



52J13NE0004 52J13NE0016 ROOT LAKE

010

REPORT ON
MAGNETOMETER SURVEY
AND
ELECTRICAL RESISTIVITY CHECK SURVEY

On Property of

CAPITAL LITHIUM MINES LIMITED

ROOT LAKE AREA

RED LAKE MINING DIVISION

ONTARIO



Prepared by:

G.D. Maurice, Ph.D.,
Prof. Eng. & Geologist.

Geo-Technical Development Company Limited,
24 Wellington Street West,
TORO. TO 1, Ontario.



52J13NE0004 52J13NE0016 ROOT LAKE

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63.857

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PLAN NO. 1.....Iso-Dynamic Contours of Magnetic Intensities
in part
Electrical Resistivity Check Survey
and
Magnetic Survey
(Drawing Ref. No. 46-5-57)

PLAN NO. 2.....Iso-Dynamic Contours of Magnetic Intensities
in part
Electrical Resistivity Check Survey
and
Magnetic Survey
(Drawing Ref. No. 47-5-57)

63.857

Capital Lithium Mines Ltd.,
100 Adelaide Street West, Suite 1600,
Toronto 1, Ontario.

Gentlemen:

A magnetometer survey followed by an electrical resistivity check survey has been carried out over your 34-claim group property lying adjacent to the north shore of Root Lake, in the Red Lake Mining Division, Ontario. These surveys were carried out during the period from March 28th - April 9th, 1957. The following report describes the results of the geophysical work correlated with the known geology of the general area.

The magnetic results are plotted on the accompanying map (Plan No. 1 and 2) on the east side of the picket lines, expressed in gammas; the electrical resistivity results are shown on the west side of the picket lines expressed in Ohm-centimeters x 10³.

CONCLUSIONS AND RECOMMENDATIONS

An interesting structure was outlined by the geophysical surveys which the writer interprets as a syncline pitching eastward. The main magnetic anomaly which is likely caused by lenses of iron formations has the form of a crescent, concave to the east, in the vicinity of Lake St. Joseph, some 25 miles to the east, Dr. E. L. Bruce has found evidence of similar folds pitching eastward. The iron bearing formations could thus be continuous in the synclinal basin and if the pitch is gentle, they would lie at relatively shallow depth. A careful examination of the outcrops may give some clue to the degree of pitch and diamond drilling could establish the true width and grade of the iron formations.

Four diamond drill holes are recommended in the fold area, to test not only the width and grade of the iron formations

but also the significance of the low resistivity zones associated with them. A fifth hole is recommended outside of the fold area in anomaly "R" 4, which is also associated with high magnetic readings and where the better conductivity is possibly caused by sulphides.

Surface prospecting to locate lithium bearing pegmatites is recommended especially in the interpreted synclinal basin, and on the high ground north of anomaly "R" 4.

The north-east interpreted fault, which occurs in a topographic depression, is probably a late structure, its importance could be greatly increased if significant mineralization was encountered in D. D. #3, intersecting anomaly "R" 2, which is parallel to the fault.

PROPERTY, LOCATION AND ACCESS

The property is located near the north shore of Root Lake, approximately 52 miles due north of Sioux Lookout, Ontario. It is comprised of a group of 34 contiguous claims numbered as follows:

39439 - 39472, inclusive

Root Lake covers a portion of the five south-western claims (39450 - 39454) and affords excellent landing facilities for float or ski-equipped aircraft, operating from bases in Sioux Lookout.

TOPOGRAPHY

The topography of the area is typical of the Canadian Shield and is best described as an eroded peneplain. There are extensive portions of low and swampy ground in the north-west and center of the property but a greater proportion of the claim group is on high and dry ground where several rock outcrops have been observed by the survey crew. The ridges run east-west or north-east and are remarkably parallel to the main geophysical contour lines; there is little doubt that the

orientation of the topographic and geophysical lineaments reflect on the structural attitude of the underlying rock formations.

GENERAL GEOLOGY

There is no direct knowledge of the geology of the area surrounding Root Lake; the only geological map which covers the property is Map 347A of the Geological Survey of Canada; the area surrounding Root Lake is left as a blank on this map. From the results of the geophysical surveys, however, it may be assumed with confidence that a band of Keewatin rocks consisting of intermediate and basic volcanics, with iron formations and slaty sediments, crosses the property in an east-west direction. The high hills near the north shore of Root Lake are likely underlain by a granite intrusive.

The geology on map 347A is considerably simplified due to the scale of mapping which is two miles to the inch; more details of the geology are given in areas further east, where the Keewatin rocks are separated into two bands consisting of greenstone to the north and predominantly sediments to the south. The iron formations are closely associated with the sediments which are intruded by numerous dykes of quartz porphyry, granite and pegmatite (See map No. 31E, Ontario Department of Mines).

The Keewatin rocks are known to have been folded into a series of anticlines and synclines; the axes of these folds are generally believed to be pitching eastward. One synclinal axis probably exists on the property in the vicinity of the main base line; the evidence for such a fold is both geophysical and topographical and will be discussed further.

There is also geophysical and topographical evidence for north-east faulting along a line stretching south-westward from the base line in the vicinity of picket line 0+00.

Magnetic variations have been noted in this area since early historic times, when trappers and Hudson's Bay Company officials used the Albany River route to travel to their trading posts along the river. The first test drilling was done on an island in St. Joseph Lake, about 25 miles east of the property. The composition of seven channel samples and the results of four mill tests on the ore are given in a report by the Ontario Department of Mines (Vol. XXXI, Part VIII, Pp. 30 - 31).

Base metal sulphides and precious metals were never prospected thoroughly and the writer is not aware of any significant discoveries of these metals. It is felt, however, that some of the good conducting zones outlined during the surveys could possibly be caused by sulphide concentrations.

Spodumene bearing pegmatites have been explored on the property of Capital Lithium, less than three miles north-west of the area surveyed; results of analyses on samples taken from three showings on this property are reproduced in a report by S. S. Szetu, dated January 4th, 1956.

INTERPRETATION OF THE MAGNETOMETER SURVEY RESULTS

A crescent-shaped anomalous zone was outlined on the property, starting from the north-east corner on claim 39476 south-westward to the base line near picket line 28W, then east-south-east on the south side of the base line to picket line 0+00. The anomaly is closely parallel to prominent topographic contours throughout its

length. There is, thus, good evidence that a fold with an axis approximately east-west in the vicinity of the base line is present; since these folds are known to pitch eastward in the area*, the shape of the crescent would indicate a syncline.

The magnetic readings along extensive lenses in the anomalous zone are very high and quite often off-scale, indicating the presence of iron formations along a total length of approximately 9000 feet. Nothing is known about the degree of pitch of the supposed syncline; if a 45° pitch is assumed iron bearing formations could lie at a depth of about 1700 feet in the vicinity of line 16W and the base line, near line 0+00, a vertical line would intersect them at about 4000 feet in depth. Depending on the true width and grade of the iron formation and on the degree of pitch of the fold, the iron reserves in the supposed synclinal basin could prove to be of economic importance, especially in the event that other iron deposits were exploited nearby.

Other magnetic indications which support the synclinal theory are the apparent widening of the anomalous zone in the vicinity of line 28W near the crest of the fold and the extensive area of low magnetic intensity within the synclinal basin which indicates a probable dip inward of the magnetic deposit.

At several locations along the main anomalous zone, the magnetic contours indicate the probable existence of two or three parallel lenses of iron formations, two other small anomalies were outlined on lines 12E, 2,550 feet south and 24W, 2,500 feet south.

* See Ont. Dept. of Mines, Vol. XXXI, Part 8, Page 22.

There is evidence of faulting along the topographic depression which runs north-eastward to the base line near picket line 0+00. The south limb of the anomalous zone is displaced westward on the south side of the assumed fault. Low resistivity readings along the fault are further signs of its existence.

EXPLANATION OF THE ELECTRICAL RESISTIVITY METHOD

The method used by Geo-Technical Development Company Limited is a form of the early resistivity survey or "mapping" methods, modified by some eleven years' experience in the field.

In short, a known current is introduced into the ground by means of two screen contacts, which are separated by a distance approximately equal to three times the width of the property, with a spread line drawn through the centre of the property, at right angles to the Base Line. The contacts are spaced equi-distant from the central Base Line. Readings are then taken at 50-foot intervals along the picket lines, by means of a sensitive vacuum tube voltmeter which measures the potential drop across the interval. The apparent resistivity is then calculated from the potential readings and current, in terms of Ohm-centimeters.

Shear and fracture zones are relatively better conductors, due to their higher water content. This is true also of porous unconsolidated sediments. Extreme low resistivity readings may be due to graphite or to sulphide mineralization, and there is no way to distinguish between sulphide and graphite from the results obtained. Graphite is suspected as cause of an anomaly when there are occurrences of this mineral within schists or shear zones in the immediate vicinity.

Sulphide mineral deposits have also been discovered in areas of high resistivity contrasts which did not register extremely low readings.

INTERPRETATION OF THE ELECTRICAL RESISTIVITY SURVEY

The electrical resistivity survey covered the western part of the property from line 12E to line 40W. The anomalous resistivity areas correspond closely with the magnetic anomalies and it is not unlikely that the better conduction is due in part to the iron formations.

The areas surrounding the zones of high magnetic intensity in the north-west and south have consistently high resistivity values, the remainder of the surveyed property is of comparatively low resistivity except near the south limb of the supposed synclinal structure where narrow zones of high readings are shown.

Four particularly low resistivity anomalies are identified on Plan No. 1 with the prefix "R".

Anomaly "R" 1 adjoins the north limb of the main magnetic anomaly along its south-east edge; at one point near the north-east end of anomaly "R" 1 there is perfect coincidence of high off-scale magnetic readings and sharply contrasting low resistivity values.

Anomaly "R" 2 is near the south limb of the crescent-shaped magnetic anomaly; the low resistivity readings are oriented parallel to the interpreted fault and could represent a parallel shear.

Anomaly "R" 3 lies further east along the south limb of the main high magnetic zone, very sharp magnetic and resistivity contrasts are observed at the east end of "R" 3.

Anomaly "R" 4 lies south of the main magnetic anomalous zone and is associated with a short magnetic anomaly believed to be caused by a small lens of iron formation. The narrow zone of relatively

low resistivity continues to the eastern boundary of the surveyed area, the low readings occur on the south side of a topographic rise and could be due to wet surface conditions at the edge of the slope; however, there are sharp magnetic variations at a few points along this narrow zone notably on line 4E and 12E, magnetic mineral concentrations could be the cause of the magnetic variations as well as of the low resistivity values.

Another low resistivity reading occurs on line 12E, 2100 feet north, it is associated with a sharp drop in magnetic intensity immediately north. If further exploration proved the low resistivity areas economically important, it would become urgent to extend the resistivity survey eastward.

INSTRUMENT DATA

A Sharpe Magnetometer, Model A-2 with a sensitivity of 20 gammas per scale division was used for the magnetic survey. The electrical Resistivity survey was conducted with a Canadian Research Institute Vacuum Tube Voltmeter, Model E-3579, with 100 microvolt full scale deflection, together with a Canadian Fairbanks-Morse Onan Motor Generator Plant, 115V, 400W.

SURVEY DATA

A ground magnetometer survey followed by an electrical resistivity check survey has been carried out by Geo-Technical Development Co. Ltd., over the 34-claim property of Capital Lithium Mines Ltd. in the Root Lake Area, Red Lake Mining Division, Ontario. The surveys were carried out during the period from March 28th to April 9th, 1957, the results of which are shown on Plans No. 1 and 2 accompanying this report.

Two east-west base lines were established across the property and picket lines were turned off at right angles to the base lines at intervals of 400 feet. A total of 37 miles of line was thus cut and chained including tie lines and spread line.

The magnetometer survey was conducted along each picket line with readings being registered at 100 foot intervals; these were converted to gammas and plotted on the east side of the picket lines. A total of 29.0 miles of line was thus surveyed involving 1539 readings.

The electrical resistivity survey was carried out along lines 12E to 40W inclusive, voltmeter readings were registered at 50 foot intervals and converted to Ohm-cms x 10³. A total of 15.3 miles of line was thus surveyed involving 1616 readings.

The number of 8-hour man days required to complete these surveys is as follows:

	<u>8-hour Man days</u>	<u>Attributable to Assessment Work</u>
Line Cutting & Chaining	60 x 4	240
Operating Resistivity Survey	12 x 4	48
Operating Magnetometer Survey	28 x 4	112
Drafting	5 x 4	20
Preparation of Report & Supervision	6 x 4	24
Office Typing	3 x 4	12
Total	114	456

Respectfully submitted,
GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED

O. D. Maurice

O. D. Maurice, Ph. D.,
Prof. Eng. & Geologist.

Toronto, Ontario,

May 29, 1957.

ODM/ms

A P P E N D I X

Names and addresses of persons employed on survey and dates on which each worked.

G. D. Maurice, Geologist	April 13 - April 18 incl./57;
P. Michaud, Operator	March 31 - April 8 incl./57;
T. Miskupski, Operator	March 28 - April 9 incl./57;
B. Fedde, Helper	March 28 - April 5 incl./57;
F. Cuspilli, Helper	March 28 - April 5 incl./57;
Hick Harding, Craftsman	April 15, 16, 17, 1957;
F. Teckert, Craftsman	April 19, 20, 1957;
Mrs. L. Sieger, Typist	May 27, 28, 29, 1957;

-all of 24 Wellington St. W., Toronto, Ontario.

Line Cutters:

G. Mustard	Feb. 14 - Feb. 25 incl./57;
W. McFarlane	Feb. 14 - Feb. 25 incl./57;
M. Anderson	Feb. 14 - Feb. 25 incl./57;
L. Lorteau	Feb. 14 - Feb. 25 incl./57;
W. Stienke	Feb. 14 - Feb. 25 incl./57;

-all of Oakville, Ontario.



Ontario



52J13NE0004 52J13NE0016 ROOT LAKE

900

Ministry of
Natural
Resources

Box 860
Red Lake, Ontario
POV 2MO

Telephone 807/727-2252

File number

August 24, 1978

MEMORANDUM TO:

Dr. P.A. Palonen
Resident Geologist
Ministry of Natural Resources
P.O. Box 1089
Sioux Lookout, Ontario
POV 2TO

Re: Capital Lithium Property

Concerning your query of August 13, 1978, we have drill logs, and other information as per the assessment index plans and lists attached.

Herewith find two copies each of:

- (i) Claim Map M.2340, Root Lake area, Red Lake Mining Division claims.
- (ii) Assessment Work Index Plan, M.2340, Red Lake files.
- (iii) Assessment Work Index List, M.2340, Red Lake files.

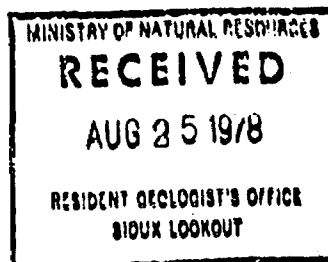
Regards,

L.O. Koskitalo

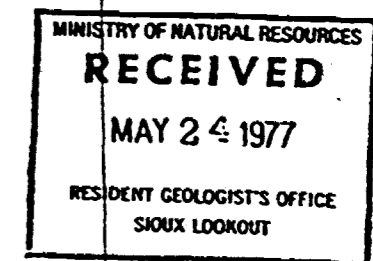
L.O. Koskitalo
Resident Geologist
Red Lake

LOK/ah

Encl.



NO.	FILE NO.	COMPANY NAME	YEAR	WORK PERFORMED	ADDITIONAL COMMENTS
1	52J/NW/13	Capital Lithium Mines Ltd.	1957 1956 1957	Magnetometer Survey and Resistivity Check Survey 2 DDH (KRL 38098) (813.0') 5 DDH (3240.0')	
2	52J/NW/13	Capital Lithium Mines Ltd.	1956 1955-56 1956	Geological Survey 6 DDH (2678.9') Main Group 5 DDH (2606.5') Stollery	
3	52J/NW/13	Consolidated Morrison Explorations Limited	1957	16 DDH (6329') DDH Location	
4	52J/NW/13	Three Brothers Mining Exploration	1956	5 DDH (2017') DDH Location	



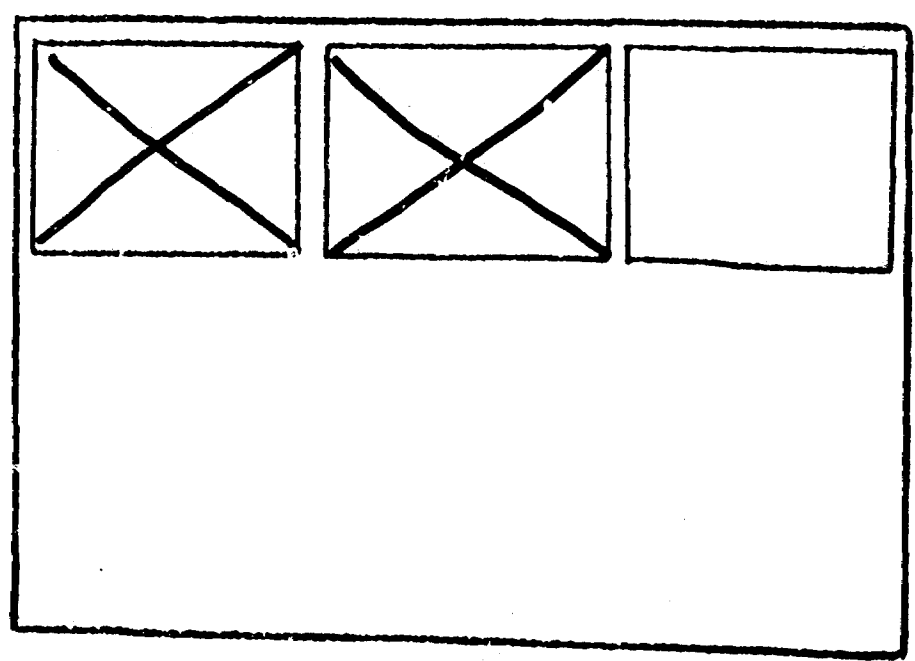
Root Lake M-2342
52 J/NW 13

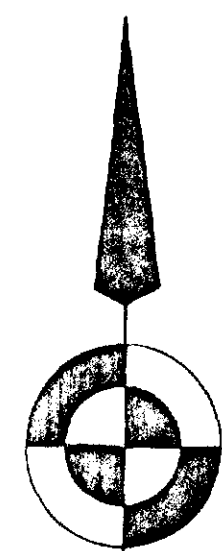
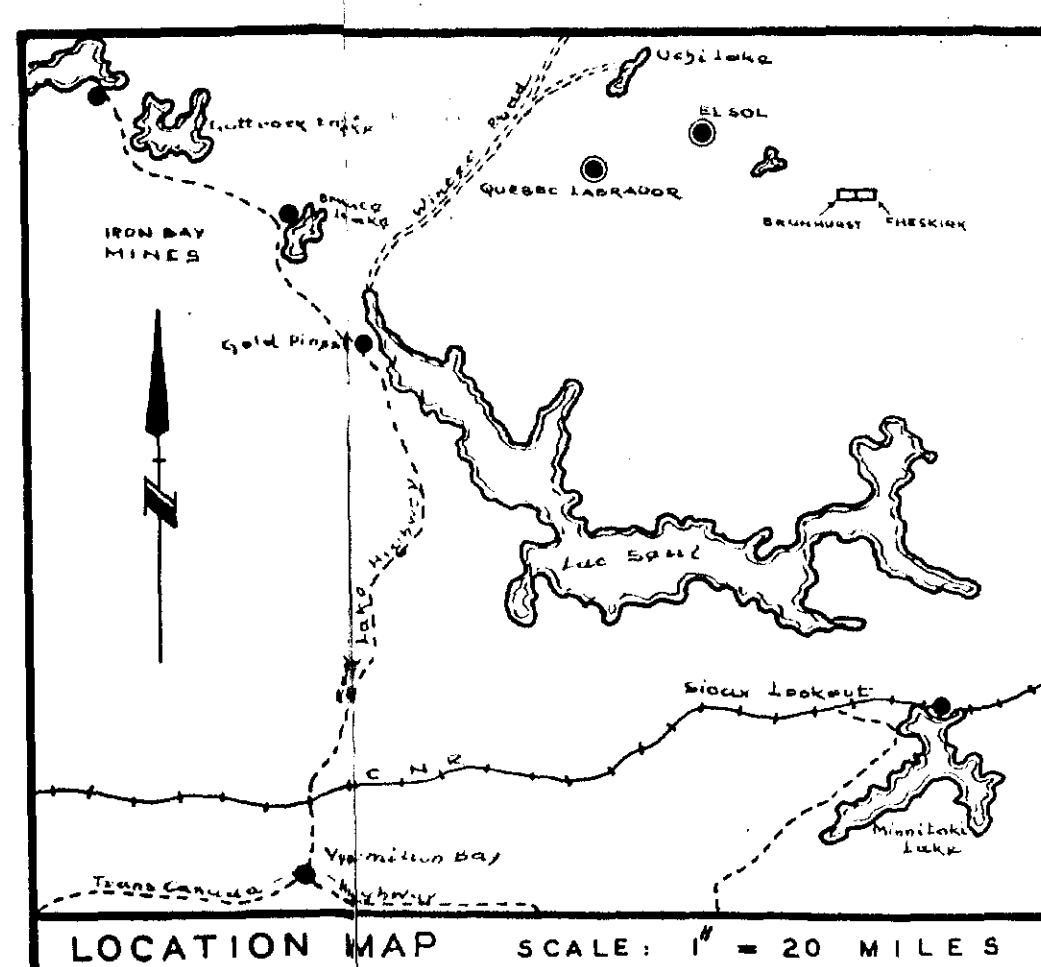
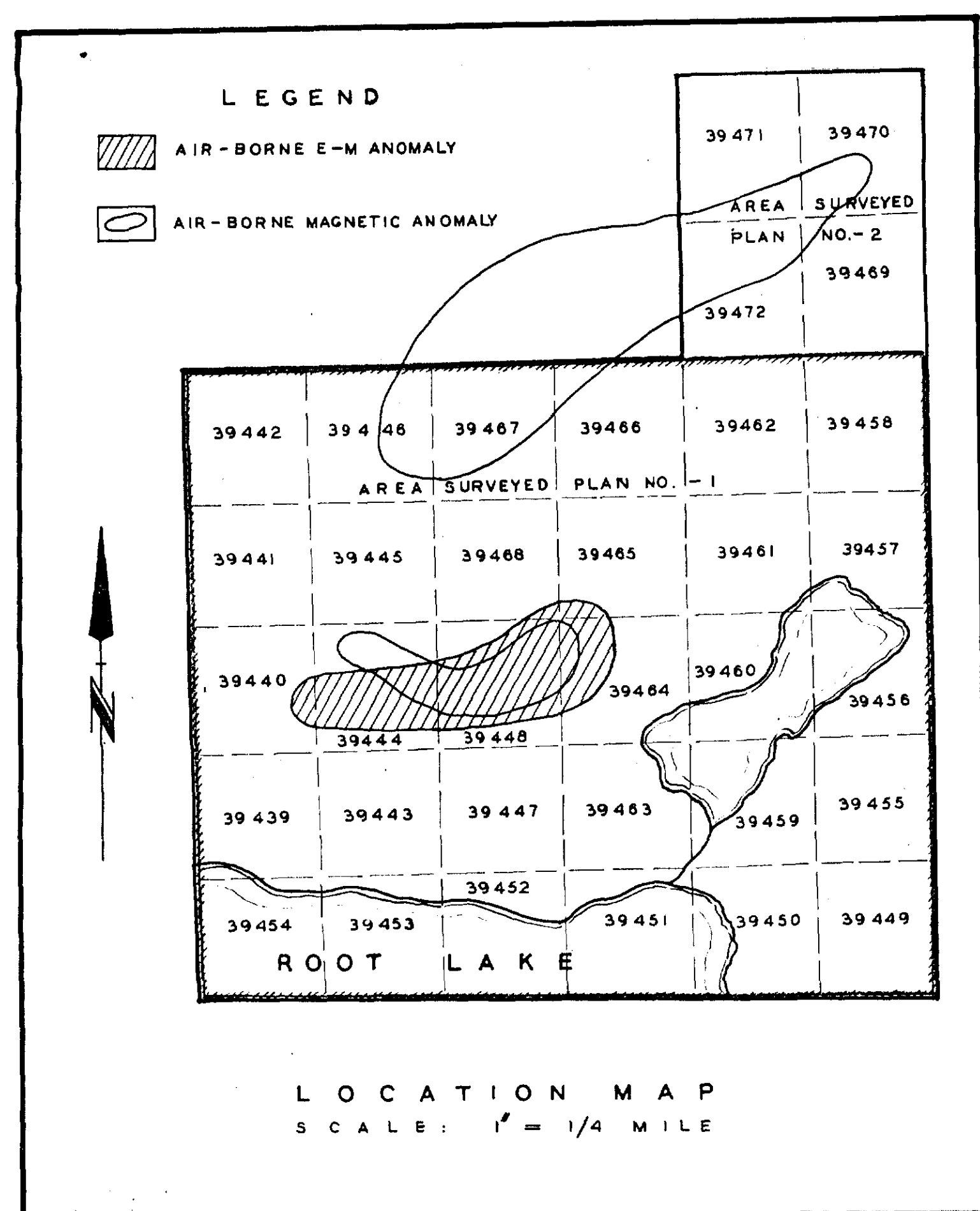
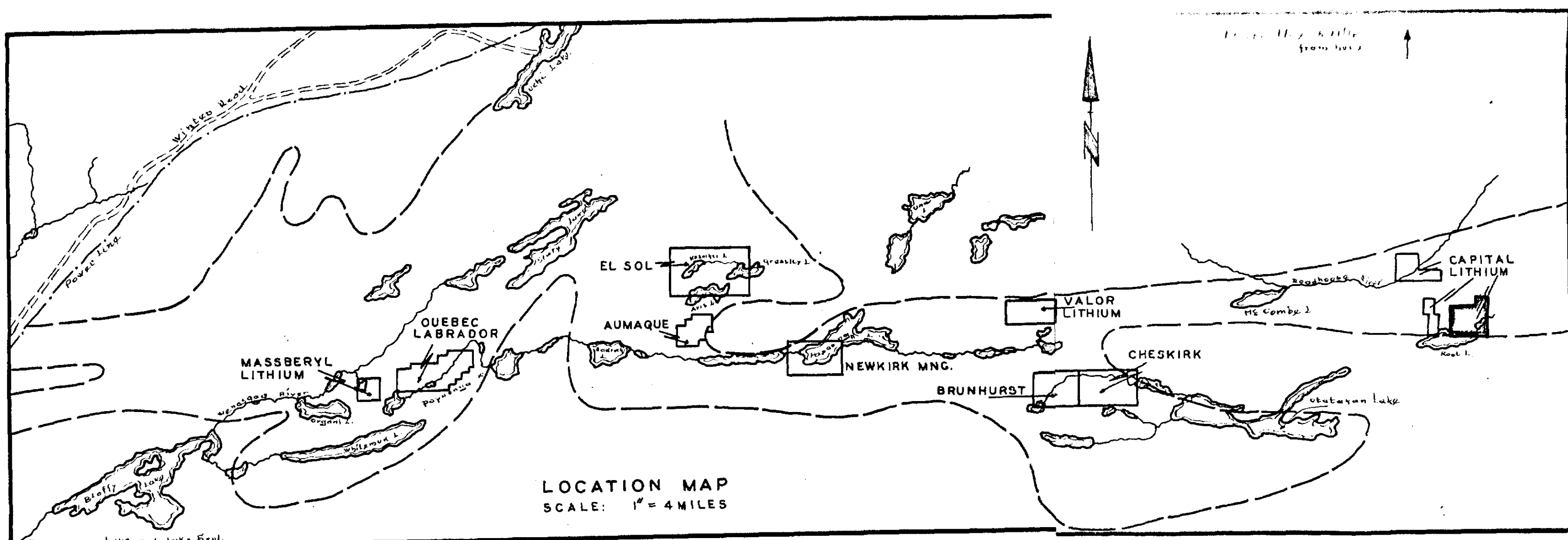
SEE ACCOMPANYING
MAP(S) IDENTIFIED AS

52 J/13 NE-0016 #1

52 J/13 NE-0016 #2

LOCATED IN THE MAP
CHANNEL IN THE FOLLOWING
SEQUENCE (X)





LEGEND

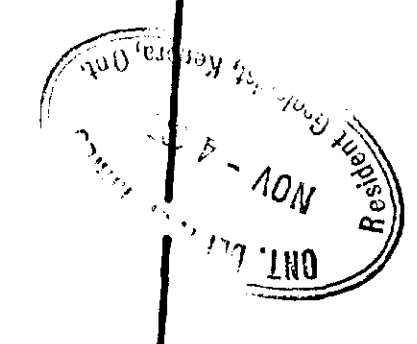
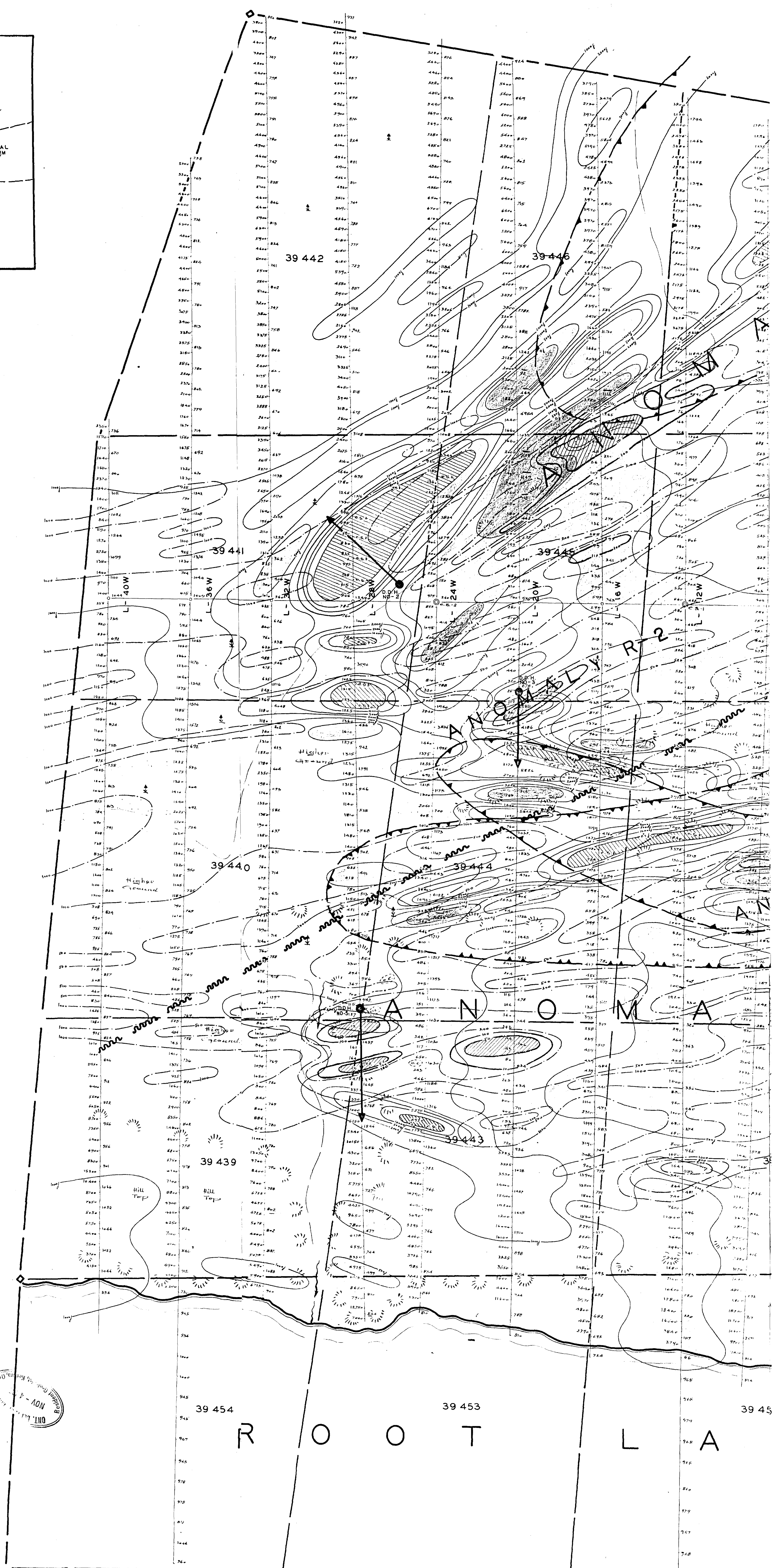
- | | | | | |
|--|---|--|--------------|----------------------------|
| | LINES CUT AND CHAINED MAGNETIC READINGS OBSERVED AND PLOTTED ON EAST SIDE OF LINE GRID. | | 0 - 50 | GAMMA |
| | MAGNETIC CONTOUR. | | 0 - 500 | |
| | ELECTRICAL RESISTIVITY READINGS OBSERVED AND PLOTTED ON WEST SIDE OF LINE GRID. | | 500 - 1000 | |
| | ELECTRICAL RESISTIVITY CONTOUR. | | 1000 - 2000 | |
| | MAGNETIC BASE CONTROL STATION. | | 2000 - 5000 | |
| | MAGNETIC CONTROL STATION. | | 5000 - 10000 | |
| | OUTLINE OF HIGHER GROUND. | | 10000 - UP | |
| | SWAMP AND SWAMPY LOW GROUND. | | 0 - 50 | OHM - CM X 10 ³ |
| | OUTCROP AREA. | | 50 - 100 | |
| | CLAIM POST LOCATION AND CLAIM BOUNDARY. | | 100 - 200 | |
| | APPROXIMATE LOCATION OF AERO MAGNETIC ANOMALY. | | 200 - 500 | |
| | APPROXIMATE LOCATION OF AERO E. M. ANOMALY. | | 500 - 1000 | |
| | INFERRED GEOLOGICAL FAULT. | | 1000 - UP | |
| | PROPOSED DIAMOND DRILL HOLE | | | |

GEOPHYSICAL SURVEY DATA OVER PART OF PROPERTY
CAPITAL LITHIUM MINES LIMITED
 ISO-DYNAMIC CONTOURS OF MAGNETIC INTENSITIES
 IN PART
 ELECTRICAL RESISTIVITY CHECK SURVEY DATA
 AND
 GEOLOGICAL INTERPRETATION

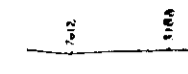
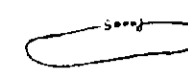
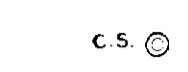
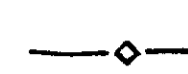

RED LAKE MINING DIVISION
 DISTRICT OF KENORA
 ONTARIO


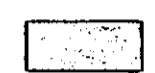
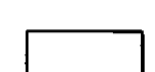


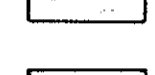

GEOPHYSICAL SURVEY BY:
GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED

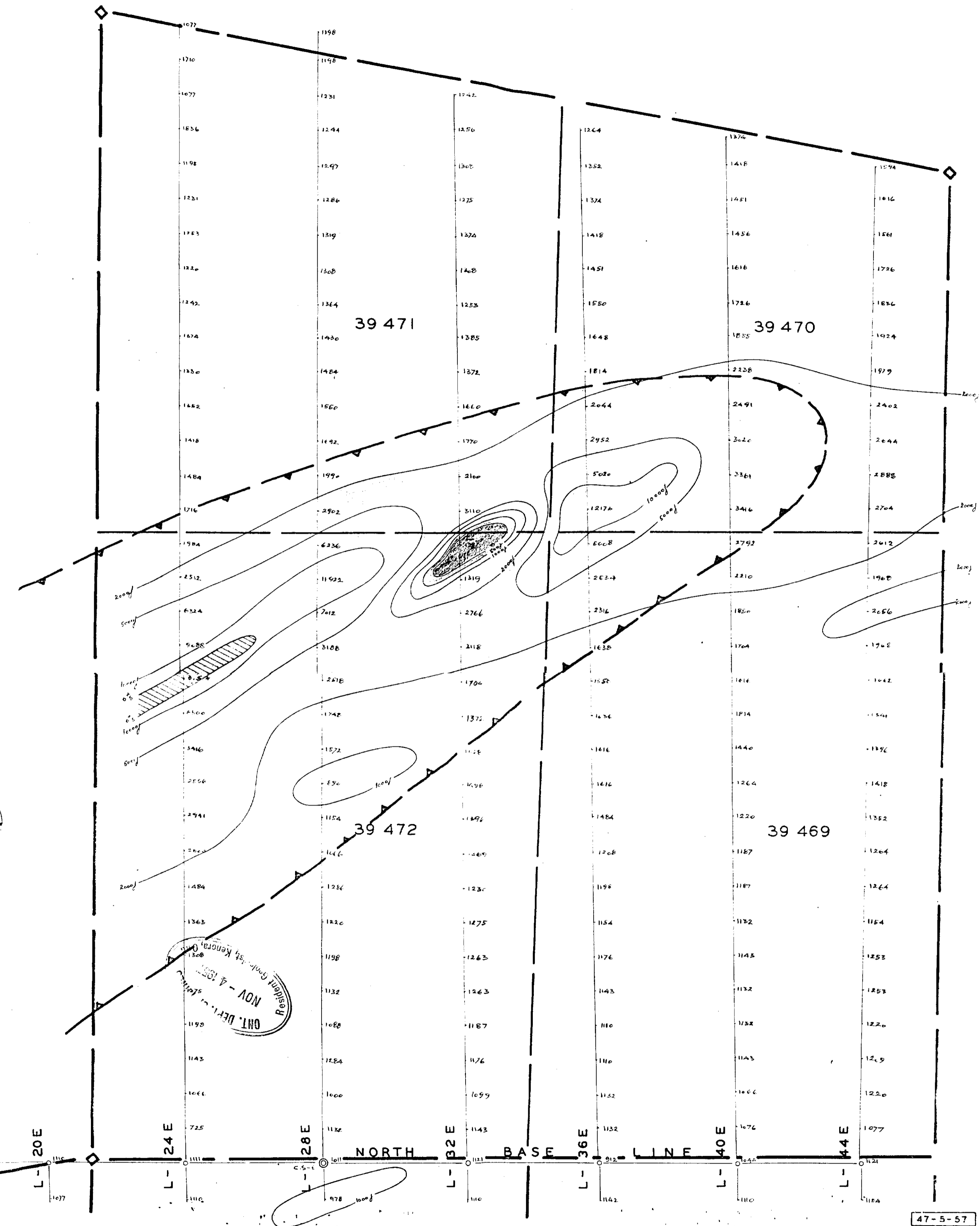
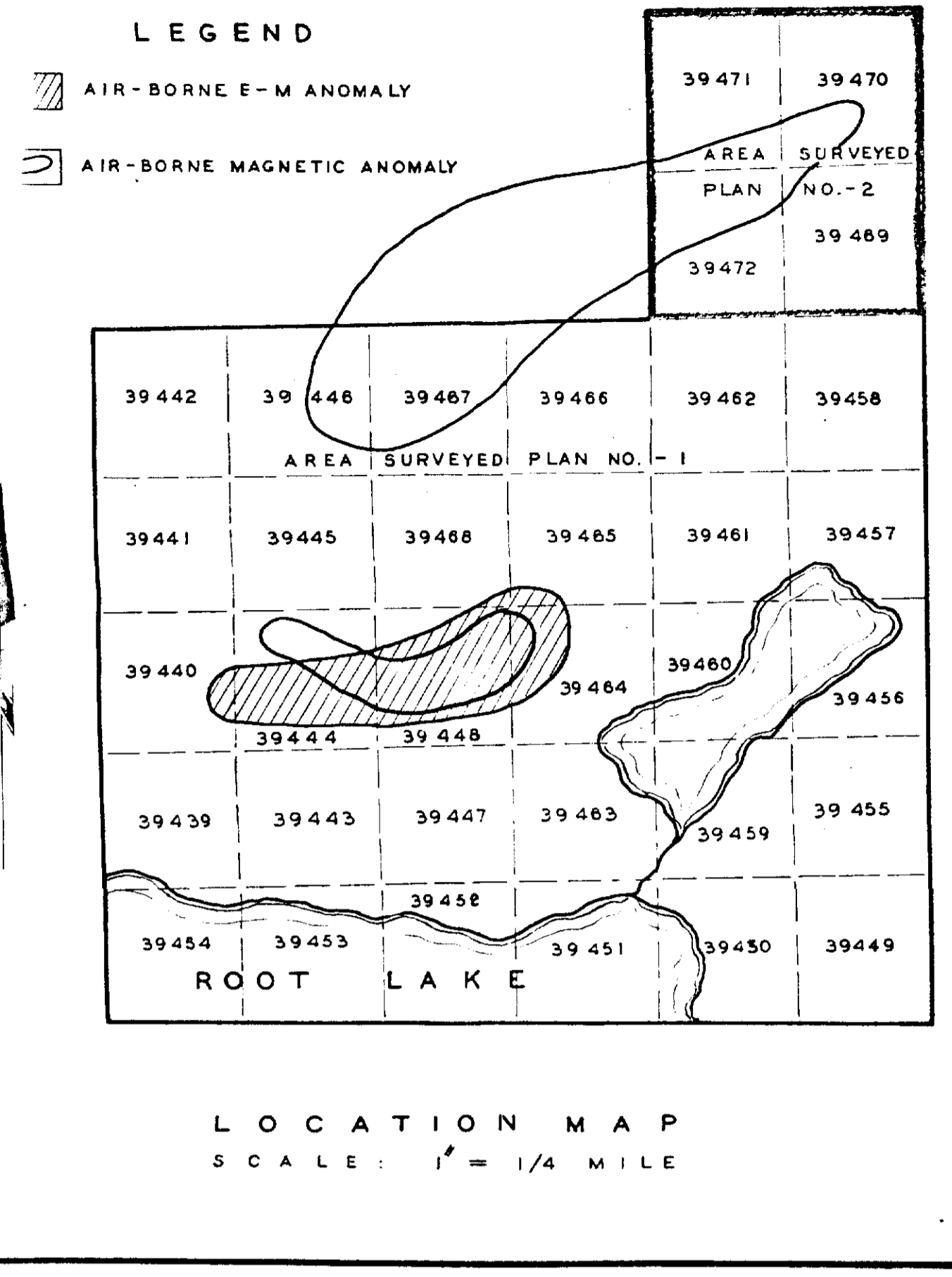
PLAN NO. - 1
 SCALE: 1" = 200'
 MAY - 1957



L E G E N D

-  LINES CUT AND CHAINED MAGNETIC READINGS OBSERVED AND PLOTTED ON EAST SIDE OF LINE GRID.
-  MAGNETIC CONTOUR.
-  C.S. ○ MAGNETIC CONTROL STATION
-  CLAIM POST LOCATION AND CLAIM BOUNDARY.
-  APPROXIMATE LOCATION OF AERO MAGNETIC ANOMALY.

	0 - 50	GAMMA
	0 - 500	
	500 - 1000	
	1000 - 2000	
	2000 - 5000	
	5000 - 10000	
	10000 - UP	



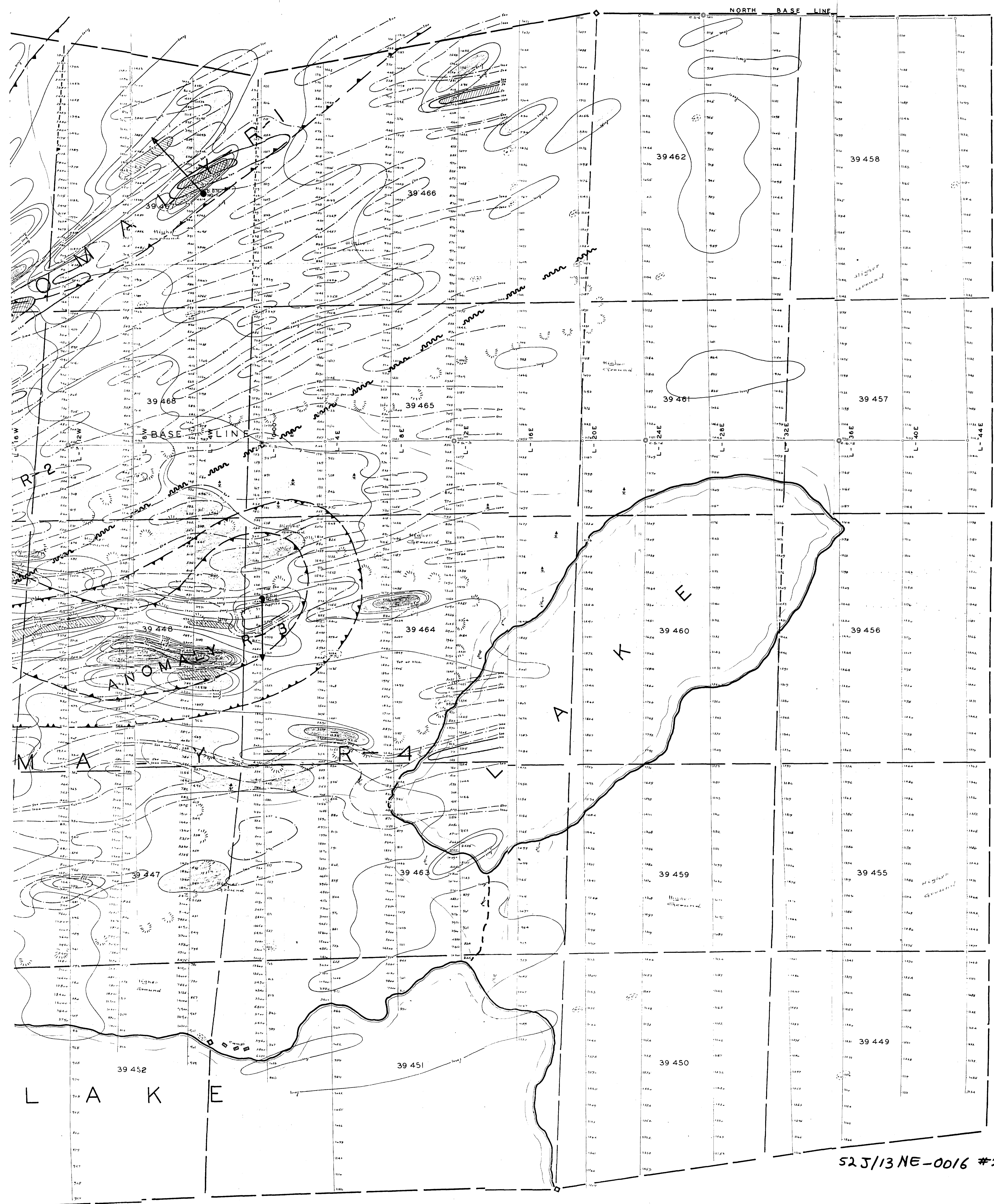
GEOPHYSICAL SURVEY DATA OVER PART OF PROPERTY
CAPITAL LITHIUM MINES LIMITED
ISO-DYNAMIC CONTOURS OF MAGNETIC INTENSITIES
IN PART
ELECTRICAL RESISTIVITY CHECK SURVEY DATA
AND
GEOLOGICAL INTERPRETATION

RED LAKE MINING DIVISION
DISTRICT OF KENORA
ONTARIO

GEOPHYSICAL SURVEY BY:
GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED

PLAN NO.-2
SCALE: 1" = 200'
MAY - 1957

525/13 NE-0016 #1



525/13NE-0016 #2