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REPORT

on

THE ROCKLAND GROUP OF CLAIMS SILVERTON, BRITISH COLUMBIA

for

ROCKLAND MINING LTD.

by

R.W. PHENDLER, B.Sc., P.Eng.

Vancouver, B.C.

October 22nd, 1970.

1250 Cas Fort St. Joh В S H R 550 1350 Smithen PROPERTY Terrace Queen GEORG Charlotte UM 0 Islands B L Lillooet Ashcroft Por lard Merritt * 500 1300 Vancouver Princeton Island 1200 STATES UNITED R.L. Plu 0 BACON & CROWHURST LTD. ROCKLAND MINING LTD. LOCATION MAP SILVERTON, B.C. SCALE I"=136 MILES FIG.I. ALTAIR drafting services Itd. OCT. 1970

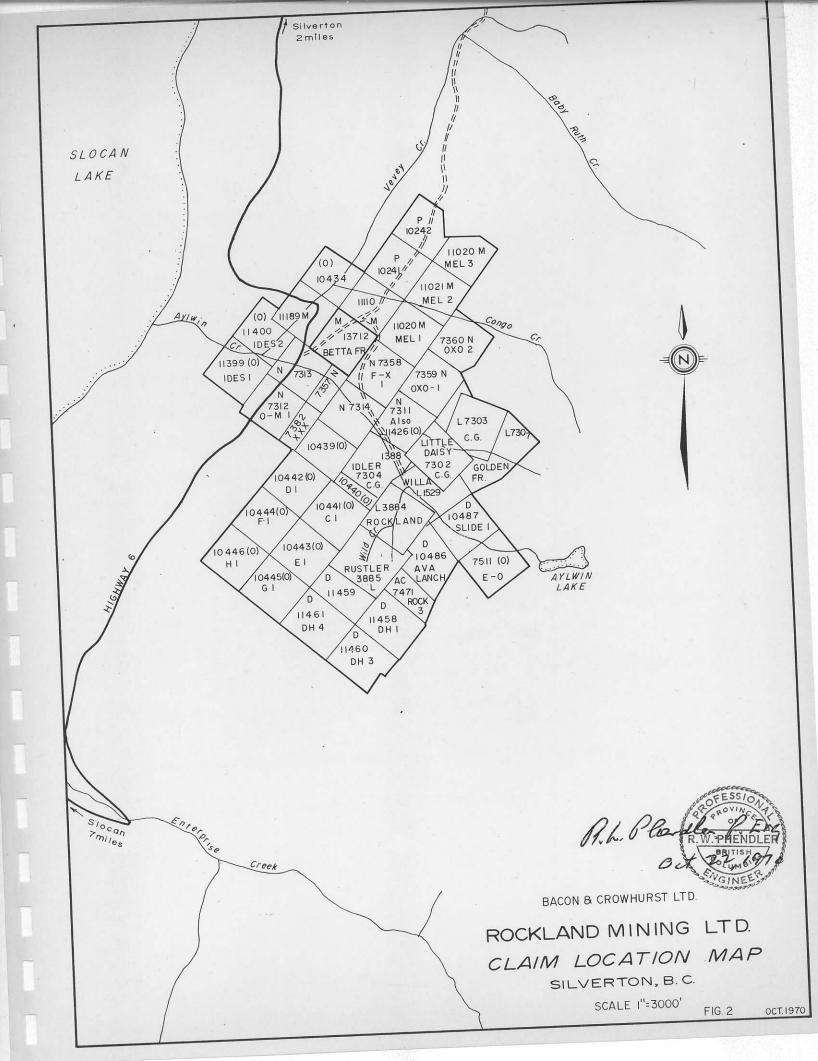


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SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

. 1 .

The property of Rockland Mining Ltd. is in the Slocan area of British Columbia, near the town of Silverton. It occurs on the northern margin of the Nelson batholith, in a roof pendant of altered volcanics and younger granitic rocks. It is in an area containing numerous silver-lead-zinc deposits.

The prospect is particularly interesting in that it displays characteristics of a porphyry copper-molybdenum deposit in a region where vein and skarn deposits have been predominant. In addition, the Rockland property contains a strong shear zone with widespread disseminated chalcopyrite mineralization associated with a silicified, pipe-like, breccia zone. The breccia zone occurs in altered volcanic rocks. The shear zone, known as the Willa-Rockland shear, extends along strike in both directions into quartz porphyry. This rock type exhibits fracturing, limonite staining and widespread pyritization. Some disseminated chalcopyrite and quartz-molybdenite stringers have also been observed.

A soil survey has disclosed the presence of copper and molybdenum anomalies. The largest of these (A) is 2000' by 700' and shows readings greater than 300 ppm in copper and 20 ppm in molybdenum.

Anomaly C is associated with the Willa-Rockland shear zone in a quartz porphyry host rock; it indicates abnormal amounts of copper and molybdenum. Molybdenite has been observed in quartz veins in this area. Diamond drilling carried out in the summer of 1969 explored in depth the Willa-Rockland shear zone in the vicinity of the Main chalcopyrite showings. Although of limited strike length, sampling of surface exposures and underground workings (No. 1 Adit) shows that a grade of 0.37% Cu and 0.11 oz. Au occurs across a width of 200^s. Diamond drilling (D.H. #1) also showed that the zone extends to a depth of 300^s (0.32% Cu, 0.05 oz. Au across 190.0^s).

The mineralized areas of most importance are undoubtedly related to the Willa-Rockland shear zone. Testing of the shear in the volcanics has shown appreciable widths with near commercial grades. It is recommended that additional diamond drilling be carried out to explore the pipe-like, mineralized breccia zone at depth.

The geochemical anomalies (A and C) warrant further exploration and the Rockland and Little Daisy adits provide access for underground diamond drilling of the anomalous areas. The vertical dips of the fractures and the quartz-molybdenite veins indicate that the drill holes should be horizontal.

Geological mapping should be extended to cover all of the company's claim group in detail. More detailed soil sampling is warranted on the extremities of the presently-known anomalies. Further investigation by geophysical methods should be undertaken, followed by diamond drilling.

It is recommended that ground be acquired along strike to the southeast of Anomaly A. Preliminary investigation by the writer during the present examination showed that anomalous soil conditions exist and that the favourable pyritized, quartz porphyry rock continues beyond the claims held by Rockland Mining Ltd.

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It is recommended that the sum of \$150,150 be provided to carry out the above program. This does not include the acquisition of ground mentioned in the previous paragraph.

COST ESTIMATE

Stage 1

1.	Geophysical survey - EM a Tunnel preparation		\$10,000 10,000	
3.	Underground diamond dril 5000' @ \$8.50/ft.	Contraction of the second	42,500	
li.	Auxiliary services - road core storage, etc.	d clearing,	3,000	
5.	Engineering and geology		5,000	
6.	Sampling and assaying		\$72,000	
	10% contingen	cies	7,200	\$79,200
Sta	<u>ge 2</u>			
1.	Geochemical sampling		3,000	
2.	Geological mapping Diamond drilling - surfa	CD =	5,000	
17.6	4000' @ \$12/ft.		48,000	
le.	Engineering and geology		4,000	
5.	Sampling and assaying		1,500	
6.	Road maintenance		<u>3,000</u> \$64,500	
	10% contingen	cies	6,450	<u>\$70,950</u>

\$150,150.

Respectfully submitted,

BACON & CROWHURST LTD.

R.W. Phendler, B.Sc., P.Eng.

INTRODUCTION

Between October 4th and October 8th, 1970, the writer examined the Rockland group of claims near Silverton, British Columbia. He was accompanied by Mr. U.E. Butcher, President of Rockland Mining Ltd., Mr. J. Crichton, a director, and Mr. D. Hawkins, prospector, who has been actively engaged in exploring the property for a number of years.

During the visit the writer carried out geological mapping, underground sampling and took 74 soil samples to check on the validity of anomalous readings from soil samples taken in 1968.

Previous to the present examination, the writer visited the property on June 10th and 11th, August 3rd and 4th and September 23rd and 24th of 1969, during the surface diamond drilling program. Core logging, sampling and geological mapping was carried out.

LOCATION AND ACCESS

The Rockland group of claims is at an elevation of 3000'-6000', a few miles east of Slocan Lake and about 40 miles due north of Nelson. The town of Silverton, which is three miles north of the property, is on Highway 6, halfway between Revelstoke and Trail. Access to the mineralized areas is by a three mile gravel road, east from the highway up the Aylwin Creek valley.

PROPERTY AND OWNERSHIP

The Rockland Mining Ltd. property consists of four Crown granted mineral claims, a three claim mineral lease and 36 located claims, as follows:

Crown Grants

Little Daisy Golden Idler Golden Fraction	98 89	7302 7303 7304 7307		
Mineral Lease M	-58 co	vers r	everted	Crown grants
Willa Rockland Rustler	- Lot "	1529 3884 3885		
Located Claims				Record No.
D.H. 1, 2, 3, 4 Dave 1 Mel 5 A.S. 1 OM 1 OM 2 OM 3 O.X. 1 and O.X. F.X. 1 A.C. 1 Mel 1, 2, 3 Blanket 2 & 3 Completion Al Fr. Bl Fr. Cl Dl El F1 Cl H1 Avalanche Slide 1 and 2 Active E.O. XXX1				11458, 59, 60, 61 11109 11110 7311 7312 7313 7314 7359, 7360 7358 7357 11022, 11021, 11020 10241, 10242 10438 10443 10444 10443 10444 10445 10445 10446 10445 10446 10487 and 10535 11400 and 11399 11426 7511 7382

The area covered by the claims is 2½ miles by 1½ miles,

the long dimension bearing northeasterly.

HISTORY

The first discovery of gold on the mainland of British Columbia was made in 1855 on the Pend-d'Oreille River, sixty miles south of the Rockland property. These placer deposits never yielded much production but possibly aided in renewing interest in the area and in the re-discovery (in 1882) of the Blue Bell Mine, known since 1820. Later discoveries were made in the Ainsworth and Nelson areas, leading to construction of the first mill in 1892.

In 1889 the first claims were located in the Rossland camp and production reached a peak in 1903. By 1928 the principal mine closed.

The Slocan camp came into prominence in 1891 and it was about this time that work on the Rockland property was initiated. Early work consisted of open cutting and about 500 feet of crosscutting in three adits on the principal Willa-Rockland zone.

During 1964 and 1965 the Consolidated Mining and Smelting Company of Canada Limited carried out geological mapping and a limited diamond drilling program in the vicinity of the principal chalcopyrite showings on Aylwin Creek. Diamond drilling in 1965 amounted to 975' in four holes. Results are not available.

In 1967 Amax Exploration Ltd. conducted a reconnaissance geochemical survey along roads, trails and creeks. Results indicated that geochemical investigation was practicable and additional work was recommended. Anomalous readings in copper and molybdenum were discovered. J.F. McIntyre, P.Eng., mining consultant, examined the property in early 1968 and further exploratory work was recommended. In October and November of the same year Allen Geological Engineering Ltd. of Vancouver carried out a qualitative geochemical survey for copper under the direction of A.R. Allen, P.Eng. His work disclosed the presence of a sizeable anomaly in the vicinity of the principal showings on Aylwin Creek and along the Willa-Rockland shear to the northeast. This work was carried out for Rockland Mining Ltd. which had been incorporated to investigate and develop this and other properties.

In 1969 the consulting engineering firm of Bacon & Crowhurst Ltd. was asked to examine the chalcopyrite showings on Aylwin Creek and to supervise a diamond drilling program. Five holes were completed, all intersecting the Willa-Rockland shear zone. Results warranted additional investigation of the property.

In mid-1970, prospecting disclosed the presence of molybdenum-bearing quartz veins in the Little Daisy area and in an area a few hundred feet south of the Rockland tunnel. In addition, 1500' of trenching in the Rockland adit area was carried out, exposing oxides of copper in quartz porphyry.

The No. 1, Rockland and Little Daisy adits have been rehabilitated for sampling purposes and to provide access for underground diamond drilling.

In September 1970 Rockland Mining Ltd. re-ran the geochemical samples taken under the direction of A.R. Allen, P.Eng., for copper and molybdenum at Crest Laboratories Ltd. and results showed anomalous

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conditions in both elements. Consequently the writer was asked to take geochemical samples over the anomalous areas to check the earlier results, which were found to be reliable. Geological mapping was also carried out over the anomalies and some underground chip sampling was conducted.

GEOLOGY AND MINERALIZATION

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The area in which the Rockland property is located is within and close to the north-central margin of the Nelson batholith. The batholith is of granitic composition and is considered to be Jurassic or Cretaceous in age. It measures 50 miles (NS) by 30 miles. Within the batholith are numerous roof pendants of mixed sedimentary and volcanic rocks of the Slocan group of Triassic age.

The mineral showings on the Rockland property are within an area that appears to be underlain by equal proportions of porphyry (quartz eye) and altered sedimentary and volcanic rock, presently identified as augite porphyry (locally termed greenstone). The Willa-Rockland shear zone crosses these rock types, striking northeasterly. It dips steeply and is traceable on surface for 1000'. It passes through altered andesites that narrow to the southwest between converging masses of quartz porphyry in the vicinity of the principal showings (See Fig. 5).

To the northeast the Willa-Rockland shear zone enters massive quartz porphyry in the vicinity of the copper and molybdenum geochemical anomalies. An examination of the porphyry shows widespread disseminated pyrite with some chalcopyrite specks and occasional steeplydipping quartz veins with molybdenite blebs and specks. To the southwest the Willa-Rockland shear zone also passes from the greenstones to quartz porphyry a few hundred feet south of the Rockland Tunnel (See Fig. 3). Quartz-molybdenite veins were observed.

During the present examination the following chip samples

were taken:

Sample No.	Width	<u>% Mo</u>	% Cu	Oz.Au	Location
36111 36112	1.0"	0.37	0.09	0.01	North of Little Daisy Adit ditto
36122 36123	0.5*	0.08	60 40	**	South of Rockland Adit ditto

In 1969 the writer chip-sampled the principal chalcopyrite showing on Aylwin Creek in 10' sections and they averaged 0.37% Cu and 0.17 oz. Au across 100'. Host rock for the disseminated chalcopyrite is brecciated, silicified, fine-grained andesite. About 700' to the southwest of this location, the Rockland tunnel intersected a 60' width of mineralized, sheared quartzite which is reported to average 0.51% Cu and tr. Au.

During the present examination the No. 1 Adit was chipsampled by the writer. Continuous disseminated pyrite and chalcopyrite was observed in a host rock of silicified meta-andesite. Results were as follows (See Fig. 6):

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	% Cu	Oz. Au	Width	Location		
	0,39	0.10	10*	Main XC	0-10*	- E. wall
	0.98	0.18	10'	91	101-201	11
	0.23	0,02	10*	19	201-301	20
	0.14	0,02	10*	89	301-401	11
	0,26	0.01	10*	52	401-501	91
	0.47	0.02	10'	8.8	501-601	98
	0.14	tr.	10*	22	601-701	80
	0.23	tr.	10*	58	701-801	11
	0.30	0.01	10*	11	801-901	8.6
	0.16	0.01	9:	93	901-991	23
	0.96	0.18	10"	SW XC	0'-10'	- W. wall
	0.67	0.04	101	88	101-201	88
	0.92	0.06	10*	8.8	201~301	19
	0.34	0.08	10*	8.0	301-401	11
	0.24	0.02	10'	12	401-501	80
	0.28	0.04	10*	81	501-601	8.8
	0.20	0.03	10*	88	601-691	58
	0.25	0.01	101	S XC	201-301	- E. wall
	0.21	0.01	10*	88	301-401	68
	0.28	0,02	10*	11	401-501	
	0.34	0.02	10*	11	501-601	##
	0.25	0.01	131	8.0	601-731	87
Average	0.37	0.05	99.0*			

All samples taken in 1970 were assayed at Crest Laboratories, Vancouver. Those taken in 1969 were assayed at Chemex Labs, North Vancouver.

DIAMOND DRILLING (See Fig. 5)

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During July and August, 1969, BQ diamond drilling was carried out on the Rockland property. The purpose was to investigate the down dip extension of the Willa-Rockland shear zone below the principal showings on Aylwin Creek. Five holes totalling 2188' were drilled at approximately 200' intervals along the shear. All holes were drilled to the southeast. Results were as follows:

D.H.	Dip	Length	<u>% Cu</u>	Oz.Au	Width	Location	
#1	-450	335"	0.32	0.05	190.0*	Under principal	showing.
#2	-450	386*	0.42	0.06	105.0"	130' NE of D.H.	#1.
#3	-450	550*	0.10	0.01	30.0"	220' SW of D.H.	#1.
			0.25	0.01	5.0"		
			0.14	0.01	5.0*		
			0.05	0.01	250.01		
非4	-450	500*	0.06	0.02	23.0"	400' SW of D.H.	#1.
			0.08	0.02	10.0"		
			0.05	0.02	15.0"		
#5	-450	417 .	0.20	0.05	2.0"	360' NE of D.H.	#1.
		Alternative particular serve	0.04	tr.	5.0*		
Total		2188*					

Core recovery averaged 93%.

All holes intersected the mineral trace, although only two encountered appreciable quantities of mineral. The best mineralization in this section of the Willa-Rockland shear zone is confined to a relatively short strike length. The width of the mineralized breccia zone is impressive but copper values are below economic grades.

GEOCHEMICAL SURVEY

In 1968 Allen Geological Engineering Ltd. took about 500 geochemical samples and analyzed them qualitatively by rubeanic acid methods. The results showed anomalous copper values. These samples were then analyzed in November, 1968, by TSL Laboratories Ltd., Vancouver, using partial extraction methods. The results were apparently not plotted. Anomalous readings for both copper and molybdenum were noted.

In 1970 these same samples were re-run by Crest Laboratories (B.C.) Ltd., Vancouver, being analyzed by total extraction methods. Results were similar to those by TSL Laboratories but somewhat higher.

The copper and molybdenum soil anomalies warrant additional attention. During the present examination the writer took 74 soil samples in anomalous areas. These samples were analyzed at Crest Laboratories and verified the presence of copper and molybdenum geochemical anomalies (See Figs. 3 and 4).

<u>Copper Results</u> - Fig. 3 shows results of the copper geochemical survey with the following breakdown:

> 0-149 parts per million copper - background 150-299 " " " " - threshold 300 plus - anomalous

Six anomalous areas were disclosed and are discussed separately (See Fig. 3).

Anomaly A is underlain by quartz eye porphyry containing disseminated pyrite and minor chalcopyrite. It measures 2000' long (NW) by 700' and remains open to the southeast. Additional investigation is warranted.

Anomaly B is centred on the principal chalcopyrite showing that has been diamond drilled on Aylwin Creek. Testing at depth appears to be justified.

Anomaly C is on the southwest extension of the Willa-Rockland shear zone where strong limonite staining is present. Specks of chalcopyrite were observed in the area and a sample taken by the writer during the present examination assayed 0.14% Cu across 25.0⁴ (Sample 36121).

<u>Anomaly D</u> - This anomaly is in the northwest corner of the map area and an examination of the ground discloses the presence of limonite stained volcanics. Additional geochemical sampling is warranted in the vicinity.

Anomaly E - This was thought to be a down slope migration of the A anomaly but more probably it is associated with a northwesterly striking shear zone containing Aylwin Creek. Ground examination is warranted.

Anomaly F is northeast of Anomaly A and is underlain by porphyry. This anomaly should be closed off to the north by additional geochemical sampling.

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Molybdenum Results - Fig. 4 shows molybdenum results and breakdown is as follows:

0 - 9 parts per million - background 10 - 19 " " - threshold 20 plus - anomalous

Anomaly A is coincident for copper and molybdenum and warrants diamond drilling. Quartz molybdenum stringers strike northeasterly and holes should traverse them.

Anomaly B lies up-slope from the Willa-Rockland shear zone and is underlain by metsediments. Additional work does not appear to be warranted.

<u>Anomaly C</u> lies south and northwest of the Rockland adit and is much more strongly pronounced than the copper anomaly over the same area. Rock type is essentially quartz porphyry with observed quartz molybdenum stringers. Diamond drilling is warranted.

Anomaly D appears to be rather limited in size but should be closed off to the north. At least two more grid lines should be added to the north for the purpose of geological mapping and soil sampling.

Anomaly E consists of a few isolated, anomalous readings and should be checked by more closely spaced geochemical samples.

Anomaly F - This anomaly is weak for molybdenum and relatively weak for copper. Additional geochemical sampling to the north is warranted.

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CERTIFICATION

I, Roy William Phendler, of the City of Vancouver in the Province of British Columbia, HEREBY CERTIFY AS FOLLOWS:

- 1. That I am a registered Professional Engineer in the Province of British Columbia, No. 4421.
- That I am a graduate of McGill University, Montreal, Quebec, with a Bachelor of Science degree in Geology.
- 3. That I have practiced my profession as geologist continuously for the past eighteen years in Quebec, Ontario, Saskatchewan, Newfoundland, British Columbia and the Yukon Territory in Canada; in the western U.S.A.; Mexico; and Peru and Colombia in South America.
- 4. That I have no interest directly or indirectly in the Rockland Mining Ltd. property nor do I expect to receive any.
- That the information contained herein was compiled as a result of my examination of the Rockland property on June 10th and 11th, August 3rd and 4th and September 23rd and 24th, 1969, and October 4th-8th, 1970.

R.W. Phendler, B.Sc., P.Eng.

Vancouver, B.C. October 22nd, 1970.

