



A REPORT
on
AN INDUCED POLARIZATION SURVEY
WHITEHORSE MINING DIVISION, YUKON TERRITORY
for
INTERNATIONAL MINE SERVICES LIMITED
TORONTO, ONTARIO
by
EAGLE GEOPHYSICS LIMITED
VANCOUVER, BRITISH COLUMBIA

JUNE 1969

This report has been examined by
the Geological Evaluation Unit.
Approved as to technical worth by:

A. H. Cray

REGISTERED GEOLOGIST

Approved as to cost in the amount
of: \$ 2,745⁰⁰

J. C. Jamnston

REGISTERED MINING INSPECTOR

Accepted as representation work
under Section 53(4) Yukon Quartz
Mining Act.

[Signature]

COMMISSIONER

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INTRODUCTION

Between May 30th and June 5th, 1969 Eagle Geophysics Limited carried out an Induced Polarization survey over a part of a property located near Marsh Lake, Yukon Territory, held by International Mine Services Limited of Toronto, Ontario.

The survey was carried out over part of a northeast-southwest grid on which an electromagnetic conductor was located in 1967.

Readings of apparent chargeability (the I.P. response parameter) were taken every 100 feet along the picket lines using an electrode separation of 200 feet. Simultaneous measurements of resistivity were also made.

In addition measurements of chargeability and resistivity were made using 100 and 300 foot electrode separations on Line 28E, and a "resistivity" expander was also done about station 0 on Line 28E.

The data are presented on a plan map of the line grid, Map E-152-1, that accompanies this report. This map is at a scale of 1 inch to 200 feet.

PROPERTY AND LOCATION

The property consists of the Oak group of mineral claims, part of which were surveyed. The claims surveyed were as follows:-

Oak 92, 94, 131, 133

The property is situated in the Whitehorse Mining Division, Yukon Territory and is located about 1-1/2 miles northeast of Mile 983 on the Alaska Highway. It can be reached by two wheel drive vehicle from the town of Whitehorse (mile 917) via the Alaska Highway and a two mile stretch of bush road.

PURPOSE

The purpose of the survey was to try and determine by the I.P. method whether the previously located weak electromagnetic conductor (report by Eagle Geophysics Limited 1967) corresponded to disseminated sulphide mineralization or graphite, or to a shear zone or overburden conductivity.

GEOLOGY

The reader is referred to Map 1.93A and G.S.C. Memoir 312. The property itself has been mapped by D.G. McIntosh of International Mine Services Limited in 1967.

Outcrop occurrence is frequent on the property except on the Western end which is drift covered. Esker complexes occur on this land. The majority of the outcroppings are metabasalts of Triassic age, some of which are siliceous but greywacke, limestone and some andesite has also been noted.

No mineral occurrence has been reported on the property except for minor pyrite in some of the volcanics. However massive graphite has been seen in one place.

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 C₁ and C₂, the primary voltage (V_p) appearing between the potential electrodes P₁ and P₂ during the "current on" part of the cycle, and a secondary or over voltage (V_s) appearing between P₁ and P₂ during the "current off" part of the cycle.

The apparent chargeability (Ma) 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 (Pa) 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 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 traverse. The second current electrode C_2 is kept fixed at "infinity".

Thus, in a "three electrode array" traverse with an electrode spacing of 200 feet, a body lying at a depth of 100 feet will produce a strong response, whereas the same body lying at a depth of 200 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.

DISCUSSION OF RESULTS

The results of the I.P. survey as performed with a 200 foot electrode separation showed the property to exhibit a very high chargeability background above which no anomalies are discernible (Map E-152-1).

The resistivity survey (Map E-152-1) done simultaneously with the I.P. survey, showed a large resistivity low, i.e. conductivity high, trending WNW across the grid whose location coincided with those of high out-of-phase readings obtained on the 1967 Ronka horizontal loop E.M. survey (Map E-118-2, 1967).

An apparent contact can be seen trending WNW across the north end of the grid from the chargeability and resistivity results (Map E-152-1). This contact approximately coincides with a 20 foot topographic rise.

Detail work done with 100, 200 and 300 foot separations on L 28-E showed little or no difference in the chargeability results, but showed the 100 foot resistivity readings to be higher than the 200 and 300 foot ones.

A "resistivity expander" done about station 0 on L-28E showed the resistivity to drop off sharply from around 1800 ohm-metres on the 25 foot separation to 23 ohm-metres on the 100 foot separation (Map E-152-1), and then remain fairly constant up to the 800 foot separation. This resistivity curve is believed by the writer to be caused by conductive graphitic bands in the rocks beneath a thin (6 feet) soil cover.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between May 30th and June 5th, 1969, Eagle Geophysics Limited carried out a limited Induced Polarization survey over part of the Marsh Lake property of International Mine Services Limited.

The survey was carried out to try and determine whether the cause of a previously located (July 1967) weak E.M. conductor was disseminated sulphide mineralization, graphite, shear zone, or thickening of overburden.

The chargeability results showed the property to exhibit a very high background above which no anomalies were discernible.

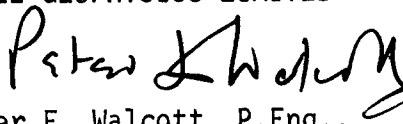
The resistivity results showed a large resistivity low i.e. conductivity high, trending across the property whose location corresponded very well with those of high out-of-phase E.M. readings.

On the basis of the above results it was concluded that (1) the E.M. conductors were most probably caused by rocks with graphitic content of high conductivity, as can be seen from the resistivity survey results, and definitely not by economic sulphide mineralization, and (2) the conductors are unworthy of further investigation.

Therefore no further work is recommended on the property.

Respectfully submitted,

EAGLE GEOPHYSICS LIMITED


Peter E. Walcott, P.Eng.,
Geophysicist.

Vancouver, British Columbia.
June, 1969.

A P P E N D I X

(1)

COST OF SURVEY

Eagle Geophysics Limited provided a geophysicist, operator, 7.5 I.P. unit, the necessary crewmen, transportation, and room and board on a daily basis. Therefore the total cost of services provided by Eagle Geophysics Limited was \$2,370.00.

(II)

PERSONNEL EMPLOYED ON SURVEY

<u>Name</u>	<u>Occupation</u>	<u>Address</u>	<u>Dates</u>
Peter E. Walcott	Geophysicist	810-525 Seymour St, Vancouver 2, B.C.	May 30 - June 5, June 23, 1969.
Gary MacMillan	Geophysical operator	810-525 Seymour St, Vancouver 2, B.C.	May 30 - June 5, 1969.
C. Sneddon	Geophysical operator	810-525 Seymour St, Vancouver 2, B.C.	May 30 - June 5, 1969
L. Tommy	Helper	General Delivery, Whitehorse.	May 30 - June 5, 1969
W. Wadman	Drafting	810-525 Seymour St, Vancouver 2, B.C.	June 17 to 19, 1969.
Rory Stephens	Typing	311-736 Granville St, Vancouver, B.C.	June 27, 1969

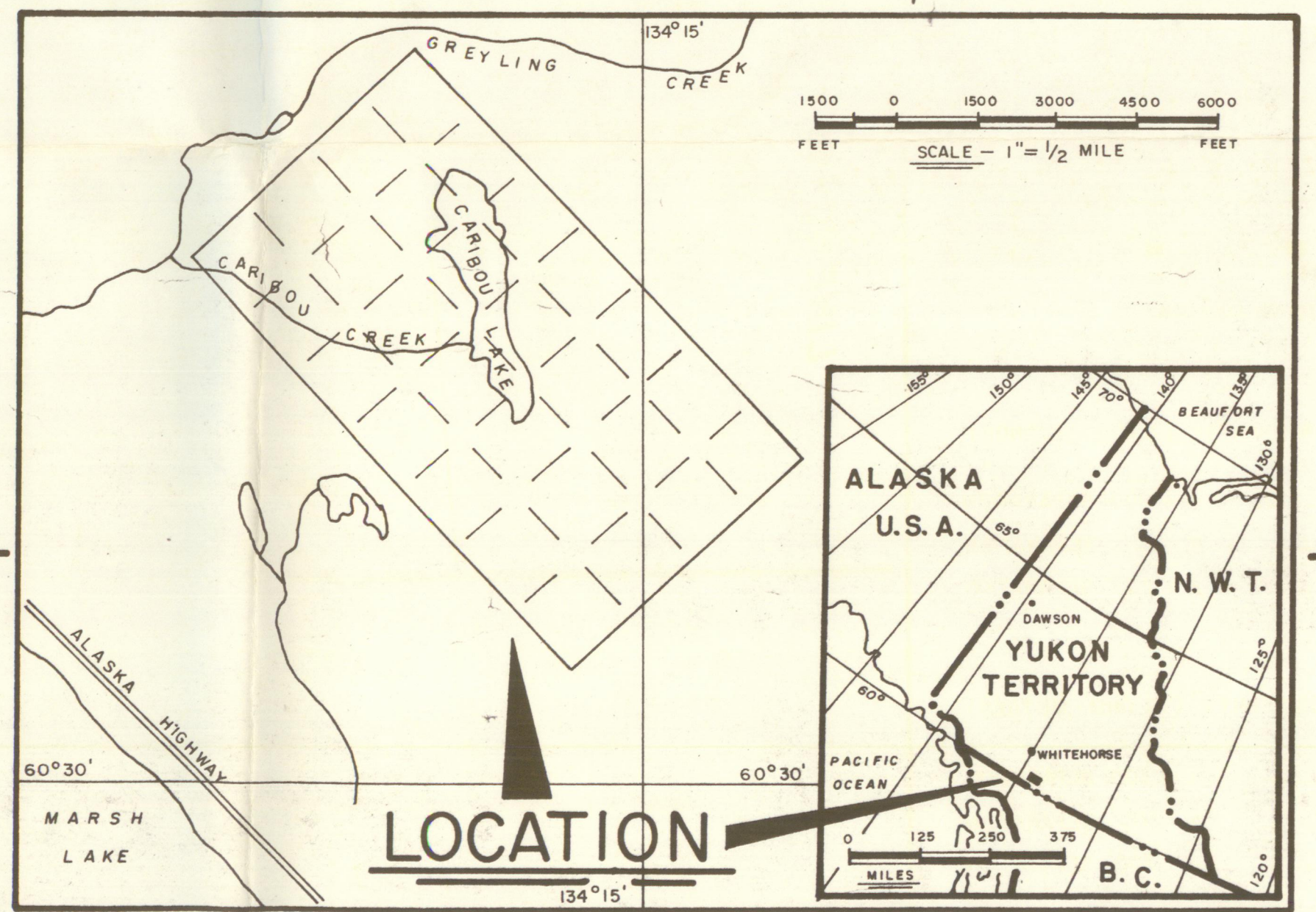
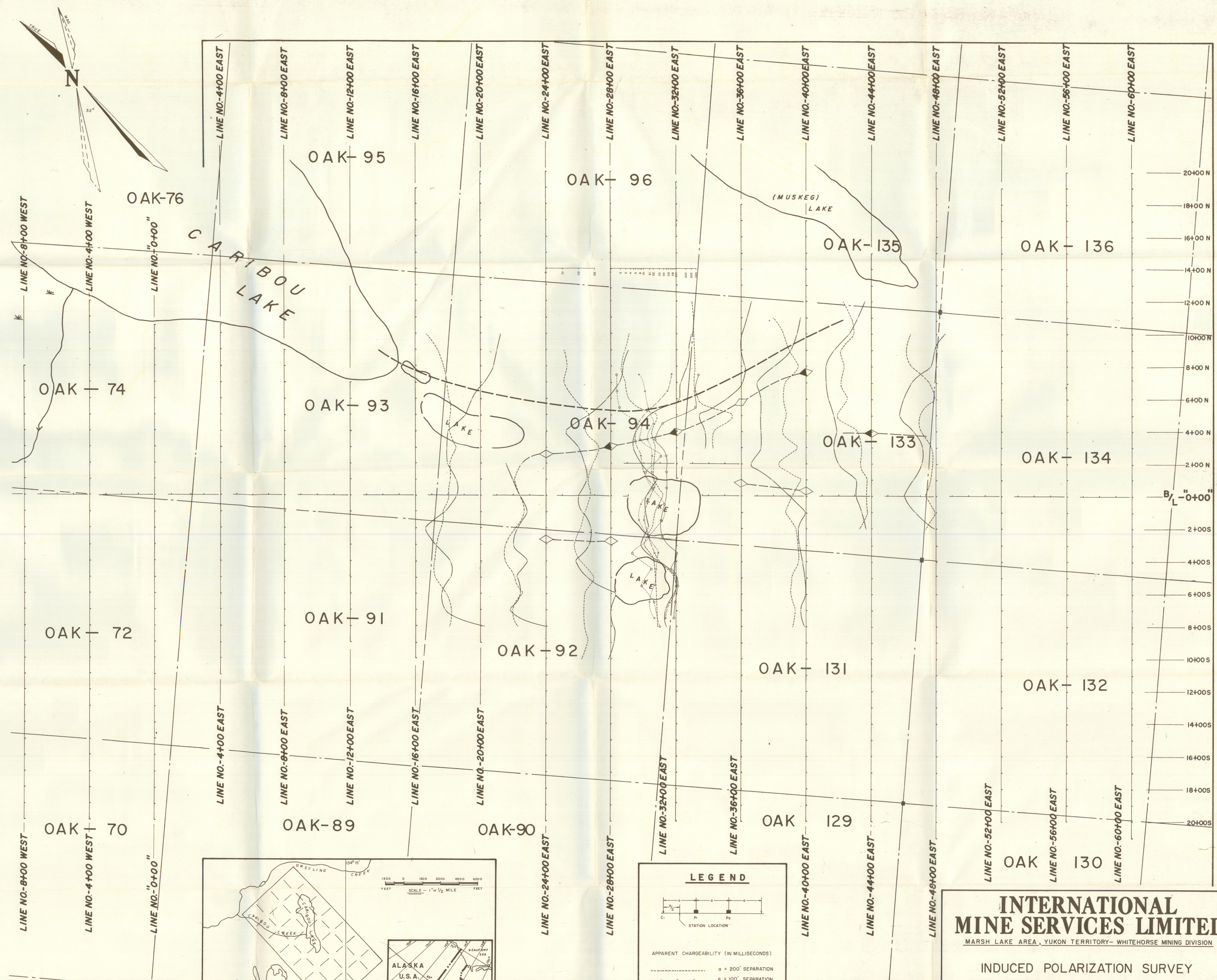
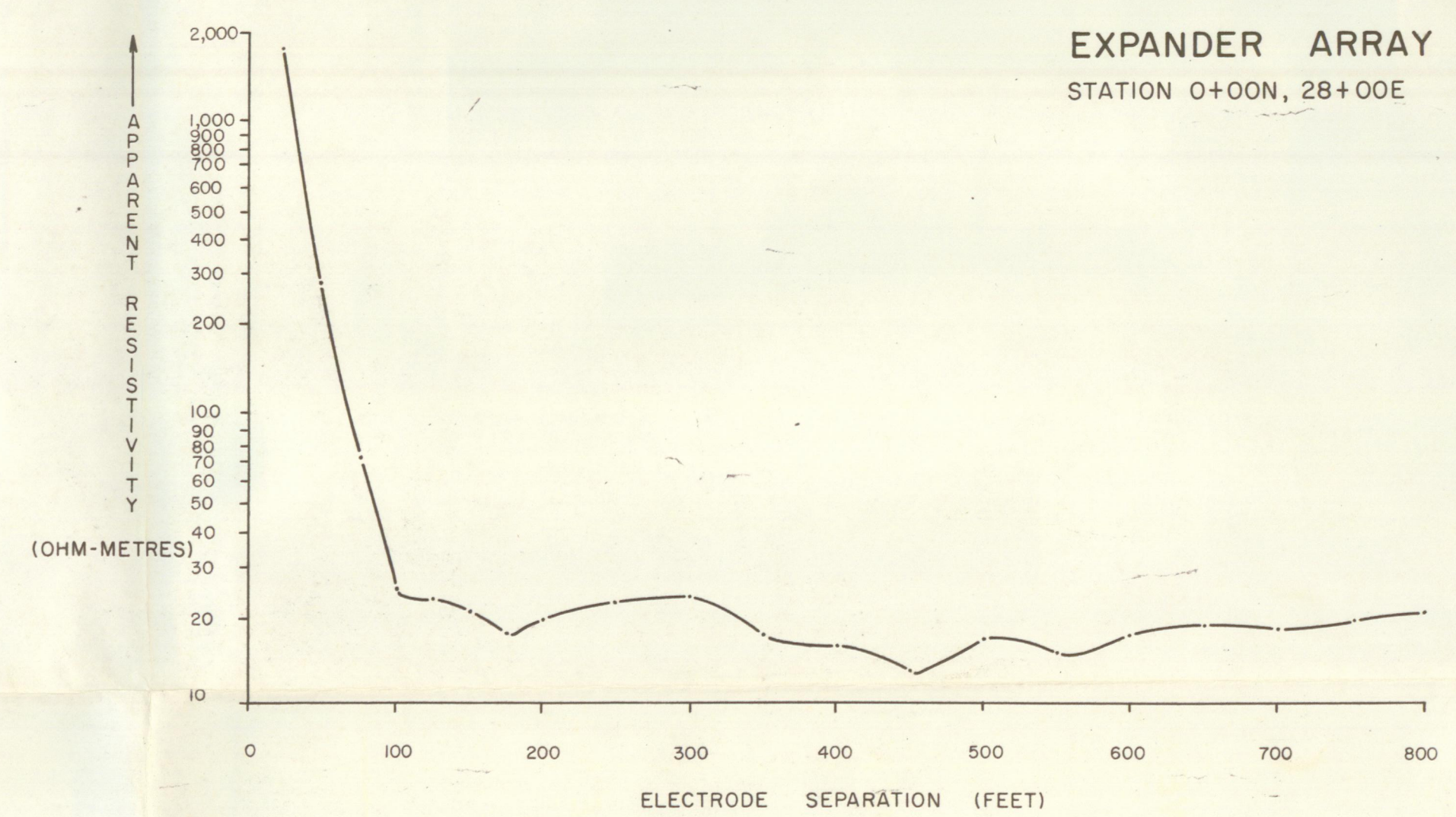
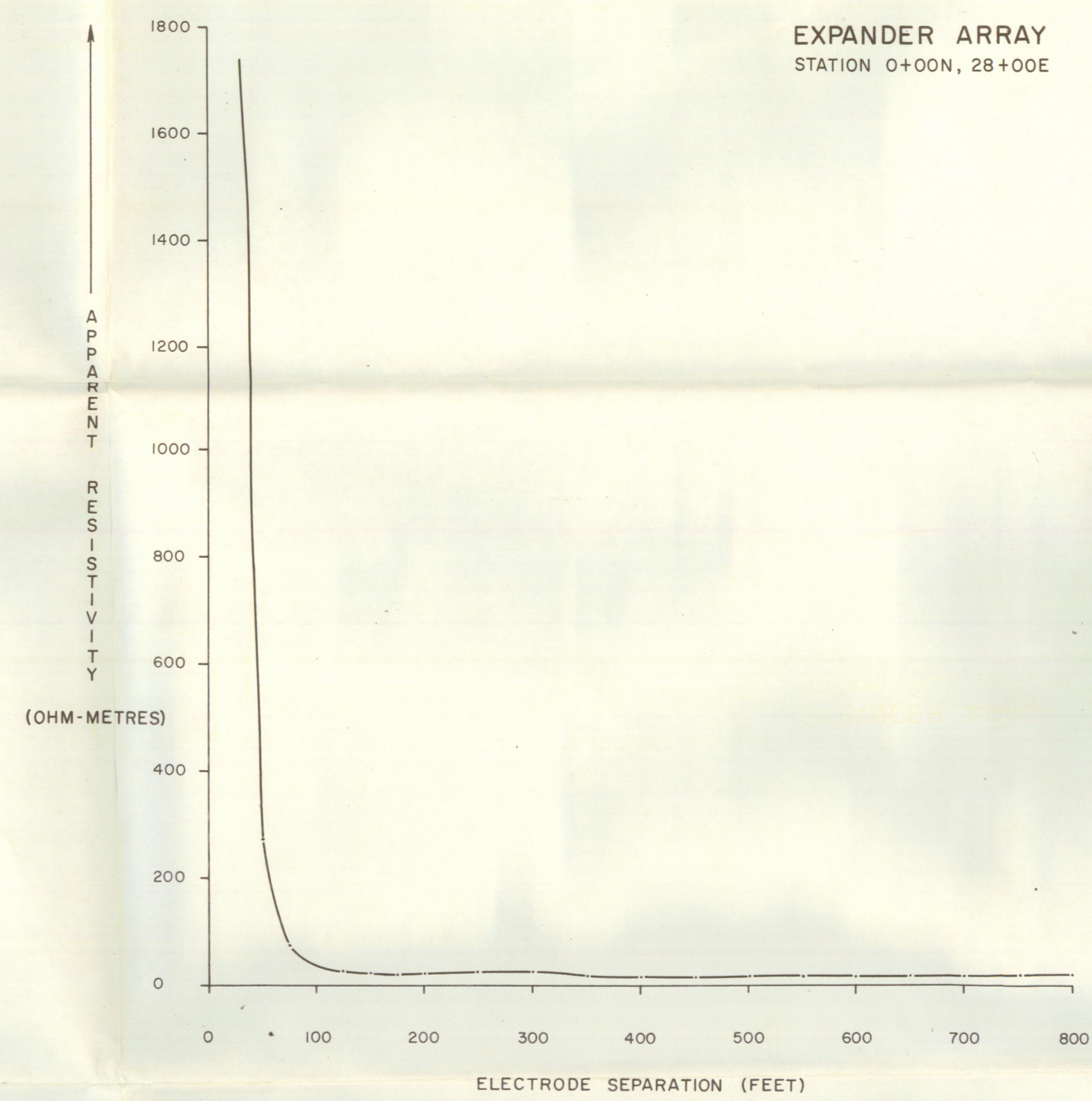
(III)

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 seven years.
3. I am a member of the Association of Professional Engineers of British Columbia, Ontario and the Yukon Territory.
4. I have no interest, direct or indirect, in the property described in this report.

PETER E. WALCOTT, P.Eng.

Vancouver, British Columbia,
June, 1969.



LEGEND

STATION LOCATION

APPARENT CHARGEABILITY (IN MILLISECONDS)

- = 200' SEPARATION
- = 100' SEPARATION
- = 300' SEPARATION

APPARENT RESISTIVITY (IN OHM-METRES)

- = 200' SEPARATION
- = 100' SEPARATION
- = 300' SEPARATION

INTERPRETED CONTACT

- ◇ = POOR CONDUCTOR 1967 SURVEY
- ◆ = MODERATE CONDUCTOR 1967 SURVEY

INTERNATIONAL MINE SERVICES LIMITED
MARSH LAKE AREA, YUKON TERRITORY - WHITEHORSE MINING DIVISION

INDUCED POLARIZATION SURVEY
APPARENT CHARGEABILITY & RESISTIVITY PROFILES

Scale - 1" = 200 Feet

MAP No. E-152-1
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT P. Eng.
DATED JUNE, 1969

Pro. J. Walcott

EAGLE GEOPHYSICS LIMITED
JUNE - 1969