611

GEOPHYSICAL REPORT

CHATAWAY GROUP

Highland Valley, Kamloops

and Nicola Mining Districts

for

CHATAWAY EXPLORATION CO. LTD
Vancouver, B.C.

by

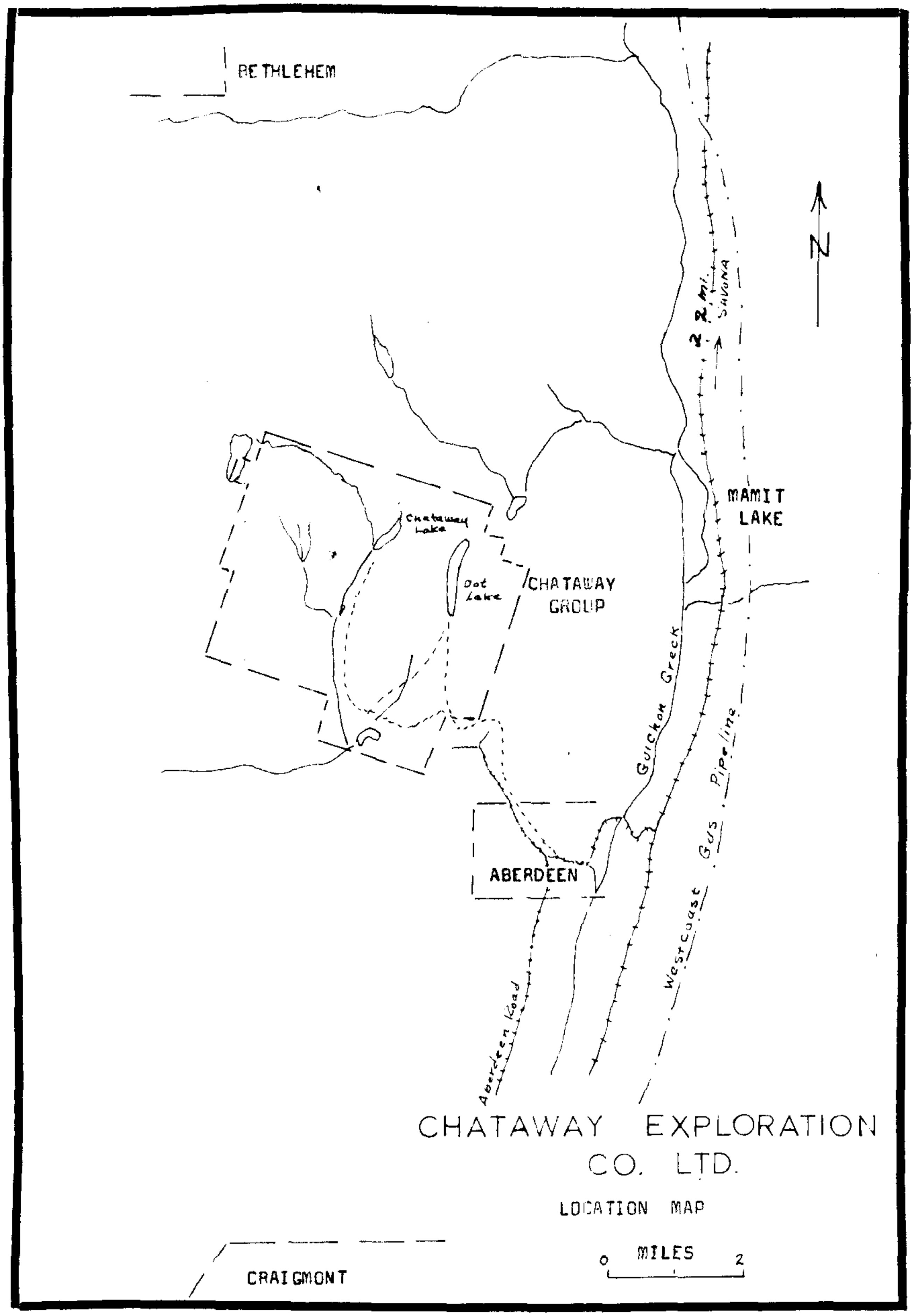
GEO CAL LIMITED
Vancouver, B. C.

Survey Commenced - September 2, 1964

Survey Completed - December 15, 1964

Geophysicist: Calbert B. Selmser, P. Eng.
Vancouver, B. C.

INDEX


BETHLEHEM
N
22 mi. Savona
MAMIT LAKE
Chataway Lake
Dot Lake
CHATAWAY GROUP
Guichon Creek
Westcoast Gas Pipeline
ABERDEEN
Aberdeen Road
CHATAWAY EXPLORATION CO. LTD.
LOCATION MAP
MILES
0
2
CRAIGMONT

GEOPHYSICAL REPORT

The Chataway Group - Highland Valley Property

Chataway Exploration Co. Ltd.

LOCATION: The Chataway Group which consists of about 200 mineral claims is situated in the Highland Valley area of southwestern British Columbia, and is fairly large, occupying an area of 16 square miles. The property lies about midway between the Bethlehem Copper operation on the north and the Craigmont Mine property on the south.

This location, which is about 20 miles from Merritt, B. C., is reached by means of the Aberdeen road which branches off Highway No. 8 at Lower Nicola. A secondary road extends northward from the Craigmont Mine to the Aberdeen property. From there the property and camp is reached by a rather steep road which is negotiable by four-wheel drive vehicles.

The main camp is situated at the southern end of Dot Lake. The main buildings at the camp site consist of a bunk house, an office and a cook house with dining alcove. The camp has facilities for about a dozen men. During the time of the survey the geophysical party was boarded at this camp.

A location map which is included with this report shows the area for Chataway Group and its position with respect to Bethlehem and Craigmont Mines. There are trails within the claim area which are negotiable with four-wheel drive vehicles. These trails, one of which goes towards Roscoe Lake and one of which goes west of Chataway Lake, and the other which goes part way to Antler Lake were used to service the area under survey. This area included that section of the property which extends from Dot Lake and Antler Lake to the western boundary of the property.

CLAIMS: The work done on this survey was accomplished by a geophysical crew operating under the company name of Geo Cal Limited, a registered

Provincial Company operating from Vancouver, B. C. This survey was performed for Chataway Exploration Company Limited of Vancouver, B. C. They are holders of the claims listed on the following pages, under Mineral Claims for the 1st of November, 1964. This list gives the Mining Division and the work due date for each group of claims. The claims have been listed under their names and record numbers.

EXPENDITURES: Included with this report is an Affadavit for the work done during this survey on the property held by Chataway Exploration Company, Limited. This Affadavit includes only those expenses entailed on the property and with the immediate work which consisted of Electro-magnetic and Induced Polarization Geophysical Surveys.

The field crew consisted of personnel familiar with geophysical work and who had some previous experience in survey work. In addition to the field crew, the geophysicist who was in charge of this survey has had 17 years experience in the field of Geophysics. His work history includes service with International Nickel Company of Canada, Texaco Exploration Company, Triad Oil Company and Spartan Air Services. While working for Inco and Spartan he was their Cheif Geophysicist and he was also Staff Geophysicist for Texaco Exploration and Triad Oil Company in Calgary, Alta.

DESCRIPTION OF THE METHODS: The use of the Electro-magnetic method for the detection of sub-surface conductors including base metal sulphide ore bodies is well established and accepted. The fundamental principal on which all these methods are based could be described as a conductor placed in an audio frequency alternating magnetic field where secondary currents have been caused to flow. These secondary currents set up a secondary field, which distorts the original field. All Electro-magnetic methods detect the presence of a subsurface conductor by measuring the distortion of the resultant transmitted field.

When an electric current passing into the earth through ground electrodes is suddenly interrupted a potential can be measured between these or nearby electrodes for sometime after the current stops. This potential decays exponentially with time after the interruption. This effect is known as induced polarization and is associated with electro-chemical reactions in the earth. From these phenomena it appears that polarization effects may arise from a number of sources within the area, where there are buried metalic bodies, such as calco-pyrite. It has been shown that the surfaces of the conductor opposite the two current electrodes takes on respectively positive and negative polarities; which are in opposition to the polarities of the nearest electrodes. When the current is interrupted these surfaces act as elements of an electrolytic cell. This cell will dissipate its charge after sending a current into the earth which decays with time and which generates a potential difference at the surface.

The electro-magnetic unit used in this survey was an SE-250 instrument, manufactured by E. J. Sharp Instruments of Canada, Limited. This unit was designed to give greater separation and deeper penetration than any similar battery operated single frequency portable EM unit. The SE-250 is fully transistorized with a standard frequency of 1000 cycles per second. Since the primary signal is pulsating it can be readily distinguished from any background noise.

The Induced Polarization Unit used in this survey is the Model IPU-3 which is manufactured by Electronic Associates Limited of Toronto, Ontario. This is then a direct reading type of instrument developed by Dr. Seigel. The control console is operated by a 2 KVA 900 cycle per second generator set, driven by a $7\frac{1}{2}$ HP 4-cycle gas engine. This instrument is capable of developing several amperes of current and up to 3000 volts E.M.F. The control sequence involves a time motor and a cam shaft which operates micro switches to regulate the polarity of the current and to measure the polarization current.

The metering console includes selector switches and a sensitive meter which will measure both the resistivity and the potential from the integrating circuit. It also has balancing controls which will null all self potential current so that only the integrated current from the induced polarization effect will be measured. The integration measurement is carried out in steps which are averaged for the voltage reading used to calculate the chargeability.

The broadside configuration was used for the electro-magnetic survey as carried out on the property being considered. In this method the traverse lines are inclined at approximately 90° to the expected strike, although the direction is not critical. The two coils move progressively up two parallel lines separated by 400 feet with both coils being at the same station number relative to the grid. A transmitter coil which is using the 1000 cycles per second frequency is always north in direction from the receiver coil. The transmitter coil is held vertically and directed so that its plane includes the receiver station. The receiver coil is held horizontally and tilted to the west or the east respectively to make the measurement. Measurements are made for the null effect of the signal or a minimum signal strength at the extreme ends of a band of low signal strength. A clinometer affixed to the receiver coil is used to determine the angularity of the tilt of the coil which is recorded along with the direction at which the coil has been tilted.

After considerable testing it was decided that the gradient array should be used for the Induced Polarization measurement. Critical tests were made to determine whether any other array could be used. It was found, however, that the very high ground resistance would prevent using a moveable electrode along the lines. Therefore, fixed electrodes were set out at some distance from the lines of survey and were grounded in low swampy ground for maximum contact. The current electrodes were placed at an average distance apart of at least 5000 feet. The potential electrodes were placed at the station along the lines of survey at a constant separation of 100 feet. These were moved along lines parallel to the line joining the two electrodes. In this configuration, the separation of the potential contacts merely governs the amount of resolution which may be made for the Induced Polarization values. The smaller the amount of separation the closer the reading is to a point measurement.

The main advantages of the rectalinear configuration are that it is the least susceptible to the masking effect of conductive overburden. It also has a depth penetration which is deep (2000 ft.) while retaining a high degree of resolution for small bodies. Interpretation is also relatively easy since the anomalies are similar to horizontal magnetic field anomaly forms.

GEOPHYSICAL MAPS: A primary map has been prepared called the Electro-magnetic Profile Map for the entire Electro-magnetic survey. The lines and stations have been laid out on a horizontal scale of one-half centimeter equals 100 feet. The readings of the dip angle have been plotted at a vertical scale of 1/2 centimeter equals 10 degrees. The readings which have been plotted above the datum line are west dipping and those which have been plotted below the datum line are east dipping.

For the area west of the 250 east base line on the Electro-magnetic Map the surveyed boundaries of the claims have been depicted. The rest of the claims which are included in the area of the survey have not as yet been completely surveyed as to the exact location for the lines and the claim posts.

The Induced Polarization Maps, which are two in number (No. 1 and No. 2) are of two individual areas of survey. Map No. 1 covers an area south of Chataway Lake. Both of these areas were selected for high conductivity effects as shown by the Electro-magnetic Profile Map. Readings are mapped in units of 0.1 milliseconds of chargeability.

The apparent resistivity maps which duplicate the same areas as those which are depicted on the Induced Polarization Maps can be used to give some indication of the relative thickness of overburden. Since the apparent resistivity measures to a depth which is relatively the same as the chargeability then it is a composite of the restivities of the overburden and the bedrock for the section which is being measured. Where the apparent resistivity is fairly high it is an indication that the bedrock is quite close to the surface, since the resistivity would depend on the relative porosity of the material and the presence of electrolytic water in the interstices of rock and the overburden grains. Where the apparent resistivity level is fairly low there is an indication that the overburden is being measured which is relatively more conductive than the bedrock. The measurements which have been contoured on the Apparent Resistivity Maps are given in units which are equal to 0.001 ohm meters.

RESULTS AND RECOMMENDATIONS: On the Electro-magnetic Profile Map it will be observed there are dashed broad lines. These are the correlation lines which pass through a relative cross-over position for the Electro-magnetic profile plots. These cross-overs are the points at which the dips change from an east plotting to a west plotting or a west plotting changes to an east plotting. These are the geometric centres for any conducting body which is generating a secondary field. Any dip less than 5^{0} is not considered to be a secondary field in every sense of the word since slight mis-orientation of the transmitter or receiver, or inhomogenity of the electrical qualities of the overburden at the station points may give a small dip relation to the null point. Any dip over 5^0 either east or west giving a broad change of 10^0 is considered to be a possible secondary field coming from a conductor within a depth of 200 feet below the surface. Steep ridges and the unsymmetrical presence of swamps or lakes will also sometimes have an effect on the readings.

The qualifying proof for a conductor will be therefore mainly guided by the continuity of cross-overs from one line to another. It will be observed on the map that some of these continuities extend for several miles. These are thought to have been generated by structural shearing and faulting and originate from either gouge or mineralization along their fracture planes. Dips of 20^0 to 30^0 are thought to depict first class conductors and to be unquestionably secondary fields. As shown on the Map most of these structural lineaments extend for some distance in a north to south direction. In the northwest sector of the Map the lineaments have a slight north by northeast trend. This is also the standard direction for those lineaments immediately east and southeast of Chataway Lake. South of Chataway Lake the lineaments seem to converge from two directions; from both the west and the east side of the lake. This convergence is also marked by very high dips which are mostly of east polarity. As a result of these observations this was the area chosen as the first to be mapped in detail with an induced polarization survey. In contrast the No. 2 area chosen shows some slight convergence and large dips of mainly west polarity.

Map No. 1 for the Induced Polarization affect shows areas of high chargeability marked with broad dashed lines. There is some indication of northeast to southwest lineaments, but the continuity in detail is somewhat broken and discontinuous. This may be caused by mineralized and altered fracture zones which continue to some depth since the vertical coverage is much greater for chargeability than it was for the Electro-magnetic field effect. On Map 2 the high chargeability lineament at the centre of the mapped area is very regular and extends northeast to southwest. Other lineaments of high chargeability in this area are very irregular in direction and show marked discontinuity.

It is recommended that if any further work be done on the present area with Induced Polarization Instruments that the work be extended up the east side of Chateway Lake. If any extensive mineralization is found south of the Lake it is most probable that it extends into this area.

Respectfully submitted,

GEO CAL LIMITED

Calbert B. Selmser
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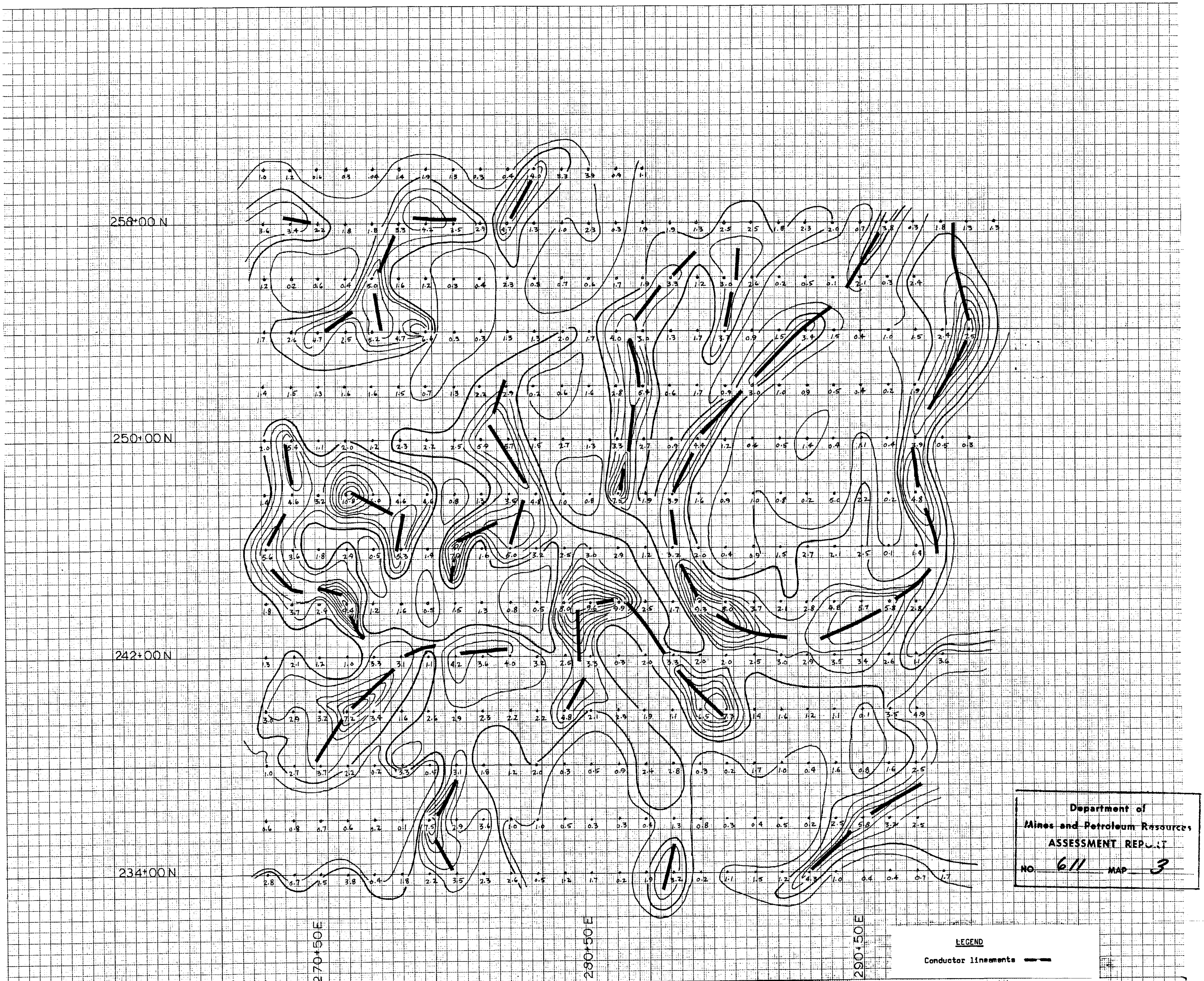
Calbert B. Selmser, P. Eng.


N
BOB 1
BOB 2
BOB 3
BOB 4
BOB 5
BOB 6
BOB 7
BOB 8
COE FR. 8
COE FR. 4
JAY 1
JAY 2
JAY 4
JAY 7
RUM 1
RUM 2
Pond
Swamp
MAP 4
MAP 3
Chataway Lake
Dot Lake
Base Line
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 611 MAP 2
LEGEND
Conductor lineaments
CHATAWAY GROUP, NICOLA & KAMLOOPS M.D.
CHATAWAY EXPLORATION CO. LTD.
ELECTROMAGNETIC PROFILE MAP
Horizontal Scale: ½ cm. = 100 ft.
Date: Dec. 15, 1964
Vertical Scale: ½ cm. = 10 deg.
W dip up; E dip down
To accompany a Geophysical Report by:
P. Eng.
611
2
To accompany geophysical report by Calbert B. Selmser, P. Eng. onthe Chataway Group, on Guichon Creek, Kamloops and Nicola Mining Divisions, dated December 15, 1964.



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 611 MAP 3

LEGEND

Conductor lineaments

CHATAWAY GROUP, NICOLA & KAMLOOPS M.D.

CHATAWAY EXPLORATION CO. LTD.

INDUCED POLARIZATION MAP 1.

Scale: 1 inch = 200 feet   Date: Dec. 15, 1964

Contour Interval = 1 Unit = 0.1 Millisecond

To Accompany a Geophysical Report by:

C. B. Selmser ....P. Eng.

611

GEO CAL LIMITED
2658 NELSON AVE.
WEST VANCOUVER, B.C.

To accompany geophysical report by Calbert B. Selmser, P..Eng. on the Chataway Group, on Guichon Creek, Kamloops and Nicola Mining Divisions, dated December 15, 1964.

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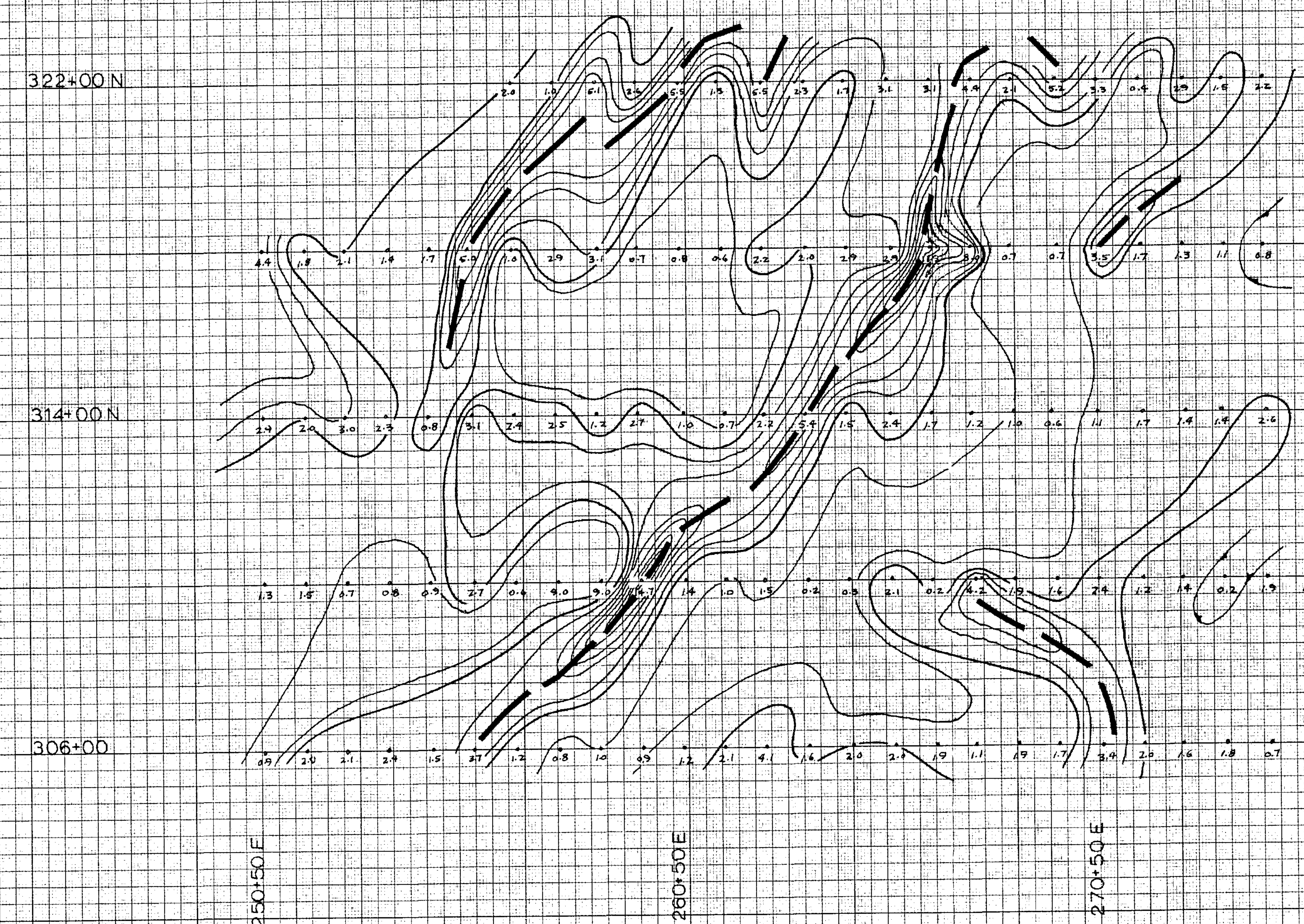

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CHATAWAY GROUP, NICOLA & KAMLOOPS M.D.

CHATAWAY EXPLORATION CO. LTD.

INDUCED POLARIZATION MAP 2.

Scale: 1 inch = 200 feet Date: Dec. 15, 1964

Contour Interval = 1 Unit = 0.1 Millisecond

To accompany a Geophysical Report by:

C. B. Selmser .... P. Eng.

Department of Mines and Petroleum Resou[rces]
ASSESSMENT REPORT
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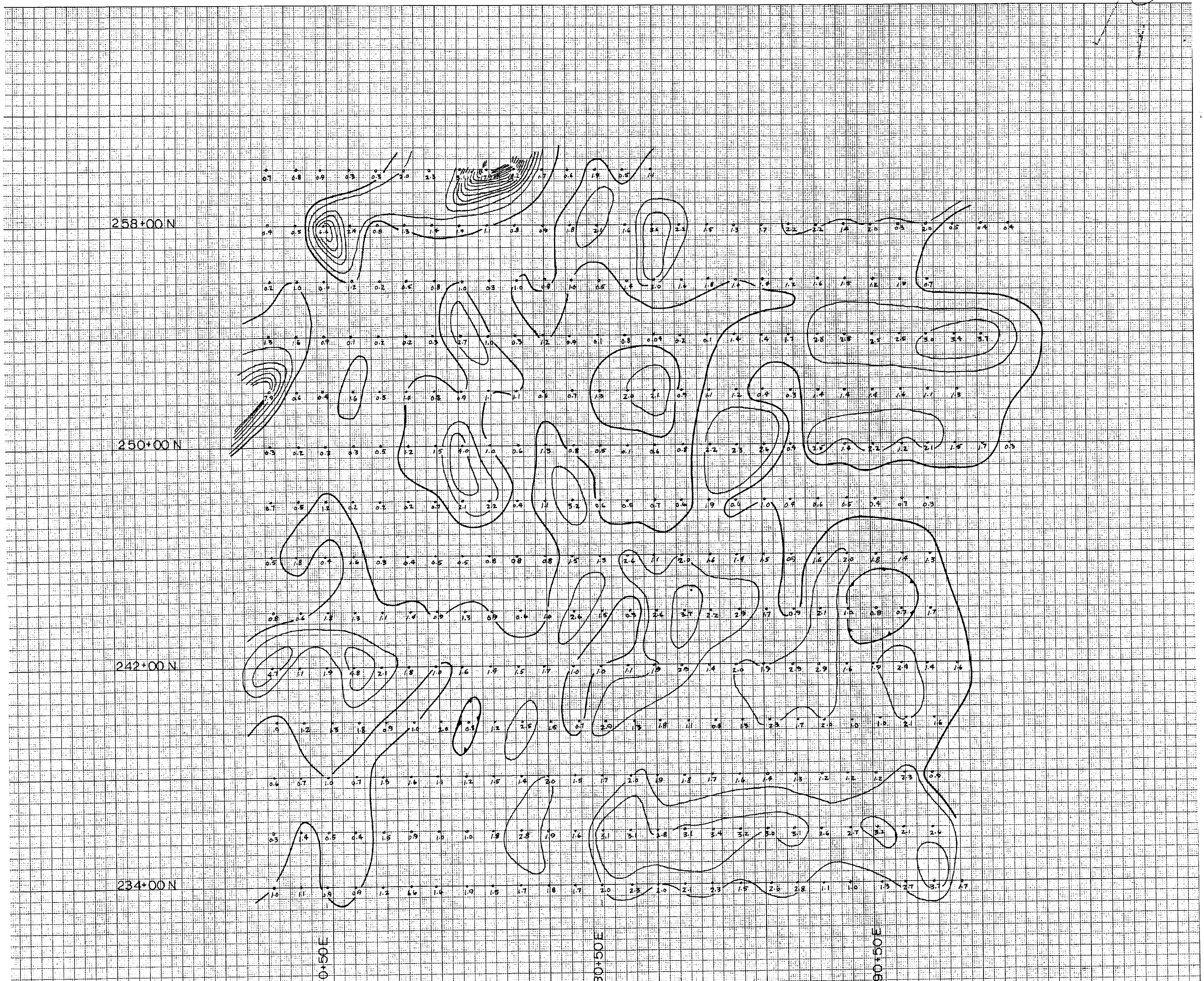
LEGEND

Conductor lineaments — —

To accompany geophysical report by Calbert B. Selmser, P. Eng. on the Chataway Group, on Guichon Creek, Kamloops and Nicola Mining Divisions, dated December 15th, 1964.



CHATAWAY GROUP, NICOLA & KAMLOOPS M.D.

CHATAWAY EXPLORATION CO. LTD.

APPARENT RESISTIVITY MAP 1.

Scale: 1 inch = 200 feet

Date: Dec. 15, 1964

Contour Interval = 1 Unit = 0.001 Ohm Meter

To accompany a Geophysical Report by:

C.B. Selmser, P. Eng.

Department of Mines and Petroleum Resourc
ASSESSMENT REPORT
NO. 611 MAP 5

To accompany geophysical report by Calbert B. Selmser, P. Eng. on the Chataway Group, on Guichon Creek, Kamloops and Nicola Mining Divisions, dated December 15, 1964.

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CHATAWAY EXPLORATION CO. LTD.

APPARENT RESISTIVITY MAP 2.

Scale: 1 inch = 200 feet   Date: Dec. 15, 1964

Contour Interval = 1 Unit = 0.001 ohm meter

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Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 611 MAP 6

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