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GEOLOGICAL REPORT
ON
THE BOYES COPPER PROSPECT
FOR
CONOCO SILVER MINES LTD. (N.P.L.)

Jan. 1971 John S. Vincent, P.Eng.

GEOLOGICAL REPORT

on

THE BOYES COPPER PROSPECT,

Sayward Area, Vancouver Island,
Nanaimo Mining Division, B.C.

for

CONOCO SILVER MINES LTD., (N. P. L.)

by

John S. Vincent, P. Eng.,
Consulting Geologist.

Vancouver, B. C. January 30, 1971.

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I N T R O D U C T I O N

At the request of Mr. Walter J. Kapp, President of Conoco Silver Mines Ltd. (N.P.L.), the writer has undertaken a study of the Company's copper property located in the Sayward area of Vancouver Island, British Columbia. The body of this report consists of a compilation of the results accruing from the work of previous examining Engineers, the results of the writer's observations made August 1, 1970, conclusions, and detailed recommendations for further work. The reports made available to the writer are:

1) Geological Report on the Boyes Group, by E. P. Shepperd, P. Eng., October 15, 1968.

2) Geological Report on the Boyes Copper Prospect, for Bethlehem Copper Corp. Ltd. (N. P. L.), by W. M. Sharp, P. Eng., July 1969.

Mr. Sharp's report is based on a six day field examination, and includes detailed information regarding mineral occurrences which the writer did not have the opportunity to examine. With the kind permission of Mr. R. E. Anderson, Bethlehem Copper Corp. Ltd., Mr. Sharp provided the writer with copies of his maps which he prepared to illustrate geological and geochemical features on the property and in adjoining areas, and a detailed geological and assay plan of the Boyes Creek showings. This information will greatly facilitate future work.

SUMMARY and RECOMMENDATIONS

The widespread occurrence of copper mineralization in massive stringers of bornite, and disseminations of chalcopyrite and bornite in amygdaloidal lavas, constitutes an interesting prospect which warrants a detailed and thorough evaluation. Although this work has been outlined by previous examining Engineers, a comprehensive program has not been followed through, and only limited work has been carried on in the immediate area of the initial discovery.

It is recommended that a two stage exploration program be undertaken to:

1. Determine the extent and significance of known mineralization.
2. Evaluate the areas underlain by geochemical soil anomalies.
3. Evaluate major portion of the property which has not been closely examined.
4. Evaluate the target areas by diamond drilling.

The first stage of the program will consist of thorough geological, geochemical, and geophysical work to define target areas which will be evaluated by diamond drilling during the second stage.

The cost estimate is based on a six month program, and is presented as follows:

Stage 1.

a.	Personnel	$18,590.00
b.	Camp costs	9,300.00
c.	Line cutting	7,100.00

d.	Sampling and Assay	$ 3,000.00
e.	Magnetometer Rental	310.00
f.	Bulldozer	8,000.00
g.	Gasoline Plugger	500.00
h.	Transportation	2,250.00
i.	Engineering and Supervision	5,000.00
		$54,050.00

Stage 2.

a.	Diamond Drilling 5000 ft. BQWL @ $12.00 per ft.	$60,000.00
b.	Camp costs	2,800.00
c.	Engineering and Supervision	5,000.00
		$67,800.00

COST SUMMARY

Stage 1	$ 54,050.00
Stage 2	67,800.00
Administration and Contingencies at approximately 15%	18,000.00
Total Estimate	$139,850.00

PROPERTY and HISTORY

The Boyes Claim Group consists of 103 mineral claims located approximately 10 miles southwest of Sayward, British Columbia, in the Nanaimo Mining Division (Figure 1). The claims, their record numbers, and expiry dates, were checked by the writer January 25, 1971, in the Mining Recorder's office, Vancouver, and these particulars are listed as follows:

CLAIM NAME	RECORD NUMBER	EXPIRY DATE
Bruce 1 to 22 incl.	27052 - 2703	September 17, 1971.
Bruce 23, 24	27186 - 27187	October 8, 1971.
Dennis 1 to 39 incl.	27074 - 27112	September 17, 1971.
Boyes 1, 2, 4	18636,-37,-39	May 27, 1973.
Boyes 3	18638	May 27, 1974.
George 1	19256	March 28, 1973.
George 2, 3, 5	19257,-58,-60	March 28, 1972.
George 4	19259	March 28, 1971.
Kevin 1 to 15 incl.	32936 - 32950	September 4, 1971.
Kevin 16, 17	26249, -50	August 8, 1971.
Kevin 18 to 30 incl.	27113 to 27125	September 17, 1971.

The distribution of the claims is shown in Figure 2.

These claims are held by Western Standard Silver Mines Ltd. (N.P.L.) by right of purchase from the owner, and have been transferred

to Conoco Silver Mines (N. P.L.) under an Option Agreement dated January 15, 1971.

Although the property has been located since 1968, very little evaluation work has been carried out to date. The discovery showings on a vein system have received most of the attention, and bedrock trenching and sampling has been concentrated along a strike length of approximately 1000 feet. Reconnaissance soil sampling in the area has indicated several potential areas of interest, but no apparent follow-up has been carried out.

Bethlehem Copper Corporation Ltd. (N. P. L.) had the property under option during the 1969 season. At their request, Consulting Geologist, W. M. Sharp, P. Eng., carried out a detailed examination of the property and outlined a sound and comprehensive exploration program. The details of the actual work accomplished by Bethlehem are not known to the writer at this time, however, it does not appear that the recommended program was followed, and it is not clear why the Option Agreement was terminated. A limited amount of diamond drilling was completed some distance to the south and east of the exposed mineralization, and it appears that the target may have been a contact zone which lies along the Adam River. The drill core is stored in Sayward and will be logged by the writer.

LOCATION and ACCESS

The property is located approximately 10 miles southwest of the town of Sayward and centered at longitude 126° 04' W. and latitude 50° 17' N. (Figure 1). The claim block is rectangular in outline, and the Adam River flows northerly through the eastern side of the property (Figure 2).

The area is easily accessible by 10 miles of well maintained logging road which trends westerly from Highway 19 at the White River bridge south of Sayward. From the Adam River bridge a branch road parallels the river to the south and cuts through the property. At the time of the writer's visit these roads were quite navigable by car.

Much of the area lies within the MacMillan - Bloedel Kelsey Bay Forest Management area and as a result has been logged. The eastern side of the property along a strip approximately 3 claims wide has been logged, while the remainder is timber-covered. Within the claim group the topography is not extreme, and the maximum relief is approximately 2500 feet. Local precipitous feature can be expected in the valleys of the tributory streams which drain easterly across the property (Figure 2).

GEOLOGY

General:

To date, this portion of Vancouver Island has received only a preliminary study by Provincial and Federal geologists and, as a result relatively little published geological detail is available.

In general, the northern portion of the Island is underlain by a sequence of volcanic and sedimentary rocks regarded as Triassic to Jurassic in age. In order of decreasing age, the sequence may be broken down into the Karmutsen Group, the Quatsino Formation, and the Bonanza Group. The Karmutsen is comprised of basaltic to andesitic lavas with several amygdaloidal phases. The Quatsino Formation consists mainly of limestone, and the Bonanza Group is recorded as a series of intermediate volcanic and sedimentary rocks. In the immediate area of the property present information indicates a general easterly strike, and a dip of 20° to 30° to the north. As Mr. Sharp has pointed out, several principal mines and prospects across the northern end of the Island occur within this same sequence of volcanic rocks.

These volcanic and sedimentary rocks are cut by the Island Intrusives; a series of medium to coarse grained granodiorites probably Mesozoic in age.

A preliminary regional G. S. C. map by Dr. J. E. Muller, 1967, shows prominent faulting in northwesterly and northeasterly directions.

Photogeological work by Mr. Sharp has delineated several significant sets of fractures in the immediate area of the claim group.

Local:

The mineralization in Boyes Creek constitutes the discovery, and has been the object of exploration efforts to date. As a result, the volcanics exposed along this section provide the basis for a description of some of the important aspects of these rocks.

Limestones are exposed along the Adam River and on top of a ridge towards the north end of the property. Otherwise, the Karmutsen volcanic rocks underly most of the claim block. They consist of basaltic to andesitic flows composed of varying amounts of amygdaloidal, tuffaceous and brecciated material. The rocks vary from medium to dark green in colour, and range considerably in texture from the aphanitic to amygdaloidal phases. One of the more interesting phases has amygdules of epidote, quartz, calcite, chalcopyrite and bornite.

Fracturing is instrumental in localizing massive stringers of bornite, and careful attention must be directed towards the fracture patterns as geologic mapping is carried out. A set trending west-northwest localizes the vein system exposed in Boyes Creek, while a northeasterly set intersects and displaces them in a left-hand sense. Particular attention must be given areas with a high density of intersecting fractures.

Mineralization:

Mineralization consists of chalcopyrite, chalcocite, and bornite

with minor values in gold and silver. It is apparent that two basic types are present:

1. Veins and disseminations associated with a strong and well developed set of fractures.
2. Dissemination of bornite and chalcopyrite in the amygdaloidal volcanic rocks.

Massive stringers of bornite and chalcocite occur in a sheeted or braided vein system in a shear zone which strikes N. 70° W. and dips steeply south. Boyes Creek occupies this structural feature. Fourteen hand trenches have been blasted and cleaned out across the vein system along a strike length of 1000 feet. Mineralization across widths ranging from 1 to 15 feet have been sampled by W. M. Sharp, P. Eng., and E. P. Shepperd, P. Eng., and the tabulated results of their work is presented as follows:

W. M. S.					E.P.S. & Associates Ltd.				
Trench No.	Ft. Width	Oz/T Au	Oz/T Ag	% Cu	Trench No.	Ft. Width	Oz/T Au	Oz/T Ag	% Cu
1	4.5	0.02	Tr.	2.83	1	9.5	0.02	0.30	4.32
1	13.5	0.01	0.10	0.51	1	12.5	0.015	0.05	0.80
2	2.8	0.01	0.20	5.86	2	6.0	Tr.	0.20	1.03
3	5.5	Tr.	0.10	1.56	2 ?	13.5	Tr.	Tr.	1.35
3	4.5	Tr.	0.10	0.95	3	12.5	Tr.	0.33	4.76
4-5	3.5	Tr.	Tr.	0.08	4	7.5	Tr.	0.10	0.63
4-5	3.5	Tr.	0.20	0.25	4	36.0	0.005	0.05	0.22
4-5	5.4	Tr.	Tr.	0.17					
4-5	5.2	Tr.	0.10	0.12					
4-N	4.0	Tr.	0.20	1.24					
9	3.5	Tr.	0.10	1.08	9	2.0	0.78	5.90	4.11
9-1	2.8	Tr.	0.10	0.49	T91	20.0	Tr.	Tr.	1.0
9-2	5.0	Tr.	0.30	6.04	T92	6.0	Tr.	Tr.	1.85
11	4.2	0.01	Tr.	1.95	11	1.0	0.02	0.60	18.93
12	5.3	Tr.	0.30	4.20	12	1.0	0.02	2.60	26.26
"13"	3.0	0.01	0.60	13.75					
"14"	3.5	0.01	0.10	0.14					

Although the vein system can be traced over a significant strike length, the irregular nature of the structure requires that more closely spaced sampling, preferably supported by diamond drilling, is required before grade, width, and tonnage calculations can be considered. However, based on the presently exposed material, further work is justified to evaluate the potential of the vein system.

Two similarly mineralized shear zones have been encountered on the property. The North Creek zone lies approximately 1600 feet to the north, and the South Creek zone 1000 feet to the south.

The second type of minerlization is difficult to see on the weathered outcrop surface, and was discovered as a result of drilling and blasting. The disseminated chalcopyrite and bornite is associated with varying amounts of epidote alteration, and is concentrated in the amygdaloidal phases of the basalt flows. The reconnaissance soil sampling efforts have located several other occurrences of this material, but nothing has been done to determine their size or significance. After more detailed geochemical work has been carried out, stripping, drilling, and blasing will be required to evaluate the occurrences.

CONCLUSIONS and RECOMMENDATIONS

The copper mineralization discovered on the Boyes Claim Group constitutes a prospect which warrants a thorough evaluation. The vein-type of mineralization constitutes a high grade target, while the disseminated material encountered in the amygdaloidal lavas suggests a potential for the occurrence of a large tonnage of low grade copper mineralization. The irregular and erratic nature of the mineralization will necessitate careful geological work and sampling, before any meaningful calculations regarding grade, widths, and tonnage can be made.

Considering the length of time that the property has been held, surprisingly little basic evaluation work has been accomplished. On two previous occasions the necessary work has been outlined and recommended by competent Consulting Geologists, but the programs were not carried out. This work must be done before a proper assessment of the property can be made, and the following exploration program is recommended to provide the necessary information.

Although the mineralization vein system in Boyes Creek can be considered a drill target, the writer recommends that this work be deferred until such time as additional targets are located and verified by geological and geochemical work. The total exploration program and cost estimate will be presented in two stages. Stage 1 will consist of a primary exploration phase of geological, geochemical, and geophysical work as required. Anomalous areas will be stripped, trenched and sampled to evaluate their significance.

The second stage will consist of diamond drilling to assess the targets established by Stage 1.

Stage 1:

(a) A grid system of control lines is required and can be continued from that already existing. An estimated 71 line miles of picket line, base line, and tie line is required as shown in Figure 3.

(b) Soil samples will be collected along the picket lines at 200 foot intervals and analysed for total copper. This will require approximately 1800 samples.

(c) Geological mapping must be completed on the property, and a scale of 200 feet to the inch is recommended.

(d) A magnetometer survey is recommended, with readings to be taken at 100 foot intervals along the picket lines.

(e) Bulldozer stripping and trenching will be carried out to evaluate the anomalous areas indicated by the preceeding work, and drilling and blasting will be necessary to examine and sample mineralized zones. A gasoline plugger and powder should be available on the property.

(f) During the time a bulldozer is on the property an access road should be constructed from the logging road across claims George 6, Boyes 4, and Boyes 2. The road should be located on the south side of Boyes Creek to facilitate the location of diamond drill sites. Further road locations will be determined by the stripping and trenching requirements.

Stage 2:

A minimum of 5000 feet of diamond drilling should be allowed for in estimating budget requirements for the initial phase of drilling. The erratic nature of the mineralization may necessitate a closely spaced pattern of holes.

The cost estimate is based on a six month program.

COST ESTIMATE

Stage 1.

a. Personnel

1 Geologist - $1,000.00 per month x 5	$ 5,000.00	
1 Assistant - $700.00 per month x 5	3,500.00	
1 Assistant (swamper) - $700.00 per month x 6	4,200.00	
1 Cook - $700.00 per month x 6	4,200.00	
	$16,900.00	
Plus benefits @ 10%	1,690.00	
	$18,590.00	$18,590.00

b. Camp

Estimate	3,000.00

c. Subsistence

Estimate 900 man days at $7.00 per man per day	6,300.00

d. Line Cutting

71 line miles @ $100.00	7,100.00

e. Sampling and Assay

(1) Soil: 1800 x $1.00	$ 1,800.00	
(2) Rock: Estimate	1,200.00	
	$ 3,000.00	3,000.00

f.	Magnetometer Rental		
	1 month @ $310.00		$ 310.00
g.	Bulldozer		
	Road building, stripping & trenching Estimate 400 hours with a D 6 @ $20.00 per hour		8,000.00
h.	Gasoline Plugger		
	2 months' rental @ $185.00	$ 370.00	
	2 - 2 ft. steel @ $ 17.40	34.80	
	2 - 4 ft. steel @ $ 18.40	36.80	
		$ 441.60	
	Allow		500.00
i.	Transportation		
	6 months rental on a Toyota Land Cruiser @ $375.00		2,250.00
j.	Engineering and Supervision		5,000.00
	TOTAL, Stage 1		$54,050.00

Stage 2.

a.	Diamond Drilling	
	5000 ft. of BQWL core drilling @ $12.00 per ft. (inclusive of mobilization, demobilization, moves between holes, core boxes, sampling and assaying)	$60,000.00
b.	Camp Costs	
	Estimate 400 man days @ $7.00 per man per day	2,800.00
c.	Engineering and Supervision	5,000.00
	TOTAL, Stage 2	$67,800.00

Stage 1 estimate	$ 54,050.00
Stage 2 estimate	67,800.00
Adminstration and Contingences at approximately 15%	18,000.00
TOTAL	$139,850.00

Respectfully submitted,

JOHN S. VINCENT, P.Eng.,
Consulting Geologist.

C E R T I F I C A T E

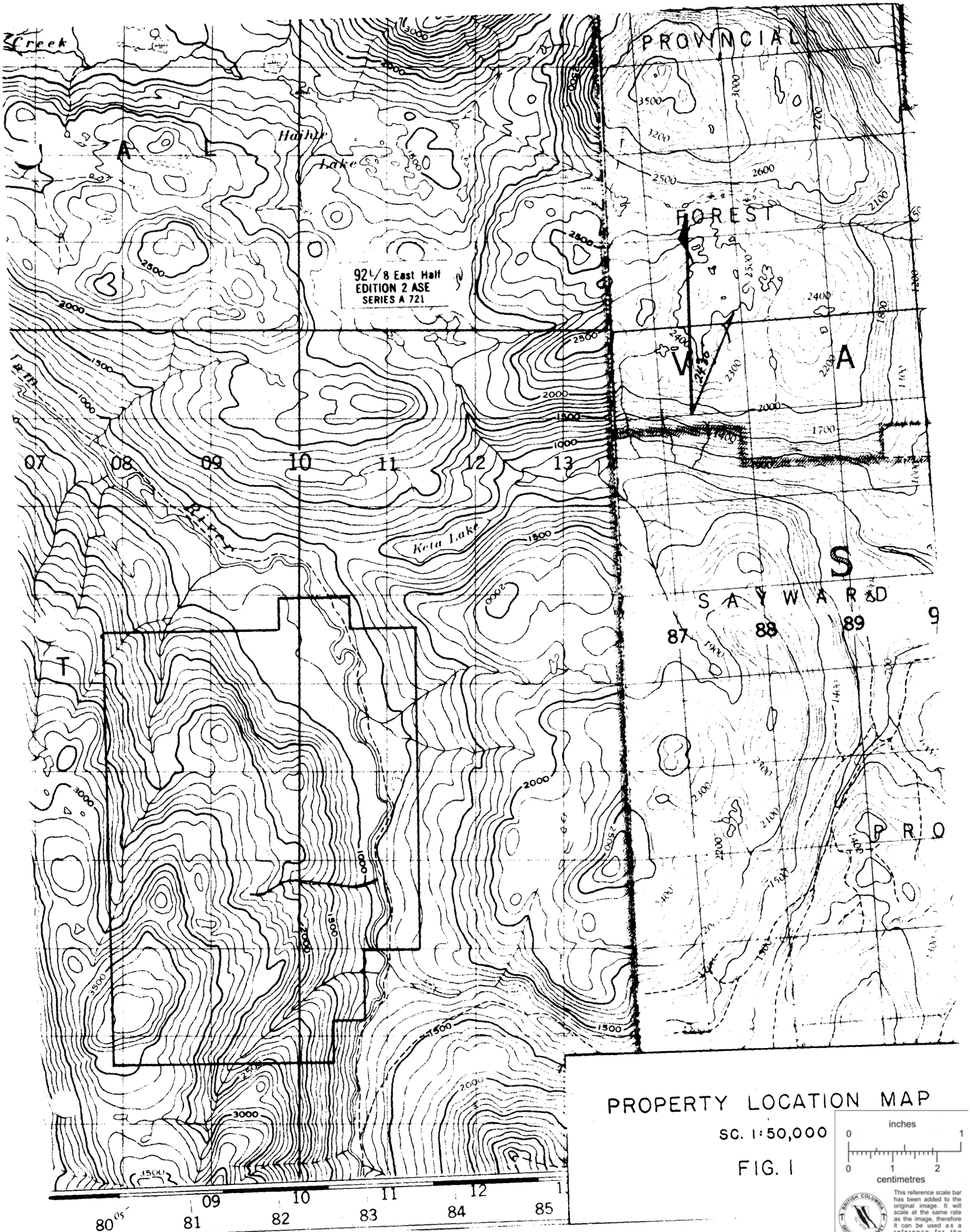
January 30, 1971.

I, JOHN S. VINCENT, with business and residential address in Vancouver, British Columbia, do hereby certify that:

1. I am a Consulting Mining Geologist.
2. I am a graduate of Queen's University, B. Sc., 1959, Geological Sciences, and of McGill University, M. Sc., 1962, Economic Geology.
3. I am a Fellow of the Geological Association of Canada, and a member of the Association of Professional Engineers in the Province of British Columbia.
4. From 1962 until 1969, I was engaged as Mines Exploration Geologist with the International Nickel Co. of Can. Ltd. in Thompson, Manitoba.
5. The information presented in this report was obtained from reports made available to me from company files, maps obtained from Mr. W. M. Sharp, P. Eng., and from my own observations on the property.
6. I have no interest, direct or indirect, in the properties or securities of Conoco Silver Mines Ltd. (N. P. L.), nor do I expect to acquire any such interest.

Respectfully submitted,

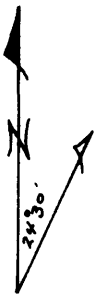
JOHN S. VINCENT, P.Eng.



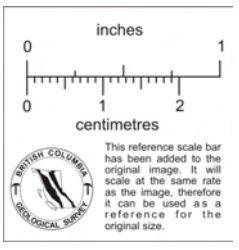
PROPERTY LOCATION MAP

SC. 1:50,000

FIG. 1



					Bruce 24 27187	Bruce 23 27186		
Bruce 14 27065	Bruce 12 27063	Bruce 10 27061	Bruce 8 27059	Bruce 6 27057	Bruce 4 27055	Bruce 2 27053	Bruce 16 27067	Bruce 15 27066
13 27064	11 27062	9 27060	7 27058	5 27056	3 27054	1 27052	18 27069	17 27068
Dennis 34 27107	Dennis 32 27105	Dennis 30 27103	Dennis 25 27101	Dennis 26 27099	Dennis 24 27097	Dennis 22 27095	Bruce 20 27071	Bruce 19 27070
33 27106	31 27104	29 27102	27 27100	25 27098	23 27096	21 27094	22 27073	21 27072
Dennis 20 27093	Kevin 22 27117	Kevin 21 27116	Kevin 20 27115	Kevin 19 27114	George 4 19259	George 3 19458	Kevin 24 27119	Kevin 23 27118
Dennis 39 27112	Kevin 6 32941	Kevin 5 32940	Kevin 2 32937	Kevin 1 32936	George 2 19257	George 1 19256	Kevin 29 27124	Kevin 30 27125
Dennis 38 27111	Kevin 7 32942	Kevin 4 32939	Kevin 3 32938	Boyes 1 18636	Boyes 3 18638	George 6 19261	Kevin 27 27122	Kevin 28 27123
Dennis 37 27110	Kevin 15 32950	Kevin 12 32947	Kevin 11 32946	Boyes 2 18637	Boyes 4 18639	George 5 19260	Kevin 16 26249	Kevin 17 26250
Dennis 36 27109	Kevin 14 32949	Kevin 13 32948	Kevin 10 32945	Kevin 9 32944	Kevin 8 32943	Kevin 18 27113	Kevin 25 27120	Kevin 26 27121
Dennis 35 27108	Dennis 12 27085	Dennis 9 27082	Dennis 8 27081	Dennis 5 27078	Dennis 4 27077	Dennis 1 27074		
19 27092	11 27084	10 27083	7 27080	6 27079	3 27076	2 27075		
18 27091	17 27090	16 27089	15 27088	14 27087	13 27086			



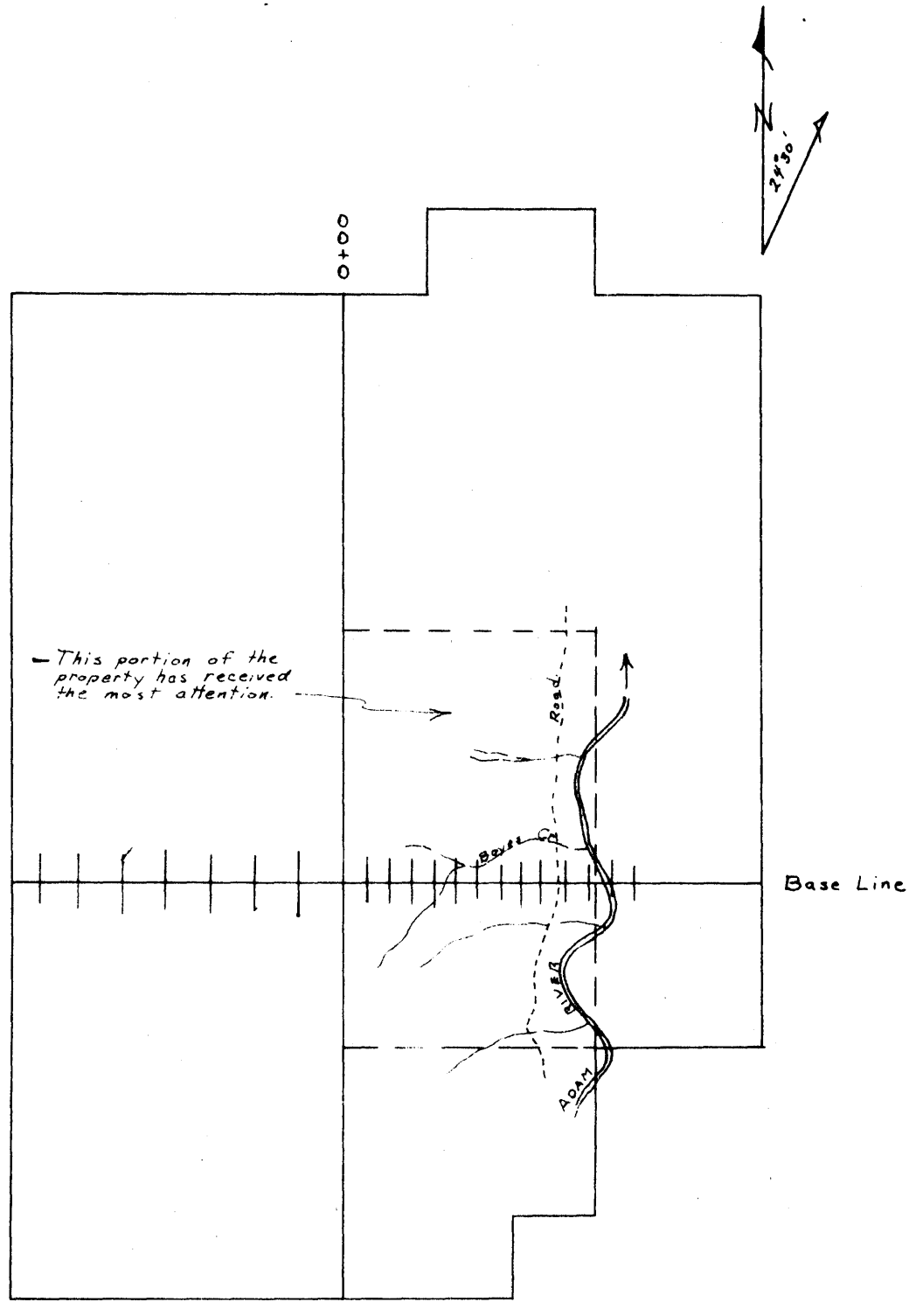
J.S. VINCENT ——— CONSULTANT

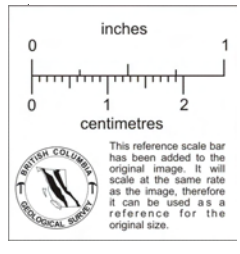
CONOCO SILVER MINES LTD.

BOYES GROUP

PROPERTY MAP

SC. 1"=3000'	JAN. 1971	FIG. 2





J.S. VINCENT ——— CONSULTANT

CONOCO SILVER MINES LTD.

BOYES GROUP

GRID SYSTEM

SC. 1"= 3000'	JAN. 1971	FIG. 3

W. M. SHARP, P.Eng.
CONSULTING GEOLOGICAL ENGINEER
VANCOUVER 1, B.C.

BETHLEHEM COPPER CORP. LTD. (N.P.L.)

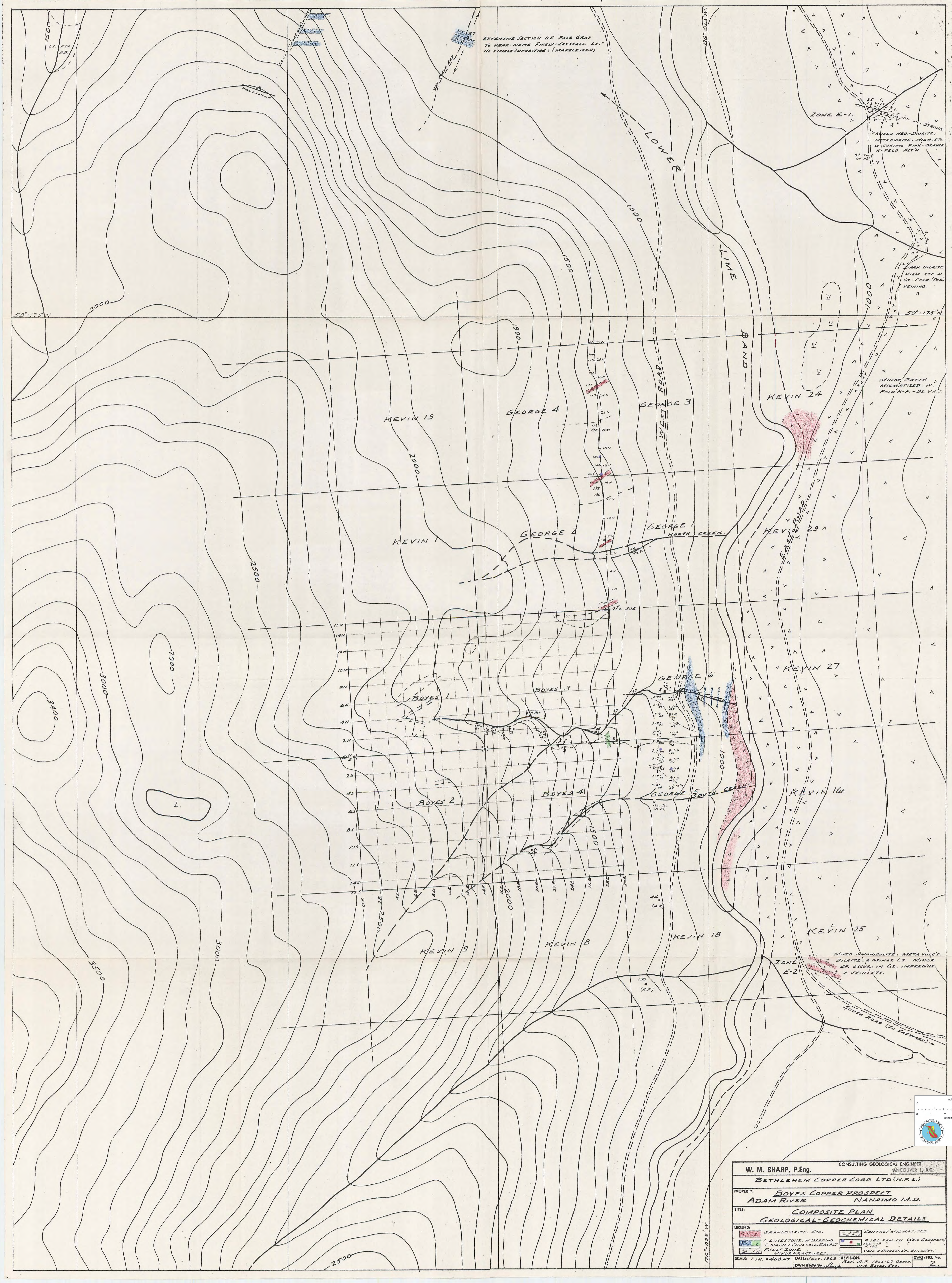
PROPERTY: BOYES COPPER PROSPECT
ADAM RIVER NANAIMO M.D.

TITLE: GENERAL GEOLOGICAL-GEOCHEMICAL FEATURES

LEGEND:
- GRANODIORITE, ETC.
- 1. LIMESTONE W. BEDDING 2. MAINLY CRYSTALL BASALT
- FAULT ZONE / MINOR FRACTURE
- PHOTO-LINEAR (POSS. FAULT)
- ≥ 200 PPM. CU, GEOCH. / 100-199 " " " / 80-99 " " "
- FRACT.-FILL CP. BN. CH'CT. / DISSEMIN. " " "

SCALE: 1:50.000
DATE: JULY, 1969
DWN BY: W. M. Sharp
REVISION: REF: CANADA 92 L-8, W.R. BOYES, ETC.
DWG/FIG. No. 1.

inches 0 1 2
centimetres 0 1 2 3 4 5
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.



W. M. SHARP, P.Eng. — CONSULTING GEOLOGICAL ENGINEER, VANCOUVER 1, B.C.

BETHLEHEM COPPER CORP. LTD. (N.P.L.)

PROPERTY: BOYES COPPER PROSPECT — ADAM RIVER — NANAIMO M.D.

TITLE: COMPOSITE PLAN — GEOLOGICAL-GEOCHEMICAL DETAILS

LEGEND:
- GRANODIORITE, ETC.
- 1. LIMESTONE, W. BEDDING; 2. MAINLY CRYSTALL. BASALT
- FAULT ZONE, MINOR FRACTURES.
- 'CONTACT' MIGMATITES.
- ≥ 180 P.P.M. Cu (SOIL GEOCHEM.); 100-179 " " (" "); < 100 " "
- VEIN & DISSEM. CP., BN. CH'C'T.

SCALE: 1 IN. = 400 FT | DATE: JULY, 1969 | REVISION: REF. A.P. 1966-67 GEOCH. W.R. BOYES, ETC. | DWG/FIG. No. 2.

DWN BY: W.M. Sharp