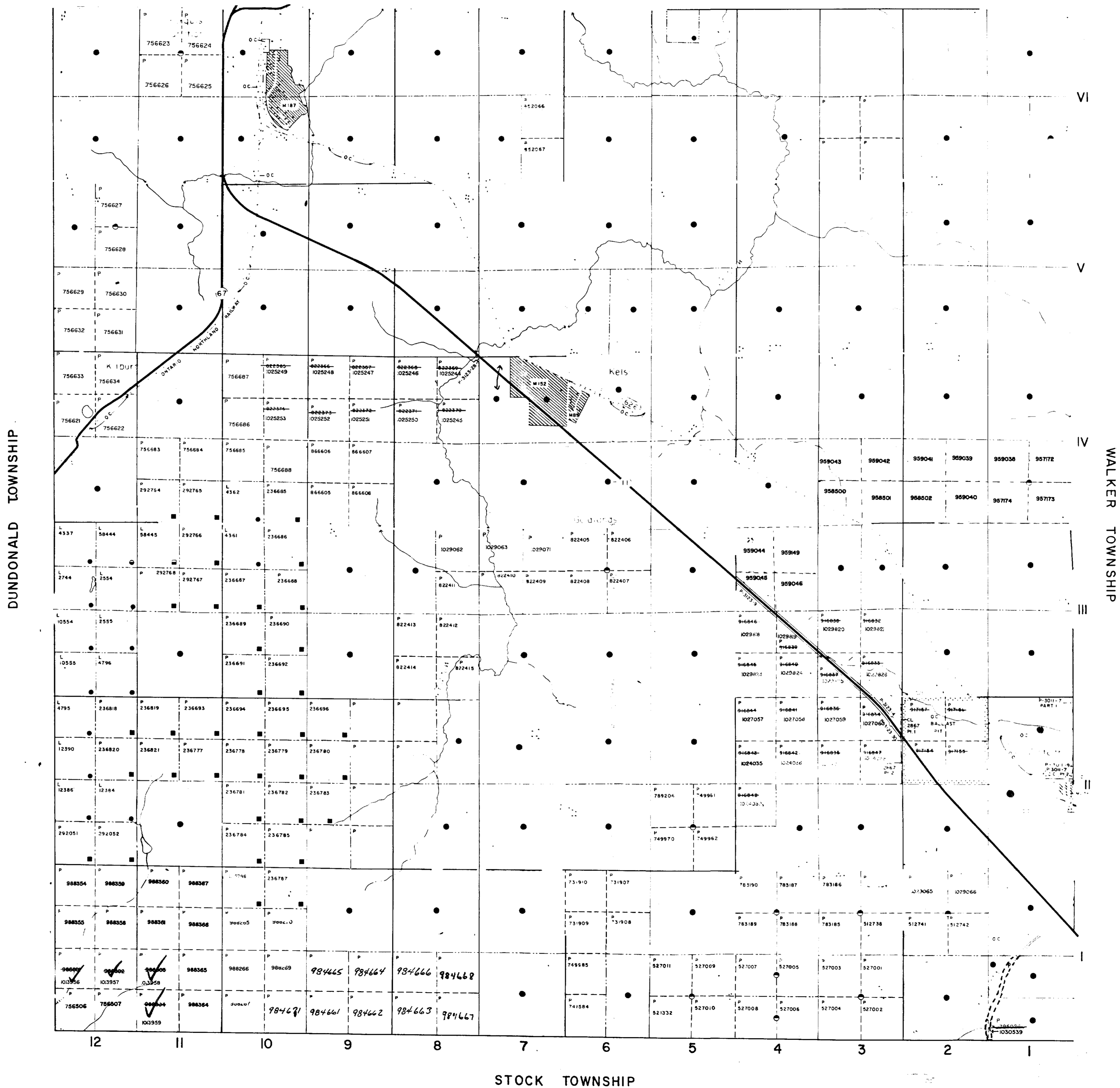


AREAS WITHDRAWN FROM DISPOSITION

- M.R.O. - MINING RIGHTS ONLY
- S.R.O. - SURFACE RIGHTS ONLY
- M.+S. - MINING AND SURFACE RIGHTS

Description Order No. Date Disposition File

CALVERT TOWNSHIP

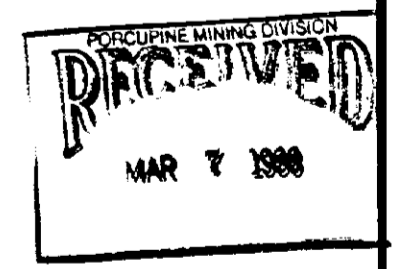


LEGEND

DISPOSITION OF CROWN LANDS

| TYPE OF DOCUMENT | SYMBOL |
|------------------|--------|
| ... | ● |
| ... | ○ |
| ... | □ |
| ... | △ |
| ... | ◇ |
| ... | ◇ |
| ... | ◇ |
| ... | ◇ |

SCALE 1:20 000



CLERGUE

M.N.R. ADMINISTRATIVE DISTRICT
 COCHRANE
 MINING DIVISION
 PORCUPINE
 LAND TITLES / REGISTRY DIVISION
 COCHRANE

Ministry of Natural Resources Ontario Ministry of Northern Development and Mines

SEPTEMBER, 1986 Number: G-3487



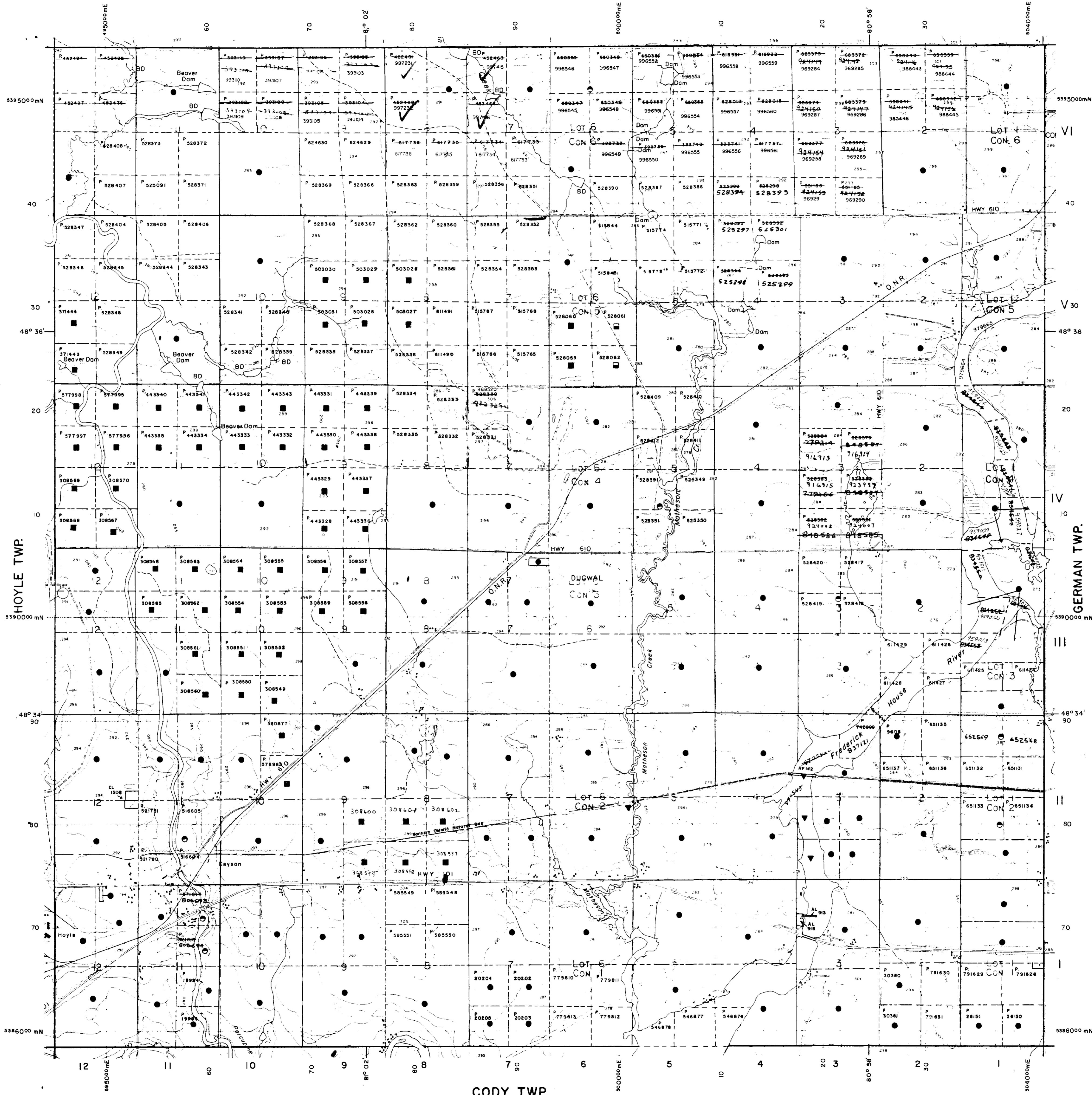
MAP SYMBOLOLOGY

| | |
|---|---|
| Aerial Cableway | Pipeline |
| Boundary | Railroad |
| International | Single Track |
| Interprovincial | Double Track |
| District, Township Index Reserve | Abandoned |
| Approximate | Terrace |
| Lot, Concession | Road |
| Approximate | Highway, County |
| Park Boundary | Township |
| Bridge | Access Road of doubtful maintenance or significant driveway |
| Road, Beltroad | Trail, Back Road (average steep) |
| Building | Double line river with multiple rapids |
| Chimney | Rapids |
| Cliff, Pit, Pile | Reservoir |
| Contours | River, Stream, Canal |
| Intermittent | Approximate direction of flow |
| Approximate | Lock |
| Depression | Spot Elevation (feet elevations) 300.0 |
| Control Points | Tower |
| Horizontal 0.077409 | Transmission Line |
| Vertical 0.30002 | Power |
| Culvert | Utility Poles |
| Falls | Wharf, Dock, Pier |
| Double line river | Wooded Area |
| Fence, Hedge, Wall | |
| Feature Outline (Construction Features, etc.) | |
| Flooded Land | |
| Lock | |
| Marsh or Swamp | |
| Moat | |
| Mine Head Frame | |
| Outcrop | |

AREAS WITHDRAWN FROM DISPOSITION

| | | | | |
|-----------------------------------|-----------|------|-------------|------|
| M.R.O. - MINING RIGHTS ONLY | | | | |
| S.R.O. - SURFACE RIGHTS ONLY | | | | |
| M.+S. - MINING AND SURFACE RIGHTS | | | | |
| Description | Order No. | Date | Disposition | File |

EVELYN TWP.

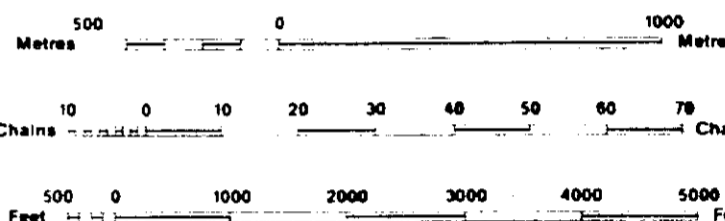


Highway and Route No
OTHER ROADS
TRAILS
SURVEYED LINES
TOWNSHIPS, BASE LINES, ETC
LOTS, MINING CLAIMS, PARCELS, ETC
UNSURVEYED LINES
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

| TYPE OF DOCUMENT | SYMBOL |
|---------------------------------|--------|
| PATENT, SURFACE & MINING RIGHTS | ● |
| SURFACE RIGHTS ONLY | ○ |
| MINING RIGHTS ONLY | ◐ |
| LEASE, SURFACE & MINING RIGHTS | ■ |
| SURFACE RIGHTS ONLY | ◼ |
| MINING RIGHTS ONLY | ◻ |
| LICENCE OF OCCUPATION | ○ |
| ORDER-IN-COUNCIL | OC |
| RESERVATION | ○ |
| CANCELLED | ○ |
| SAND & GRAVEL | ○ |

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. 63, SUBSEC. 1.

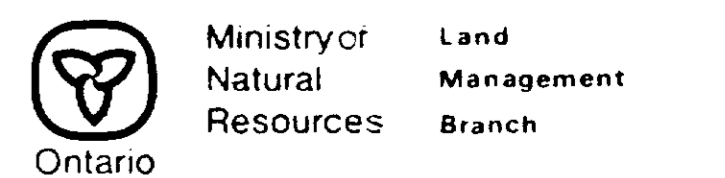


SCALE 1:20 000
GRID ZONE: 17

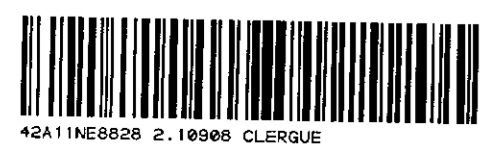
NOTES

FLOODING RIGHTS ON THE FREDERICK HOUSE RIVER TO 903 CONTOUR RESERVED TO H.E.R.C.

TOWNSHIP
MATHESON
M.N.R. ADMINISTRATIVE DISTRICT
TIMMINS
MINING DIVISION
PORCUPINE
LAND TITLES / REGISTRY DIVISION
COCHRANE



ORIGINAL COMPILATION JULY 1984
REVISED
Number: **G-3982**

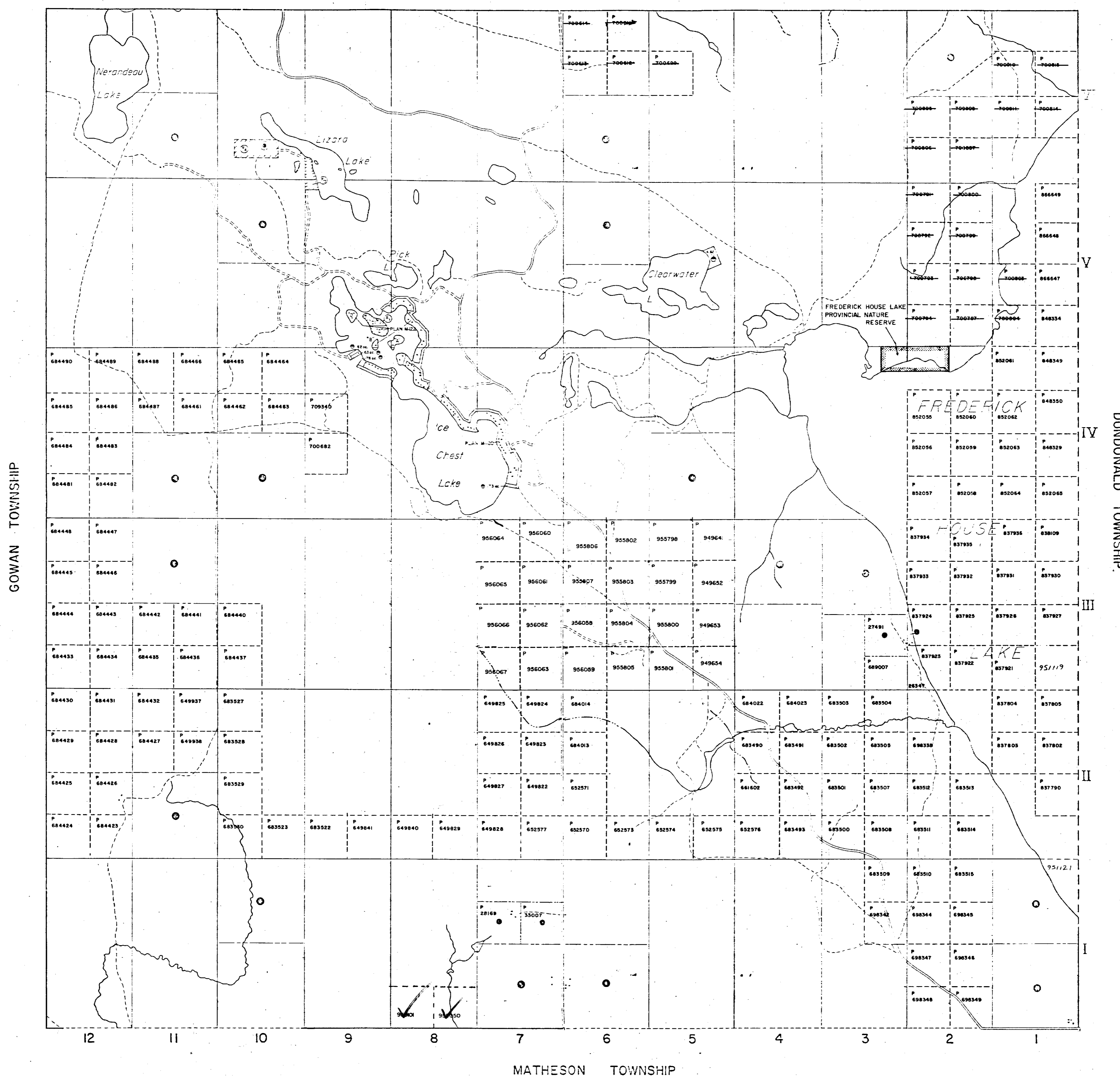


AREAS WITHDRAWN FROM DISPOSITION

M.R.O. - MINING RIGHTS ONLY
 S.R.O. - SURFACE RIGHTS ONLY
 M.+S. - MINING AND SURFACE RIGHTS

| Description | Order No. | Date | Disposition | File |
|-------------|-----------|----------|-------------|--------|
| ⊙ | W28/73 | 04/06/73 | S.R.O. | 134839 |
| ⊙ | W19/78 | 10/04/78 | S.R.O. | 188543 |
| ⊙ | NW 41/85 | | S.P.O. | |

LITTLE TOWNSHIP



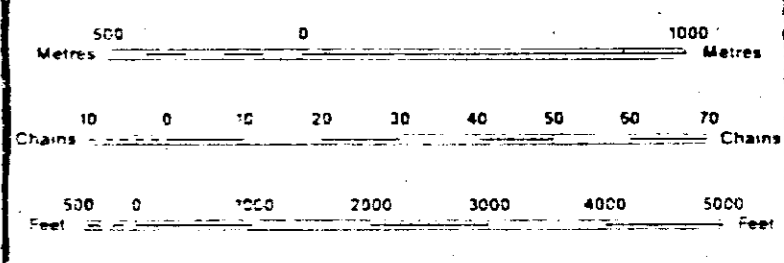
LEGEND

- HIGHWAY AND ROUTE No.
- OTHER ROADS
- TRAILS
- SURVEYED LINES
- TOWNSHIPS, BASE LINES, ETC.
- LOTS, MINING CLAIMS, PARCELS, ETC.
- UNSURVEYED LINES
- LOT LINES
- PARCEL BOUNDARY
- MINING CLAIMS ETC.
- RAILWAY AND RIGHT OF WAY
- UTILITY LINES
- NON-PERMANENT STREAM
- FLOODING OR FLOODING RIGHTS
- SUBDIVISION OR COMPOSITE PLAN RESERVATIONS
- ORIGINAL SHORELINE
- WASH OR MUSKIEG
- MINES
- TRAVERSE MONUMENT

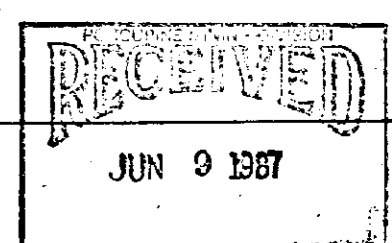
DISPOSITION OF CROWN LANDS

| TYPE OF DOCUMENT | SYMBOL |
|--------------------------------|--------|
| PATENT SURFACE & MINING RIGHTS | ⊙ |
| SURFACE RIGHTS ONLY | ○ |
| MINING RIGHTS ONLY | ⊙ |
| LEASE, SURFACE & MINING RIGHTS | ⊙ |
| SURFACE RIGHTS ONLY | ○ |
| MINING RIGHTS ONLY | ⊙ |
| LICENCE OF OCCUPATION | ⊙ |
| ORDER IN COUNCIL | OC |
| RESERVATION | ⊙ |
| CANCELLED | ⊙ |
| SAND & GRAVEL | ⊙ |

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6 1913 VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970 CHAP. 380, SEC. 63, SUBSEC. 1.



SCALE 1:20 000



TOWNSHIP
EVELYN
 M.N.R. ADMINISTRATIVE DISTRICT
 TIMMINS
 MINING DIVISION
 PORCUPINE
 LAND TITLES / REGISTRY DIVISION
 COCHRANE

Ministry of Natural Resources Ontario
 Ministry of Northern Development and Mines

Date: OCTOBER 1986
 Checked: M. J. 11/86
 C.M. 2/17/87
 G-3940



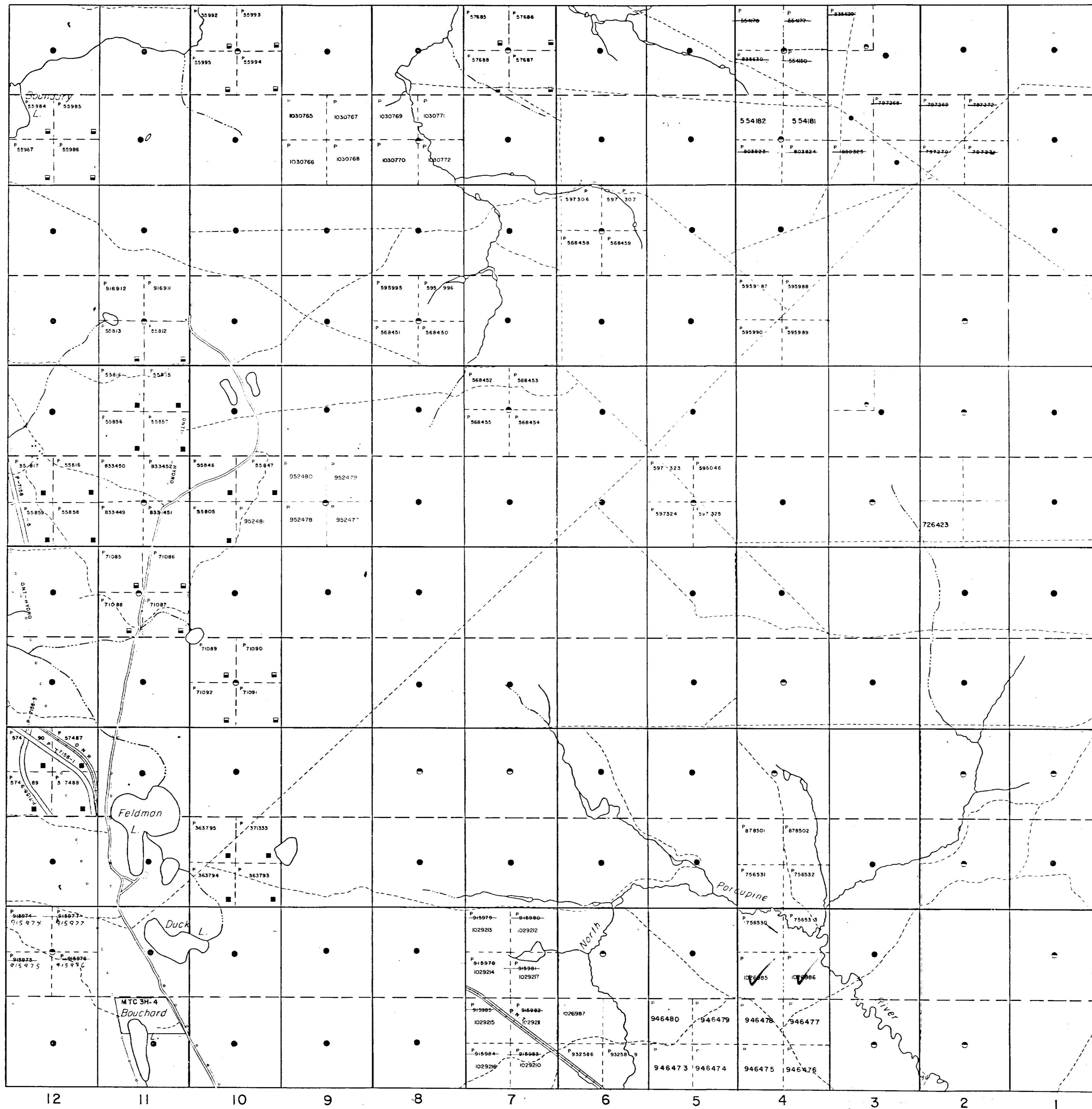
AREAS WITHDRAWN FROM DISPOSITION

- M.R.O. - MINING RIGHTS ONLY
- S.R.O. - SURFACE RIGHTS ONLY
- M.+S. - MINING AND SURFACE RIGHTS

Description Order No. Date Disposition File

PROSSER TOWNSHIP

KIDD TOWNSHIP



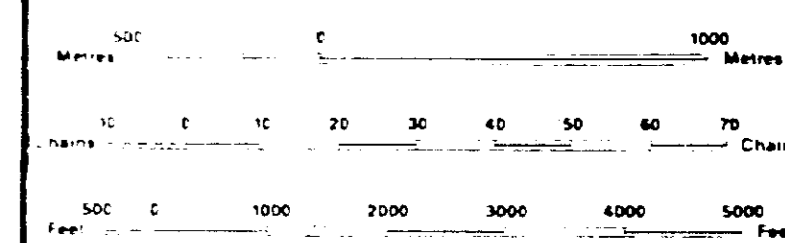
LEGEND

- HIGHWAY AND ROUTE No.
- OTHER ROADS
- TRAILS
- SURVEYED LINES
- TOWNSHIP, BASE LINES, ETC.
- LOTS, MINING CLAIMS, PARCELS, ETC.
- UNSURVEYED LINES
- LOT LINES
- PARCEL BOUNDARY
- MINING CLAIMS ETC.
- RAILWAY AND RIGHT OF WAY
- UTILITY LINES
- NATURAL STREAM
- FLOODING OR FLOODING RIGHTS
- SUBSIDY OR COMPENSATION PLAN
- RESERVATIONS
- ORIGINAL SURVEY LINE
- MARSH OR MINE
- MINES
- TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

| TYPE OF DOCUMENT | SYMBOL |
|--------------------------------|--------|
| PATENT SURFACE & MINING RIGHTS | ● |
| SURFACE RIGHTS ONLY | ○ |
| MINING RIGHTS ONLY | ◐ |
| LEASE SURFACE & MINING RIGHTS | ■ |
| SURFACE RIGHTS ONLY | ◑ |
| MINING RIGHTS ONLY | ◒ |
| ORDER IN COUNCIL | OC |
| RESERVATION | ⊙ |
| CANCELLED | ⊖ |
| SAND & GRAVEL | ⊕ |

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC AND ACT 1910, CHAP. 380, SEC. 63, SUBSEC. 1.



SCALE 1:20 000

1/2 LOT 9, CON 3, LOT 9, CON 2 B
 1/2, 1/2, LOT 6, CON 3 - Withdrawn from staking -
 SR B MR.

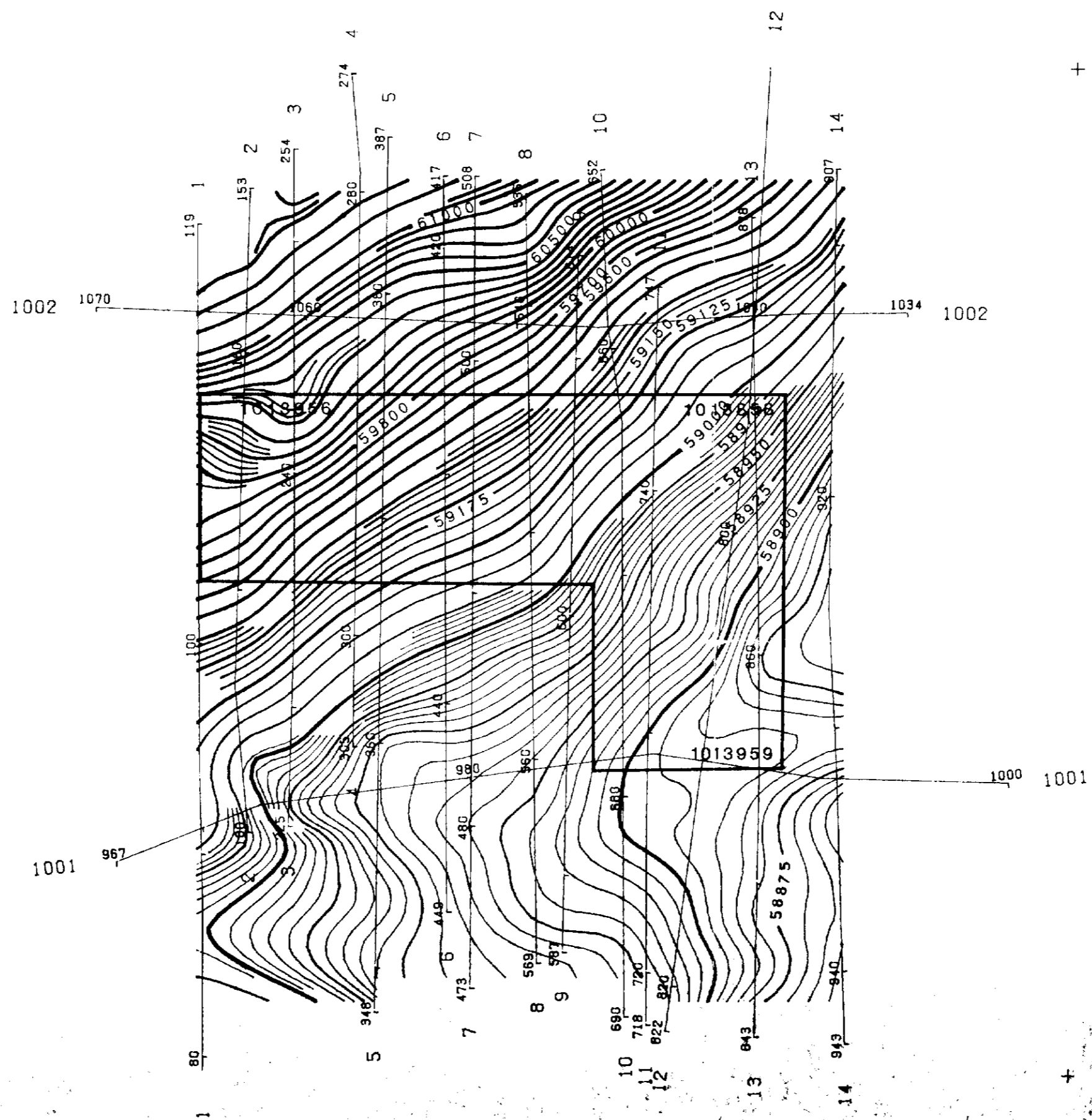


TOWNSHIP
WARK
 M.N.R. ADMINISTRATIVE DISTRICT
 TIMMINS
 MINING DIVISION
 PORCUPINE
 LAND TITLES / REGISTRY DIVISION
 COCHRANE

Ministry of Natural Resources Ontario
 Ministry of Northern Development and Mines

Date: SEPTEMBER 1986
 Number: G-3989





2.10908



LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

TOTAL MAGNETIC FIELD

500 gammas 
 100 gammas 
 25 gammas 
 5 gammas 

MR. A. J. SALO

**AIRBORNE MAGNETIC SURVEY
 TOTAL MAGNETIC FIELD**

CLERGUE TOWNSHIP, ONTARIO

N.T.S. NO. 42A/10

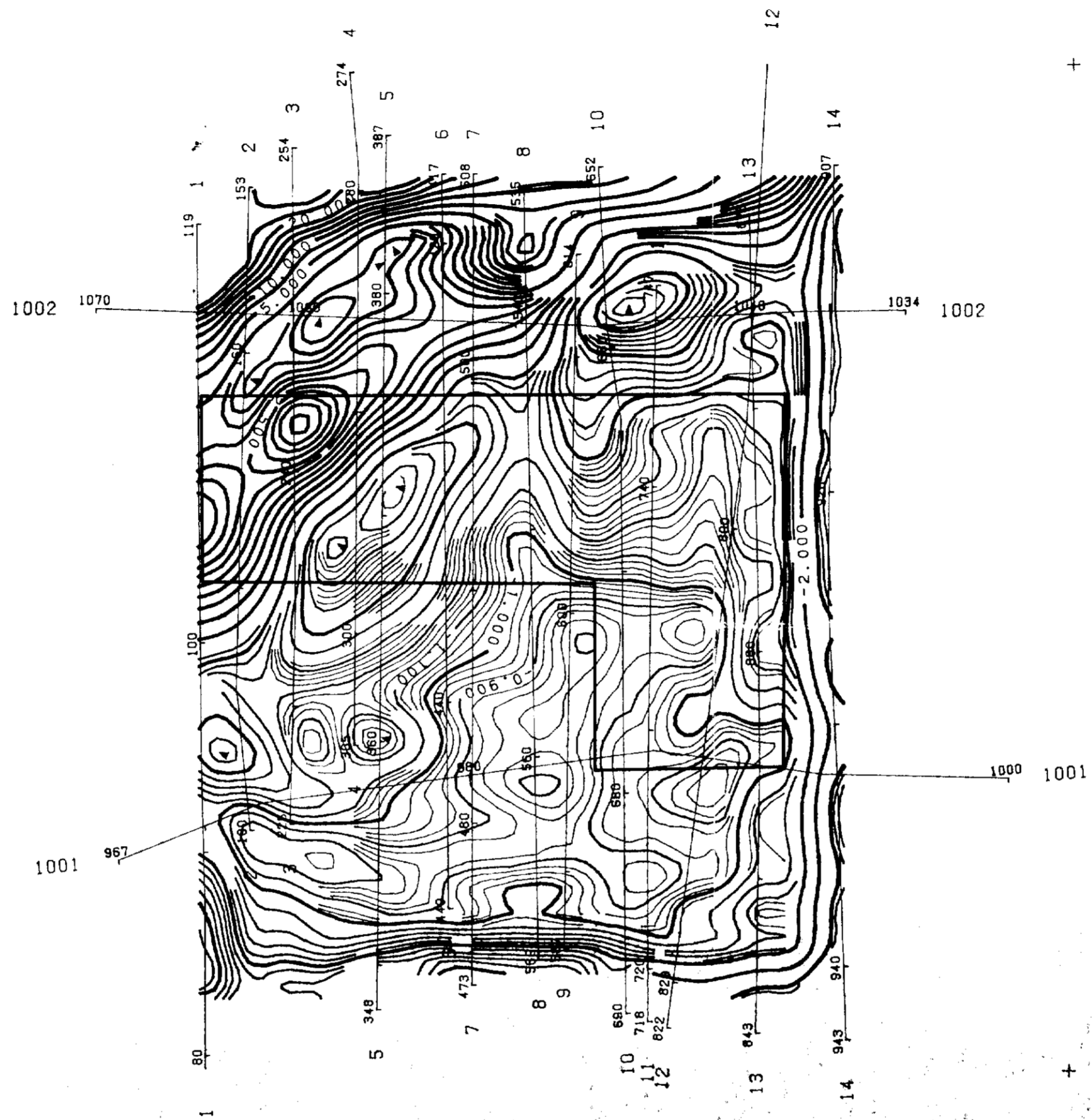
DRAWING NO. A-739.1-1

SCALE: 1:10,000

DATE: February 1988

TERRAQUEST LTD. 
 TORONTO, CANADA



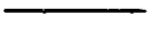
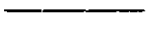




LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

VERTICAL MAGNETIC GRADIENT

2.500 gammas/meter 
 .500 gammas/meter 
 .100 gammas/meter 
 .025 gammas/meter 

MR. A. J. SALO

AIRBORNE MAGNETIC SURVEY
 VERTICAL MAGNETIC GRADIENT
 Calculated From Total Field


CLERGUE TOWNSHIP, ONTARIO

NTS NO 42A/10

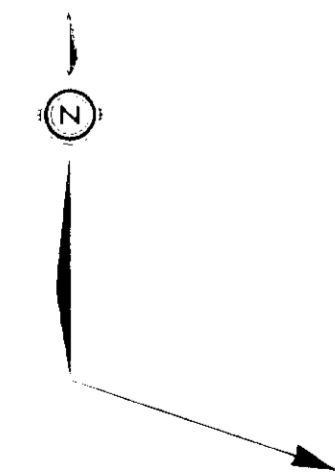
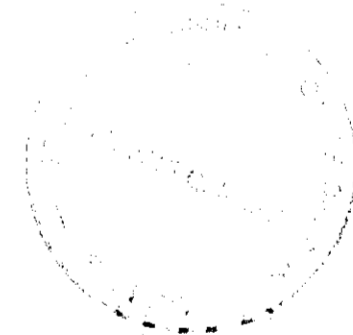
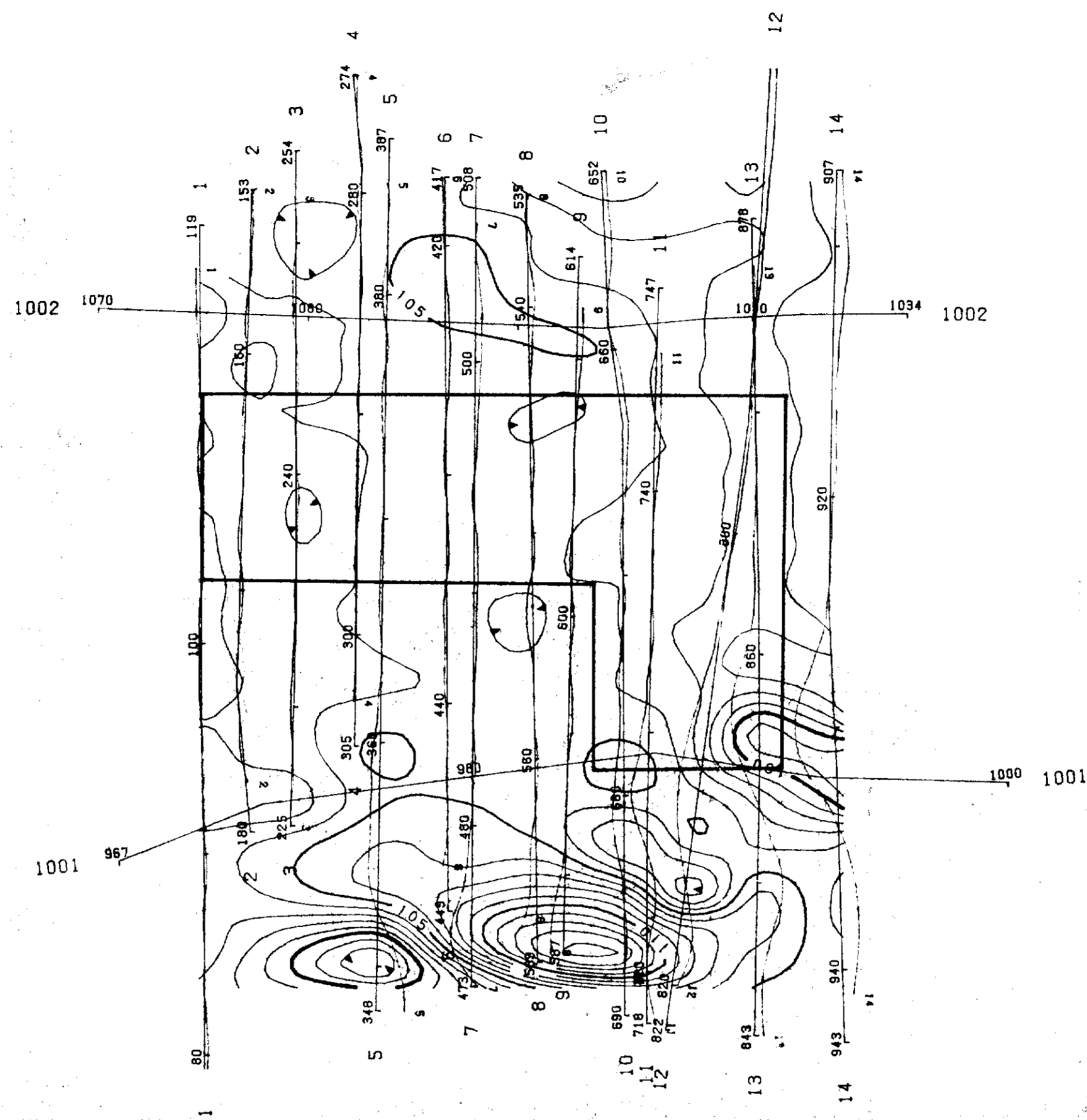
DRAWING NO A-739.1-2

SCALE 1:10,000

DATE February 1988

TERRAQUEST LTD. 
 TORONTO, CANADA





VLF Transmitter
 NAA Cutler, 24.0 kHz
 Azimuth 108

LEGEND

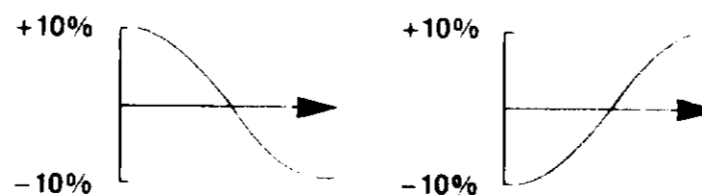
Terrain Clearance 100 meters
 Line Spacing 100 meters

TOTAL FIELD STRENGTH (Contours)

5% 
 1% 

QUADRATURE (Profiles)

Normal Slope Reverse Slope



MR. A. J. SALO

AIRBORNE VLF-EM SURVEY
 CONTOURS OF TOTAL FIELD STRENGTH
 PROFILES OF QUADRATURE

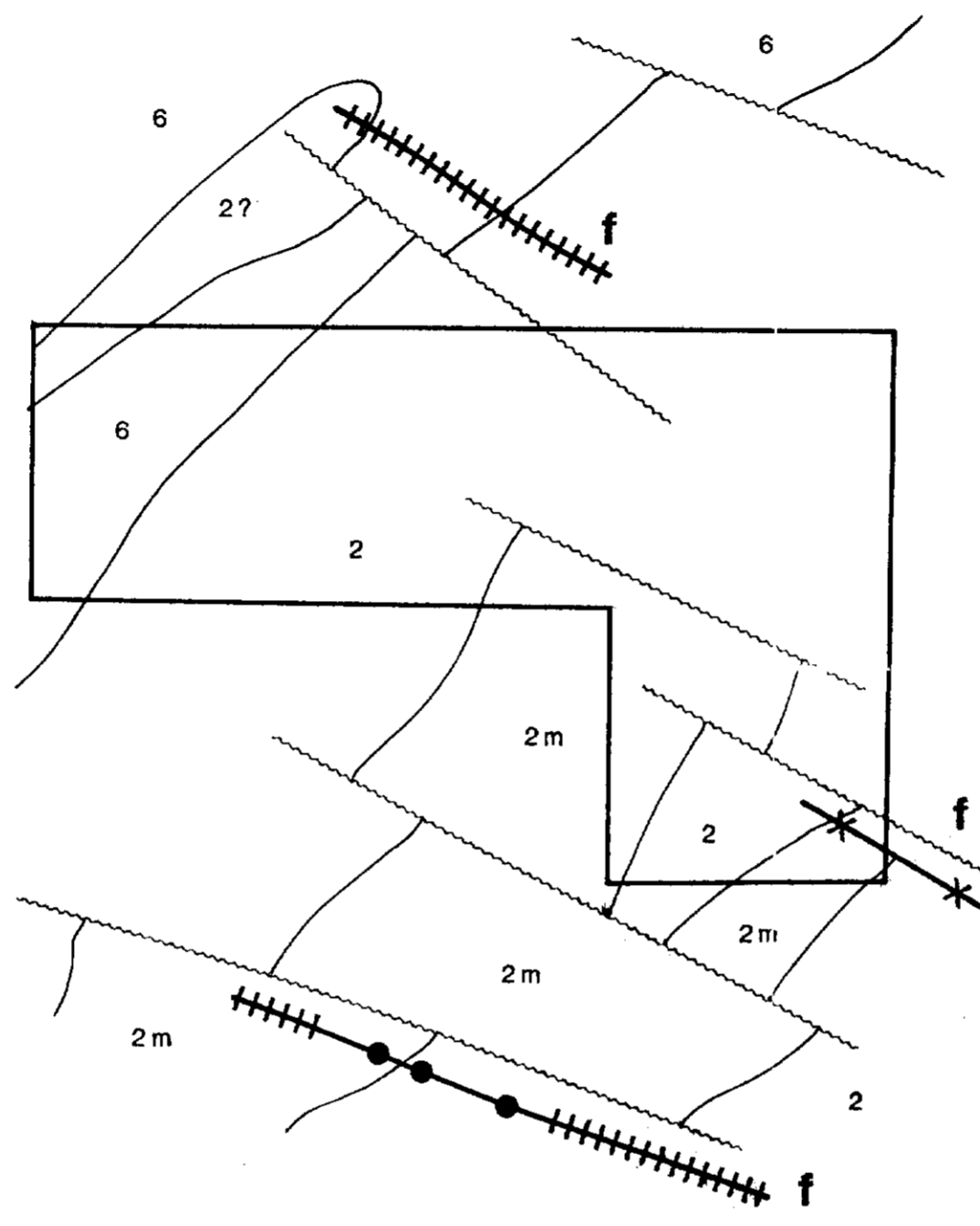
CLERGUE TOWNSHIP, ONTARIO

NTS NO 42A/10 DRAWING N A-739.1-3

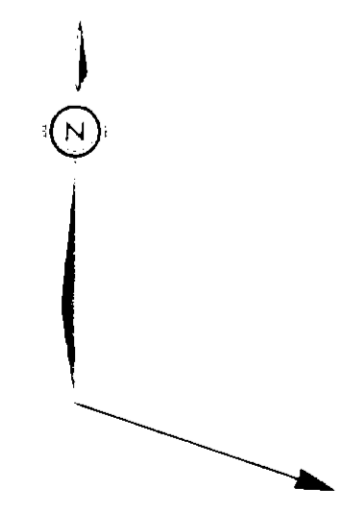
SCALE 1:10,000 DATE February 1988

TERRAQUEST LTD. 
 TORONTO, CANADA





2.10.98



VLF Transmitter:
NAA Cutler, 24.0 kHz
Azimuth 108

LITHOLOGY

- 6 Peridotite, Pyroxenite
- 2m Magnetic Unit Within 2
- 2 Andesitic & Rhyolitic Metavolcanics

LEGEND

Terrain Clearance 100 meters
Line Spacing 100 meters

INTERPRETATION

- Contact
- - - Fault
- Property Boundary

VLF-EM Conductor Axes

- normal quadrature
- x-x- reverse quadrature
- + + + + total field only

See text for classification of
VLF-EM conductor axes

MR. A. J. SALO

INTERPRETATION

CLERGUE TOWNSHIP, ONTARIO

N.T.S. NO. 42A/10

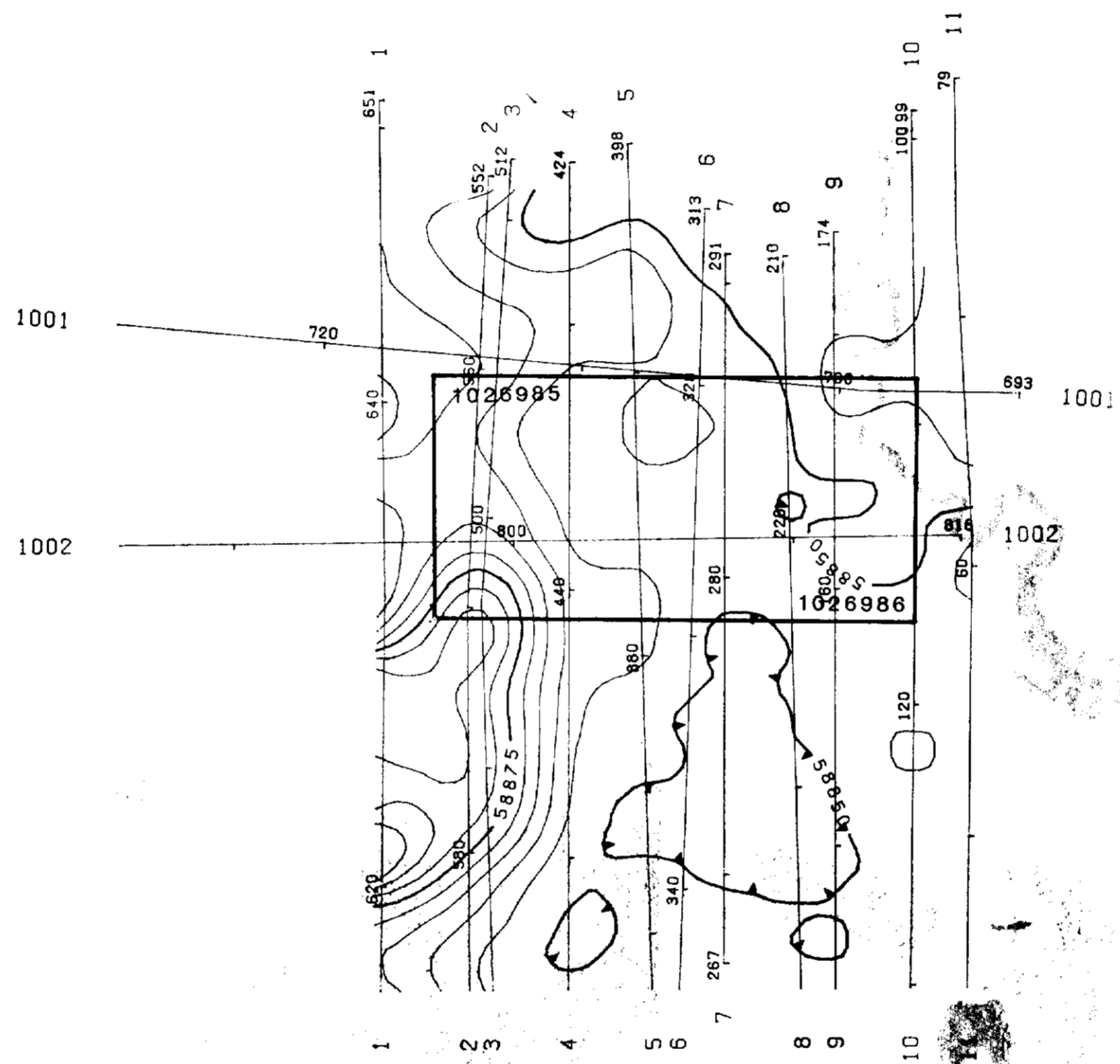
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SCALE: 1:10,000

DATE: February 1988



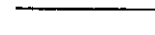

TERRAQUEST LTD.
TORONTO, CANADA





LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

TOTAL MAGNETIC FIELD
 500 gammas 
 100 gammas 
 25 gammas 
 5 gammas 


MR. A. J. SALO

**AIRBORNE MAGNETIC SURVEY
 TOTAL MAGNETIC FIELD**

WARK TOWNSHIP, ONTARIO

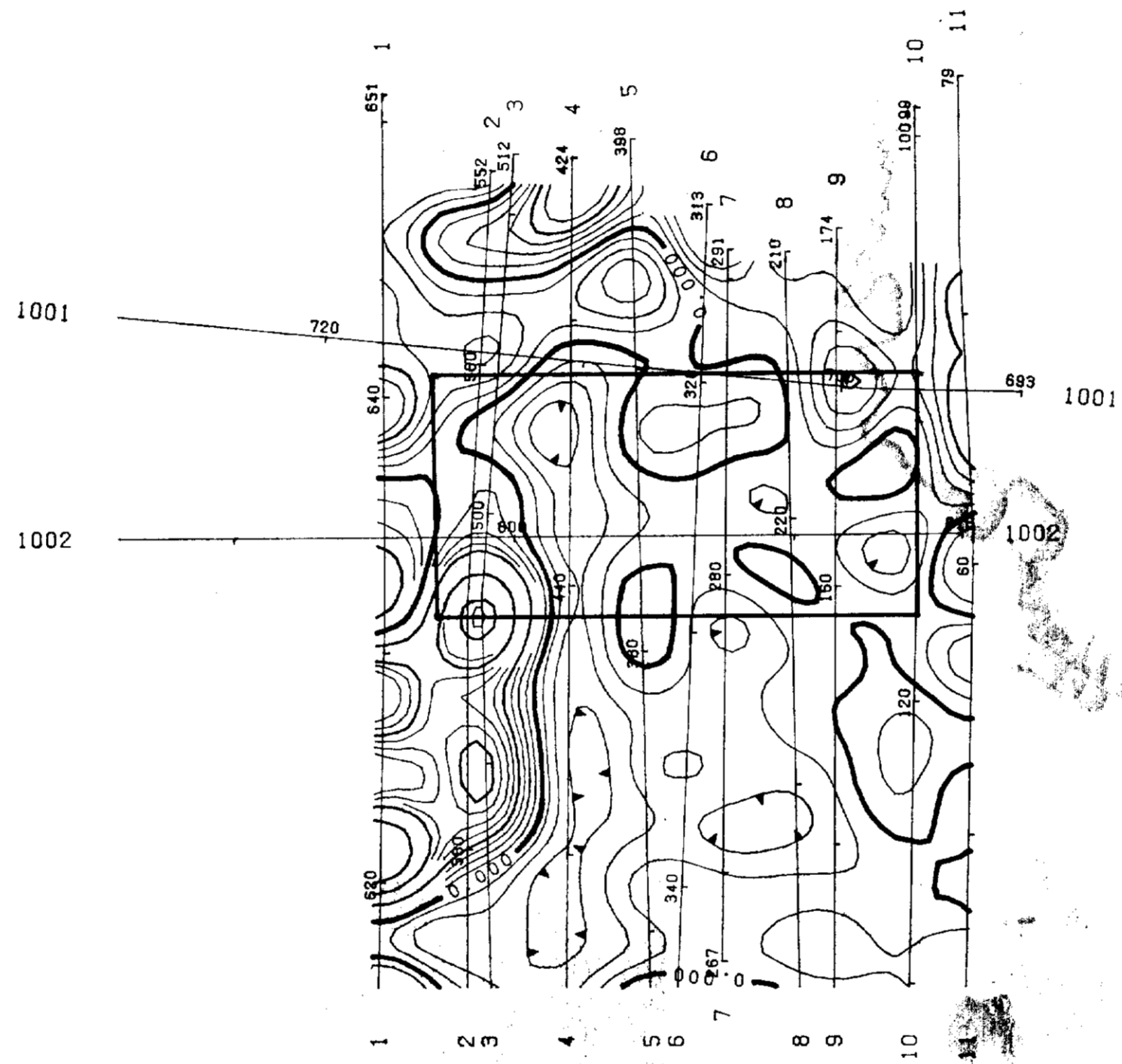
NTS NO 42A/11 DRAWING NO A-739.2-1

SCALE 1:10,000 DATE February 1988

TERRAQUEST LTD. 

IRON ORE CANADA





LEGEND

- Terrain Clearance 100 meters
- Line Spacing 100 meters

- VERTICAL MAGNETIC GRADIENT**
- 2.500 gammas/meter
- .500 gammas/meter
- .100 gammas/meter
- .025 gammas/meter

MR. A. J. SALO

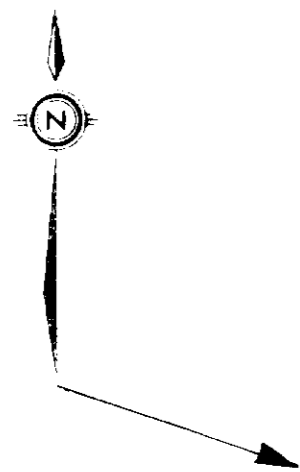
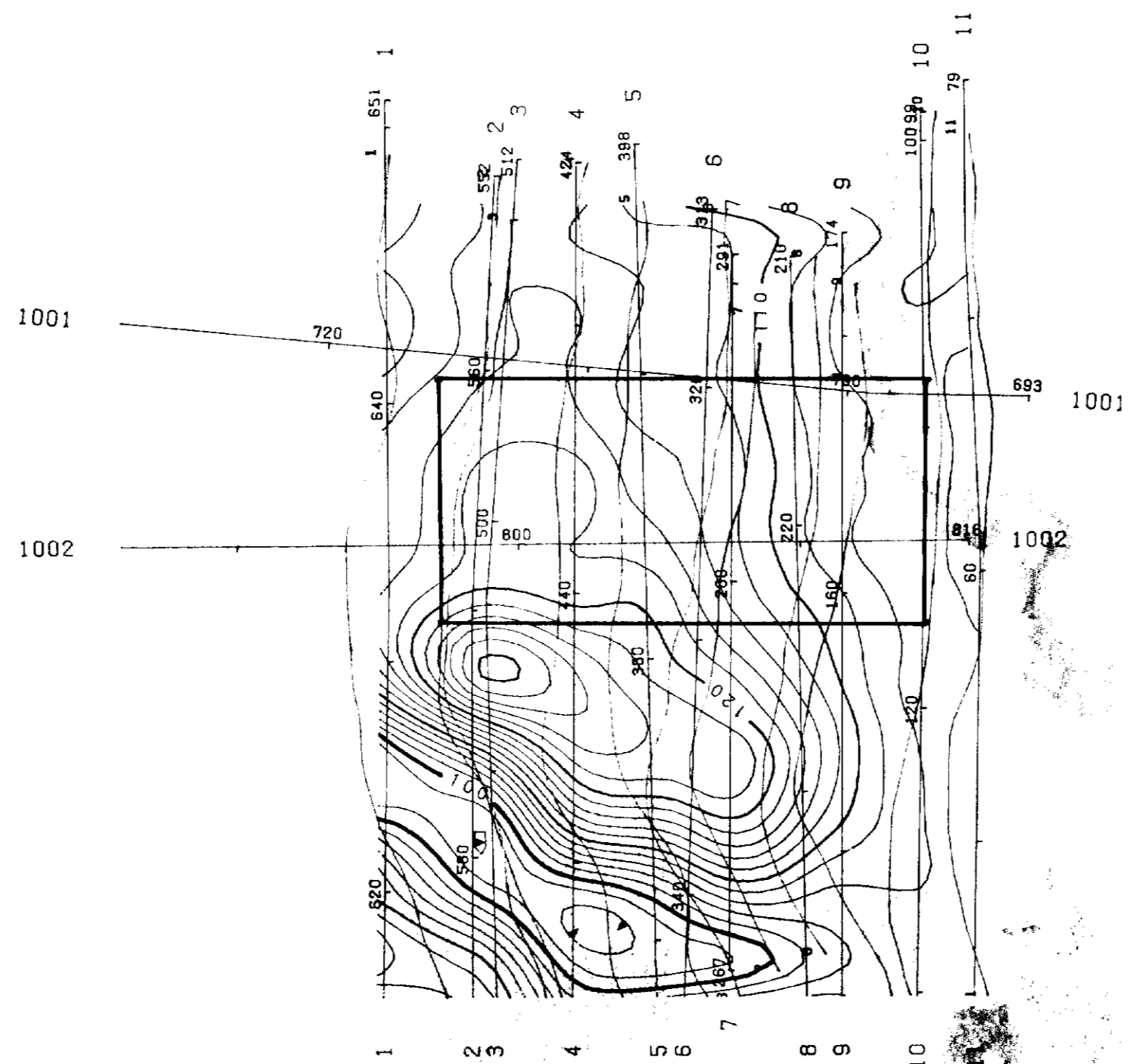
AIRBORNE MAGNETIC SURVEY
 VERTICAL MAGNETIC GRADIENT
 Calculated From Total Field

WARK TOWNSHIP, ONTARIO

| | | | |
|---------|----------|-------------|---------------|
| NTS NO. | 42A/11 | DRAWING NO. | A-739.2-2 |
| SCALE | 1:10,000 | DATE | February 1988 |

TERRAQUEST LTD.
 TORONTO, CANADA





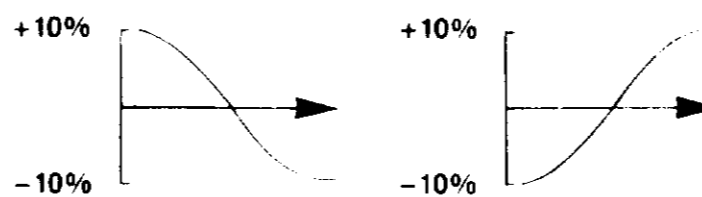
VLF Transmitter
 NAA Cutler, 24.0 kHz
 Azimuth 108

LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

TOTAL FIELD STRENGTH (Contours)
 50%
 10%
 2%

QUADRATURE (Profiles):
 Normal Slope Reverse Slope



MR. A. J. SALO

AIRBORNE VLF-EM SURVEY
 CONTOURS OF TOTAL FIELD STRENGTH
 PROFILES OF QUADRATURE

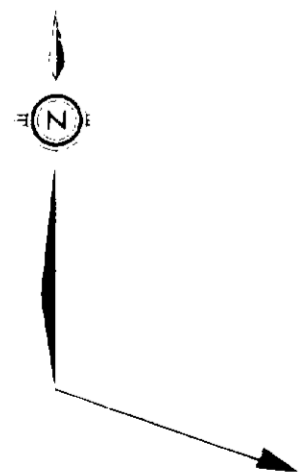
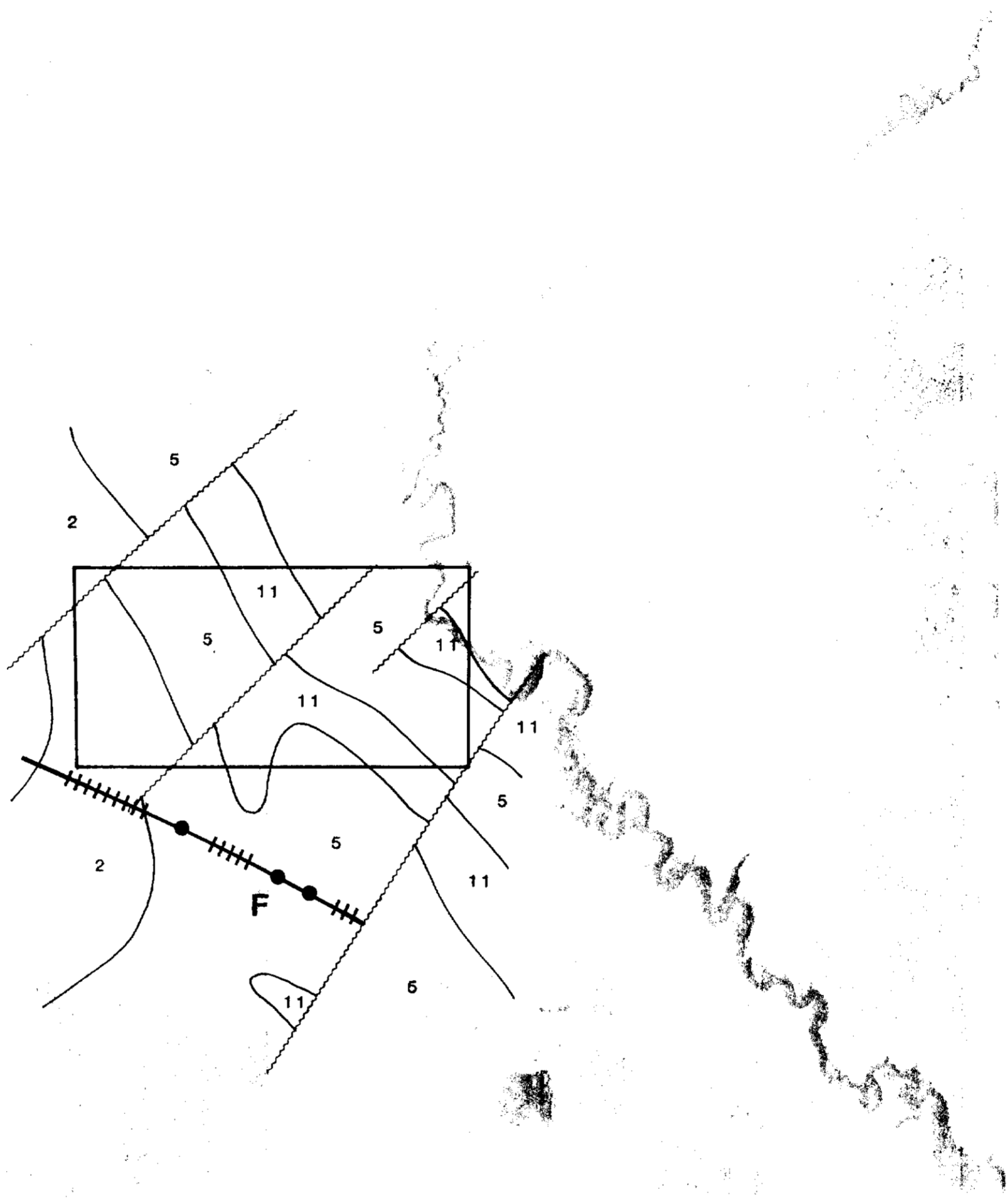
WARK TOWNSHIP, ONTARIO

NTS NO 42A/11 DRAWING NO A-739.2-3

SCALE 1:10,000 DATE February 1988

TERRAQUEST LTD. ↑
 TORONTO, CANADA





VLF Transmitter
 NAA Cutler. 24.0 kHz
 Azimuth 108

LITHOLOGY

| | |
|----|--------------|
| 11 | Diabase Dyke |
| 5 | Greywacke |
| 2 | Rhyolite |

LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

INTERPRETATION

| | |
|--|-------------------|
| | Contact |
| | Fault |
| | Property Boundary |

VLF-EM Conductor Axes

| | |
|--|--------------------|
| | normal quadrature |
| | reverse quadrature |
| | total field only |

See text for classification of
 VLF-EM conductor axes

MR. A. J. SALO

INTERPRETATION

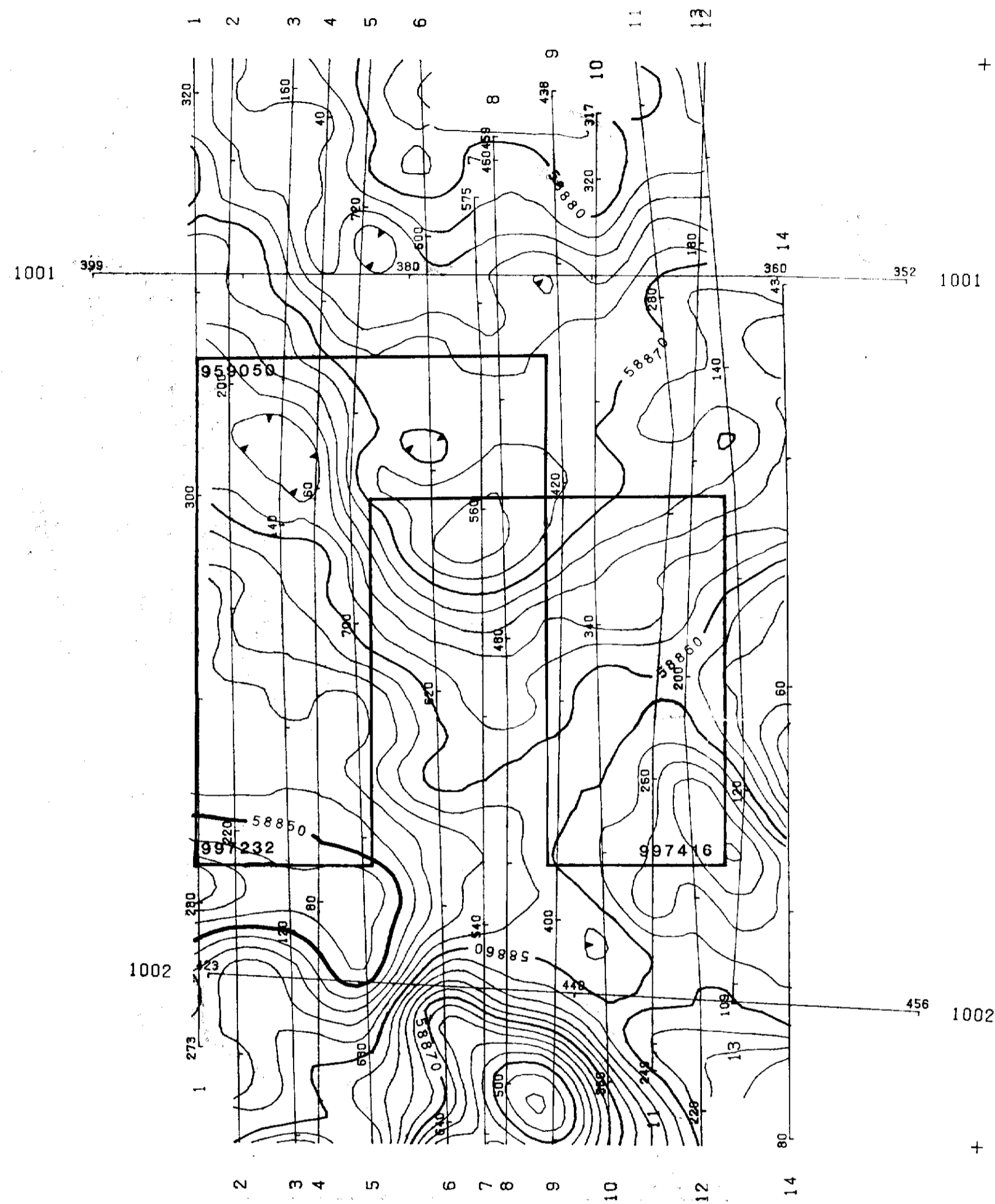
WARK TOWNSHIP, ONTARIO

| | | | |
|------------|----------|-------------|---------------|
| N.T.S. NO. | 42A/11 | DRAWING NO. | A-739.2-4 |
| SCALE: | 1:10,000 | DATE: | February 1988 |

TERRAQUEST LTD.

TORONTO, CANADA





LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

TOTAL MAGNETIC FIELD

50 gammas
 10 gammas
 2 gammas

MR. A. J. SALO

**AIRBORNE MAGNETIC SURVEY
 TOTAL MAGNETIC FIELD**

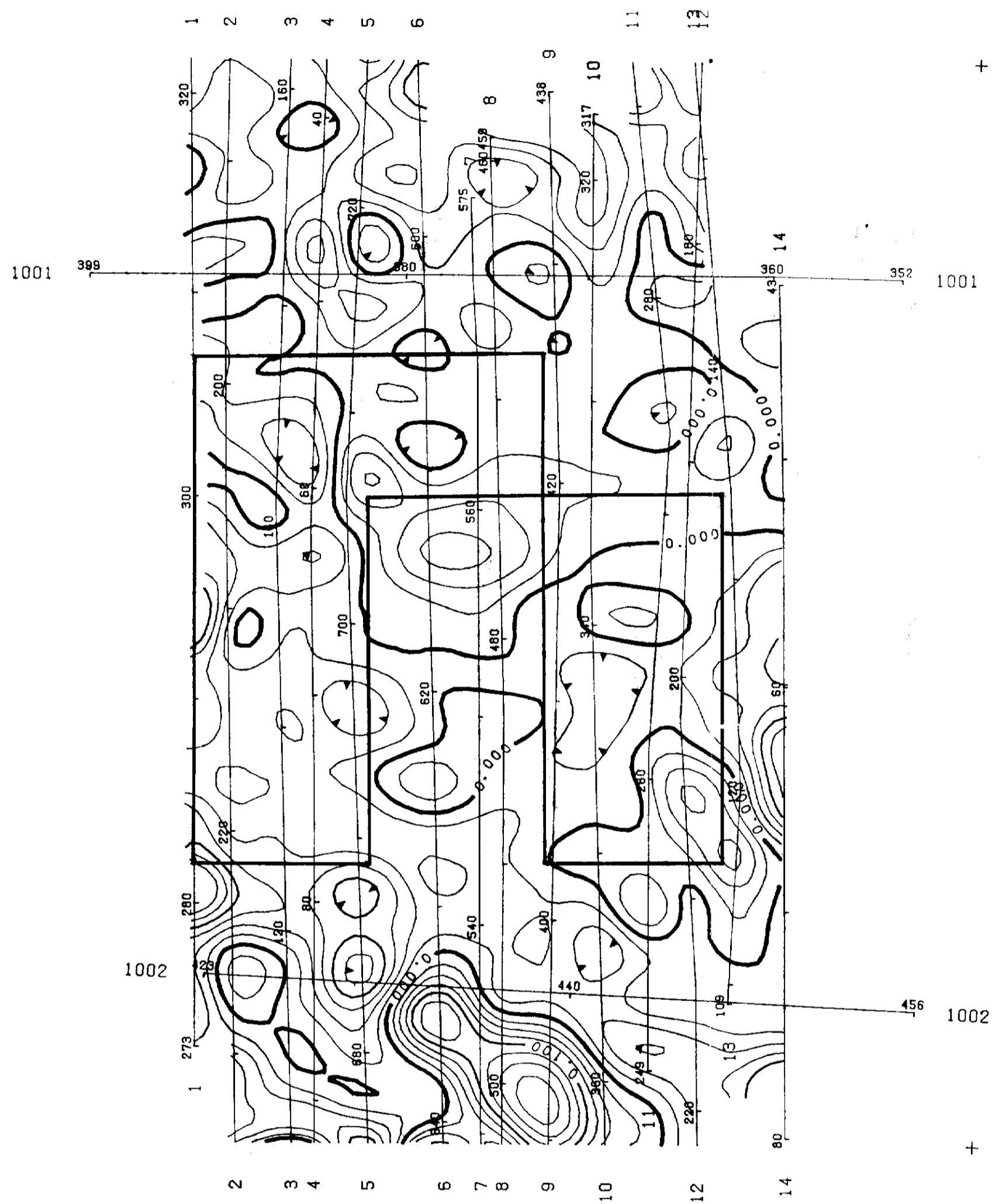
MATHESON, EVELYN TOWNSHIPS
 ONTARIO

NTS NO. 42A/11 DRAWING NO. A-739.3-1

SCALE 1:10,000 DATE February 1988

TERRAQUEST LTD. ↑
 TORONTO, CANADA


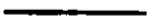






LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

VERTICAL MAGNETIC GRADIENT

2.500 gammas/meter 
 .500 gammas/meter 
 .100 gammas/meter 
 .025 gammas/meter 

MR. A. J. SALO

AIRBORNE MAGNETIC SURVEY

VERTICAL MAGNETIC GRADIENT
 Calculated From Total Field

MATHESON, EVELYN TOWNSHIPS
 ONTARIO

N.T.S. NO. 42A/11

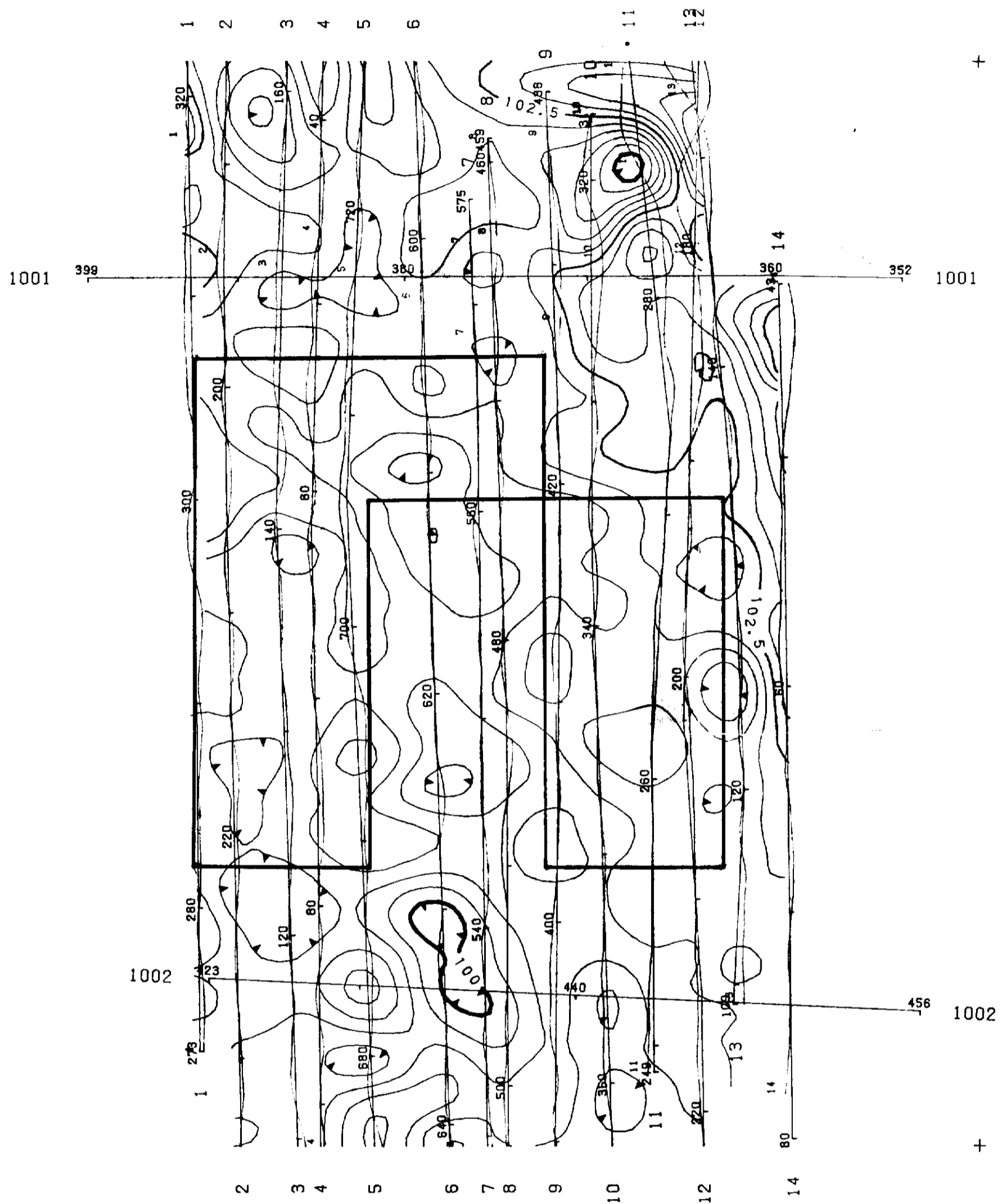
DRAWING NO. A-739.3-2

SCALE 1:10,000

DATE February 1988

TERRAQUEST LTD. 
 TORONTO, CANADA





VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 108

LEGEND

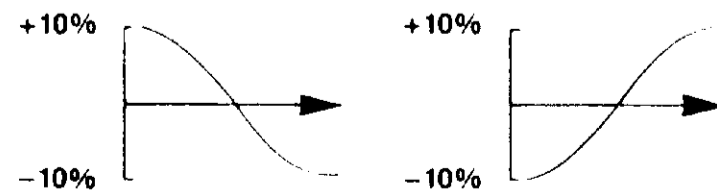
Terrain Clearance 100 meters
Line Spacing 100 meters

TOTAL FIELD STRENGTH (Contours)

10.0%
2.5%
0.5%

QUADRATURE (Profiles)

Normal Slope Reverse Slope



MR. A. J. SALO

AIRBORNE VLF-EM SURVEY CONTOURS OF TOTAL FIELD STRENGTH PROFILES OF QUADRATURE

MATHESON, EVELYN TOWNSHIPS
ONTARIO

NTS NO 42A/11

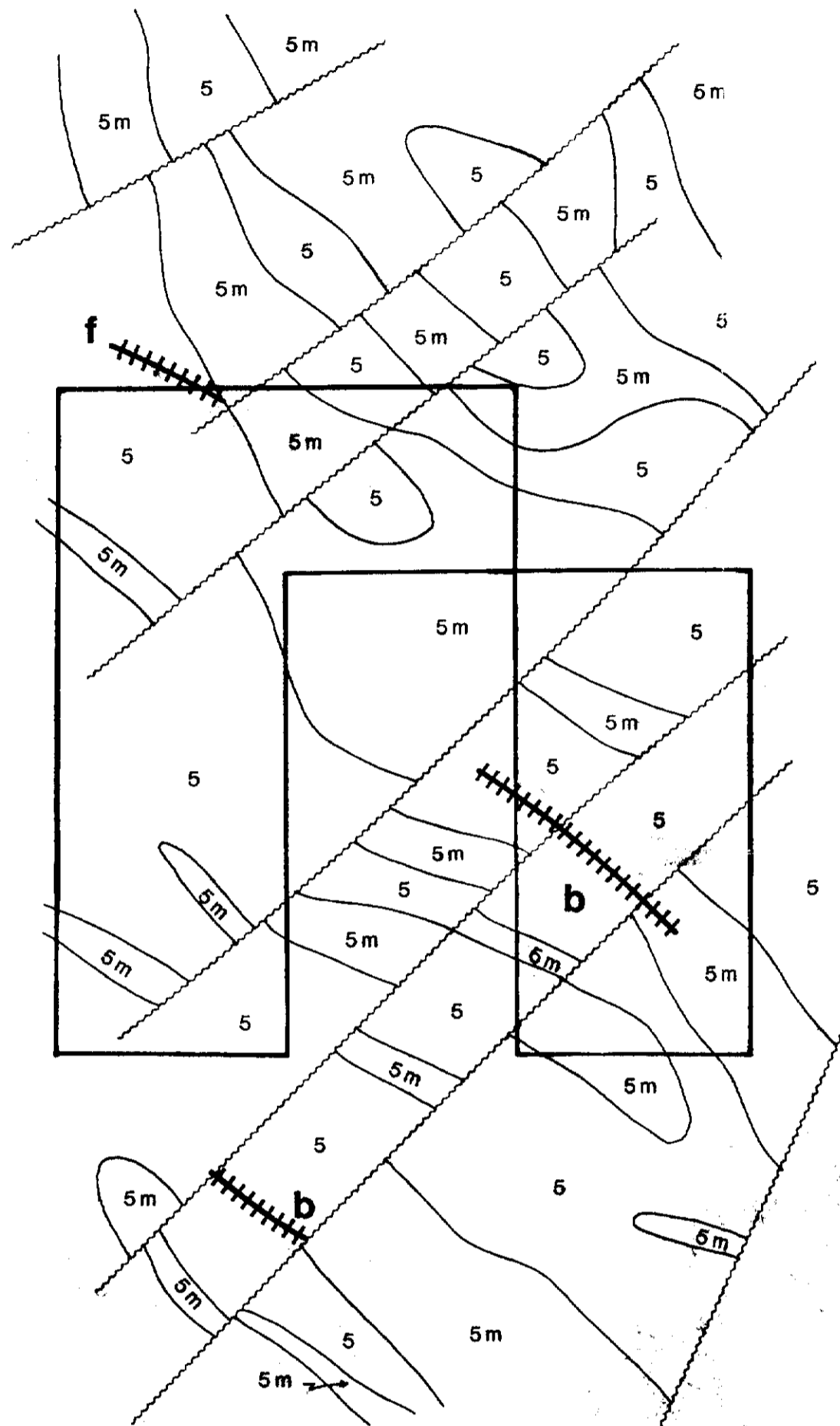
DRAWING NO A-739.3-3

SCALE 1:10,000

DATE February 1988

TERRAQUEST LTD.
TORONTO CANADA





VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 108

LITHOLOGY

- 5m Magnetic Unit Within 5
- 5 Greywacke

LEGEND

Terrain Clearance 100 meters
Line Spacing 100 meters

INTERPRETATION

- Contact
- Fault
- Property Boundary
- VLF-EM Conductor Axes**
- normal quadrature
- reverse quadrature
- total field only

See text for classification of
VLF-EM conductor axes

MR. A. J. SALO

INTERPRETATION

MATHESON, EVELYN TOWNSHIPS
ONTARIO

N.T.S. NO. 42A/11

DRAWING NO. A-739.3-4

SCALE: 1:10,000

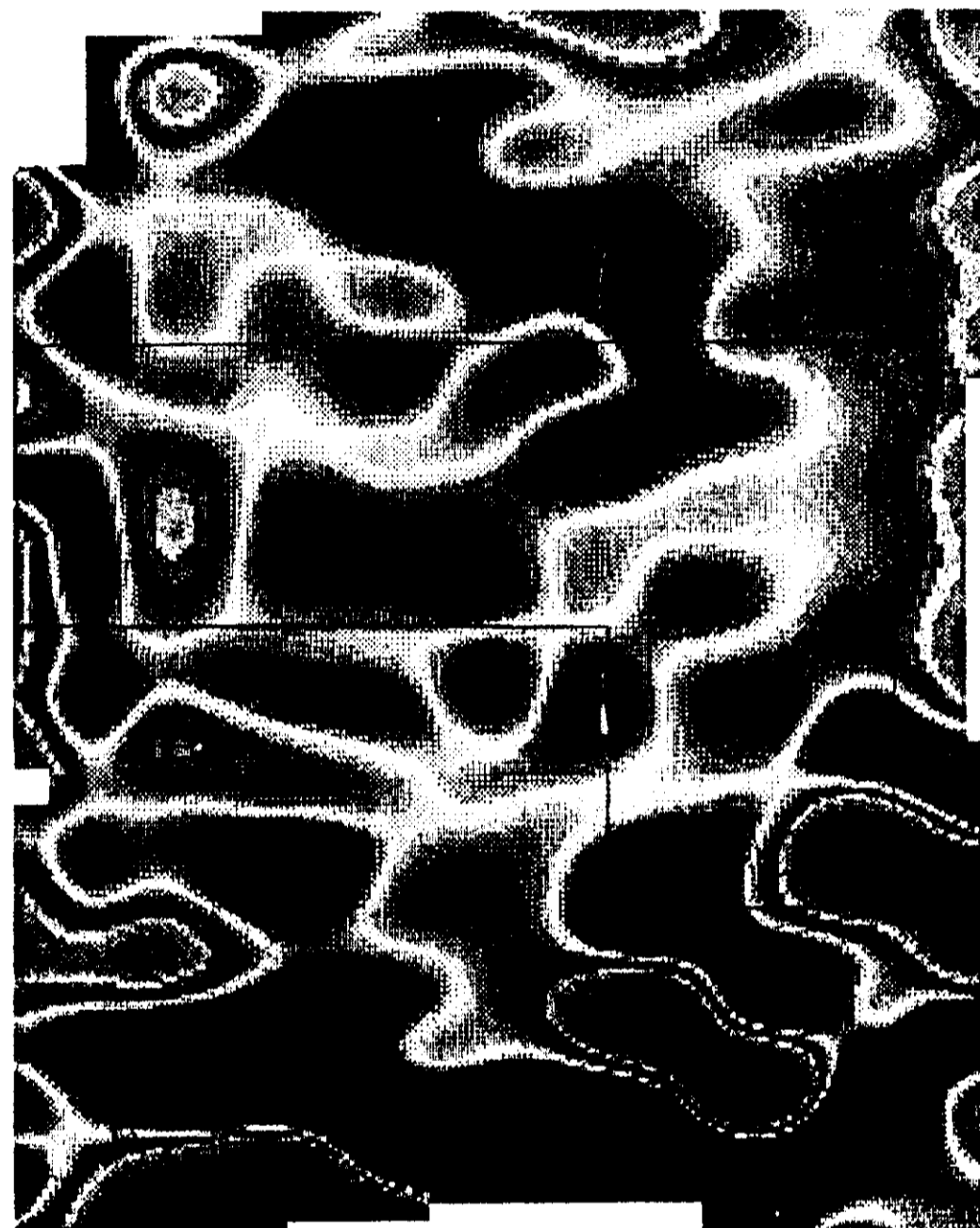
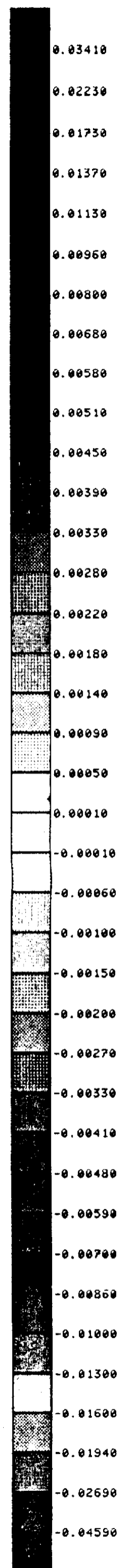
DATE: February 1988


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TORONTO, CANADA



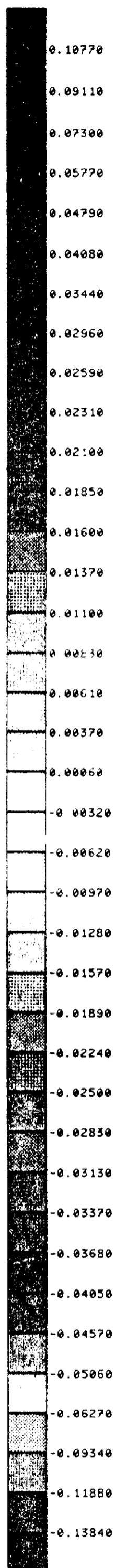
42A11NE9828 2.10928 CLERGUE


% PER METER



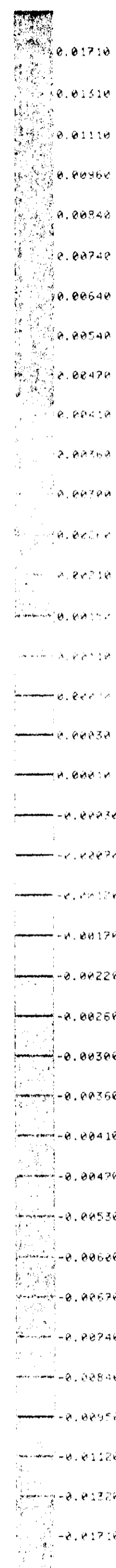
| | |
|--|-----------------------|
| MR. ARVO SALO | |
| AIRBORNE VLF-EM SURVEY COMPUTED VERTICAL GRADIENT OF TOTAL FIELD (IN-PHASE) | |
| CLERGUE TOWNSHIP, ONTARIO | |
| N.T.S. NO. 42A/10 | DRAWING NO. A-739.1-5 |
| SCALE: 1:10,000 | DATE: February 1988 |
| TERRAQUEST LTD.  TORONTO, CANADA | |


% PER METER



| | |
|--|-----------------------|
| MR. ARVO SALO | |
| AIRBORNE VLF-EM SURVEY COMPUTED VERTICAL GRADIENT OF TOTAL FIELD (IN-PHASE) | |
| WARK TOWNSHIP, ONTARIO | |
| N.T.S. NO. 42A/11 | DRAWING NO. A-739.2-5 |
| SCALE: 1:10,000 | DATE: February 1988 |
| TERRAQUEST LTD.  TORONTO, CANADA | |

% PER METER



| | |
|--|-----------------------|
| MR. ARVO SALO | |
| AIRBORNE VLF-EM SURVEY COMPUTED VERTICAL GRADIENT OF TOTAL FIELD (IN-PHASE) | |
| MATHESON, EVELYN TOWNSHIP, ONTARIO | |
| N.T.S. NO. 42A/11 | DRAWING NO. A-739.3-5 |
| SCALE: 1:10,000 | DATE: February 1988 |
| TERRAQUEST LTD.  TORONTO, CANADA | |

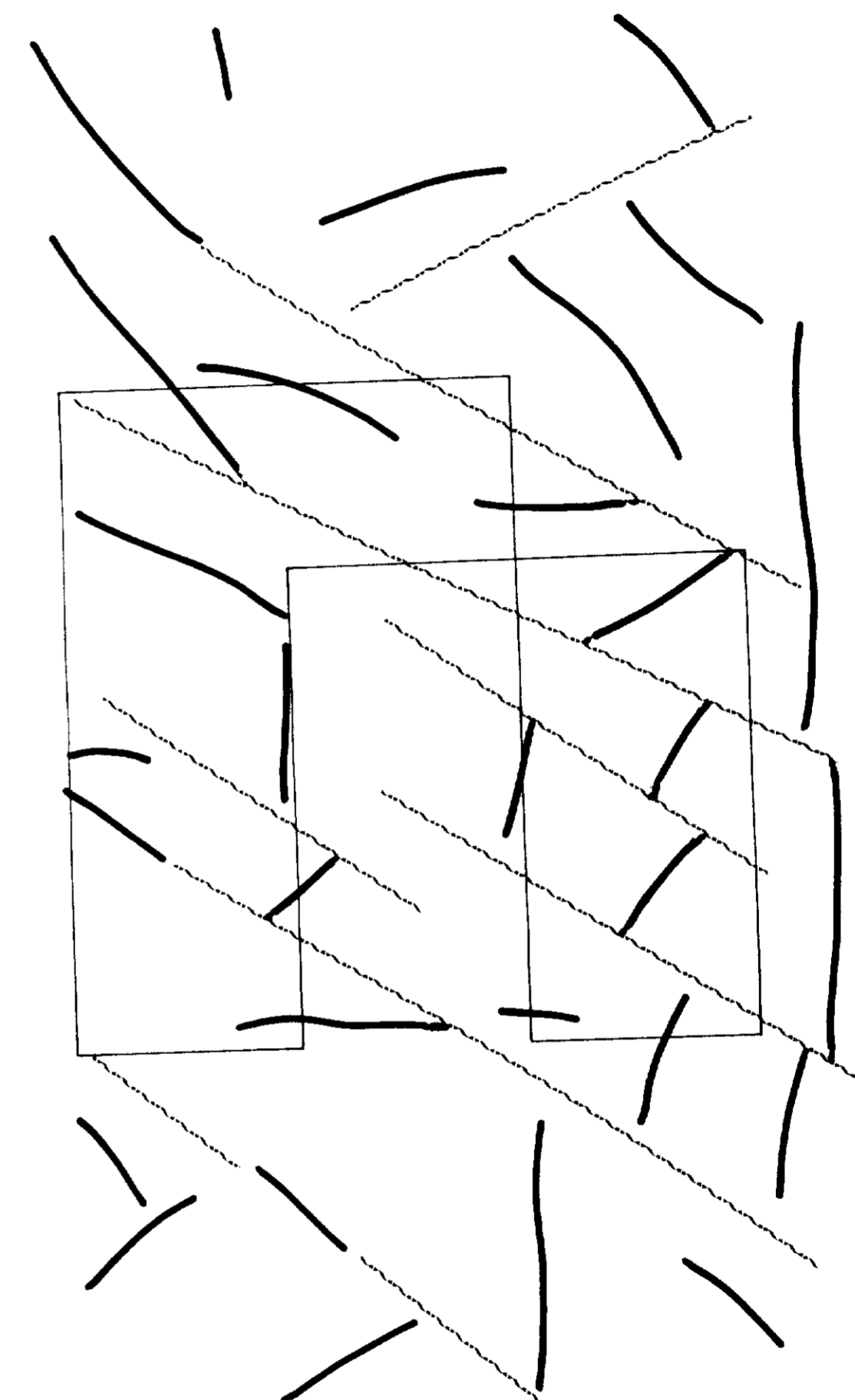
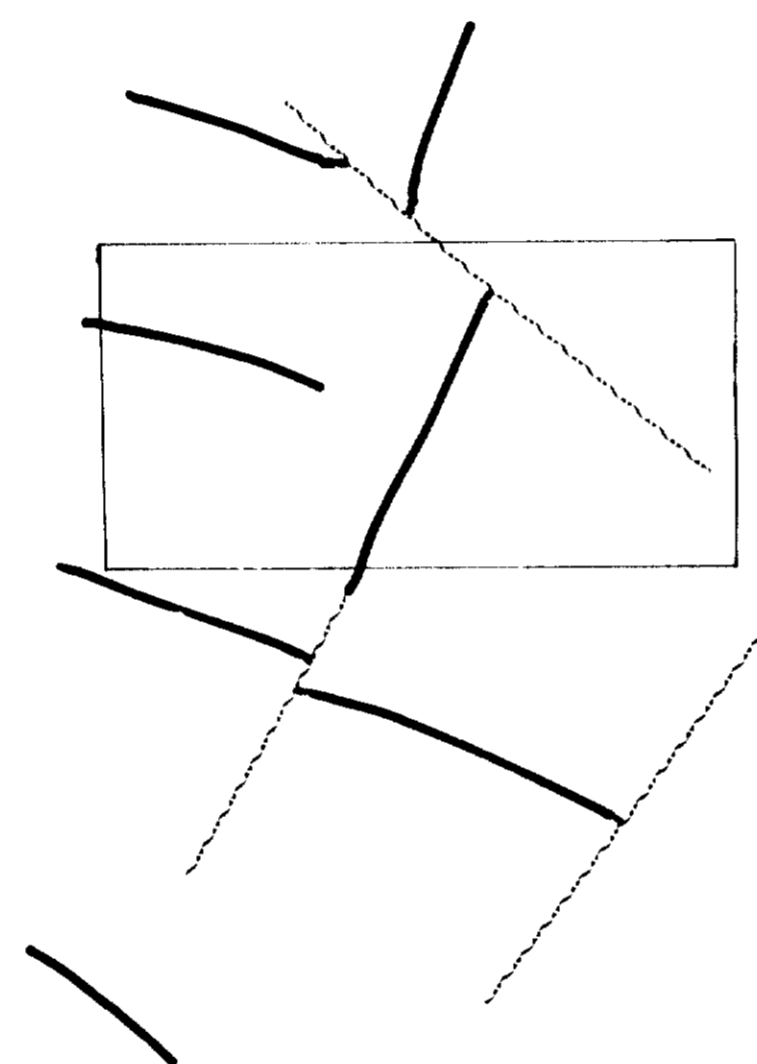
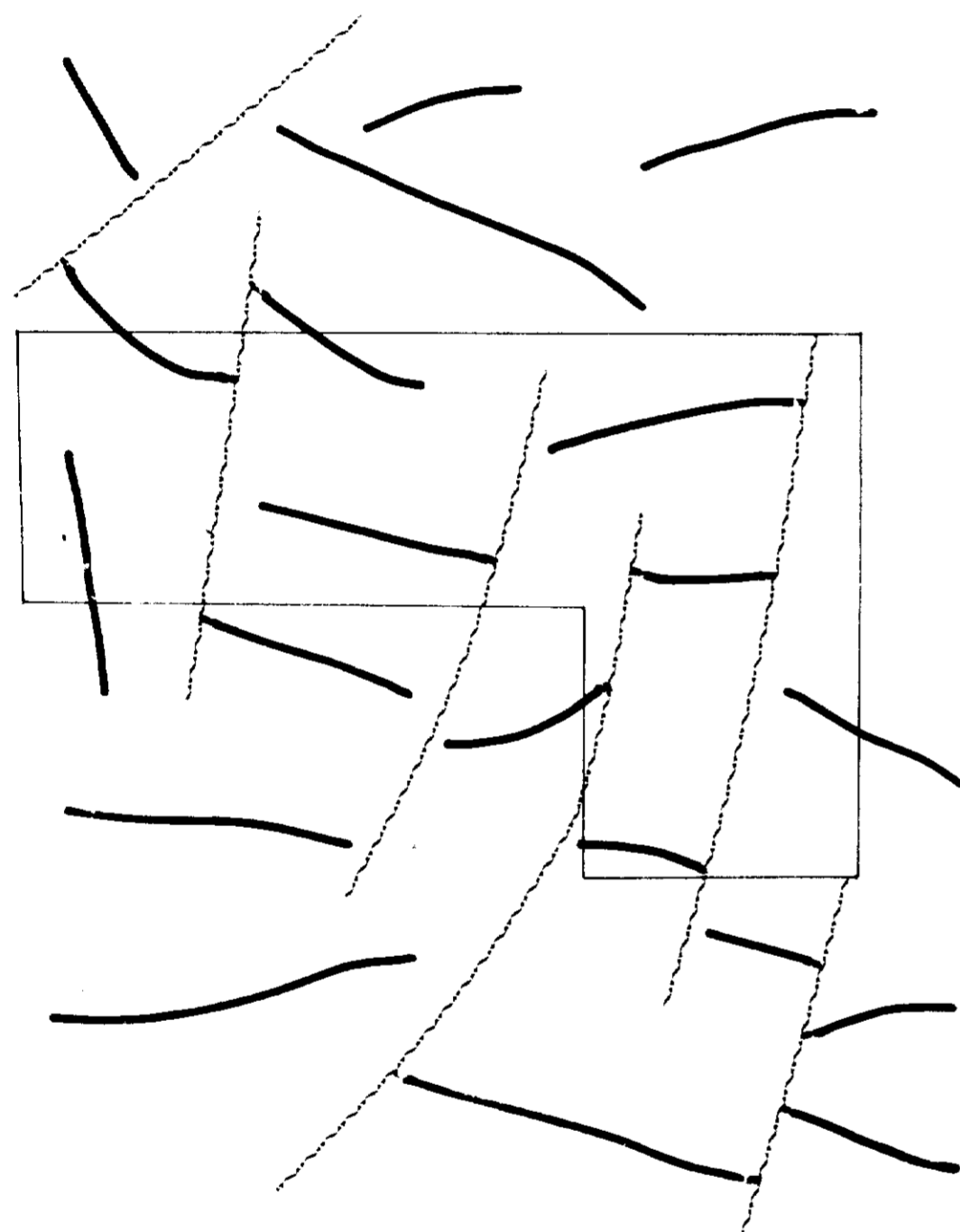


LEGEND

Terrain Clearance 100 meters
 Line Spacing 100 meters

INTERPRETATION

- ENHANCED CONDUCTOR AXIS
- - - - - FAULTS INTERPRETED FROM DISPLACEMENTS AND TRUNCATION OF CONDUCTOR AXIS



| | |
|---|-----------------------|
| MR. ARVO SALO | |
| AIRBORNE VLF-EM SURVEY COMPUTED VERTICAL GRADIENT OF TOTAL FIELD INTERPRETATION | |
| CLERGUE TOWNSHIP, ONTARIO | |
| N.T.S. NO. 42A/10 | DRAWING NO. A-739.1-5 |
| 0,000 | DATE: February 1988 |
| TERRAQUEST LTD. TORONTO, CANADA | |

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| MR. ARVO SALO | |
| AIRBORNE VLF-EM SURVEY COMPUTED VERTICAL GRADIENT OF TOTAL FIELD INTERPRETATION | |
| WARK TOWNSHIP, ONTARIO | |
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| TERRAQUEST LTD. TORONTO, CANADA | |

| | |
|---|-----------------------|
| MR. ARVO SALO | |
| AIRBORNE VLF-EM SURVEY COMPUTED VERTICAL GRADIENT OF TOTAL FIELD INTERPRETATION | |
| MATHESON, EVELYN TOWNSHIP, ONTARIO | |
| N.T.S. NO. 42A/11 | DRAWING NO. A-739.3-5 |
| SCALE: 1:10,000 | DATE: February 1988 |
| TERRAQUEST LTD. TORONTO, CANADA | |





42A11NE8828 2.10908 CLERGUE

010

REPORT ON AN
AIRBORNE MAGNETIC AND VLF-EM SURVEY
CLERGUE TOWNSHIP
WARK TOWNSHIP
MATHESON AND EVELYN TOWNSHIPS
PORCUPINE MINING DIVISION, ONTARIO

2.10908

for

MR. A.J. SALO

by

TERRAQUEST LTD.
Toronto, Canada

RECEIVED

MAR 11 1988

MINING LANDS SECTION

February 24, 1988

A-739

RECEIVED

FEB 24 1988

MINING LANDS SECTION

REPORT ON AN
AIRBORNE MAGNETIC AND VLF-EM SURVEY
CLERGUE TOWNSHIP
WARK TOWNSHIP
MATHESON AND EVELYN TOWNSHIPS
PORCUPINE MINING DIVISION, ONTARIO

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Toronto, Canada

February 24, 1988





42A11NE8828 2.10908 CLERGUE

010C

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- Figure 2 - Survey Area Map
- Figure 3 - Sample Record
- Figure 4 - Terraquest Classification of VLF-EM Conductor Axes

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- No. A-739-1, Total Magnetic Field
- No. A-739-2, Vertical Magnetic Gradient
- No. A-739-3, VLF-EM Survey
- No. A-739-4, Interpretation

Note: There are three survey areas, therefore there are three of the above listed maps.

1. INTRODUCTION

This report describes the specifications and results of a geophysical survey carried out for Mr. A.J. Salo of General Delivery, Prince George, B.C., V2L 4R8 by Terraquest Ltd., 240 Adelaide Street West, Toronto, Canada. The field work was performed on February 2, 1988 and the data processing, interpretation and reporting from February 3 to February 24, 1988.

The purpose of a survey of this type is two-fold. One is to prospect directly for anomalously conductive and magnetic areas in the earth's crust which may be caused by, or at least related to, mineral deposits. A second is to use the magnetic and conductivity patterns derived from the survey results to assist in mapping geology, and to indicate the presence of faults, shear zones, folding, alteration zones and other structures potentially favourable to the presence of gold and base-metal concentration. To achieve this purpose the survey area was systematically traversed by an aircraft carrying geophysical instruments along parallel flight lines spaced at even intervals, 100 metres above the terrain surface, and aligned so as to intersect the regional geology in a way to provide the optimum contour patterns of geophysical data.

2. THE PROPERTIES

CLERGUE TOWNSHIP

The property is located in the southwest corner of Clergue township, in the Porcupine Mining Division of Ontario about 44 kilometres northeast of the town of Timmins. The property can be accessed by bush roads to the west leading from Highway 67.

The latitude and longitude are 48 degrees 38 minutes, and 80 degrees 48 minutes respectively, and the N.T.S. reference is 42A/10.

The claim numbers are shown in figure 2 and listed below:

P.1013956-1013959 (4) Total of 4 claims

WARK TOWNSHIP PROPERTY

The property is located in the southeast quadrant of Wark township in the Porcupine Mining Division of Ontario about 18 kilometres northeast of the town of Timmins. The property lies on the southwest side of the North Porcupine River and can be accessed by bush roads from the southwest which connect to Highway 655.

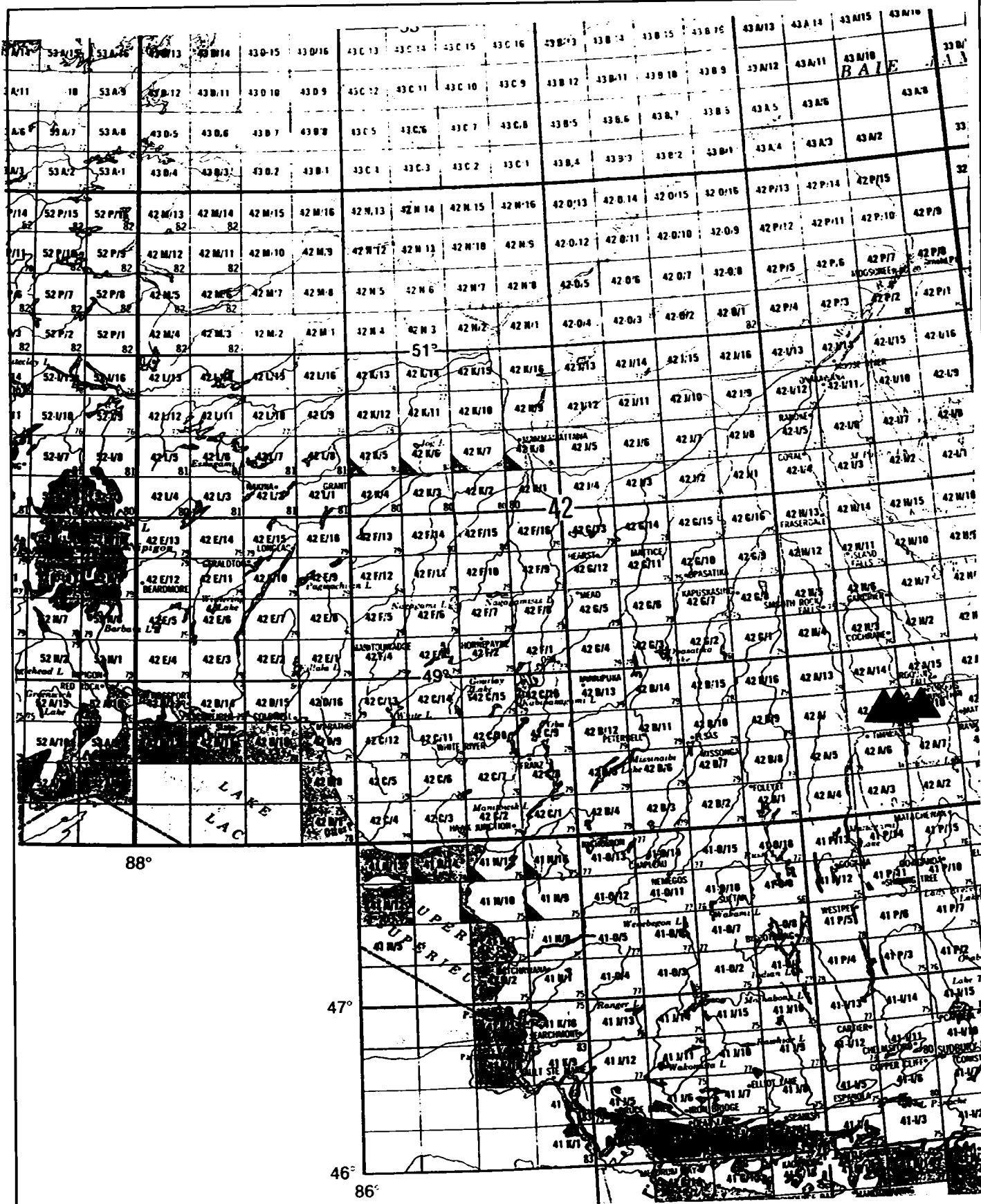


FIGURE 1. General Location



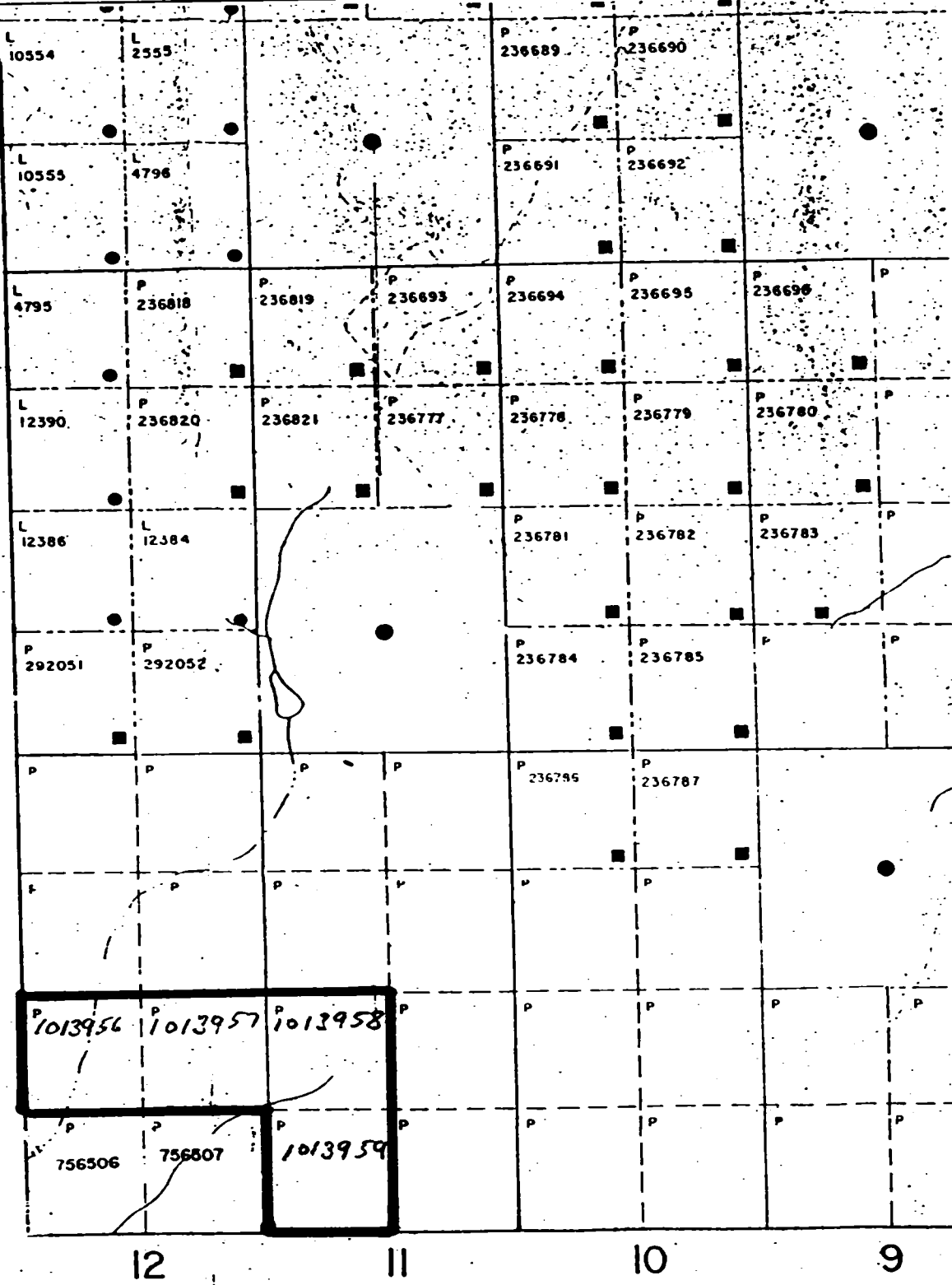


FIGURE 2A Claim Location Map
(exact locations not certified)



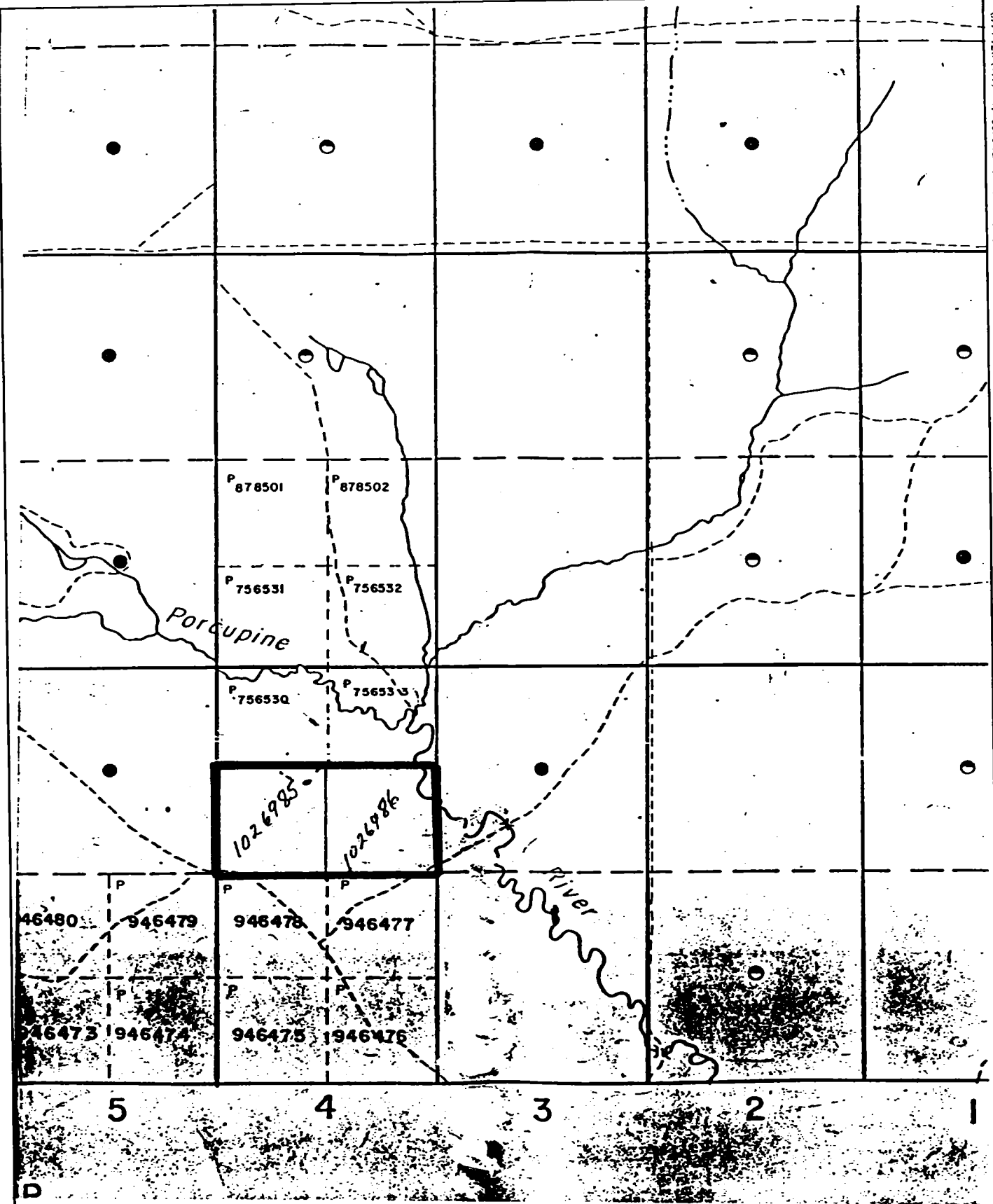


FIGURE 2B Claim Location Map
(exact locations not certified)



The latitude and longitude are 48 degrees 38 minutes, and 81 degrees 15 minutes respectively, and the N.T.S. reference is 42A/11.

The claim numbers are shown in figure 2 and listed below:

P.1026985-1026986 (2) Total of 2 claims

MATHESON AND EVELYN TOWNSHIPS PROPERTY

This property is located in the north centre of Matheson township and the south centre of Evelyn township in the Porcupine Mining Division of Ontario about 28 kilometres northeast of the town of Timmins. The property is approximately one half a kilometre west of a major road which connects to Highway 610 at the settlement of Dugwal.

The latitude and longitude are 48 degrees 38 minutes, and 81 degrees 02 minutes respectively, and the N.T.S. reference is 42A/11.

The claim numbers are shown in figure 2 and listed below:

| | | |
|---|---------------|----------------------------|
| P | 59050 | (1) |
| | 595101 | (1) |
| | 997231-997232 | (2) |
| | 997415-997416 | (2) Total of 6 claims |

3. GEOLOGY

Map References

1. Map 48N: Big Water Lake Area. scale 1:63,360. O.D.M. 1939.
2. Map P.308: Clergue Township. scale 1:15,840. O.D.M. 1965.
3. Map 2205: Timmins-Kirkland Lake, Geological Compilation Series. scale 1:253,440. O.D.M. 1973.

CLERGUE TOWNSHIP PROPERTY (A-739.1)

No outcrops have been mapped within the survey area. By extrapolation from drilled hole data to the northeast the area is thought to be underlain by andesitic and rhyolitic metavolcanics trending to the northeast. A peridotite-pyroxenite mafic intrusive occurs to the northwest and hosts asbestos mineralization. Regionally faults trend to the east, northeast and north-northwest.

WARK TOWNSHIP PROPERTY (A-739.2)

The geological maps do not show any outcrops within the survey area. Regional mapping suggests that the property is underlain predominantly by northeast trending greywacke and minor rhyolite.

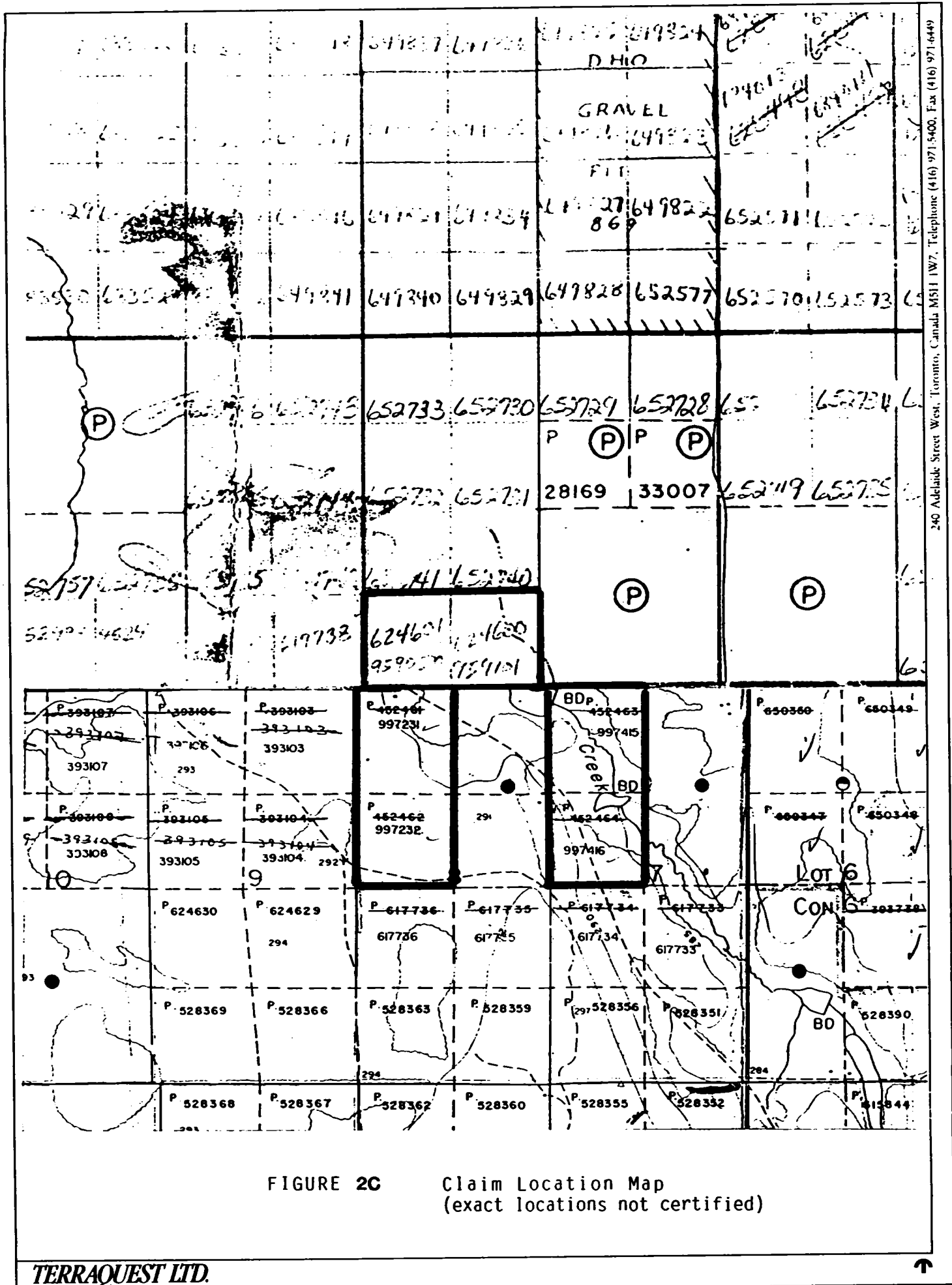


FIGURE 2C Claim Location Map
(exact locations not certified)

Gabbroic intrusives are common throughout the area. Regional structures trend to the northeast, north-northeast and northwest. Diabase dykes trend to the north-northwest.

MATHESON AND EVELYN TOWNSHIPS PROPERTY (A-739.3)

There are no outcrops indicated on the geological maps within this survey area. Regional geology indicates east trending greywackes and slate. The property lies on the centre of an east trending syncline. Locally faults trend to the northwest and diabase dykes trend to the north.

4. SURVEY SPECIFICATIONS

4.1 Instruments

The survey was carried out using a Cessna 182 aircraft, registration C-FAKK, which carries a magnetometer and a VLF electromagnetic detector.

The magnetometer is a proton precession type based on the Overhauser effect. The Overhauser effect allows for polarization of a proton rich liquid of the sensor by adding a "free radical" to it and irradiating it by RF magnetic field. Strong precession signals are generated with modest RF power. The sensor element is mounted in an extension of the right wing tip. It's specifications are as follows:

| | |
|---------------------|---|
| Resolution: | 0.5 gamma |
| Accuracy: | 0.5 gamma |
| Cycle time: | 0.5 second |
| Range: | 20,000 - 100,000 gammas in 23 overlapping steps |
| Gradient tolerance: | Up to 5000 gammas per metre |
| Model: | GSM-9BA |
| Manufacturer: | GEM Systems Inc., 105 Scarsdale Rd., Don Mills, Ontario, M3B 2R5 |

The VLF-EM unit uses three orthogonal detector coils to measure (a) the total field strength of the time-varying EM field and (b) the phase relationship between the vertical coil and both the "along line" coil (LINE) and the "cross-line" coil (ORTHO). The LINE coil is tuned to a transmitter station that is ideally positioned at right angles to the flight lines, while the ORTHO coil transmitter should be in line with the flight lines. It's specifications are:

| | |
|-------------------|--------------------------|
| Accuracy: | 1% |
| Reading interval: | 1/2 second |
| Model: | TOTEM 2A |
| Manufacturer: | Herz Industries, Toronto |

The VLF sensor is mounted in the left wing tip extension.

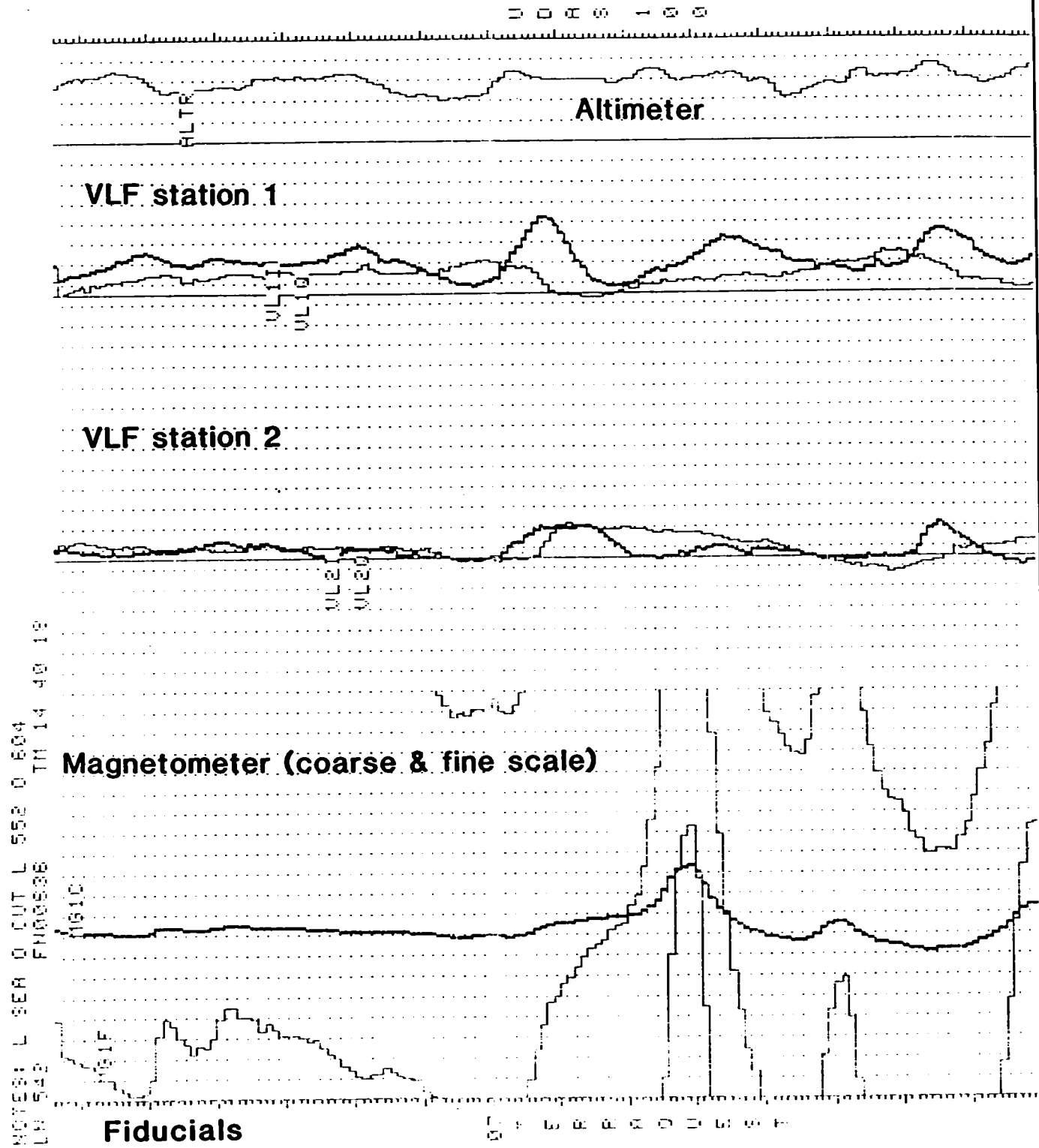


FIGURE 3. Sample of analogue data



Other instruments are:

- . King KRA-10A radar altimeter
- . PDAS-1100 data acquisition system with two 3.5" floppy disk drives manufactured by Picodas Group Inc., Richmond Hill, Ontario.
- . Geocam video camera and recorder for flight path recovery, manufactured by Geotech Ltd., Markham, Ontario.
- . PBAS-9000 portable field base station with a 3.5" floppy disk drive and an analog print out manufactured by Picodas Group Inc., Richmond Hill, Ontario, coupled with a GSM-8 proton magnetometer manufactured by Gem Systems Inc., Toronto, Ontario.

4.2 Lines and Data

- a) Line spacing: 100 metres
- b) Line direction: 000 degrees
- c) Terrain clearance: 100 metres
- d) Average ground speed: 156 km/hr.
- e) Data point interval:
 - Magnetic: 27 metres
 - VLF-EM: 27 metres
- f) Tie Line interval: 2 kilometres
- g) Channel 1 (LINE): NAA Cutler, 24.0 kHz
- h) Channel 2 (ORTHO): NSS Annapolis. 21.4 kHz
- i) Line km over total survey area including overrun: 40 line km
- j) Line km over claim groups: Clergue Township Property... 8 line km
Wark Township Property 4 line km
Matheson, Evelyn Property ..12 line km

4.3 Tolerances

- a) Line spacing: Any gaps wider than twice the line spacing and longer than 10 times the line spacing were filled in by a new line.
- b) Terrain clearance: Portions of line which were flown above 125 metres for more than one km were reflown if safety considerations were acceptable.
- c) Diurnal magnetic variation: Less than twenty gammas deviation from a smooth background over a period of two minutes or less as seen on the base station analogue record.
- d) Manoeuvre noise: Approximately +/-5 gammas.

4.4 Photomosaics

For navigating the aircraft and recovering the flight path, mosaics of aerial photographs were made from existing air photos.



5. DATA PROCESSING

Flight path recovery was carried out in the field using a video tape viewer to observe the flight path as recorded by the Geocam video camera system. The flight path recovery was completed daily to enable reflights to be selected where needed for the following day.

The magnetic data was levelled in the standard manner by tying survey lines to the tie lines. The IGRF has not been removed. The total field was contoured by computer using a program provided by Dataplotting Services Inc. To do this the final levelled data set is gridded at a grid cell spacing of 1/10th of an inch at map scale.

The vertical magnetic gradient is computed from the total field data using a method of transforming the data set into the frequency domain, applying a transfer function to calculate the gradient, and then transforming back into the spatial domain. The method is described by a number of authors including Grant, 1972 and Spector, 1968. The computer program for this purpose is provided by Paterson, Grant and Watson Ltd. of Toronto

The VLF data was treated automatically so as to normalize the non conductive background areas to 100 (total field strength) and zero (quadrature). The algorithms to do this were developed by Terraquest and will be provided to anyone interested by application to the company.

All of these dataprocessing calculations and map contouring were carried out by Dataplotting Services Inc. of Toronto.

- Grant, F.S. and Spector A., 1970: Statistical Models for Interpreting Aeromagnetic Data; Geophysics, Vol 35
- Grant, F.S., 1972: Review of Data Processing and Interpretation Methods in Gravity and Magnetics; Geophysics Vol 37-4
- Spector, A., 1968: Spectral Analysis of Aeromagnetic maps; unpublished thesis; University of Toronto

INTERPRETATION

6.1 General Approach

To satisfy the purpose of the survey as stated in the introduction, the interpretation procedure was carried out on both the magnetic and VLF data. On a local scale the magnetic gradient contour patterns were used to outline geological units which have different magnetic intensity and patterns or "signatures". Where possible these are related to existing geology to provide a geological identity to the units. On a regional scale the total field contour patterns were used in the same way.

Faults and shear zones are interpreted mainly from lateral displacements of otherwise linear magnetic anomalies but also from long narrow "lows". The direction of regional faulting in the general area is taken into account when selecting faults. Folding is usually seen as curved regional patterns. Alteration zones can show up as anomalously quiet areas, often adjacent to strong, circular anomalies that represent intrusives. Magnetic anomalies that are caused by iron deposits of ore quality are usually obvious owing to their high amplitude, often in tens of thousands of gammas.

VLF anomalies are categorized according to whether the phase response is normal, reverse, or no phase at all. The significance of the differing phase responses is not completely understood although in general reverse phase indicates either overburden as the source or a conductor with considerable depth extent, or both. Normal phase response is theoretically caused by surface conductors with limited depth extent.

Areas showing a smooth response somewhat above background (ie. 110 or so) are likely caused by overburden which is thick enough and conductive enough to saturate at these frequencies. In this case no response from bedrock is seen.

The VLF-EM conductor axes have been identified and evaluated according to the Terraquest classification system (Figure 4). This system correlates the nature and orientation of the conductor axes with stratigraphic, structural and topographic features to obtain an association from which one or more origins may be selected. Alternate associations are indicated in parentheses.

6.2 Interpretation

The magnetic and VLF-EM data are shown in contoured format on maps in the back pocket. An interpretation map is also provided. The following notes are intended to supplement these maps.

FIGURE 4

TERRAQUEST CLASSIFICATION OF VLF-EM CONDUCTOR AXES

| <u>SYMBOL</u> | <u>CORRELATION</u> | <u>ASSOCIATION: Possible Origins</u> |
|------------------|--|---|
| a , A | Coincident with magnetic stratigraphy | Bedrock magnetic horizons: stratabound mineralogic origin or shear zone |
| b , B | Parallel to magnetic stratigraphy | Bedrock non-magnetic horizons: stratabound mineralogic origin or shear zone |
| c , C | No correlation with magnetic stratigraphy | Association not known: possible small scale stratabound mineralogic origin, fault or shear zone, overburden |
| d , D | Coincident with magnetic dyke | Dyke or possible fault: mineralogic or electrolytic |
| f , F | Coincident with topographic lineament or parallel to fault system | Fault zone: mineralogic or electrolytic |
| ob , OB | Contours of total field response conform to topographic depression | Most likely overburden: clayey sediments, swampy mud |
| cul , CUL | Coincident with cultural sources | Electrical, pipe or railway lines |

NOTES

- 1 - Upper case symbols denote a relatively strong total field strength
- 2 - Underlined symbols denote a relatively strong quadrature response
- 3 - Mineralogic origins include sulphides, graphite, and in fault zones, gouge
- 4 - Electrolytic origins imply conductivity related to porosity or high moisture content

CLERGUE TOWNSHIP PROPERTY (A-739.1)

The total magnetic field over the Clergue township property has a relief of approximately 1,125 gammas and shows a strong magnetic anomaly trending to the northeast in the northwest corner of the survey area. This anomaly appears to dominate and overwhelm the responses from the rest of the survey area. The vertical magnetic gradient improves the resolution of the strong anomaly and enhances a weak magnetic trend to the south.

The strong anomalies to the northwest correlate well with the peridotite-pyroxenite intrusives (Unit 6). The remaining responses are interpreted to be derived from the andesitic and rhyolitic rocks (Unit 2). Horizons with a slight increase in magnetic activity (Unit 2m) are probably related to the andesitic or more mafic compositions.

Several northwest trending faults have been interpreted from displacements in the magnetic data. These possess the same orientation as a geologically mapped fault approximately two kilometres to the east of the survey area.

The VLF-EM survey shows very flat and uniform responses, probably a function of masking or saturation by wide spread conductive overburden. Three very weak to moderate strength conductor axes have been identified, all of them are associated with magnetically interpreted faults.

WARK TOWNSHIP PROPERTY (A-739.2)

The total magnetic field has a relief of approximately 40 gammas and shows a magnetic anomaly along the western edge of the survey and several weak anomalies trending to the northwest across the centre of the property. The vertical magnetic gradient data show greater continuity within the weaker magnetic anomalies.

The strongest anomaly to the west which is only approximately 30 gammas in relief, is interpreted to be derived from the rhyolitic metavolcanics (Unit 2). The quiet magnetic background is associated with the greywacke (Unit 5). The weak northwest trending anomalies cross-cut the regional trend and therefore are interpreted as diabase dykes (Unit 11).

Several northeast trending faults have been interpreted from disruptions in the east magnetic trends. Any faults trending to the northwest would be difficult to detect as they would parallel the diabasic magnetic units.

The VLF-EM survey shows relatively flat and uniform responses, probably due to masking by conductive overburden. One moderately strong conductor axis south of the property trends to the northwest and is interpreted to be associated with structural sources.

MATHESON AND EVELYN TOWNSHIPS PROPERTY (A-739.3)

The total magnetic field has a relief of approximately 37 gammas, the higher responses are located to the north and south of the property. Very weak magnetic units trend to the northwest across the property. The vertical magnetic gradient data shows improved resolution of all the anomalies.

The low magnetic relief across the survey area is consistent with the regionally mapped greywacke (Unit 5). The weak magnetic trends (Unit 5m) are probably related to minor metavolcanic intercalations or possibly to increased concentrations of magnetic minerals such as pyrrhotite or magnetite.

Numerous northeast trending faults have been interpreted from the magnetic data, showing considerable displacement. Northwest trending faults would be difficult to detect by magnetic techniques.

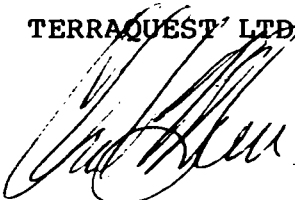
The VLF-EM survey shows very weak and flat responses, probably related to extensive conductive overburden. There are no significant conductor axes indicated by this survey. Three very weak and poorly defined conductor axes are shown tentatively on the interpretation map. They may be associated either with structural or stratigraphic origins. These should be verified on the ground using EM or IP methods.

7. SUMMARY

An airborne combined magnetic and VLF-EM survey has been done on the property at line intervals of 100 metres. The total field and vertical gradient magnetic data, VLF-EM data and interpretation maps are produced at a scale of 1:10,000.

The magnetic data has been used to modify and update the existing geology and has shown a number of new contacts and faults. A number of VLF-EM conductor axes were found of which most are associated with structural origins.

TERRAQUEST LTD.



Charles Q. Barrie, M.Sc.
Geologist



210908
P

AN ADDENDUM TO REPORT A-739 AIRBORNE VLF/EM SURVEY

COMPUTED VERTICAL GRADIENT OF TOTAL FIELD
(IN-PHASE)

CLERGUE TOWNSHIP, WARK TOWNSHIP, MATHESON AND EVELYN TOWNSHIP

PORCUPINE MINING DIVISION, ONTARIO

RECEIVED

MAR 28 1988

MINING DIVISION

for

MR. A.J. SALO

by

TERRAQUEST LTD.
Toronto, Canada

March 28, 1988

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| A-739.2-5 | Colour Plot of Computed Vertical Gradient of Total Field, Wark Township |
| A-739.3-5 | Colour Plot of Computed Vertical Gradient of Total Field, Matheson/Evelyn Townships |
| A-739.1-6 | Interpretation of Enhanced VLF/EM Data, Clergue Township |
| A-739.2-6 | Interpretation of Enhanced VLF/EM Data, Wark Township |
| A-739.3-6 | Interpretation of Enhanced VLF/EM Data, Matheson and Evelyn Townships |

INTRODUCTION

The calculated vertical gradient of the total field VLF/EM data is an innovative application and is created by applying the same process as is used on the magnetic data. The calculation removes broad regional anomalies and leaves the short wavelength part of anomalies. Some advantages of treating the data this way are:

- 1) Improved resolution between strong conductors that on the unprocessed VLF/EM data appear as a large conductive area.
- 2) Enhancement of subtle conductor axes, revealing conductors that were too weak to be seen on the unprocessed data.
- 3) Reduces the necessity of the VLF/EM conductor to have optimum coupling with the transmitter.
- 4) The increase in the number of conductors improves the detection of faults and other displacement "structures".

The enhanced data is shown on colour plots, one for each property. An interpretation of each area is provided on drafting mylar and can be superimposed on the interpretation maps from the original report (A-739).

INTERPRETATION

In general, the vertical gradient enhancement of the VLF over all three properties shows a considerable increase in the number of conductor axes. It should be noted that the unprocessed VLF/EM data maps show very little relief in conductivity and therefore it is difficult to ascertain whether the enhancements are a mathematical artifact or a bonafide enhancement of weak conductors within the bedrock or overburden. Furthermore, the interpretation maps are highly subjective, several variations are possible.

The data over the Clergue Township property shows numerous southeast trending conductor axes, parallel to the magnetically interpreted faults. Displacement of these trends suggests the presence of several north to northeast trending faults.

The enhancement of the VLF/EM data from Wark Township property shows several southeast trending faults. These are parallel to both the magnetic units and the topographic features. It is suspected that they are related to structural sources. Several northeast trending structures have also been interpreted.

The calculated vertical gradient of the total field VLF from the Matheson and Evelyn Townships property shows numerous conductor axes with a wide variety of orientations. Note that the original unprocessed VLF data map shows very weak responses that do not correlate very well with the magnetic data. It is suspected that most of these responses are related to a combination of overburden and bedrock sources and hence are very difficult to interpret. Most of the responses are so short that it is difficult to obtain a definitive orientation. This interpretation shows a variety of orientations with numerous faults trending to the northwest.



DOCUMENT NO. 8808



8806-039

Mini

42A11NE8828 2.10988 CLERGUE

900

Type of Survey: Airborne Magnetic + ...

Claim Holder(s): ARVO JOHN SALO Prospector's Licence No. A-46680

Address: GENERAL DELIVERY - PRINCE GEORGE B.C. V2L 4R8

Survey Company: Terraquest Ltd. Date of Survey (from & to): 2 2 88 to 2 2 88 Total Miles of line Cut: _____

Name and Address of Author (of Geo-Technical report): C. Q. Barrie 240 Adelaide St W. Toronto, ONT.

Credits Requested per Each Claim in Columns at right

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

Mining Claims Traversed (List in numerical sequence)

| Prefix | Mining Claim Number | Expend. Days Cr. | Prefix | Mining Claim Number | Expend. Days Cr. |
|--------|---------------------|------------------|--------|---------------------|------------------|
| P | 997415 | 80 | | | |
| | 997416 | 80 | | | |
| | 997231 | 80 | | | |
| | 997232 | 80 | | | |

RECEIVED
MAR 14 1988

MINING LANDS SECTION

ONTARIO GEOLOGICAL SURVEY
ASSESSMENT FILES
OFFICE
MAY 19 1988
RECEIVED

RECORDED
MAR 03 1988

Total number of mining claims covered by this report of work. 4

Expenditures (excludes power stripping)

Type of Work Performed: _____

Performed on: MAR 3 1988

Calculation of Expenditure Days Credits: 5 ÷ 15 = _____

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.

Date: FEB 16/88 Recorded Holder or Agent (Signature): [Signature]

For Office Use Only

Total Days Cr. Recorded: 320 Date Recorded: Mar. 3 1988 Mining Record: [Signature]

Date Approved as Recorded: 9 May 88 Branch Director: [Signature]

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: TERRA QUEST LTD - C Q BARRIE

Date Certified: _____ Certified by (Signature): [Signature]



Ministry of Northern Development and DOCUMENT No.

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

AULF
AMAG

- Instructions: - Please type or print.
- If number of mining claims traversed exceeds space on this form, attach a list.
Note: - Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
- Do not use shaded areas below.

8806-044

2-10908 Mining Act

| | |
|---|---|
| Type of Survey(s) Airborne Magnetic + ULF-EM | Township or Area Clergue Twp |
| Claim Holder(s) ARVO JOHN SALO | Inspector's Licence No. A46680 |
| Address GENERAL DELIVERY - PRINCE GEORGE B.C. VAL4R8 | |
| Survey Company Terraquest Ltd. | Date of Survey (from & to) Day Mo. Yr. Day Mo. Yr. 2 2 88 2 2 88 |
| Name and Address of Author (of Geo-Technical report) C.B. Barrie 240 Adelaide St W Toronto, ONT | |

Credits Requested per Each Claim in Columns at right

Mining Claims Traversed (List in numerical sequence)

| Special Provisions | Geophysical | Days per Claim |
|---|-------------------|----------------|
| For first survey: Enter 40 days. (This includes line cutting) | - Electromagnetic | |
| | - Magnetometer | |
| For each additional survey: using the same grid: Enter 20 days (for each) | - Radiometric | |
| | - Other | |
| | Geological | |
| | Geochemical | |

| Man Days | Geophysical | Days per Claim |
|--|-------------------|----------------|
| Complete reverse side and enter details here | - Electromagnetic | |
| | - Magnetometer | |
| | - Radiometric | |
| | Geological | |
| | Geochemical | |

| Airborne Credits | Electromagnetic | Days per Claim |
|--|-----------------|----------------|
| Note: Special provisions credits do not apply to Airborne Surveys. | | 70 |
| | Magnetometer | 40 |
| | Radiometric | |

| Mining Claim | | Expend. Days Cr. | Mining Claim | | Expend. Days Cr. |
|--------------|---------|------------------|--------------|--------|------------------|
| Prefix | Number | | Prefix | Number | |
| P | 1013956 | 80 | | | |
| | 1013957 | 80 | | | |
| | 1013958 | 80 | | | |
| | 1013959 | 80 | | | |

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MAR 23 1988
MINING LANDS SECTION

RECORDED
MAR - 3 1988

Expenditures (excludes power stripping)

Type of Work performed

Performed on Claim(s)
MAR 3 1988

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. **4**

For Office Use Only

Total Days Cr. Date Recorded **320** Mining Registrar **Mar 3/88**

Date Approved as Recorded **9 May 88** Branch Director **OK. W. Coen**

Date **FEB 16/88** Recorder/Inspector Signature **[Signature]**

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
TERRAQUEST LTD - C.B. BARRIE