25,666,133	-

Pre-tax IRR		59.5%
Pre-tax NPV@0%	CAD	$60,421,645
Pre-tax NPV@5%	CAD	$46,681,340

	-2	-1	1	2	3	4
Revenues	-	-	54,617,208	59,051,500	41,660,888	-
Operating Costs	-	-	22,955,878	18,208,575	13,709,790	-
Capital Costs	13,682,650	16,517,350	3,825,980	3,722,763	2,284,965	-
Pre-tax cash flow	(13,682,650)	(16,517,350)	27,835,350	37,120,162	25,666,133	-
Accumulated Pre-tax cash flow	(13,682,650)	(30,200,000)	(2,364,650)	34,755,513	60,421,645	
Pre-tax payback period (years)				1.06		

MAX MOLYBDENUM PROJECT
CASE 1 - 500TPD
PRE-TAX CASHFLOW

HATCH

SCENARIO 3 - NEW EQUIPMENT

Project No.: 318273
Client: ROCA Mines Inc.

Simple Mine Cash Flow	Unit/Value		-2	-1	1	2	3	4
Tonnage								
Ore Mined	t			1,156	138,723	187,813	148,519	
Waste Mined	t			35,902	158,128	71,283	24,197	
Ore Milled	t				139,879	187,813	148,519	
Production & Sales								
Ore Grades								
MoS2 - %	%				1.31	1.02	0.91	
Contained MoS2	t				1,817	1,916	1,352	
Contained Mo	t				1,089	1,148	810	
Ore Recovery								
MoS2 Recovery	%				91%	91%	91%	
Conc Grade - %MoS2	%				87%	87%	87%	
Conc produced	dmt				1,901	2,004	1,414	
Conc moisture	12%				2,160	2,004	1,414	
Conc produced	wmt							
Conc - contained Mo	t				991	1045	737	
Payable Metal in Concentrates								
Contained Moly	lb				2,184,688	2,303,009	1,624,775	-
Sales Revenue - US$								
Mo Price		US$/lb			30	30	30	
Offsite Costs	Included				-	0	0	
Transport	Included				-	-	-	
Conversion Losses	Included				-	-	-	
Moly Revenue		US$/annum			65,540,650	69,090,255	48,743,239	-
Exchange Rate		CAD/US			0.80	0.78	0.78	-
Total Sales Revenue - CAD$					**81,925,812**	**88,577,250**	**62,491,332**	
					-	**-**	**-**	
Operating Costs - CAD$								
Mining		$		-	19,347,000	13,363,000	9,878,000	
Milling + Supply Transport	19.55	$/t milled ore			2,734,634	3,671,744	2,903,546	
G&A	6.25	$/t milled ore			874,244	1,173,831	928,244	
Total				**-**	**22,955,878**	**18,208,575**	**13,709,790**	**-**
Operating Cash Flow				**-**	**58,969,934**	**70,368,675**	**48,781,542**	**-**
Capital Investment - CAD$								
Access & Power			1,860,800	465,200				
Processing/Tails			4,800,150	5,866,850				
Mobile Equipment/Fuel			307,000	-				
Mining			3,598,650	4,398,350				
Construction/overheads			3,116,050	5,786,950				
Sustaining - Tailings						688,000		
Working capital (2mths of OPEX)			-	-	3,825,980	3,034,763	2,284,965	
Total			**13,682,650**	**16,517,350**	**3,825,980**	**3,722,763**	**2,284,965**	**-**
Net Pre-tax cash flow			(13,682,650)	(16,517,350)	55,143,955	66,645,912	46,496,577	-

Pre-tax IRR		112.4%
Pre-tax NPV@0%	CAD	$138,086,444
Pre-tax NPV@5%	CAD	$110,883,644

	-2	-1	1	2	3	4
Revenues	-	-	81,925,812	88,577,250	62,491,332	-
Operating Costs	-	-	22,955,878	18,208,575	13,709,790	-
Capital Costs	13,682,650	16,517,350	3,825,980	3,722,763	2,284,965	-
Pre-tax cash flow	**(13,682,650)**	**(16,517,350)**	**55,143,955**	**66,645,912**	**46,496,577**	**-**
Accumulated Pre-tax cash flow	(13,682,650)	(30,200,000)	24,943,955	91,589,867	138,086,444	
Pre-tax payback period (years)			0.55			

MAX MOLYBDENUM PROJECT
CASE 1 - 500TPD
PRE-TAX CASHFLOW

HATCH

SCENARIO 1 - USED EQUIPMENT

Project No.: 318273
Client: ROCA Mines Inc.

Simple Mine Cash Flow	Unit/Value		-2	-1	1	2	3	4
Tonnage								
Ore Mined	t			1,156	138,723	187,813	148,519	
Waste Mined	t			35,902	158,128	71,283	24,197	
Ore Milled	t				139,879	187,813	148,519	
Production & Sales								
Ore Grades								
MoS2 - %	%				1.31	1.02	0.91	
Contained MoS2	t				1,817	1,916	1,352	
Contained Mo	t				1,089	1,148	810	
Ore Recovery								
MoS2 Recovery	%				91%	91%	91%	
Conc Grade - %MoS2	%				87%	87%	87%	
Conc produced	dmt				1,901	2,004	1,414	
Conc moisture	12%				2,160	2,004	1,414	
Conc produced	wmt							
Conc - contained Mo	t				991	1045	737	
Payable Metal in Concentrates								
Contained Moly	lb				2,184,688	2,303,009	1,624,775	-
Sales Revenue - US$								
Mo Price		US$/lb			15	10	10	
Offsite Costs	Included				-	0	0	
Transport	Included				-	-	-	
Conversion Losses	Included				-	-	-	
Mo Revenue		US$/annum			32,770,325	23,030,085	16,247,746	-
Exchange Rate		CAD/US			0.80	0.78	0.78	-
Total Sales Revenue - CAD$					**40,962,906**	**29,525,750**	**20,830,444**	
					-	**-**	**-**	
Operating Costs - CAD$								
Mining		$		-	19,347,000	13,363,000	9,878,000	
Milling + Supply Transport	19.55	$/t milled ore			2,734,634	3,671,744	2,903,546	
G&A	6.25	$/t milled ore			874,244	1,173,831	928,244	
Total				**-**	**22,955,878**	**18,208,575**	**13,709,790**	**-**
Operating Cash Flow				**-**	**18,007,028**	**11,317,175**	**7,120,654**	**-**
Capital Investment - CAD$								
Access & Power			1,674,720	418,680				
Processing/Tails			4,320,135	5,280,165				
Mobile Equipment/Fuel			276,300	-				
Mining			3,238,785	3,958,515				
Construction/overheads			2,804,445	5,208,255				
Sustaining - Tailings						688,000		
Working capital (2mths of OPEX)			-	-	3,825,980	3,034,763	2,284,965	
Total			**12,314,385**	**14,865,615**	**3,825,980**	**3,722,763**	**2,284,965**	**-**
Net Pre-tax cash flow			(12,314,385)	(14,865,615)	14,181,048	7,594,412	4,835,689	-

Pre-tax IRR		-1.0%
Pre-tax NPV@0%	CAD	($568,851)
Pre-tax NPV@5%	CAD	($2,924,584)

	-2	-1	1	2	3	4
Revenues	-	-	40,962,906	29,525,750	20,830,444	-
Operating Costs	-	-	22,955,878	18,208,575	13,709,790	-
Capital Costs	12,314,385	14,865,615	3,825,980	3,722,763	2,284,965	-
Pre-tax cash flow	(12,314,385)	(14,865,615)	14,181,048	7,594,412	4,835,689	-

MAX MOLYBDENUM PROJECT
CASE 1 - 500TPD
PRE-TAX CASHFLOW

HATCH

SCENARIO 2 - USED EQUIPMENT

Project No.: 318273
Client: ROCA Mines Inc.

Simple Mine Cash Flow	Unit/Value		-2	-1	1	2	3	4
Tonnage								
Ore Mined	t			1,156	138,723	187,813	148,519	
Waste Mined	t			35,902	158,128	71,283	24,197	
Ore Milled	t				139,879	187,813	148,519	
Production & Sales								
Ore Grades								
MoS2 - %	%				1.31	1.02	0.91	
Contained MoS2	t				1,817	1,916	1,352	
Contained Mo	t				1,089	1,148	810	
Ore Recovery								
MoS2 Recovery	%				91%	91%	91%	
Conc Grade - %MoS2	%				87%	87%	87%	
Conc produced	dmt				1,901	2,004	1,414	
Conc moisture	12%				2,160	2,004	1,414	
Conc produced	wmt							
Conc - contained Mo	t				991	1045	737	
Payable Metal in Concentrates								
Contained Moly	lb				2,184,688	2,303,009	1,624,775	-
Sales Revenue - US$								
Mo Price		US$/lb			20	20	20	
Offsite Costs	Included				-	0	0	
Transport	Included				-	-	-	
Conversion Losses	Included				-	-	-	
Mo Revenue		US$/annum			43,693,767	46,060,170	32,495,493	-
Exchange Rate		CAD/US			0.80	0.78	0.78	-
Total Sales Revenue - CAD$					**54,617,208**	**59,051,500**	**41,660,888**	
					-	**-**	**-**	
Operating Costs - CAD$								
Mining		$		-	19,347,000	13,363,000	9,878,000	
Milling + Supply Transport	19.55	$/t milled ore			2,734,634	3,671,744	2,903,546	
G&A	6.25	$/t milled ore			874,244	1,173,831	928,244	
Total				**-**	**22,955,878**	**18,208,575**	**13,709,790**	**-**
Operating Cash Flow				**-**	**31,661,330**	**40,842,925**	**27,951,098**	**-**
Capital Investment - CAD$								
Access & Power			1,674,720	418,680				
Processing/Tails			4,320,135	5,280,165				
Mobile Equipment/Fuel			276,300	-				
Mining			3,238,785	3,958,515				
Construction/overheads			2,804,445	5,208,255				
Sustaining - Tailings						688,000		
Working capital (2mths of OPEX)			-	-	3,825,980	3,034,763	2,284,965	
Total			**12,314,385**	**14,865,615**	**3,825,980**	**3,722,763**	**2,284,965**	**-**
Net Pre-tax cash flow			(12,314,385)	(14,865,615)	27,835,350	37,120,162	25,666,133	-

Pre-tax IRR		67.1%
Pre-tax NPV@0%	CAD	$63,441,645
Pre-tax NPV@5%	CAD	$49,482,621

	-2	-1	1	2	3	4
Revenues	-	-	54,617,208	59,051,500	41,660,888	-
Operating Costs	-	-	22,955,878	18,208,575	13,709,790	-
Capital Costs	12,314,385	14,865,615	3,825,980	3,722,763	2,284,965	-
Pre-tax cash flow	(12,314,385)	(14,865,615)	27,835,350	37,120,162	25,666,133	-
Accumulated Pre-tax cash flow	(12,314,385)	(27,180,000)	655,350	37,775,513	63,441,645	
Pre-tax payback period (years)			0.98			

MAX MOLYBDENUM PROJECT
CASE 1 - 500TPD
PRE-TAX CASHFLOW

HATCH

SCENARIO 3 - USED EQUIPMENT

Project No.: 318273
Client: ROCA Mines Inc.

Simple Mine Cash Flow	**Unit/Value**		-2	-1	1	2	3	4
Tonnage								
Ore Mined	t			1,156	138,723	187,813	148,519	
Waste Mined	t			35,902	158,128	71,283	24,197	
Ore Milled	t				139,879	187,813	148,519	
Production & Sales								
Ore Grades								
MoS2 - %	%				1.31	1.02	0.91	
Contained MoS2	t				1,817	1,916	1,352	
Contained Mo	t				1,089	1,148	810	
Ore Recovery								
MoS2 Recovery	%				91%	91%	91%	
Conc Grade - %MoS2	%				87%	87%	87%	
Conc produced	dmt				1,901	2,004	1,414	
Conc moisture	12%				2,160	2,004	1,414	
Conc produced	wmt							
Conc - contained Mo	t				991	1045	737	
Payable Metal in Concentrates								
Contained Moly	lb				2,184,688	2,303,009	1,624,775	-
Sales Revenue - US$								
Mo Price		US$/lb			30	30	30	
Offsite Costs	Included				-	0	0	
Transport	Included				-	-	-	
Conversion Losses	Included				-	-	-	
Mo Revenue		US$/annum			65,540,650	69,090,255	48,743,239	-
Exchange Rate		CAD/US			0.80	0.78	0.78	-
Total Sales Revenue - CAD$					**81,925,812**	**88,577,250**	**62,491,332**	
					-	**-**	**-**	
Operating Costs - CAD$								
Mining		$		-	19,347,000	13,363,000	9,878,000	
Milling + Supply Transport	19.55	$/t milled ore			2,734,634	3,671,744	2,903,546	
G&A	6.25	$/t milled ore			874,244	1,173,831	928,244	
Total				**-**	**22,955,878**	**18,208,575**	**13,709,790**	**-**
Operating Cash Flow				**-**	**58,969,934**	**70,368,675**	**48,781,542**	**-**
Capital Investment - CAD$								
Access & Power			1,674,720	418,680				
Processing/Tails			4,320,135	5,280,165				
Mobile Equipment/Fuel			276,300	-				
Mining			3,238,785	3,958,515				
Construction/overheads			2,804,445	5,208,255				
Sustaining - Tailings						688,000		
Working capital (2mths of OPEX)			-	-	3,825,980	3,034,763	2,284,965	
Total			**12,314,385**	**14,865,615**	**3,825,980**	**3,722,763**	**2,284,965**	**-**
Net Pre-tax cash flow			(12,314,385)	(14,865,615)	55,143,955	66,645,912	46,496,577	-

Pre-tax IRR		123.0%
Pre-tax NPV@0%	CAD	$141,106,444
Pre-tax NPV@5%	CAD	$113,684,926

	-2	-1	1	2	3	4
Revenues	-	-	81,925,812	88,577,250	62,491,332	-
Operating Costs	-	-	22,955,878	18,208,575	13,709,790	-
Capital Costs	12,314,385	14,865,615	3,825,980	3,722,763	2,284,965	-
Pre-tax cash flow	(12,314,385)	(14,865,615)	55,143,955	66,645,912	46,496,577	-
Accumulated Pre-tax cash flow	(12,314,385)	(27,180,000)	27,963,955	94,609,867	141,106,444	
Pre-tax payback period (years)			0.49			

HATCH

Project No.: 318273
Client: ROCA Mines Inc.

MAX MOLYBDENUM PROJECT
CASE 2 - 2500TPD
PRE-TAX CASHFLOW

Simple Mine Cash Flow	Unit/Value	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10
Tonnage															
Ore Mined	t			1,200	331,597	419,201	606,243	912,500	912,500	912,500	912,500	912,500	912,500	912,500	912,500
Waste Mined	t		11,178.0	239,577	236,250	135,000	101,250	67,500	-	-	-	-	-	-	-
Ore Milled	t		-	1,200	331,597	419,201	606,243	912,500	912,500	912,500	912,500	912,500	912,500	912,500	912,500
Production & Sales															
Ore Grades															
MoS2 - %	%		0.32	0.32	0.32	0.40	0.40	0.36	0.3	0.3	0.31	0.29	0.28	0.28	0.28
Contained MoS2	t		-	4	1,061	1,677	2,425	3,285	2,920	2,920	2,829	2,646	2,555	2,555	2,555
Contained Mo	t		-	2	636	1,005	1,454	1,969	1,750	1,750	1,696	1,586	1,531	1,531	1,531
Ore Recovery															
MoS2 Recovery	%				91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
Conc Grade - %MoS2	%				87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%
Conc produced	dmt				1,110	1,754	2,536	3,436	3,054	3,054	2,959	2,768	2,672	2,672	2,672
Conc moisture	12%														
Conc produced	wmt				1,261	1,993	2,536	3,436	3,054	3,054	2,959	2,768	2,672	2,672	2,672
Conc - contained Mo	t					915	1323	1792	1593	1593	1543	1443	1394	1394	1394
Payable Metal in Concentrates															
Contained Moly	lb					2,015,821	2,915,254	3,949,163	3,510,367	3,510,367	3,400,668	3,181,270	3,071,571	3,071,571	3,071,571
Sales Revenue - US$															
Mo Price	US$/lb					20	20	20	20	20	15	15	15	10	10
Offsite Costs	Included					-	-	-	-	-	-	-	-	-	-
Transport	Included					-	-	-	-	-	-	-	-	-	-
Conversion Losses	Included					-	-	-	-	-	-	-	-	-	-
Mo Revenue	US$/annum					40,316,425	58,305,087	78,983,266	70,207,348	70,207,348	51,010,026	47,719,057	46,073,572	30,715,715	30,715,715
Exchange Rate	CAD/US					0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Total Sales Revenue - CAD$						**50,395,532**	**72,881,358**	**98,729,083**	**87,759,185**	**87,759,185**	**63,762,533**	**59,648,821**	**57,591,965**	**38,394,643**	**38,394,643**
Operating Costs - CAD$															
Mining	$				-	34,580,000	40,844,000	43,319,000	36,640,000	35,495,000	34,783,000	34,785,000	34,783,000	34,381,000	17,690,000
Milling + Supply Transport	10.87 $/t milled ore					4,556,715	6,589,861	9,918,875	9,918,875	9,918,875	9,918,875	9,918,875	9,918,875	9,918,875	9,918,875
G&A	2.46 $/t milled ore					1,031,234	1,491,358	2,244,750	2,244,750	2,244,750	2,244,750	2,244,750	2,244,750	2,244,750	2,244,750
Total					**-**	**40,167,949**	**48,925,219**	**55,482,625**	**48,803,625**	**47,658,625**	**46,946,625**	**46,948,625**	**46,946,625**	**46,544,625**	**29,853,625**
Operating Cash Flow					**-**	**10,227,582**	**23,956,139**	**43,246,458**	**38,955,560**	**40,100,560**	**16,815,908**	**12,700,196**	**10,645,340**	**(8,149,982)**	**8,541,018**
Capital Investment - CAD$															
Access & Power		230,300	1,842,400	1,842,400	690,900										
Processing/Tails		1,344,850	12,103,650	9,413,950	4,034,550										
Mobile Equipment/Fuel		332,800	83,200		-										
Mining			7,632,000	24,708,500	36,739,500										
Construction/overheads		1,500,050	7,500,250	13,500,450	7,500,250										
Sustaining - Tailings							1,888,700	1,630,600	1,550,000	2,111,500	2,058,400	2,147,600	2,367,500	1,821,600	580,000
Working capital (2mths of OPEX)		-			-	6,694,658	8,154,203	9,247,104	8,133,938	7,943,104	7,824,438	7,824,771	7,824,438	7,757,438	-
Total		**3,408,000**	**29,161,500**	**49,465,300**	**48,965,200**	**6,694,658**	**10,042,903**	**10,877,704**	**9,683,938**	**10,054,604**	**9,882,838**	**9,972,371**	**10,191,938**	**9,579,038**	**580,000**
Net Pre-tax cash flow		(3,408,000)	(29,161,500)	(49,465,300)	(48,965,200)	3,532,924	13,913,236	32,368,754	29,271,622	30,045,956	6,933,070	2,727,825	453,403	(17,729,019)	7,961,018

Pre-tax IRR		-4%
Pre-tax NPV@0%	CAD	($21,521,210)
Pre-tax NPV@5%	CAD	($36,653,020)

	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10
Revenues	-			-	50,395,532	72,881,358	98,729,083	117,012,247	117,012,247	85,016,710	79,531,761	76,789,287	51,192,858	51,192,858
Operating Costs	-			-	40,167,949	48,925,219	55,482,625	65,071,500	63,544,833	62,595,500	62,598,167	62,595,500	62,059,500	39,804,833
Capital Costs	3,408,000			48,965,200	6,694,658	10,042,903	10,877,704	12,911,917	13,406,139	13,177,117	13,296,494	13,589,250	12,772,050	773,333
Pre-tax cash flow	(3,408,000)			(48,965,200)	3,532,924	13,913,236	32,368,754	39,028,830	40,061,274	9,244,094	3,637,100	604,537	(23,638,692)	10,614,691