

DATE: February 12, 1991
A TO: Ian Pirie
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SUBJECT: Rey Lake Property Submittal

825554

REY LAKE PROPERTY SUBMITTAL
MERRITT AREA, B.C.

TARGET: Cu-Mo CALC-ALKALINE PORPHYRY MINERALISATION;
POLYMETALLIC SKARN MINERALISATION
STRUCTURALLY CONTROLLED POLYMETALLIC QUARTZ VEIN SYSTEMS

RECOMMENDATION: OBTAIN GOVERNMENT AIRBORNE MAGNETOMETER SURVEYS TO ASSESS POTENTIAL OF AREAS LACKING GEOLOGICAL INFORMATION; OBTAIN ORIGINAL MAPS SO UNITS MAY BE SEEN CLEARLY; VISIT PROPERTY AND LOOK FOR EVIDENCE OF LARGE ALTERATION ZONES CHARACTERISTIC OF THE SIZE OF SYSTEM MINNOVA WOULD BE INTERESTED IN.

Geology: In a regional sense the property is underlain by Triassic-Jurassic Nicola Group intermediate to mafic volcanics, volcanoclastics, and sediments. To the north, in the Rey Lake area, a high level Cretaceous quartz monzonite stock intrudes Nicola rocks. The stock measures roughly 3000 metres in length, by 200 to 1200 metres width. Alteration consists of quartz-sericite and epidote-calcite assemblages. The stock is elongated northwesterly and may be structurally controlled. To the south, in the Lucky Mike and Old Alameda mine areas, geology consists of steeply dipping Nicola Group volcanics and includes massive andesitic and fragmental units. A thick package of felsic flows, sediments, lithic tuffs and limy volcanics with minor limestone occurs as a break within the volcanics. Felsic quartz-porphyry dykes locally intrude these units.

Mineralisation - Rey Lake: In the Rey Lake area mineralisation is associated with areas adjacent to the quartz monzonite stock, particularly along its western contact with Nicola volcanics. Drilling has been concentrated along this margin. Although

consistent, mineralisation is generally sub-economic in grade.

Drilling by Asarco and Craigmont identified two zones of mineralisation. Rough tonnage "guestimates" have been calculated for the first zone by both Asarco, and more recently, and presumably, by Rick Wynne for Brenda Mines. The estimates were based on only 5 diamond drill holes, as well as 11 percussion holes. Estimates are contradictory. Asarco indicates 31 Mt grading 0.20% Cu and 0.021% Mo, while Fred Wynne estimates 83 Mt grading 0.15% Cu and 0.018% Mo. Regardless of which is correct, grades and tonnage are not high enough to make this an economic prospect. The second zone, 400 metres northwest of the first, was identified by only one diamond drill hole which intersected 0.25% Cu and 0.010% Mo over 190 metres. This mineralisation may continue to the northwest and southeast but no follow-up drilling was conducted in the area. Mineralisation in this zone may be associated with a mag low.

Mineralisation - Lucky Mike, Old Alameda: Mineralisation of this area falls into two general categories: polymetallic (Cu, W, Ag, minor Au, Zn) skarns and polymetallic (Pb, Zn, Ag, Cu, Au) quartz vein systems. The main skarn unit at Lucky Mike strikes northeasterly for 100 metres and occurs at the contact between epidotized, andesitic breccias and intermediate to felsic, crystal-lithic tuff within a lens of limy volcanics, lithic tuffs and limestone. According to Wells (1989 Assessment Report) the skarn is bimodal in mineralogy consisting of garnet skarn and carbonate skarn. Tungsten mineralisation is reportedly widespread within the garnet skarn (to 0.152%/14.1m) while Cu, Zn, Au, and Ag values (to 1.34% Cu, 8.01 oz/t Ag/1.06m) appear controlled by post skarn shallow east dipping fault zones within the skarn and in the footwall epidotized volcanics. Gold values are low (to 400ppb) and occur where the skarn is fractured. Wells (1989) reports that skarn available for tungsten mineralisation is less than 100000 tons as compared with Torwest's estimate of 300000 tons containing 0.22% WO_3 .

Four holes drilled at the Old Alameda mine in 1988 were

designed to test the projections of the shaft vein at shallow depths. Wells (1989) reports intersections of 0.04 oz Au, 1.31 oz Ag, 0.23% Cu, 1.14% Pb, and 3.80% Zn over 0.33 metres, and 0.01 oz Au, 4.90 oz Ag, 1.09% Cu, 5.25% Pb, and 20.90% Zn over 0.68 metres.

CONCLUSIONS AND RECOMMENDATIONS

In the Rey Lake area copper and molybdenum mineralisation appear to be associated with mag highs having coincident mag low features along the margins of increasing PFE (>6) as indicated by I.P. methods. The change from mag high to mag low roughly correlates with the contact between Cretaceous quartz-monzonite intrusives and Triassic Nicola volcanics. An area of high resistivity is also roughly coincident with the contact.

In the Lucky Mike and Old Alameda areas tungsten is widespread within the skarn unit but other metal values are associated with shallow east dipping post-skarn fault zones within the skarn. The skarn reaches 25 metres true width near the surface but tapers to 1 to 2 metres around 50 metres below surface.

Rey Lake Area:

Based on the information made available, tonnage and grades do not appear economic. A worthwhile venture would need on the order of several hundred million tons to be appealing. However, the information provided is insufficient to fully assess the remaining area. Geology maps provided are of extremely poor quality. Having been copied from coloured originals they lack a numbering system to identify units and are unreadable. A copy of the original maps, or a copy having a numbered legend, would be useful. Government airborne magnetometer maps for the Rey Lake area would be most useful in assessing the remaining property area. This would allow a comparison of magnetometer signatures over the area of known mineralisation with other areas lacking geological information. Finally, the most useful method of assessing the property is to pay it a first hand visit and look for evidence of a large porphyry system. A system of the size that Minnova is

looking for should have large alteration zones easily seen from ground level assessment.

Lucky Mike, Old Alameda Area:

Both the Lucky Mike polymetallic skarn, and the Old Alameda polymetallic quartz vein system do not have sufficient tonnage to fit Minnova's current exploration criterion.

1500 x 500' x 200' → 21 MT

~~St. Cu grade~~
5.8% Cu, 0.25% Mo, 0.021

- Ryhab Property 92I/7E
- Calc-alkaline Cu-Mo prospect.
 - north of Swakum Mountain.
 - explored by Boares and Cragmont from '72-'75
 - extensive diamond drilling and percussion drilling.
 - Cretaceous quartz monzonite stock intruding volcanics and sediment of Triassic-Jurassic Nicola.
 - Calcopyrite moly occurs mainly in Nicola rocks adjacent to the stock.
 - Tonnage est in one area from 5 diamond and 11 percussion holes
 - 83 million tons @ 0.15% Cu, 0.018% Mo
 - at another location one ddh intersected 0.25% Cu and 0.10% Mo over 190 m.
 - typical calc-alkaline porphyry setting.

Geology

- this in a belt of volcanics, volcaniclastics and sediment of Triassic-Jurassic Nicola Gp.
- high level, Cretaceous quartz monzonite stock intrudes Nicola, altering and mineralizing them.
- stock is altered and weakly mineralized but main mineralization occurs in Nicola rocks just outside the stock.
- 83-schists and ep-calcite to skarn assemblages where there are limy beds in Nicola.
- stock is ~ 3000m x 200-1200m wide.
- elongated NW and in part controlled by strong NW trending structure.

Geophysics IP and VLF, ~~mag~~ mag?

Mineralization

- occurs mainly in Nicola adjacent to quartz monzonite stock
 - disseminations, veinlets and shears with pyrite the dominant sulphide, followed by chalcopyrite and stibnite.
 - uniform but low grade.
- two zones identified by Pearce and the Craigmont
 - the larger is $\approx 200 \times 500$ m
 - 0.15% Cu, 0.018% Mo.
 - southernmost drill section (3200)
 - $\approx 0.19\%$ Cu 0.020% Mo.
- ~~zone 2~~
 - ≈ 400 m W of zone 1. along west margin of stock.
 - only 1 hole. 0.25% Cu, 0.010% Mo / 190 m
 - possible assoc mag low
- Cu mineralization extends to zone of I.P. region ~~to~~ reserve from 37.8% Fe. suggesting a central I.P. high to over 15% Fe.
 - not drill tested.

Corona/Petrie report 1988.

- 1988 strolling on the lucky Mike (Cu, W, Ag, minor Au, Zn) skarn proved it to be much smaller than previously indicated. W mineralization is widespread in the garnet skarn while Cu, Zn, Au, Ag tend to be restricted to late cross cutters, structure.
 - low mag potential for both styles of mineralization, appears limited
- at Oldameda shaft, poly metallic (Au, Ag, Cu, Pb, Zn) quartz veins are controlled by narrow, gently west dipping (35°) fault zone
 - vein are narrow with erratic base and precious metal values.

* Suakun Mtn.

Lucky Mike: 26 tons - ~~202 oz Au, 137 oz Ag~~
00802/t. Au, 5.3 oz/t. Ag. 1932# Cu, 1753# Pb

Shelma + Bonnie: 89 tons - 82.1 oz Au, 83.4 oz/t Ag
9683# Pb, 10237# Zn.

Oes, Amanda: 3 tons - 0.33 oz/t Au, 17.33 oz/t Ag
576# Pb.

Lucky Mike poly sham

- main unit is 100 m long
25 m wide at surface and tapers to 1-2 m
wide 50 m below surface
- occurs at contact between epidotized
andesitic bas. and unmineralized
felsic, crystal lithic tuffs within
a lens of glenay volcanics, lithic
tuffs and limestone.

< 100,000 tons

I. P. Survey 1972

- avg low bkg response 2-6 PFE
- localized bugs to 8 PFE
- intrusive has a low ~~avg~~ avg. of 0-1.5 PFE.

~~John Man 876-7194~~

~~re: L875 in Midway~~

~~Michaey~~

Lucky Mike Clair Dutton,

.23% Cu. 15.2 ppm Ag.

72-1 0.453 + $\bar{x} = 0.18\% \text{ Cu}$

0.10/718

72-1: $\frac{0.10, 0.15}{718}$

72-2: $\frac{0.22, 0.027}{591}$

72-3: Bensen QM.

72-4: Bensen

72-5: $\frac{0.127, 0.011}{595}$

72-6: $\frac{0.25, 0.01}{625}$

DDH Summary

Ray Lake Area

72-1: $\frac{0.10, 0.015}{718'}$

72-2: $\frac{0.22, 0.027}{591}$

72-3: Barren

72-4: Barren

72-5: $\frac{0.12, 0.012}{595'}$

72-6: $\frac{0.25, 0.01}{625'}$

Lucky Mike, Old Alameda

- ~~skarn~~ polymetallic skarn and poly metallic qtz veins
- 800 metres drilling
 - 7 holes in skarn
 - 4 holes in gvn
- polymetallic skarn assoc = altered sections of the 'Marker' horizon (altered tuff) at Lucky Mike (Cu, W, Ag, minor Au, Zn)
- limited tonnage potential for skarn
- erosive loss and precious metal values in vein system

Results Lucky Mike

- tested skarn for 110 m strike length.
- remain skarn end 100 m dip length
- wide at surface (25 m) tapering to 1-2m at depth (50m)
- avg W grade 0.15% - 0.40%
- estimate of skarn available < 100000 tons
- Cu mineralization appears structurally controlled.

Old Alameda

- 9 holes in gvn

- West striking, dipping west.

intersection	Au	Ag	Cu%	Pb	Zn	
LS 8-88	0.0402	1.31	0.23	1.14	3.80	/ 33m
LS 9-88	0.0102	4.90	1.09	5.25	20.90	

Conclusions and Recommendations:

Lucky Mike and Old Alameda Area

~~By this~~ Prospects in this area consist of polymetallic skarn and polymetallic quartz vein systems. ~~At the~~

Production from this area in the past has amounted to little more than 118 tons of ore yielding 4 oz of Au, 76.08 oz of Ag, ~~115# Cu~~, 1935# Cu, 12012# Pb, and 10237# Zn, ~~from the~~ from the Lucky Mike, Theina and Benice, and Old Alameda mines, combined. A 1988 report by Corona states a tonnage estimate by Jormet Resources Ltd. during the 1960's amounted to 350,000 tons for the Lucky Mike deposit with W grade of 0.2 - 0.3% Wg. Few assays occur for Au, Ag, or Zn, and work ceased ~~as~~ as a result of the low grade. Drilling by Corona during 1988 indicated that much of Jormet's drilling was down dip and this did not give accurate estimate of ore reserve potential. Subsequent drilling by Corona indicated less than 100,000 tons available for tungsten mineralization. ~~Cu, Ag, and Zn~~ appear to be structurally controlled along shallow east dipping fault zones.