

A REPORT

ON

INDUCED POLARIZATION & MAGNETIC SURVEYS

ON

MIKE CLAIM GROUP

Whitehorse Copper Belt, Y.T.

This report has been examined by the Geological Evaluation Unit, and is recommended to the Commission to be considered as representation work to the amount of \$3400.

D.B. Craig

Resident Geologist or
Resident Mining Engineer

Considered as representation work under
Section 63 (4) Yukon Quartz Mining Act.
DAWOOD MINES LTD.
Vancouver, B.C.

[Signature]
Commissioner of Yukon Territory

FOR



BY

PETER E. WALCOTT & ASSOCIATES LIMITED

Vancouver, B.C.

JUNE 1970

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
PROPERTY, LOCATION, AND ACCESS	2
PURPOSE	3
GEOLOGY	4
SURVEY SPECIFICATIONS	6
DISCUSSION OF RESULTS	8
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	10

APPENDIX

COST OF SURVEY	i
CERTIFICATION	ii
PERSONNEL EMPLOYED ON SURVEY	iii

ACCOMPANYING MAPS

MAP POCKET

Survey Areas - Scale 1" = 2640 feet	W-110-1
<u>Area I</u> - Apparent Chargeability, Resistivity & Magnetic Profiles Scale 1" = 200 feet	W-110-2
<u>Area II</u> Apparent Chargeability & Resistivity Profiles Scale 1" = 200 feet	W-110-3
<u>Area III</u> Contours of Relative Vertical Intensity and Apparent Chargeability & Resistivity Profiles Scale 1" = 200 feet	W-110-4

INTRODUCTION

Between June 3rd and 11th, 1970, Peter E. Walcott & Assoc. Ltd. carried out limited Induced Polarization (I.P.) and Magnetometer surveys over three parts of the Mike claim group, located in the Whitehorse Copper Belt Area, Yukon Territory, held by Trans Western Investments Ltd.

The surveys were carried out over handcut lines which were turned off at right angles from approximately north-south baselines, and which were chained and picketed at 100 foot intervals.

Measurements of apparent chargeability (the I.P. response parameter) and resistivity were made using the "pole-dipole array" method of surveying with a basic electrode separation of 400 feet over lines in three areas of the claim group while magnetometer work consisting of measurements of the relative vertical intensity of the earth's magnetic field at 100 foot intervals was done over two of the above mentioned areas.

The data are presented in profile form on plan maps of the grid area with the exception of the magnetic data for Area No. 3 which is in contour form. The maps, Map W-110-2, 3 & 4, are at a scale of 1" = 200 feet.

PROPERTY, LOCATION, AND ACCESS

The property consisting of the Mike claim group, is registered in Whitehorse, Yukon Territory, as follows:

<u>Claim Name</u>	<u>Record No.</u>	<u>Expiry Date</u>
MIKE 1 - 32	Y 18840-18871	June 24, 1970

The claims are situated on the east side of Haeckel Hill about 6 miles northwest of the town of Whitehorse, Yukon Territory.

Access to the property can be obtained by means of the road to the Haeckel Hill forestry tower, a gravel road negotiable by two wheel drive vehicle.

PURPOSE

The purpose of the survey was to

1. do sufficient useful work to hold the claims in good standing for another year;
2. investigate the airborne magnetic anomaly in the northern portion of the claim group;
3. locate by the induced polarization technique the presence of economic sulphide mineralization on the property as suggested by F. L. Croteau, P.Eng. in a report dated January 2nd, 1968.

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. E. Kindle; briefly it is as follows:

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 forementioned rocks have been covered in parts by the Miles Canyon Extrusive Basalts.

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 "porphyry 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 on the western edge of the Whitehorse Copper Belt with over half of it being drift covered.

Biotite granite outcroppings occur within the aeromagnetic high on the northern extremity, while sedimentary

GEOLOGY cont'd

rocks and tuffaceous equivalents outcrop in the centre of the property in the vicinity of Haeckel Hill.

No limestones with the exception of a dark grey variety were seen by the writer on his limited traverses of the property.

SURVEY SPECIFICATIONS

The Induced Polarization (I.P.) survey was carried out using a pulse-type system manufactured by Hunttec 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" with 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) appearing between the two 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 "pole-dipole 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 each of these electrodes is kept constant with the distance between C_1 and P_1 being roughly equal to the depth to be explored by that traverse. The second current electrode C_2 is kept fixed at "infinity".

SURVEY SPECIFICATIONS cont'd

Thus, on a "pole-dipole array" traverse with an electrode spacing of 400 feet, a body lying at a depth of 200 feet will produce a strong response, whereas the same body lying at a depth of 400 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 McPhar M 700 Fluxgate Magnetometer. This instrument measures variations in the vertical component of the earth's magnetic field to an accuracy of ± 10 gammas. Corrections for diurnal variations were made by tying-in to previously established base stations at intervals not exceeding two hours.

DISCUSSION OF RESULTS

Area I.

A strong I.P. anomaly was located trending northwest across Mike 32, as can be seen from the chargeability profiles on Map W-110-2. This anomalous trend is open on both its extremities trending into other claim groups.

A generally coincident resistivity low, i.e. conductivity high, especially pronounced on the tie line, was also observed (Map W-110-2).

The magnetic survey failed to indicate the presence of magnetite and/or a contact between two magnetic rock types of the claim surveyed. This would seem to negate the presence of a limestone-granite contact as from previous experience in the Copper Belt a 500 to 700 gamma step is usually apparent.

Area II.

The results, as can be seen from Map W-110-3, show the area to have a high erratic background of some 10 to 14 milliseconds above which no clearly discernible anomalies are apparent. These results are considered typical of those obtained over the sediments in the Copper Belt.

Area III.

A "pace and compass" magnetic survey delineated the airborne magnetic anomaly as indicated on the Government Airborne Magnetic Survey Map No. 3377G.

This anomaly is located on the side of a small hill where numerous outcroppings of tight "hungry" biotite granite occur.

An I.P. profile was run over Line 3 W (Map W-110-4) resulting in a corresponding chargeability and resistivity high over the magnetic high. A plot of the apparent metal factor (i.e. the ratio of chargeability to resistivity times 1000) gave an almost flat profile suggesting the chargeability response was entirely due to the increase in resistiv-

DISCUSSION OF RESULTS cont'd

ity, and not due to sulphide or magnetite occurrence.

The high values of the resistivity i.e. about 10,000 ohm-metres, also suggested the underlying rock to be massive unconducting unfractured granite.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between June 3rd and 11th, 1970, Peter E. Walcott & Associates Ltd. carried out limited induced polarization and magnetic surveys for Dawood Mines Ltd. over parts of a property held by Trans Western Investments Ltd.

The property, i.e. the Mike claim group, is located in the northwest section of the Whitehorse Copper Belt, Yukon Territory.

The surveys showed that:

1. An anomalous chargeability and resistivity condition exists on Area I, but no accompanying magnetite and/or limestone-intrusive contact is apparent.
2. Area II is underlain by the sedimentary rocks of the Lewes River Group, and no anomalous conditions, detectable by the I.P. method, exist.
3. Area III is underlain by massive biotite granite with no mineralized occurrence suggested by the I.P. method.

The writer, therefore, concludes that the southern portion, i.e. the overburden covered portion, of the claim group holds the most promise for the discovery of economic mineralization.

He cautions that the I.P. anomaly in Area I could also be caused by similar rock types as those in Area II, and as a result recommends that soil sampling and magnetometer work be carried out on the southern portion of the claim group before further I.P. surveying is undertaken.

The cost for such a programme is estimated as follows:

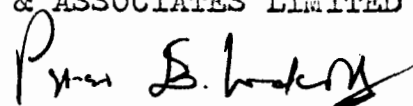
Soil sampling (Cu only), 6 miles - at \$125.00 per mile	\$750.00
Magnetometer surveying, 6 miles - at \$65.00 per mile	390.00
I.P. surveying, 6 miles - at \$500.00 per mile	<u>\$3,000.00</u>
	\$4,140.00 fwd.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS cont'd

Brought fwd.	\$4,140.00
Contingencies 15%	<u>621.00</u>
Total estimated cost	<u><u>\$4,761.00</u></u>

Respectfully submitted,

PETER E. WALCOTT & ASSOCIATES LIMITED



Peter E. Walcott, P.Eng.
Geophysicist.

VANCOUVER,
British Columbia

June 1970

A P P E N D I X

COST OF SURVEY

Peter E. Walcott & Associates Ltd. undertook the surveys on a daily basis. As a result the total cost of services provided was \$3,400.00.

CERTIFICATION

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

1. I am a Graduate of 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 eight years.
3. I am a member of the Association of Professional Engineers of British Columbia, Ontario and the Yukon Territory.
4. I hold no interest, direct or indirect, in the securities or properties of Dawood Mines Ltd., nor do I expect to receive any.



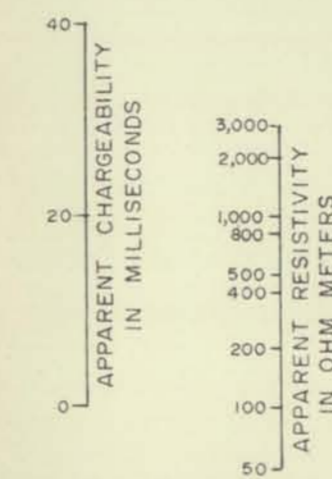
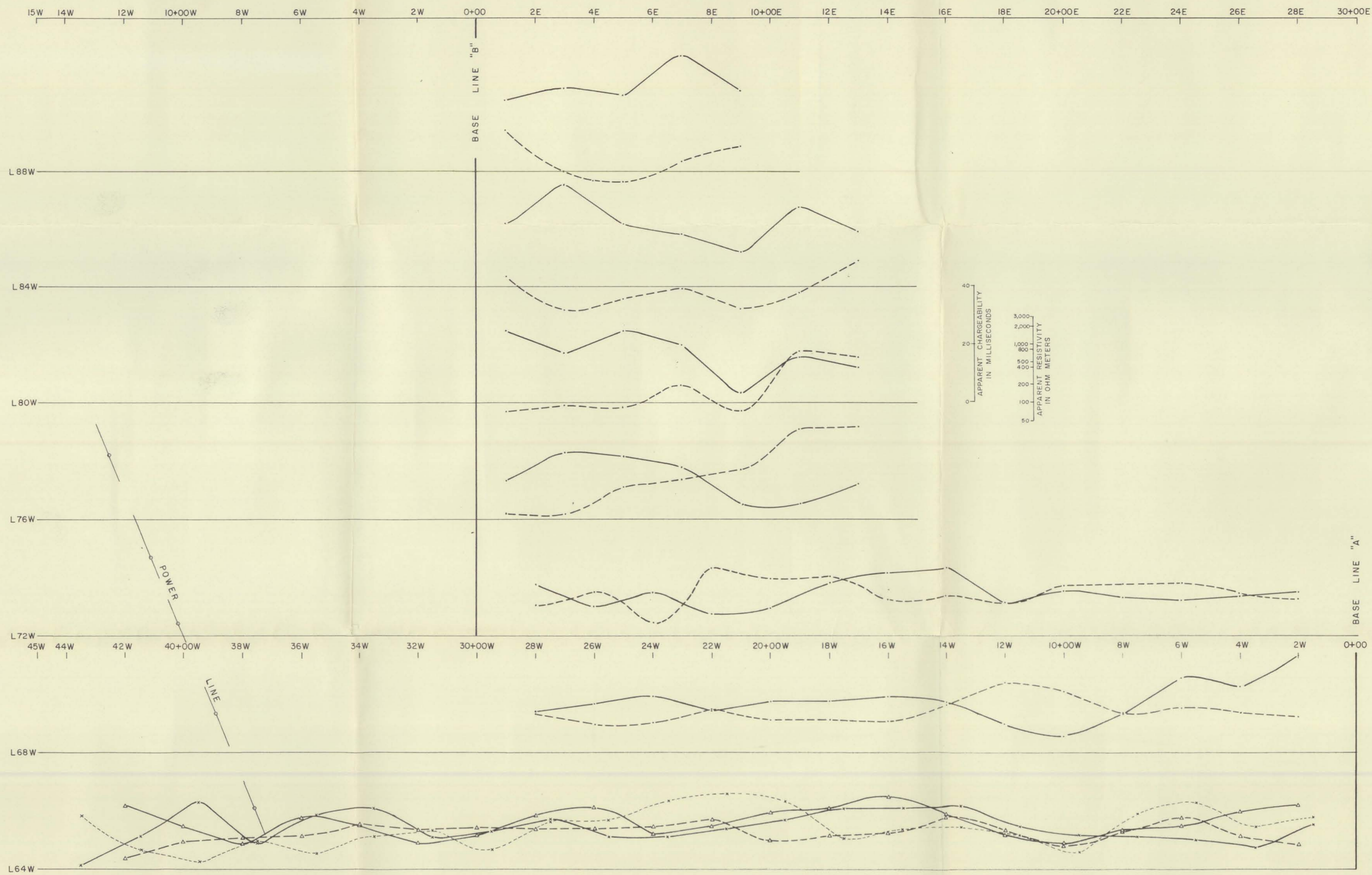
Peter E. Walcott,
P.Eng.

VANCOUVER,
British Columbia

June 1970

PERSONNEL EMPLOYED ON SURVEY

<u>Name</u>	<u>Occupation</u>	<u>Address</u>	<u>Date</u>
Peter E. Walcott	Geophysicist	Peter E. Walcott & Assoc. Ltd. 605 Rutland Crt. Coquitlam, B.C.	Jun. 3rd-11th, & Jun. 19th, 1970
G. MacMillan	Geophysical Operator	"	Jun. 3rd-11th, 1970
P. Charlie	Helper	General Delivery Whitehorse, Y.T.	Jun. 4th-11th, 1970
S. Scurvie	"	"	Jun. 4th-11th, 1970
B. Patnode	"	"	Jun. 8th-11th, 1970
B. Savage	"	"	Jun. 4th-6th, 1970
W. Wadman	Draughting	P. E. Walcott & Assoc. Ltd. 605 Rutland Crt. Coquitlam, B.C.	Jun. 23rd - Jun. 25th, 70
J. Walcott	Typing	"	Jun. 25th, 70



LEGEND

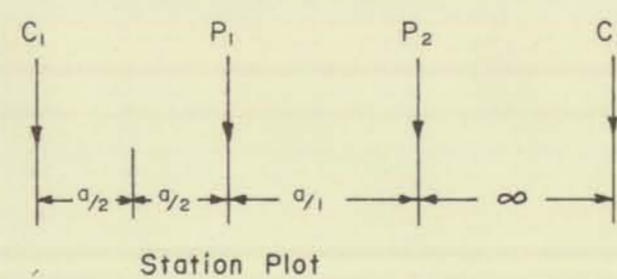
PROFILES OF APPARENT CHARGEABILITY

- 300 FT. x-----x
- 400 FT. - - - - -
- 600 FT. Δ-----Δ

PROFILES OF APPARENT RESISTIVITY

- 300 FT. x-----x
- 400 FT. - - - - -
- 600 FT. Δ-----Δ

POLE - DIPOLE ARRAY



DAWOOD MINES LTD.

MIKE CLAIMS, WHITEHORSE MINING DISTRICT, YUKON TERRITORY

AREA No. 2

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT CHARGEABILITY AND RESISTIVITY

SCALE: 1 INCH = 200 FEET

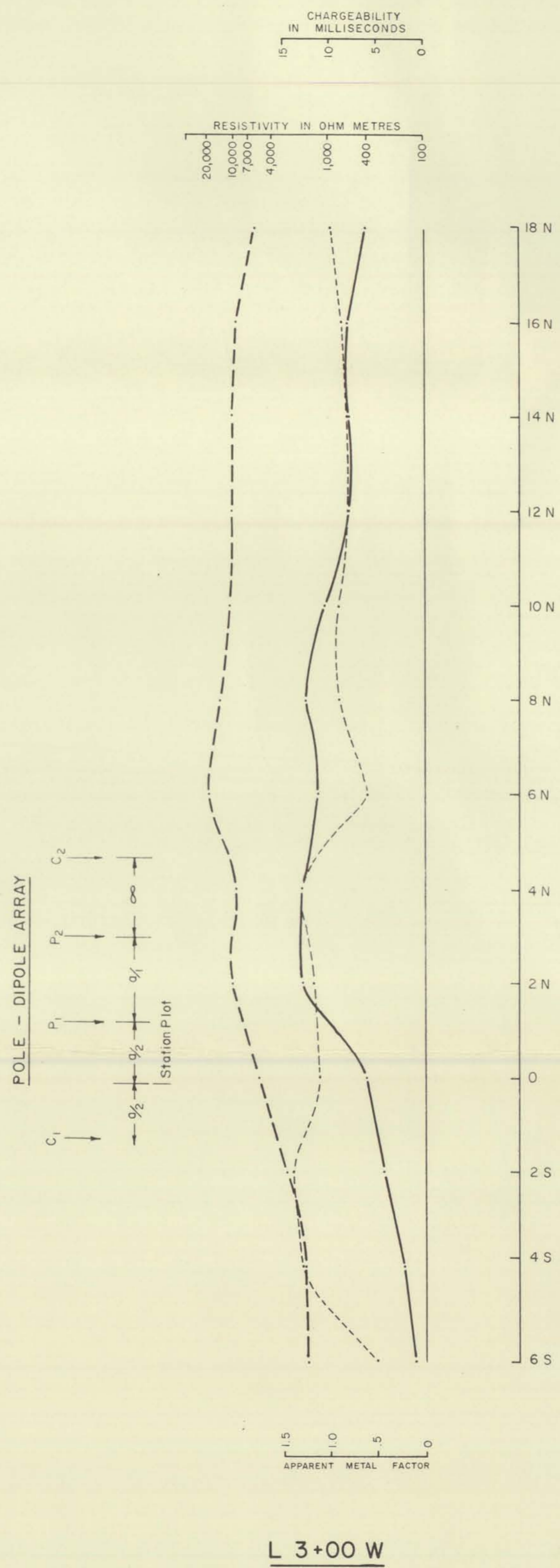
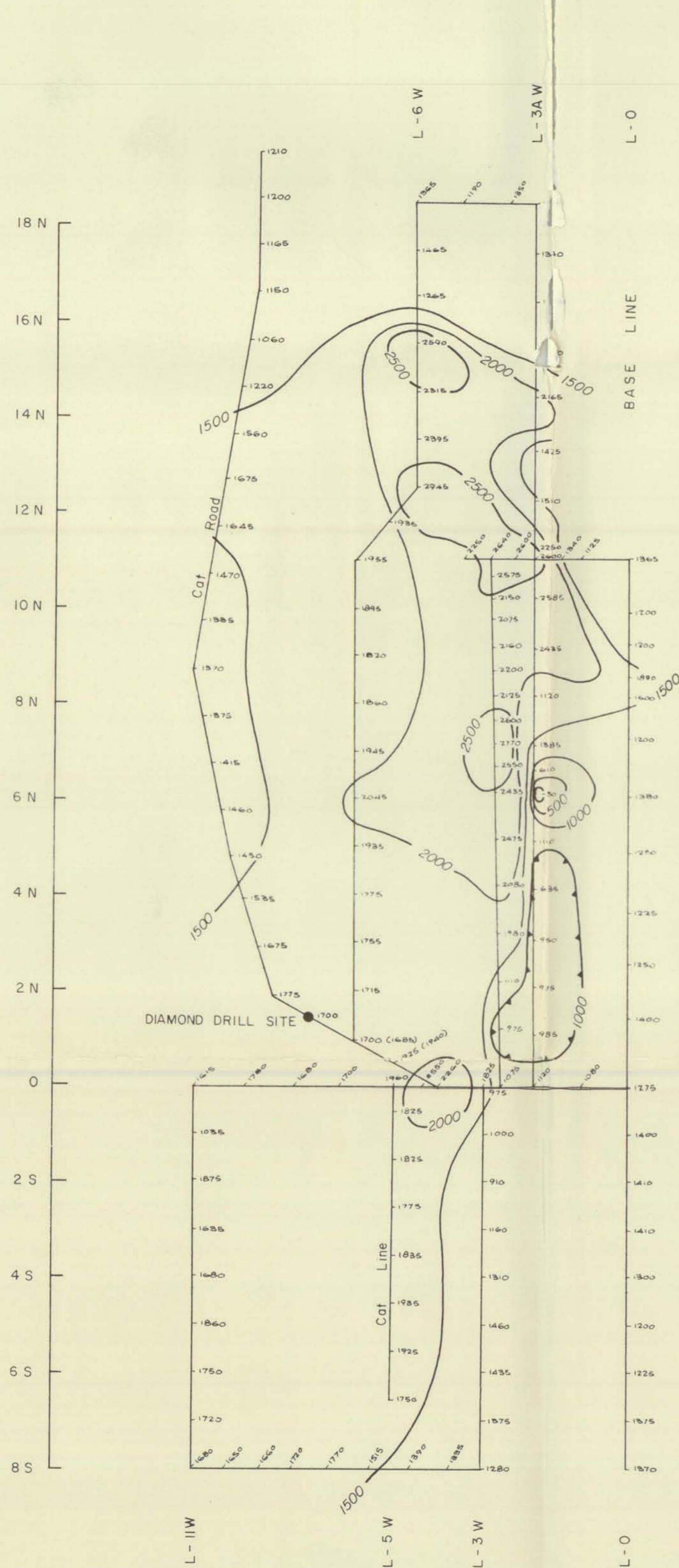


MAP No. W-110-3

PETER E. WALCOTT & ASSOC. LTD.

TO ACCOMPANY A REPORT BY
PETER E. WALCOTT
DATED: JUNE 1970

JUNE 1970



LEGEND

- APPARENT CHARGEABILITY (MILLISECONDS) $a = 400'$
- - - APPARENT RESISTIVITY (OHM - METRES) $a = 400'$
- · - · APPARENT METAL FACTOR (MILLISEC/OHM METRE $\times 10^3$) $a = 400'$

DAWOOD MINES LTD.

MIKE CLAIMS, WHITEHORSE MINING DISTRICT, YUKON TERRITORY

AREA No. 3

MAGNETIC AND INDUCED POLARIZATION SURVEY

CONTOURS OF RELATIVE VERTICAL INTENSITY IN GAMMAS
AND

APPARENT CHARGEABILITY AND RESISTIVITY PROFILES

SCALE: 1 INCH = 200 FEET



MAP No. W-110-4

PETER E. WALCOTT & ASSOC. LTD.

TO ACCOMPANY A REPORT
PETER E. WALCOTT P.
DATED JUNE 1970

JUNE 1970

Peter E. Walcott