# ELECTROMAGNETIC - MAGNETIC SURVEY

on the property of

VANGULF EXPLORATION COMPANY

Little Township, Ontario

Timmins, Ontario,

November 4, 1971.

R. J. Bradshaw, P. Eng.,

Consulting Geologist.

## INTRODUCTION

A magnetic-electromagnetic survey has been completed on the property of Vangulf Exploration Company in the extreme north-east sector of Little Township, Ontario. This property, one of three held by Vangulf in Little Township, is termed Group 3.

A grid system on the claim group was established during the period October 17 to October 27 inclusive, 1971. The geophysical survey work was completed during the period October 27 - 31 inclusive.

The object of the survey work was to locate and outline an airborne indicated conductive zone relative to the magnetic susceptibilities of the area.

## PROPERTY, LOCATION AND ACCESS

The property consists of six claims designated 316216 to 316221 inclusive totalling 240 acres. Termed Group 3, the property is situated in Lot 1, Concession VI, Little Township, Ontario.

About 28 miles northeast of Timmins, the claim group is not easily accessible overland. A truck road, west from highway 11 through McCart Township, provides access to within 2.5 miles of the Group 3. The walk, however, is through wet, second growth topography. A more convenient means of access is by aircraft to Devonshire Lake on the north boundary of McCart Township, about a mile east of Group 3.

## PREVIOUS WORK

Some, if not all, of the claims were previously held by

Inco. It is probable that they presently retain the adjacent patented claims to the east in McCart Township.

The assessment work files of the Ontario Department of Mines indicate that Inco completed a magnetic survey and diamond drilling on their holdings in this area. It appears that their main objective was the location of nickel deposits associated with ultramafic intrusives.

Three Inco holes were drilled in the extreme northeast corner of Group 3, as shown on the accompanying plans. Apparently these holes were drilled to investigate the contact of an ultramafic intrusive. About 20 per cent pyrrhotite-pyrite mineralization was intersected over a width of 2 feet at the serpentine contact. The two inclined holes were stopped in greenstone while the vertical hole was stopped in serpentine.

No other drilling or survey work was reported on the claims of Group 3.

GEOLOGY

Rock exposure on the claim group is nonexistent and in the general area is very limited. The property is low, wet and covered by extensive alder growth.

Map 2046 by the O.D.M. indicates that the claim group probably is underlain by mafic to intermediate volcanic rocks which are in contact with an ultramafic intrusive near the north boundary of the property. Here the contact strikes northwest.

The long-held Inco property adjacent to the east suggests that the ultramafic intrusives are nickel-bearing.

## MAGNETIC SURVEY RESULTS AND INTERPRETATION

The survey method and instrument are described in the Appendix to this report. A contoured plan of the magnetic readings at a scale of one inch to four hundred feet accompanies this report.

The magnetic susceptibilities on the claim group vary from 5250 to 65 gammas while the isomagnetics trend northwest.

In the extreme northeast sector of the property a very strong magnetic gradient is represented by magnetic susceptibilities varying from 65 to 5250 gammas. This gradient indicates the contact of ultramafic intrusive which strikes northwest and dips northeast. According to the Inco drilling, the ultramafic intrusive is in contact with a grey schist phase of greenstone.

There is a very gradual magnetic gradient across the property to the southwest varying from 65 to 1015 gammas, thereby suggesting the presence of an ultramafic intrusive to the southwest which dips northeast.

## ELECTROMAGNETIC SURVEY RESULTS AND INTERPRETATION

The instrument and survey method are described in the Appendix to this report. Two plans at a scale of one inch to four hundred feet, showing the survey results, accompany this report. Profiles of a very limited amount of electromagnetic survey work utilizing Crone JEM and Ronka EM 16 units are presented on a separate plan.

One very strong conductive zone has been outlined by the survey. This conductor strikes north 35° west across the property for a length of 2800 feet. Profiles near the property boundaries indicate that the conductivity is continuous beyond the property boundaries. Evidence for the dip of the conductor is conflicting. To the north the conductor appears to dip steeply west while to the south it appears to dip east. The Crone JEM profile indicates a dip to the east. The relative displacement of the conductor axis from various transmitter setups indicates that the conductive zone may be up to 200 feet wide.

The very poor response of conductivity on high frequency is quite unusual. It is thought that conductivity characteristics of the overburden may account for this feature.

Traverses utilizing the Crone JEM in an in-line configuration, with a 300 foot coil separation, indicates that the conductor dips east and is covered by about 75 feet of overburden. Traverses utilizing the Ronka EM 16 also indicate the conductive zone.

## CONCLUSIONS AND RECOMMENDATIONS

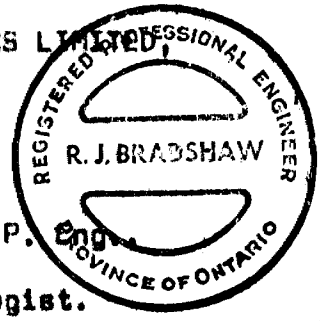
A very strong conductive zone, striking north 35° west, dipping steeply east, and over 2800 feet long has been outlined by the survey work. The source of conductivity appears to be wide, up to 200 feet, and is completely covered by overburden in the order of 75 feet. Sulphides with or without graphite is considered to be the cause of conductivity.

The conductive zone appears to be located about midway between ultramafic intrusives about 4000 feet apart which dip northwest. This spatial relationship may in turn be related to a genetic relationship of the conductive zone to the ultramafics and the presence of nickel mineralization. However, there is no indication of magnetic minerals, which are normally expected with nickel mineralization, in the zone of conductivity.

At least one drill hole is proposed for investigation of the conductor. This hole should be directed southwest at 50° near the middle of the zone.

Respectfully submitted,

SHIELD GEOPHYSICS LIMITED,

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# APPENDIX

## INSTRUMENT DATA AND SURVEY METHOD

### Electromagnetic Survey

Any alternating magnetic field will induce an electrical eddy current in the medium through which the magnetic field passes. If a source of an alternating magnetic field is located near a conductive body enomalously strong eddy currents will be induced in the deposit due to its high electrical conductivity. Electrical currents induced in the conductive body will produce a secondary magnetic field proportional to the intensity current flow.

A receiver coil tuned to the frequency of the transmitting device will pick up both the directly transmitted signal and the eddy current signal.

The electromagnetic unit used in this survey is a McPher unit and consists of a vertically mounted, motor-generator powered transmitting coil operating at frequencies of 5000 and 1000 cps. and a receiving coil, tuned to the transmitting frequencies, an inclinometer, an amplifier and a headset.

Throughout the survey, the transmitter and receiver were separated by distances of 400, 800 and 1200 feet. The plane of the transmitter coil was oriented so that the transmitter was vertical and pointed towards the receiver. Orientation was obtained using a plate on which predetermined receiver positions were plotted. Stations were read at one hundred foot intervals. At all times, the receiver "faced" the transmitter. The results obtained are dip angles, measured in degrees. The dip angles are obtained by first orienting the receiver coil in the plane of the

magnetic field by rotating the coil about a vertical axis until a null or minimum signal is obtained, and then rotating the coil about a horizontal axis until a null or minimum signal is obtained. The angle which the magnetic field makes with the horizontal is recorded as a "dip" or "tilt" angle. In the absence of a conductor the dip angle will be zero since no secondary field is present. In the presence of a conductor, the axis of the receiver coil points towards the conductor and the plane of the coil away from the conductor. In the presence of a conductor, the secondary magnetic field is usually displaced from the primary in-phase as well as direction so that the total field is elliptically polarized. The receiver cannot then be nulled completely but a minimum signal can be obtained, the width of the minimum being an indication of the phase displacement.

The tilt angles are plotted as profiles, the zero or "cross-over" point indicating the focus of the conductor axis.

Once a conductor axis has been established, the transmitter is set up over the conductor and lines are read on both sides of the transmitter and the conductor axis is traced out by "leap frogging" from "cross-over" to "cross-over".

SPECIFICATIONS

Operating Frequencies: 1000 and 5000 cycles per second

Range: 2000 foot separation between transmitter and receiver for a ± 10 degree null width.

Depth of Exploration: Roughly half the distance between transmitter and receiver.

Transmitter Power Supply: 500 watt alternator driven by a 1¾ H.P. gasoline engine.

| Weights: | | |
|---|---|---|
| | Packboard-mounted engine generator | 48 lbs. |
| | Transmitter coil on packboard | 49 lbs. |
| | Coil mounting pole and spreader bar | 22 lbs. |
| | Receiver | 7 lbs. |

Magnetometer Survey

A Sharpe M.F.-1 fluxgate magnetometer was used in the magnetic survey. This instrument measures the vertical component of the earth's magnetic field in gammas. Base stations for determining the magnetic diurnal variations were established along the main base line at 100 foot intervals. Magnetic readings were taken at 50 foot intervals, along the cross lines.

File 2.780

# GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

RECEIVED
MAR 3 – 1972
PROJECTS SECTION

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey GEOPHYSICAL MAG & ELM.
Township or Area LITTLE
Claim holder(s) G. HERRIED for VANGULF EXPL. CO.
2323 YONGE ST., TORONTO, ONT.
Author of Report R.J. BRADSHAW
Address SHIELD GEOPHYSICS, 26 PINE ST. S., TIMMINS, ONT.
Covering Dates of Survey OCT. 17-31, 1971
(linecutting to office)
Total Miles of Line cut 7.2

| SPECIAL PROVISIONS CREDITS REQUESTED | | DAYS per claim |
|---|---|---|
| ENTER 40 days (includes line cutting) for first survey. | Geophysical | |
| | --Electromagnetic | 40 |
| | --Magnetometer | 20 |
| | --Radiometric | |
| ENTER 20 days for each additional survey using same grid. | --Other | |
| | Geological | |
| | Geochemical | |

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)
Magnetometer ____ Electromagnetic ____ Radiometric ____
(enter days per claim)

DATE: March 2, 1971 SIGNATURE: Robert J. George.
Author of Report or Agent

PROJECTS SECTION
Res. Geol. ____ Qualifications This
Previous Surveys L.D.

Checked by ____ date ____

GEOLOGICAL BRANCH

Approved by ____ date ____

GEOLOGICAL BRANCH

Approved by ____ date ____

OFFICE USE ONLY

**MINING CLAIMS TRAVERSED**
**List numerically**

| (prefix) | (number) |
|---|---|
| P | 316216 |
| P | 316217 |
| P | 316218 |
| P | 316219 |
| P | 316220 |
| P | 316221 (½) |

If space insufficient, attach list

TOTAL CLAIMS 6

Show instrument technical data in each space for type of survey submitted or indicate "not applicable"

# GEOPHYSICAL TECHNICAL DATA

## GROUND SURVEYS

Number of Stations 382 Number of Readings 720 MAGNETIC 494 EM.

Station interval 100'

Line spacing 400'

Profile scale or Contour intervals EM - 1" = 20' Mag 100 gamma contour interval

(specify for each type of survey)

## MAGNETIC

Instrument Sharpe MF-1

Accuracy - Scale constant ± 10 gammas.

Diurnal correction method All readings tied to base line

Base station location Base line - not tied to regional base

## ELECTROMAGNETIC

Instrument McPhar 1000/5000 VEM.

Coil configuration Vertical, Fixed Transmitter

Coil separation up to 1600'

Accuracy ± 2°

Method: ☒ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency 1000 & 5000 hz.

(specify V.L.F. station)

Parameters measured dip angles.

## GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

## INDUCED POLARIZATION -- RESISTIVITY

Instrument

Time domain Frequency domain

Frequency Range

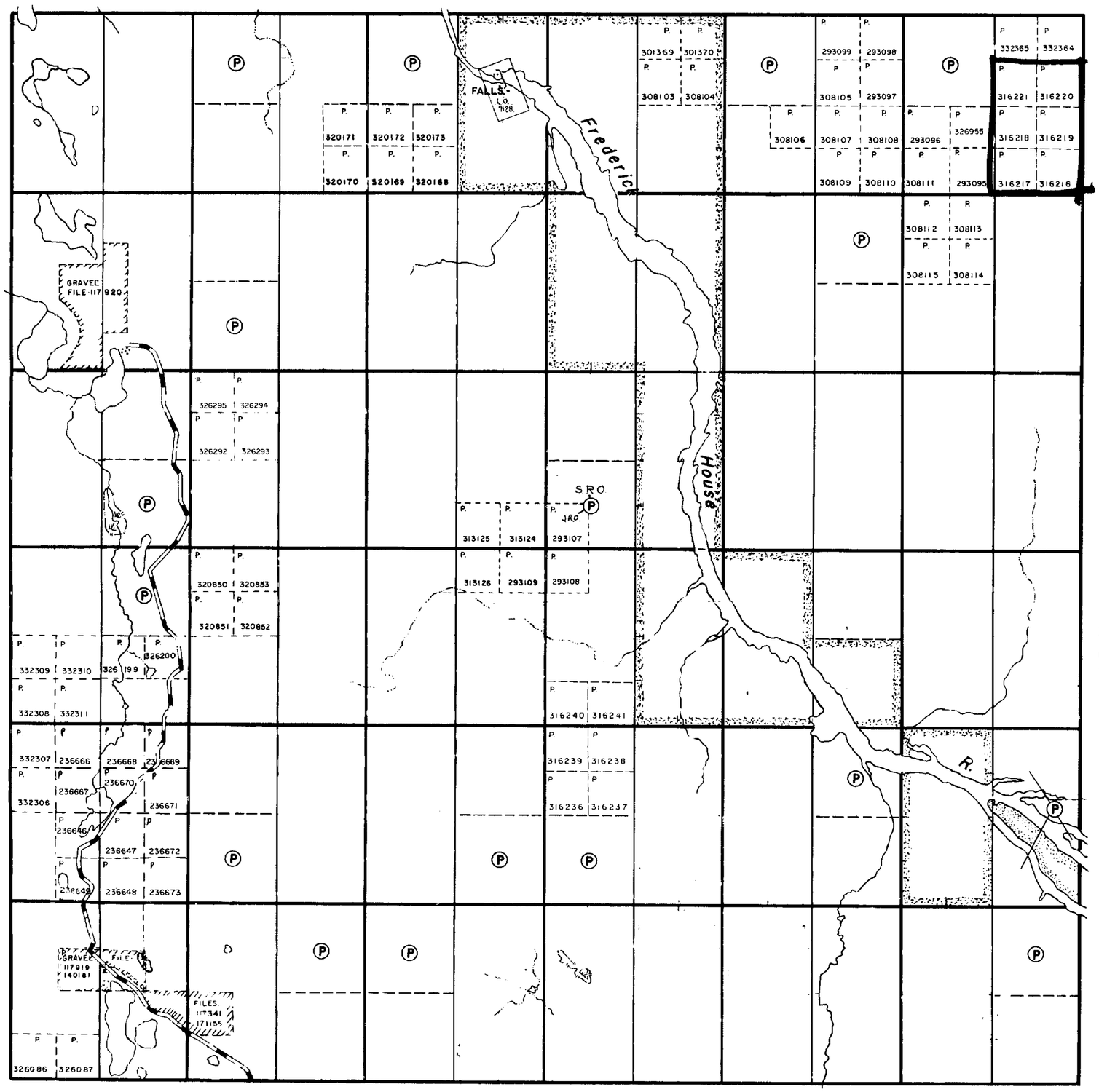
Power

Electrode array

Electrode spacing

Type of electrode

Mann Twp.




Tully Twp.

McCart Twp.

Evelyn Twp.

# THE TOWNSHIP OF LITTLE

DISTRICT OF COCHRANE

PORCUPINE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

## LEGEND

| | |
|---|---|
| PATENTED LAND | (P) |
| CROWN LAND SALE | C.S. |
| LEASES | (L) |
| LOCATED LAND | Loc. |
| LICENSE OF OCCUPATION | L.O. |
| ROADS | |
| IMPROVED ROADS | |
| RAILWAYS | |
| POWER LINES | |
| MARSH OR MUSKEG | |

## NOTES

Area reserved to H.E.P.C. for water power purposes shown thus:

Flooding rights lands bordering the Frederick House River.

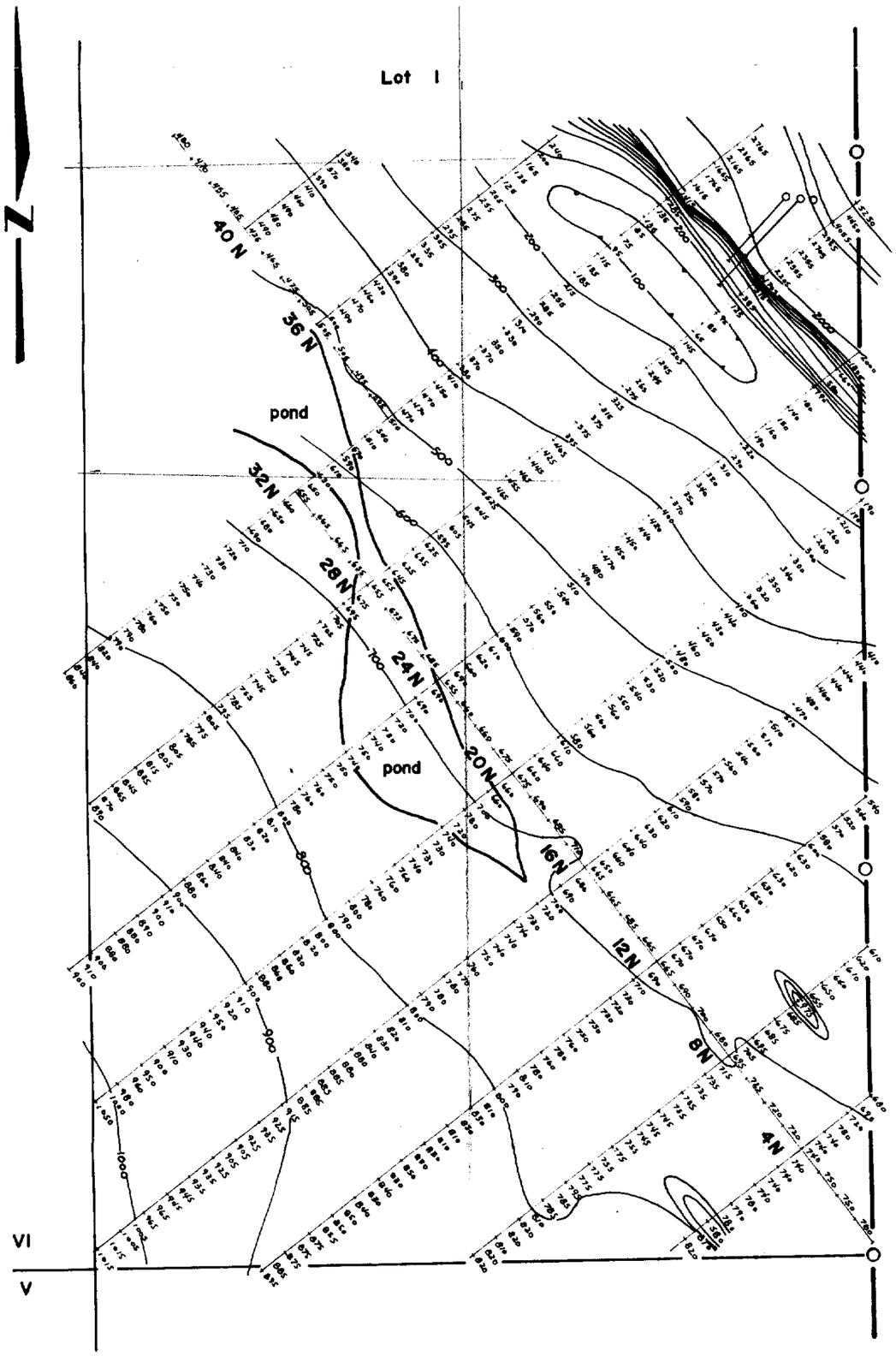
400' Surface Rights Reservation around all Lakes and Rivers.

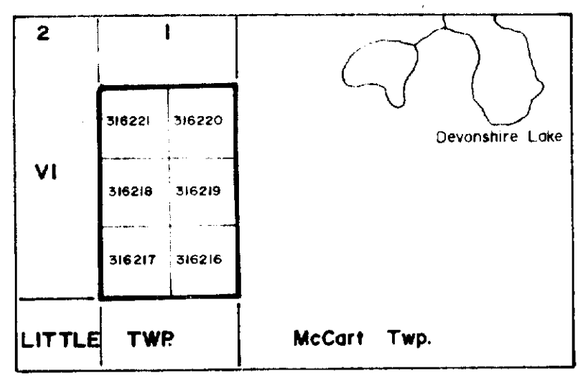


2.780

PLAN NO. — M. 535

**ONTARIO DEPARTMENT OF MINES AND NORTHERN AFFAIRS**




KEY MAP

one inch to one half mile

## LEGEND

Measurement station along picket line

Relative value of the vertical component of the earth's magnetic field in gammas

Magnetic contour

Magnetic depression

INSTRUMENT: Sharpe M.F.-1 fluxgate magnetometer.

# MAGNETOMETER SURVEY

ON THE PROPERTY OF

# VANGULF EXPLORATION COMPANY

LITTLE TOWNSHIP, ONTARIO

BY

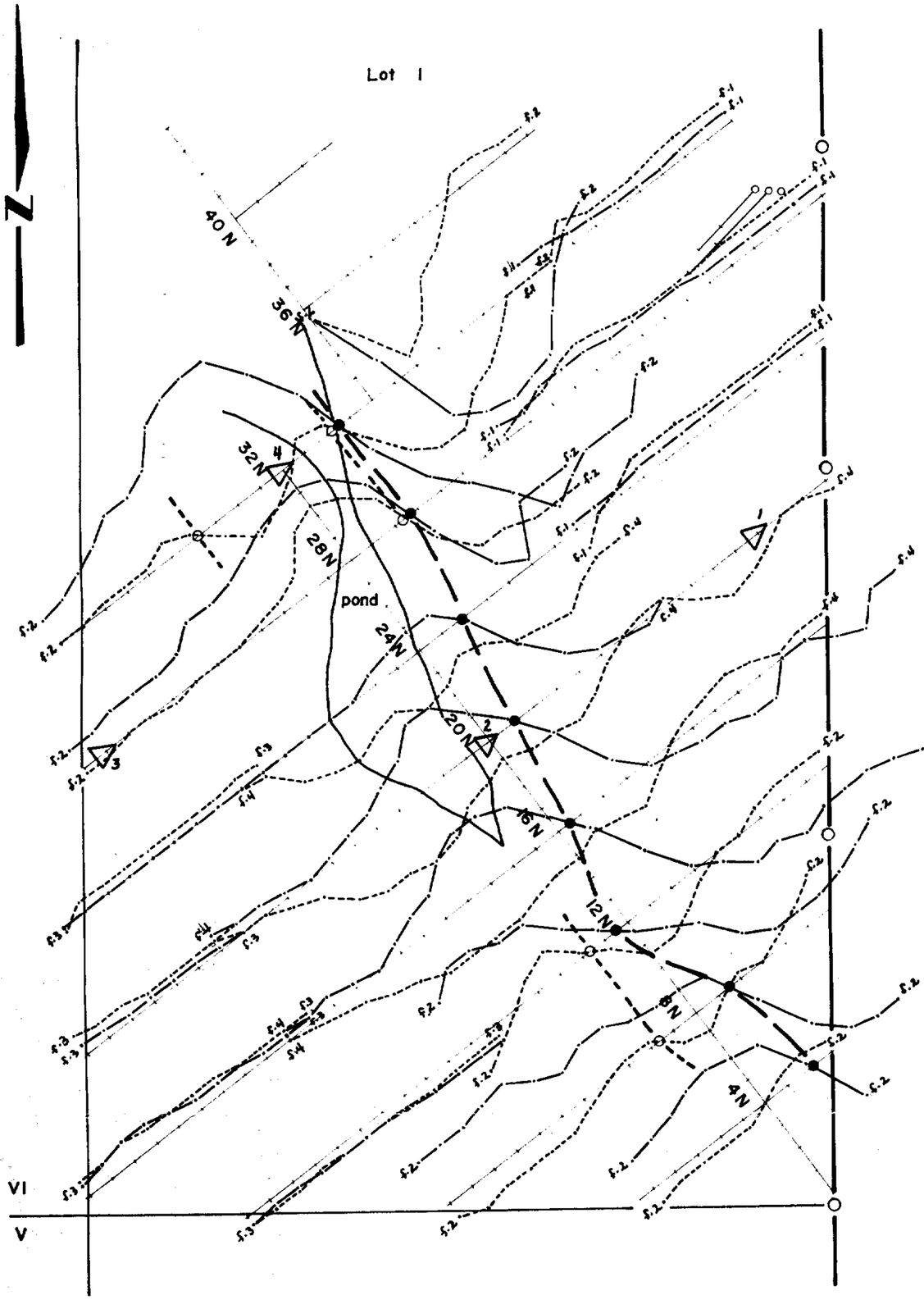
SHIELD GEOPHYSICS LIMITED

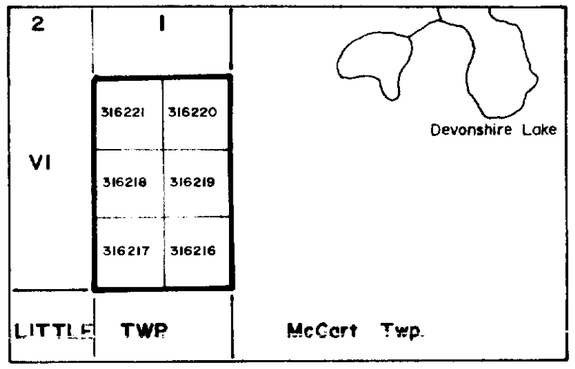
SCALE

0 400 800 1200 1600

FEET

OCTOBER 1971




KEY MAP

one inch to one half mile

For LEGEND: See Detailed Electromagnetic Survey Map.

# ELECTROMAGNETIC SURVEY

ON THE PROPERTY OF

# VANGULF EXPLORATION COMPANY

LITTLE TOWNSHIP, ONTARIO

BY

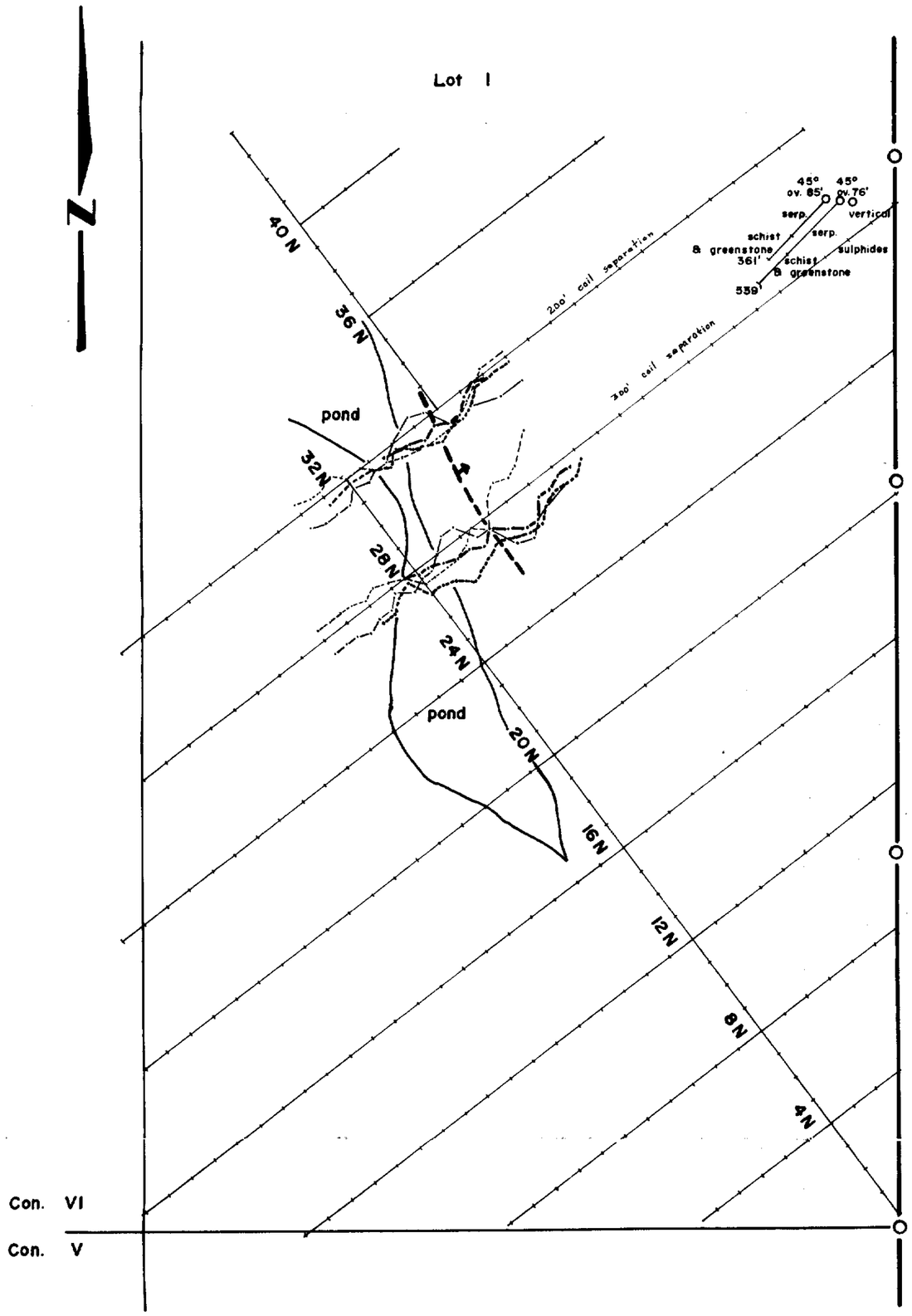
SHIELD GEOPHYSICS LIMITED

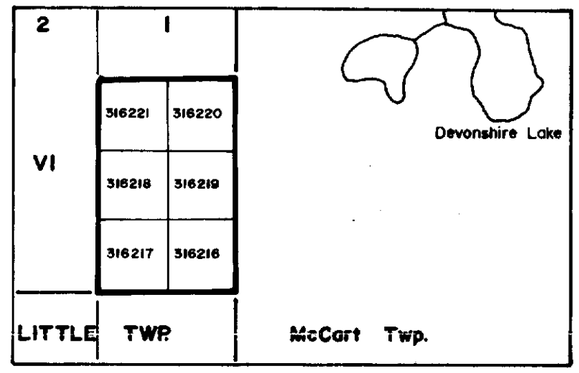
SCALE

0 400 800 1200 1600

FEET

OCTOBER 1971




KEY MAP

one inch to one half mile

## LEGEND

Positive dip angles to left of line
Negative dip angles to right of line

High frequency profile

Low frequency profile

Profile scale: 1" = 20°

Conductor axis

INSTRUMENT: Crone JEM unit; 1800 & 480 cps.

## LEGEND

In phase profile (%)

Quadrature profile (%)

Profile scale: 1" = 20%

Conductor axis

INSTRUMENT: Ronka EM 16 - No. 36; Readings taken using station NAA, Cutler, Maine.

# ELECTROMAGNETIC SURVEY

ON THE PROPERTY OF

# VANGULF EXPLORATION COMPANY

LITTLE TOWNSHIP, ONTARIO

BY

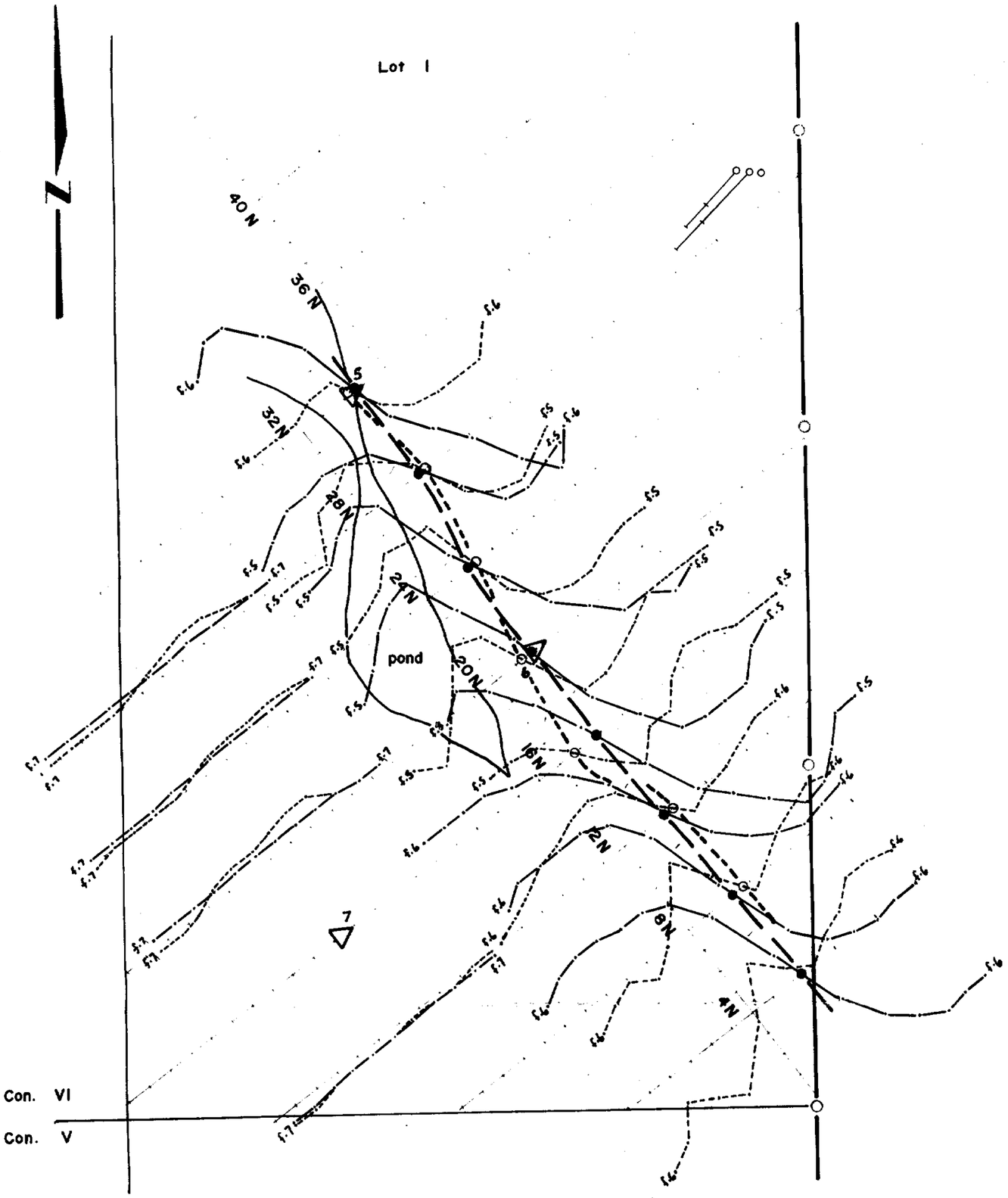
SHIELD GEOPHYSICS LIMITED

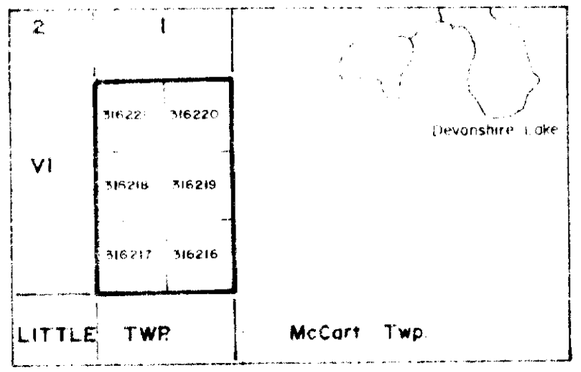
SCALE

0 400 800 1200 1600

FEET

OCTOBER 1971




KEY MAP

one inch to one half mile

## LEGEND

Measurement station along picket line

West dip angles below the line
East dip angles above the line

High frequency profile

Low frequency profile

Profile scale: 1" = 20°

Transmitter location

Conductor axis - 1000 cps
" " - 5000 cps

INSTRUMENT: McPhar 1000/5000 E.M.

DETAILED

# ELECTROMAGNETIC SURVEY

ON THE PROPERTY OF

# VANGULF EXPLORATION COMPANY

LITTLE TOWNSHIP, ONTARIO

BY

SHIELD GEOPHYSICS LIMITED

SCALE

0 400 800 1200 1600

FEET

OCTOBER 1971