

Geological Report on the
King Salmon Lake Property
Claims KS 1 to 26
One Mile North of King Salmon Lake, B. C.
58° 132° S. E.

by
Alex Burton, P. Eng.

for
Mr. W. McGowan and
KENNCO EXPLORATIONS (WESTERN) LTD.

From July 17 to 20, 1967

104 K 10/15 W

ALRAE EXPLORATION LTD

1171

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Report on
King Salmon Lake Property
for
KENNCO EXPLORATIONS (WESTERN) LTD.

ALRAE EXPLORATION LTD.

November 30, 1967

TO PROTECT OUR CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS AND EXTRACTS FROM OUR REPORTS MUST RECEIVE OUR WRITTEN APPROVAL.

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MAPS

Scale

Geology ~~1~~ /

1" = 100 ft.

Landing and Camp Locations ~~1~~ /

1" = 3,125 ft.

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INTRODUCTION

The King Salmon copper property was examined by the writer and Mr. Gordon House from July 17th to 20th, 1967, at the request of Dr. J. Gower of Kennco, who optioned the property from the owners, Mr. McGowan and Mr. Williamson.

LOCATION

The showings are on the north shore of the eastern end of King Salmon Lake, at an approximate elevation of 4,500 feet, just below the mountain top, at tree level.

The King Salmon River flows west into the Taku River.

Several landings and camps have been established at various times and their locations are shown on the accompanying sketch which is based on R.C.A.F. air photo #A 11446-324.

N.T.S. co-ordinates are 104K-15 with latitude 58°45' and longitude 132°35'.

ACCESS

Access is by float plane from either Atlin, B.C. or Juneau, Alaska, to King Salmon Lake. Flying time from Juneau is about three quarters of an hour. The lake, at an elevation of 1,800 feet, is large enough to take any float plane.

The property has been reached by river boat up the Taku River and thence overland 20 miles by trail; or by packhorse trail from Telegraph Creek, over a hundred miles away.

The old campsite, furthest to the east, on the north side of the lakeshore is the better campsite. It was well located for the original packhorse trail to the upper camp. However, the forest

fire of 1950 burned over the trail and at present the best route up is west of the canyon to the upper camp and then follow the packhorse trail up to the showings.

About four hours is required to walk from the lakeshore to the upper showings.

There are several landing spots for a helicopter on the showings and, of course, the mountain top is above treeline.

A helicopter landing pad could be easily prepared at the upper camp.

Running water is available from a small stream east of the breccia zone between the two diamond drill holes.

HISTORY

In 1947, George Bacon and Ralph Wolverton investigated and staked the rusty outcrops for Cominco. The claims lapsed and in 1949 the two men restaked the ground which they optioned to Hudson Bay Exploration and Development Company. In 1950, Hudson Bay built the trail, set up the camps and started work. Two diamond drill holes were completed when a forest fire stopped the work. After the fire the company did no further work and the option was dropped.

The claims lapsed again and were staked for the present owners, Williamson and McGowan.

In July of 1964, Newmont Mining Corporation of Canada Ltd., examined the property, did some airborne magnetic work and ground follow up, grid, magnetics and geology.

Since that time the property has been examined by persons unknown.

CLAIMS

The property consists of the following claims in the Atlin Mining Division held by Bill of Sale to W.F. McGowan:

<u>Name</u>	<u>Record No.</u>	<u>Tag No.</u>	<u>Located</u>
KS #1 - 26	5549B - 5574B	507001 - 507026	Feb. 1964 and still valid

None of the claim posts were checked out in the field as their validity had been previously established to the client's satisfaction.

GENERAL GEOLOGY

In 1960, the G.S.C. published Map 6-1960, sheet 104K which includes King Salmon Lake.

Rocks in the vicinity of the property are all mapped as Unit #4 Upper Triassic sediments overlain to the northeast by the Sinwa Formation (limestone).

The sediments in Unit #4 are mapped as:

"thick bedded, dark coloured greywacke and mudstone; minor silty shale and green siltstone."

In addition, some volcanic and volcanic-sedimentary beds were seen.

About half way up the hillside from King Salmon Lake there is a band of predominately extrusive volcanic rocks including flow breccias and pillow lavas.

Occasional pyrrhotite and pyrite was noted in some of the more massive flows, and some of the thin bedded sediments carried bands of pyrite. The more massive rocks weather without the sulphides staining the surface, however, the pyritiferous sediments produce a prominent gossan on weathering.

The change from Unit #4 appears to be conformable and gradational to the Sinwa Formation which is mapped as:

"a brown, fetid, white-weathering limestone containing minor lenses of sandstone and argillite."

Attitudes on the property match the overall regional north-west strike and north dip but do vary slightly in detail. Dips range from 30 to 60 degrees and average about 40 degrees. Strikes vary from the common norm of N50°W to N65°W and N10°E, the more northerly strikes being commoner in the vicinity of the mineralization.

Dykes of two distinct types cut the Triassic country rocks.

Probably the oldest dyke type is a fine to medium grained monzonitic to dioritic rock. A chilled selvedge in contact with Unit #4 had an attitude of N50°W/90°. This dyke type is commonest in the vicinity of the mineralized breccia zone, generally trends N50°W, has a variable shape and is cut by the porphyry type of dyke. There may be larger plugs or stocks of this dioritic rock.

The porphyry dykes, typically, are 10 to 20 feet wide, strike N50°E, dip to the north and has equidimensional quartz eyes, as well as medium sized feldspar phenocrysts set in a finer grained matrix. In places there is little matrix and the dyke looks like a granite.

This porphyry dyke has been mapped as post ore but is definitely pre-ore, as it is cut by mineralized quartz veins.

STRUCTURAL GEOLOGY

The examination was made to investigate whether the basic concept that the copper mineralization was a "porphyry copper" type of deposit in which a large pear shaped breccia zone was developed in a porphyritic intrusive and the intruded Triassic sediments.

Investigation revealed that while the surface gossan has a large pear shape, the mineralization is related solely to quartz filling in breccias developed along definite fault zones.

Based on the exposures presently available, a more tenable concept of control for the mineralization is the dioritic dykes or stocks to the northwest and to the southeast which could have acted as fulcrum points for tectonic activity which brought in the porphyry dykes along tension directions and formed the breccia along shear directions.

The dioritic rocks to the northwest and southeast are barren.

Attitude of the porphyry dykes averages about N45°E with dips generally 45° to the north. The porphyry dyke around trench #8 swings from N45°E to north - south and is narrower and has a flatter dip at this point. Other narrow dykes in the range of two to three inches near the east end of trench #6 strike N50°W. The porphyry is barren except where it is brecciated and cut by veins. Veins in breccia zones are filled with quartz, chlorite, chalcopryrite and pyrite.

MINERALIZATION

Copper and some silver values are the only economic elements on the property. Mineralization consists of chalcopryrite and lesser amounts of pyrite and occasional hematite associated with a network

of narrow (1/2 inch) quartz veinlets which cut both the Mesozoic rocks and the porphyry dykes in and near the breccia zone.

No magnetite or sphalerite were seen in the copper breccia zone, although both have been reported in lenses to the east, in limestones of the Sinwa Formation.

Weathering has formed a prominent gossan on the outcrops and talus slopes. The better mineralized portions of the talus slopes are well paved with quartz vein fragments. Detailed examination of the available bedrock in these areas shows that the quartz veining is restricted to the breccia zones and that within the gossan stained slopes there are fresh unmineralized sections. The breccia zones run through both the porphyry dykes and Unit #4. Gossan stained talus slopes in the vicinity of samples #3, 4 and 5, northwest of DDH #2 and west of the breccia zone by DDH #1 have few quartz vein fragments on them. These zones make up the greater width of the gossan zone and give it its pear shape.

Where the mineralization cuts the narrow dyke in trench #6 it is poor, although it is of fair grade on the west side of the dyke in trench #6. East of the dyke, the mineralization is not well exposed. Mineralization in the breccia quartz veins is of better grade in trenches #6 and #8 in the vicinity of the porphyry dykes. Where the quartz veins are in only sediments and volcanics without dykes, the grade is lower and they are narrower, however, there may be some very low grade disseminated mineralization in the breccia. Both the breccia and the quartz veins can have fine grained blebs of chlorite as gangue.

In trench #2 most of the values were from a quartz vein in breccia in porphyry across a ten foot section of the 30 foot trench.

Trench #1 consisted mostly of unaltered volcanics with some weathered breccia and a small amount of porphyry on the east end where the better values were.

DIAMOND DRILLING

Collar positions of the two drill holes were located. Some confusion existed in the old reports as to which hole was #1 and which was #2. The wooden skids for the drill were found at the northernmost collar location, a fact which would back up the majority opinion that this was hole #2. Geology matches these locations also. Drill core is stored on a bench downhill from drill hole #1.

Sediments and the contact with the volcanics along the trail immediately below drill hole #1 strike north - south and to line up with the sediments - volcanics contact in drill hole #1 must be offset by faulting parallel to the porphyry dykes or folded to swing the strike further northwest to line up. Faulting is more logical as no evidence of folding was seen.

Diamond drill hole #2 extends far enough west to intersect the diorite in the bottom of the hole. However, for most of its length, it was drilled along a topographic gulley and is largely in porphyry dyke with occasional slightly mineralized breccia sections. Thus none of the rusty sediments and volcanics seen in trench #3 were cut by the hole and this zone remains untested.

SAMPLES

Sample numbers and locations are as follows:

<u>Tag #</u>	<u>Sample</u>	<u>Location and Description</u>	<u>Assay</u>		
			<u>Au.</u>	<u>Cu.</u>	<u>Ag.</u>
7551D		Composite sample of 6 boxes drill core		.01	
7552D		Composite sample of 9 boxes drill core		.03	

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Tag #	Sample	Location and Description	Assay		Ag.
			Au.	Cu.	
7553D		Composite sample of 6 boxes drill core		.03	
7554D	#1	Chip sample, 45 ft. width, trend 045°, over ridge		.10	
7555D	#2	Chip sample, 30 ft. width, trend 175°, over ridge		2.92	
7556D	#3	Talus sample, on line 60S from 750E to W; width 120 ft., trend 040°	.002	.60	.219
7557D	#4	Talus sample, 70 ft. S of line 60S, width approx. 75 ft., trend 045°	.001	.07	.013
7558D	#5	Talus sample, 'trench' 50 ft. above 60S6E, width 50 ft., trend 010°	.00.	.03	.011
7559D	#6	A3 trench, solid chip sample 30 ft. width, trend 053°		1.30	
7560D	#7	A2 trench, solid chip sample, 10 ft. width, trend 050°		.28	
7561D	#8	A1 trench, solid chip sample, 50 ft. width, trend 025°		.60	

Some of the trenches sampled in 1950 and reported in the B.C. Department of Mines Annual Report were re-sampled.

Sample #7561D was sampled across only 50 feet of width due to sluffing. The 1950 sampling was across 90 feet of width and ran:

Au. Nil
Ag. 0.4 oz/T
Cu. 0.9%

Samples #7560D and #7559D were sampled as one sample in 1950 and ran:

Au. Nil
Ag. 0.4 oz/T
Cu. 0.4%

The "B" series of trenches near drill hole #1 were not resampled. In 1950 a sample across 30 feet of the better mineralized zone ran:

Au.	Nil
Ag.	0.1 oz/T
Cu.	0.6%

The 30 foot section is on the east side of the zone, the remaining 100 feet of width is not as well mineralized and is on the west side.

ASSAY RESULTS

Note: Sample #7555D at time of writing is being re-assayed for total and oxide copper.

ORE CONTROLS

Mineralization appears to be related solely to the complex breccia zone. Overall, the zone trends N50°W but in detail within the zone, mineralization may run in any direction.

The quartz veining is an open space filling, typically with long terminated quartz crystals extending into the open central core with blebs of chalcopyrite around the base of the quartz crystals.

In two exposures, at the outer contact of the zone, there was some mineralization in the shearing or faulting along the contact, however, the mineralization is weaker and more evenly distributed than in the breccia.

Previous interpretation of the mineralization was of a pear shaped breccia zone with the narrow, or tail end, at the south. Present interpretation retains the general outline of the zone as a whole but stresses that there are significant blocks of fresh unbrecciated and thus unmineralized rocks within the zone.

Mineralization is restricted to breccia and fault zones and is not of the "porphyry copper" type.

CONCLUSIONS

Any mine making potential on the King Salmon property is not as a porphyry copper deposit but depends upon solving the complex structural problems of the individual breccia and fault zone ore shoots. Each ore shoot has a reasonable potential of grading better than 1% copper but tonnages are limited and widths are likely to be narrow.

For a small to medium sized underground operation, this property has an excellent exploration potential, marred only by the lack of roads to its remote location.

Respectfully submitted:



A. D. K. Burton, P. Eng.

REFERENCES

B.C. Dept. of Mines Annual Report - 1950
(B.W.M. Copper Property)

Rex - Piscis - Lake group of mineral claims
Brikon Explorations Ltd.
September 7, 1955 by S. H. Davis
Private Report

Hudson Bay Exploration
Map and DDH Sections
from Private Report

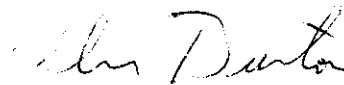
Geological - Geophysical Report
K.S. 1 - 26 mineral claims
Newmont Mining Corp. of Canada Ltd.
D. M. Cannon - October 9, 1964
Private Report

CERTIFICATE

I, A.D.K. Burton, of the City of Vancouver, British Columbia, do hereby certify that:

1. I am a consulting geological engineer.
2. I am a graduate of the University of British Columbia, Vancouver, B.C. (B.A. in Arts & Sciences, 1954).
3. I am a registered Professional Engineer of the Province of British Columbia and also a member of the Canadian Institute of Mining and Metallurgy and the American Institute of Mining and Metallurgy.
4. I have practiced my profession since 1954 with American Smelting and Refining Company Limited, Torbit Silver Mines, Noranda Exploration Company Limited, BrenMac Mines Ltd., and Alrae Exploration Ltd.
5. I have personally examined mineralization on the King Salmon Lake property from July 17th to 20th, 1967.
6. I have no interest, nor do I expect to receive any interest, either directly or indirectly, in the properties or securities of Kennco Explorations (Western) Ltd.

DATED AT VANCOUVER, this 30th day of November, A.D. 1967.

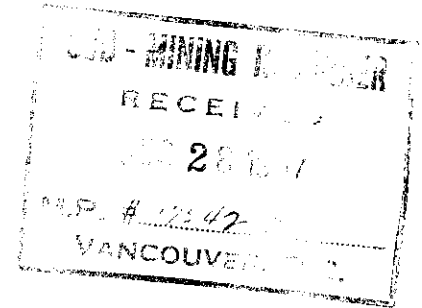


A. D. K. Burton, P. Eng.



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Kennco Explorations (Western) Ltd.
730 - 505 Burrard Street
Vancouver, B. C.

GEOLOGICAL EXAMINATION - KING SALMON LAKE PROPERTY

<u>Personnel</u>	<u>Occupation</u>	<u>Dates</u>	<u>Total</u>
A. Burton	Geological Engineer	July 16, 17, 18, 19, 20, 21, 1967	\$ 775.00
G. House	Geologist	July 16, 17, 18, 19, 20, 24, 25, 1967	675.00
M. Lee	Draftsman	Aug. 7, 1967	30.00
Transportation - Cessna Charter			<u>188.60</u>
			<u>\$ 1,668.60</u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the city
of Vancouver, in the
Province of British Columbia, this 7th
day of December, 1967, A.D.

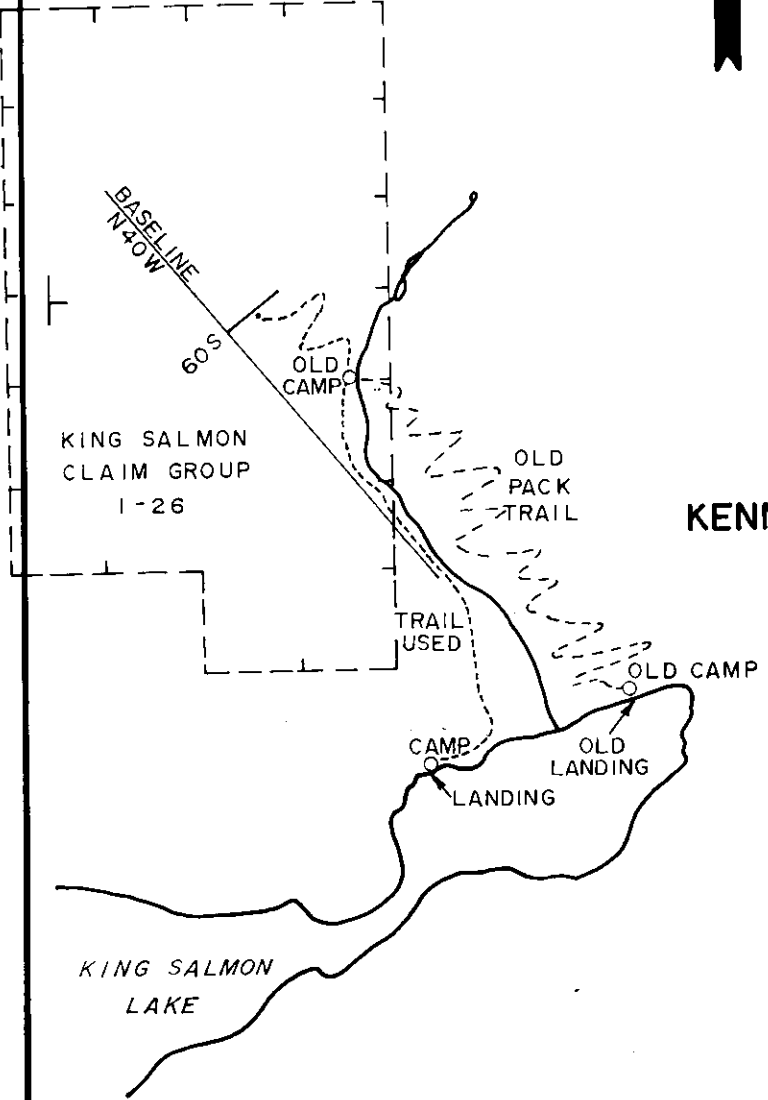
A Commissioner for taking Affidavits for British Columbia or
A Notary Public in and for the Province of British Columbia.

T



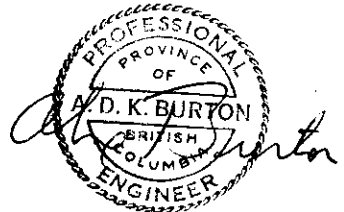
Department of
 Mines and Petroleum Resources
 + ASSESSMENT REPORT

NO. 1111 MAP 2



KENNCO EXPLORATIONS (WESTERN) LTD.
 LANDING & CAMP LOCATIONS
 King Salmon Lake Property
 Scale: 1" = 3125'

To accompany report by A. BURTON, P. Eng., on
 KING SALMON LAKE PROPERTY, July 28, 1967.



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990-2

Overlay for Air Photo No. A11446-324
 Drawn by ALRAE EXPLORATION LTD.

KS 19

KS 20

KS 17

KS 18

KS 15

KS 16

31° Magnetic North

APPROXIMATE OUTLINE OF GOSSAN ZONE

No. 1
No. 2
40
VOLCANICS

DDH No. 2
-45°

No. 5
No. 3

No. 7
No. 6
No. 8
BETTER MINERALIZED ZONE

DIORITE

DDH No. 1
-50°

BETTER MINERALIZED ZONE

SEDIMENTARY VOLCANICS

10+00E

1+00E

BASELINE N. 40° W

LAKE

OLD DRILL CAMP

PACK TRAIL TO LAKE

KING SALMON LAKE
1/2 Miles



LEGEND

- STRIKE OF CONTACTS, DIP, VERTICAL.
- STRIKE OF BEDDING, DIP, VERTICAL.
- OUTLINE OF GOSSAN ZONE
- DIAMOND DRILL HOLE
- TALUS SAMPLE
- TRENCH CHIP SAMPLE
- PORPHYRY DYKE
- TRAIL
- GEOLOGICAL CONTACT, DEFINED, ASSUMED.

THE ROCK TYPES MAPPED BY THE G.S.C. AND DESIGNATED UNIT 4, UPPER TRIASSIC, CONSIST OF GRAYWACKES AND MUDSTONES, WITH VOLCANIC SANDSTONES IN THE LOWER PART. DEFINITE VOLCANIC TUFFS AND LAVAS WERE LOCATED ON THE MID PART OF THE HILL SOUTH OF THIS MAP AREA, AND ARE INCLUDED IN THE UNIT.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1171 MAP 1

KENNCO EXPLORATIONS (WESTERN) LTD.	
KING SALMON LAKE PROPERTY Geology and Sampling Plan	
ALRAE EXPLORATION LTD. GEOLOGISTS AND ENGINEERS VANCOUVER, B. C.	
DESIGNED A. BURTON, G. HOUSE	SCALE: HOR. 1" = 100'
DRAWN M. R. L.	VERT.
CHECKED R. S. J.	DWG. No.
DATE AUGUST, 1967	
Covered by Map 6-1960, Geology Sheet 104 K TULSEQUAH Grid of NEWMONT MINING CORP. of CANADA LTD.	

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