

ROKMASTER RESOURCES CORP.

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Review of the Test Work on Mineralisation from the Revel Ridge Project, Canada

Metallurgy Update April 2022



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- 2014 Summary
- Mineralogy
- Flowsheet, Payables, Development.
- Next Steps



2014 Summary



Comminution

- Preconcentration using Dense Media Separation (DMS)
- Flotation
- Treatment of Gold Concentrate: Biox, POX.

Historical Sampling

- All but one metallurgical program since the 1980's were undertaken on bulk drift samples from 830m level.
- 2014 work was undertaken on 7 composites from the 830m level.
- In 2020 when met work restarted, PEA was underway and there was no core or fresh samples available. Metallurgical optimisations were consequently undertaken on the 2014 bulk samples readily accessible.
- Drilling program in 2021-2022 has provided variability samples which will be tested this year once the flowsheet is selected.



Comminution - 2014

- Crushing Work Index: 11.9 kWh/t Medium Hard.
- Abrasion Indices
 - Main Zone: 0.240g (considered less abrasive, range from 0-1g).
- SAG Pinion Energy
 - Main Zone: 6.4 kWh/t (amenable to SAG milling).
- Bond Work Index (BWi)
 - Rod 75th percentile: 12.9 kWh/t Medium
 - Ball 75th percentile: 9.7kWh/t Medium Soft



Work index, Wi, plotted as a function of abrasion index, Ai, for a variety of materials using the data of Bond (1964).

Pre-concentration - 2014



 Tested 2" and 1" particles using Tetra-bromo-ethane (TBE) at SG's of 2.72, 2.82 and 2.95.

	Distribu	tion (%)	Ν	Metal Recovery (% Sinks)								
	Mill Feed	Rejects										
Composite	(Sink)	(Float)	Au	Ag	Pb	Zn						
JL1	64.0	36.0	99.3	97.2	96.6	91.5						
YJ (3/4")	42.0	58.0	80.7	83.2	83.1	87.4						
Average MZ	76.6	23.4	99.6	98.2	99.0	97.6						

Flotation - 2014



- Simplified 2014 Flotation Flowsheet
- 31 Open cycle tests
- 6 Locked Cycle Tests (LCT)
- 2-3x stages of rougher flotation
- 4x stages of Pb and Zn Cleaning



2014 Sequential Flowsheet Results on Main Zone

Product		Final C	Concentr	% Metal Recovery						
Description	Wt. %	Au, g/t	Ag, g/t	%Pb	%Zn	%As	Au	Ag	Pb	Zn
Lead Concentrate	2.93	29.8	720	58	8.7	3.1	8.1	34	57	5.2
Zinc Concentrate	4.12	1.44	40.9	1.23	61.1	0.49	0.5	2.7	1.7	51.4
Gold Concentrate	62.4	15.5	62.9	1.9	3.3	13.5	90	63	40	42.4
Bulk Tail	30.5	0.49	2.0	0.15	0.16	0.99	1.4	1.0	1.5	1.0

Flotation - 2014

Product

Description

Lead Concentrate

Zinc Concentrate

Gold Concentrate

Bulk Tail

Saleable as a "Gold Con" -Arsenic below 3.25% and Gold above 15g/t. Penalised above 1.5% As and only 75% payables 20-30g/t Au.

Saleable - Penalised above 0.1% As at \$2.5/dmt to a MAX limit of 1.0%.

Using current proposed plant throughput of 2200tpd = 1364tpd of concentrate to ship

Wt. %

2.93

4.12

62.4

30.5

Au, g/t

29.8

1.44

15.5

0.49

Not Saleable – Approx. 500,000tpa of concentrate to blend so Arsenic below 3.25% and Gold above 15g/t. Only 65% payables 15-20g/t Au. – Not Feasible.

%Zn

8.7

3.3

0.16

61.1

58

1.23

1.9

0.15

%As

3.1

0.49

13.5

0.99

Final Concentrate Grade

720

40.9

62.9

2.0

Ag. g/t %Pb



Flotation - 2014

- Simplified 2014 Flotation Flowsheet
- 9 Open cycle tests
- 1 Locked Cycle Tests (LCT)
- 2x stages of rougher flotation
- 2-3x stages of Pb and Zn Cleaning
- 2014 Sequential Flowsheet Results on Yellow Jacket

Product		Final Con	centrate	% Metal Recovery							
Description	Wt. %	Au, g/t	Ag,g/t %Pb %Zn		%Zn	Au	Ag	Pb	Zn		
Calc Mill Head	100	0.11	54.9	2.04	7.97	-	-	-	-		
Lead Concentrate	4.1	1.57	1090	43.3	10.4	58.3	81.9	87.5	5.4		
Zinc Concentrate	12.0	0.25	56.2	1.14	61.9	27.5	12.3	6.7	93.1		
Zn 1st Cl Sc Tail	5.0	0.1	16.5	0.51	0.72	2.3	1.5	1.2	0.5		
Bulk (Zn Ro.) Tail	78.9	0.02	3.0	0.12	0.11	11.9	4.3	4.6	1.1		



Treatment of Sulphide Concentrate - 2014

• BIOX

- tests were undertaken at Inspectorate and at SGS Lakefield.
- Even with "bacteria adaption" pulp densities remained at 6% solids, and oxidation ranged from 78-95% over 50-69 <u>days.</u>
- Gold extraction from the oxidised concentrate was 88.9 91.1%
- Silver extraction approximately 97.6%
- Cyanide consumption elevated at ~10kg/t con.
- Due to the poor response, Bioxidation was discarded in preference for Pressure Oxidation (POX).

- Leach Parameters Tested were:
 - Leach Time 48 hours
 - NaCN 2,000ppm for 24 hours,
 1,000ppm for last 24 hours.
 - Pulp density 33% solids
 - pH 11
 - Dissolved Oxygen (DO) ~8-9ppm using Air.

Treatment of Sulphide Concentrate - 2014

• POX

- Parameters tested on concentrates ranging from 17-25 g/t Au, 14-18% As and 23-30% S_T :
 - Time: 15-90 minutes
 - Pulp Density: 10-15% solids
 - Temperature: 200-220°C
 - Oxygen Pressure: 100 psi O₂
- Gold extraction from the oxidised concentrate averaged 96.8%
- Silver extraction averaged approximately 31.0%
- Cyanide consumption elevated at ~39kg/t con.

- Leach Parameters Tested were:
 - Leach Time 48 hours
 - NaCN <u>5,000ppm</u>.
 - Pulp density 25% solids
 - pH 10.5-11
 - Dissolved Oxygen (DO) ~6-8ppm using Air.

 Lime boil tests were inconclusive, with silver recoveries ranging from 49-94% and in one instance appears to impede the gold recovery from mid 90's to 87%.

Mineralogy – Gold Associations

- Is pre-treatment by Pressure Oxidation (POX) required with increasing free gold at depth?
- All the mineralogy, geological and metallurgical data observations to date, indicates that most of the gold is refractory and in solid solution with arsenopyrite.
- This is suggested by
 - (i) the grades of Main Zone are too uniform to be consistent with gold as coarse macroscale grains and
 - (ii) free gold, in the Main Zone is very seldom identified.
- To confirm these observations this year, select core samples throughout the deposit will be sent for mineralogical work.





Flowsheet Development

- Based on the 2014 test work, the PEA flowsheet ("Flowsheet A") includes;
 - dense media separation (DMS),
 - fine grinding,
 - sequential flotation with large mass pulls,
 - POX with leach and gold recovery.
- Lead Flotation Zinc Flotation Sulphide Float Paste Plant. Ore Filtration and Bin Dry Stack Tailings Primary Regrind Grind 10-15µm 30µm K₈₀ K_{80} DMS Gold Concentrate Lead Concentrate Zinc Concentrate Neutralisation and CCD **Process Water** Hot POX Acid Cure. ADR – Carbon Stripping, Gold Room – Electrowinning Detox CIL And Regeneration and Furnace Dore

 Examine viable flowsheets.

Flowsheet Optimisation - 2021



- 2021 Flowsheet optimisations objectives were:
 - Try and create a saleable gold concentrate with less mass for shipping.
 - If not possible to sell concentrate, reduce mass to the POX circuit.
 - Optimise leach recoveries on new concentrate.
 - Is preconcentration required?

Flowsheet Optimisation - 2021



Comparison of S.G.

- Reasoning: it stands to reason that gold in solid solution with an AsPy particle would have a higher S.G. than galena or lead and respond to continuous gravity which in turn would help reduce the mass pull.
- "Flowsheet B"



- 2021 Flowsheet Results:
- Test work undertaken without DMS due to time and budget.
- 2021 BL801 Flowsheet Results on Main Zone (CIT1) OPEN CYCLE





- Key Learnings:
 - Concentrate the gold we concentrate the arsenic to similar levels. Lines up with mineralogical understanding to date.
 - Gold concentrate was created with mass pulls decreased to 27.8% from historical average of 62.4%.
 - Continuous gravity concentration works on the JL1 composite sample tested.
 - Lead and zinc flotation grades are similar and have been duplicated without DMS preconcentration. Simplifies that part of the flowsheet, removes the need for that process step and the associated capital.



Draduct	Weight			Assay	(% or	g/t)			
Product	%	Pb	Zn	Fe	Au	Ag	S	As	Not Saleable – As above
Gravity Con.	5.6	4.32	2.97	25.8	38.08	133	27.6	25.4	
Lead Con.	0.6	45.10	4.46	5.6	19.77	3021	19.8	1.3	Saleable as a Gold Cor
Zinc Con.	2.7	2.37	53.62	5.6	1.38	67	32.8	0.6	Arsenic below 3.25% ar
Sulphide Con.	22.2	0.72	1.09	25.0	25.84	22	24.6	18.1	above 15g/t.
Combined Con.									Saleable - Penalised abo
or	27.8	1.4	1.5	25.2	28.3	44.2	25.2	19.6	0.1% As at \$2.5/dmt to
POX Feed									limit of 1.0%.

Using current proposed plant throughput of 2200tpd = 611tpd of concentrate to ship. ~220,000 tpa. (Down from 500,000 tpa.)

Not Saleable – Arsenic is too high and only 65% payables 15-20g/t Au. – Not Feasible.

- Could we simplify the circuit even further, and float a bulk concentrate for sale using gravity to reduce mass pull?
- ("Flowsheet C" wo. Gravity: "Flowsheet D" w. Gravity)



Flotation – "Flowsheet C" Optimisation – 2022

BL801 T23 Bulk Sulphide flotation test results at a ~150um P80 primary

Droduct	Weight Assay - percent or g/t										Distribution - percent								
Product	%	Pb	Zn	Fe	Au	Ag	S	As	Pb	Zn	Fe	Au	Ag	S	As				
Bulk Con	42.1	5.4	9.2	24.1	15.0	133.0	25.3	13.3	95.6	99.1	94.0	96.7	97.3	96.9	94.0				

Using current proposed plant throughput of 2200tpd = 930tpd of concentrate to ship. ~340,000 tpa.

- "It will take a million tonnes of clean concentrate to get this to below 3.5% arsenic. That will be very expensive and I do not believe it an option.
- A couple of Chinese plants are interested. Our HK office believes the market could absorb about 100k tonnes per year. Ballpark estimates would be Au 50% (for Au > 20 g/dmt) and Ag 45% (for Ag>80 g/dmt).
- These plants are roasters and from experience, their tested recovery varies widely with each unique concentrate. All of them struggled with Eldorado's Olympias so adding in the Pb & Zn may make the payable estimate moot."

Flotation – "Flowsheet D" Optimisation – 2022

BL801 T16 Bulk grav-flotation test results at a ~150um P80 primary grind.

Droduct	Weight		Д	ssay -	perce	ent or g	g/t	Distribution - percent							
FIOUUCI	%	Pb	Zn	Fe	Au	Ag	S	As	Pb	Zn	Fe	Au	Ag	S	As
Bulk Con	45.3	6.1	8.2	19.9	13.6	131.7	24.0	12.9	96.5	98.7	95.9	98.3	97.6	94.9	98.0

Using current proposed plant throughput of 2200tpd = 997tpd of concentrate to ship. ~360,000 tpa.

- Same issues as "Flowsheet C"
- Although overall gold recovery to the bulk con is up slightly ~2%.

Bulk Flotation – Key Consideration – 2022															
Droduct		Distribution - percent													
Product	%	Pb	Zn	Fe	Au	Ag	S	As	Pb	Zn	Fe	Au	Ag	S	As
Bulk Con	45.3	6.1	8.2	19.9	13.6	131.7	24.0	12.9	96.5	98.7	95.9	98.3	97.6	94.9	98.0

- Key Considerations for Simplified Flowsheets "C & D":
 - Should this concentrate be sent to POX, potentially no revenue from the base metals.
 - The lead will stay in the residue, forming a very stable jarosite; which may suppress the silver jarosite formation and help with silver leaching. (Need to test.)
 - The zinc however will leach into solution. If it is not floated before hand, the liquor will either need to be treated to remove the zinc or possibly it can be precipitated. Either way there are added Capex and Opex – not as simple as it originally appears.

Bulk Flotation – Zinc Treatment – 2022

- No Zinc Recovery = precipitate and filter with tails.
 - Step 1: Neutralize the acid generated in POX with Limestone up to ~ pH 4, OR tailings if contains carbonates.
 - This will neutralize any free sulphuric acid and ferric and aluminum sulphate in the POX liquor. (This will likely be >90% of the sulphate in solution.)
 - Step 2: Raise the pH further to 9-10 using lime. This precipitates the zinc and any magnesium in solution which will be required as the water will be recycled from the filters to the mill.
 - Based on the Ca(OH)₂:Zn stoichiometry, the amount of lime that will be needed to raise the pH to 9-10 will be ~1.2 tons for every ton of zinc in solution, or ~30,000 tpa.
 - These are all slimy precipitates (Al₂(OH)₃, Fe(OH)₃, CaSO₄.2H₂O, Zn(OH)₂, Mg(OH)₂) that will cause operation issues in solid liquid separation. Combining them with the float tailings prior to tailings filtration will affect the tailings filtrability but easy than trying to filter them on their own.

Bulk Flotation – Zinc Treatment – 2022



Zinc Recovery = precipitate for sale.

- Requires POX slurry solid/liquid (S/L) separation, either after POX or hot acid cure..... and working
 with the acidic liquor.
- Step 1: Neutralize the acid generated in POX with Limestone up to ~ pH 4, OR tailings if contains carbonates.
- Step 2: Remove separation of slimy Al2(OH)3, Fe(OH)3, CaSO4.2H2O precipitates.
- Step 3: Raise the pH to 8-9 with good quality Mg(OH)2 to precipitate Zn(OH)2, followed by S/L separation.
 - ZnSO4 + Mg(OH)2 \rightarrow Zn(OH)2 + MgSO4.
 - The Mg(OH)2 consumption to raise the pH to 8-9 and precipitate 27,000 tpa Zn from solution will be 25,000-30,000 tpa.
- Step 4: Raise the pH to ~10 with lime (milk of lime) to precipitate the MgSO4 that went into solution in the Step 3, otherwise it will accumulate in the process water.
- Based on a 1:1 stoichiometry of Ca:Mg, lime consumption will be ~3 ton for every ton of Mg added in the previous step to bring down zinc.....ie 75,000 to 90,000 tpa lime.
- Th ~45% mass pull would give you ~80 tpd Zn or 30,000 tpa. If we assume 90% recovery (27,000 tpa Zn) and \$2,500/t for the product (this is 60% of current Zn price), the revenue per annum from this stream would be ~\$70M.

• So with that in mind... could we do this... "Flowsheet E"



- BL801 T23 Results "Flowsheet E"
 - Includes Pb 1CT going to Zn Regrind and into Zn Cleaners.

	Weight			Assay	- perce	nt or g	g/t		Distribution - percent							
Product	%	Pb	Zn	Fe	Au	Ag	S	As	Pb	Zn	Fe	Au	Ag	S	As	
Lead Con.	3.7	49	10.8	9.8	32.91	662	21.2	5.32	77.4	10.4	3.41	18.9	43	7.24	3.35	
Zinc Con.	3.0	1.24	54	8.6	2.82	79	32.1	1.828	1.58	41.7	2.41	1.31	4.14	8.83	0.93	
Tails (Con/POX)	30.8	0.64	2.53	27.98	14.37	38.17	24.75	15.81	8.35	19.9	80.1	68	20.4	69.4	81.7	

- Using current proposed plant throughput of 2200tpd = 678tpd of concentrate to ship. ~250,000 tpa.
- Gold Recovery to concentrates = 88.3%.
- Lead grade and recovery are excellent, arsenic is a little elevated and would be penalised.
- Tails would POX easily with lead and zinc removed. As we are getting closer to that ~100,000tpa "absorption" suggestion – might be saleable?

POX-Leach – Flowsheet Optimisation – 2021-22

- POX Parameters Tested to-date:
 - Pre-acid: pH 1-2
 - Time: 60-120 minutes
 - Pulp Density: 10-30% solids
 - Temperature: 220-230°C
 - Oxygen Pressure: 100 psi O₂
 - Concentrate POX'd As-is and also reground.
 - Hot Acid Cure included. (4hours @ 95°C) (Currently testing if required?)

- Leach Parameters Tested to-date:
 - Leach/CIL Time 24, 48, 56 hours
 - NaCN 5,000ppm.
 - Pulp density 10% solids
 - pH 10.5-11
 - Dissolved Oxygen (DO) ~9-11ppm using Air
 - Regrind after POX and before leach.

POX-Leach – Flowsheet Optimisation – 2021-22

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- POX-Leach Learnings:
 - Pre-acidification pH 2.0 is sufficient.
 - Pulp Density should be based on S²⁻ which equates approximately ~10-14%
 - A temperature of 220°C for 60-90 minutes oxidizes the concentrate to levels averaging 97.7%
 - Regrinding the concentrate prior to POX provides no benefit, however regrind after POX appears to increase recovery while reducing leach kinetics.



POX-Leach – Flowsheet Optimisation - 2022

POX-Leach Results:

- The two best are:
 - 230°C for 60mins.
 - 220°C for 90mins the regrind before leach.
 - Leach time can be reduced to 10-24 hours.
 - Regrinding before leach provides the best recovery in the shorted time.
 - CIL may be required with longer leach times.





Next Steps - 2022



- Flotation:
 - LCT on Flowsheet E.
- POX:
 - Test on Flowsheet D & E concentrate.
 - Test precipitating Zn for inputs to trade-off.
- Leach:
 - Leach respective concentrates.
 - Attempt to reduce cyanide levels and consumption.
 - Test alternatives to cyanide.
- Process
 - Undertake trade-off on alternative flowsheets.
- Metallurgical testing on variability composites using selected flowsheet.
- Mineralogy on Main Zone to confirm Arsenopyrite relationship to Gold through deposit.