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INTRODUCTION

Between 19th June and 28th October, 1965, combined ground electromagnetic, magnetic and seismic surveys were carried out in an area to the south of Moosonee, Ontario, by Huntec Limited for Argor Explorations Limited.

The geophysical program was directed from Moosonee by F. H. Faulkner, R. K. Watson, W. J. Scott and P. E. Lane for varying durations. The project was supervised from Toronto by Mr. Watson. In addition, eight other Huntec personnel were employed at some time in the field. The periods of employment of all personnel employed on this project and report are shown in the Appendix. The report was typed and drafted in the Toronto office of Huntec Limited.

The ground geophysical program consisted of magnetometer, electromagnetic (E. M.) and seismic surveys over anomalous areas selected from aerial magnetometer and E. M. surveys flown by Canadian Aero Service Ltd. These anomalous areas were selected by the client.

The report is in two parts, Part I dealing with the anomalies within the concessions, Part II with anomalies on after-acquired ground.

PROPERTY AND LOCATION

The claims lie within the coordinates 50^{o}N 80^{o}W, NW approximately 26 miles south of Moosonee, Ontario.

The claims surveyed were:

Beta Anomaly

L90909-10, L90903-4, L90899-900

Delta A

L90954-57, L90961-64

Delta B

L90754-56, L90922-24, L90960, L90967, L90974

Delta C

L90975-79, L90990-94, L90997-91000, L91004-7

Delta D

L90809-10, L90800-01, L90791-2

Delta E

L90813-4, L90804-5

Argor 8

L94394-6, 94397-9, 94400-4

SURVEY SPECIFICATIONS AND INTERPRETATION PROCEDURES

Electromagnetic Surveys

Dip Angle Method

In the dip angle electromagnetic method a transmitter coil produces a primary field which induces a current in an earth conductor. The induced current produces a secondary field and by tilting a receiver coil until a minimum signal is obtained the "dip angle" is measured, i. e. direction of the combined primary and secondary field.

Three units were used in dip angle surveys. These were the Sharpe SE 100, with a frequency of 1000 cycles per second (cps); McPhar SS-15, with frequencies of 1000 and 5000 cps; Crone J. E. M. with frequencies of 480 and 1800 cps. The SE 100 unit was used in all the dip angle surveys except where otherwise stated.

The first two units are of the vertical loop type in which the transmitter is a loop of wire mounted with its plane vertical and connected to a motor-generator set. The primary field is produced by the loop, the plane of which is pointed toward the receiver coil which is carried along lines at distances from 400 feet to 1200 feet from the transmitter.

The Crone J. E. M. unit consists of two coils, both of which can be transmitter or receiver. These are carried along the lines connected by a cable and by orienting the coils and using each alternately as receiver and transmitter, the dip angle for each coil is obtained and the mean is taken.

Across a conductor dip angle values will be a minimum on one side and a maximum on the other side of the axis. The inflexion point or "crossover" between the maxima and minima will be the location of the main current axis.

The data are presented as profiles in which the dip angles to the left are plotted furthest from the transmitter at a vertical scale of 1 inch to 20° and a horizontal scale of 1 inch to 200 feet.

Depth calculations to the conductor axis are inexact as they are based on assumptions of the shape and depth extent of the conductor. Quality of the conductor is likewise indeterminate as the main criterion is the amplitude of the plotted dip angles, which is not only affected by depth of burial of the conductor axis but also by the transmitter-receiving coil separation and strike-length of the conductor. Hence, a shallow conductor near the receiving coil will give a large dip angle reading, but so will a weak conductor at greater distance from the transmitter.

All depths calculated from vertical loop data represent the depth to the conductor axis as opposed to the top of the conductor.

Overburden conductors give a typical profile of slowly increasing dip angles to each side of and away from the crossover.

The profiles are graded strong, medium or weak depending on the combination of amplitude, transmitter-receiver distance and curve-shape.

There are instances in which there is doubt whether the crossover is caused by an overburden or bedrock conductor. Such cases are indicated by an appropriate symbol on the map. Crossovers thought definitely due to overburden effect are not indicated.

Horizontal Loop Method

The equipment used was the Ronka Mark IV unit which has a 4 watt alternating signal of 876 cps.

In this method, two horizontally oriented coils are carried along the line separated by a 300 or 200-foot cable. One coil transmits the primary field which will induce a secondary current in any earth conductor in the vicinity. The in-phase and out-of-phase components of the secondary field produced are compared to the primary field components. The secondary field is measured as a percentage of the primary field and data is plotted at a vertical scale of one inch to 20% and a horizontal scale of one inch to 200 feet.

The typical anomaly for a good conductor is negative and has in- and out-of-phase components in the ratio of 2:1 or better. However, ratios as low as 1:1 have been experienced over sulphide deposits.

Readily distinguishable anomalies are sometimes caused by coil shortening, tilted coils, swamps, lakes and high concentrations of magnetite. The latter will give positive readings on the in-phase component and negative readings on the out-of-phase component.

Turam Method

The unit used was the Type 1182 Turam manufactured by A. B. E. M. of Sweden.

In this method, the primary field is produced by an alternating signal of 220 or 660 cycles per second. This is produced by passing a current from a motor-generator through a rectangular loop of wire of dimensions ranging from 1000 feet square to 2800 feet by 2000 feet laid on the ground.

The receiver is carried down the lines which run at 90^{o} to the longside of the loop. It consists of 2 coils connected by a 100-foot cable and measures, by means of a compensator-amplifier, the field strength ratios and phase differences between the two coils.

The results are presented as profiles in which the vertical scale is 1 inch to 0.2 field strength ratio and 1 inch to 10^{o} phase, and the horizontal scale is 1 inch to 200 feet.

A good conductor may normally be considered as one in which the ratio of field strength to phase is of the order of 3 to 1. Where phase anomalies occur with no field strength ratio anomaly, the cause is probably an overburden conductor. In cases where loops have been laid on each side of the suspected conductor, it has been possible to predict the dip of the conductor.

A grading of anomalies is based on the shape of the profile as well as the amount of phase. Generally, the greater the phase, the less conductive the causative body.

Depth calculations are based on measurements made on the field profiles and give the order of depth to the conductor axis.

Magnetometer Surveys

The Jalander magnetometer was used in all ground magnetometer surveys. Readings were taken to the nearest 10 gammas when plotted.

Where possible, the susceptibility for the rock type has been calculated.

Seismic Surveys

The Huntec FS-2 shallow refraction seismograph using electric seismic detonators and dynamite as the wave source, was used to determine depth of overburden.

The depths are shown on the magnetometer contour map.

Correlation

A "major interpreted conductor" axis shown on the magnetic maps represents the most likely location or locations of the bedrock conductor based on all the available geophysical data. Being self-explanatory, it is not mentioned in the text of the interpretations.

INTERPRETATION, CONCLUSIONS AND RECOMMENDATIONS

BETA ANOMALY

The anomaly was investigated by magnetometer and vertical loop and Crone J. E. M. surveys.

INTERPRETATION

Magnetometer Survey

There is low magnetic relief over the grid. The main feature is an east-west trending zone which is discontinuous due to faulting. It could represent a faulted intrusive of slightly higher magnetite content than the rocks which it intrudes, or simply a magnetite-rich band in volcanic or gneissic country rocks.

Vertical Loop Survey

There are several conductor axes of medium or weak strength.

Conductors numbered 1 and 2 are of medium intensity and strike east-west. Number 1 extends between Lines 28W and 32W and depth determinations give 210 feet and 270 feet on respective lines. Conductor 2, displaced southward from Conductor 1, has an estimated depth on Line 24W of 200 feet at a point between two seismic determinations which give depth to bedrock as 118 feet at Station 3+00N and 163 feet at Station 1+00S.

Conductor 3 extending between Line 16W and 12W is weaker, maintains an east-west strike and is offset southward from the strike of 2 by 150 feet.

Conductors 1, 2 and 3 form a set of en-echelon axes each 400 feet in length and set progressively southward from west to east. They could conceivably be connected to form a continuous conductor.

Conductor 4 of poor to medium quality stretches 800 feet from Line 48W to Line 40W with an east-west strike which curves to the north toward Line 40W. The depth at Line 48W is estimated at 280 feet.

There are other isolated possible conductor axes on Line 60W, Line 36W and 8W. On Line 36W the two interpreted weak axes could possibly be interpreted as a single conductor approximately midway between the two. Such an interpretation would suggest a continuous conductor from Line 40W to 28W and possibly longer. The poor conductor on Line 8W at Station 1+50S could form a continuation of Conductor 3.

Crone J. E. M.

No anomalies were detected with this unit.

Correlation

There is a marked coincidence between the vertical loop conductor axes and the interpreted magnetic body.

If Conductors 1, 2 and 3 are connected, the resulting axis tends to follow strike of the magnetic anomaly.

CONCLUSIONS

An electromagnetic conductor varying in depth from 100 feet to 300 feet to its axis coincides with a magnetic anomaly possibly representing an intrusive or a more magnetic band in volcanic or gneissic country rock, which in two places is in the order of 100 feet deep. The conductor is believed to represent sulphides and/or graphite in association with magnetite.

RECOMMENDATIONS

A diamond drill hole is recommended to intersect a target at 250 feet beneath Station 2+00N on Line 20W.

DELTA ANOMALY

DELTA GRID A

Magnetometer, horizontal loop and vertical loop surveys were conducted over the grid.

INTERPRETATION

Magnetometer Survey

The main magnetic feature is a narrow dike-like zone of high magnetic intensity running approximately north-south across the area, curving eastward at the north end. Apart from this, there are several other zones of higher intensity, all of which have a generally north-south trend. There is a possibility that faulting has caused displacement of the dike feature between Lines 28S and 36S and between Lines 20S and 24S.

It is notable that out of ten occurrences of outcrop, seven coincide with zones of higher magnetic intensity. Hence, the magnetic anomalies may be due partly to shallowing of the overburden, but most probably involve a rock type containing a higher percentage of magnetite which is of more resistant nature, and has been differentially weathered.

The anomalies are considered to be associated with narrow, basic intrusions such as diabase dikes, which have been cross-faulted in a number of places.

Vertical Loop Survey

There are three probable bedrock conductors, all of moderate strength.

Conductor 1 trends N 20° S for 800 feet from Station 1+50E on Line 44S to Station 0+00 on Line 36S. The conductor may continue southward to Line 48S. The conductor appears to lie at a depth of the order of 100 feet.

Conductor 2 has a slightly curved strike in a north-south direction between Line 20S and Line 12S. Three calculations give varying depths of 350 feet, 90 feet and almost at surface. The latter depth is on Line 16S at Station 3+50W. Outcrop is seen at Station 1+00W, so the possibility of very shallow overburden at Station 3+50W is good.

Conductor 3 occurs at about Station 2+00W on Line 28S. It may extend southward to Line 32S. A depth calculation suggests that it should be close to surface. The nearest occurrence of outcrop is 500 feet away.

It is possible that the three conductors link up to form a single conductor which would have an irregular strike. The evidence for this is only slight.

Horizontal Loop

Three horizontal loop conductors (A, B and C) coincide more or less with the vertical loop conductors described above. With the exception of Conductor B, they occur only in the out-of-phase component and must therefore be considered to be of very low conductivity.

Conductor B shows a ratio of 2.2 on Line 16S and a positive in-phase component on Line 20S which would normally be considered a susceptibility effect but in this case is most probably an error due to cable shortening.

The lack of in-phase component on most of the conductors may be partly the result of extreme overburden thickness, as depth determinations from the vertical loop data suggest extremely variable overburden conditions.

Correlation

There seems to be a rough relationship between the electromagnetic conductors and the magnetic anomalies.

In the cases of Conductors 1 and 3, they are positioned near the flanks of magnetic anomalies. Conductor 2 is roughly coincident with a magnetic high over half of its strike length. The correlation between vertical and horizontal loop anomalies is quite good.

CONCLUSIONS

The parallelism of the E. M. conductor axes and the magnetic anomalies suggests that they are controlled by the same geologic structures, such as a system of north-south faults or shears. The very low (or zero) horizontal loop anomalies indicates conductivity of the type normally associated with electrolytic conduction in overburden or bedrock shears.

The one good horizontal loop conductor on Line 16S is believed to represent conducting sulphides in association with magnetite.

RECOMMENDATIONS

One diamond drill hole is recommended to intersect Conductor B at a depth of 150 feet at Station 3+50N on Line 16S. Its direction should be from west to east.

DELTA B GRID

Magnetometer, horizontal loop and vertical loop surveys were conducted over the grid.

INTERPRETATION

Magnetometer Survey

The dike feature described in Grid A is continuous across Grid B, swinging from a northeast-southwest trend at Line 0 to a north-south direction in the northern half of the grid.

Paralleling this to the west are three other magnetic highs of dike-like form and striking north-south.

There are no recorded occurrences of outcrop.

All of the magnetic features are believed to be associated with diabase dikes or other narrow basic intrusions.

Vertical Loop Survey

There are two interpreted bedrock conductors striking approximately north-south.

Conductor 1 extends from Line 28N to Line 40N with a possible continuation as far as Line 48N. The strongest anomaly lies on Line 32N at Station 4+50E and is probably close to bedrock surface. Other depth calculations on Line 28N and Line 40N give depths as 140 feet and 210 feet respectively.

Conductor 2, extending between Lines 16N and 20N, gives widely varying depth estimates, being less than 90 feet and 200 feet respectively.

Horizontal Loop Survey

Two horizontal loop E. M. anomalies correspond closely with the vertical loop conductors. Ratios of 3.3 are recorded on Lines 16N and 32N as Conductors A and B. The horizontal loop data indicate discontinuities in these conductors on Lines 20N and 36N and the continuations of the conductors beyond these points are referred to as A-1 and B-1 respectively.

Correlation

The horizontal loop and vertical loop conductors are almost exactly coincident where the two occur on the same lines. Also the E. M. anomalies are coincident with the magnetic anomalies although there is no E. M. conductor along the main dike-like magnetic feature.

This correlation is different to that of the Delta A anomaly where the E. M. conductors flank the magnetic anomalies. Nonetheless, the magnetic anomalies still apparently control the E. M. conductors.

CONCLUSIONS

A number of electromagnetic conductors, some with a fairly high ratio, and evidence of both good width and good conductivity, are probably structurally related to the north-south trending magnetic anomalies of dike-like form. In some instances the conductor may come to shallow depth, if not to bedrock surface. The conductors are believed to represent massive sulphides and/or graphite, in association with magnetite, in basic intrusions.

RECOMMENDATIONS

Two diamond drill holes are recommended.

D. D. H. #1 Line 16N dipping 45° to the east to intersect a target at 100 feet beneath Station 0+00.

D. D. H. #2 Line 32N dipping at 45° to the east to intersect a target at 120 feet beneath Station 4+50E.

DELTA C GRID

The grid has been covered with magnetometer, vertical loop and horizontal loop surveys.

INTERPRETATION

Magnetometer Survey

There are two magnetic trends:

a) roughly northwest-southeast of relatively high intensity,

b) north-south of much weaker intensity.

There are three distinct zones of higher intensity, M_1, M_2, M_3, all of which probably dip to the southwest and are probably due to the same rock type. M_1 and M_2 are probably part of the same structure, which may be faulted at about Line 28S and again just east of Line 48S. M_3 has a rather irregular outcrop although it is still elongate. All three zones probably represent basic intrusions into generally acid country rocks.

The weaker (and narrower) magnetic trends, M_4 and M_5, have a definite north-south strike and appear to intersect and traverse the northwest-southeast trend. They are almost certainly dikes (probably diabase), intruded after the other intrusions, along north-south faults or planes of weakness.

Vertical Loop Survey

There are five possible bedrock conductors which could be caused by sulphide mineralization.

Conductor 1 is strong to medium intensity, has a possible strike length of 1900 feet and is most strongly anomalous on Lines 48S and 56S on which depths of 160 feet and 170 feet have been calculated respectively.

Conductor 2 has a strike length of 600 feet and is of weak intensity. This may be due to the masking effect of adjacent anomalies. It has the same strike direction as Conductor 1.

Conductor 3 also has the same strike direction as Conductors 1 and 2, except at the northern end where it may swing northward. Alternatively, it could continue to Line 32S. On this conductor, the intensity of the anomalies varies from strong to weak, the strongest lying on 36S and 40S. A depth calculation gives 125 feet on Line 36S. The length of the axis is about 1200 feet.

Conductor 4, of medium intensity, is of uncertain length. Its minimum length is 400 feet in a north-south direction but it may curve at its southern end and extend to Line 32S. The depth at 1E on Line 28S may be of the order of 85 feet. Seismic determinations at 0 and 2E give overburden depths as 30 feet and 12 feet, respectively.

Conductor 5 has a strike north-south and has a medium intensity with a possible depth on Line 20S of 220 feet.

Horizontal Loop Survey

There are three strong conductors, plus several weak ones which could in part be caused by magnetite concentrations in the underlying rocks.

Conductor A of 600 feet strike length in a northwest-southeast direction has a strong to medium intensity and has a ratio of 2.0.

Conductor B with north-south strike of 400 feet has a medium intensity and a ratio of 2.1. It extends between 28S and 24S.

Conductor C of medium to strong intensity strikes roughly northwest-southeast between Lines 16S and 12S, and has a ratio of 1.7.

Isolated anomalies occur at Station 2+00E on Line 16S and at 4+00W on Lines 52S and 56S. These are believed to be caused partly by magnetite and partly by conducting material.

At Station 0+00 and 2+00E on Line 36S are two weak anomalies which have the typical characteristics of susceptibility anomalies and occur over two strong magnetic highs.

Correlation

The electromagnetic axes are almost certainly related to the magnetic anomalies since the former parallel the latter and are generally in the vicinity of the magnetic anomalies on the flanks.

The strongest horizontal loop conductors are in exact coincidence with the vertical loop axes. The horizontal loop Conductor C was not covered adequately by the vertical loop survey. It correlates with part of one of the magnetic zones interpreted as a north-south dike.

Conductor 1 lying outside the area covered by magnetometer and horizontal loop surveys should also be considered as a significant conductor.

CONCLUSIONS

Strong vertical loop conductors are corroborated in most instances by horizontal loop data.

The conductors appear to be related to the same geological structures that have controlled the basic intrusions and dikes.

They are believed to represent massive sulphides with or without graphite; in some cases in association with magnetite.

RECOMMENDATIONS

Two drill holes are recommended, as follows:

D. D. H. #1 Line 28S at 45° to intersect a target below Station 1+00E at 150 feet.

D. D. H. #2 Line 36S at 45° to intersect a target beneath Station 9+00E at 200 feet.

Further drilling of Conductor 1 and C should follow the results of these holes.

DELTA D GRID

Magnetometer and vertical loop surveys were carried out on this grid.

INTERPRETATION

Magnetometer Survey

A weak, narrow magnetic high runs approximately northwest-southeast across the area. The strike is slightly sinuous. The breaking of the 1000-foot contour into small units is probably due to the anomaly coinciding with the base line rather than evidence of faulting.

The anomaly is believed to represent a basic intrusion, probably a diabase dike or a narrow gabbro or peridotite body.

Vertical Loop Survey

Cross-overs are present from Line 12S to Line 4N. On Line 6N and Line 8N, the existence of a conductor is undertain. Depth determinations are very variable from 20 feet on Lines 4N and 0 to 200 feet on Line 8S. In the case of the latter line and Line 4S, there is some evidence from the curve shape that the conductor may dip to the west.

Correlation

There is good correlation between the vertical loop conductor axis and the magnetic anomaly from Line 12S to Line 0 over which distance the variations in strike of electromagnetic and magnetic anomalies are coincident. The conductor axis diverges from the magnetic trend after Line 0, the former lying further to the east.

The magnetic survey did not extend beyond Line 4N, so the doubtful vertical loop conductors cannot be correlated.

CONCLUSIONS

The electromagnetic conductor is definitely related to a narrow intrusive body, probably a diabase dike. The source of conductivity may be metallic (such as sulphides and/or graphite) or electrolytic (such as water in a fault, coincident with the dike).

RECOMMENDATIONS

The conductor should be re-examined by the horizontal loop method on Lines 0 and 4S before any drilling is carried out.

DELTA E GRID

Magnetometer, vertical loop and Turam surveys were used to investigate the anomaly.

INTERPRETATION

Magnetometer Survey

The area is of generally low magnetic relief but two distinct anomalies are present, one in the northeast corner and the other in the region of the base line near Line 8S. The former has a northwest-southeast strike and may be part of a steep-sided intrusive; the latter may be due to a plug-like mass of slightly higher magnetite content. There is a strong likelihood that it is faulted in a north-south direction in the vicinity of Line 2W. It appears that this magnetic body lies at very shallow depth.

Vertical Loop Survey

A medium to weak conducting zone extends from Line 12S to Line 8N. It is made up of three conductors referred to as Conductors 1, 2 and 3.

Conductor 3 is a weak conductor, at least 800 feet long, striking north-south and terminating between Lines 0+00 and 4S.

Conductors 1 and 2 are weak to medium, about 800 feet long, Conductor 1 being open at its south end. They may be the extension of Conductor 3 which has split into two branches. Interpreted depth is 120 feet on Lines 4S and 12S.

Turam Survey

The Turam and vertical loop anomalies are exactly coincident. The conductors are referred to as Conductors A, B and C, Conductor A appearing to be the strike extension of Conductor C.

The strongest Turam anomaly is located at Station 0+50W on Line 4S, shows a conductor at an approximate depth of 120 feet probably dipping westward. Comparison of phase and ratio components at this point indicate a moderately conductive zone, possibly of considerable width. Elsewhere, the ratio response is quite weak, and the conductivity is believed to be low. A seismic depth determination between Stations 1+00W and 3+00W on Line 8S gives a depth to bedrock of 44 feet.

Correlation

The Turam and vertical loop conductors coincide well with one another and with the magnetic grain of the area. Turam conductors A and B correspond roughly in strike and position to shallow magnetic features, and terminate at the same point between Lines 0 and 4S as do these features. Conductor C has some minor magnetic correlation.

CONCLUSIONS

The conductors occur in a manner suggesting quite close correlation with the underlying rocks. They are believed to be caused by sulphide mineralization in formational contacts, faults or shears. The conductors are quite variable in both form and strength, the only zone of significant width and conductivity occurring in the vicinity of Line 4S.

RECOMMENDATIONS

A diamond drill hole is recommended on Line 4S at Station 2+00W dipping 45° to the east, to intersect the conductor axis at 0+50E at a depth of 250 feet.

ARGOR 8 ANOMALY

Magnetometer and vertical loop surveys were conducted over the anomaly.

INTERPRETATION

Magnetometer Survey

The grid is crossed from north to south by a broad region of low magnetic intensity. In each corner of the grid the magnetic intensity increases, coinciding with outcrop. A very approximate extrapolation of the bedrock topography would give a depth of 150 feet to 200 feet in the vicinity of the base line.

Vertical Loop Survey

There are three conductor axes which are more likely to be bedrock conductors than others which are present.

Conductor 1 lies to the west, off the area covered by the magnetometer survey. It has a northeast-southwest strike and may be considered of medium strength. The calculated depth of the conductor is 70 feet on Line 36S and 200 feet on Line 28S. It is most probable that overburden is present over the area at which the 200-foot calculation is made. All other probable or possible conductors are in the region covered by overburden.

Conductor 2 has an irregular strike in a predominantly north-south direction. The crossovers are of large amplitude, width and often with more than one possible inflexion point. This could be due to parallel, closely spaced conductors, possibly of the electrolytic type found in overburden. This also leads to uncertainty of the location of the conductor axis.

Conductor 3 has a northeast-southwest trend of 400 feet from Line 40S to Line 36S with possible continuation to Line 32S. It is of very weak amplitude.

Conductors 4 and 5 are very weak and may represent conditions in the overburden.

Correlation

Generally, the interpreted E. M. conductors have a northeast-southwest trend and are within the area covered by overburden.

CONCLUSIONS

There is a strong possibility that the conductors may be caused by overburden conditions. Depth calculations from the broad crossovers would give depths of the order of 400 feet. If the crossovers represent several closely spaced conductors, the individual conductors would not be of very great strength.

Only Conductor 1 should be considered of prime interest.

RECOMMENDATIONS

Conductor 1 should be investigated further by the Turam method before diamond drilling.

SUMMARY OF RECOMMENDATIONS

ANOMALY	TYPE OF SURVEY	RECOMMENDATION
Beta	Magnetometer	Diamond Drilling
	Vertical Loop	
	Dip Angle	
Delta A	Magnetometer	Diamond drilling
	Horizontal Loop	
	Vertical Loop	
Delta B	Magnetometer	Diamond drilling
	Horizontal Loop	
	Vertical Loop	
Delta C	Magnetometer	Diamond drilling
	Horizontal Loop	
	Vertical Loop	
Delta D	Magnetometer	Horizontal loop survey
	Vertical Loop	
Delta E	Magnetometer	Diamond drilling
	Vertical Loop	
	Turam	

ANOMALY	TYPE OF SURVEY	RECOMMENDATION
Argor 8	Magnetometer	Turam Survey
	Vertical Loop	

HUNTEC LIMITED

for N. R. Paterson, Ph. D., P. Eng.

P. E. Lane, B. Sc.

APPENDIX

INSTRUMENTS

The following geophysical instruments were used:

(a) Jalander magnetometer.

(b) Crone J. E. M. dual frequency (480 and 1800 cps) electromagnetic unit.

(c) Sharpe SE 100 single frequency (1000 cps) electromagnetic (vertical loop) unit.

(d) McPhar SS 15 dual frequency (1000 and 5000 cps) electromagnetic (vertical loop) unit.

(e) Ronka Mark IV single frequency (876 cps) electromagnetic (horizontal loop) unit.

(f) ABEM 1182 Turam dual frequency (220 and 660 cps) electromagnetic unit.

(g) FS-2 seismograph.

CLAIMS COVERED

Beta Anomaly: L90909-10, L90903-4, L90899-900.

Delta A: L90954-57, L90961-64.

Delta B: L90754-56, L90922-24, L90960, L90967, L90974.

Delta C: L90975-79, L90990-94, L90997-91000, L91004-7.

Delta D: L90809-10, L90800-01, L90791-2.

Delta E: L90813-4, L90804-5.

Arger 8: L94394-6, 94397-9, 94402-4.

MILES SURVEYED

Various instruments were used on each anomaly as listed below:

	Miles	Stations
Beta Anomaly		
Magnetometer	4.6	304
SE 100	2.3	132
Crone J. E. M.	2.3	132
Delta Anomaly		
A Grid		
Magnetometer	6.3	437
Ronka	5.5	307
SE 100	5.0	304
B Grid		
Magnetometer	6.0	412
Ronka	4.6	265
SE 100	6.0	342
C Grid		
Magnetometer	10.8	834
Ronka	9.7	527
SE 100	9.0	534
D Grid		
Magnetometer	1.0	96
SE 100	1.[illegible]	62
E Grid		
Magnetometer	1.8	129
SE 100	1.4	82
Argor 8 Anomaly		
Magnetometer	6.8	562
SE 100	5.0	304

OFFICE OF MINING RECORDER

ONTARIO
DEPARTMENT OF MINES

LARDER LAKE MINING DIVISION
BOX 984, KIRKLAND LAKE, ONTARIO

June 15, 1966.

Mr. R. V. Scott,
Director,
Mining Lands Branch,
Department of Mines,
Parliament Buildings,
Toronto, Ontario.

Dear Sir:

This is to advise that the following reports of geophysical work were received from Argor Explorations Ltd., Suite 1700, 11 King Street West, Toronto, and recorded on June 13th:

18 days' on each of mining claims L.90899, L.90900, L.90903, L.90904, L.90909 and L.90910.
23.9 days' on each of mining claims L.90954 to L.90957 inclusive and L.90961 to L.90964 inclusive.
18.9 days' on each of mining claims L.90754, L.90755, L.90756, L.90922, L.90923, L.90924, L.90960, L.90967 and L.90974.
16 days on each of mining claims L.90975 to L.90979 inclusive, L.90990 to L.90994 inclusive, L.90997 to L.91000 inclusive, and L.91004 to L.91007 inclusive.
4.1 days on each of mining claims L.90809, L.90810, L.90800, L.90801, L.90701, and L.90702.
19 days on each of mining claims L.90813, L.90814, L.90804 and L.90805.
19.4 days on each of mining claims L.94394 to L.94404 inclusive.

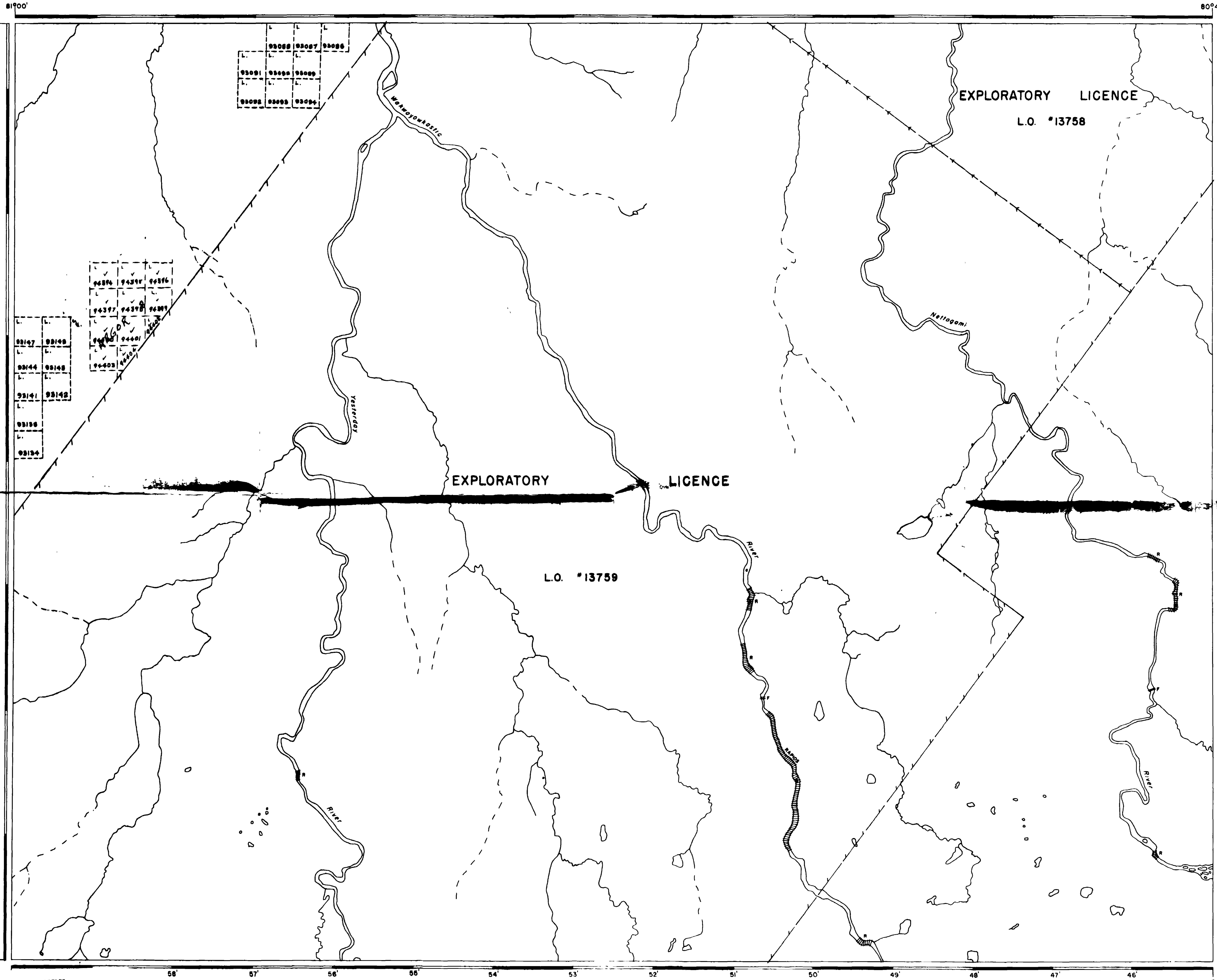
All claims are situate Centre part of Southbluff Dreek Area (Plan M.2956) except L.94394 to L.94404 which are shown in South of Kiasko River Area (Plan M.2948)

Yours very truly,

P. Logee,
Mining Recorder.

Kiasko River Area - M.2946

East of DePencier Twp. - M.2969



South of Southbluff Creek Area - M.2947

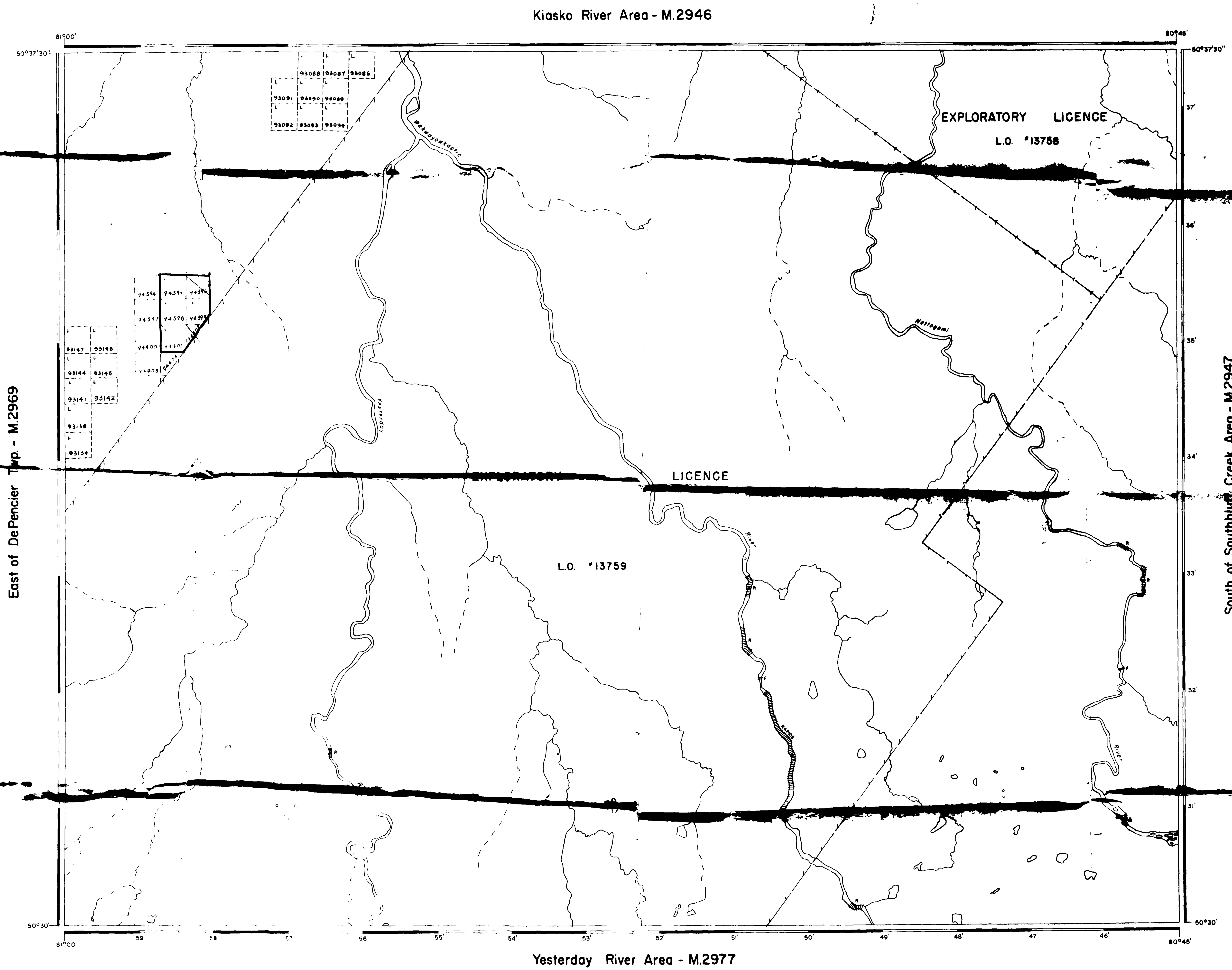
Yesterday River Area - M.2977

42115SE0016 63.1981 CENTRE PT SOUTHBLUFF

200

505804

M.2948



AREA OF

SOUTH OF KIASKO RIVER

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	
CROWN LAND SALE	C.S.
LEASES	
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	C.

NOTES

400' Surface Rights Reservation around all lakes and rivers.

DATE OF ISSUE
APR 17 1967
ONTARIO DEPT. OF MINES

PLAN NO. M.2948

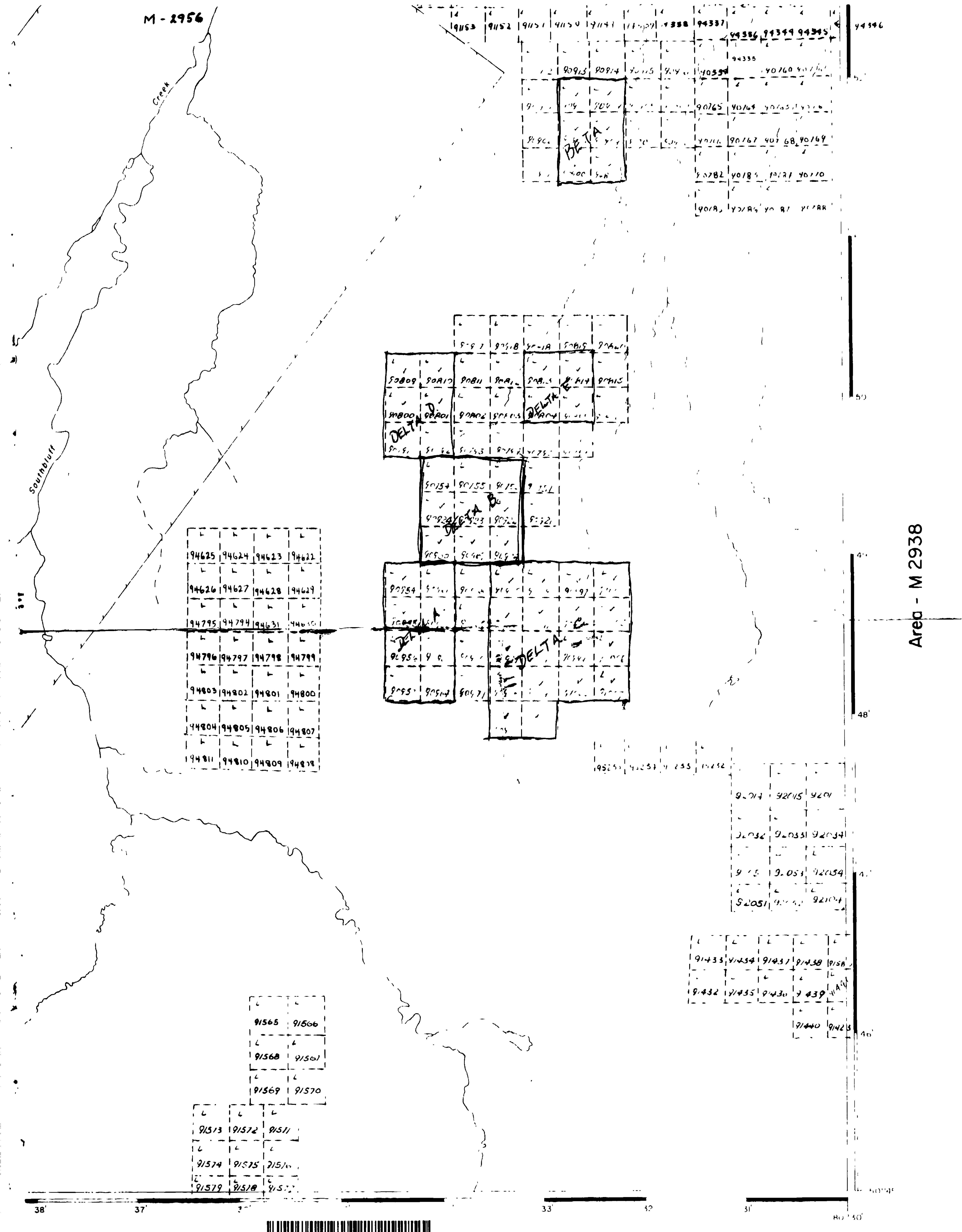
DEPARTMENT OF MINES
— ONTARIO —

505804

TRIM LINE

42I15SE0018 63.1981 CENTRE PT SOUTHBLUFF

210

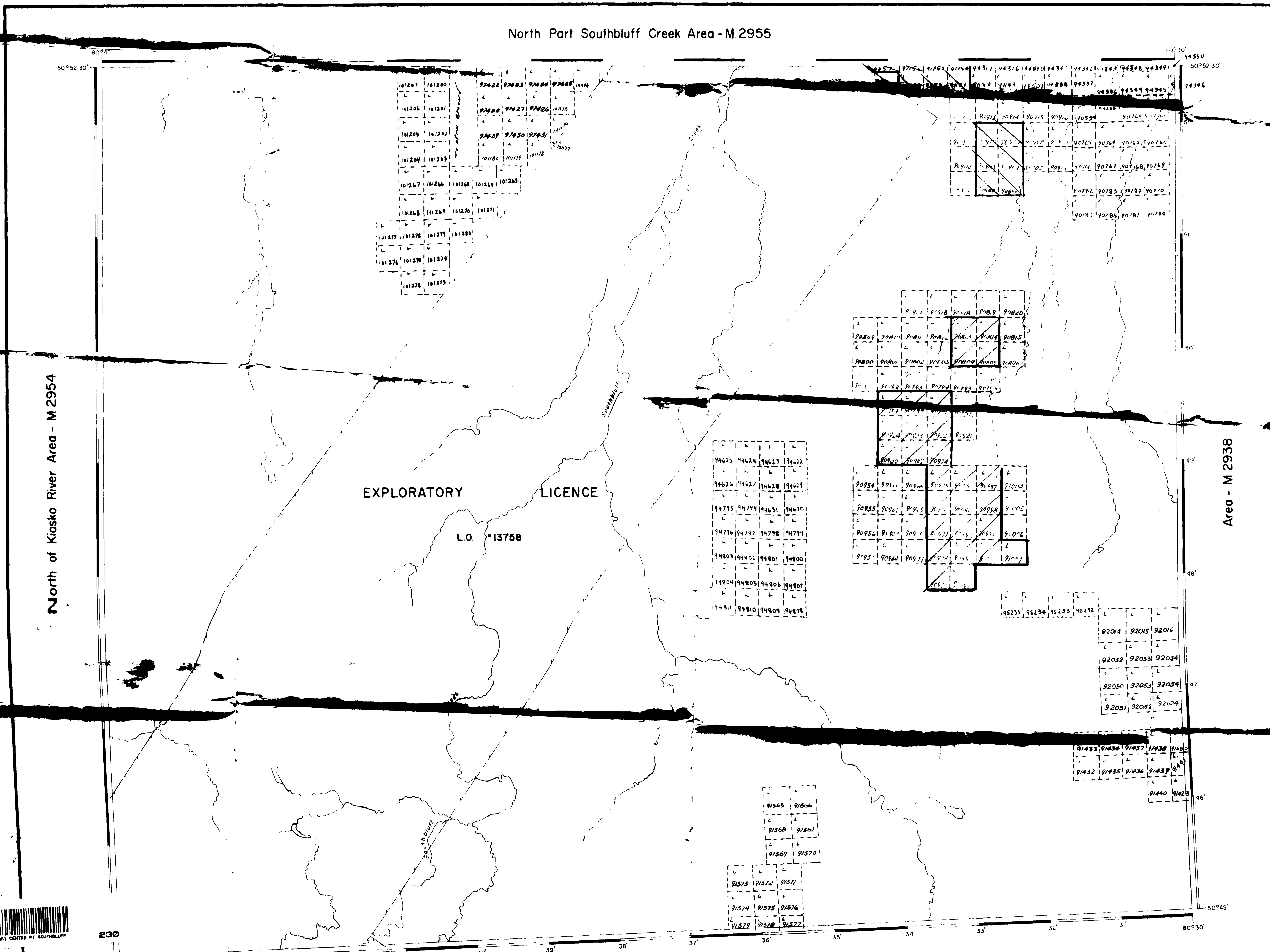


f Creek Area - M.2945

421155E0010 83.1981 CENTRE PT SOUTHBLUFF

220

507803



AREA OF

CENTER PART SOUTHBLUFF CREEK

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	CS
LEASES	Ⓛ
LOCATED LAND	Loc
LICENSE OF OCCUPATION	LO
MINING RIGHTS ONLY	MRO
SURFACE RIGHTS ONLY	SRO
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	C

NOTES

Rights Reservation around all lakes and rivers

DATE OF ISSUE

APR 17 1967

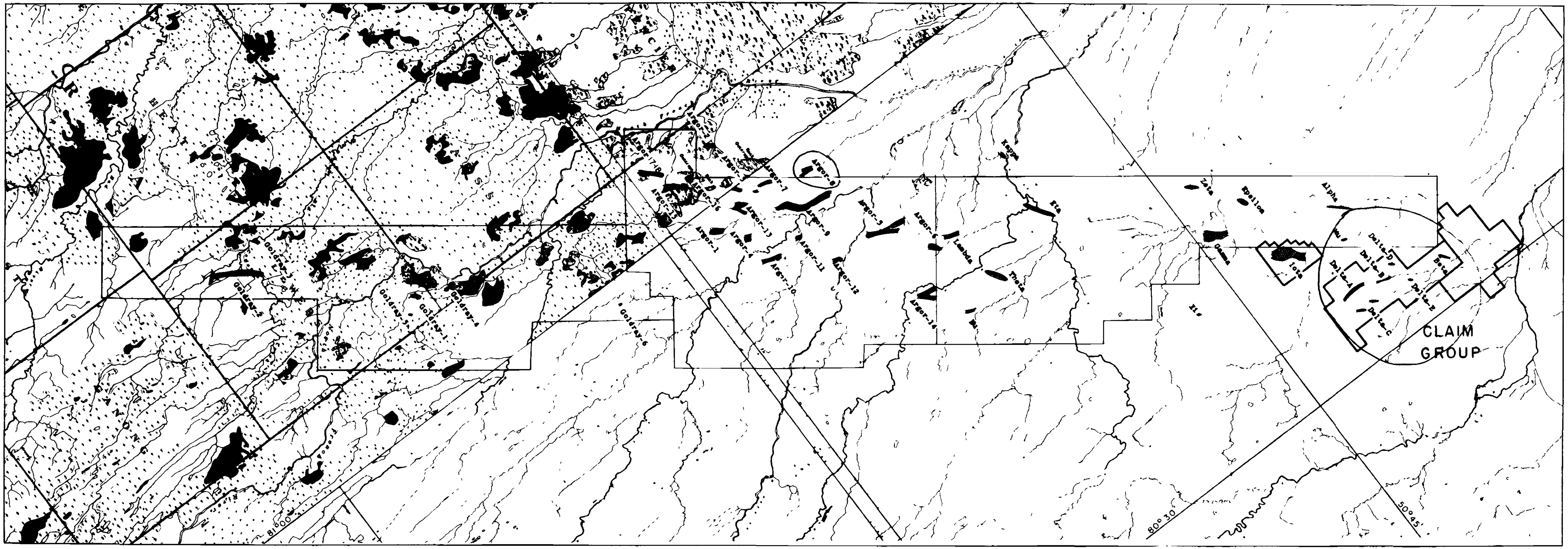
ONTARIO DEPT. OF MINES

PLAN NO. M.2956

DEPARTMENT OF MINES

ONTARIO

PH 224/65



HUNTEC LIMITED
Toronto, Canada
January, 1966

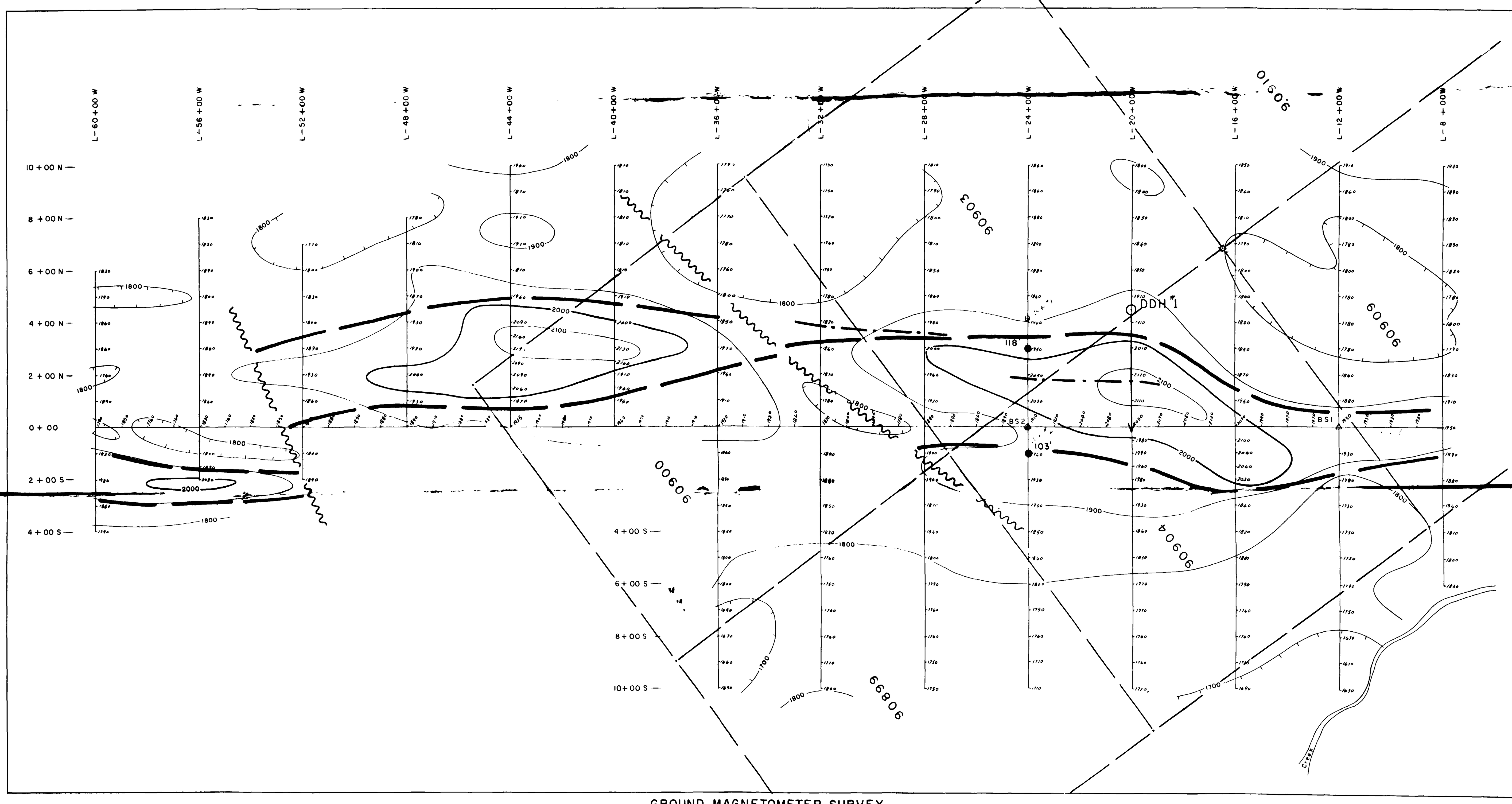
42I15SE0010 63.1961 CENTRE PT SOUTHBLUFF

240

ARGOR EXPLORATIONS LIMITED
LOCATION MAP
for
CLAIMS
SOUTH OF MOOSONEE, ONTARIO

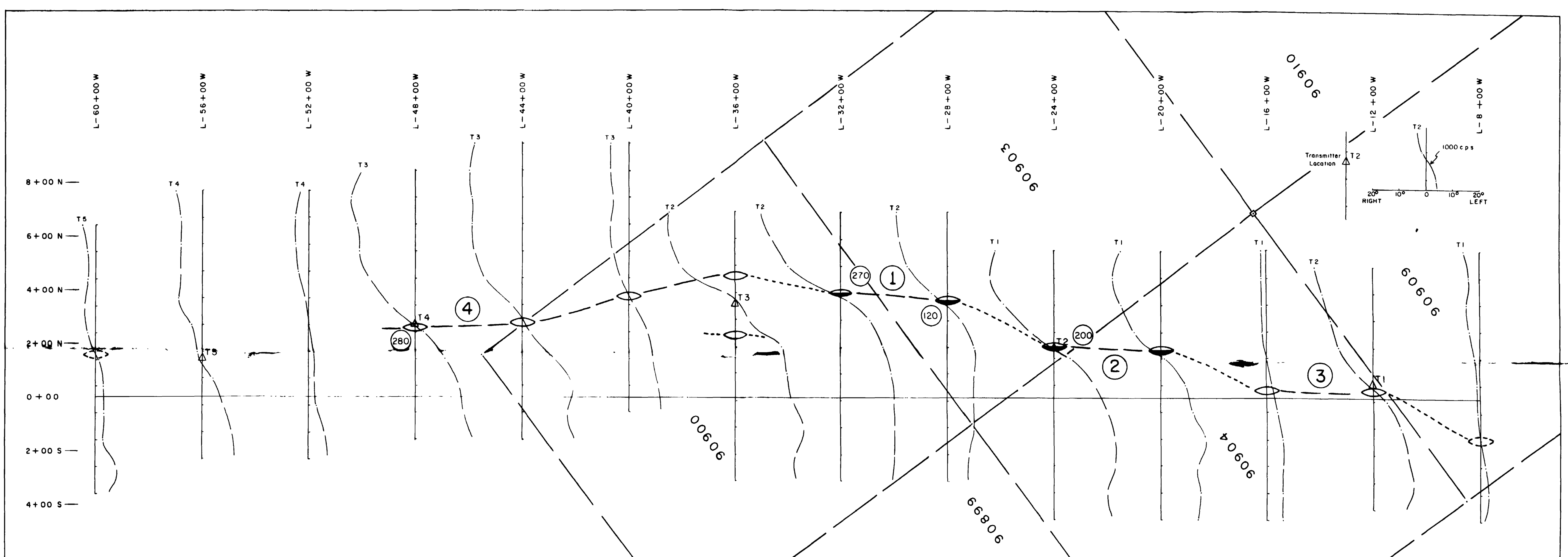
SCALE
4 3 2 0 4 miles

PLATE 8

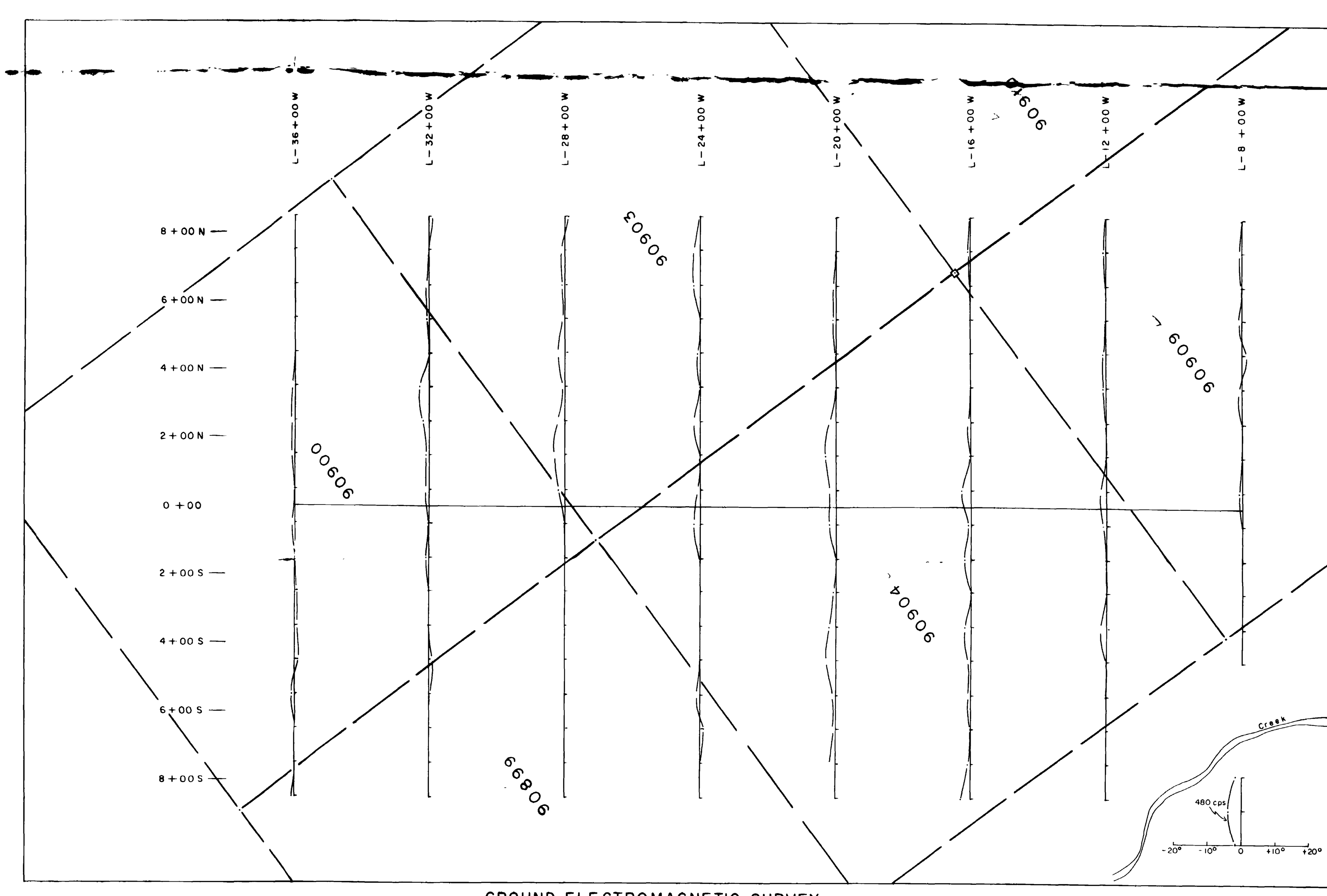


GROUND MAGNETOMETER SURVEY
WITH INTERPRETATION

CONTOUR INTERVAL 100 gammas SCALE 1 inch = 200 feet



GROUND ELECTROMAGNETIC SURVEY
(VERTICAL LOOP)
WITH INTERPRETATION
SCALES 1 inch = 200 feet
1 inch = 20°



GROUND ELECTROMAGNETIC SURVEY
(DIP-ANGLE)
SCALES 1 inch = 200 feet
1 inch = 20°

N

INTERPRETATION LEGEND

MAGNETOMETER MAP

- Interpreted geologic contact (approximate)
- Interpreted fault
- Medium major interpreted conductor axis
- D.D.H. #1 — Recommended diamond drill hole
- 103' — Interpreted depth in feet to bedrock from seismic data

ELECTROMAGNETIC MAPS

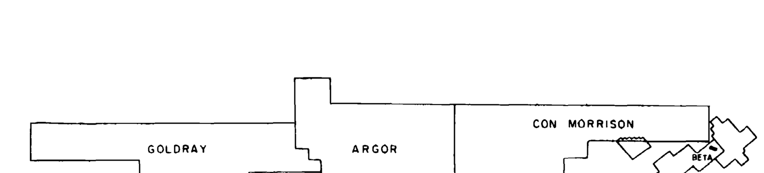
- Medium bedrock anomaly
- Weak bedrock anomaly
- Doubtful bedrock anomaly
- Interpreted bedrock conductor axis
- Doubtful bedrock conductor axis
- (120) — Interpreted depth in feet to conductor axis from E M data

ARGOR EXPLORATIONS LIMITED
GROUND GEOPHYSICAL SURVEYS
MOOSONEE, ONTARIO
PLATE I
BETA ANOMALY

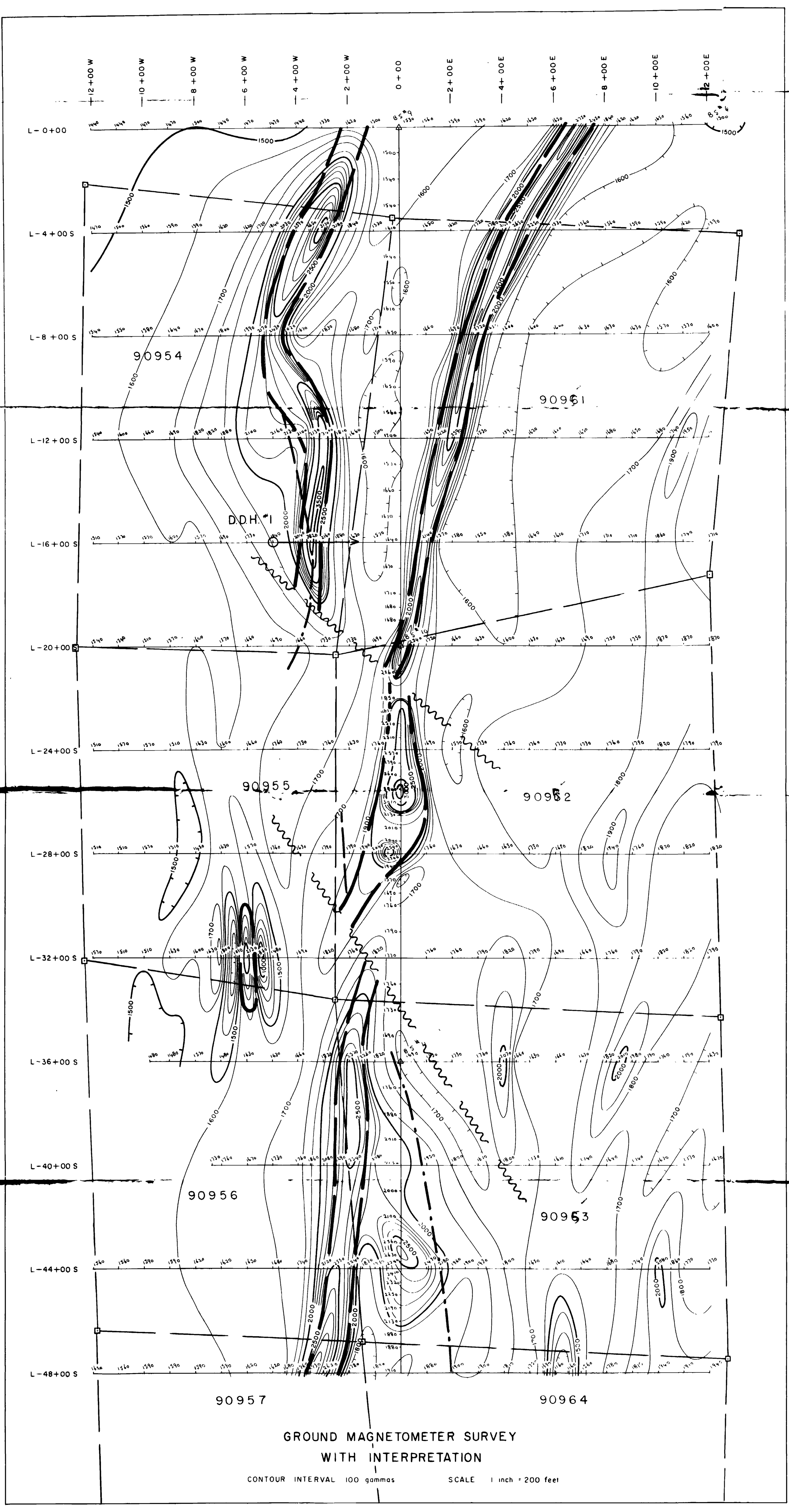
HUNTEC LIMITED, Toronto, Canada — January, 1966

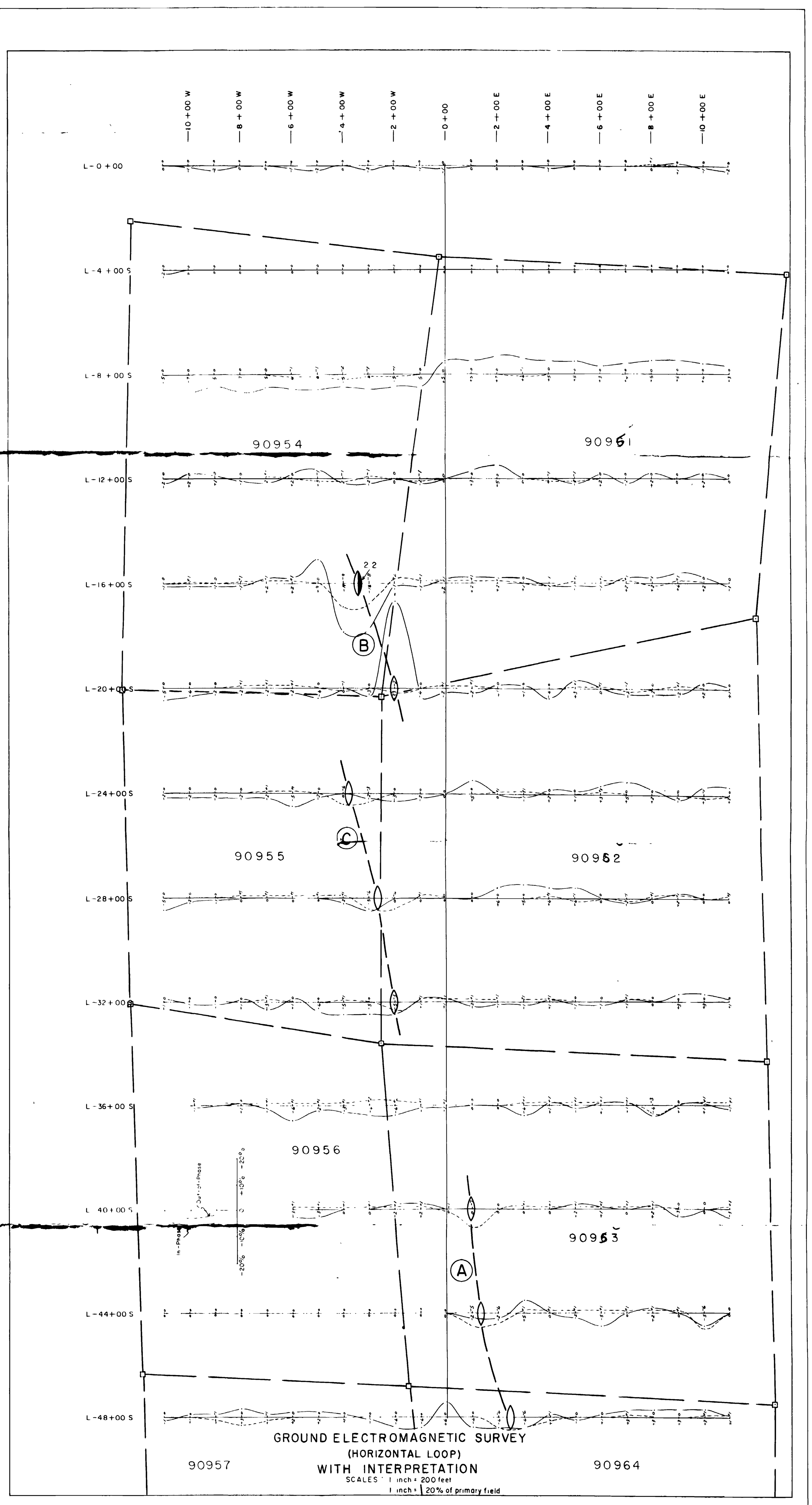
N R Paterson, Ph D, P Eng, Geophysicist

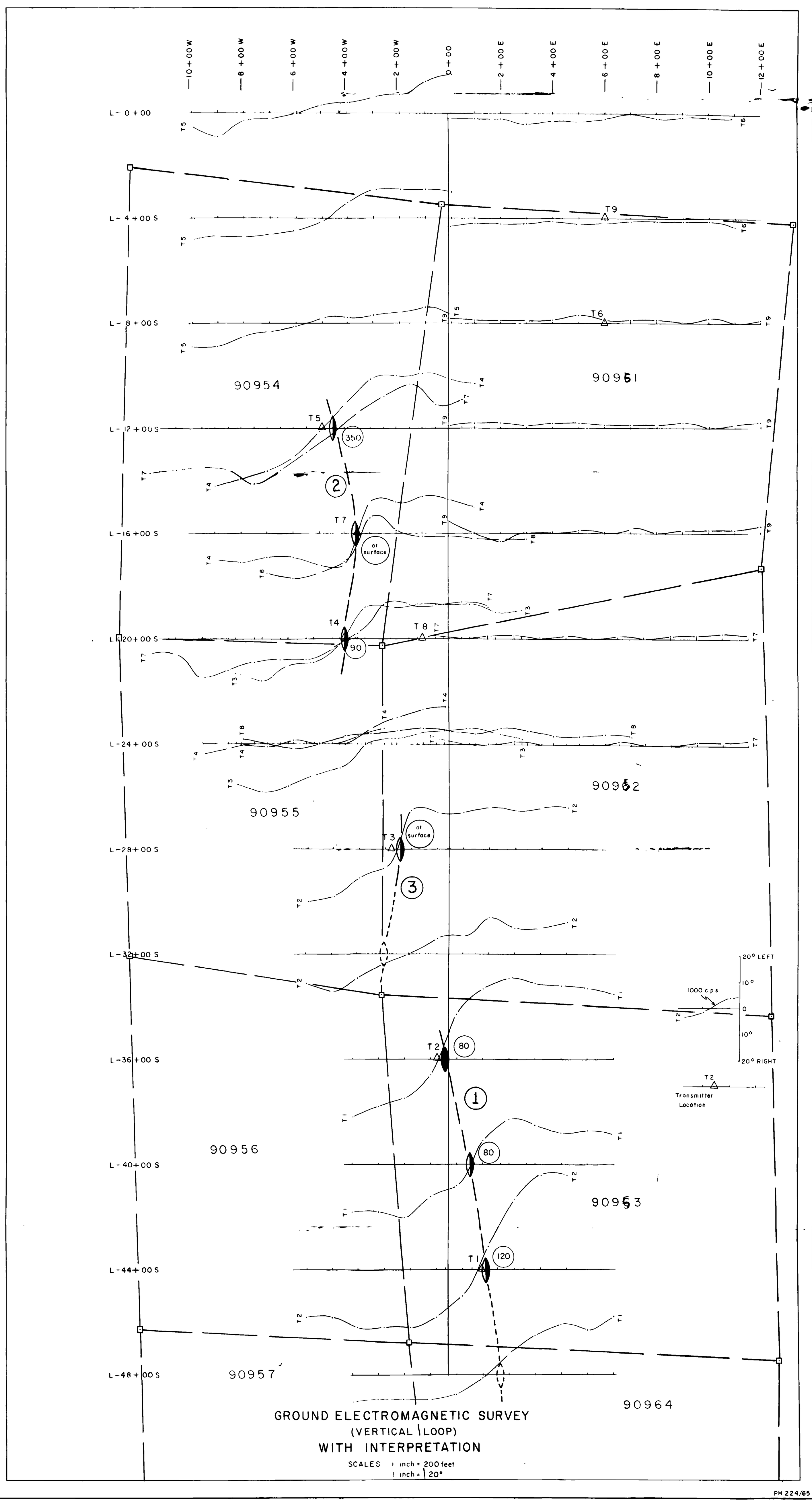
P E Lane, B Sc, Geophysicist



PH 224/65







INTERPRETATION LEGEND

MAGNETOMETER MAP

- Interpreted geologic contact (approximate)
- Interpreted fault
- Major interpreted conductor axis: Strong; Medium
- D.D.H. 1 — Recommended diamond drill hole

ELECTROMAGNETIC MAPS

- Strong bedrock anomaly
- Medium bedrock anomaly
- Weak bedrock anomaly
- Doubtful bedrock anomaly
- Interpreted bedrock conductor axis
- Doubtful bedrock conductor axis
- (90) Interpreted depth in feet to conductor axis from E M data
- 22 Ratio, in-phase/out-of-phase

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GROUND GEOPHYSICAL SURVEYS

MOOSONEE, ONTARIO

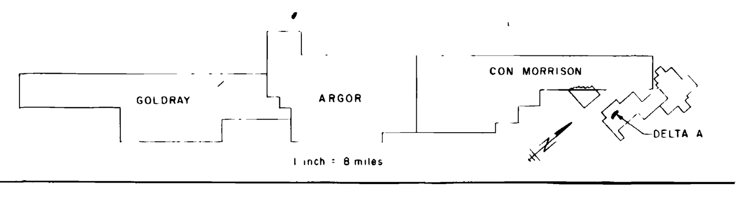
PLATE 2

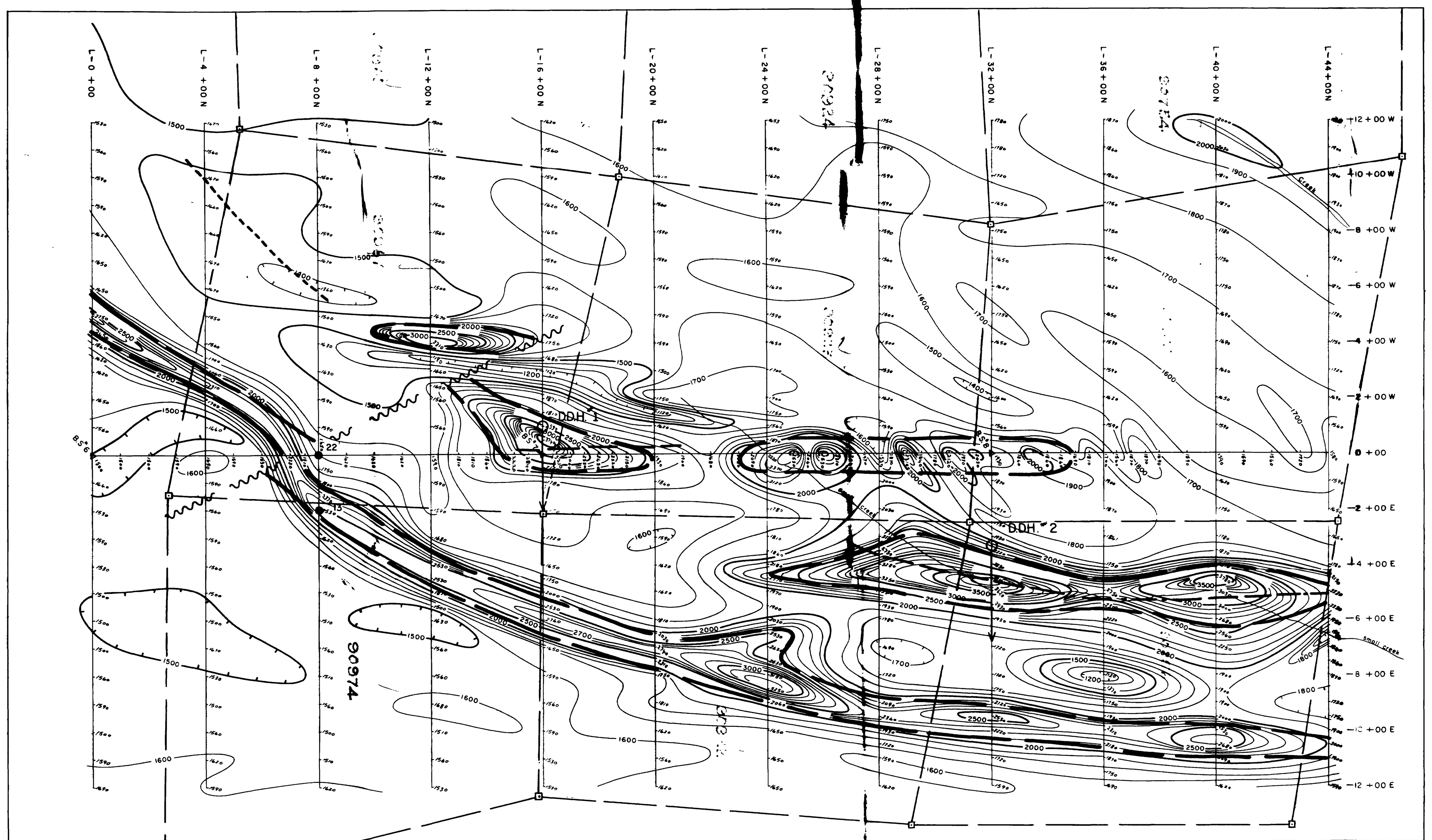
DELTA A ANOMALY

HUNTEC LIMITED, Toronto, Canada — January, 1968

N R Paterson, Ph D, P Eng., Geophysicist

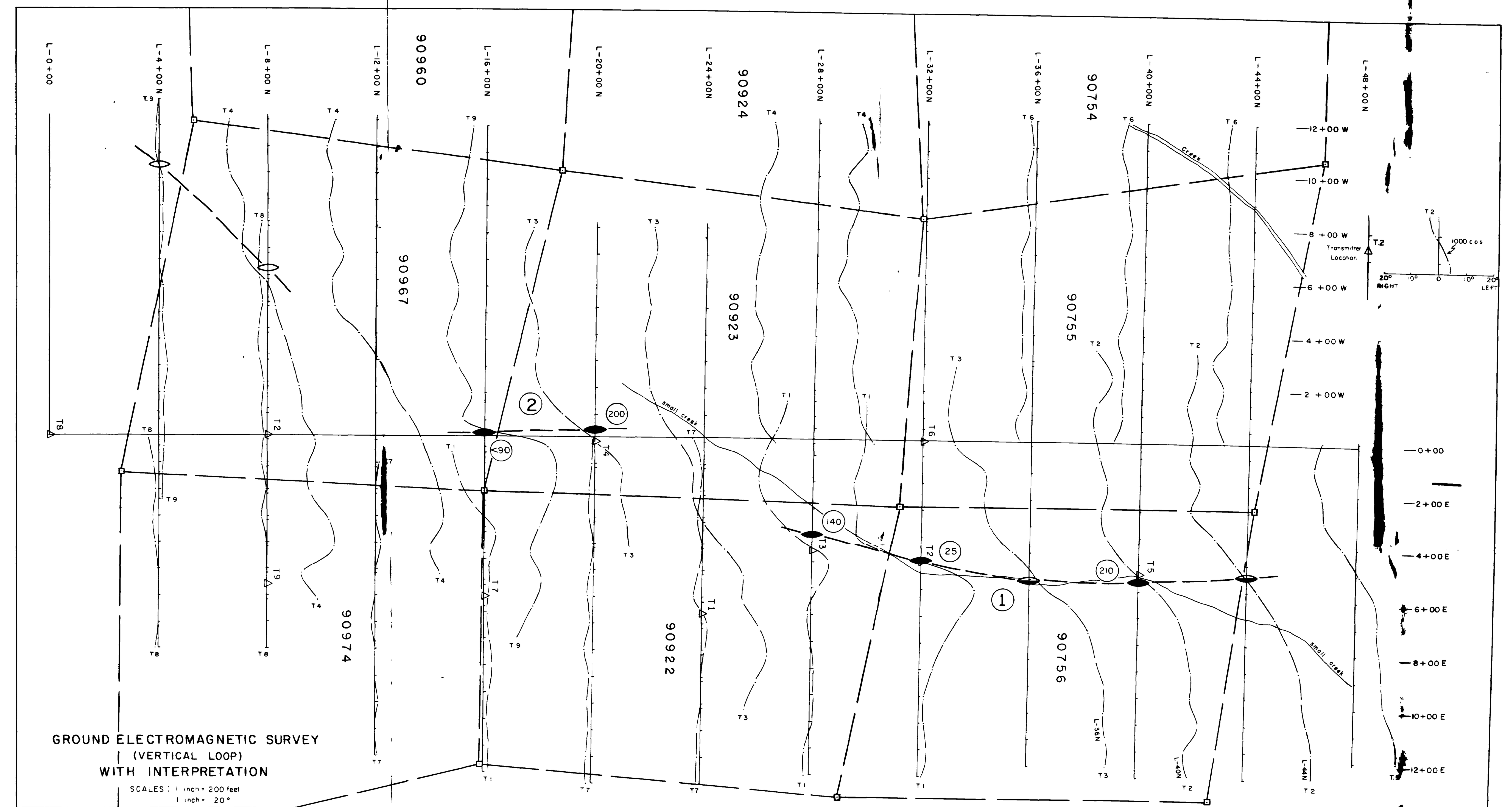
P E Lane, B Sc, Geophysicist



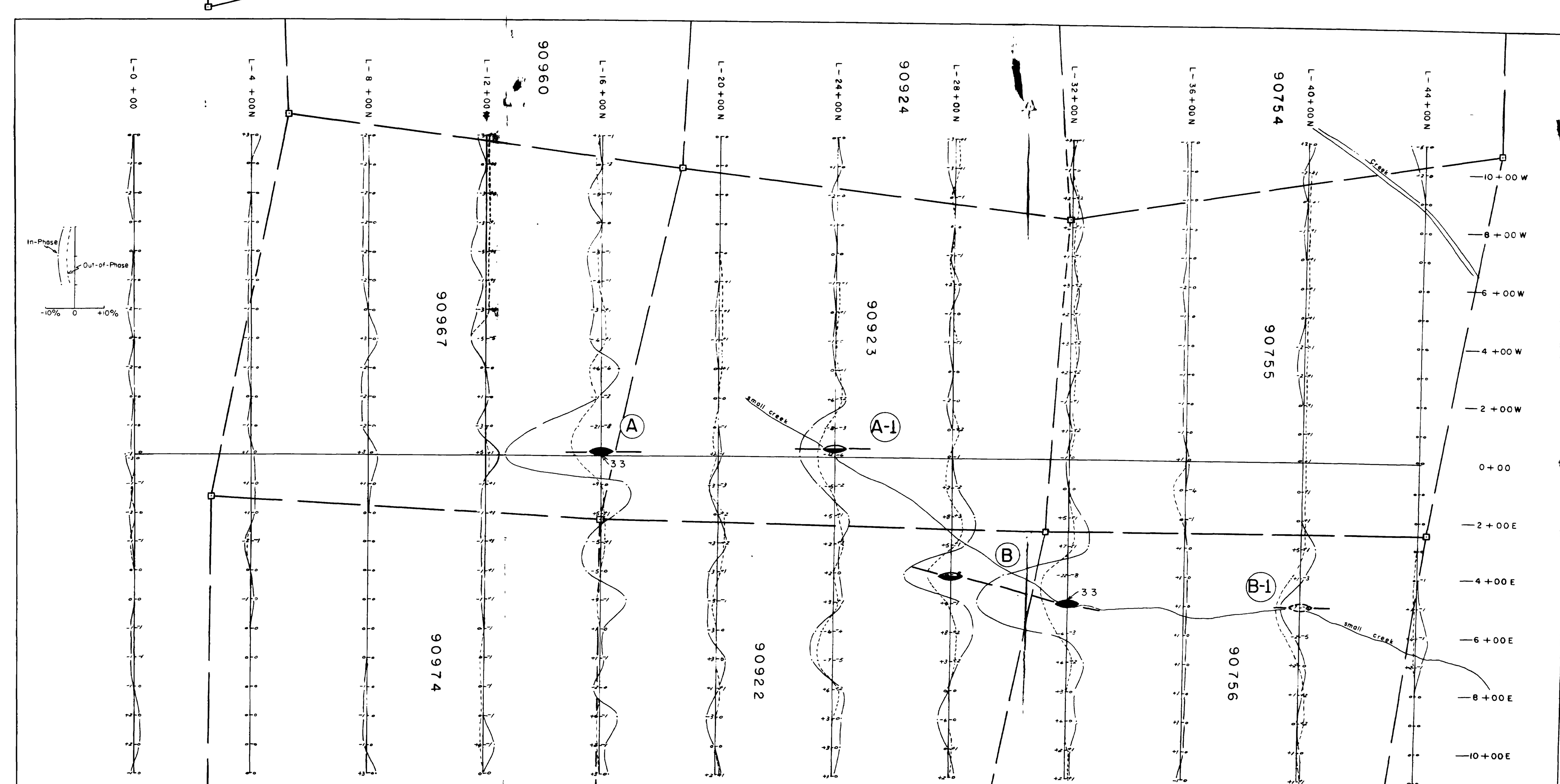


GROUND MAGNETOMETER SURVEY
WITH INTERPRETATION

CONTOUR INTERVAL 100 gammas SCALE 1 inch = 200 feet



GROUND ELECTROMAGNETIC SURVEY
(VERTICAL LOOP)
WITH INTERPRETATION



GROUND ELECTROMAGNETIC SURVEY (HORIZONTAL LOOP) WITH INTERPRETATION

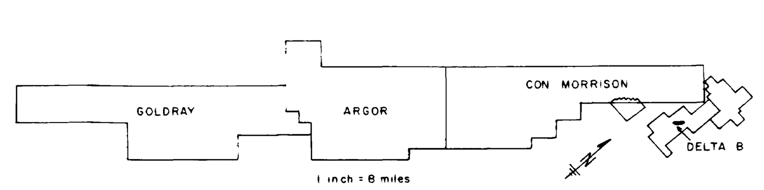
INTERPRETATION LEGEND

MAGNETOMETER MAP

- Interpreted geologic contact (approximate)
- Interpreted fault
- Major interpreted conductor axis
  - Strong
  - Medium
  - Weak
- D.D.H. #1 — Recommended diamond drill hole
- 22' — Interpreted depth in feet to bedrock from seismic data

ELECTROMAGNETIC MAPS

- Strong bedrock anomaly
- Medium bedrock anomaly
- Weak bedrock anomaly
- Doubtful bedrock anomaly
- Interpreted bedrock conductor axis
- 25 — Interpreted depth in feet to conductor axis from E M data
- 33 — Ratio, in-phase/out-of-phase



ARGOR EXPLORATIONS LIMITED

GROUND GEOPHYSICAL SURVEYS

MOOSONEE, ONTARIO

PLATE 3

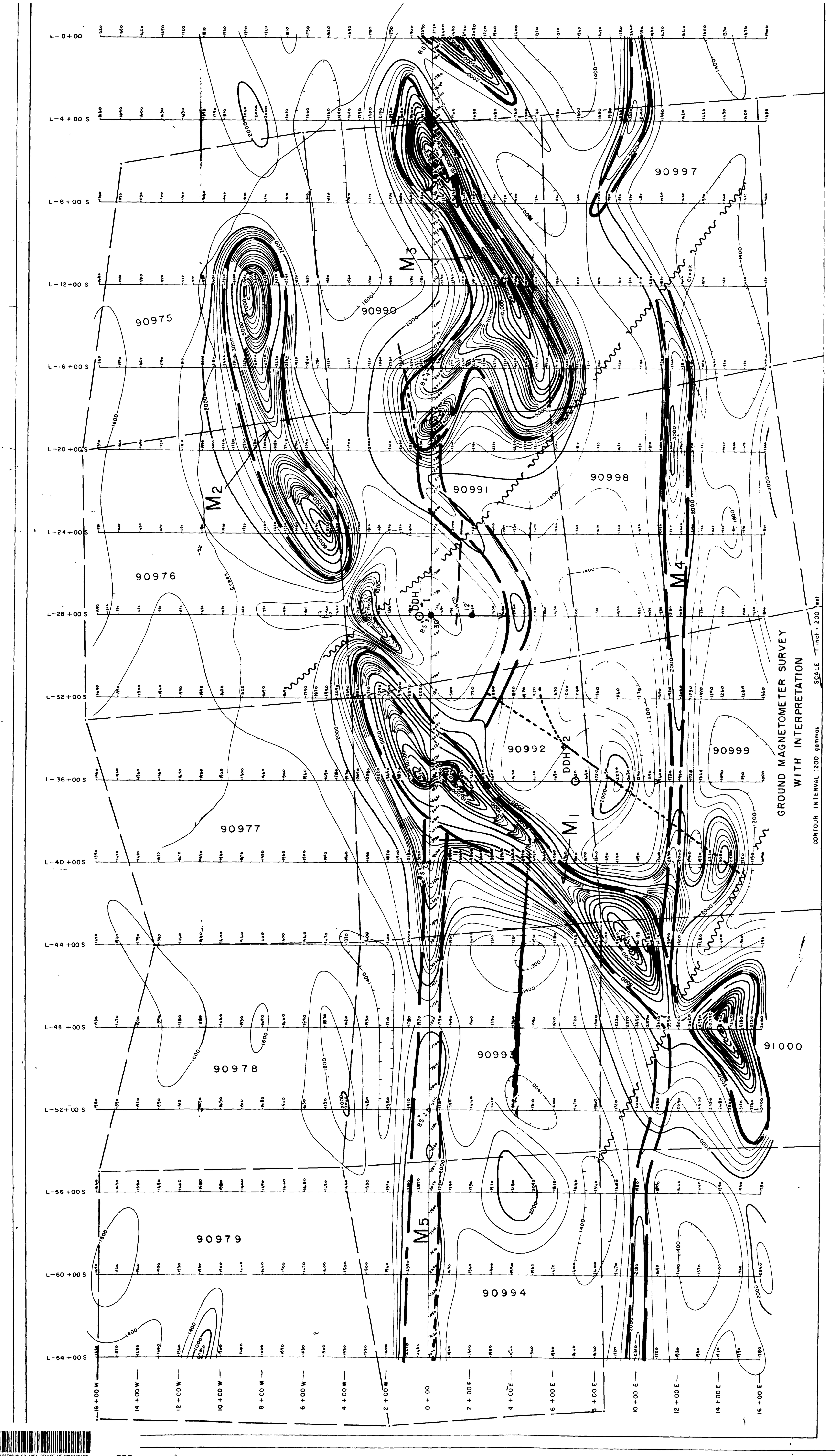
DELTA B ANOMALY

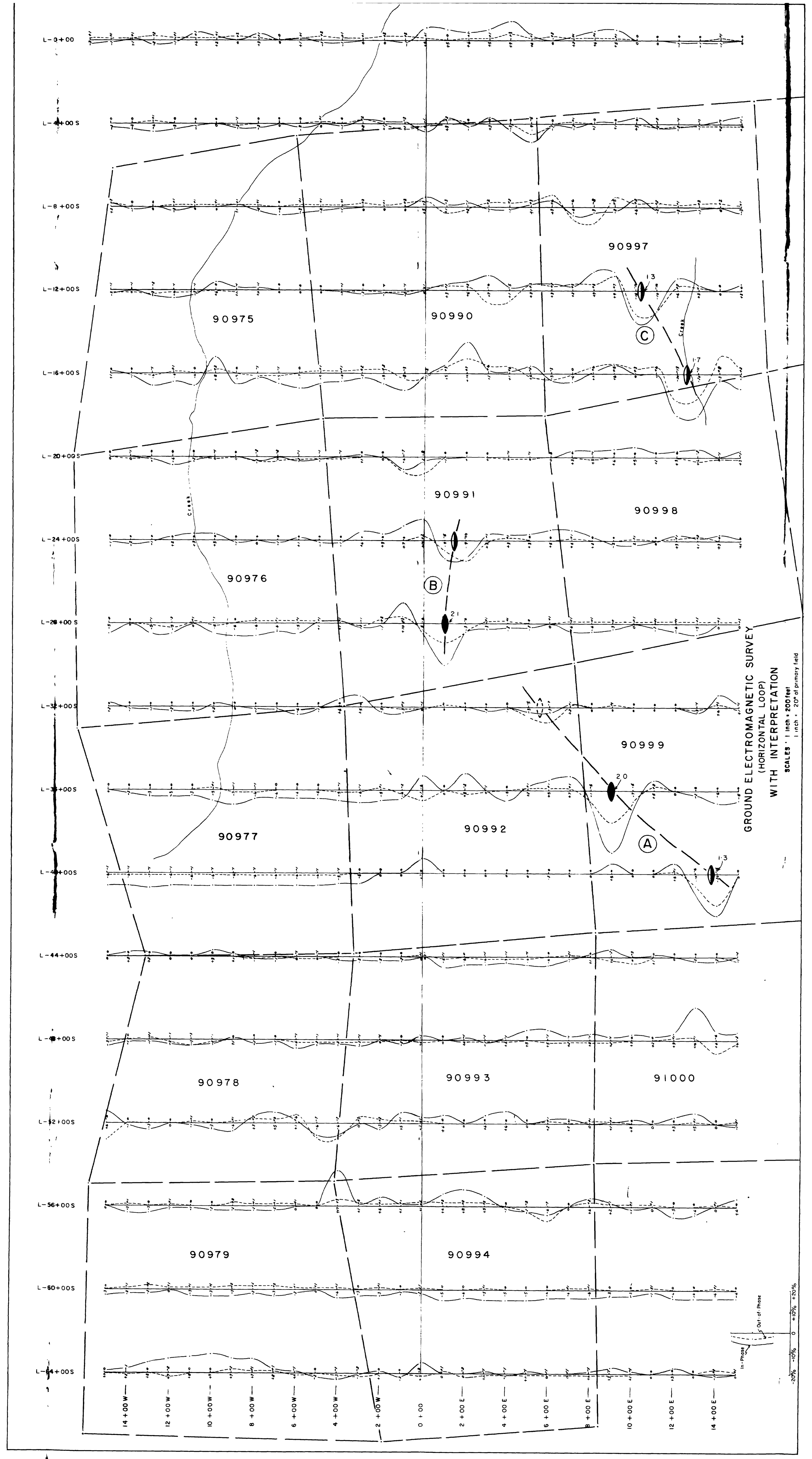
HUNTEC LIMITED, Toronto, Canada - January, 1966

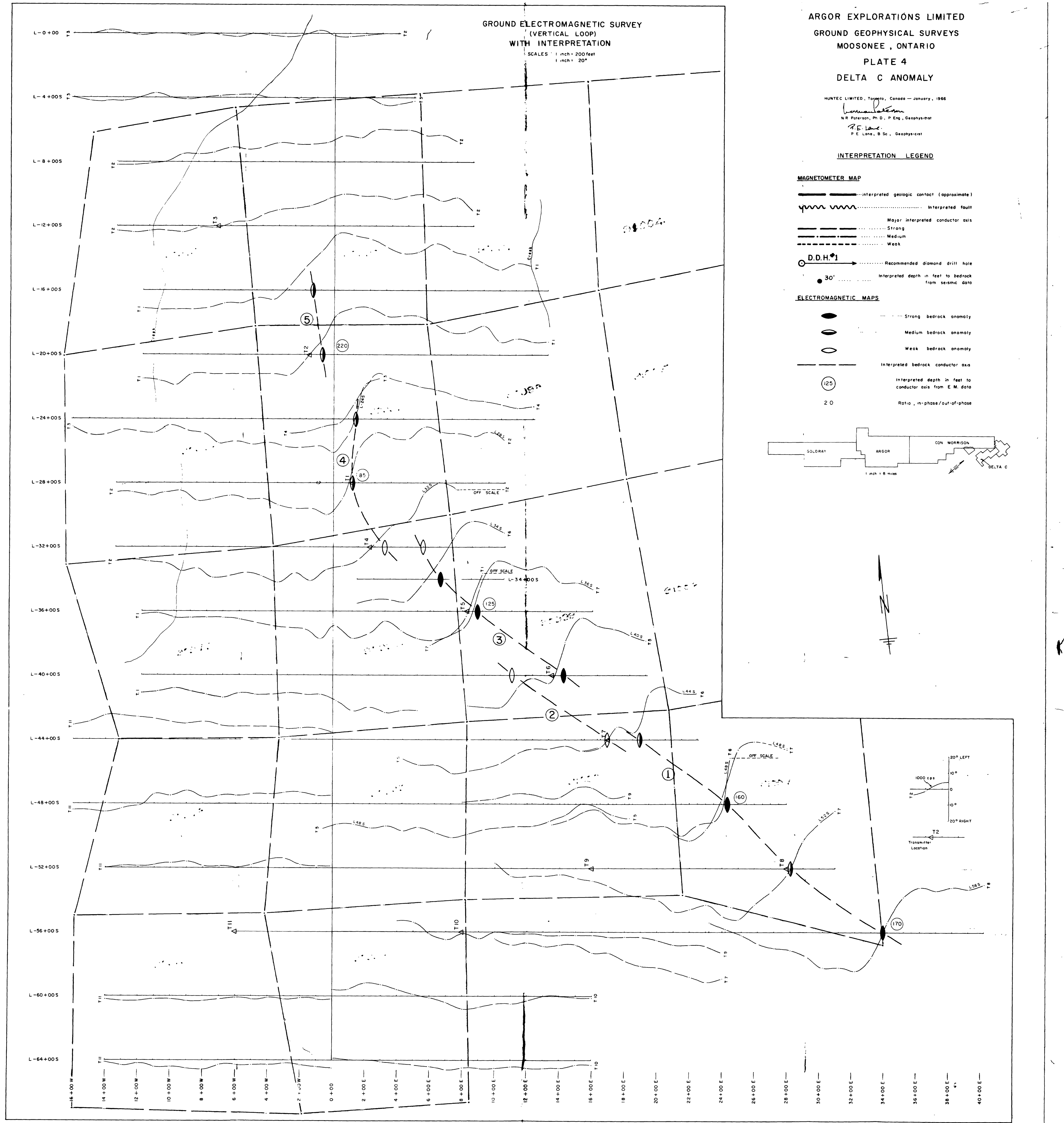
N R Paterson, Ph D, P Eng, Geophysicist

P E Lane, B.Sc, Geophysicist

270







ARGOR EXPLORATIONS LIMITED

GROUND GEOPHYSICAL SURVEYS

MOOSONEE, ONTARIO

PLATE 4

DELTA C ANOMALY

HUNTEC LIMITED, Toronto, Canada — January, 1966

N R Paterson, Ph D, P Eng, Geophysicist

P E Lane, B Sc, Geophysicist

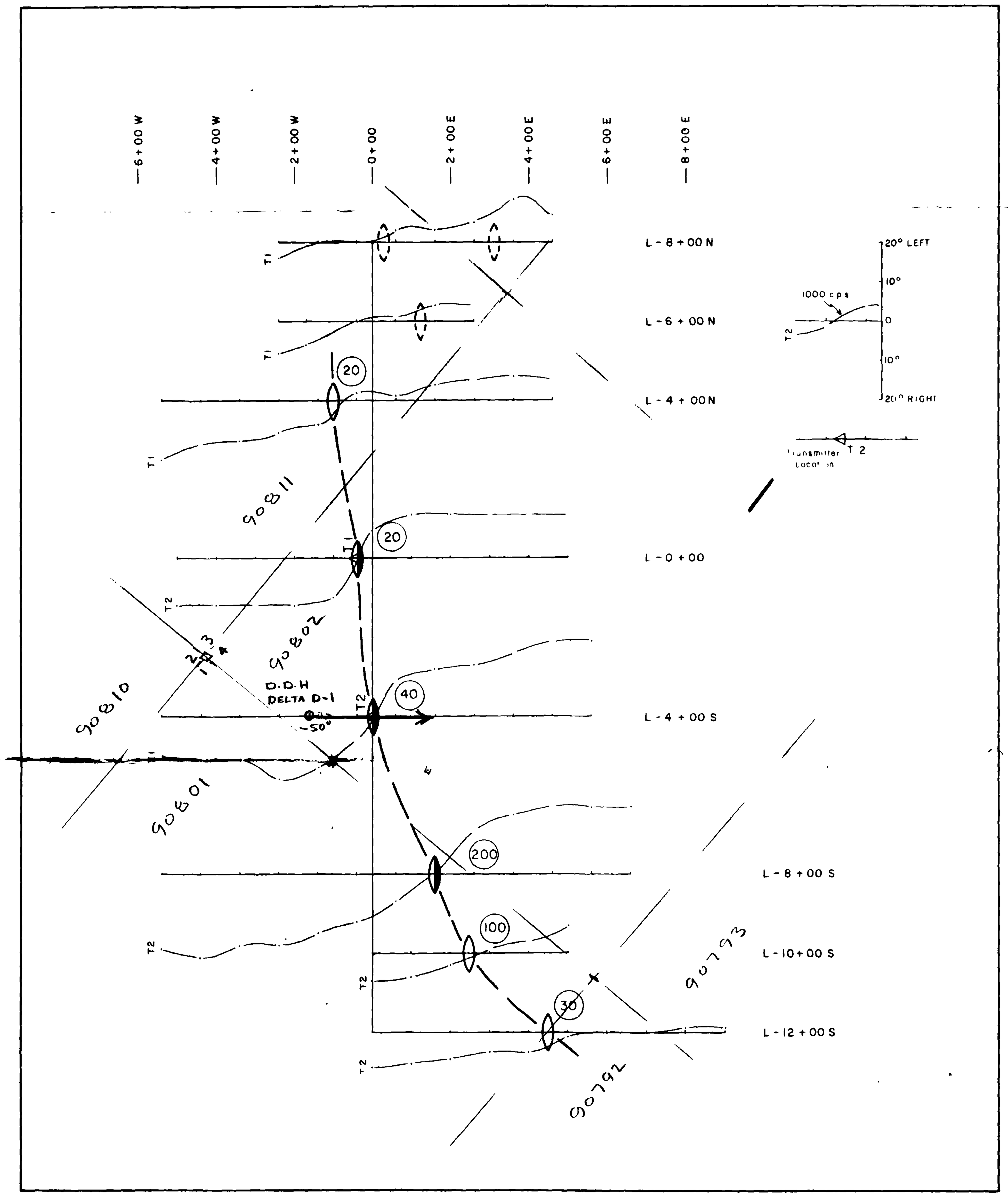
INTERPRETATION LEGEND

MAGNETOMETER MAP

- Interpreted geologic contact (approximate)
- Interpreted fault
- Major interpreted conductor axis: Strong / Medium / Weak
- D.D.H.#1 — Recommended diamond drill hole
- 30' — Interpreted depth in feet to bedrock from seismic data

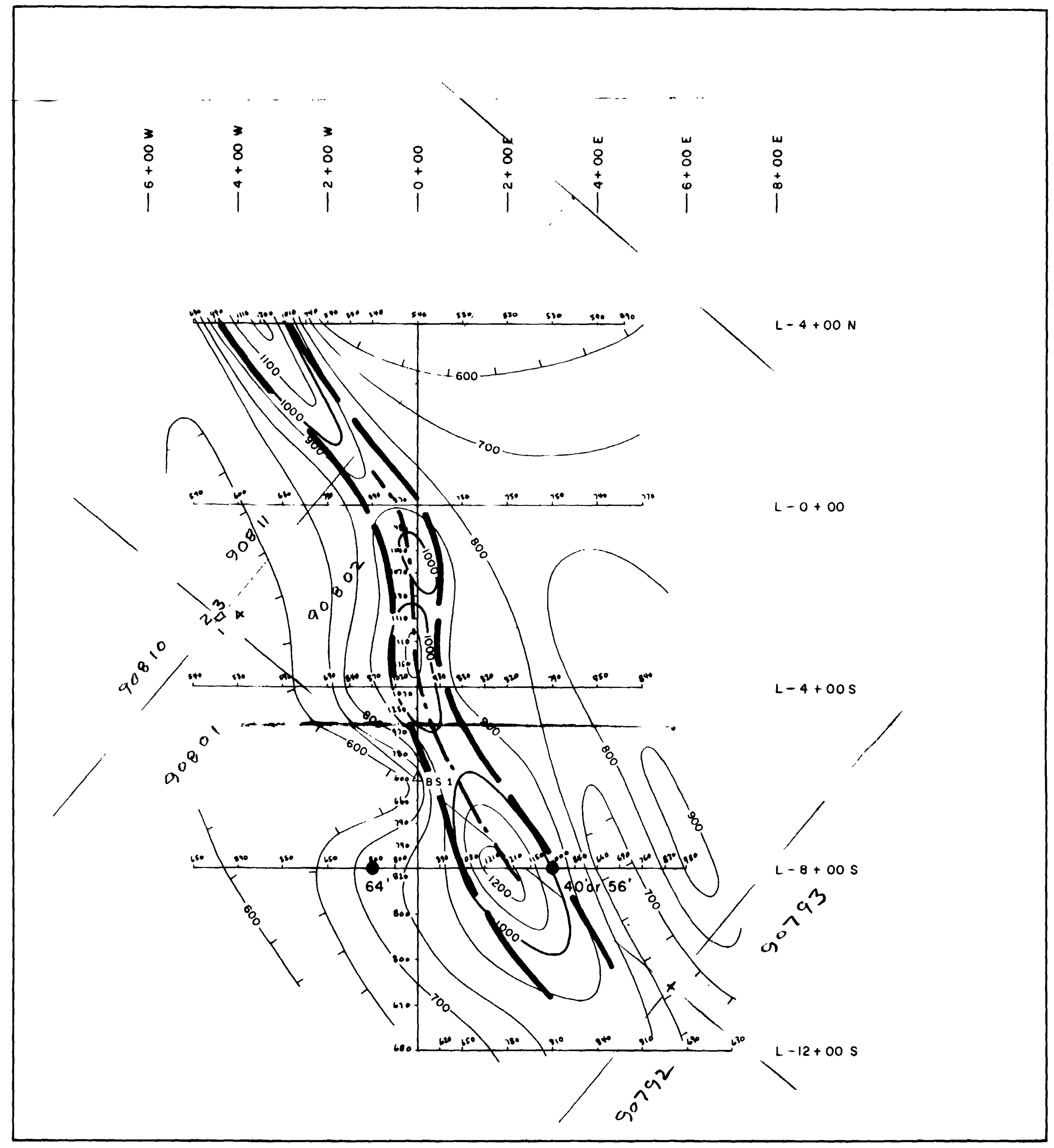
ELECTROMAGNETIC MAPS

- Strong bedrock anomaly
- Medium bedrock anomaly
- Weak bedrock anomaly
- Interpreted bedrock conductor axis
- (125) — Interpreted depth in feet to conductor axis from E M. data
- 2 0 — Ratio, in-phase/out-of-phase



GROUND ELECTROMAGNETIC SURVEY
(VERTICAL LOOP)
WITH INTERPRETATION

SCALES 1 inch = 200 feet
1 inch = 20°



GROUND MAGNETOMETER SURVEY
WITH INTERPRETATION

CONTOUR INTERVAL: 100 gammas SCALE 1 inch = 200 feet

INTERPRETATION LEGEND

MAGNETOMETER MAP

Interpreted geologic contact (approximate)

Medium major interpreted conductor axis

64' Interpreted depth in feet to bedrock from seismic data

ELECTROMAGNETIC MAP

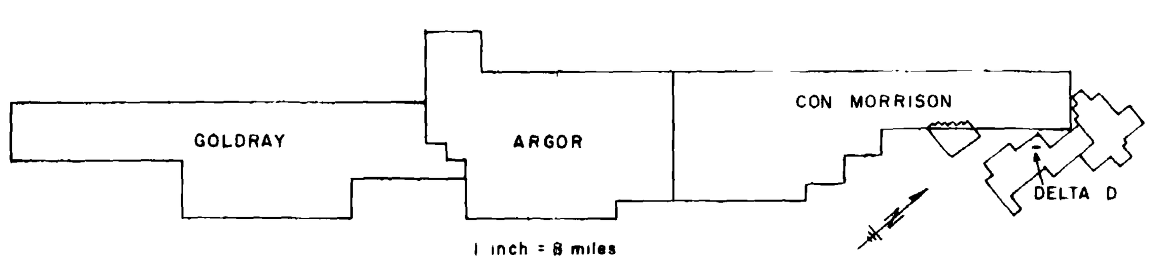
Medium bedrock anomaly

Weak bedrock anomaly

Doubtful bedrock anomaly

(100) Interpreted depth in feet to conductor axis from E M data

Interpreted bedrock conductor axis



ARGOR EXPLORATIONS LIMITED

GROUND GEOPHYSICAL SURVEYS
MOOSONEE, ONTARIO

PLATE 5

DELTA D ANOMALY

HUNTEC LIMITED, Toronto, Canada - January, 1966

N R Paterson, Ph D, P Eng, Geophysicist

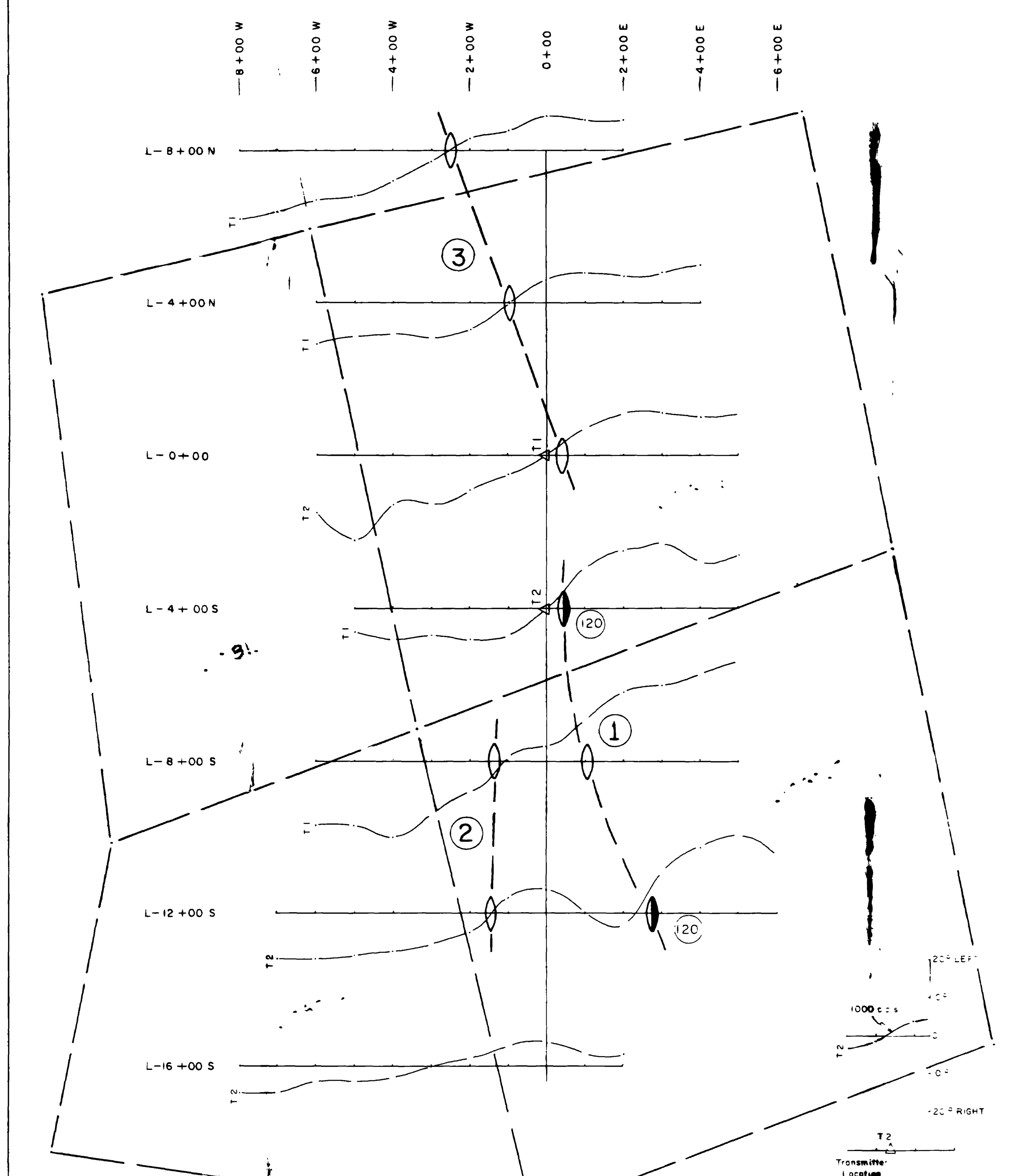
P E Lane, B Sc, Geophysicist

PH 224/65

280

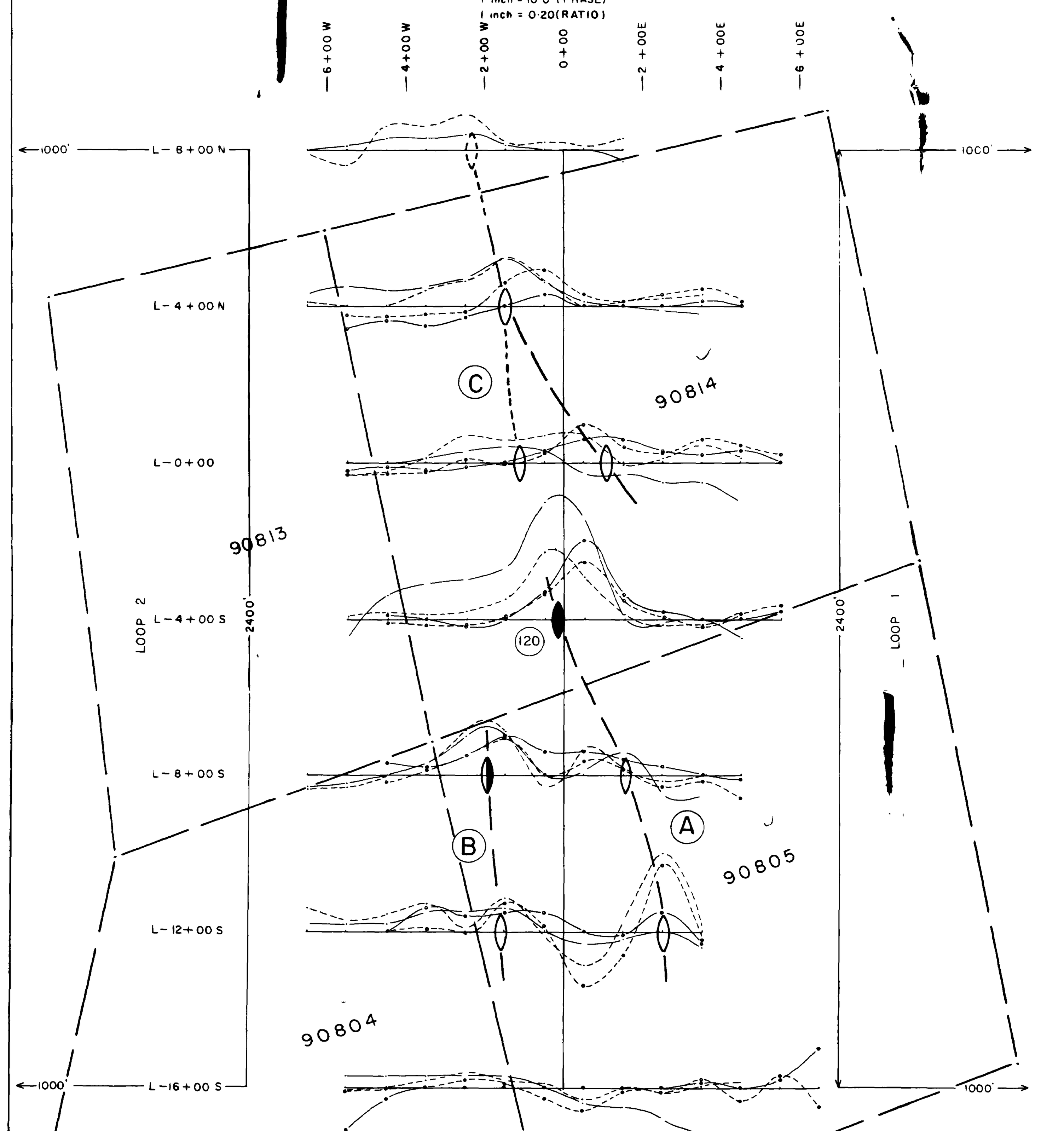
GROUND ELECTROMAGNETIC SURVEY
(VERTICAL LOOP)
WITH INTERPRETATION

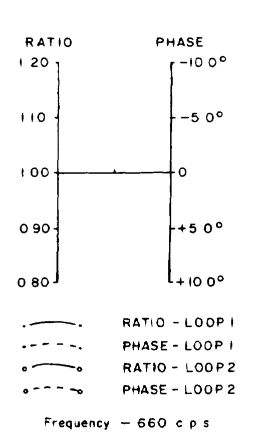
SCALES : 1 inch = 200 feet
1 inch = 20°

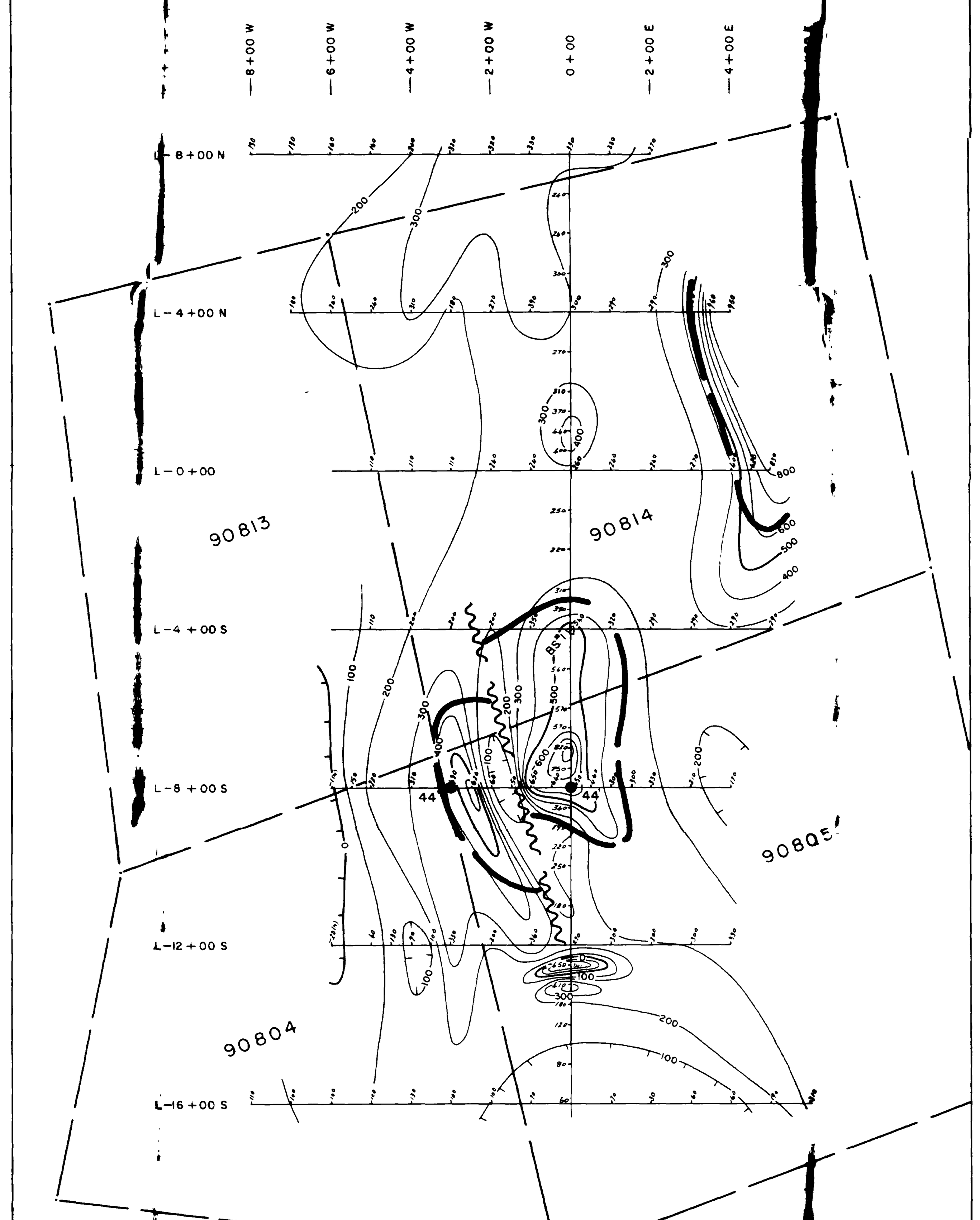


GROUND ELECTROMAGNETIC SURVEY
(TURAM)
WITH INTERPRETATION

SCALES : 1 inch = 200 feet
1 inch = 10.0° (PHASE)
1 inch = 0.20 (RATIO)







GROUND MAGNETOMETER SURVEY WITH INTERPRETATION

CONTOUR INTERVAL : 200 gammas   SCALE : 1 inch = 200 feet

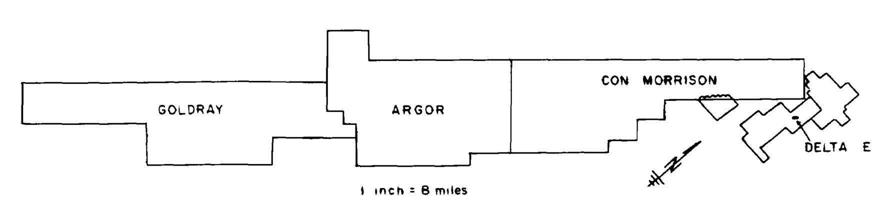
INTERPRETATION LEGEND

MAGNETOMETER MAP

- Interpreted geologic contact (approximate)
- Interpreted fault
- 44' Interpreted depth in feet to bedrock from seismic data

ELECTROMAGNETIC MAPS

- Strong bedrock anomaly
- Medium bedrock anomaly
- Weak bedrock anomaly
- Doubtful bedrock anomaly
- Interpreted bedrock conductor axis
- Doubtful bedrock conductor axis
- (120) Interpreted depth in feet to conductor axis from E.M data



ARGOR EXPLORATIONS LIMITED
GROUND GEOPHYSICAL SURVEYS
MOOSONEE, ONTARIO
PLATE 6
DELTA E ANOMALY

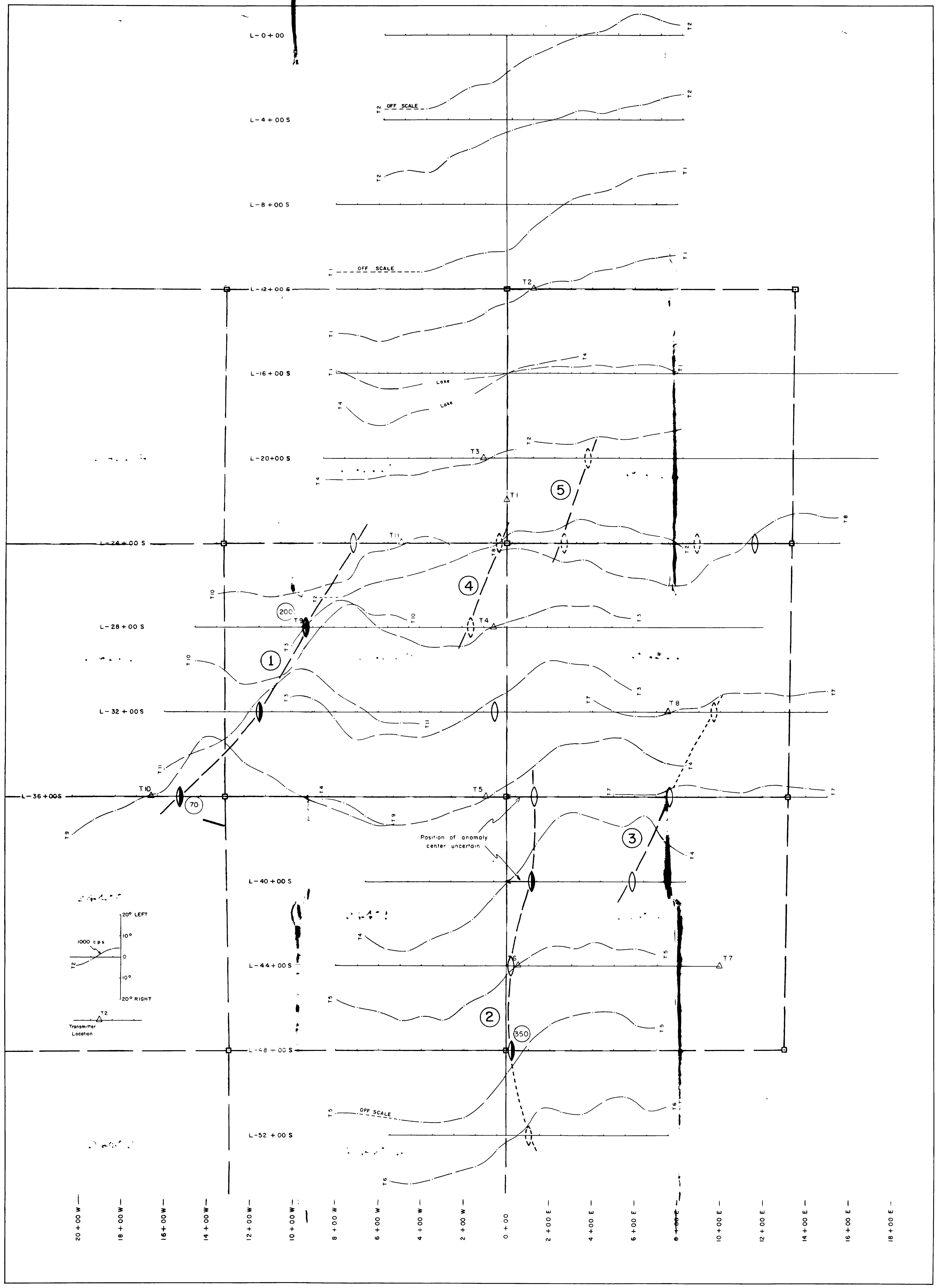
HUNTEC LIMITED, Toronto, Canada — January, 1966

N.R. Paterson, Ph.D., P. Eng., Geophysicist

P. E. Lane, B.Sc., Geophysicist

PH 224/65

300



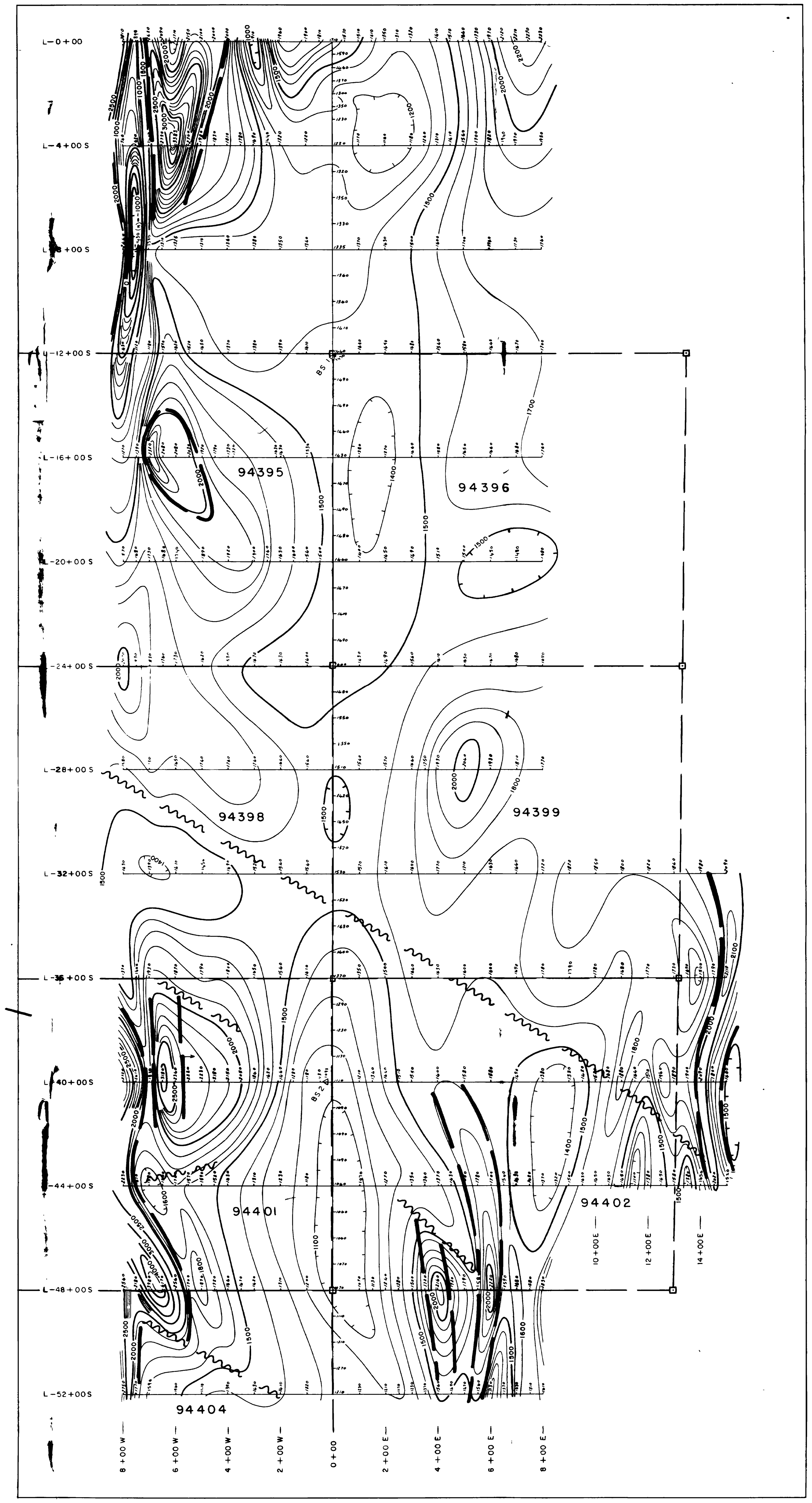
GROUND ELECTROMAGNETIC SURVEY
(VERTICAL LOOP)
WITH INTERPRETATION

SCALES 1 inch = 200 feet
1 inch = 20°

INTERPRETATION LEGEND

ELECTROMAGNETIC MAP

- Medium bedrock anomaly
- Weak bedrock anomaly
- Doubtful bedrock anomaly
- Interpreted bedrock conductor axis
- Doubtful bedrock conductor axis
- (350) Interpreted depth in feet to conductor axis from E M data



GROUND MAGNETOMETER SURVEY
WITH INTERPRETATION

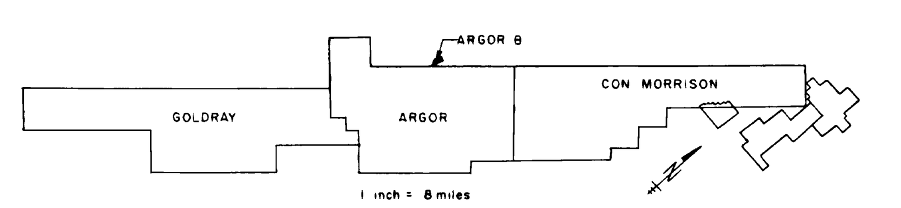
CONTOUR INTERVAL 100 gammas SCALE: 1 inch = 200 feet

INTERPRETATION LEGEND

MAGNETOMETER MAP

- Interpreted geologic contact (approximate)
- Interpreted fault

ARGOR EXPLORATIONS LIMITED
GROUND GEOPHYSICAL SURVEYS
MOOSONEE, ONTARIO
PLATE 7
ARGOR 8 ANOMALY



HUNTEC LIMITED, Toronto, Canada — January, 1966

N R Paterson, Ph D, P Eng, Geophysicist

P E Lane, B Sc, Geophysicist

PH 224/65