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REPORT ON
THE GEOLOGICAL AND MAGNETOMETER SURVEYS
OF THE PENNY MINERAL CLAIMS OF
COPPER GIANT MINING CORPORATION LTD. (NPL)
NORTHERN VANCOUVER ISLAND, B.C.

BY
F. HOLCAPEK, GEOLOGIST

January 26, 1971

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 2832 MAP

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MAPS

#1 Location Map

#2 Magnetometer - Scale 1" = 400 feet

#3 Geology - Scale 1" = 400 feet

REPORT ON
THE GEOLOGICAL AND MAGNETOMETER SURVEYS
OF THE PENNY MINERAL CLAIMS OF
COPPER GIANT MINING CORPORATION LTD. [NPL]
NORTHERN VANCOUVER ISLAND, B.C.

INTRODUCTION:

The Penny Group of Copper Giant Mining Corporation comprise a total of 16 mineral claims located 13 miles south south-east of Port Hardy, B. C.

During the 1968 field season a reconnaissance and detailed geochemical soil sampling program, a preliminary claims survey and a detailed geological survey over a selected area, was conducted. Based on the results obtained from these surveys, the original 96 claim holdings were reduced to 16 claims.

During the latter part of November 1970, the property was geologically mapped and a magnetometer survey was conducted over all 16 claims.

The work was carried out by personnel of Agilis Exploration Services Ltd. under supervision of the writer.

LOCATION AND ACCESS:

The Copper Giant claims lie 13 miles south south-east of Port Hardy and 10 miles west south-west of Port McNeill, B. C.

Coordinates near the centre of the claim group are $127^{\circ} 20'$ west longitude, $50^{\circ} 31\frac{1}{2}'$ north latitude.

Access to the property is by logging roads from both Port Hardy and Port McNeill. These roads are private and a permit must be obtained to travel them during the weekdays. Port Hardy, 220 miles northwest of Vancouver, can be reached by road or regularly scheduled airline services from that city.

PHYSIOGRAPHY:

The claims lie in an area of moderate relief, broken by several steep, low rocky knolls and ridges.

Typical, heavy Vancouver Island forest covers the central and southern part of the group. The northern part has recently been logged.

Climate is moderate with excessive rainfall during most of the year. Snow can be expected for short periods during the winter months.

PROPERTY:

The Penny group consists of 16 contiguous mineral claims located in the Nanaimo Mining Division.

Penny 21-28	21726-21733
Penny 35-42	21740-21747

REGIONAL GEOLOGY:

Reconnaissance mapping, [carried out by the Geological Survey of Canada and published at a scale of 1 inch = 5 miles, in paper 67-1, in the vicinity of the claim group], indicates that the area is underlain by rocks of the Karmutsen Formation, in contact, to the north of the property, with units of the younger Bonanza Sub-group. Both are members of the Vancouver Group.

The Vancouver group consists of a sequence of interbedded volcanic flows, limestone and shales, and can be subdivided into two formations and one sub-group. Dr. J. E. Muller's terminology was used to break the Vancouver group into distinct units.

STRATIGRAPHY:

[Late Jurassic to Tertiary]

Island Intrusions: Quartz Diorite, andesitic sills and dykes.

Vancouver Group:

[Upper Triassic and [?] Jurassic]

Bonanza Sub Group: Andesitic flows and breccia, felsite, tuff, greywacke, shale, argillaceous and calcareous shales, argillaceous tuff and limestone.

[Upper Triassic]

Quatsino Formation: Limestone.

Karmutsen Formation: Massive and amygdaloidal volcanic flows, breccia, pillow lava, tuff of andesitic and basaltic composition, thin bedded, discontinuous limestone bands.

STRUCTURAL GEOLOGY:

The main structural feature in vicinity of the claim group is block faulting. To the north of the property Karmutsen volcanics are brought in contact with the Bonanza Sub-group. The Quatsino Limestone Formation, overlaying the Karmutsen volcanics has not been observed, hence a large vertical displacement is indicated.

Changes in attitude, where observed, are in most instances associated with fault or shear zones. The general trend of the bedding is northwesterly with a dip of 25° to 45° to the south-west. No evidence, to indicate large scale folding, has been found in the vicinity of the claim group.

ECONOMIC GEOLOGY:

Several genetically different mineral deposits are known to occur in the Northern Vancouver Island Region.

- [1] Disseminated Chalcopyrite and Molybdenite in Bonanza tuffs associated with porphyritic sills, dykes and stocks.

Island Copper deposit of Utah Construction and Mining in the Port Hardy area, the Hepler Creek prospect and the West Coast Mining prospect, south and west respectively of Nahwitti Lake belong to this group.

- [2] Contact metamorphic skarn type deposit carrying values in Magnetite and Chalcopyrite. The Benson Lake deposit of Cominco, the Yreka, the Kinman deposit and several others belong to this type. The main feature of this deposit is the association of skarn with magnetite and varying amounts of chalcopyrite within volcanics and limestone. All members of the Vancouver Group can act as host, but proximity of limestone appears to be the controlling factor.

- [3] Chalcopyrite as amygdaloidal filling, dissemination or along shear zones producing narrow high grade zones. Bornite and native copper can be present in varying amounts.

This type of mineralization is common within the Karmutsen formation, but no economic deposit has been found as of date.

LOCAL GEOLOGY:

Geological mapping was conducted at a scale of 1 inch = 400 feet over the whole property. Ground control was provided by a grid, re-established for the magnetometer survey, and by air photographs.

Outcrops are nearly always restricted to roadcuts or steep hillsides.

Rocks were identified in the field with the use of a hand lense, therefore any names given are field names only. However, care was taken to place the different rock units within the correct stratigraphic horizon.

DISCUSSION OF LOCAL GEOLOGY:

All rock outcrops observed within the map area can be definitely placed within the upper section of the Karmutsen Formation. Major difficulties were encountered in subdividing the observed volcanics into mapable units, because of gradational changes or large intervening areas of no rock exposure. The main criteria used for mapping purposes was crystalinity, color, type of alteration, if fragmental color variations within the fragments, angularity and presence of sulphides.

Unit 1: Flow Breccia [?]: Possible strongly deformed pillow lava, Fragments are up to $1\frac{1}{2}$ feet in diameter, rounded to elliptical in shape, but have not the typical pillow form. Alteration rims up to 2 inches thick, where observed, are well pronounced. Individual fragments are separated by intervening small shears filled by epidote and quartz. Minor chalcopyrite as plebbs and fine dissemination is frequently present.

The main outcrop of unit 1 occurs along a creek at the south-east boundary of the mapped area.

Unit 2: Fragmental Andesite: Dark green to purplish, fragments are strongly angular and can be up to $1\frac{1}{2}$ inches in diameter. Narrow bands of andesitic tuff and amygdaloidal

andesites are interbedded with this unit. Alteration, where present consists mainly of epidote and chlorite. Quartz stringer carrying minor chalcopyrite, or dissemination of chalcopyrite is abundant in the central section of the mapped area. [27 + 50N, 15 + 00W].

Unit 3: Andesite: Dark green, dense interbedded with tuffs and amygdaloidal andesites.

The main outcrop area of this unit lies in the north-eastern to northern section of the mapped area. The andesite are usually very dark in color and fresh in appearance. The interbedded tuffs are bluish green in color and have evidence of argillic alteration. Epidote occurs occasionally as fracture filling. The amygdaloidal beds appear to be of the same composition and grade into dense andesites. Minor chalcopyrite and pyrite has been found as filling, associated with quartz in the amygdules or as fine dissemination in the dense andesite. Bornite occurs in minor amounts with the tuffs.

STRUCTURAL GEOLOGY:

The main structural feature observed is faulting and shearing. There are three prominent directions as expressed by drainage and outcrop pattern.

The most prominent direction of faulting trends from N 75° to E and has vertical dips. This direction controls the outcrop pattern and topography in the south-eastern part of the claim group.

The second direction is north-easterly and varies between N 30°E to N 45°E dipping at 75° W.

The third fault was observed in one location only and has an attitude of N 10°W, 85°W.

No definite evidence of movement has been found, but from the distribution of rocktypes an apparent north-westerly displacement is indicated.

Evidence for large scale folding is absent but variation of attitude has been observed in the different rock units, and are most likely due to faulting or small scale dragfolding. Although dragfolding has not been observed within the claim group, mapping in other parts of Northern Vancouver Island show that they are commonly associated with incompetent rocks near fault zones.

North of the claim group the Bonanza Sub-group is in direct contact with the Karmutsen Formation; no outcrops of the Quatsino Limestone have been found. This indicates a minimum vertical displacement of 500 feet.

MINERALIZATION:

The economic minerals found on the property are chalcopyrite and minor Bornite. The first occurs as very minor disseminations or as amygdaloidal fillings within the fragmental andesites or flow breccia [?]. A float of chalcopyrite associated with epidote skarn has been found at 27 + 50N, 15 + 00W. This location coincides with a detail soil anomaly outlined during the 1968 field season. Bornite occurs as occasional specks and finely disseminated with a bluish green, slightly altered tuff. No mineralization of economic grade has been found, as of date, on the property.

MAGNETOMETER SURVEY:

The purpose of the magnetometer survey was to help to locate any skarn zones possibly present, and to give added inform-

ation helpful in interpreting the observed geological features.

A total of 18.5 miles of crosslines and one mile of baseline have been surveyed.

FIELD PROCEDURE:

The grid established during the 1968 field season as control for the geochemical survey was re-established by compass and flagging. It consists of lines 400 feet apart and stations marked at 200 foot intervals.

The magnetometer was zeroed for the property and base stations established at 400 feet intervals along the baseline. In establishing the base station, each loop was started and ended at the same station and the average of three readings taken at each station, one-half hour apart was used in subsequent calculations.

Following this magnetometer readings were taken at 200 ft. intervals along all crosslines.

INSTRUMENT USED:

The instrument used was a Sharpe Model MF1 fluxgate magnetometer. It is self-orienting, requires only coarse leveling, and has built-in temperature compensation. The magnetometer can be read to five gammas on the lowest scale range and scale ranges vary from a minimum of plus or minus 1,000 gammas to plus or minus 100,000 gammas on the highest scale. A high latitude adjustment permits zeroing of the magnetometer at any location.

CORRECTIONS:

Compensation built into the instrument eliminates any need for temperature corrections being applied to the field readings. Short term and long term time correction have been applied to all

readings and were determined by the difference from the corrected reading between the initial and final base stations of each traverse.

This variation is assumed to be linear and the correction for anyone reading in a traverse is the diurnal variation multiplied by the ratio, time elapsed when reading taken, divided by total time elapsed in the loop.

If:

V_c = corrected value
 B_c = corrected base station reading
 B_i = initial base station value when loop is started
 B_f = final base station value when loop is finished
 V_t = reading of station at time t when loop is run
 t_i = time of initial base station value
 t_f = time of final base station value
 t = time when station is read

then the corrected value for a station read at time t is:

$$V_c = V_t + [B_c - B_i] + [B_i - B_f] \cdot \frac{t - t_i}{t_f - t_i}$$

INTERPRETATION AND RESULTS:

The Magnetic survey outlines two northeasterly trending lows in the centre of the surveyed area. The southernmost coincides with a topographic low, bounded by cliff-like rock exposures indicating a major fault zone. The second low is not as well defined by topography, but some indication on adjacent outcrops suggest also the presence of a fault. This low coincides with the detailed geochemical anomaly outlined during the 1968 field season. None of the northerly trending indicated fault zones have been outlined clearly enough to allow correlation with observed geological data.

The magnetic relief, disregarding the lows caused by structural features is in the 500 gamma range and can be considered normal for the Karmutsen Formation.

No magnetic highs, suggesting the presence of skarn zones, has been observed.

CONCLUSION:

- [1] Geological mapping of the claim group shows that the area is underlain by the upper part of the Karmutsen Formation.
- [2] No outcrops of the Bonanza Sub-group, Quatsino Limestone or Island Intrusion has been found within the claim group or in the immediate vicinity of the claim group.
- [3] The main structural feature observed is faulting.
- [4] The magnetic survey outlined two northeasterly trending lows caused by fault structures and coinciding with the geochemical anomaly outlined during the 1968 field season.
- [5] Mineralization, found on the property, consists of chalcopyrite, minor bornite and pyrite associated with shears as filling over narrow widths and andesites adjacent to shears or fault zones, as minor disseminations.
- [6] No economic concentration of copper minerals have been found on the claim group.

RECOMMENDATIONS:

- [1] Detail geochemical survey over the other reconnaissance anomalies outlined in 1968.
- [2] Exploratory X-Ray diamond drilling to check the geochemical anomalies in overburden covered area.

- [3] If results favorable, then a more extensive drill program will be necessary.

Respectfully submitted,



F. Holcapek
Geologist

January 26, 1971

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA:

To Wit:

In the Matter of the geological and geochemical
survey of the PENNY Group of claims for Copper
Giant Mining Corporation Ltd.

I, Fred Holcapek
201-714 West Hastings St., Vancouver 1, B. C.

of

in the Province of British Columbia, do solemnly declare that the following personnel were
employed and costs incurred in conducting the above surveys during
November 1970

PERSONNEL:

J. Hunyadi - Field-	5 days @ \$ 50.00	\$ 250.00
E. Buck - Magnetometer op	5 days @ 55.00	275.00
F. Holcapek- Geologist-Fld	4 days @ 80.00	320.00
" Office	2 days @ 100.00	200.00
		<u>1,045.00</u>

DISBURSEMENTS:

Groceries	120.00	
Truck, Gas, Mileage	150.00	
Road permit	19.50	
Magnetometer rental, Camp	150.00	
Typing, printing, supplies	58.00	
Altair drafting	75.00	
	<u>572.50</u>	
10 % Overhead on disbursements	57.25	<u>629.75</u>
<u>Total costs</u>		<u>\$ 1,674.75</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
VANCOUVER, B. C., in the
of
FEB 1 1971
Province of British Columbia, this
day of
Sub-Mining Recorder, A.D.

F. Holcapek

L. Hughes
Sub-Mining Recorder

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

D



To
Port Alice
Road
1 1/2 mile

WALK WAAS
CREEK

Road to Port Mc
Neill

O'Connor
Lake
15 mile

22	21	36	35
24	23	38	37
26	25	40	39
28	27	42	41

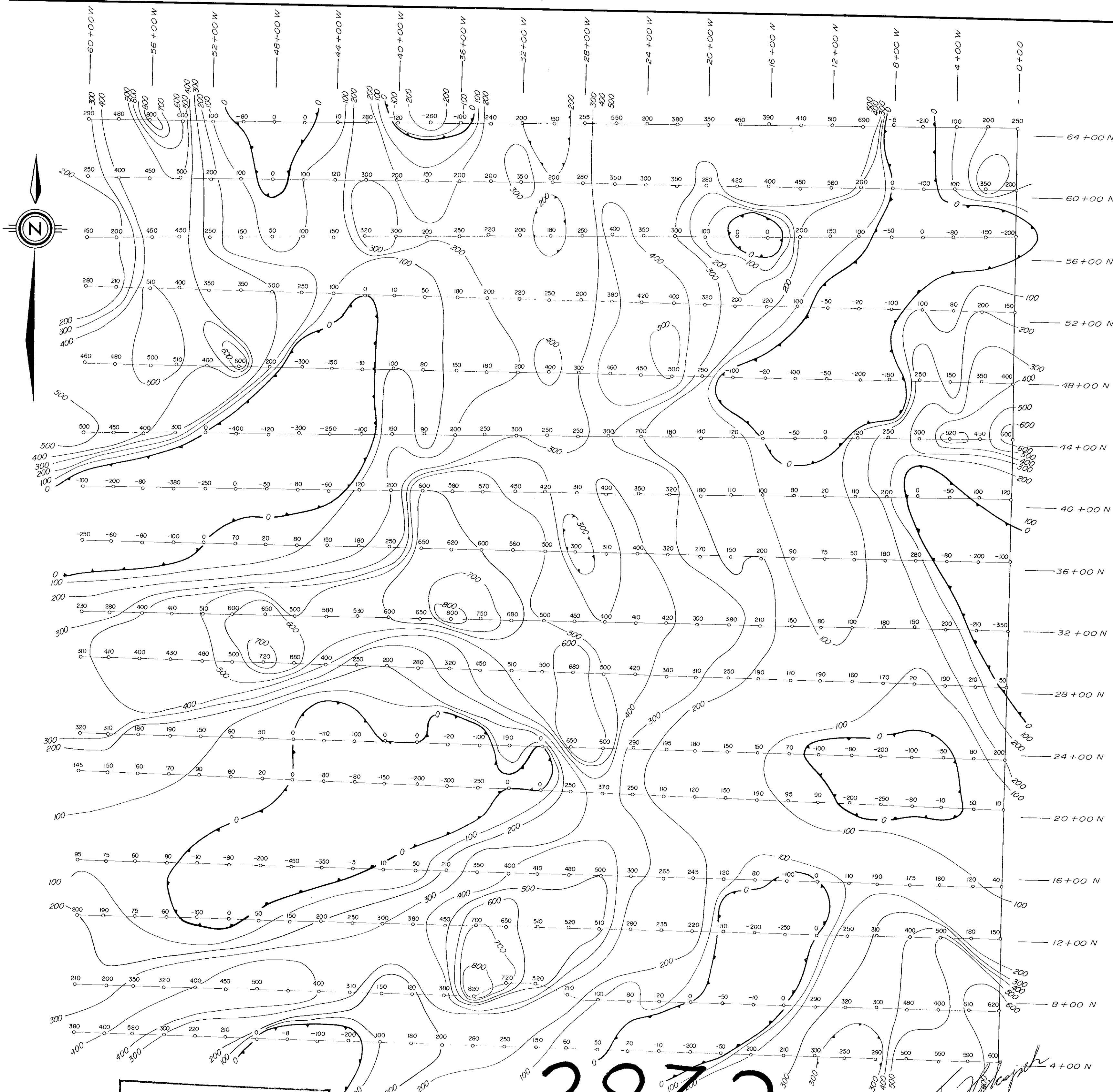
→ CREEK
- - - LOGGING ROADS

Scale: 1" = 1/2 mile

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **2832** MAP **#1**

Claim Location
Penny group
Copper Giant Mining
Nanaimo M.D.

M.R.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2832 MAP #2

2832

LEGEND

820 Magnetometer reading in gammas.
100 Magnetometer contour - contour interval 100 gammas.

M-2

AGILIS EXPLORATION SERVICES LTD.	
COPPER GIANT MINING CORPORATION LTD.	
PENNY CLAIM GROUP	
MAGNETOMETER SURVEY	
DRAWN BY: K. K.	SCALE: 1" = 400 Feet
CHECKED BY: F. H.	DATE: Jan., 1971



LEGEND

KARMUTSEN FORMATION

- 3 Flow Breccia (?) Epidote and Quartz along fractures possibly strongly deformed pillow lavas Andesitic.
- 2 Andesite, dark green to purplish fragmental, interbedded with massive Andesites minor Amygdaloidal flows.
- 1 Dark green dense Andesite, partly Amygdaloidal and minor tuffs.

- x x x Minor chalcopryite - disseminated, or along fractures.
- ~~~~~ Fault inferred
- ~~~~~ Fault observed
- 30° Strike and dip
- Contact inferred
- * Swamp
- ~ Creek
- Road

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ASSESSMENT REPORT
NO. 2832 MAP #3

AGILIS EXPLORATION SERVICES LTD.	
COPPER GIANT MINING CORPORATION LTD.	
PENNY CLAIM GROUP	
GEOLOGY MAP	
DRAWN BY: K. K.	SCALE: 1" = 400 Feet
CHECKED BY: F. H.	DATE: Jan., 1971

H. H. H. H. H.