REPORT ON

A GROUND MAGNETOMETER AND INDUCED POLARIZATION (I.P.) SURVEY WHITEHORSE AREA, YUKON TERRITORY

FOR

QUATSINO COPPER-GOLD MINES LIMITED
VANCOUVER, BRITISH COLUMBIA

BY

EAGLE GEOPHYSICS LIMITED
VANCOUVER, BRITISH COLUMBIA

DECEMBER 1968

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INTRODUCTION

Between July 28th and August 6th, 1968, Eagle Geophysics Limited carried out a ground magnetic and induced polarization (I.P.) survey on a property held by Quatsino Copper-Gold Mines Limited and located in the Whitehorse area, Yukon Territory.

The survey was conducted along N 75° W handcut lines, which were turned off every 250 feet from a N 15° E baseline, and chained and picketed at 100 foot intervals.

Readings on the magnetic survey were taken every 100 feet along the picket lines using a Sharpe M.F.1 fluxgate magnetometer with additional readings at 50 feet intervals where deemed necessary.

Measurements of apparent chargeability (the I.P. response parameter) were made over that part of the line grid where an interpreted magnetic contact was thought to exist using the 'three electrode array' method with an electrode separation of 300 feet and a station interval of 200 feet. Simultaneous measurements of apparent resistivity were also made.

The data are presented on plan maps on the line grid, maps E-135 1 and 2, at a scale of 1 inch equals 200 feet. The chargeability and resistivity readings are presented in profile form on map E-135-2, while the magnetic measurements are shown in contoured form on map E-135-1.

PROPERTY AND LOCATION

The property consists of the following mineral claims:

EMIL 1 to 16 inclusive.

These claims are situated in the Whitehorse Mining District of the Yukon Territory (Claim Map No. 105-D-10) and are located about 10 miles south of the town of Whitehorse in the northern part of a moderately treed area known locally as 'Cowley Park'.

They lie about ½ mile north of the boundary of New Imperial Mines Limited and are within 2 miles of the Keewenaw and Cowley Creek deposits where the latter company are reported to have mineable orebodies.

They are readily accessible from Whitehorse via the Alaska Highway and the old Carcross road, and with a two wheel drive vehicle it is possible to drive onto the claims.

PURPOSE

The purpose of the survey was to try to determine by the magnetic method the existence of a possible limestone-granite contact as indicated by the government aeromagnetic maps, and to detect by the induced polarization technique the presence of any mineralization that might be associated with or occur near this contact.

GEOLOGY

GENERAL

For a general description of the geology of this area the reader is referred to: (a) Memoir 312 of the Geological Survey of Canada, 'Whitehorse Map-Area, Yukon Territory, 165 D,' by J.O. Wheeler and (b) Paper 63-41 of the Geological Survey of Canada, 'Copper and Iron Resources, Whitehorse Copper Belt, Yukon Territory,' by E.D. Kindle. Briefly it is as follows:

(a) Geological Environment The original rocks of the Whitehorse Copper Belt were the Lewes River group, Upper Triassic in age and consisting for the most of quartzites, arkoses, greywackes, argillites, limestones and dolomites. These, in parts of the Copper Belt, are overlain by the Laberge group of Lower Jurassic age. The limestones and dolomites were the most predominant rock types before being intruded and consequently metamorphosed by the large Coastal Intrusive batholith of Cretaceous age. In very recent times the fore-mentioned rocks have been covered in parts by the Miles Canyon extrusive basalts.

(b) Economic Geology The deposits of the Whitehorse Copper Belt lie at or near the contact of granitic rock with the limestones of the Lewes River Group. These deposits are mostly contact metamorphic skarn deposits with associated magnetite, but occurrences of 'porphry type' deposits such as the Keewenaw ore body do occur. Bornite and chalcopyrite are the principal economic copper minerals but chalcocite, copper carbonates and chrysocolla do occur.

GEOLOGICAL SETTING OF THE PROPERTY

The property lies in the southern portion of the Whitehorse Copper Belt and is entirely drift covered. This thickness of overburden is thought to vary from 50 to 100 feet throughout the property.

The claim group is believed by the writer to be underlain by Triassic sedimentary rocks of the Lewes River Group and by Cretaceous Coast Intrusions, outcroppings of which occur to the north and east of the property.

SURVEY SPECIFICATIONS

The Induced Polarization (I.P.) Survey was carried out using a pulse-type system manufactured by Huntec Limited of Toronto, Ontario. Measurements with this system are made in the time domain.

The system consists basically of three units, a receiver, a transmitter and a motor-generator. The transmitter, which provides a maximum of 7.5 kw. d.c. to the ground, obtains its power from the 7.5 kw. 400 cycle three phase generator driven by a gasoline engine. The cycling rate of the transmitter is 1.5 seconds 'current on' and 0.5 seconds 'current off', the pulses reversing continuously in polarity. The data recorded in the field consists of careful measurements of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V_p) appearing between the potential electrodes, P_1 and P_2, during the 'current on' part of the cycle and a secondary or overvoltage (V_s) appearing between P_1 and P_2 during the 'current off' part of the cycle. The apparent chargeability (M_a) is calculated by dividing the secondary voltage by the primary voltage and multiplying by 400, which is the sampling time in milliseconds of the receiver unit. The apparent resistivity (P_a) in ohm-metres is proportional to the ratio of the primary voltage and the measured current, the proportionality factor depending on the geometry of the array used. The chargeability and resistivity obtained are called apparent as they are values which that portion of the earth sampled would have if it were homogeneous. As the earth sampled is usually inhomogeneous the calculated apparent chargeability and resistivity are functions of the actual chargeability and resistivity of the rocks.

The survey was carried out using the 'three electrode array' method of surveying. In this method the current electrode C_1 and the two potential electrodes P_1 and P_2 are moved in unison along the survey lines. The spacing between these three electrodes is kept constant for each traverse at a distance roughly equal to the depth to be explored by that particular traverse. The second current electrode C_2 is kept fixed at 'infinity'.

Thus, on a 'three electrode array' traverse with an electrode spacing of 300 feet, a body lying at a depth of 150 feet will produce a strong response, whereas the same body lying at a depth of 300 feet will only just be detected. By running subsequent traverses at different electrode spacings more precise estimates can be made of depth, width, thickness and percentage of sulphides of causative bodies located by the I.P. method.

The magnetic survey was carried out using a Sharpe M.F.1 fluxgate magnetometer. This instrument measures variations in the vertical component of the earth's magnetic field to an accuracy of $\pm$ 10 gammas. Corrections for duirnal variations of the earth's field were made by tying-in to previously established base stations at intervals not exceeding two hours.

DISCUSSION OF RESULTS

The magnetometer survey (Map E-135-1) indicated that the part of the property surveyed is underlain by two different magnetic rock types, units M_1 and M_2 respectively. On the basis of other work done in the area it is the writer's belief that these units correspond to the intrusive and sedimentary rocks of the area.

The I.P. Survey (Map E-135-2) as performed over and around the indicated intrusive-sedimentary contact with a 300 foot electrode separation, failed to detect the presence of any anomalous conditions that could correspond to mineralization associated with this interpreted contact.

The resistivity survey (Map 135-2), which was done simultaneously with the I.P. Survey, exhibited a very flat background, indicating reasonable thickness of overburden, and showed no resistivity lows, ie. conductivity highs.

SUMMARY AND RECOMMENDATION

From July 28th to August 6th, 1968, Eagle Geophysics Limited carried out a ground magnetic and Induced Polarization survey over part of a property held by Quatsino Copper-Gold Mines Limited.

The property is located in the 'Whitehorse Copper Belt' of the Yukon Territory and is situated within 2 miles of the Keewenaw and Cowley Creek orebodies of New Imperial Mines Limited.

The magnetic survey suggested that the property is underlain by two different magnetic and rock types corresponding to sedimentary and Coast intrusive rocks.

The I.P. survey failed to indicate the presence of any anomalous conditions over and around the intrusive-sedimentary contact as interpreted from the magnetics.

The resisitivity survey did little but indicate overburden and bedrock conductivity.

As a result of the above surveys the writer recommends that no further work be done on the part of the property surveyed at this time, but that the assessment credits be applied for, and that consideration be given to carrying out similar surveys on the remaining portion of the property.

Respectfully submitted,

EAGLE GEOPHYSICS LIMITED,

Peter E. Walcott, P.Eng.
Geophysicist.

Vancouver, B.C.
December 1968.

APPENDIX

COST OF SURVEY

On August 5th and 6th, 1968, Eagle Geophysics Limited provided a geophysicist, a geophysical operator, a 7.5 kw I.P. unit and a four wheel drive truck for $275.00 per day, and undertook the magnetometer surveying at $65.00 per line mile.

Draughting and interpretation charges were extra, so that the total cost of all services provided by Eagle Geophysics Limited was $1,688.00.

PERSONNEL EMPLOYED ON SURVEYS

NAME	OCCUPATION	ADDRESS	DATES
Peter E. Walcott	Geophysicist	815-736 Granville Vancouver, B.C.	August 5-6 December 20, 1968.
John Lloyd	Geophysicist	"	August 5-6, 1968
G. MacMillan	Geophysical Operator	"	July 28-31, 1968 August 5-6, 1968
V. Pashniak	"	"	August 5-6, 1968
S. Main	Typing	"	December 31, 1968

CERTIFICATION

I, Peter E. Walcott, of the Municipality of Coquitlam, British Columbia, hereby certify that:

1. I am a graduate from the University of Toronto in 1962 with a B.A.Sc. in Engineering Physics, Geophysics Option.

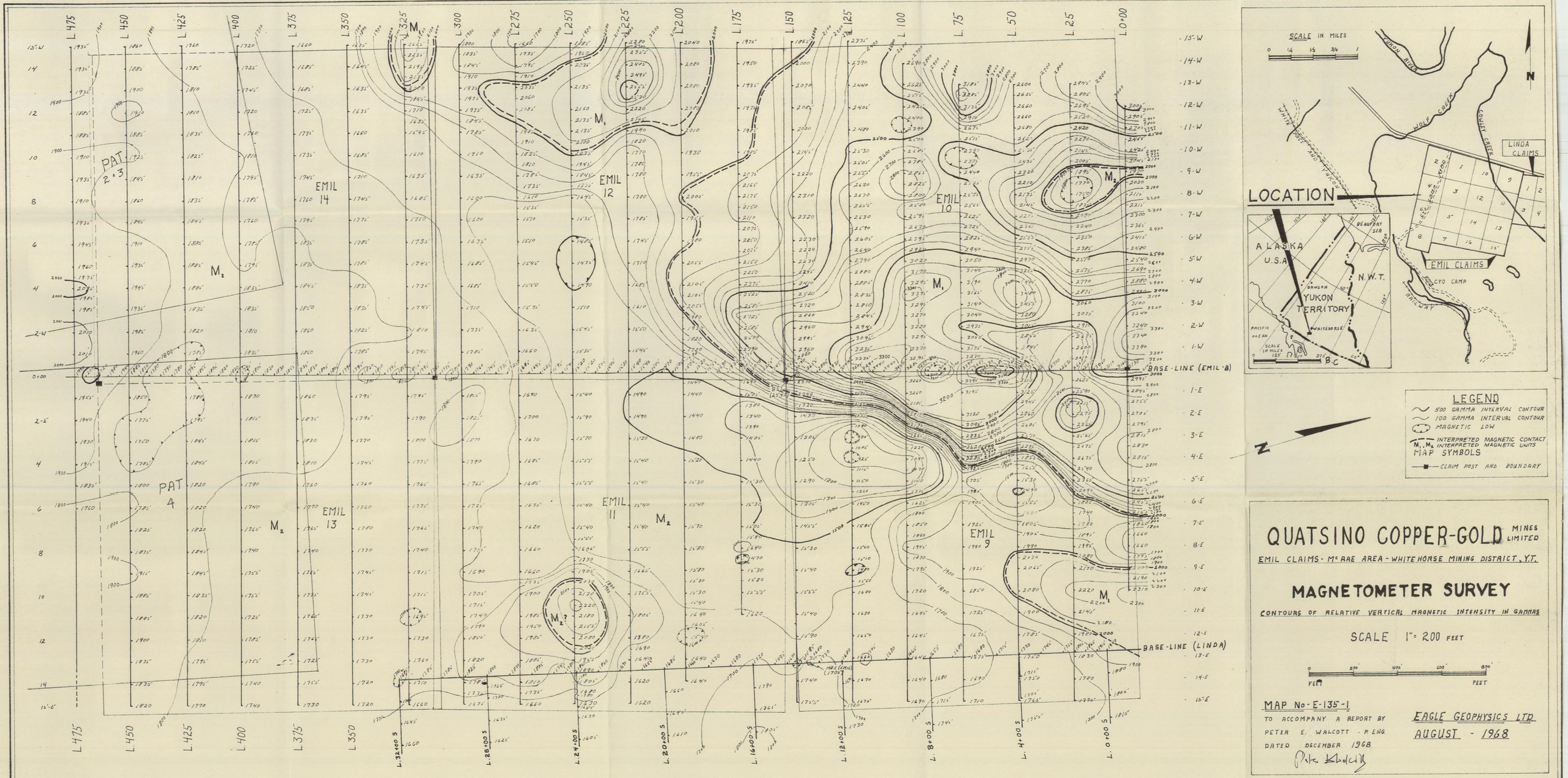
2. I have been practising my profession for the last six years.

3. I am a member of the Association of Professional Engineers of British Columbia, Ontario and the Yukon.

4. I have no interest, direct or indirect, in the securities of Quatsino Copper-Gold Mines Limited, nor do I expect to receive any.

Peter E. Walcott, P.Eng.

December 31, 1968.



LEGEND

- 500 GAMMA INTERVAL CONTOUR
- 100 GAMMA INTERVAL CONTOUR
- MAGNETIC LOW
- M_1, M_2 INTERPRETED MAGNETIC CONTACT
- INTERPRETED MAGNETIC UNITS

MAP SYMBOLS

- CLAIM POST AND BOUNDARY

QUATSINO COPPER-GOLD MINES LIMITED

EMIL CLAIMS - McAAE AREA - WHITEHORSE MINING DISTRICT, Y.T.

MAGNETOMETER SURVEY

CONTOURS OF RELATIVE VERTICAL MAGNETIC INTENSITY IN GAMMAS

SCALE 1" = 200 FEET

0 200 400 600 800 FEET

MAP No-E-135-1

TO ACCOMPANY A REPORT BY PETER E. WALCOTT - P. ENG.

DATED DECEMBER 1968

EAGLE GEOPHYSICS LTD

AUGUST - 1968

4+00 W

2+00 W

BASELINE (EMIL B)

2+00 E

4+00 E

6+00 E

8+00 E

10+00 E

12+00 E

LINE 35+00S

LINE 30+00S

LINE 25+00S

LINE 20+00S

LINE 15+00S

LINE 10+00S

LINE 5+00S

LINE 0+00S

EMIL 13

EMIL 14

EMIL 11

EMIL 12

EMIL 9

EMIL 10

1000

500

100

APPARENT RESISTIVITY (ohm-metres)

10

0

APPARENT CHARGEABILITY (milliseconds)

SCALE IN MILES

0 1/4 1/2 3/4 1

YUKON RIVER

ALASKA HIGHWAY

WOLF CREEK

COWLEY CREEK

N

WHITE PASS AND YUKON

LOCATION

ROAD

CAMP

DRILL CUT

EMIL CLAIMS

CYO CAMP

RAILWAY

ALASKA U.S.A

BEAUFORT SEA

N.W.T.

DAWSON

YUKON TERRITORY

WHITEHORSE

PACIFIC OCEAN

B.C.

SCALE IN MILES 0 125 250 375

LEGEND

PROFILE OF APPARENT CHARGEABILITY
a = 300 FEET
1" = 10 MILLISECONDS

PROFILE OF APPARENT RESISTIVITY
a = 300 FEET

C_2 P_2 P_1 C_1 ∞ a a/2 a/2

STATION LOCATION

CLAIM POSTS AND BOUNDARY

QUATSINO COPPER-GOLD MINES LIMITED

EMIL CLAIMS - McRAE AREA - WHITEHORSE MINING DISTRICT Y.T.

INDUCED POLARIZATION SURVEY

APPARENT CHAREABILITY AND RESISTIVITY PROFILES

SCALE 1" = 200 FEET

0 200 400 600 800

MAP No-E-135-2

TO ACCOMPANY A REPORT BY
PETER E. WALCOTT. P.ENG
DATED DECEMBER 1968

EAGLE GEOPHYSICS LTD.
AUGUST - 1968