ELECTROMAGNETIC SURVEY

for

MOUNT JAMIE MINES LIMITED

on the property of

E. J. JUTILA

Godfrey and Jamieson Townships

Porcupine Mining Division, Ontario

by

Shield Geophysics Limited

Timmins, Ontario,

June 30, 1969.

P. T. George, M.G.A.C.,

Consulting Geologist.

INTRODUCTION

A vertical loop electromagnetic survey was carried out on the property of E. J. Jutila in Godfrey and Jamieson Townships by Shield Geophysics Limited.

On the basis of this survey, it has been recommended that Mount Jamie Mines Limited do a detailed vertical loop survey to check out the conductors indicated on Map 1 (in pocket).

LOCATION AND ACCESS

The property is located in Lots 3, 4, 5 and 6, Concession I of Jamieson Township and Lots 4 and 5, Concession VI of Godfrey Township (See Key Map, in pocket). Access to the property is via Highway 576 to Lot 7, Concession V of Godfrey Township then via bush roads to the property.

The following 30 mining claims were surveyed: P59800, P59801, P59804, P95172 to P95181 inclusive, and P96482 to P96498 inclusive.

RESULTS OF THE ELECTROMAGNETIC SURVEY

The survey was done using a Crone Vertical Loop Electromagnetic Instrument. Pertinent instrument data is presented in Appendix I.

The results of the survey are presented on the maps enclosed in the map pocket at the back of the report.

A number of weak to moderate anomalies were detected by the survey. The conductor axes are indicated on the enclosed map.

In addition to the conductors indicated on the map, it would appear that a conductor may exist in the Baseline B, Lines 48, 52 and 56N area near the baseline. A similar condition may exist in the Baseline A, Lines 56 and 60N area.

CONCLUSIONS AND RECOMMENDATIONS

The survey has outlined a number of possible conductors. It is recommended that all of the conductors be checked by locating the vertical loop transmitter on the conductor and running detailed surveys in the area of each conductor.

Respectfully submitted,
SHIELD GEOPHYSICS LIMITED

P. T. George

Peter T. George,
Consulting Geologist.

Timmins, Ontario,
June 30, 1969.

C E R T I F I C A T E

I, Peter T. George, residing at 153 Toke Street, Timmins, Ontario, a consulting geologist with office at 26 Pine Street South, Timmins, Ontario, do hereby certify that:

I attended Queen's University, Kingston, Ontario, and graduated with an Honours B.Sc. degree in Geological Sciences in 1964 and I have completed two years of post graduate studies at Queen's University, Kingston, Ontario.

I am a Member of the Geological Association of Canada and a Member of the Canadian Institute of Mining and Metallurgy.

I have no interest either directly or indirectly in the shares or securities of Mount Jamie Mines Limited.

P. T. George

Timmins, Ontario,
June 30, 1969.

P. T. George, M.G.A.C.,
Consulting Geologist.

APPENDIX

SURVEY METHOD AND INSTRUMENT DATA

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, anomalously 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 of 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.

A Crone VEM electromagnetic survey was used in this survey. The unit consists of a virtually mounted, battery powered transmitting coil operating at frequencies of 1800 and 480 cps. and a receiving coil tuned to the transmitting frequency, 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 platen 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 receiving coil in the plane of the magnetic field by rotating the coil about a vertical axis until a null or minimum single is obtained, and then rotating the coil about a horizontal axis until a null or minimum single 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 "crossover" 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 "crossover" to "crossover".

<u>Specifications</u>

<u>Operating Frequencies</u>: 480 and 1800 cycles per second

Maximum Range: Up to 2000 foot separation between transmitter and receiver on high power for a ±7° null width at both 480 and 1800 cps.

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

Transmitter Power Supply: Rechargeable NiCad battery mounted on a packboard.

Weights:

Packboard mounted batteries	44 lbs.
Transmitter coil	16 lbs.
Transmitter mast	6 lbs.
Transmitter control box	8 lbs.
Receiver	13 lbs.

ELECTROMAGNETIC SURVEY

for

MOUNT JAMIE MINES LIMITED

on the E. J. Jutila Property

APPENDIX II

GENERAL

A total of 21.1 days of detailed electromagnetic survey work was carried out on the Jutila property, Godfrey and Jamieson Townships. Appendix I describes the Crone VEM unit used for the survey.

DETAILED ELECTROMAGNETIC SURVEY

Of the conductors located by the detailed electromagnetic survey, two, namely "A" and "B", show good characteristics and the balance, including "C" and "D", are weak. The conductors are described as follows:

Conductor "A" - This conductor, located in the northwest sector of the property, is approximately 2000 feet long. The conductivity is strong with excellent ratios between high and low frequencies. Depth to maximum intensity of conductivity is substantial since the best profiles occur with a coil spacing of 800 feet or better. This probably indicates deep overburden conditions. The shape of the profiles indicate a near vertical conductive zone.

According to P. T. George, B.Sc., March 1, 1969, the zone of conductivity is underlain by undifferentiated folded felsic and mafic rocks. The conductor axis almost coincides with the probable fold axis of the rocks which strikes north-northwest.

Conductor "B" - At least 2800 feet long, this conductor, located near the west boundary of the property, displays moderate to weak conductivity. Depth of overburden appears to be moderate while the profiles indicate a near vertical zone of conductivity.

The weak to moderate conductivity displayed along the south portion of the conductive zone coincides approximately with the west contact of a diabase dyke (P. T. George, March 1, 1969). The conductivity is probably caused by shearing or faulting along the contact of the diabase.

The north portion of the conductive zone where the conductivity is of moderate strength, with good ratios between the high and low frequencies, coincides in part with a north-northwest fault through undifferentiated felsic volcanics.

That portion of the conductor between the north-northwest trending fault, Line 66 North, and the west contact of the diabase dyke, Line 58 North, displays the strongest conductivity and most favourable geological environment to the deposition of sulphides.

Conductor "C" - At least 1200 feet long, this conductor displays weak conductivity with generally poor ratios between high and low frequencies. The best profile is present on Line 20 East, at the base line.

This crossover coincides with the nose of an area of undifferentiated mafic volcanics just north of a west-northwest trending fault (P. T. George, March 1, 1969). Although the conductivity is weak, because of the associated geological environment, some further investigation of Conductor "C" is merited.

Conductor "D" - This conductor approximately 1200 feet long, located in the northwest sector of the property, is weak and seemingly discontinuous.

A few other weak conductors have been located on the property. These, however, in addition to having poor ratios of high to low frequencies, are generally confined to one line crossovers. Moreover, the conductor axes coincide with diabase dyke contacts or faults according to the interpretation of George, March 1, 1969.

CONCLUSIONS

Three conductors, designated "A", "B", and "C" on the accompanying plan, merit further investigation to determine whether or not they are caused by sulphides. Conductor "A" is most important and Conductor "C" is least important in terms of priority of investigation as based on the characteristics of conductivity and geological environment.

RECOMMENDATIONS

A minimum 1000 feet of diamond drilling is recommended to investigate Conductors "A" and "B". It is tentatively proposed that an additional 400 feet of drilling be allocated for Conductor "C" dependent upon the initial results of drilling.

A schedule for the drilling is as follows:

Hole No.	Location	Direction	Dip	Depth
69-1	Line 64 N S. 19+50 E	Northeast (grid)	50°	500'
69-2	Line 62 N S. 4+00 W	Northeast (grid)	50°	500'
69-3 (tentative)	Line 20 E S. 2+00 N	South (grid)	50°	400'

The dip of Conductors "A" and "B" might be more accurately ascertained by one line surveys using the Crone JEM unit and may indicate that one or both of the conductors might be more effectively investigated by drilling from the opposite direction.

The cost including assaying and supervision for a minimum 1000 feet of drilling is estimated at $10,000. Encouraging results would, of course, require that additional drilling be done, including 69-3.

Respectfully submitted,

SHIELD GEOPHYSICS LIMITED,

R. J. Bradshaw,

Consulting Geologist.

Timmins, Ontario,

July 15, 1969.

Ask Poulsen to
get copies of maps
re Geophysical Surv

020

MAGNETOMETER SURVEY

for

NORLAND GRUBSTAKERS

on the property of

E. J. JUTILA

Godfrey and Jamieson Townships

Porcupine Mining Division, Ontario

by

P. T. George

Shield Geophysics Limited

Timmins, Ontario. March 1, 1969.

INTRODUCTION

A magnetometer survey was undertaken for Norland Grubstakers on the property of E. J. Jutila, in Godfrey and Jamieson Townships, by Shield Geophysics Limited during January, 1969.

On the basis of the magnetometer results, it has been recommended that Norland Grubstakers do a vertical loop electromagnetic survey on the property.

LOCATION AND ACCESS

The property is located in lots 3, 4, 5 and 6, concession I of Jamieson Township and lots 4 and 5, concession VI of Godfrey Township (see Magnetic Map, in pocket). Access to the property is via Highway 576 to lot 7, concession V of Godfrey Township then via bush roads to the property.

The following 30 mining claims were surveyed: P59800, P59801, P59804, P95172 to P95181 inclusive, and P96482 to P96498 inclusive.

MAGNETOMETER SURVEY

Base stations for the correction of diurnal variation during the magnetometer survey were established at 100 foot intervals on both baselines on the property using an Askania torsion bar magnetometer. The baselines were tied into one another as well as to the Ontario Department of Mines magnetic base station established in 1966 on the east bank of the Mattagami River on the Jamieson-Godfrey boundary by R. Middleton. The O.D.M. station was arbitrarily assigned a value of 1000 gammas.

The survey was done using a Sharpe M.F.-1 fluxgate magnetometer. A total of 2371 stations were established. Instrument data is presented in Appendix I.

RESULTS OF THE MAGNETIC SURVEY

The results of the magnetic survey are presented on the map enclosed in the map pocket at the back of the report.

The following outcrops occur on the property:

(1) Line 2E at 24S - mafic volcanic rocks

(2) Line 68N at 15W - felsic volcanic rocks

(3) The northwest corner of the property contains exposures of felsic volcanics.

The outcrops were not seen by the author. The rock types are based on the observations of R. Middleton of the O.D.M.

On the basis of the magnetic data it has been inferred that the property is underlain by felsic volcanic rocks containing a 500 to 1500 foot thick sequence of mafic volcanics. The volcanics have been folded and faulted and intruded by a series of north to northwest striking diabase dikes. On the basis of the dipole effect in the magnetic data, it would appear that the dike on the west side of the property dips to the east.

The complex magnetically anomalous zone in the central part of the property has been interpreted as being due to mafic volcanics, possibly containing some pyrrhotite or magnetite concentrations, the complexity of the pattern being due to faulting. Some of the anomalous values may be due to gabbroic intrusives; however, this interpretation is not favoured by the writer.

The geological interpretation is presented on the magnetic map (in pocket).

The faulting on the property has probably occurred over an extended period of time and is probably related to the major Mattagami River fault system that strikes in a northerly direction approximately along the east boundary of the property.

Some of the faults predate the diabase as diabase dikes now occupy the fault zones whereas other of the faults appear to be younger than the diabase and offset the dikes.

CONCLUSIONS

On the basis of the magnetic data, a geological interpretation has been presented that would indicate a complex geologic environment.

As the property is located within 1½ to 3 miles of three base metal mines (Kam Kotia, Jameland and Canadian Jamieson) and lies within the same general sequence of volcanic strata it merits considerable further exploration.

RECOMMENDATIONS

The following programme is recommended for the property:

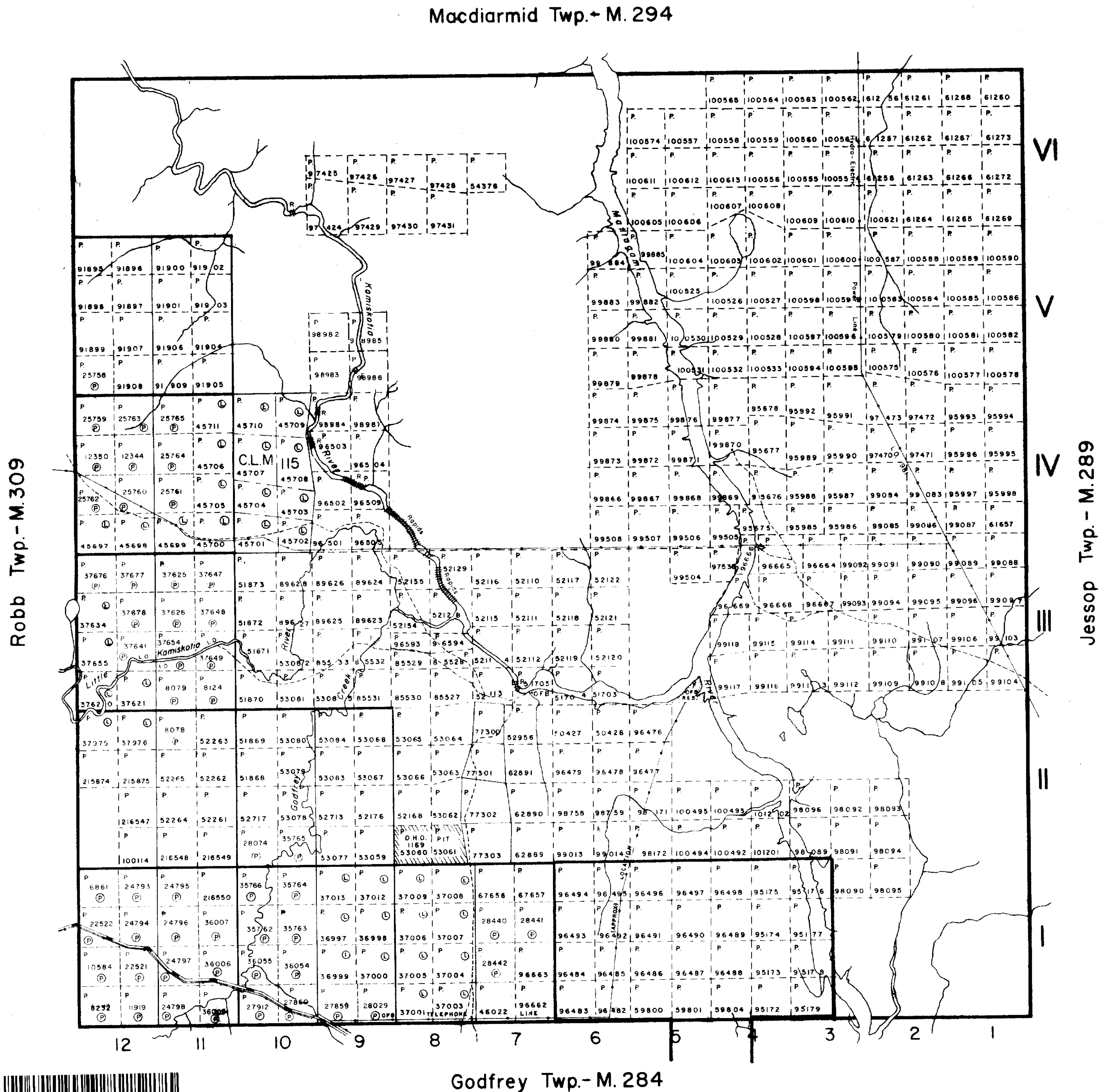
Vertical loop EM survey (Crone) - 32 mi. @ $120/mile .	$3840.00
Detailed work @ $150/day - estimated	1000.00
	$4840.00

Recommendations regarding diamond drill targets will be based on the results of the programme recommended above.

Yours truly,

SHIELD GEOPHYSICS LIMITED,

Peter T. George,
Consulting Geologist.



THE TOWNSHIP
OF

JAMIESON

DISTRICT OF
COCHRANE

PORCUPINE
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

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

NOTES

400' Surface Rights Reservation around all lakes and rivers.

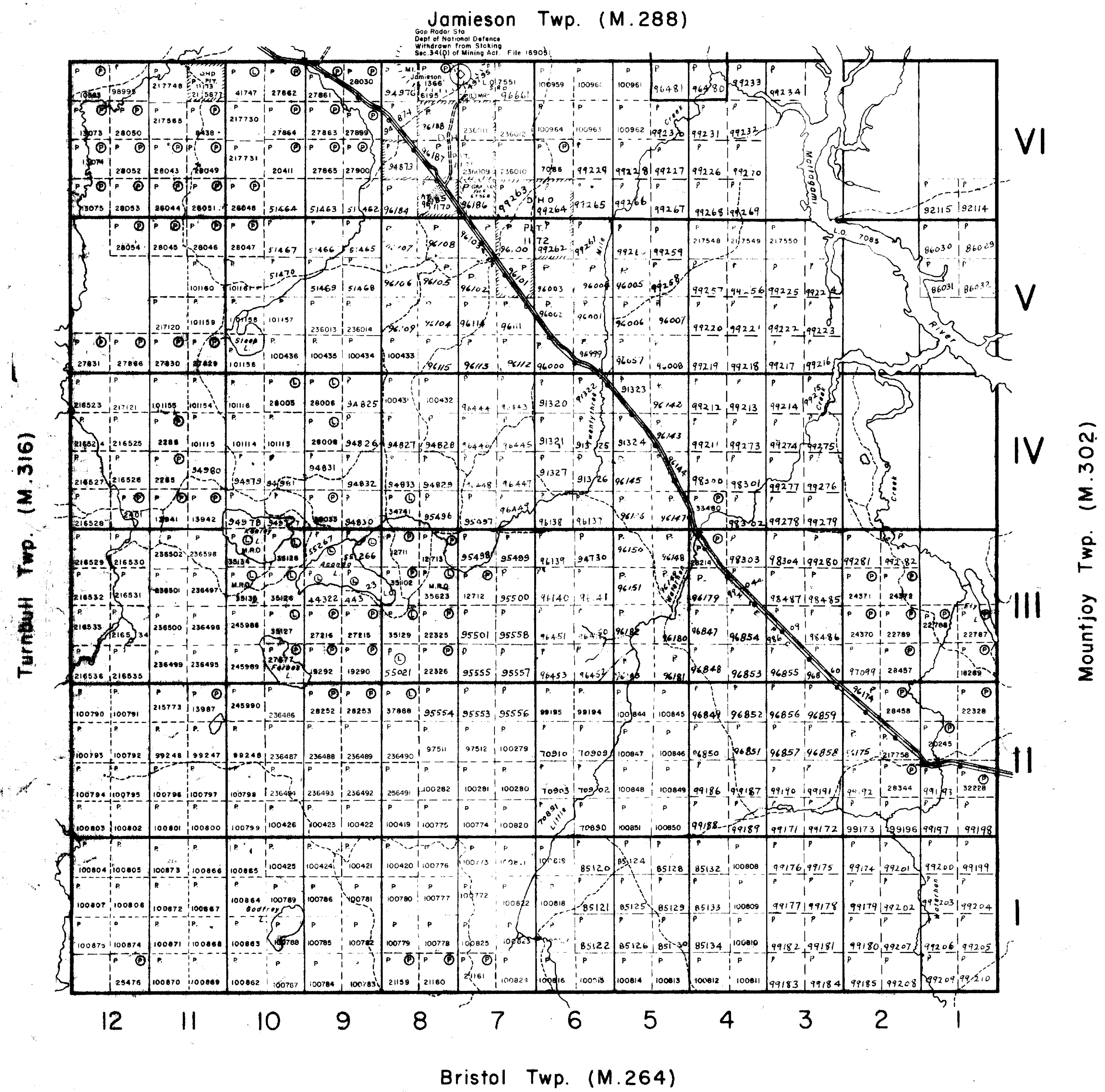
Flooding rights to areas along Mattagami River to H.E.P.C. - L.O. 7085

PLAN NO.- **M.288**

DEPARTMENT OF MINES
— ONTARIO —

42A11SW0103 63.2453 JAMIESON

200



THE TOWNSHIP
OF

GODFREY

DISTRICT OF
COCHRANE

PORCUPINE
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

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

NOTES

400' surface rights reservation around all lakes and rivers.

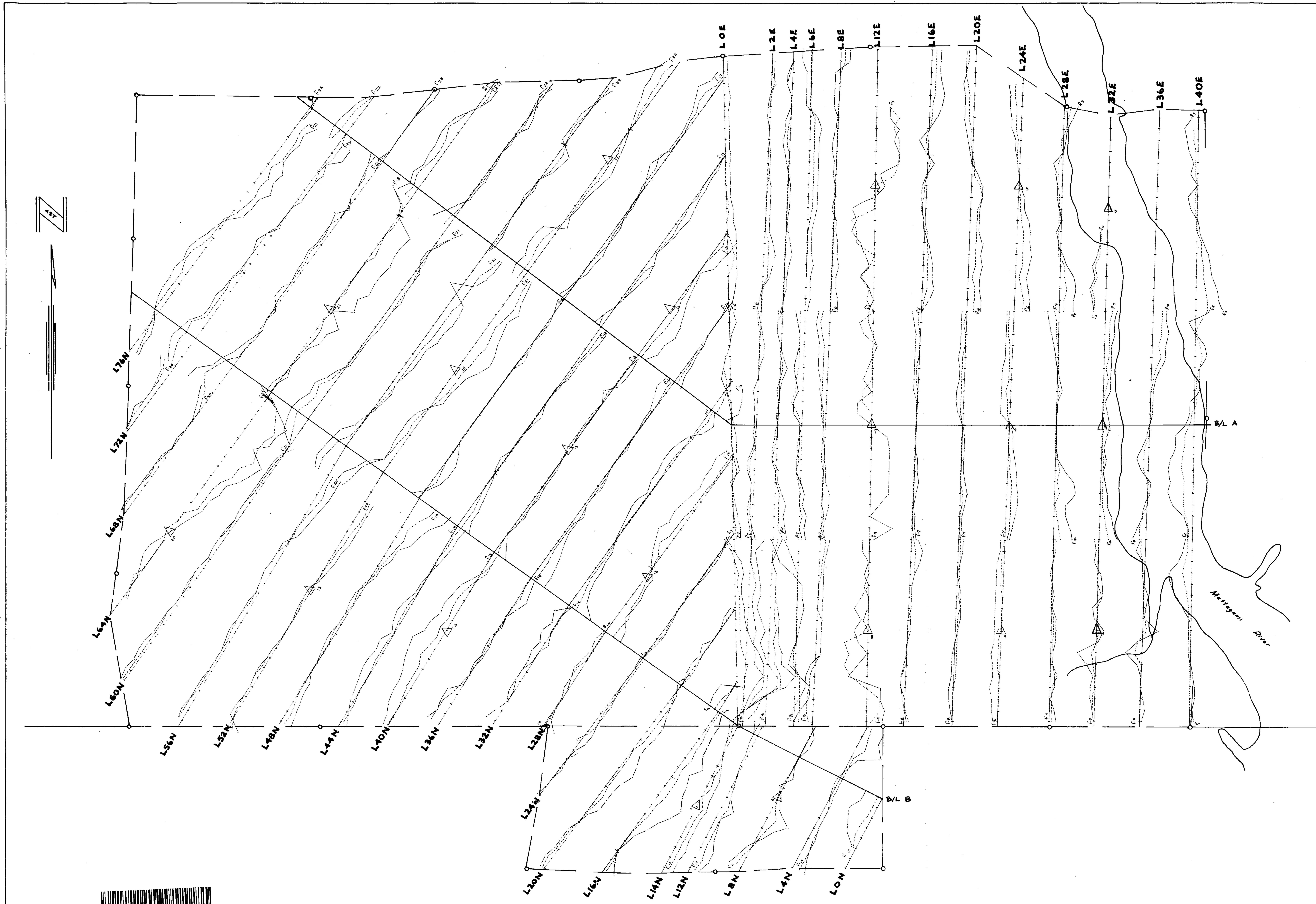
Flooding rights on either side of the Mattagami to H.E.P.C.

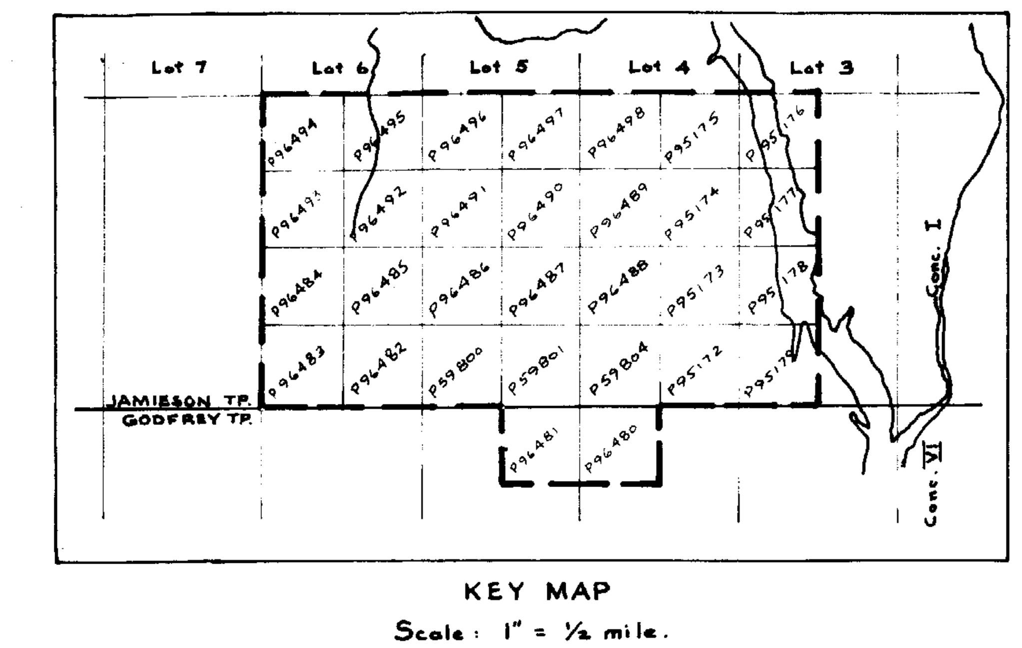
PLAN NO. M.284

DEPARTMENT OF MINES
— ONTARIO —

42A11SW0103 63.2453 JAMIESON

210





KEY MAP
Scale: 1" = ¼ mile.

SYMBOLS

Measurement station along picket line.

Profile scale: 1" = 20°

1800 cps.

480 cps.

Δ_2 Transmitter location

o Claim post.

Conductor axis.

INSTRUMENT: Crone VEM unit; 1800 & 480 cps.

ELECTROMAGNETIC SURVEY

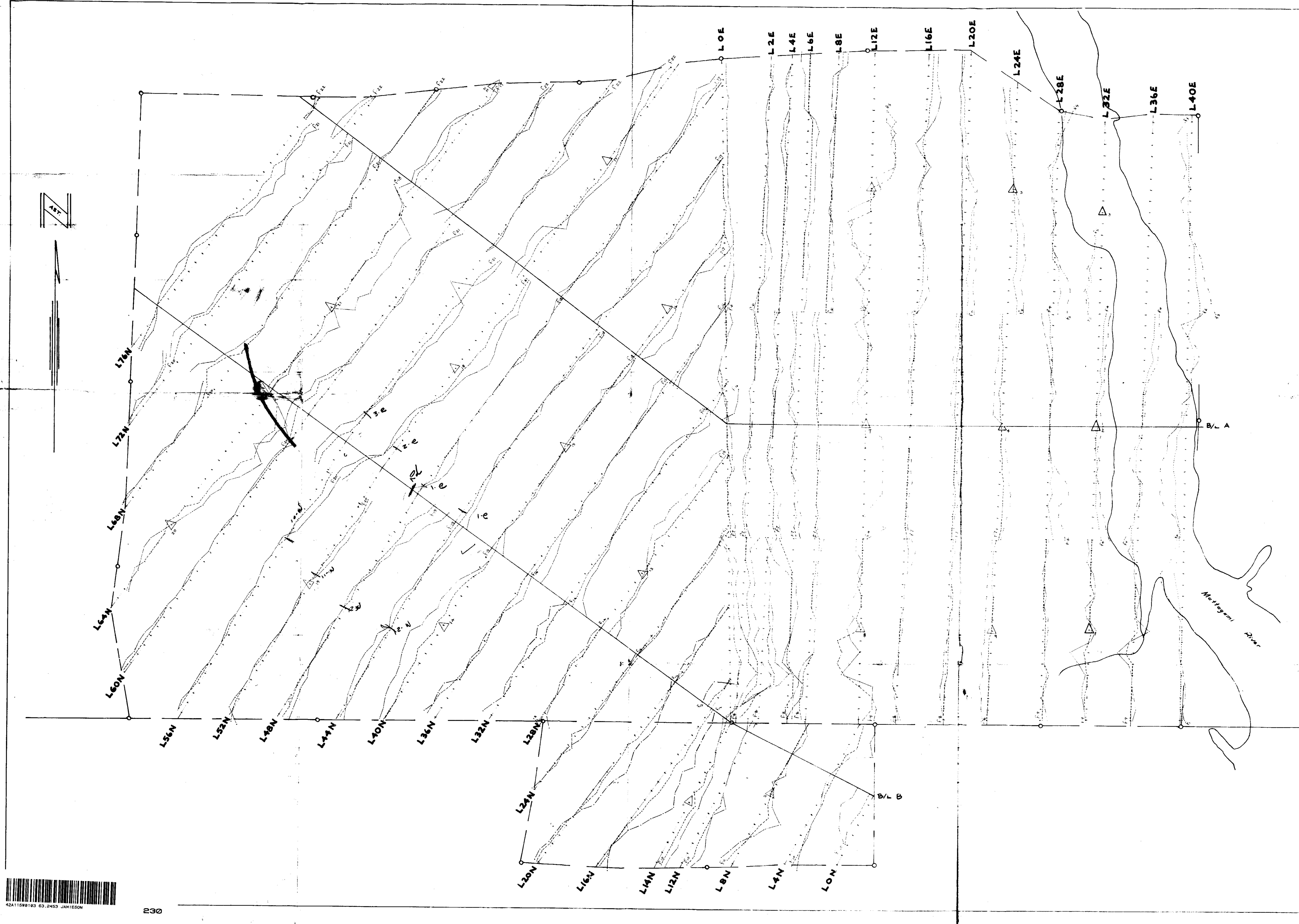
ON THE PROPERTY OF
E. J. JUTILA
JAMIESON AND GODFREY TWP'S.
PORCUPINE MINING DIV.
BY

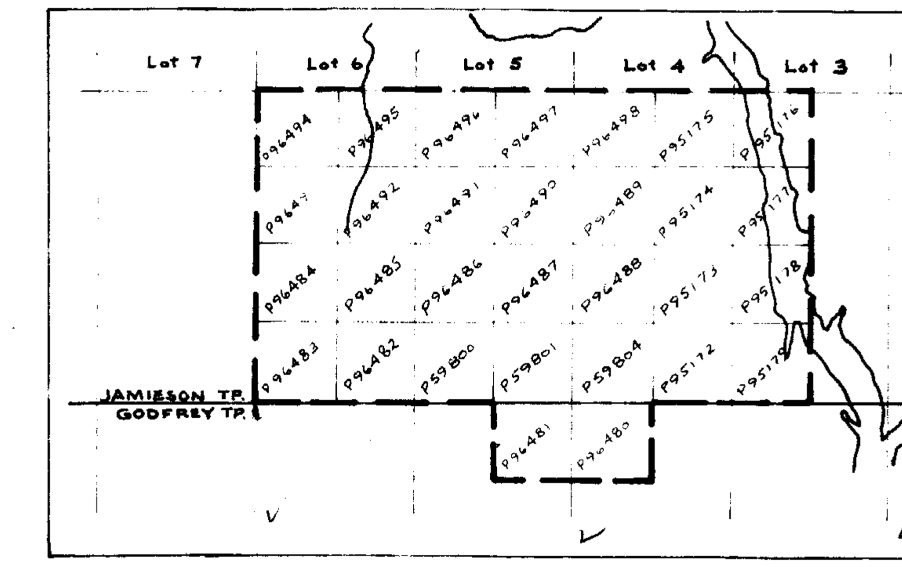
SHIELD GEOPHYSICS LIMITED
FOR
MOUNT JAMIE MINES LIMITED

MARCH 1969

SCALE
0 400 800 1200 1600
FEET

220





KEY MAP
Scale: 1" = ½ mile.

SYMBOLS

Measurement station along picket line.

Profile scale: 1" = 20°

1800 cps.

480 cps.

Δ_2 Transmitter location

o Claim post.

Conductor axis.

INSTRUMENT: Crone VEM unit; 1800 & 480 cps.

ELECTROMAGNETIC SURVEY

ON THE PROPERTY OF
E. J. JUTILA
JAMIESON AND GODFREY TWP'S.
PORCUPINE MINING DIV.
BY

SHIELD GEOPHYSICS LIMITED

FOR

MOUNT JAMIE MINES LIMITED

MARCH 1969

SCALE
0 400 800 1200 1600
FEET

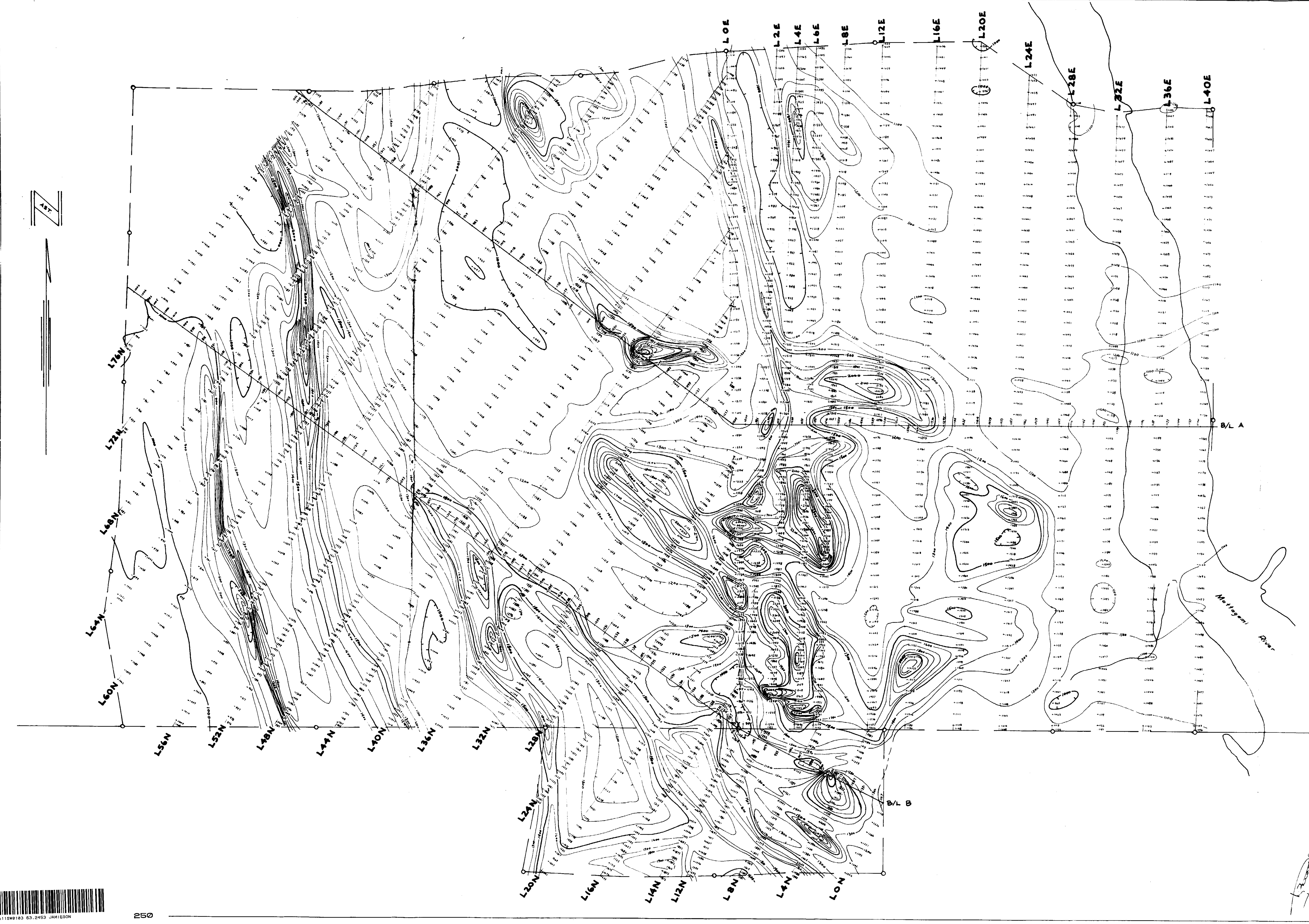
INTERP.

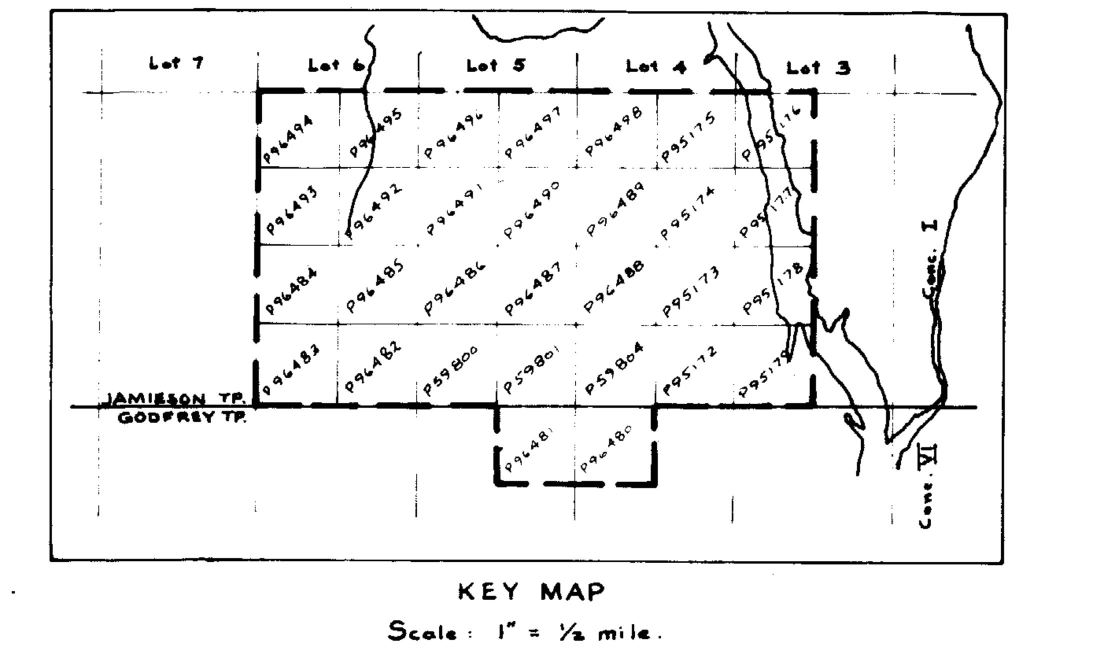
42A11SW0183 63.2453 JAMIESON

230

42A11SW8103 63.2453 JAMIESON

240





KEY MAP
Scale: 1" = 1/8 mile.

LEGEND

- Measurement station along picket line.
- 250 Relative value of the vertical component of the earth's magnetic field in gammas.
- Magnetic contour
- Magnetic depression
- Claim post.

INSTRUMENT: Sharpe MF-1 fluxgate magnetometer

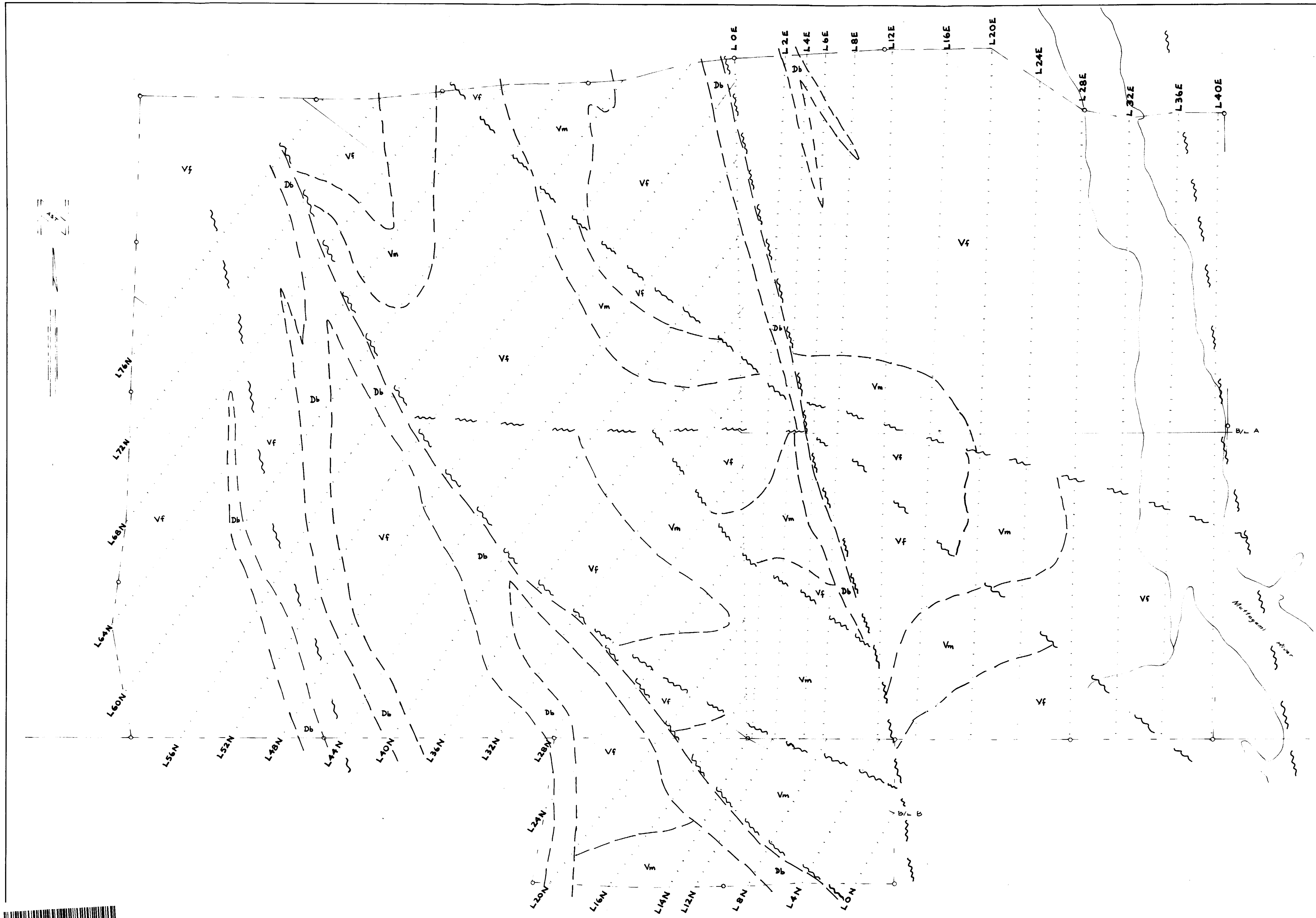
MAGNETOMETER SURVEY

ON THE PROPERTY OF
E. J. JUTILA
JAMIESON AND GODFREY TWP'S.
PORCUPINE MINING DIV.
BY
SHIELD GEOPHYSICS LIMITED
FOR
NORLAND GRUBSTAKERS
FEBRUARY 1969

SCALE
0 400 800 1200 1600
FEET

Dec. 16, 69

250



LEGEND

- Db — Diabase
- Vf — Undifferentiated Felsic Volcanics
- Vm — Undifferentiated Mafic Volcanics
- Inferred contact
- Inferred fault

GEOLOGICAL INTERPRETATION

OF THE

MAGNETOMETER SURVEY

ON THE PROPERTY OF

E J JUTILA

JAMIESON AND GODFREY TWPS.

PORCUPINE MINING DIV

BY

SHIELD GEOPHYSICS LIMITED

FOR

NORLAND GRUBSTAKERS

FEBRUARY 1969

SCALE

0 400 800 1200 1600

FEET