



32D05SW0009 2.10571 CLIFFORD

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GEOLOGICAL REPORT
ON
GRID C-14
CLIFFORD TOWNSHIP, ONTARIO
LARDER LAKE MINING DIVISION
DISTRICT OF TIMISKAMING

RECEIVED

NOV 25 1987

MINING LANDS SECTION

Latitude: 48° 17' N
Longitude: 79° 80' W

By: John Kovala

Latitude: 48° 17' N



	<u>Page No.</u>
INTRODUCTION AND SUMMARY OF RESULTS	1
LOCATION AND ACCESS	1
PROPERTY DESCRIPTION	2
TOPOGRAPHY AND VEGETATION	2
PREVIOUS WORK	3
SURVEY PROCEDURE	3
RESULTS OF GEOLOGICAL MAPPING	4
Regional Geology	4
Property Geology	4
Economic Geology	6
CONCLUSIONS	7
FIGURES	
1. Location Map	
2. Location Map	
ENCLOSURES	
1. Geology Map	

INTRODUCTION AND SUMMARY OF RESULTS

This report describes the results of a geological survey conducted over a continuous block of 18 claims located in Clifford Twp. by the author.

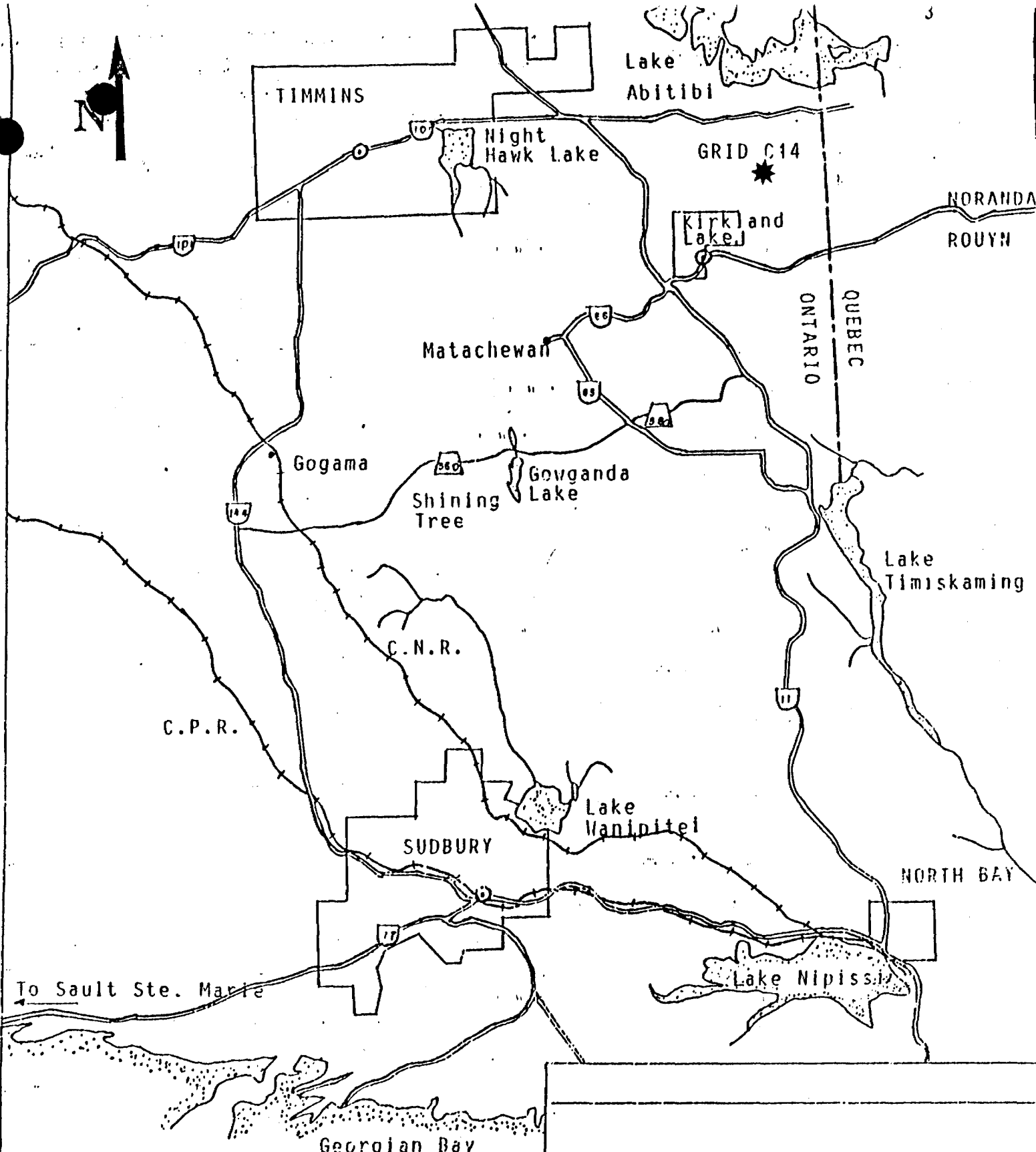
Geological mapping at a scale of 1:5,000 was conducted over a total of 26.7 kilometers of north-south grid lines spaced at 125 m.

Based on the geological mapping no interesting veining sulphide mineralization or alteration has been located. As a result no geological targets with any economic interest have been outlined.

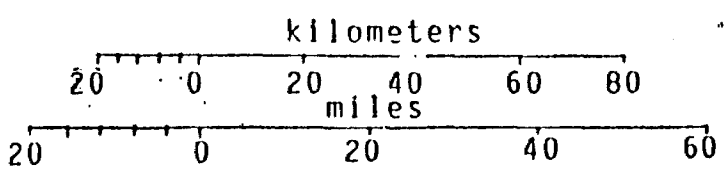
LOCATION AND ACCESS

The property is located 20 km northeast of Kirkland Lake, Ontario on the southern boundary of Clifford Twp., N.T.S. 32 D/5, latitude $48^{\circ} 17' N$, longitude $79^{\circ} 80' W$. Figures 1 and 2 illustrate the properties location at scales of 1:1,600,000 and 1:500,000 respectively.

Access to the property is gained by following a sandy bush road that turns off of the Esker Lakes Park Road. This sand road is followed for a distance of approximately 5 kilometers to the southern boundary of the property.



To Sault Ste. Marie



GRID C14 LOCATION MAP	
Date	OCT 1987
Scale	1:1,600,000
JOHN KOVALA	Fig. 1

PROPERTY DESCRIPTION

Property C-14 covers 18 continuous unpatented mining claims located in Clifford Township, Larder Lake Mining District of Timiskaming. The 18 claims are listed below:

Claim Numbers:

L803325, L803326, L803327, L803328, L803329, L803330,
L803331, L803332, L803333, L803334, L803335, L803336,
L803337, L803338, L803339, L803340, L803341, L803342

Total = 18 claims

TOPOGRAPHY AND VEGETATION

The property is covered by pleistocene to recent deposits of basal till clay aeolian sand dunes and swamp through which about 5% bedrock is exposed.

Most of the property is covered by elongate sand dunes separated by low lying flat swampy ground. The sand dunes form elongate northwest to southeast ridges 2 to 10 m high with steep north dipping slopes.

Till deposits and clay are exposed on the east part of the property. They are found generally on higher ground and near areas of outcrop.

Vegetation consists mainly of pine, spruce and small isolated clusters of birch and poplar. Tag alders are abundant in wet swampy areas.

Selected areas on the western quarter of the property have been logged. Logging activities have been restricted to the elongate sand ridges.

PREVIOUS WORK

The only evidence of previous work is in the form of blasted pits restricted to the central eastern portion of the property in zones of pyrite mineralization.

Assessment work files indicate that Canadex Mining Corporation has carried out a magnetic and VLF-EM survey and a portion of the survey covers the six eastern claims.

Mining Corporation of Canada has drilled 5 holes in the area. Assessment work files have no exact locations for the drill holes but to date none have been located on the 18 claim group mapped.

SURVEY PROCEDURE

Geological mapping was conducted over the entire grid at a scale of 1 to 5,000 along north-south metric grid lines spaced 125 m. apart and with stations located at 25 m intervals.

RESULTS OF GEOLOGICAL MAPPING

Regional Geology

Regionally the property is located in the central - western part of the Blake River Group volcanics, a synclinorium that opens to the east. The rocks of the Blake River Group consist mainly of calc alkaline basalt andesite minor Mg-rich tholeiitic lava, calc alkalic dacite, rhyolite and tuff (OGS Map 2484).

In the central portion of the synclinorium occurs a domal anticline intruded by granodiorite. The map area is located 2 miles south of the axis of the domal anticline over a complimentary W.N.W. syncline. The syncline is centred by felsic volcanics and flanked to the N.N.E. and S.S.W. by intermediate volcanics. A large quartz gabbro intrusive is located along the southeastern boundary of the property.

Property Geology

Map 1 located at the back of this report presents the results of the geological mapping survey. Outcrop exposure in the map area is approximately 5%.

Felsic volcanics are found centrally on the property. These rocks occupy a 600 to 800 m wide area striking W.N.W. It has been suggested L.S. Jensen (1975) that felsic volcanics occupy the centre of a syncline with a W.N.W. axis. No top directions have been found

to confirm this.

In this report rhyodacite and dacite have been categorized as felsic volcanics. The felsic volcanics have been subdivided into; massive, amygdaloidal, feldspar porphyry, quartz porphyry, tuff, lappilli tuff, tuff breccia and agglomerate.

In the area between L17+50 to L21+25E and 4+00N to 6+00N the rocks are dominantly massive felsic volcanics and felsic tuff. They are fine grained light yellowish to green and weather to white. 1 to 2% pyrite occurs disseminated, often weathering out causing rusty streaks. In places the rock is intensely fractured in 3 directions causing it to break up into small blocks.

Between L12+50E to L17+50E and 8+00N to 12+00N occur intercalated felsic tuff, tuff breccia, agglomerate and massive feldspar porphyry and amygdaloidal to massive non-porphyrific non-amygdaloidal felsic volcanics.

Flows varied in thickness from 2 to 30 m. Contacts, lappilli beds in felsic tuff and elongate direction of fragments in agglomerate all strike between 125° and 135°. Tuff breccia and agglomerate occur intercalated and contain grey to grey-green porphyritic fragments 5 to 25 cm in diameter in a grey porphyritic matrix. Feldspar phenocrysts in the matrix and fragments are 1 to 3mm in diameter. Minor yellow sericite occurs in the matrix. A subparallel primary alignment of fragments at 125° to 135° was noted.

Felsic tuff occurs as thin < 5m beds. The rock is often finely bedded cherty and yellowish to pale green in colour. At L16+00/9+12N rusty bands 1 to 4 cm wide containing pyrite and 1 to 3 mm feldspars strike at 135°.

Massive, porphyritic and amygdaloidal volcanics tend to be darker green in colour and weather to a green white.

Intermediate volcanics andesite and dacite can be found on the N.N.E. and S.S.W. flanks of the rhyolite. To the S.S.W. no flow textures were noted. The rocks are massive aphanitic medium grey green in colour often containing feldspar phenocrysts and/or amygduals. Large quartz carbonate masses from 2 to 30 cm in diameter were noted at L0+00/5+50N. A feldspar porphyry dyke 5 m wide at L7+50E/0+775N has a strike of 85°.

N.N.E. of the felsic volcanics occurs a variety of rock types stratigraphically from south to north, tuff, intermediate volcanics, gabbro and syenite intrusives, felsic volcanics and basalt. A strike of 105° was obtained from tuffs located at the southern end of the cluster of outcrops.

A large stock of quartz gabbro occupies the area from L12+50E to 23+50E and south of 3+50N. The rock is medium to dark green massive and medium grained. There is very little textural variation across the body. No contacts with the volcanics were observed.

Economic Geology

Minor disseminated pyrite was observed in the area of L21+25/5+00 to 6+00N in felsic volcanic rocks. Trace amounts of pyrite were observed with thin quartz carbonate veins. Across the property there is a lack of any interesting veining sulphide mineralization and alteration. As a result of the mapping no geological targets of any economic interest have been outlined.

CONCLUSIONS

Based on the geological mapping, no geological targets of any economic potential have been located. The cause of VLF-EM conductors has not been determined based on the geological mapping. Some VLF-EM anomalies may be due to topographic effects.

It is recommended that an IP survey be conducted over selected VLF anomalies possibly followed by drilling if any IP targets of interest are located.

John Kovach



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VLF EM-16 SURVEY REPORT
ON
GRID C-14
CLIFFORD TWP., ONTARIO
LARDER LAKE MINING DIVISION
DISTRICT OF TIMISKAMING

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NOV 25 1987

MINING LANDS SECTION

N.T.S.: 32 D/5
Latitude: 48° 17' N
Longitude: 79° 80' W

By: John Kovala



	<u>Page No.</u>
INTRODUCTION	1
PROPERTY	1
LOCATION AND ACCESS	2
TOPOGRAPHY AND VEGETATION	2
PREVIOUS WORK	3
GENERAL GEOLOGY	3
SURVEY METHOD	4
SURVEY RESULTS	4
CONCLUSIONS AND RECOMMENDATIONS	5

FIGURES

LOCATION MAP (Figure 1)	after page 2
LOCATION MAP (Figure 2)	after page 2

ENCLOSURES

1. VLF-EM Survey Values
2. VLF-EM Survey Filtered Values and Contours

INTRODUCTION

A VLF-EM 16 was carried out over a continuous group of 18 unpatented mining claims located on the southern boundary of Clifford Township, about 20 kilometers northeast of Kirkland Lake. In April and May, 1987 the survey was conducted over a total of 26.7 kilometers of metric north-south grid lines.

The Cutler, Maine transmitter (24.0 kHz) NAA was read at 25 meter intervals along the north-south grid lines with a Geonics EM-16 VLF unit.

PROPERTY

The survey area covers 18 continuous unpatented mining claims located in Clifford Township, Larder Lake Mining Division, District of Timiskaming. The 18 claims are listed below:

Claim Numbers:

L803325, L803326, L803327, L803328, L803329, L803330,
L803331, L803332, L803333, L803334, L803335, L803336,
L803337, L803338, L803339, L803340, L803341, L803342

Total = 18 claims

LOCATION AND ACCESS

The property surveyed is located 20 kilometers northeast of Kirkland Lake in the south central part of Clifford Township at longitude $79^{\circ} 80' W$ and Latitude $48^{\circ} 17' N$ (N.T.S. 32-D-5). Figure 1 and Figure 2 illustrate the properties location at scales of 1:1,600,000 and 1:500,000 respectively.

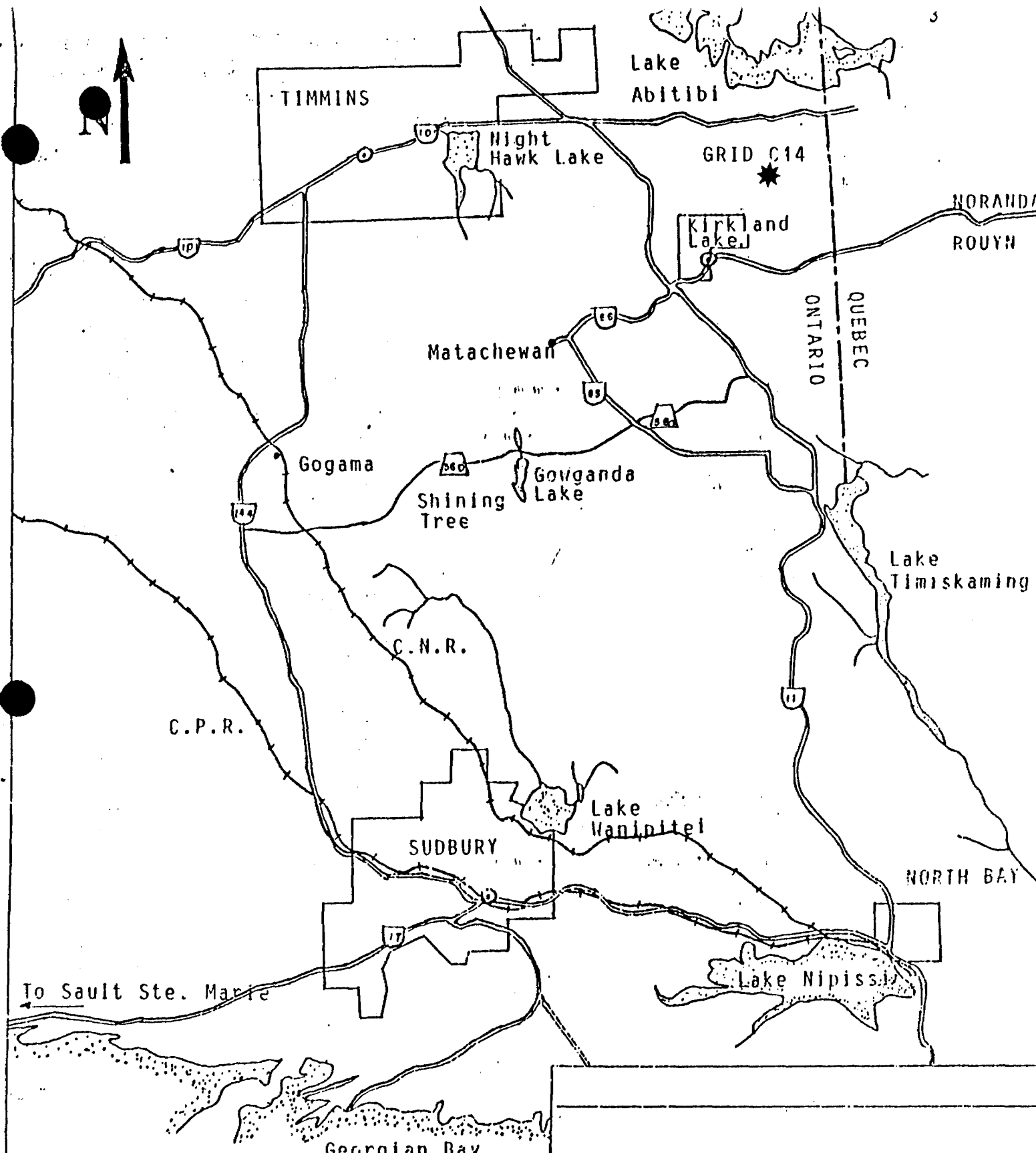
Access to the property is gained by following a sandy bush that turns east off of the Esker Lakes Park. This sand road is followed for a distance of approximately 5 kilometers.

TOPOGRAPHY AND VEGETATION

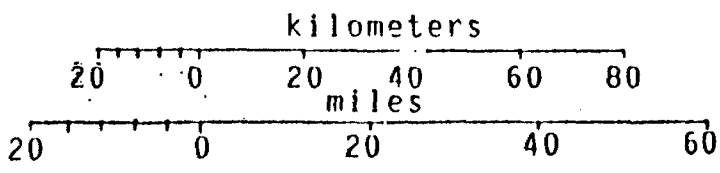
The property is covered by pleistocene to recent deposits of basal till, clay, aeolian sand dunes and swamp through which 5% bedrock is exposed.

Much of the property is covered by elongate sand dunes separated by low lying flat swampy ground. The sand dunes form elongate W.N.W. to E.S.E. ridges 2 to 10 m high with steep north dipping slopes.

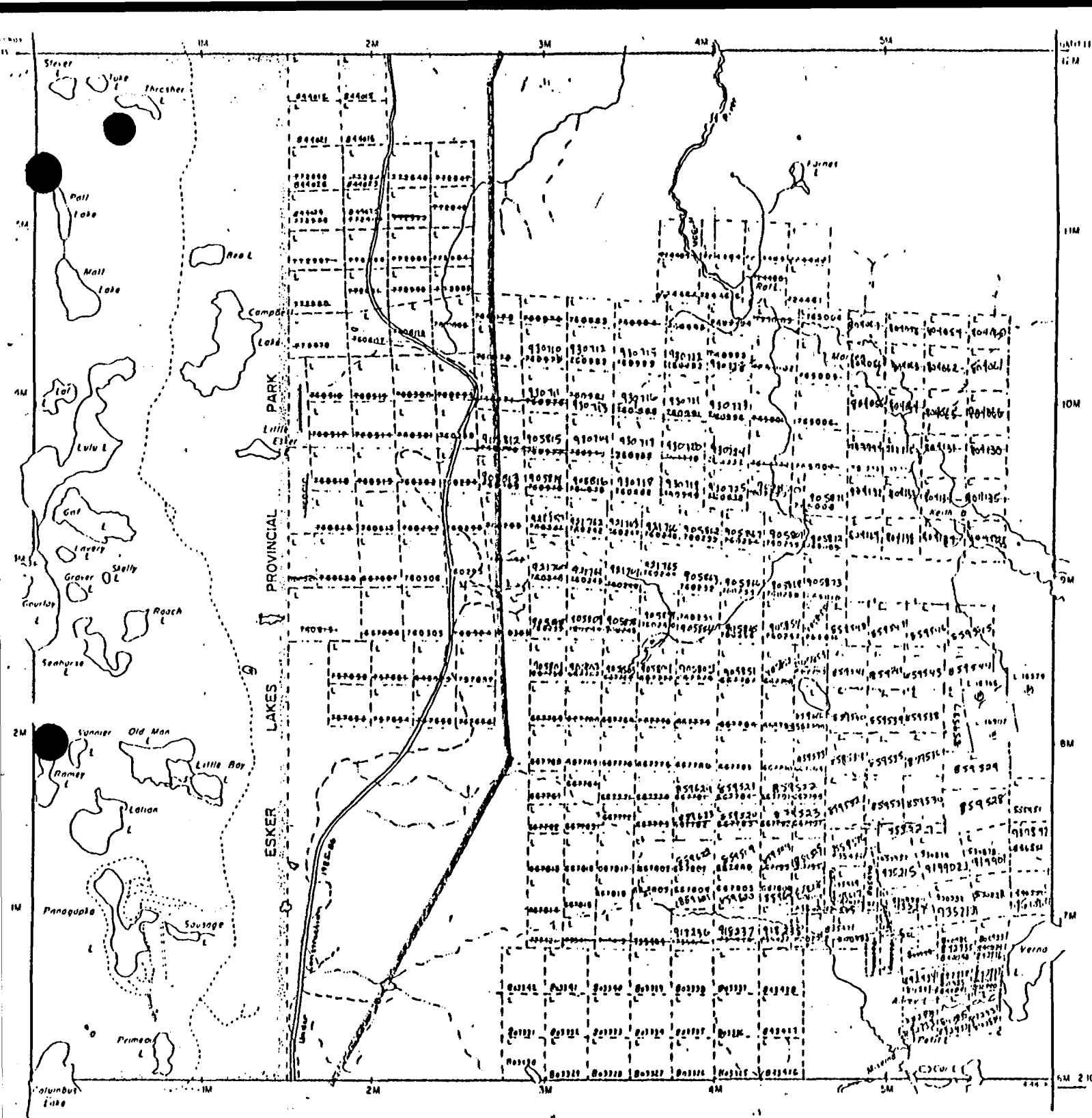
Till deposits and clay are exposed on the east part of the property in areas of higher ground and near outcrop.



To Sault Ste. Marie



GRID C14 LOCATION MAP	
Date	OCT 1987
Scale	1:1,600,000
JOHN KOVALA	Fig. 1



TOWNSHIP OF
CLIFFORD

GRID LOCATION MAP

DISTRICT OF
 COCHRANE

C 14

LARDER LAKE
 MINING DIVISION

FIG. 2

Vegetation consists mostly of pine, spruce and small isolated clusters of birch and poplar. Tag alders are abundant in wet swampy areas.

PREVIOUS WORK

Evidence of previous work in the form of pits is restricted to the eastern central portion of the property. Pyrite mineralization has been observed in these pits.

Assessment work files indicate that Canadex Mining Corporation has carried out a magnetic and VLF-EM survey in this area. A portion of their survey covers the 6 eastern claims.

Mining Corporation of Canada have drilled 5 holes in this area. Assessment work files have no exact location for the drill holes but none have been located on any of the 18 claims.

GENERAL GEOLOGY

The central portion of the property is underlain by a felsic volcanic unit that is 600 to 800 m wide with a west-northwest axis. It is flanked to the north-northeast and south-southwest by intermediate volcanic consisting of dacite and andesite.

A large quartz gabbro intrusive occupies the southeastern portion of the claim block.

Small intrusives bodies and dykes on the property include; feldspar porphyry, syenite, gabbro and fine grained rhyolite.

SURVEY METHOD

The VLF-EM survey was performed with a Geonics EM-16 unit. Stations were read at 25 meter intervals over north-south lines spaced 125 meters apart covering the entire 18 claim group.

The Cutler Maine transmitter station 24.0 (kHz) was used with the operator facing north.

SURVEY RESULTS

The VLF-EM survey has outlined numerous anomalies on the property. It is apparent from the contoured Fraser Filter presentation of the survey results that there are three main conductor trends across the property; south-east, east-west and north-east. These anomalies are interpreted as three possible directions of faulting.

In some cases the anomalies occur at the northern edge of

outcrops indicating that the outcrop may be fault band. Anomalies occurring at the north edge of outcrops in lower ground may be due to topographical responses.

The south-east trending anomalies are subparallel to the strike of the stratigraphy and may occur at or near the contacts between felsic and intermediate volcanics.

An east-west anomaly that cuts across the entire south central portion of the property has been interpreted as a fault. The anomaly is continuous and crosses three rock types.

CONCLUSIONS AND RECOMMENDATIONS

Three main trends of VLF-EM anomalies have been identified; southeast, east, west and northeast. The anomalies suggest possible faulting in three directions. Many of the discontinuous anomalies occurring in low lying areas proximal to outcrop may be interpreted as topographic responses.

The southeast trending anomalies occurring parallel to subparallel to stratigraphy may follow stratigraphic contacts between felsic and intermediate volcanics.

IP over selected anomalies followed by drilling of targets

located with the IP survey is recommended.

John Kavala



Ministry of
Natural
Resources

Report of Work
(Geophysical, Geological,
Geochemical and Expenditures)

L.M. 375/8



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Mining

Do not use shaded areas below

Type of Survey(s) **Geophysical (VLF-EM) and Geology** Township or Area **Clifford Township**

Claim Holder(s) **LAC Minerals Ltd.,** Prospector's Licence No. **T-664**

Address **91 Duncan Ave., Kirkland Lake, Ontario P2N 1Y2**

Survey Company **LAC Minerals Ltd.** Date of Survey (from & to) **VLF Geology 05-87 to 05-87** Total Miles of line Cut **25.98 Km**

Name and Address of Author (of Geo-Technical report) **John Kovala, 91 Duncan Ave., Kirkland Lake, Ontario P2N 1Y2**

Credits Requested per Each Claim in Columns at right

Special Provisions For first survey: Enter 40 days. (This includes line cutting)	Geophysical VLF Cutler - Electromagnetic	Days per Claim 20
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
Man Days Complete reverse side and enter total(s) here	Geological	20
	Geochemical	
	Geophysical - Electromagnetic	
Airborne Credits Note: Special provisions credits do not apply to Airborne Surveys.	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.	Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	803325				
	803326				
	803327				
	803328				
	803329				
	803330				
	803331				
	803332				
	803333				
	803334				
	803335				
	803336				
	803337				
	803338				
	803339				
	803340				
	803341				
	803342				

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SEP 24 1987
PM
10:11 12 (2) 14:56

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures \$ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Total number of mining claims covered by this report of work. **18**

Date **Sept. 1/87** Recorded Holder or Agent (Signature) *Chris Pegg*

For Office Use Only

Mining Recorder *J. Bottin* Acting

Date Approved as Recorded **17 Dec 87** Branch Director *[Signature]*

720

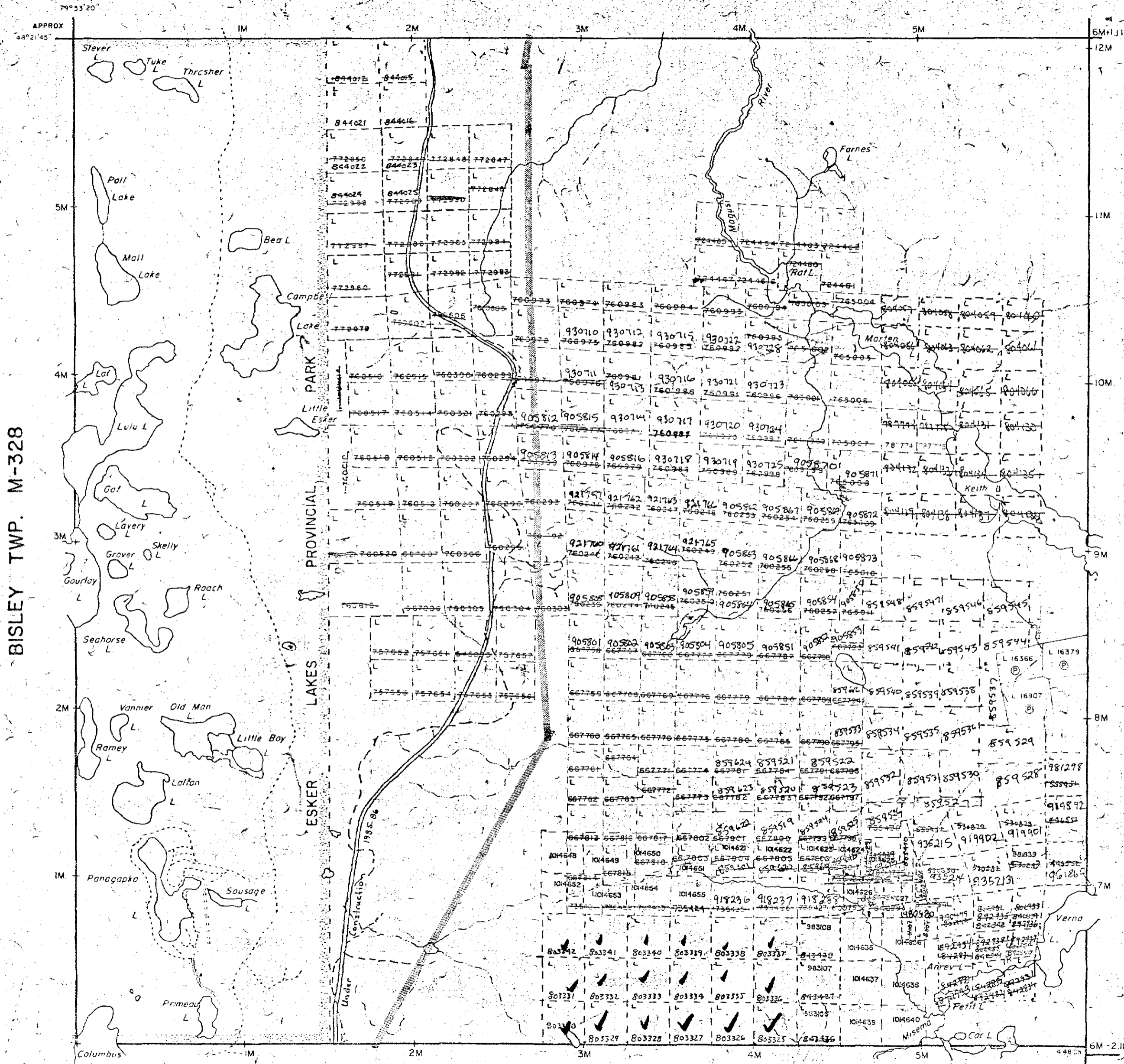
Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying
Chris Pegg, 91 Duncan Ave., Kirkland Lake, Ontario P2N 1Y2

Date Certified **Sept. 1/87** Certified by (Signature) *Chris Pegg*

ELLIOTT TWP. M-347



ARNOLD TWP. M-321

NOTES

400 surface rights reservation along the shores of all lakes and rivers
 Order No. 115/85 Date April 10/85 Disposition MR 458
 SEC 36/80 Above responded Oct 31/85 3:55pm

DATE OF ISSUE
 OCT 23 1987
 LARDER LAKE MINING DIVISION

LEGEND

- PATENTED LAND
- PATENTED RIGHTS ONLY
- LEASE
- LICENSE OF OCCUPATION
- CROWN LAND SALES
- LOCATED LAND
- CANCELLED
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- HIGHWAY & ROUTE ROADS
- TRAILS
- RAILWAYS
- POWER LINES
- MARCH OR MUSKIE
- MINES

used only with permission of the Surveyor when space is limited.
 Barrick Power Line
 Application pending under Public Lands Act.

TOWNSHIP OF
CLIFFORD

DISTRICT OF
 COCHRANE

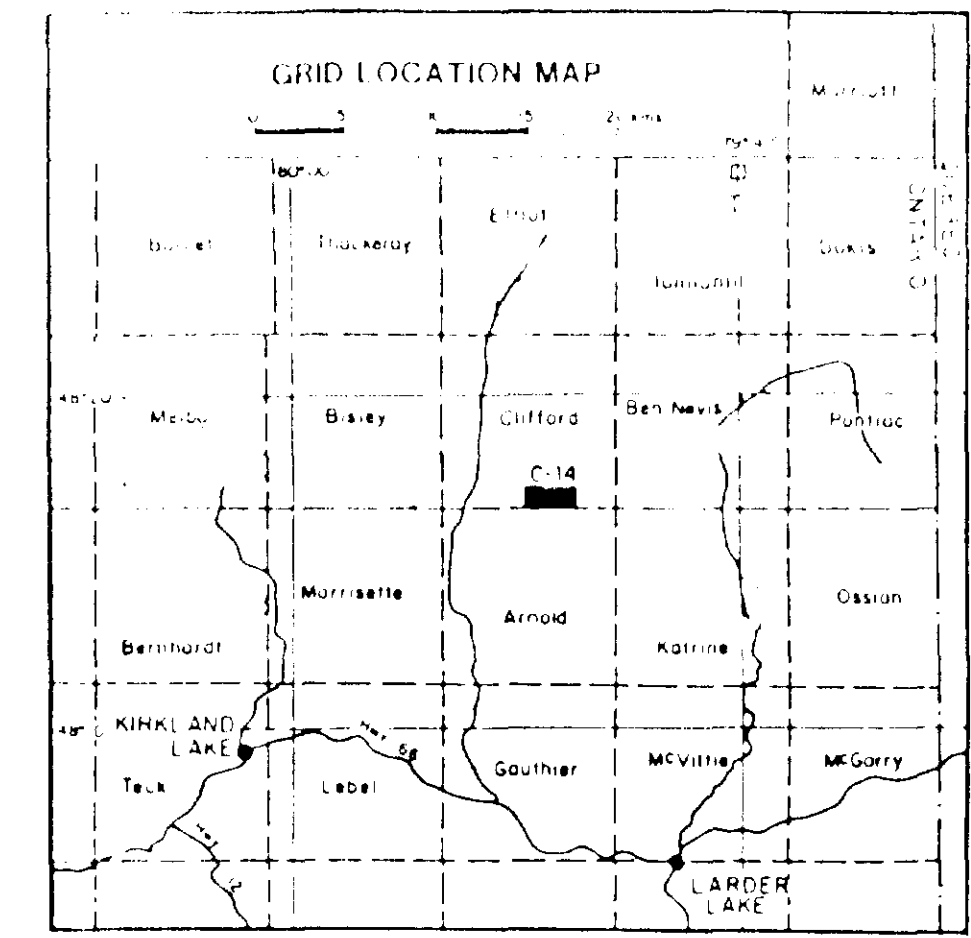
LARDER LAKE
 MINING DIVISION

SCALE 1 INCH = 40 CHAINS (1/2 MILE)

DR. RW NOBLE
 DATE DEC 9, 71
 PLAN NO. **M-338**

ONTARIO
 MINISTRY OF NATURAL RESOURCES





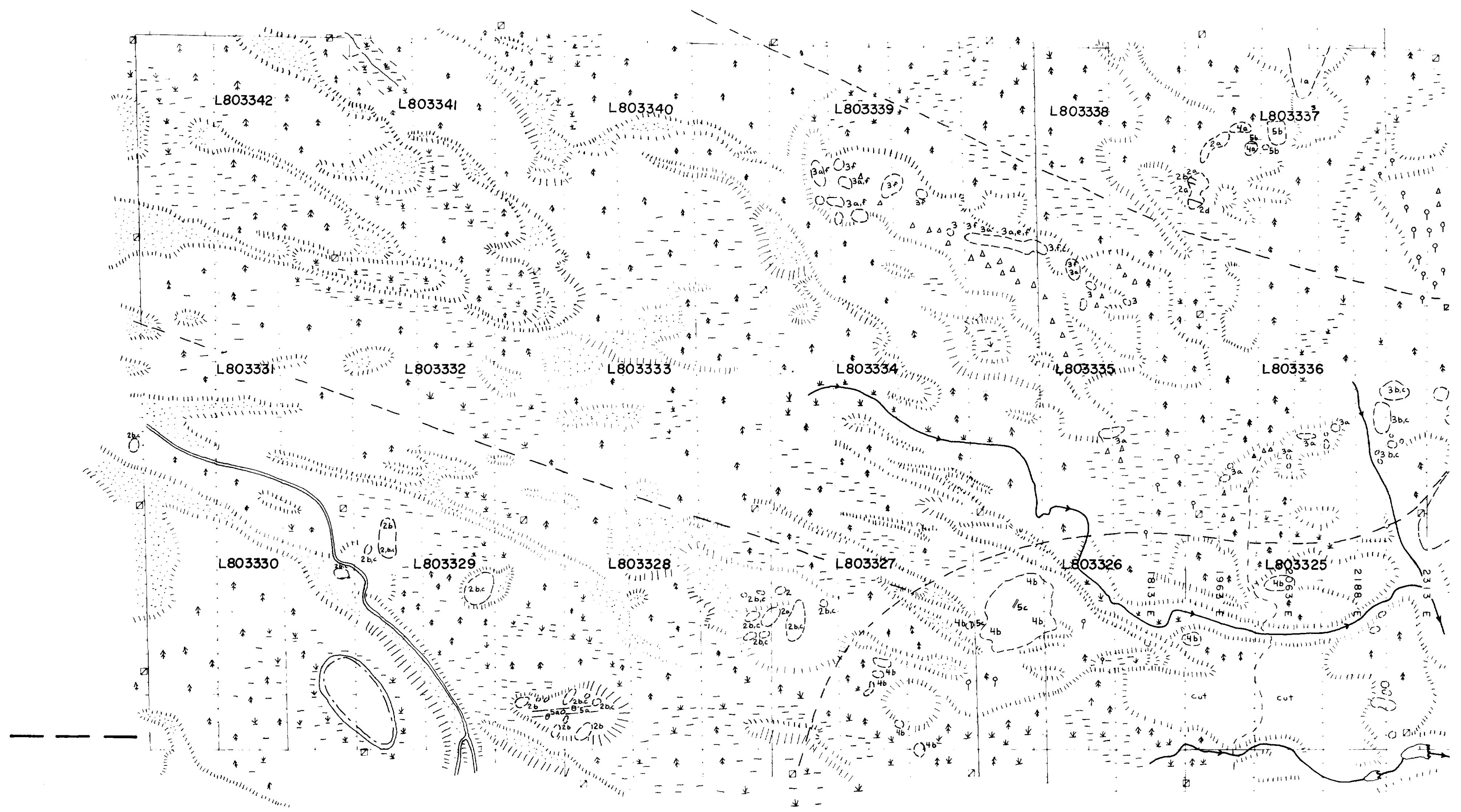
LEGEND

MIDDLE TO LATE PROCAMBRIAN (ARCHEAN)

- 5 Felsic Intrusive Rocks
 - 5a Feldspar Porphyry
 - 5b Syenite
 - 5c Rhyolite
- 1 Mafic to Intermediate Intrusive Rocks
 - 1a Gabbro
 - 1b Quartz Gabbro
- 3 Volcanic Rocks
 - 3 Felsic Volcanic Rocks
 - 3a Unsubdivided
 - 3b Massive rhyodacite and rhyolite
 - 3c Amygdales rhyodacite and rhyolite
 - 3d Feldspar porphyry rhyodacite and rhyolite
 - 3e Quartz porphyry rhyodacite and rhyolite
 - 3f Tuff and lapilli tuff
 - 3g Tuff breccia and agglomerate
 - 2 Intermediate Volcanic Rocks
 - 2a Unsubdivided
 - 2b Massive andesite and dacite
 - 2c Amygdaloidal andesite and dacite
 - 2d Porphyritic andesite and dacite
 - 2e Andesite and dacite tuff and lapilli tuff
 - 1 Mafic Volcanic Rocks
 - 1a Unsubdivided
 - 1b Massive basalt and andesitic basalt

SYMBOLS

- Ridge or Slope
- * Muskeg or Swamp
- Open Area
- *— Open Swamp or Muskeg
- ~ Creek
- ⚡ Forest
- Road
- Claim Post
- Drift features, sand dune
- ▲ Glacial Erratic
- Boundary of Outcrop
- Geological Boundary defined
- - - Geological Boundary Assumed
- Strike and dip of Top unknown
- Strike and dip of Top known
- Flow Contact
- Strike and dip of schistosity
- Joints Inclined
- Joints Vertical
- ~ Fault
- S Sulphide Mineralization



0 E 125 E 250 E 375 E 500 E 625 E 750 E 875 E 1000 E 1125 E 1250 E 1375 E 1500 E 1625 E 1750 E 1875 E 2000 E 2125 E 2250 E

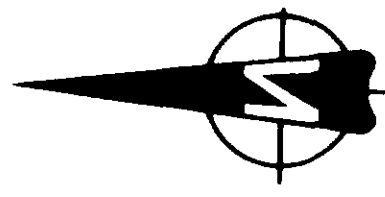
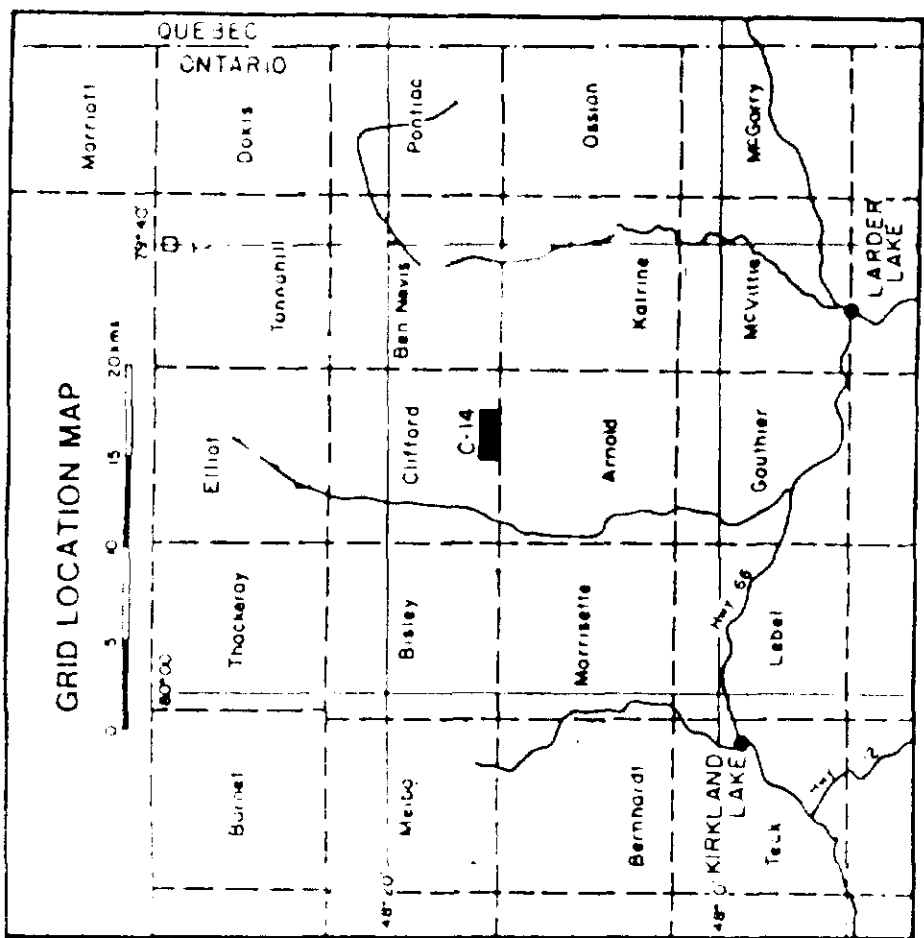
Scale 1 : 5000
0 100 200 300 400 500 METERS

GRID C14
CLIFFORD TOWNSHIP
Larger Lake RD., Ontario

GEOLOGY

D. Kavan
Nov 1971



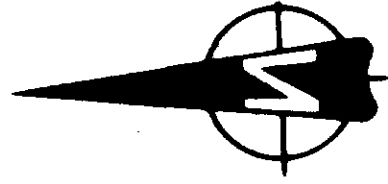
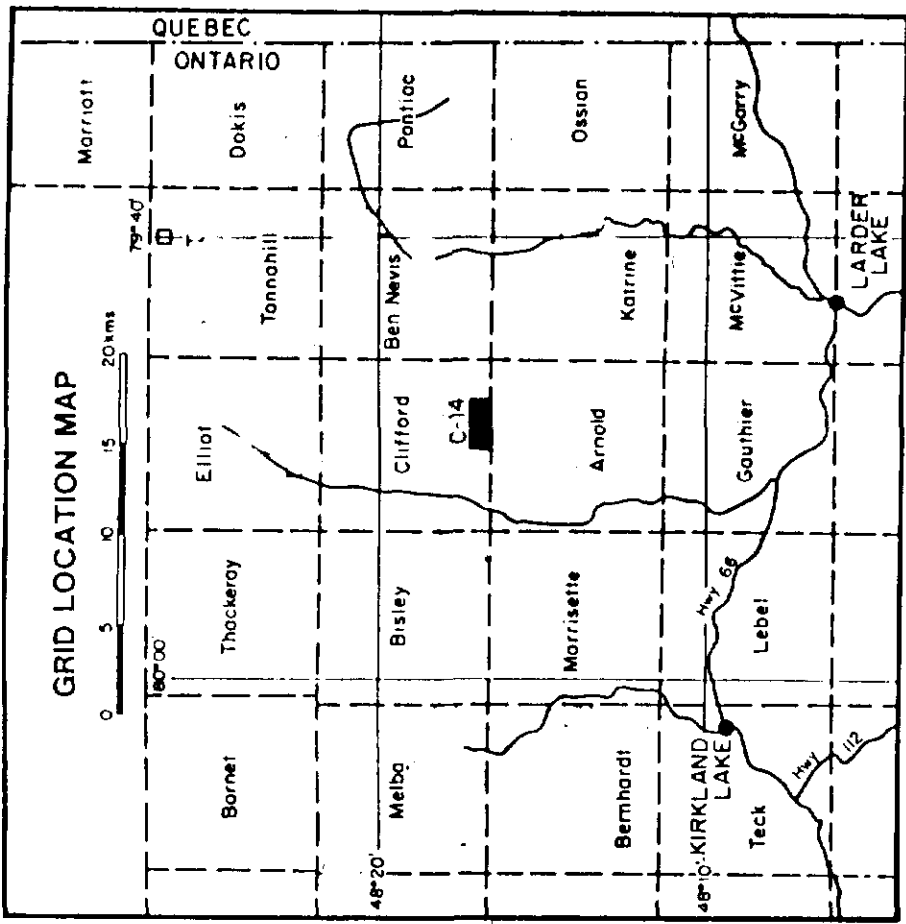


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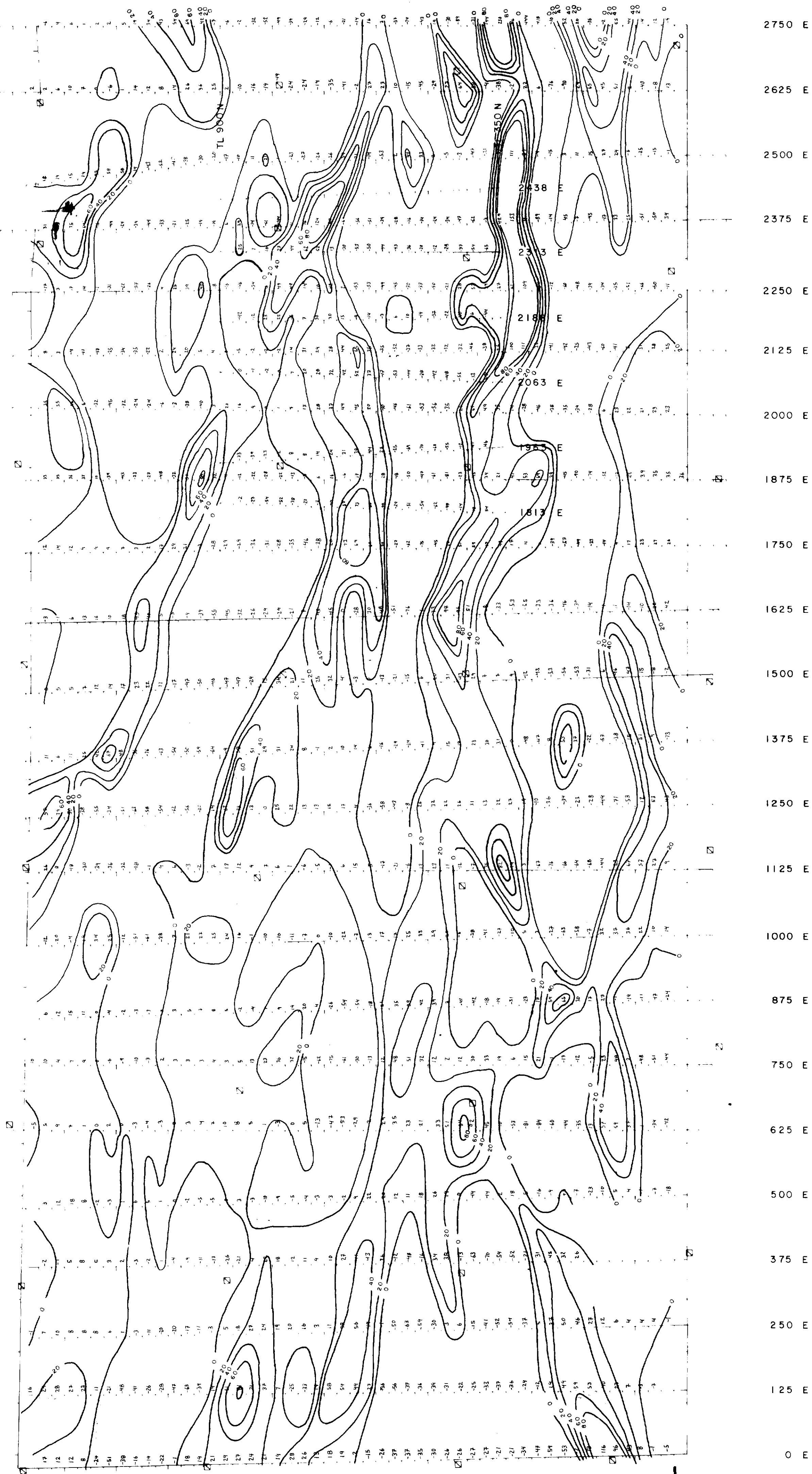
GRID C14
CLIFFORD TOWNSHIP
Larder Lake, Ontario

VLF EM Survey
INPHASE AND QUADRATURE
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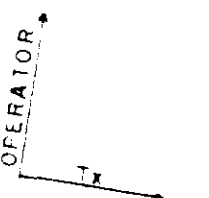


GRID C14
CLIFFORD TOWNSHIP
 Larder Lake M.D., Ontario
VLF-EM SURVEY
 (FRASER FILTER PRESENTATION)

Scale 1 : 5000
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 METRES

LEGEND

Transmitter NAA(240 Khz)
 Instrument Geonics EM-16



John Kavala June 1987

John Kavala
Nov 1987

