4266

92P/15W

GEOPHYSICAL REPORT

of the

INDUCED POLARIZATION AND MAGNETOMETER SURVEYS

on the

SUN, BET AND BEER MINERAL CLAIMS

CANIM LAKE AREA

CLINTON MINING DIVISION

Lat. 51°53'N
Long.120°51'W

for

ARAGON EXPLORATIONS LTD. (N.P.L.)

Claim Name	Record Number
Beer 1 - 8	20026 - 20033
Beer 9 - 22	20199 - 20212
Beer 23 - 40	21478 - 21495
Pat 1 - 14	25676 - 25689
Bet 1 - 8	27878 - 27885
Sun 1 - 8	28286 - 28293
Sun 9 - 10	29880 - 29881

by

P. P. Nielsen, B. Sc., Geophysicist
G. C. Gutrath, B. Sc., P. Eng., Geologist

ATLED EXPLORATION MANAGEMENT LTD.
Vancouver, B. C.

December, 1972

NTS 92P-15

ATLED EXPLORATION MANAGEMENT LTD.

420—475 HOWE STREET • VANCOUVER 1, B.C.
TELEPHONE 688-0471

July 17, 1973

Department of Mines and Petroleum Resources
Victoria, B. C.

Attention: Dr. G. E. P. Eastwood

Dear Sirs:

Re: File #166-Clinton

I have just returned from the field and have finally come across your letter dated June 27, 1973.

I confirm that the magnetometer used on the Aragon survey was zeroed and that the values relate only to each other.

Apparently, the older Sabre magnetometers were adjustable to this end. As mentioned in the report, the survey was conducted by someone outside Atled's employ. Had it been up to me, I would have used either an MF-1 or 2 or a McPhar 700.

I also agree that correlation of various magnetometer surveys is of value.

Yours truly,

7932

ATLED EXPLORATION MANAGEMENT LTD.

P. P. Nielsen

PPN:jdl

P. P. Nielsen, Manager
Geophysical Division

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INTRODUCTION

Commencing November 14, 1972 a reconnaissance induced polarization survey was conducted by Atled Exploration Management Ltd. over existing geochemical and magnetometer survey lines on the Bear, Bet and Sun claims owned by Aragon Explorations Ltd. (N.P.L.).

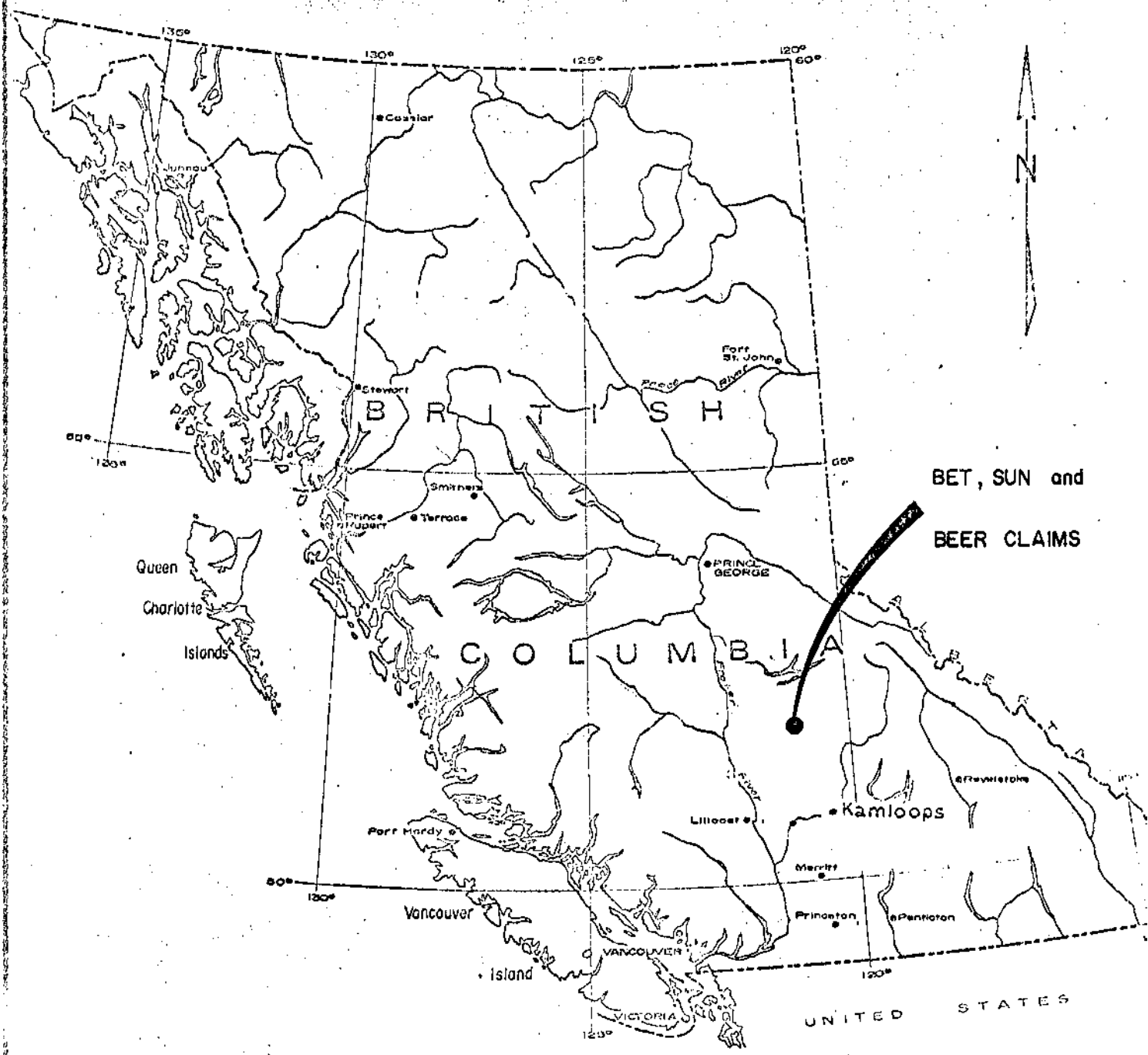
The purpose of the I. P. Survey was to test for lateral extensions of outcropping sulphides over covered areas represented by high copper geochemical soils and/or interesting ground magnetic features.

A total of 5.3 line miles was carried out in 5 days on the two grids.

LOCATION AND ACCESS

The claims are situated approximately 24 airmiles northeast of 100 Mile House, B. C.

Access is by way of a paved road from Highway 97 about 1/2 mile north of 100 Mile House to Canim Lake. Local logging roads are used from Canim Lake to the property.



ARAGON EXPLORATIONS LTD. (N.P.L.)

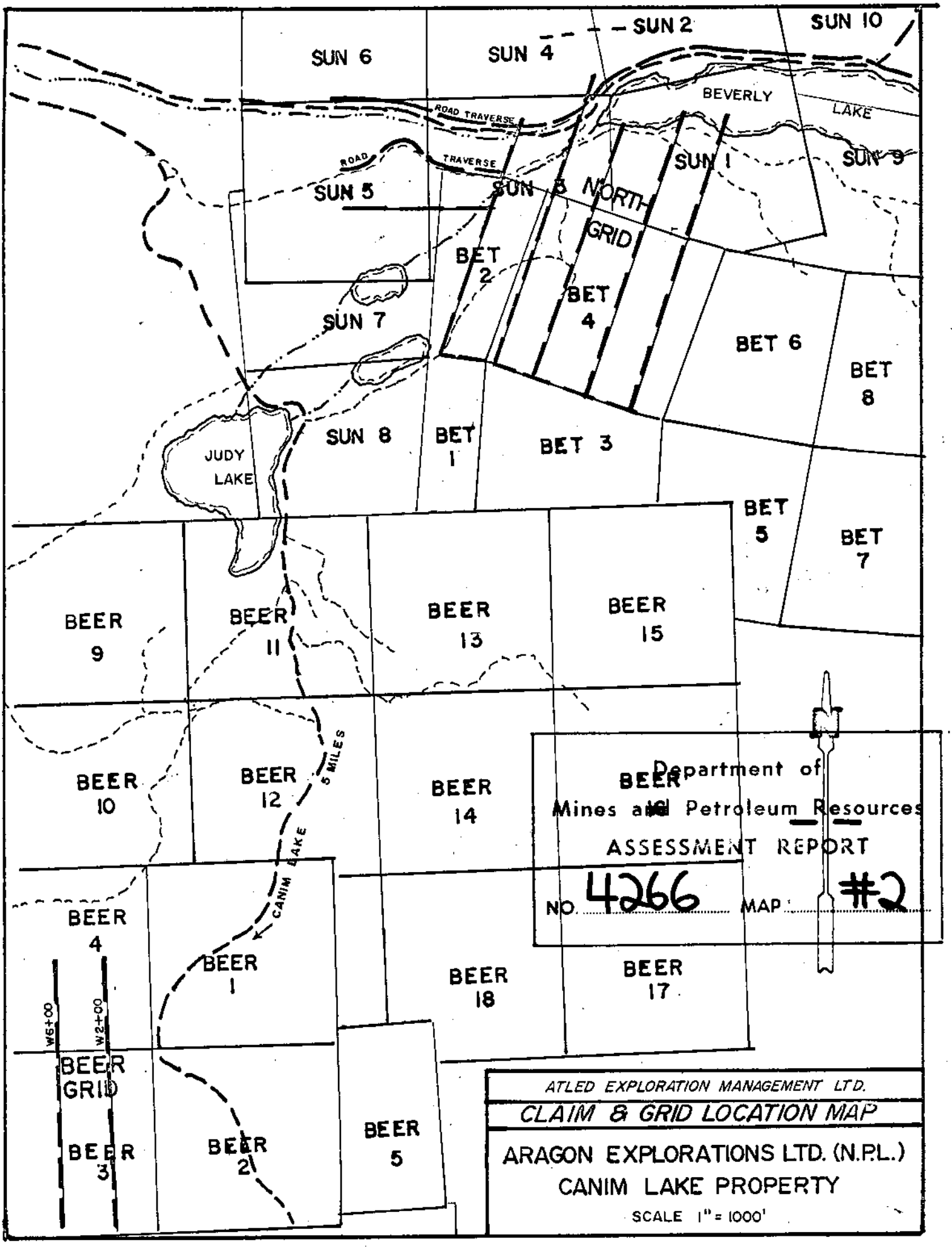
CANIM LAKE PROPERTY

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4266 MAP #1

Location Map
ATLED EXPLORATION
MANAGEMENT LTD.

SCALE : 1"=120 miles
(approx.)

0 100 200
miles


SUN 6
SUN 4
SUN 2
SUN 10
BEVERLY
LAKE
ROAD TRAVERSE
ROAD
TRAVERSE
SUN 5
SUN 3
NORTH
GRID
SUN 1
SUN 9
BET 2
BET 4
SUN 7
BET 6
BET 8
JUDY
LAKE
SUN 8
BET 1
BET 3
BET 5
BET 7
BEER 9
BEER 11
BEER 13
BEER 15
BEER 10
BEER 12
5 MILES
BEER 14
BEER
CANIM LAKE
BEER 4
BEER 1
BEER 18
BEER 17
W6+00
W2+00
BEER GRID
BEER 3
BEER 2
BEER 5
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4266
MAP #2
ATLED EXPLORATION MANAGEMENT LTD.
CLAIM & GRID LOCATION MAP
ARAGON EXPLORATIONS LTD. (N.P.L.)
CANIM LAKE PROPERTY
SCALE 1" = 1000'

CLAIMS

The property presently consists of a total of 70 contiguous mineral claims listed as follows:

Claim Name	Record No.	Recording Date
Beer 1 - 8	20026 - 20033	February 3, 1970
Beer 9 - 22	20199 - 20212	April 22, 1970
Beer 23 - 40	21478 - 21495	June 8, 1970
Pat 1 - 14	25676 - 25689	April 6, 1971
Bet 1 - 8	27878 - 27885	April 11, 1972
Sun 1 - 8	28286 - 28293	June 4, 1972
Sun 9 - 10	29880 - 29881	October 3, 1972

All claims are recorded as being in good standing as of this date.

As only a partial chain and compass survey has been completed the size and exact location of some of the claims has not been established. The claim and grid location map shows the position as established in the course of preliminary mapping.

TOPOGRAPHY AND GROUND CONDITIONS

The North grid varied in elevation from 3,000 to 3,500 feet A.S.L. and consisted primarily of flat to rolling terrain.

The Beer grid traverses were made over slightly more rugged terrain with the north and south extremities of the lines terminating at rock bluffs.

Ground conductivities were excellent despite a cover of 2 to 4 inches of crusted snow.

Overburden was estimated to be less than 100 feet thick over most of the survey areas.

GENERAL GEOLOGY

(after H. S. Aikins and V. Cukor)

The claims area is underlain by triassic Nicola volcanics intruded by and in contact with the dioritic Takomkame Batholith to the west.

The Nicola sequence consists of primarily green to dark green fine to coarse grained andesites and a tuff.

A number of small intrusive plugs and dikes cut the volcanics and vary in composition from syenite to diorite.

Alteration products in the form of epidote, chlorite, biotite and some sericite are encountered in the andesites and tuffs with potassium feldspar and calcite often appearing as fracture fillings.

The rocks in the general area are highly sheared, fractured and locally brecciated.

Minerals observed in outcrops and trenches are pyrite, pyrrhotite, chalcopyrite and bornite which occur as disseminations, blebs and small irregular stringers.

GROUND MAGNETOMETER SURVEY

(a) Survey Method

During and preceeding the execution of the Induced Polarization Survey a ground magnetometer survey was carried out over some of the Bet and Sun claims in order to define rock-types, structure and to enhance the interpretation of the geochemical and induced polarization survey results.

Readings were taken at 50 and 100 foot intervals along certain survey lines and roads as illustrated on the accompanying maps. A total of 4.9 line miles was magnetically surveyed on the North grid.

The magnetometer survey was executed using a vertical force fluxgate magnetometer which is hand held and levelled using a bubble-level on the face of the instrument.

Readings were taken at regular intervals along the survey lines and logging roads using the most sensitive scale possible.

Loop times of less than one hour were encountered resulting in good control of the duirnal variations. A nearby base-station was read each day for the day-to-day correlation and to monitor possible magnetic storms.

(b) Instrumentation

A Sabre G100 fluxgate magnetometer was used. This unit measures the vertical force variations of the earth's magnetic field which are expressed in gammas after multiplying by the appropriate scale factor. Sensitivity on the most sensitive scale is in the order of 40 gammas per scale division.

(c) Data Compilation and Presentation

The readings and the times and stations at which the readings were taken were recorded in a field book and transferred to a planimetric map for contouring after the necessary scale reading to gamma conversion was made as well as the durinal and day-to-day corrections. A detailed section west and south of Beverly Lake on the North Grid is shown on a scale of 1" = 200 feet for clarity. The survey results at large are plotted and contoured at a scale of 1" = 400 feet to correlate with the I. P. contour maps.

Where applicable, the magnetics are shown with the I. P. results in profile form at a vertical scale of 1" = 1,000 gammas.

(d) Discussion of Results and Interpretation

The relative vertical magnetic intensity varies from a low of -480 gammas on the western end of Line Sun B to a high of +7750 gammas just west of the west end of Beverly Lake (see detailed map)

This results in a total magnetic relief of 8,230 gammas over the area covered.

This magnetic contour map is roughly divided into two areas with the areas of interest occuring above the +500 gamma contour level.

The most outstanding feature is a north-north-westerly striking magnetic high at the west end of Beverly Lake shown on both the general and detail contour-values maps.

This anomaly occupies an area in excess of 800 by 1,400 feet and peaks to 5,800 and 7,750 gammas.

A profile BB' normal to strike indicates a vertical wide dike-like body of moderate to high magnetic susceptibility having a width of 300 feet centered at Stn. 37+00 N on Line 100E. The top of the causative source is thought to be within 50 of the ground surface and is likely terminated to the south by a fault or fault/contact striking Northeasterly through grid co-ordinates 104E; 24N.

Further coverage would be needed to discuss the other magnetic high features. However, there appears to be some correlation between higher magnetic responses and observed sulphide stringers in the Line 96E, Stn 17N area and to the northwest at the bend in the road. These areas are mentioned above under the I. P. profile discussion

The large low magnetic area occupying the rest of the North grid appears to be uninteresting and probably due to one rock type except for the small sub-high at Line 104E, Stn. 20N which correlates well with a chargeability high which appears to be due to a small granitic plug.

THE INDUCED POLARIZATION SURVEY

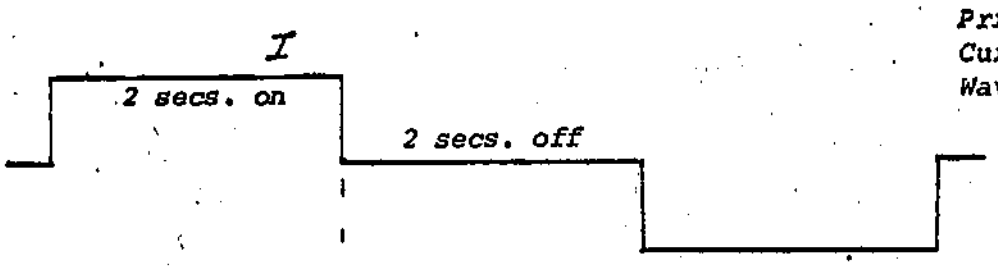
(a) Theory of Method Used

Induced Polarization refers to the polarized distribution of electrical charges throughout a medium to which an electric field has been applied.

When current is passed across an interface between an electrolyte and a metallic conducting body, double layers of charge build up at the interface creating the phenomenum known as "overvoltage" or the "I.P. effect".

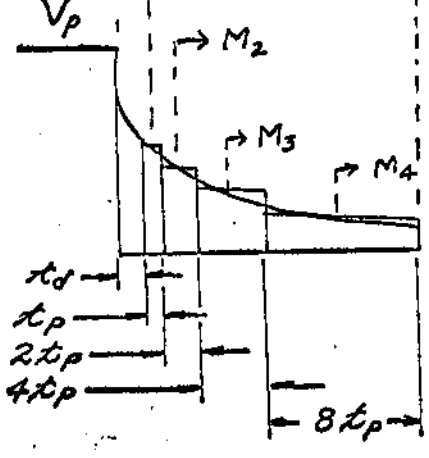
This effect can be used for the detection of conducting metallic material such as disseminated sulphides ("porphyry" copper deposits) or massive sulphides containing appreciable amounts of non-conducting sphalerite. Other materials likely to give rise to anomalous responses are pyrite, magnetite, specular hematite, graphite and certain clay-micas such as montmorillonite, vermiculite, saponite and bentonite.

In time-domain (Pulse) I.P., a transmitter injects an alternating square wave signal into the ground at two electrodes C_1 and C_2. The signal seen by the receiver at two other electrodes P_1 and P_2 provides an indication of the apparent chargeability (M_a). By observing the input current (I) and primary "on-time" voltage, (V_p) the apparent resistivity ρ_a is calculated using Ohm's Law and a geometric factor dependent upon the electrode array used and the units (ohm-meters or ohm-feet) desired.



Primary Current Waveform

$$M_1 = \sum_{1}^{N} \frac{\int_{t_d}^{(t_d+t_p)} V_s\,dt}{V_p t_p}$$



Transient Voltage Waveform

The polarization voltages established during the current "on" time decay (discharge) slowly during the current "off" time. The receiver amplifies and integrates the decay curve at four pre-selected positions in time, normalizes these amplitudes with respect to the primary voltage Vp and presents the results as M_1, M_2, M_3, and M_4 readings on digital display for logging.

The times at which the decay curve is sampled, are selected by means of a switch making it possible to obtain up to 56 distinct points on the decay curve.

This allows one to obtain the actual decay curve shape and to better estimate the size, depth and type of the causative source.

A further step which can be taken is to factor the decay curve to separate the unwanted electromagnetic transient coupling effects and background effects from the true overvoltage effects. This extends the usefulness of the I. P. method in areas of high overburden conductivity. It also assists the geophysicist in distinguishing between effects of metallic and nonmetallic conductive material, between oxides and sulphides, between large and fine-grained particules, and between massive and disseminated portions of a polarizable body.

(b) Theory of the 3-array Electrode Configuration

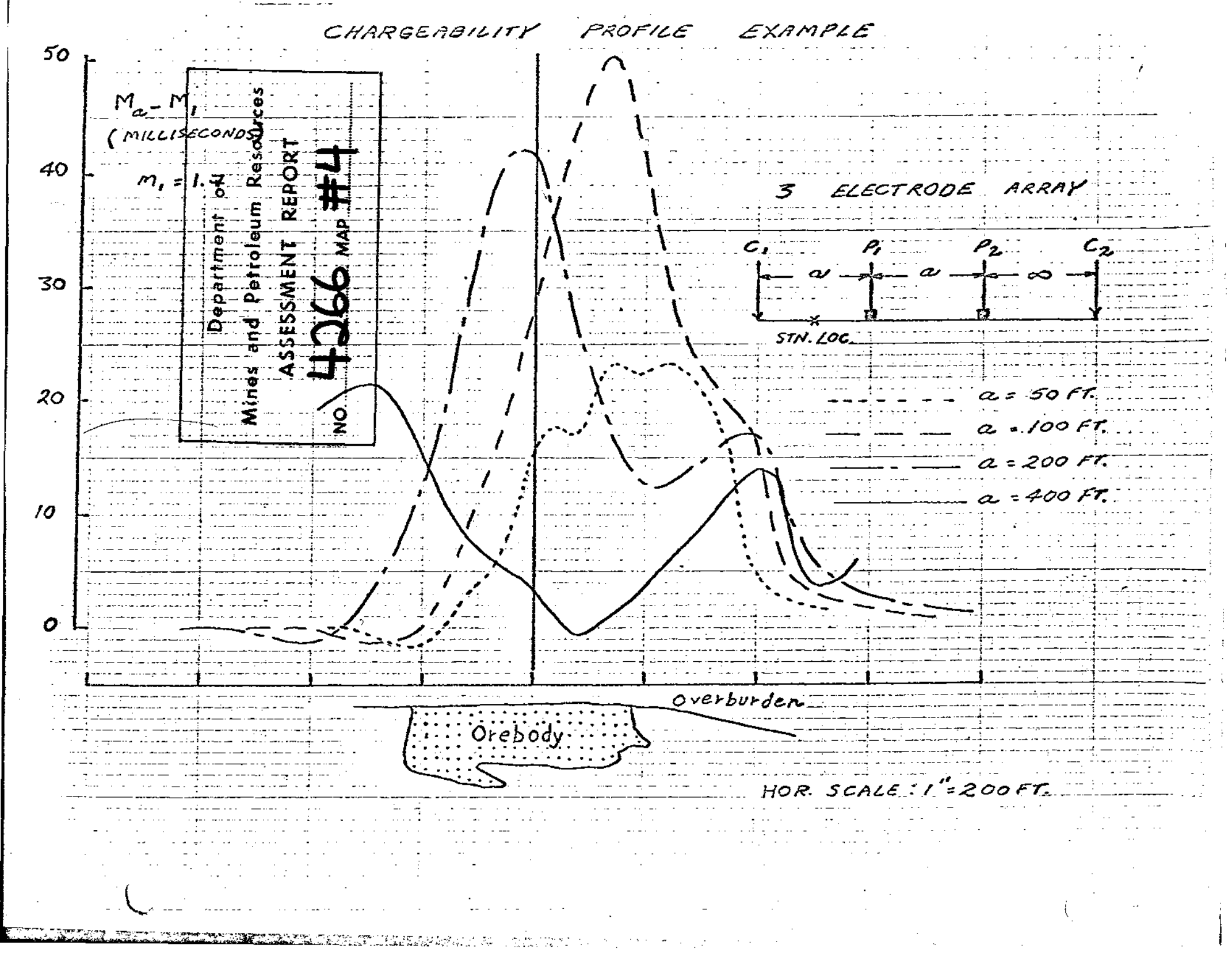
The I. P. response due to a particular distribution of polarizable material is dependent upon the electrode array employed, the geometry of the polarized body and its location relative to the array, and on the resistivity and polarization contrast between the body and surrounding environment.

Although anomalies are asymmetrical and the anomaly peaks do not always fall directly over the center of the causative source, the advantages of the 3-array more than outweigh this one disadvantage This array requires only three men on the survey line, has good depth penetration, responds well to both flat-lying and steeply-dipping bodies and permits a minimum number of electrode spacings to be used during reconnaissance surveying resulting in faster coverage.

As mentioned above, contour maps of the data should be treated with caution and are used to enhance the interpretation made primarily from the profiles. An example of a typical multiple electrode spacing response over a sulphide lens is included to illustrate the asymmetrical nature of this array as well as to point out the phenomenum of "double-peaking" which occurs when the electrode spacing is larger than the depth to the center of the body. The larger peak occurs when the first potential electrode (P_1) is in the vicinity of the body.

The maximum anomaly is obtained for the spacing equal to the depth to the center of an idealized sphere, although spacings of 3/4 to 1 1/2 times the depth give at least 90% of the maximum likely anomaly.

The use of two or more spacings gives a more reliable estimate of depth, attitude and continuity with depth. An accurate estimate of resistivity and polarization of the body cannot be made since the variables of size, conductivity, and polarizability cannot be separated, hence the term "apparent" chargeability is used.


CHARGEABILITY PROFILE EXAMPLE
50
40
30
20
10
0
$M_a - M_1$
(MILLISECONDS)
$M_1 = 1.$
Department of Mines and Petroleum Resources
ASSESSMENT REPORT NO. 4966 MAP #4
3 ELECTRODE ARRAY
C_1 P_1 P_2 C_2
a a ∞
STN. LOC.
a = 50 FT.
a = 100 FT.
a = 200 FT.
a = 400 FT.
Overburden
Orebody
HOR. SCALE: 1" = 200 FT.

(c) Field Procedure

(i) Electrode Configuration Used

A 3-electrode array was used whereby the current electrode C_1 and two potential electrodes, P_1 and P_2, were separated by a distance "a" from each other and moved in unision along the survey lines taking measurements at regular intervals. The second current electrode C_2 is fixed at "infinity" (∞) which is a minimum distance of 6a to the nearest station measured.

The station location is halfway between the current electrode C_1 and the nearest potential electrode P_1. All lines were surveyed with C_1 to the rear of the potential electrodes as the three men moved along the survey lines.

(ii) Measurements Taken in the Field

1. The Primary voltage Vp between the measuring (potential) electrodes during "current on".
2. The current flowing through the current electrodes C_1 and C_2.
3. Four pre-selected gates called M factors (M_1, M_2, M_3 and M_4) using timing settings of:

   (a) delay time t_d = 240 msecs.

   (b) Basic integration time t_p = 60 msecs.

   (c) Total integration time t_t = 900 msecs.

   (d) Basic period t_c = 8 secs. (2 secs. On and 2 secs. Off).

(d) Equipment Description and Specifications

(i) Receiver

The Huntec MKIII Receiver is a portable, remote sensing pulse-type instrument incorporating the following features:

- Adjustable timing cycle.
- Up to 56 distinct sample points measured on the decay curve.
- Automatic S.P. buck-out.
- Direct digital read out of Vp and M factors including sign.
- High noise rejection allows operation in Vp levels down to 30 micro volts with 0.1 micro volt resolution.
- Greater than 10 megohm input impedance.

Specifications

- Sensitivity: Vp = 10^{-7} to 10^{-6} volts for low noise 1% resolution.
  Vp = 10^{-6} to 10 volts for 0.1% resolution.
  Total Range 30 X 10^{-6} volts to 10 volts in 11 ranges.
- Self Potential: MAXIMUM ± 1 volt.
- Power consumption: 0.7 ampere at 12 volts.
- Dimensions: 16" x 9" x 5 3/4".
- Weight: 12.5 lbs. (without battery pack).

(ii) Transmitter - Alternator

The Huntec Pulse type transmitter alternator is a high-powered, 7.5 Kilowatt system utilizing the following:

- Solid state power control and switching mechanism.
- Produces high currents into low resistance loads.
- Accurate and adjustable timing using Crystal Clock.
- Voltage regulator with push-button field energizer.
- Dummy Load.
- 2 cylinder ONAN engine driving a Bendix alternator.

Specifications

1. *Transmitter*

   - *Output: 100 to 3,250 volts in 10 steps*
     16 amps maximum.
   - *Cycling Rates: Normally 2 sec. ON, 2 sec. OFF.*
   - *Dimensions: 21 in. x 17 in. x 17 in.*
   - *Weight: 75 lbs.*

2. *Alternator*

   - *Output: 18 K.V.A. 120/208 volts 3 phase 400 Hz.*
     52 amps/phase.
   - *Engine: 2 cylinder, 4 cycle, air-cooled 16.5 H.P.*
     ONAN at 3,600 R.P.M.
   - *Alternator: 3,600 R.P.M. direct driven Bendix with sealed bearings and rotating field.*
   - *Dimensions: 42 in. x 17 in. x 26 in.*
   - *Weight: 225 lbs.*

DATA PRESENTATION

(a) *Calculations*

(i) The apparent resistivity ρ_a *is calculated by dividing Vp by I and multiplying by a factor appropriate to the electrode array used and the ohm-meter units desired.*

(ii) The four M factors were weighted and added to obtain a single apparent chargeability parameter (called M_a *) for contouring purposes.*

$$M_a \begin{matrix} t_f \\ t_d \end{matrix} = t_p \, (M_1 + 2M_2 + 4M_3 + 8M_4) \times .01$$

where M_a *= milliseconds*

t_d *= initial delay time*

t_f *= final time at end of* $M_4 = t_d + 15\, t_p$

t_p *= integrating time of* M_1

(b) Profiles

The apparent chargeability M_a is plotted at a vertical scale of 1" = 10 msecs. and ρ_a is plotted at a vertical scale of 1 logarithmic cycle = 2 1/2 inches in ohm. meters.

All lines were surveyed using an "a" spacing of 200 feet and are plotted at a horizontal scale of 1" = 400 feet.

(c) Contours

All apparent resistivity and apparent chargeability values for electrode separations of 200 feet have been plotted on the values and contour maps at a horizontal scale of 1" = 400 feet.

The reader is cautioned as to the errors inherent within this type of data presentation which include:

(i) Upslope displacement of readings over steep terrain.

(ii) Grid bias or contour elongation due to rectangular sampling interval used.

(iii) "Double peaking" phenomenum in which causative source is located between "highs".

(iv) Some skewness of anomaly peaks due to assymetrical array used.

(v) Topographic or terrain effects in resistivity data.

DISCUSSION AND INTERPRETATION OF RESULTS

(a) General Comments

The survey was executed using an electrode separation "a" of 200 feet to provide adequate depth penetration for large targets while maintaining sufficient resolution to detect narrow, near-surface features of possible economic significance.

A lack of additional time did not allow for any detail over anomalous line segments nor was any effort made to determine the cause of the low chargeability response on Line 96E where up to 10% by volume sulphides are observed in outcrops.

It was felt that sufficient geological and magnetic information existed to augment the induced polarization interpretation to determine drill targets on the main interesting feature just west of Beverly Lake.

In retrospect it can be observed that the northerly striking grid lines were sub-parallel to the anomaly strike on the North grid resulting in difficulties interpreting the profiles, especially along Line 100E.

For this reason profile BB' is drawn at right angles to the contours and represents more accurately the attitude of the causative source. This profile is included in the text of this report following page 17. "The location of this profile BB' can be observed from the detailed magnetic contour map in the map pocket."

(b) Contour Maps - North Grid

(i) Resistivity Map

The resistivity portion of the survey results ranges in value from a low of 117 ohm-meters at the northwest edge of the survey area to a high of 7966 ohm-meters at Line 104E, Stn. 22N, resulting in a total relief of 7849 ohm-meters. Areas above 4,000 ohm-meters are stipled and areas below 500 ohm-meters are ticked. A logarithmic contour interval was used.

The high resistivity areas (2,000 ohm-meters) are thought to be caused by lamprophyre dikes or plugs and are probably related to increased fracturing.

The low along the north side of Beverly Lake (Sun A line) is primarily due to the close proximity of the Lake causing a high water content in adjacent thicker overburden. The contour pattern is complicated and distorted by varying line directions but the results indicate a NE fault through Line 104E; Stn. 23N and possibly another fault along the creek leading west from Beverly Lake.

No distinct resistivity pattern is observed over the coincident chargeability-magnetic anomaly just west of Beverly Lake although relatively low resistivities occur over most of this feature.

(ii) Chargeability Map

Chargeability values on the North grid varied from -5.6 to +50.3 millisecs. resulting in the complete or partial delineation of three anomalous areas of interest.

A background of 10 milliseconds has been assigned to the North grid survey area.

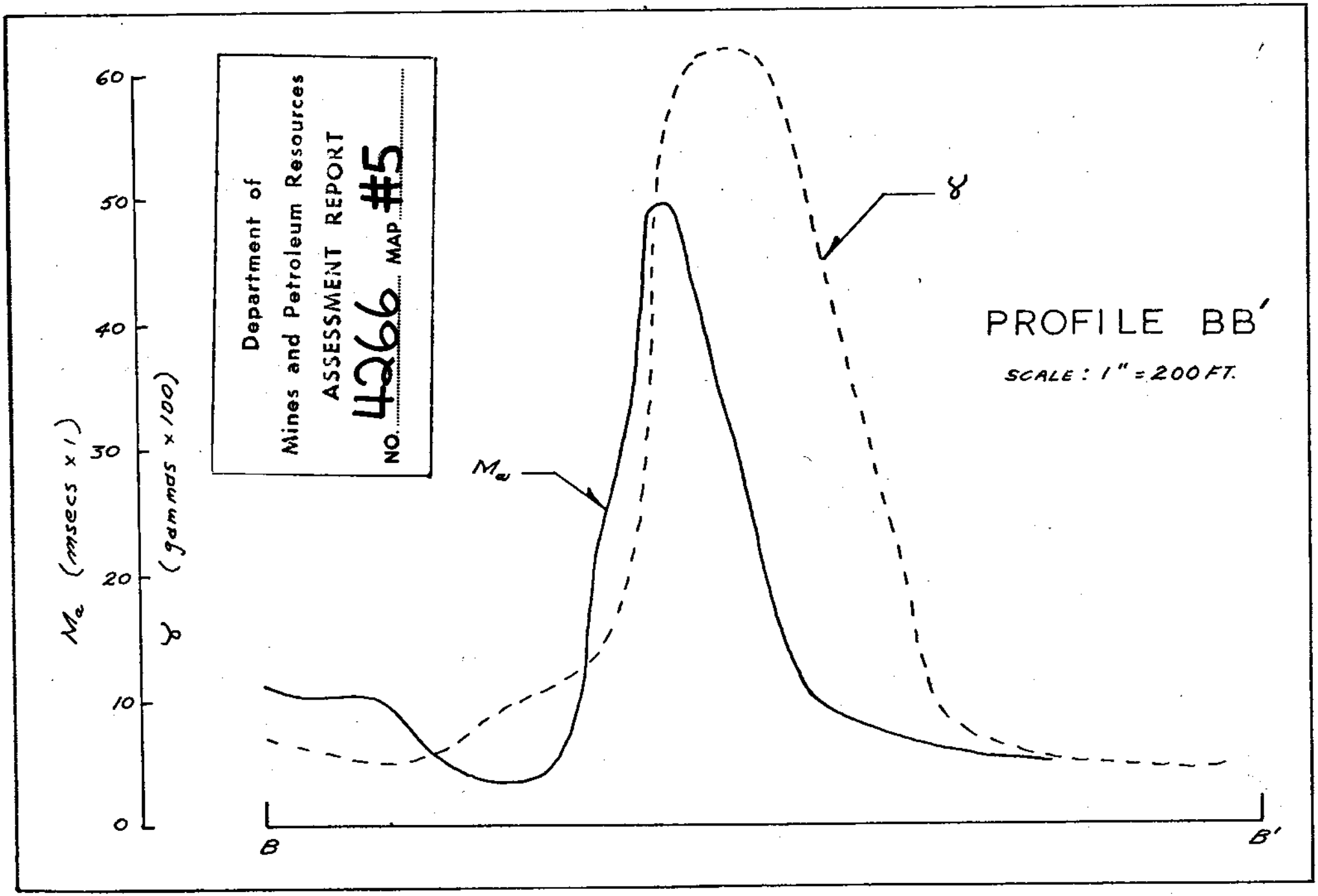
At present the most interesting I. P. feature is the high chargeability anomaly immediately west of Beverly Lake. It peaks to 50.3 and 49.1 milliseconds on line 100E which is sub-parallel to strike of the anomaly. Anomalous responses on adjacent Line 104E and the Sun A line (road) confirm and support the responses encountered on Line 100E.

An excellent ground magnetic correlation exists with this chargeability feature in an area of no outcrops but near exposed rocks containing appreciable amounts of sulphides including pyrrhotite. No magnetite has been found to date in the area either in place or in float.

The lateral dimensions of the coincident chargeability-magnetic anomaly are greater than 600 by 1,400 feet and it is still open to the north.

Another interesting but smaller chargeability high of 25.6 msecs. centered at Line 104E; Stn. 21N is virtually a "one-line" anomaly although one sub-anomalous reading on adjacent Line 108E allows these values to be contoured. Resistivities over 3,000 ohm-meters and magnetic susceptibilities from 500 to 850 gammas are coincident with this feature believed to be due to intrusive rocks, possibly a plug.

The third interesting area occurs on the western edge of the survey coverage near the bend in the access road. A peak of


Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4266 MAP #5
PROFILE BB'
SCALE : 1" = 200 FT.
M_a (msecs x 1)
γ (gammas x 100)
60
50
40
30
20
10
0
M_a
γ
B
B'

36.5 msecs was observed about 200 feet west of exposed dike (intrusive) rocks containing limonite and some sulphides. Although more coverage is needed in this area, the magnetic and resistivity data suggest that narrow, parallel dike-like bodies are the cause of the chargeability highs in this area. Negative chargeabilities on the north side of Beverly Creek opposite this anomaly are likely due to a fault sub-parallel and very near to the survey line.

A lack of anomalous chargeabilities and the presence of negative readings and very noisy receiving conditions on Line 96E in an area known to contain up to 10% by volume sulphides in stringers is disturbing. Either the mineralization is very local with no depth possibilities or the survey line was located along a structural break resulting in a serious local interuption of current flow.

(c) Profiles

(i) North Grid

Line 100E

The profile illustrated clearly the excellent magnetic-chargeability correlation suggesting that the causative source is due to a steeply dipping body 700 feet wide containing banded or bedded sections of pyrrhitite or magnetite.

As mentioned above the line is parallel to strike resulting in interpretive ambiguities. A profile BB' across the strike taken from

the contours is thought to represent more clearly the anomaly in section. The magnetic portion of profile BB' indicates a true width of 300 feet of homogeneous magnetic material of higher chargeability on the western half of the body.

The 100 foot displacement of the Ma peak west of the magnetic peak could be due to the assymetrical electrode array used or due to additional polarizable non-magnetic sulphides.

A fault is interpreted crossing Line 100E at Stn. 20N.

Line 104E

A chargeability anomaly peaking to 25.6 msecs at Stn. 21N is caused by polarizable material approximately 500 feet wide and appears to be cut off on the north by a fault passing through Stn. 23N on this line.

The remaining profile length is of little interest as it represents the flank of the magnetic-chargeability anomaly discussed in the contour map section above.

Line 108E

The 10.4 msec. peak at Stn. 19N is thought to be the eastern limit of the high feature discussed above (Line 104E). Again, line direction is poor. The magnetics are non-diagnostic with the 0 gamma contour running parallel to the survey line. A north-south geological contact is interpreted along this line from Stn. 15N to Stn. 27N where

it is deflected easterly by a northeasterly trending fault. The resistivity and magnetic relief north of this fault are due to the edge effects of the above mentioned high priority anomaly.

Line 112E

The chargeability portion of the profile is uninteresting having a high of only 7.1 msecs. at Stn. 27N which conforms to a knoll which is boardered to the west by a gulley and possibly cut off at the north (Stn. 30N) by the northeasterly trending fault mentioned on the other lines. Again the contour maps indicate a very poor line-direction.

Line 96E

This traverse was carried out over outcropping sulphides observed near Stn. 21N with very little chargeability response. Resistivity and magnetic profile data suggests a fault crossing the line at Stn. 18N and the contour data implies a fault zone striking parallel to this line.

The negative chargeability reading at Stn. 17N and the lack of a reading at 15N further testify to the likelihood of the intersection of two faults in this region. It is believed that an east-west survey direction would have yielded more substantial results in this area.

Line 26E

This E-W line was installed after experiencing difficulty in taking readings and because of ambiguous results in the N-S direction It was also surveyed to determine any possible connection between the two secondary chargeability anomalies to the northwest and southeast.

The chargeability profile indicates a broad sub-anomalous high centered at Stn. 7W. The resistivity data shows a corresponding bi-modal peak and the magnetics indicate a fault or fault contact at 8+50W.

No problems in taking readings were encountered on this line although no interesting high chargeability responses were found.

Line Sun B

This line was extended and surveyed to the west to determine the northern extent of the primary anomalous feature. Magnetic coverage is incomplete at this end of the line. The peak M_a value of 15.6 msecs. at Stn. 19W coincides with a subtle resistivity low and is interpreted as the diminishing northern portion of the main anomaly discussed above. A north-south fault is postulated at 13+50W.

Beverly Lake Road Traverse

This traverse was executed to test anomalous Cu geochemical values on the north side of the lake. No anomalous chargeability readings were encountered along this geochemical high. The anomalous M_a - γ feature at the west end was again crossed yielding a clean profile suggesting a vertical conductor 400 feet wide at Stn 19W. The resistivity

results are likely confused by the high water content of the ground along the lakeshore and by the westerly draining creek gulley. The dike system on the south road does not appear to cross the creek.

Line 30N & West Extension

This traverse followed the 30N tie-line west to Stn. 96E and then westerly along the south access road past the rusty outcrop on the bank of the road. The main anomaly crosses this line between Stns. 104E to 99E. A fault is apparent at Stn. 105E which could extend north across Beverly Lake.

A series of coincident narrow M_a *-* γ *highs are observed at the west of the gossan in the road bank. These responses are thought to be caused by a dike system containing zones of pyrite, pyrrhotite and chalcopyrite.*

(ii) Beer Grid

Line 2W

No anomalous responses were observed on this line although a slightly higher background was observed from Stn. 1N to Stn 4S.

Changes in resistivity values are thought to be caused by variations in terrain. A fault could cross the line at Stn 1S or the low could be simply due to swampy ground in this area.

Line 6W

This line too is geophysically uninteresting with only a slight chargeability rise occuring at Stn. 9S near a cat trench where minor sulphides are reported in andesitic rocks.

The resistivity low at 5S could represent a fault.

CONCLUSIONS & RECOMMENDATIONS

The geophysical surveys recently carried out over the North Grid have outlined an area greater than 500 by 1,500 feet which could be caused by a body of economic importance.

This coincident magnetic-chargeability anomaly is still open to the north but appears to be caused by a conductive, highly magnetic source striking north-northwest, steeply dipping and averaging 300 feet wide. The body appears to be more magnetic to the east where it could be terminated by a north-south fault crossing Beverly Lake. Overburden is estimated to not exceed 75 feet over this feature.

Although no outcrops occur within the borders of this anomaly geological, mineralogical and geochemical evidence collected in the immediately adjacent areas strongly suggest that the anomaly is located in a very favourable environment.

Other lower priority areas on the North grid have been partially delineated by I.P. but require further coverage using different line directions and spacings before drilling is contemplated.

Sufficient geophysical coverage has been carried out over the main anomaly at the west end of Beverly Lake to warrant drilling at this stage. Three angled holes averaging 250 feet long are recommended to test this anomaly. Exact locations and attitudes are to be determined after consultation with the project engineer.

Concurrently, exploratory drilling might be warranted in the Line 96E area between the other two chargeability anomalies in an attempt to determine continuity between them. This is the area where much difficulty in taking I. P. readings was experienced.

The other alternative is to do further I. P. work using other line directions and electrode configurations.

Considerable amounts of outcropping sulphides have also been observed in this area. Geological data indicates an northwest striking mineralized structure connecting the two chargeability highs.

In view of these initial encouraging results it is also recommended that the geochemical and geophysical coverage be extended south and southwesterly from the north grid to include the Beer #11 to #18 claims. Line orientation should be east-west.

Additional I. P. should also be carried out on the Sun #2, 4, 6 and 10 claims to test the copper geochemical highs above the north shore of Beverly Lake and to close off the main anomaly to the north.

COST ESTIMATE

To complete the recommended initial drilling and additional geochemical and geophysical exploration on Sun, Bet and Beer Claims, the following expenses are estimated, for a total of $ 30,340.00.

Diamond drilling - 1,200' @ $15.00/foot	$ 18,000.00
Linecutting and soil sampling - 10 miles @ $100.00/mile	1,000.00
Geochemical analysis - 520 samples @ $2.00/sample	1,040.00
Magnetometer Survey - 10 miles @ $80.00/mile	800.00
Induced Polarization Survey - 10 miles @ $450.00/mile	4,500.00
Engineering and Supervision	2,000.00
Administration, reports, contingencies	3,000.00
	$ 30,340.00

Respectfully submitted,

P. P. Nielsen, P. Eng.
Geophysicist

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
G. C. GUTRATH

G. C. Gutrath, B. Sc., P. Eng.,

PERSONNEL

Magnetometer Operator - S. Aikens

I.P. Crew

Geophysicist - operator	*- P.P. Nielsen*
Field Assistant	*- H. Huckson*
	- R. Kleinsjeck
	- H.P. Winzeler

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
TO WIT:

In the Matter of *COSTS INCURRED IN EXECUTING GEOPHYSICAL SURVEYS ON THE BEER, BET AND SUN CLAIMS OWNED BY ARAGON EXPLORATIONS LTD. (N.P.L.)*

I, *P. P. Nielsen,*

of *785 Premier Street, North Vancouver*

in the Province of British Columbia, do solemnly declare that *the following costs apply:*

1.	*Induced Polarization Survey* 5.3 miles @ $370/ mile	$ 1,960.00
2.	*Magnetometer Survey* 6 days @ $75/day	450.00
3.	*Consulting and Combined Geophysical Report*.....	480.00
	TOTAL	$ 2,890.00

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 *city* of *Vancouver*, in the Province of British Columbia, this 26th day of January, 1973, A.D.

P. P. Nielsen

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

STATEMENT OF AUTHOR'S QUALIFICATIONS

I do hereby state that:-

1. *I am the author of this report.*

2. *The magnetometer survey was not conducted by myself or Atled Exploration Management but the data appears to have been collected and compiled in an orderly,competent manner.*

3. *The Induced Polarization Survey was executed by Atled Exploration Management Ltd. under my personal field supervision.*

4. *I have been actively and responsibly involved in mining exploration using airborne, ground and computer techniques throughout Western Canada, the United States and Australia over the past seven years.*

5. *I graduated with a B.Sc. degree in Geophysics from the University of B. C. in 1969.*

6. *I am presently Manager, Geophysical Division, Atled Exploration Management Ltd. at #420 - 475 Howe Street, Vancouver, B. C.*

7. *I am a member of the C.I.M., S.E.G. and B.C.G.S.*

P. P. Nielsen

P. P. Nielsen

DATED at the City of Vancouver, Province of British Columbia, this 20th day of December, 1972.

ENGINEER'S CERTIFICATE

I, GORDON C. GUTRATH, of 3636 Lakedale Avenue, in the Municipality of Burnaby, in the Province of British Columbia, DO HEREBY CERTIFY:-

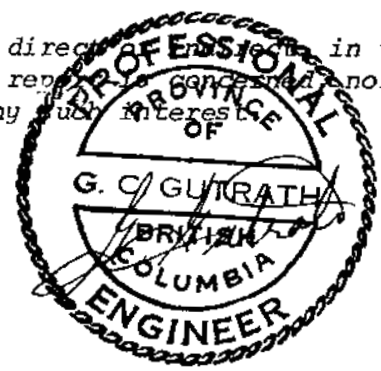
1. *That I am a consulting geologist with a business address of 420 - 475 Howe Street, Vancouver 1, British Columbia.*

2. *That I am a graduate of the University of British Columbia where I obtained my B. Sc. in geological science in 1960.*

3. *That I am a Registered Professional Engineer in the Geological Section of the Association of Professional Engineers in the Province of British Columbia.*

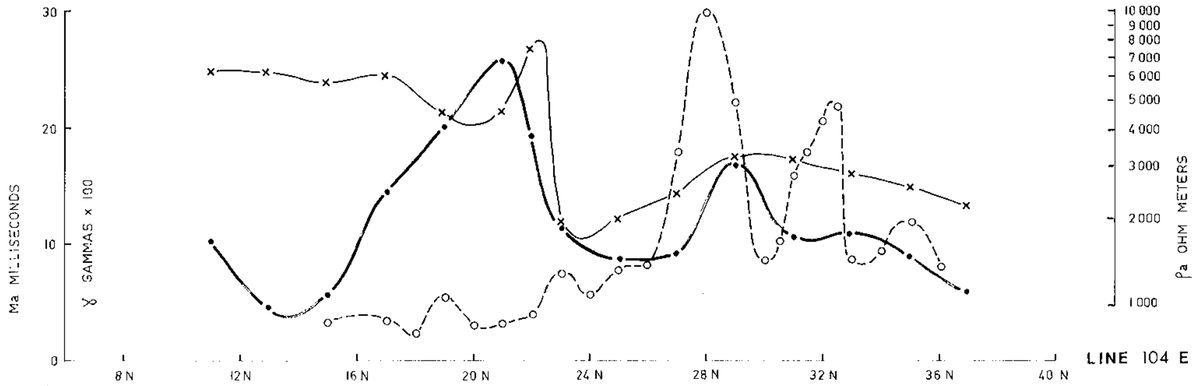
4. *That I have practised my profession as a geologist for the past ten years, and*

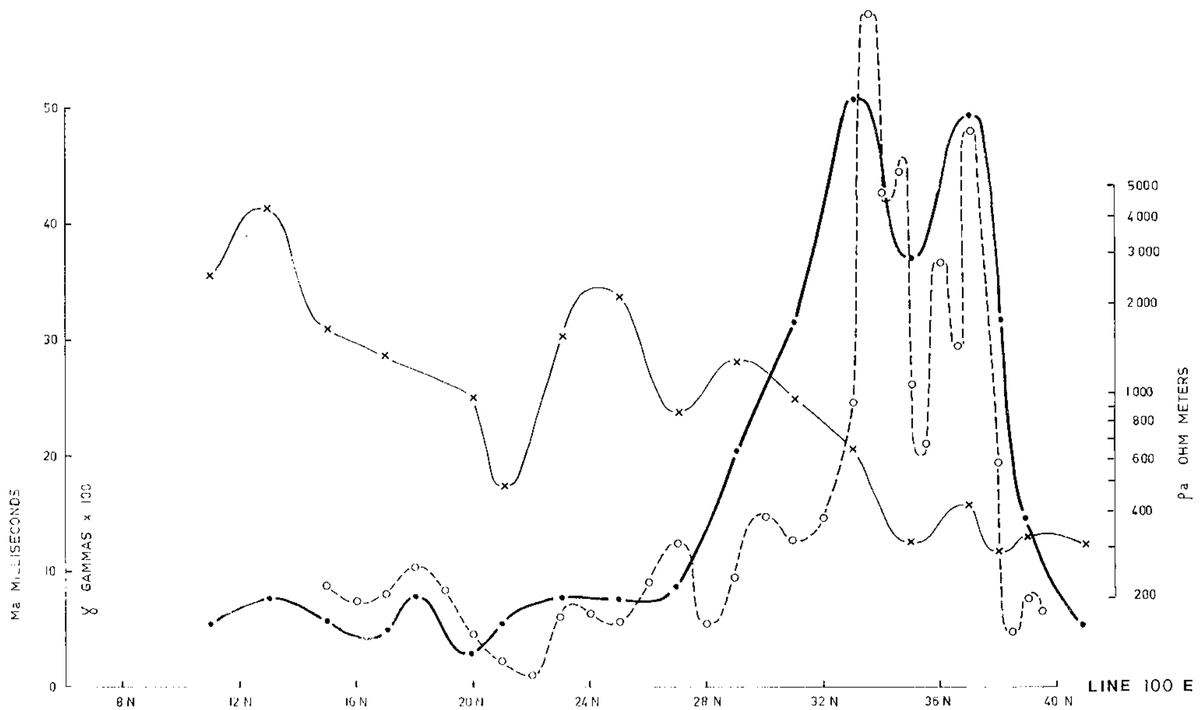
5. *That I have no interest, direct or indirect, in the property with which this report is concerned nor do I expect to receive any such interest.*



Gordon C. Gutrath, B.Sc., P.Eng.

DATED at the City of Vancouver, Province of British Columbia, this 20th day of Dec, 1972.



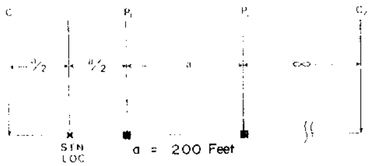


PROFILES - ~~NORTH GRID~~

APPARENT RESISTIVITY, CHARGEABILITY & MAGNETICS

LEGEND

THREE ELECTRODE ARRAY



CHARGEABILITY Ma (msecs.)

RESISTIVITY ρa (ohm meters)

MAGNETIC SUSCEPTIBILITY % (gammas)

INSTRUMENT SPECIFICATIONS

INSTRUMENT USED HUNTEC MK III & 7.5 KW TRANSMITTER

TRANSMITTER TIMING 2.0 SECONDS OFF & 2.0 SECONDS ON

RECEIVER INTEGRATING TIME 900 MILLISECONDS

RECEIVER DELAY TIME 240 MILLISECONDS

ARAGON EXPLORATIONS LTD. (N.P.L.)

BET & SUN CLAIMS

CANIM LAKE AREA, B. C.

CLINTON M.D. N.T.S. 92 P/15

400 feet 0 400 feet

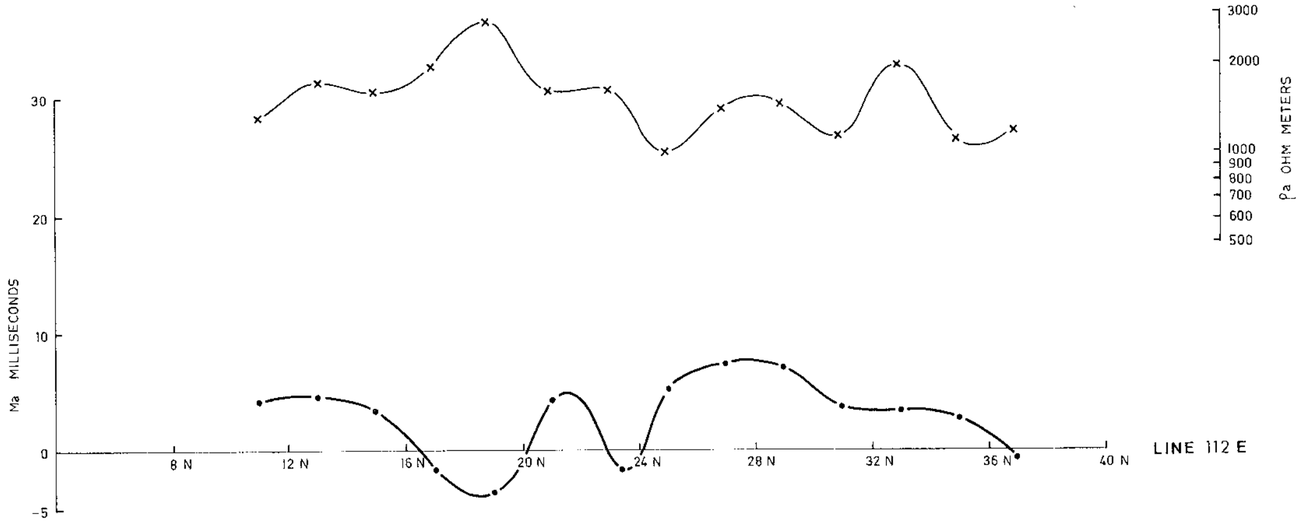
TO ACCOMPANY REPORT BY

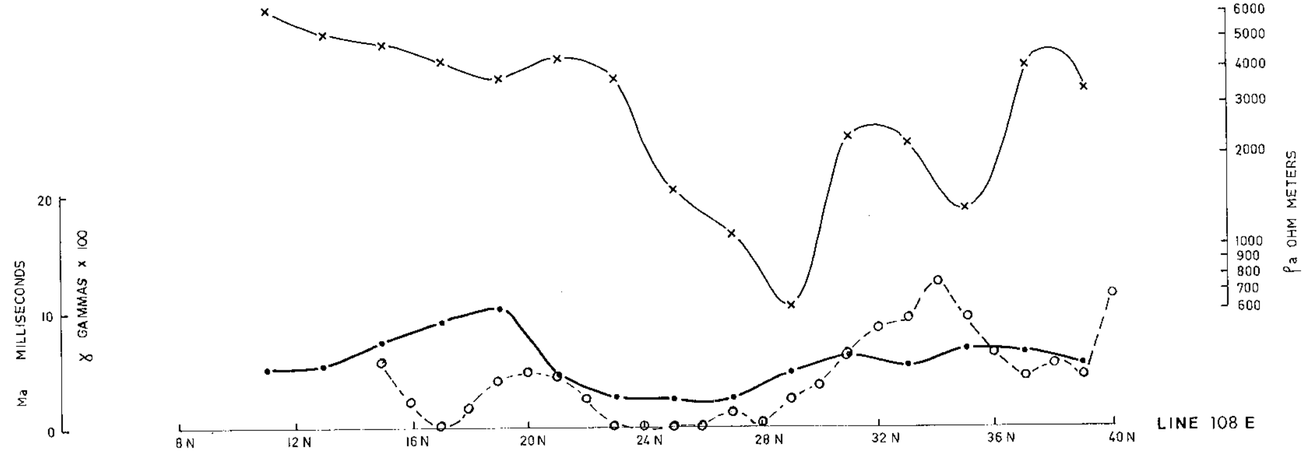
P.P. NIELSEN, B. Sc., GEOPHYSICIST

G.C. GUTHRATH, P. ENG., GEOLOGIST

ATLED EXPLORATION MANAGEMENT LTD.

NOVEMBER, 1972 VANCOUVER, B.C. DRAWN BY



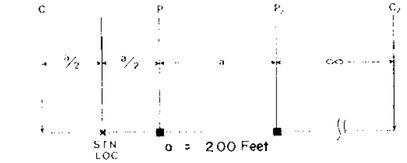


PROFILES - ~~NORTH GRID~~

APPARENT RESISTIVITY, CHARGEABILITY, & MAGNETICS

LEGEND

THREE ELECTRODE ARRAY



CHARGEABILITY Ma (msecs.)

RESISTIVITY ρa (ohm meters)

MAGNETIC SUSCEPTIBILITY χ (gammas)

INSTRUMENT SPECIFICATIONS

INSTRUMENT USED HUNTEC MK III & 7.5 KW TRANSMITTER

TRANSMITTER TIMING 2.0 SECONDS OFF & 2.0 SECONDS ON

RECEIVER INTEGRATING TIME 900 MILLISECONDS

RECEIVER DELAY TIME 240 MILLISECONDS

ARAGON EXPLORATIONS LTD. (N.P.L.)

BET & SUN CLAIMS

CANIM LAKE AREA, B.C.

CLINTON M.D. N.T.S. 92 P/15

400 feet 0 400 feet

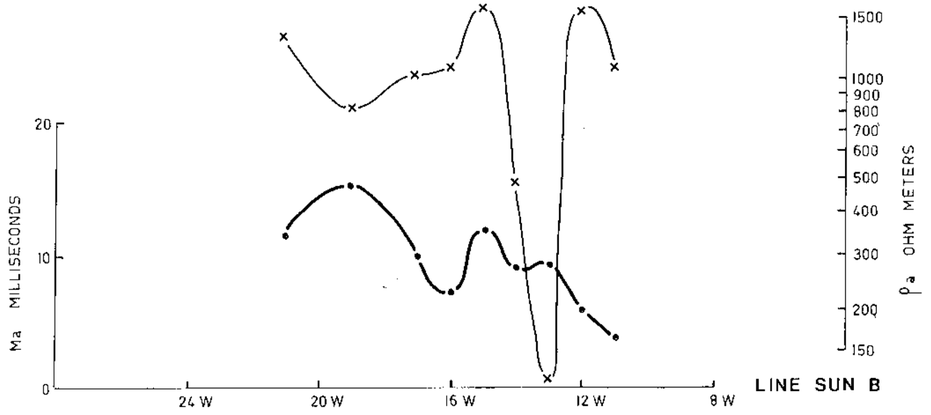
TO ACCOMPANY REPORT BY

P.P. NIELSEN, B.Sc., GEOPHYSICIST

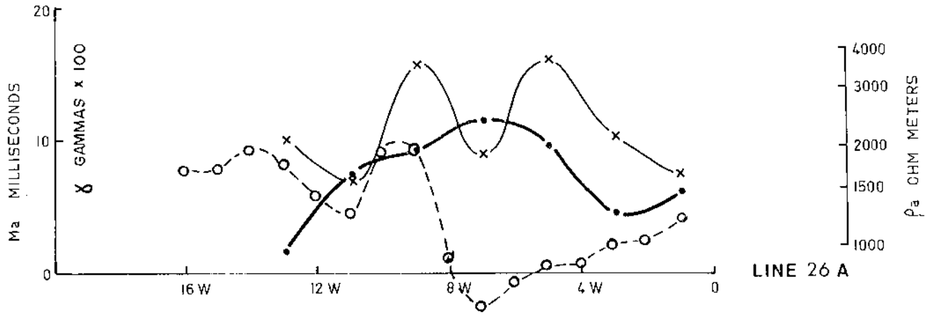
G.C. GUTHRATH, P. ENG., GEOLOGIST

ATLED EXPLORATION MANAGEMENT LTD.

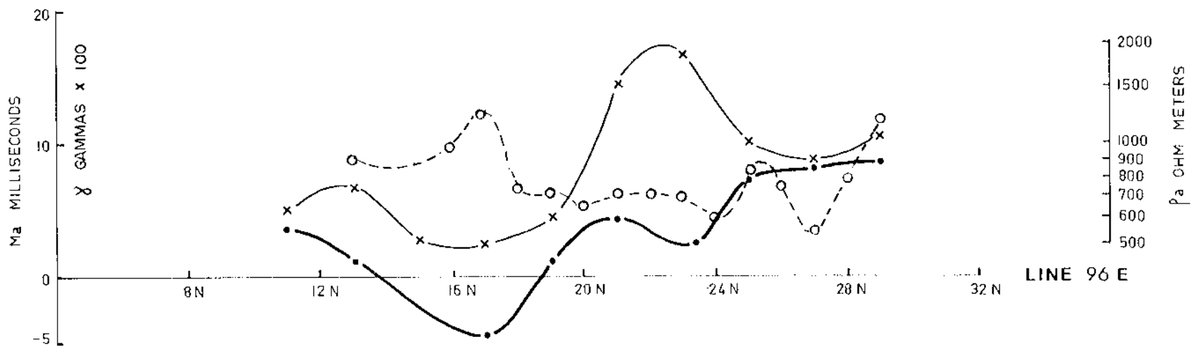
NOVEMBER, 1972 VANCOUVER, B.C. DRAWN BY: [illegible]



LINE SUN B



LINE 26 A

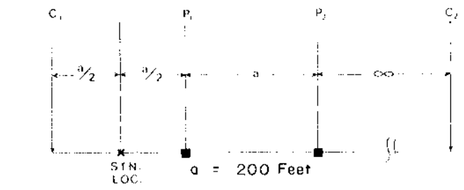


LINE 96 E

PROFILES - NORTH GRID

APPARENT RESISTIVITY, CHARGEABILITY & MAGNETICS

THREE ELECTRODE ARRAY



CHARGEABILITY Ma (msecs.)

RESISTIVITY ρa (ohm meters)

MAGNETIC SUSCEPTIBILITY γ (gammas)

INSTRUMENT SPECIFICATIONS

INSTRUMENT USED HUNTEC MK III & 7.5 KW TRANSMITTER

TRANSMITTER TIMING 2.0 SECONDS OFF & 2.0 SECONDS ON

RECEIVER INTEGRATING TIME 900 MILLISECONDS

RECEIVER DELAY TIME 240 MILLISECONDS

ARAGON EXPLORATIONS LTD. (N.P.L.)

BET & SUN CLAIMS

CANIM LAKE AREA, B.C.

CLINTON M.D. N.T.S. 92 P/15

400 feet 0 400 feet

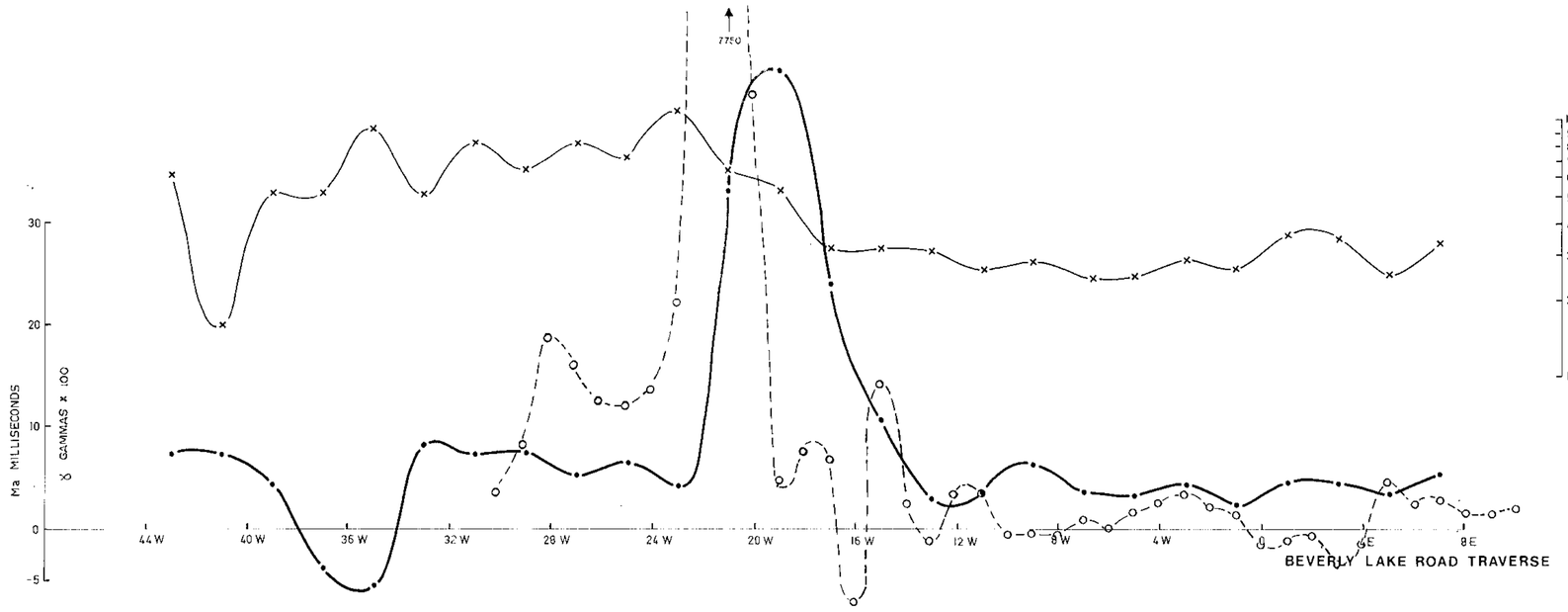
TO ACCOMPANY REPORT BY

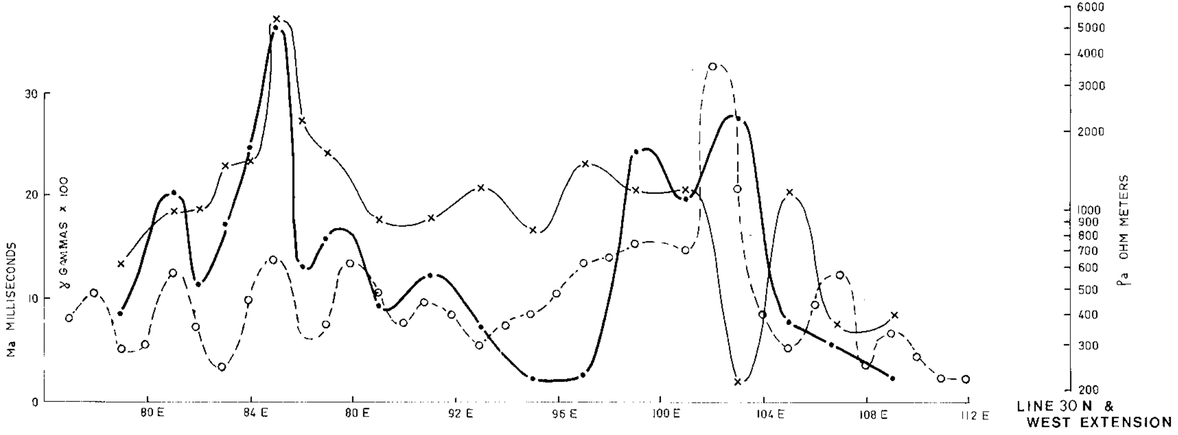
P.P. NIELSEN, B.Sc., GEOPHYSICIST

G.C. GUTHRATH, P.ENG., GEOLOGIST

ATLED EXPLORATION MANAGEMENT LTD.

NOVEMBER, 1972 VANCOUVER, B.C. DRAWN BY: NCL



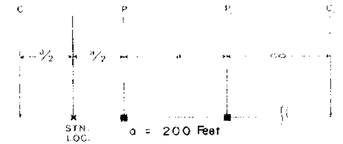


PROFILES - NORTH GRID

APPARENT RESISTIVITY, CHARGEABILITY & MAGNETICS

LEGEND

THREE ELECTRODE ARRAY



CHARGEABILITY Ma (msecs.)

RESISTIVITY Ωa (ohm meters)

MAGNETIC SUSCEPTIBILITY γ (gammas)

INSTRUMENT SPECIFICATIONS

INSTRUMENT USED HUNTEC MK III & 7.5 KW TRANSMITTER

TRANSMITTER TIMING 2.0 SECONDS OFF & 2.0 SECONDS ON

RECEIVER INTEGRATING TIME 900 MILLISECONDS

RECEIVER DELAY TIME 240 MILLISECONDS

ARAGON EXPLORATIONS LTD. (N.P.L.)

BET & SUN CLAIMS

CANIM LAKE AREA, B.C.

CLINTON M.D. N.T.S. 92 P/15

400 feet 0 400 feet

TO ACCOMPANY REPORT BY

P.P. NIELSEN, B. Sc., GEOPHYSICIST

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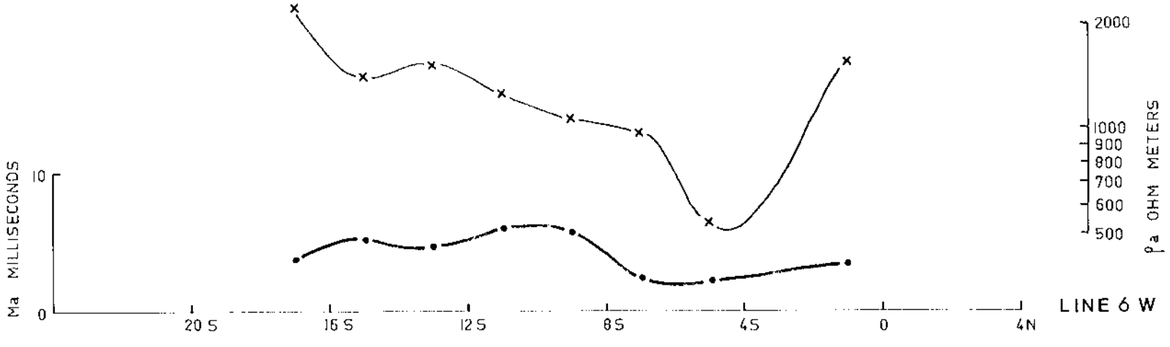
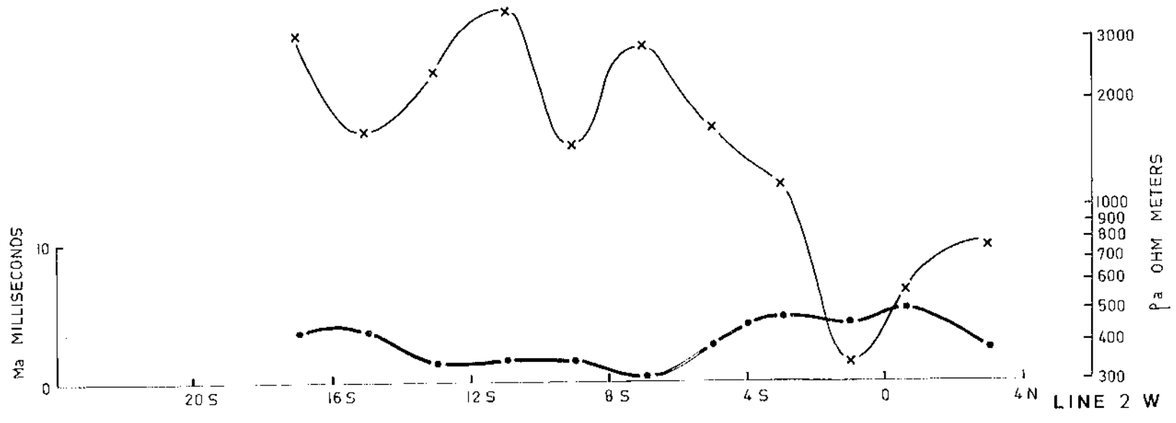
ATLED EXPLORATION MANAGEMENT LTD.

NOVEMBER, 1972 VANCOUVER, B.C. DRAWN BY



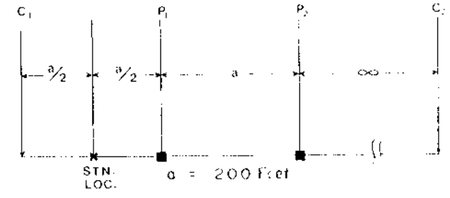


PROFILES - BEER GRID

APPARENT RESISTIVITY, CHARGEABILITY & MAGNETICS

LEGEND

THREE ELECTRODE ARRAY



CHARGEABILITY Ma (msecs.)

RESISTIVITY ρa (ohm meters)

MAGNETIC SUSCEPTIBILITY χ (gammas)

INSTRUMENT SPECIFICATIONS

INSTRUMENT USED: HUNTEC MK III & 7.5 KW TRANSMITTER

TRANSMITTER TIMING: 2.0 SECONDS OFF & 2.0 SECONDS ON

RECEIVER INTEGRATING TIME: 900 MILLISECONDS

RECEIVER DELAY TIME: 240 MILLISECONDS

ARAGON EXPLORATIONS LTD. (N.P.L.)

BEER CLAIMS

CANIM LAKE AREA, B. C.

CLINTON M.D. N.T.S. 92 P/15

400 feet 0 400 feet

TO ACCOMPANY REPORT BY

P.P. NIELSEN, B. Sc., GEOPHYSICIST

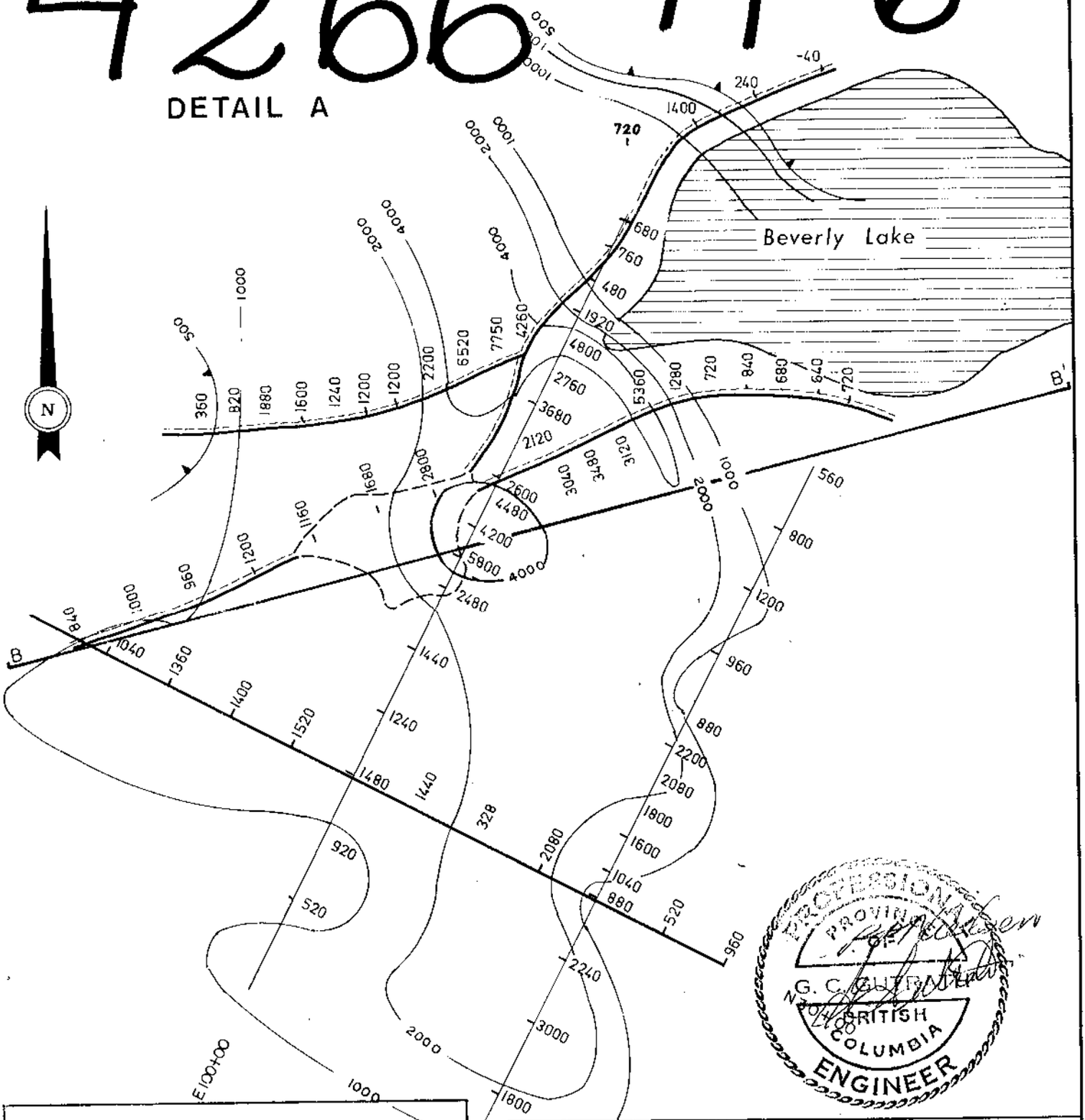
G.C. GUTHRATH, P. ENG., GEOLOGIST

ATLED EXPLORATION MANAGEMENT LTD.

NOVEMBER, 1972 VANCOUVER, B.C. DRAWN BY

4266 M-6

DETAIL A



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4266 MAP #6

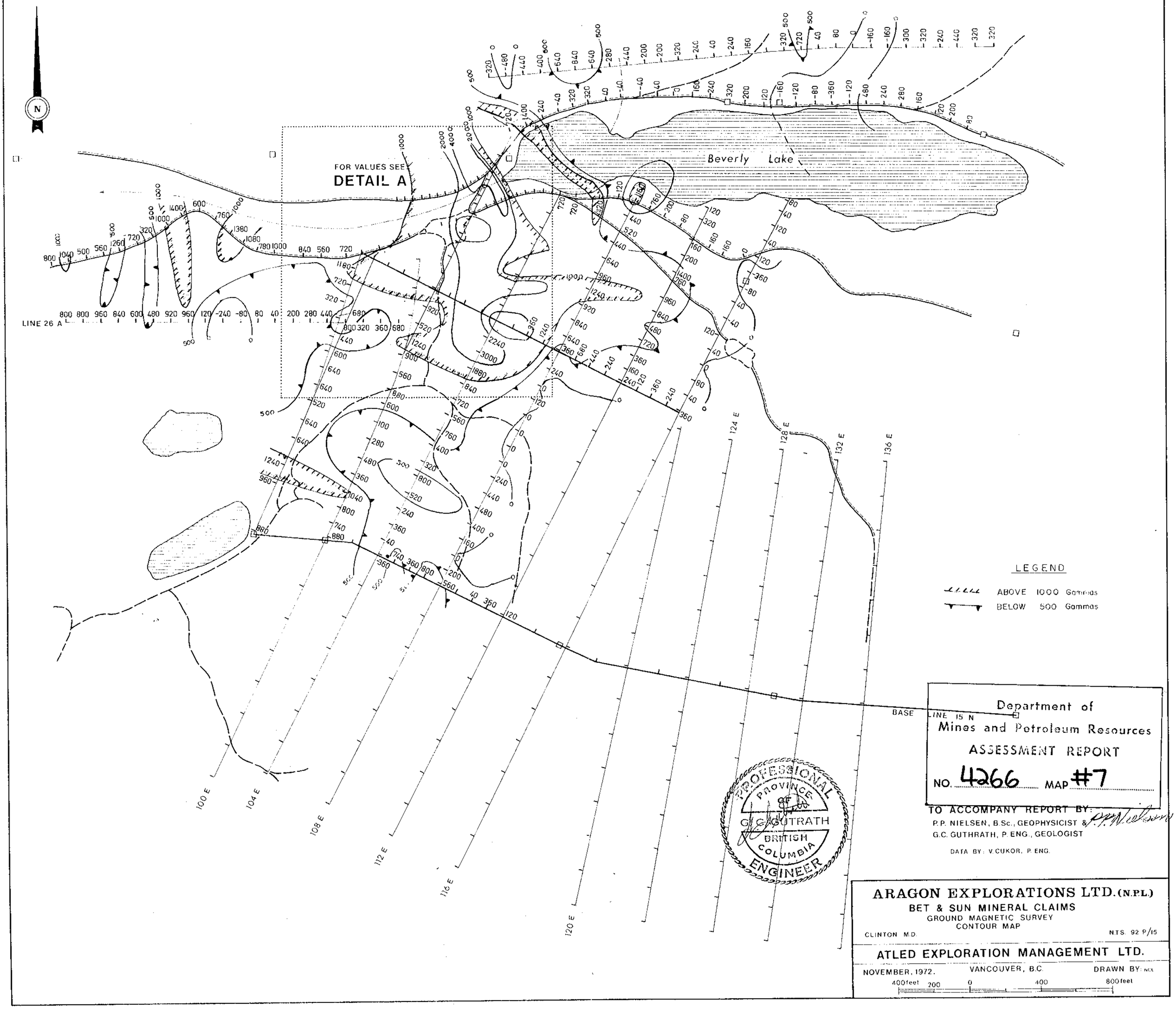
ARAGON EXPLORATIONS LTD. (N.P.L.)
BET & SUN MINERAL CLAIMS
GROUND MAGNETIC SURVEY
CONTOUR MAP

CLINTON M.D. N.T.S. 92 P/15

ATLED EXPLORATION MANAGEMENT LTD.

NOVEMBER, 1972 VANCOUVER, B.C. DRAWN BY: NCL

200 feet 0 200 feet



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4266 MAP #7

TO ACCOMPANY REPORT BY:
P.P. NIELSEN, B.Sc., GEOPHYSICIST &
G.C. GUTHRATH, P. ENG., GEOLOGIST

DATA BY: V.CUKOR, P. ENG.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
G.C. GUTHRATH

ARAGON EXPLORATIONS LTD. (N.P.L.)

BET & SUN MINERAL CLAIMS
GROUND MAGNETIC SURVEY
CONTOUR MAP

CLINTON M.D. N.T.S. 92 P/15

ATLED EXPLORATION MANAGEMENT LTD.

NOVEMBER, 1972. VANCOUVER, B.C. DRAWN BY: NCL

400 feet 200 0 400 800 feet

Beverly Lake

SUN B

LINE 26 A

BASE LINE 15 N

30 N

N.R.

100 E

104 E

108 E

112 E

116 E

120 E

LEGEND

C_1 P_1 P_2 C_2

a/2 a/2 a

STN. LOC.

THREE ELECTRODE ARRAY
a = 200 feet

CONTOUR INTERVAL { BELOW 20 MSECS 5 MSECS
ABOVE 20 MSECS 10 MSECS

AREA OF HIGH RELATIVE CHAGEABILITY

10

AREA OF LOW CHARGEABILITY

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4266 MAP #8

TO ACCOMPANY REPORT BY:
P.P. NIELSEN, B.Sc., GEOPHYSICIST &
G.C. GUTHRATH, P.ENG., GEOLOGIST

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
G. C. GUTHRATH

INSTRUMENT USED:
HUNTEC MK III RECEIVER & 7.5 KW TRANSMITTER

ARAGON EXPLORATIONS LTD. (N.P.L.)

BET & SUN MINERAL CLAIMS

INDUCED POLARIZATION SURVEY
APPARENT CHARGEABILITY VALUES &
CONTOUR MAP

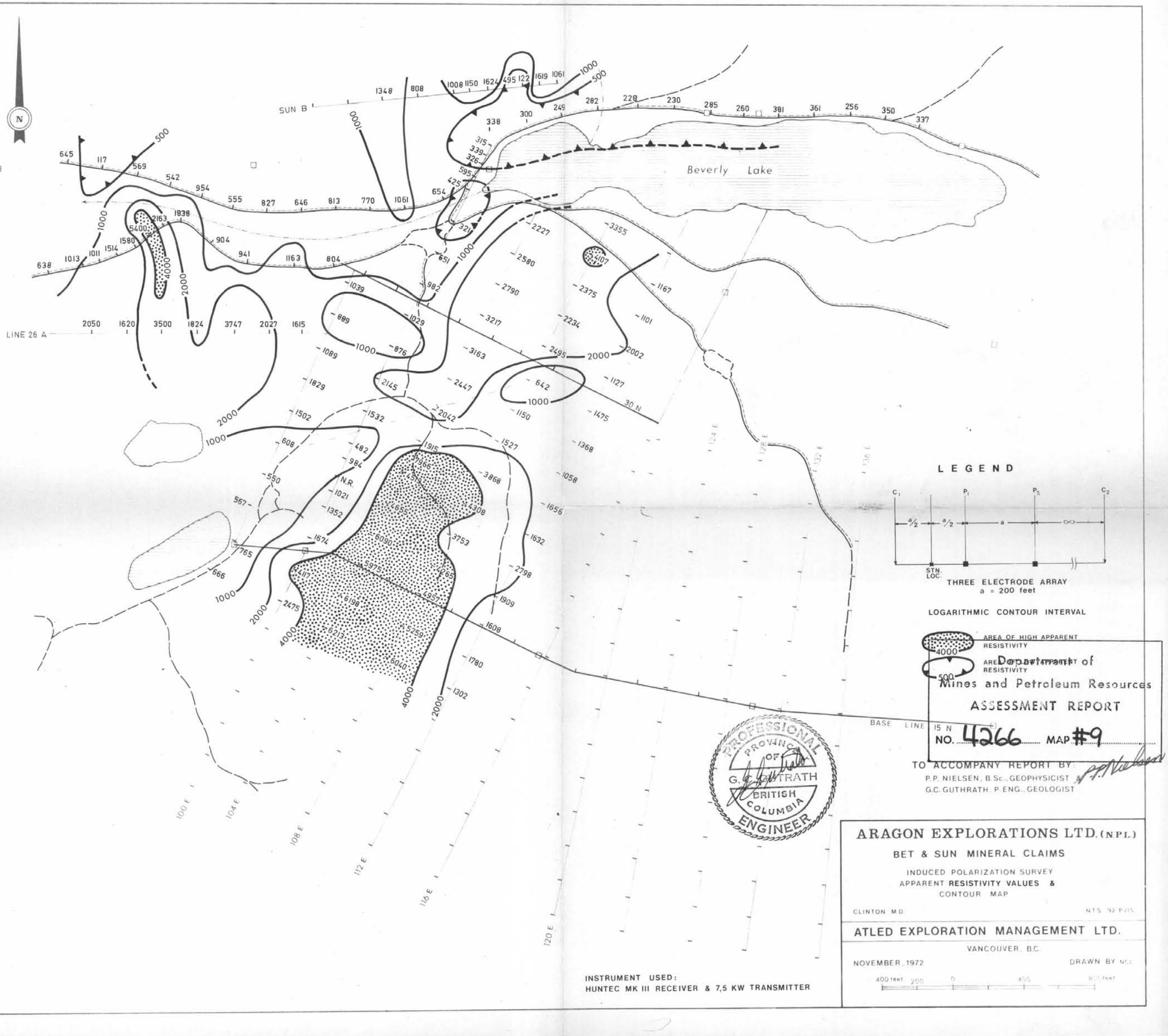
CLINTON M.D. NTS 92 P/15

ATLED EXPLORATION MANAGEMENT LTD.

VANCOUVER, B.C.

NOVEMBER, 1972 DRAWN BY: NCL

400 feet 200 0 400 800 feet



TO ACCOMPANY REPORT BY:
P.P. NIELSEN, B.Sc., GEOPHYSICIST
G.C. GUTHRATH, P.ENG., GEOLOGIST

ARAGON EXPLORATIONS LTD. (N.P.L.)

BET & SUN MINERAL CLAIMS

INDUCED POLARIZATION SURVEY
APPARENT RESISTIVITY VALUES &
CONTOUR MAP

CLINTON M.D. NTS 92 P/15

ATLED EXPLORATION MANAGEMENT LTD.

VANCOUVER, B.C.

NOVEMBER, 1972 DRAWN BY N.C.L.

400 feet 200 0 400 800 feet