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MINING LANDS SECTION

GEOPHYSICAL REPORT

ON THE

SCADDING TOWNSHIP PROJECT

SUDBURY, ONTARIO

f o r

NORTHGATE EXPLORATION LIMITED

Toronto, Ontario, Canada
July, 1981

D. Jones, M.Sc.

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SUMMARY

During the period March 11th to April 5th, 1981, M P H Consulting Limited of Toronto, Ontario carried out a programme of geophysical surveying on behalf of Northgate Exploration Limited of Toronto, Ontario on the latter's Scadding Township Project near Sudbury, Ontario.

The surveying programme consisted of VLF-EM and total field magnetometer surveys carried out on four separate grid locations.

The purpose of this work was to systematically map and survey the grid areas with a view of outlining areas of potential economic interest.

The area is mainly underlain by units of conglomerate and limestone of the Sudbury group and quartzite of the Mississagi formation. Post-Huronian gabbro intrudes the Sudbury group with smaller areas of intense shearing containing quartz located within and close to the contact. (Thompson, 1961).

The gold occurrences in the area have been documented as accompanying quartz carbonate veining within shear zones -

in the gabbro. Disseminated pyrite generally accompanied the gold.

The shear zones containing the gold mineralization could possibly respond to the high frequency (relative to other exploration geophysical methods) utilized by the VLF-EM. However this response would probably reflect a change in lateral resistivity since the nature and extent of the reported accompanying sulphides (as described in the literature) will probably not be present in sufficient quantity to produce a conductive response.

The nature and extent of the gold mineralization in Scadding Township does not lend itself to definitive mapping with the systems used for this survey and as such no high-priority targets can be outlined from the data at hand.

1. INTRODUCTION

During the period from March 11th to April 5, 1981, a programme of geophysical surveying was carried out by M P H Consulting Limited on behalf of Northgate Exploration Limited on the latter's Scadding Township Project near Sudbury, Ontario.

The field programme was carried out under the supervision of D. Jones, M.Sc., of M P H Consulting Limited with overall supervision provided by Dr. G. Harper, PhD, and R. Zinn, B.Sc., both of Northgate Exploration Limited.

This report describes the exploration techniques employed and presents the results of ground exploration work to date and provides recommendations for further exploration of the property.

2. LOCATION AND ACCESS

The property consists of 199 contiguous unpatented mining claims located in Scadding Township in the District of Sudbury and in the Sudbury Mining Division of northern Ontario.

Within Scadding Township the property covers lots 5 through 12 in concessions 1 through 5 (see Figure 1).

The claims covered by this geophysical survey are numbered:

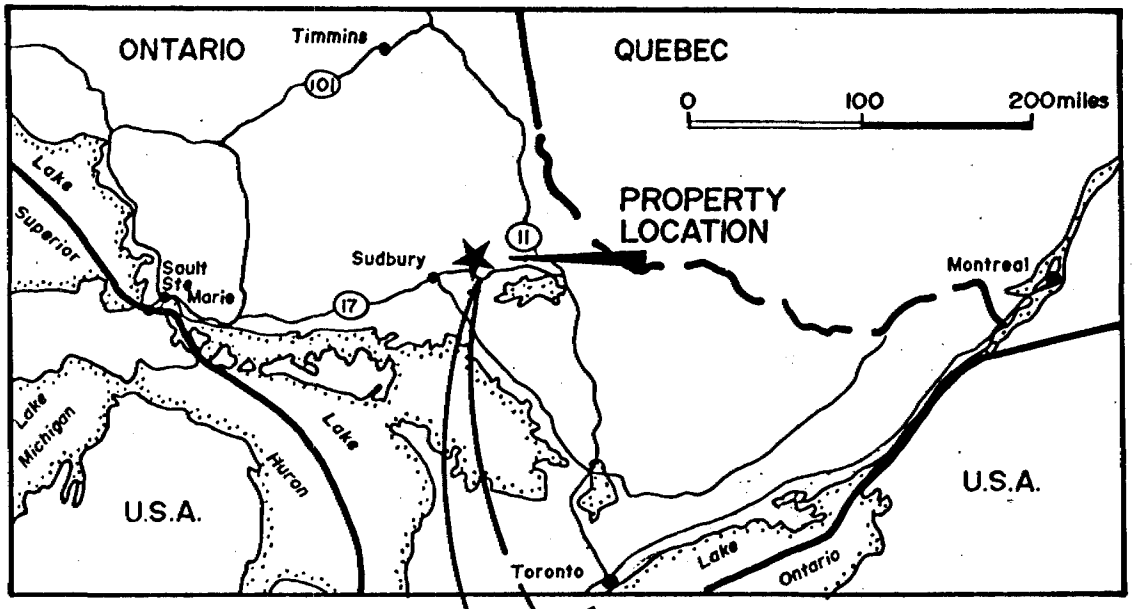
478823-478832	359343-359345	5346915,5346916
357987-357990	357993-357996	5359359,5359360
346897-346900	538818-538833	346895,546827
539389-539403	478916-478928	539384,478891
478976-478979	478880-478881	

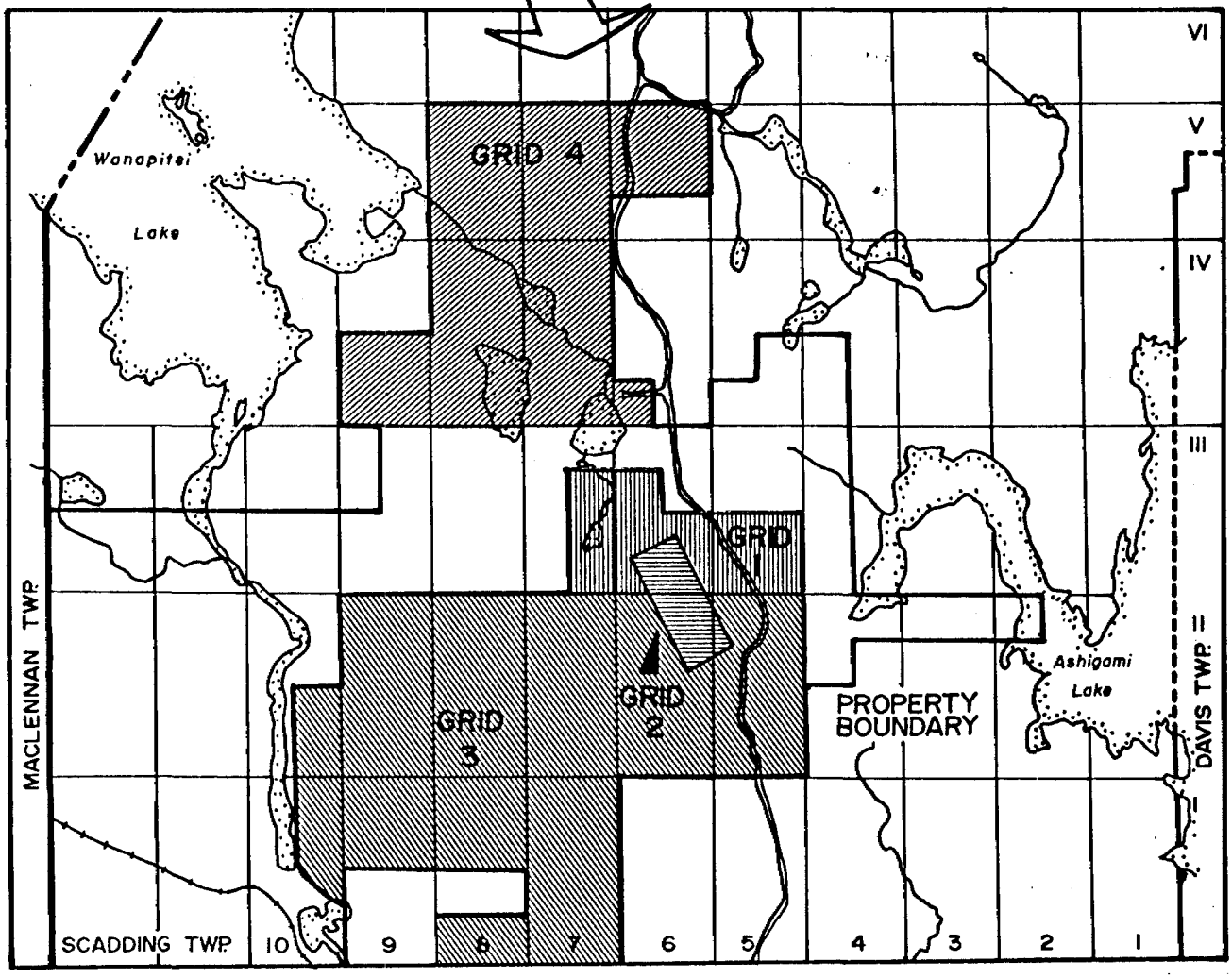
while those included in the property but not surveyed are numbered:

346887-346892	507801-507811	357991-357993
346894-364896	478876-478879	357997-357998
478886-478880	346902-346903	651183-551222
538663-538669	551176-551177	551179-551182 (part)

Access to the property is by an all weather road departing north from the Trans-Canada Highway (Highway 17) approximately 25 kilometers east of Sudbury. A series of gravel

roads leading from this all weather road provides access to various portions of the property.





Scale 1" = 1mile

Figure 1

Northgate Exploration Limited	
SCADDING TOWNSHIP PROJECT	
LOCATION MAP	
Project No:	By:
Scale:	Drawn:
Drawing No:	Date:

MPH Consulting Limited

3. SURVEY PARAMETERS

The survey grids on which the geophysical surveying was conducted were established at various times and are in both English and metric units. For this report the English grid has been converted to metric (100 feet = 30.48 meters).

3.1 Grid #1

Grid #1 was established with its main baseline having the point 0+00 on line 762+00E approximately 487.68 meters north of the concession post II and III which post also marks the boundary of lots 4 and 5 of Scadding Township. This baseline runs at an azimuth of 180° for 762 meters to point 0+00 of line 0+00 and then continues westward for a further 975.36 meters. A second baseline, located at 152.40S extends the grid from 975.36 to 1249.68W.

Crosslines were established on this baseline at intervals of 30.48 meters (100 feet) and were extended a distance of 487.68 meters south. North of the baseline the line length varied from 396.24 meters in the east to 736.52 meters in the west.

Stations on both the baselines and crosslines were at 30.48 meter (100 feet) intervals. Approximately 67 km of survey lines were cut, chained and picketed.

Grid #2

This grid was established with point 0+00 of Line 731.52N located near post #3 of Claim 357994. The baseline extends southward at an azimuth of 155° for a distance of 1036.32 meters.

Crosslines were established on this baseline at 15.26 meter (50 foot) intervals and were extended for a distance of 304.80 meters both east and west of the baseline. Stations were located on both the baselines and crosslines at 15.24 meter intervals.

Approximately 44 km of survey line was cut, chained and picketed.

Grid #3

Grid #3 was established with point 0+00 of the baseline located at the concession post common to concessions I and II, which post was also common to lots 4 and 5 of Scadding Township.

The baseline was driven due west for a distance of 4200 meters. North-south striking crosslines were established on this baseline at 100 meter intervals. These crosslines were driven north to the boundary of concessions II and III while the southern lines were cut to the property boundary. Stations were established on both the baselines and crosslines at 25 meter intervals. Approximately 105 km of line was cut, chained and picketed.

Grid #4

Grid #4 was established with the point 0+00 of the baseline located 50 meters west and 20 meters north of post marking the common boundary between lots 6 and 7 and concessions III and IV of Scadding Township.

The baseline was driven due north for a distance of 2300 meters. Crosslines were established at 100 meter intervals on this baseline and were cut and chained for a distance of 1800 meters west of the baseline. A number of the most southerly lines were extended for a further 600 meters eastward.

Stations were located on all the crosslines and baselines at 25 meter intervals.

3.2 VLF-EM Surveying

3.2.1 Grid #1 - Approximately 67 km of VLF-EM surveying was carried out on this grid. Cutler, Maine transmitting at a frequency of 17.8 kHz was the transmitting station used. The propagation direction of this station is 110° in the vicinity of Grid #1 which will ensure good electromagnetic coupling with the geologic strike of the area. For the VLF-EM surveying a 15.24 meter (50 feet) station interval was utilized with line spacing of 30.48 meters (100 feet).

3.2.2 Grid #2 - Approximately 23 km of VLF-EM surveying was completed on this grid. Line and station spacing for this grid was 15.24 meters (50 feet). As for Grid #1, Cutler, Maine was the transmitting station used and would provide good coupling with the geologic strike of the area. It was requested that the eastern half of the grid not be surveyed since a previous survey had covered this area.

3.2.3 Grid #3 - Approximately 101 km of VLF-EM surveying was completed on this grid. Cutler, Maine at 17.8 kHz was the transmitting station used as the signal source. The propagation plane wave direction was 110° which would intersect the projected geologic strike at 20° thus providing adequate coupling with

any conformable conductive trend. Station intervals of 25 meters were utilized for the systematic coverage of the grid area.

3.2.4 Grid #4 - No VLF-EM surveying was carried out on this grid since the east-west survey lines were located such as to cover a north-south geologic trend. No VLF-EM transmitting station will provide adequate coupling with conductor striking in this direction in the area and thus no VLF-EM surveying was conducted.

3.3 Magnetics

3.3.1 Grid #1 - Approximately 69 km of magnetic surveying was conducted on this grid with station observations at 15.24 meter (50 foot) intervals. Line spacing was at 30.48 meters (100 foot) intervals.

3.3.2 Grid #2 - Approximately 42 km of total field proton precession magnetometer surveying was conducted on this grid. The magnetometer reading intervals were established at 15.24 meters.

3.3.3 Grid #3 - For this grid area the line spacing was established at 100 meter intervals. Nominal station separation was at 25 meter intervals. In

anomalous areas intermediate stations at 12.5 meter intervals were observed to provide additional detail. Approximately 105 km of surveying was conducted in this fashion.

3.3.4 Grid #4 - Approximately 55 km of total field proton precession magnetometer surveying was conducted on this grid. A 25 meter reading interval was utilized for systematic coverage of the grid with a 12.5 meter station interval used in anomalous areas to provide additional detail.

3.4 Personnel

The following M P H Consulting Limited personnel were employed during this exploration programme:

D.Jones, M.Sc.	Geophysical Consultant	Toronto, Ontario
D.Hall	Party Chief	Toronto, Ontario
M.Bickers	Geophysical Operator	Toronto, Ontario
T.Kraft	Geophysical Operator	Toronto, Ontario
D.Johnston	Geophysical Operator	Windsor, Ontario
M.Nadjiwan	Geophysical Operator	Wiarton, Ontario

4. GEOLOGY

Most of Scadding township is underlain by the Aphebian Age sedimentary rocks which make up the Sudbury, Bruce and Cobalt Groups. Younger Aphebian or Helikian gabbro or diabase is intrusive into the older sediments.

Sudbury Group Sediments outcrop in the southwestern part of the township. Quartzite and conglomerate with minor limestone intercalations are the predominant rock types. These sediments are well-bedded, and generally strike northwest-southeast. Dips are variable from 40° to 70° to both the south and north. The sediments are usually brecciated near the gabbro intrusives.

Conglomerate of the Mississagi Formation unconformably overlies the rocks of the Sudbury Group. A rusty regolith has been noted at some localities in the region along the paleosurface. In Scadding Township, the Mississagi Formation is comprised of siltstone, argillite and quartzite and may contain traces of sulphides. The formation dips to the north or northeast at between 20° and 45° with local dips of up to 70°.

The sediments in the northeastern part of the township are part of the Gowganda Formation of the Cobalt Group.

Interbedded polymictic conglomerate, argillite, greywacke and quartzite lie unconformably on the rocks of the Mississagi Formation. Gowganda Formation rocks generally strike north to east and dip 20° to 80°.

Gabbro or diabase intrusives make up about 20% of the bedrock in the township. The intrusives vary in occurrence from large sill or dyke-like bodies to small, irregularly distributed swarms. Texture and composition of the gabbro may be variable due to differentiation of the intrusive sheets. Brecciation of host rocks may also have accompanied some of the intrusions.

Two major faults trending approximately northwest-southeast cross the central part of the township. Shearing, brecciation, quartz veining and sulphide mineralization with minor copper and gold values is associated with one of these faults.

Other occurrences of possible economic interest in Scadding Township are limited to quartz-carbonate veins closely associated with the gabbro intrusives. Native gold, galena, chalcopyrite and pyrite have been reported to occur with some of these veins. The basal portions of the Mississagi Formation are a possible target for paleoplacer-type uranium and gold occurrences; in Maclennan Township just to the

west, the Skead gold mine may represent a residual gold deposit formed on the Sudbury Group erosional surface with the gold being later remobilized into quartz-carbonate veins along the contact.

5. INSTRUMENTATION

5.1 VLF-EM Electromagnetic Method

The VLF-EM method employs as a source one of the numerous submarine communication transmitters in the 15 to 25 kHz band located throughout the world. At the surface of the earth these radio waves propagate predominantly in a single mode along the earth-air interface. This mode is known as the 'surface wave'. Over flat homogeneous ground in the absence of vertical conductive discontinuities the magnetic field component of this ratio is horizontal and perpendicular to its direction of propagation.

Where non-horizontal structures such as faults, contacts and conductors give rise to change in ground conductivity, secondary modes are generated which produce a vertical component of the magnetic field. This produces an elliptical polarization of the total field in a plane perpendicular to the direction of propagation.

Commercial VLF instruments enable detection of disturbing structures by measuring the tilt angle of the major

axis of the polarization ellipse. On flat homogeneous ground the tilt angle will be zero, but in the vicinity of conducting disturbances it will acquire a finite value. Direction of tilt indicates directions of the disturbing structure. Ability to deduce such parameters as depth, depth extent, dip, and width of anomalous structures is minimal.

Fortunately, this does not seriously affect location of points where VLF-EM profiles cross the upper limit of dipping structures which can be identified as areas of greatest change in tilt angle per unit of distance.

The transmitting station used during the survey was Cutler, Maine transmitting at 17.8 kHz.

The data is read as a dip angle and a vertical quadrature where the dip angle is a percentage of the incline from the horizontal, i.e. (100 x tan θ), where θ is the tilt angle of the major axis of the polarization ellipse in degrees, and the vertical quadrature is the out-of-phase amplitude of the polarization ellipse.

The data is presented as profiles with positive to the left, negative to the right. The instrument

specifications are given in Appendix I.

5.2 Magnetics

Two McPhar GP 70 proton precession magnetometers were used on the project. The proton magnetometer utilizes the precession of spinning protons of a hydrogen atom within a hydrocarbon fluid. These spinning magnetic dipoles are polarized by applying a magnetic field using a current within a coil of wire. Upon discontinuation of the current the protons precess about the earth's magnetic field and in turn will generate a small current in the wire. This current is proportional to the precession frequency which in turn is proportional to the earth's total magnetic field.

The instrument reading unit is the gamma and the reading is the absolute value of the earth's total field for that station. Repeatability is usually within two gammas for a particular station.

Magnetic data was corrected for diurnal variations using a Barringer M123 base station magnetic recorder. Deviations from a chosen base value were measured every ten seconds throughout the day. These deviations were then used to reduce field survey results to a constant datum plane.

The instruments' specifications are presented in Appendix I.

6. PRESENTATION OF DATA

All the field data from this area is presented on a series of maps at a horizontal scale of 1:2000.

The VLF-EM data is presented as profiled data along the survey lines. The in-phase or dip angle data is plotted with positive to the right and negative to the left such that negative slopes are representative of a 'true' crossover.

Conductor axes are also presented on the VLF-EM profile maps.

The magnetic data is presented as a series of isomagnetic contours superimposed on a map of corrected magnetic values recorded at each station. Contour lines at 100 and 25 gamma intervals were found suitable to highlight the magnetic expression from the survey area.

The maps accompanying this report are as follows:

Map #1	Magnetics Grid 1	East-side
Map #2	Magnetics Grid 1	West-side
Map #3	VLF Grid 1	East-side

Map #4	VLF	Grid 1	West-side
Map #5	Magnetics	Grid 2	
Map #6	VLF	Grid 2	
Map #7	Magnetics	Grid 3	Lines 0+00-16+00W st 0+00-16+00N
Map #8			Lines 16+00-32+00W st 0+00-16+00N
Map #9			Lines 32+00-44+00W st 0+00-16+00N
Map #10			Lines 16+00-32+00W st 0+00-16+00S
Map #11			Lines 32+00-44+00W st 0+00-12+00S
Map #12	VLF-EM	Grid 3	Lines 0+00-16+00W st 0+00-16+00N
Map #13			Lines 16+00W-32+00W st0+00-16+00N
Map #14			Lines 32+00W-44+00W st0+00-16+00N
Map #15			Lines 16+00W-32+00W st0+00-16+00S
Map #16			Lines 32+00W-44+00W st0+00-12+00S
Map #17	Magnetics	Grid 3	Lines 9+00N-23+00N
Map #18	Magnetics	Grid 3	Lines 0+00W- 9+00N st4+50E-10+50W
Map #19	Magnetics	Grid 3	Lines 0+00W- 9+00N st9+00W-24+00W

7. INTERPRETATION

7.1 Grid #1

7.1.1 Magnetics - The magnetic survey carried out on this grid outlined a very weak magnetic response with the majority of the area showing a magnetic relief of 100-200 gammas. This low relief coupled with a low anomaly density revealed a nebulous magnetic trend from the survey area.

The main structural features outlined from the magnetic surveying were a number of northwest striking magnetic linears which are probably attributable to diabase intrusives. These features are probably conformable but could be crosscutting stratigraphy and thus cannot be deemed to represent the geologic strike of the area.

Interpretation of selected magnetic profiles indicates a northerly dip of 45° to the magnetic linear and a depth estimation of 10 to 30 meters.

The remaining magnetic features observed from the grid area showed no distinct trends although an interpretation of the magnetic

contouring has outlined a number of possible fault structures. These are presented on Maps 1 and 2.

The grid is believed to be underlain by quartzite and quartz-pebble conglomerates of the Mississagi Formation which is in contact with conglomerate and intercalated limestone of the Sudbury group in the southwest portion of the grid area. No magnetic signature was observed which could be directly attributable to the contact zone.

7.1.2 VLF-EM - The VLF-EM survey conducted on Grid #1 revealed a generally flat response with a number of small amplitude anomalous zones showing a northwest-southeast conductive trend.

The largest amplitude and longest strike length VLF-EM features are coincident with the magnetic linears believed to represent diabase.

Inspection of the VLF-EM response indicates a topographic source for several conductive axes, and these anomalies have been discounted in the interpretation of this grid. The remainder of

the VLF-EM anomalies were short, discrete conductive horizons which are considered to be bedrock responses. These anomalies have been labelled on the VLF-EM profiles map and are discussed below.

Anomaly 'D'- This anomaly is located at approximately 182.88N between lines 30.48W and 60.96E and trends approximately 090°. The anomaly amplitude is exceedingly small (∿ 5% peak to peak) and as such no dip or depth estimates were extracted from the VLF-EM profiles.

The anomaly showed no coincident magnetic signature. The nature of the causative source is uncertain.

Anomaly 'E'- Anomaly 'E' is a semi-arcuate, small amplitude zone located at approximately 213.36N between lines 975.36W and 822.96W. The anomaly is semi-coincident with a number of topographic features which possibly in part contribute to the anomaly's signature. For this reason no dip or depth estimates were interpreted from the VLF-EM profiles.

The eastern end of the anomaly appears truncated by a north-south striking feature interpreted from the magnetics.

The conductive axis of this anomaly is located on the northern flank of a discrete magnetic high which could possibly be spatially related to the VLF-EM anomaly.

The nature of the causative source for Anomaly 'D' is uncertain .

Anomaly 'E' - is located at approximately 213.36N between lines 274.32 and 364.76E for a strike length of ∿ 80 meters. The anomaly trend is northwest-southeast and parallels the main VLF-EM trend from this grid. The eastern extent of the anomaly is curtailed by a magnetically interpreted fault. Interpretation of the VLF-EM profiles indicated a depth to conductive axis of ∿ 30 meters. No dip value was estimated from this zone since topographic effects on the south side of the anomaly distort the positive flank of the profile.

The anomaly is situated in a small magnetic low

of approximately 50 gammas. The magnetic correlation is probably coincidental with the two geophysical responses not directly attributable to the same causative source.

Anomaly 'G' - this anomaly is a long, linear, conductive feature which parallels and in places straddles the baseline between lines 426.72W and 91.44E. A possible easterly extension could be postulated to line 579.12E, however, it is possible that a topographic source contributes part if not all the VLF-EM response associated with this eastern extension.

The broadness of the VLF-EM response indicates that bedrock topography is a possible cause for this anomaly with the positive shoulder south of the baseline reflecting a ridge or uplift of the bedrock. No magnetic signature was observed coincident with this anomaly.

A number of very small 1 or 2° dip angle anomalies are observable from the VLF-EM survey. These have not been discussed within the text of this report however they are represented on the VLF-EM profile map.

7.2 Grid #2

7.2.1 General Comments - This grid lies at an azimuth of 155° and overlaps in part both grids #1 and #3.

The grid covered a gold zone which is associated with pyrite mineralization apparently conformable to the

pyrite mineralization apparently conformable to the geologic strike of the area.

7.2.2 Magnetics - The total field magnetic survey from the area revealed a low magnetic relief of approximately 200 gammas with a low anomaly density. The magnetic trend observed appears to strike north-northwest - south-southeast. This trend is dominated by a series of three magnetic linear highs (of approximately 400-500 gammas). These highs have been attributable to diabase dykes and as such may not be conformable with the geologic stratigraphy from the area. The low magnetic relief outside of these zones preclude any accurate definiation of the magnetic trend from this area.

Interpretation of selected profiles of the magnetic data indicates easterly dips of 45° to the major dyke-like features and depth values varying from 10-35 meters. A tabular body of infinite strike extent was used as a model for this work. A change in magnetic background is observable on either side of the westernmost dyke-like feature with the response on the eastern side being approximately 100 gammas higher. This probably relates to a thinning of overburden

due to uplifting of the bedrock on the eastern side of the dyke rather than a change in rock type, the diabase dyke in this case occupying the fault plane at which the movement occurred.

The portion of the grid from line 121.92N to line 335.28N shows a greatly increased magnetic relief. This response is directly attributable to cultural noise (i.e. drill casing). This portion of Grid #2 has been drilled and a mineralized gold zones discovered. Unfortunately the cultural noise resulting from the drilling has destroyed any recognizable magnetic signature from the mineralized zone such that it cannot be used as a case study by which to grade other anomalies from the grid area.

A number of crosscutting (fault?) structures have been interpreted from the truncation and deviations of the magnetic contour lines. These are presented on the magnetic map (Map 5).

7.2.3 VLF-EM - The VLF-EM survey conducted on this grid displayed a north-northwest strike direction conformable with the magnetic trend. Three anomalous features were outlined which dominated the VLF-EM response from this area. These zones corresponded

closely with the interpreted diabase dyke from the magnetic survey.
Additionally a number of short strike length anomalous features were outlined which are presented on Map 6.

All the anomalous features outlined were low amplitude anomalies indicative of a relatively homogenous bedrock with little change in lateral resistivity values within the bedrock.

No VLF-EM anomaly mapped on the grid could be correlated with the known gold mineralization on the property.

Anomaly 'A' - is located at approximately 152.40W between lines 487.68 and 335.28N. This short strike length anomaly appears to intersect a longer formational anomaly, (diabase), on line 274.32N at approximately 152.40W. This anomaly shows no magnetic signature and appears to crosscut stratigraphy at a low angle. No causative source can be attributed to this target.

Anomaly 'B' - this anomaly is located at approximately 182.88E between lines 182.88N and 121.92N and is apparently conformable with the geologic strike

of the area. The anomaly is open to the south and has been mapped by a previous survey conducted by Northgate Exploration Limited.

The anomaly shows no magnetic signature and no geological source can be ascribed to the observed geophysical response.

Anomaly 'C' - is a short arcuate anomaly located at approximately 243.84E between lines 243.84N to 304.80N with the anomaly being open to the north. The conductive strike axis is conformable with the postulated geologic strike of the area.

The anomaly is coincident with a small (100 gamma) discrete magnetic high. No definite causative source can be ascribed to this anomaly although the associated magnetic signature would suggest a possible sulphide and/or magnetite concentration in underlying gabbroic intrusive rocks.

7.3 Grid #3

7.3.1 Magnetics - The magnetic survey conducted on Grid #3 outlined a higher magnetic relief than that observed on either Grids 1 or 2. This increase in magnetic relief reflects the higher mafic content present in the gabbro intrusive believed to underlie the major portion of this grid.

The magnetic trend observed from this grid area is a basic east-west trend with a number of northwest-southeast linears crosscutting the magnetic stratigraphy in the northeast portion of the grid area. These units are the southerly continuation of the interpreted diabase dykes previously outlined on both Grids #1 and #2

The magnetic relief observed on Grid #3 is approximately 300 to 400 gammas superimposed on a relatively flat background of 58700 gammas.

Structural interpretation of the magnetic maps has outlined several fault structures trending in an approximate northwesterly direction. These are presented on Maps 7 through 11.

In addition an interpretation of the magnetic signature of the Sudbury group and the intrusive post Huronian gabbro has been carried out with the interpreted common boundaries represented as geologic contacts. This is presented on Maps 7 - 11.

A west-northwest-east-southeast striking contact has been postulated bisecting the northeast portion of the grid area. The postulated contact separates the conglomerate of the Sudbury group on the north from the Post Huronian gabbro in the south. (Thompson,

1961). (Maps 7 and 8).

The occurrence of gold mineralization in close proximity to this contact as reported by Kindle in 1933 and Thompson in 1961 makes the location and mapping of this contact of paramount importance. The gold is reported to be located within a series of irregular veins and pockets of quartz within a sheared gabbro. Disseminated pyrite accompanies the gold, some of which is reportedly visible.

The contact location as interpreted from the magnetics is empirical and the actual location should be ground located by geologic mapping.

The interpreted southern boundary of the intrusive gabbro is presented on Maps 7, 8 and 9. This projected southern boundary in essence parallels the northern boundary. This postulated southern contact is located at 0+00 on line 0+00 and runs northwesterly to 12+00N on line 42+00W.

The higher magnetic values and increasing magnetic relief located in the south-central portion of the grid area is also interpreted as reflecting a gabbroic intrusion. The postulated boundary has been

outlined on the magnetic maps.

Similarly a smaller zone has been outlined located in the southwest corner of the grid area.

The magnetic anomalies located in the interpreted intrusive portion of the grid area are mainly narrow linear, discrete zones. These features probably represent zones containing higher concentrations of magnetite and/or sulphide mineralization. The presence of gold mineralization accompanying disseminated sulphide mineralization within the gabbro is documented by Thompson (1961) and as such the linear magnetic anomalies located within the interpreted gabbroic unit could be of economic importance.

7.3.2 VLF-EM - The VLF-EM electromagnetic survey carried on on Grid #3 outlined an east-west trend conformable to the magnetic trend. In comparison with Grids # 1 and 2 the dip angle amplitudes outlined on this grid were substantially larger as were the peak to peak anomaly amplitudes. This reflects either a larger concentration of conductive material or a larger lateral inhomogeneity within the bedrock. Both these observations are probably true in the case of Grid #3.

The most prominent VLF-EM response was a long, linear anomaly extending from approximately 1+00N, Line 1+00W to 12+00N, Line 40+00W. This is coincident with and probably reflects the interpreted contact between conglomerate of the Sudbury group in the south and intrusive gabbro in the north.

The remainder of the above geologic contact as interpreted from the magnetic survey did not show any strong electromagnetic response.

Eight anomalies believed to be representative of bedrock were shown by the VLF-EM survey. These are presented on the VLF-EM profile maps (Maps 12-16).

Almost all of the VLF-EM anomalies located on the map are located within areas interpreted from the magnetics to be underlain by gabbro intrusive.

A number of anomalies interpretable from the data have been ascribed to topographic features and are not discussed further within the context of this report.

The small amplitudes and the extremely wide VLF-EM crossovers (possibly due to the shallow dips of the

geologic units) are not conducive to qualitative interpretations. Depth estimates are given only for anomalies where parameter values can be interpreted with any degree of confidence.

Anomaly 'H' - This east-west striking feature was located at approximately 12+00N between Lines 13+00W and 23+00W with a possible westerly extension of the anomaly to Line 29+00W Lack of data on the intervening lines precludes accurate definition of this extension.

The character of the anomaly changes along its strike length. From west to east, the amplitude and breadth of the anomaly diminishes indicating either a deepening, or a decreasing conductive content of the anomaly, eastward.

This anomaly shows no magnetic signature and is located in a quiescent magnetic zone. The eastern end of Anomaly 'H' could possibly be terminated by a magnetic structure which appears as an offshoot of the interpreted diabase. Within the context of the magnetic interpretation this anomaly is believed to be located within the gabbro and is subparallel to the contact.

From the VLF-EM profile map, extrapolation of Anomaly 'H' would appear to show it intersecting the southern gabbro contact at Line 24+00 or 25+00W. Both of these lines unfortunately lie off the property, and no definite conclusion regarding this observation can be made.

Anomaly 'I' - This anomaly is located at approximately 7+50N between Lines 2+00 and 12+00W. The anomaly strikes slightly north of east and is subparallel to Anomaly 'H'.

The anomaly appears to intersect the interpreted gabbro/conglomerate contact at Lines 11+00 and 12+00W at which intersection the anomaly is truncated. No magnetic signature was directly attributable to Anomaly 'I' and the anomaly was located in a relative magnetic low of approximately 100-200 gammas.

The eastern end of the anomaly abuts against a magnetic high interpreted as a diabase dyke. Thus the zone is bounded by structural controls at either end. Probable causative source for this zone is a shear or a fracture-filled fault zone.

Anomaly 'J' - is a small amplitude (5° peak to peak) short strike length anomalous zone, located at approximately 4+50N between Lines 0+00 and 3+00W. The anomaly is open to the east.

The anomaly appears to be crosscutting the magnetic trend of the area and parallels the postulated gabbro-conglomerate contact. From the magnetic interpretation the zone is located within the gabbro intrusive.

There is no directly coincident magnetic signature and no causative source could be ascribed to this anomaly.

Anomaly 'K' - is located at approximately 3+00N and between Lines 9+00 and 4+00W. The anomaly subparallels Anomalies 'H' and 'I' and as with both 'H' and 'I' it appears that its western extent intersects with and is truncated by the gabbro/conglomerate contact. The anomaly is open to the east and shows no direct magnetic signature.

Anomaly 'L' - is a long, arcuate anomalous zone located at approximately 6+00S between Lines 10+00 and 32+00W.

The western extension of the anomaly is truncated at or near an interpreted gabbro contact. The conductive axis of Anomaly 'L' could possibly represent the southern margin of the gabbro intrusive. The contact as interpreted from the magnetics is not sharply defined and could possibly be moved northward slightly from its present interpreted location to correspond with the VLF-EM conductive axis.

No direct magnetic signature can be attributed to this zone and a possible causative source is a geological contact.

Anomaly 'M' - this conductive zone straddles the baseline between Lines 20+00 and 30+00W. The anomaly is located in a topographic low but topography is not believed to be the main causative source of the anomaly. The western extent of the anomaly is truncated at an interpreted north-south striking fault.

Anomaly 'M' is located in a relative magnetic low, however the magnetic low does not appear to be caused by the source of the conductor.

Anomaly 'N' - is located at approximately 2+00N between Lines 39+00 and 45+00W, and is open to the west.

This zone is the largest amplitude anomaly on the property and depth estimates have been interpreted from the VLF-EM profile. Depth to the conductive axis of Anomaly 'N' is estimated at30 meters and a northerly dip of 60-80° is interpreted from the profile.

The anomaly is believed to be located within the conglomerate of the Sudbury group. Thompson's 1961 geological map indicates a contact in this vicinity which could relate to Anomaly 'N' however based on the geophysical interpretation of the magnetics no gabbro contact was outlined in this area.

The anomaly is believed to be underlain by conglomerate and/or possibly limestone and should be ground checked geologically.

Anomaly 'O' - is a short, discrete, large amplitude conductive zone located at approximately 7+00S between Lines 39+00 and 42+00W.

The anomaly has an interpreted depth of 15 meters and appears to be dipping steeply to the north.

The anomaly was located within an area of large magnetic relief believed to reflect a post-Huronian

gabbro. No direct magnetic coincidence was observed and no direct causative source was attributed to the geophysical response.

Other Anomalies - A number of other small anomalies were detected. These have been presented as possible conductive horizons on the VLF-EM maps. They have not been discussed in detail in this report but should not be overlooked in any subsequent investigations of this property. Re-evaluations of the targets in light of any further information may enhance these weak zones regarding their possible economic potential.

7.4 Grid #4

7.4.1 General Comments - This grid has been mapped as being underlain mainly by quartzite of the Mississagi Formation with a conglomerate and argillite of the Gowganda Formation being located in the northeast corner of the grid area. These two formations are mineralogically similar and no large magnetic contrast would be expected.

7.4.2 Magnetics - The magnetic survey conducted on the property outlined a north-south magnetic trend. The very low magnetic relief observed on the property indicates a fairly homogeneous bedrock with no large lateral

magnetic inhomogeneities.

Interpretation of the magnetic data did not reveal any signature attributable to contact zones and no distinction between any of the underlying units could be made.

A number of east-west fault zones have been interpreted and are presented on Maps 17, 18 and 19.

7.4.3 VLF-EM Survey - The geologic strike of the survey area is north-south as reflected in the magnetic survey. and as such no VLF-EM station is located such as to provide a transmitter signal which would be conducive to VLF-EM mapping of the property.

8. CONCLUSIONS

The VLF-EM and magnetic surveys carried out on the grids have shown a generally quiescent geophysical area. Known gold associations in the area are as quartz stockworks within gabbro and as possible paleo-placer deposits at the contact between Aphebian conglomerate and quartzite. Neither of these targets will give rise to unique magnetic response, and the reported nature and extent of any sulphide (pyrite) associated with the gold will probably not give rise to a VLF-EM response due to its disseminated nature. These types of gold occurrences are therefore not ideal geophysical targets although the surveys described herein have provided valuable structural lithologic information.

8.1 Grid #1

The magnetics outlined a very low relief magnetic pattern containing a number of northwest-southeast striking-magnetic linears. These zones have been attributed to diabase intrusions which are possibly paralleling stratigraphy. The VLF-EM survey also outlined the diabase zones. Four short, discrete bedrock conductors were outlined, none of which showed any magnetic signature and no definite causative source was ascribed to any of the zones. A number of other small amplitude zones were detected and are

presented on the VLF-EM profile maps. These zones were not highly rated geophysically but it is felt that their priority value should be reassessed as more information of a geological nature becomes available for the grid area.

8.2 Grid #2

The magnetics and the VLF-EM response from this grid has outlined a fairly flat geophysical response with the main geophysical features attributable to a series of diabase dykes two of which are the same as and continuations of those mapped on Grid #1.

Of the three discrete VLF-EM anomalies outlined, only Anomaly 'C' showed any magnetic correlation which could possibly be attributable to an increase in sulphide (pyrrohotite) and/or magnetic content.

As previously mentioned gold mineralization on this grid is in the process of being drill evaluated. Cultural noise associated with the drilling precluded observation of any magnetic signature associated with the gold mineralization. There was no VLF-EM response attributable to the zone.

As with Grid #1, no economic implications can be ascribed to any of the geophysical anomalies outlined. Re-evaluation of the anomalies in light of detailed geological mapping could possibly alleviate this and allow priorities to be placed on the individual anomalies.

8.3 Grid #3

A larger magnetic relief was observed on Grid #3 relative to Grids 1 and 2. This could be attributable to a higher magnetite content in the gabbro which underlies the major portion of Grid 3.

Structural interpretation outlined a fault trending north-south in the western portion of the grid. Detailed interpretation aided in outlining the gabbro/conglomerate contact with three separate intrusive bodies outlined. A southerly continuation of the diabase dyke outlined on Grid #1 was located and mapped in the northeast portion of the grid area.

The VLF-EM mapping outlined eight anomalies. Four of these anomalies, 'H', 'I', 'J', and 'K' were located within the northern gabbroic zone. Anomalies 'H' and 'I' are probably structurally controlled being truncated by the gabbro/conglomerate contact in the south and the diabase contact in the north. These are possibly shear

or fracture-filled fault zones. 'J' could represent the contact of a gabbro intrusive with conglomerate of the Sudbury group.

Anomalies 'M' and 'O' are located within gabbro units and no causative sources have been ascribed to them.

Anomaly 'N' is a large amplitude anomaly and believed to be located within the conglomerate.

No economic implications can be drawn from the data at hand although, bearing in mind the location of the known mineralization, Anomalies 'H' and 'I' are of obvious interest.

The other anomalies, though of lower priority at this time, are nonetheless good targets and further geological information is necessary before a definitive answer can be given regarding their potential.

8.4 Grid #4

The magnetic survey from Grid #4 outlined a north-south magnetic trend. The low magnetic relief and low anomaly density indicate a homogenous bedrock and no subdivisions were made from the magnetic survey. A number of east-west striking structures (faults) were interpreted from the

magnetics. No VLF-EM was carried out on this grid.

9. RECOMMENDATIONS

The nature and extent of the gold mineralization in Scadding Township does not lend itself to definitive mapping with the systems used for this survey and as such no high-priority targets can be outlined from the data at hand.

Recommendations for further work include:

1) A detailed geological mapping programme of the area using the geophysical grids as control.
2) The geological information from the drilling conducted on Grid #2 should be analysed in detail to provide information regarding the nature of occurrences and association of the gold mineralization in this area.
3) Re-evaluation of the geophysical data should be carried out following the detailed geologic analysis of the area at which time decisions regarding the further exploration of the area could be made.
4) The documented pyritic association with the gold mineralization should be examined with a view to utilizing Induced Polarization surveying to outline possible areas of economic interest.

Respectfully submitted,

D. Jones, M.Sc.

DJ:g

CERTIFICATE

I, David Jones of Toronto, Ontario hereby certify that:

1) I hold a Bachelor of Technology degree in Applied Physics from the University of Bradford, England, and a Master of Science degree in Applied Geophysics from McGill University in Montreal.

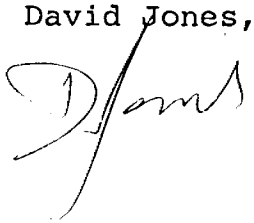
2) I have practised my profession in exploration continuously since graduation.

3) I have based conclusions and recommendations contained in this report on knowledge of the area, my previous experience with the geophysical techniques used and on the results of the field work conducted on the property during March, 1981 which was carried out under my supervision.

4) I hold no interest, directly or indirectly in this property other than professional fees, nor do I expect to receive any interest in the property or in Northgate Exploration Limited or any of its subsidiary companies.

Toronto, Ontario

David Jones, M.Sc.



REFERENCES

Society of Exploration Geophysicists	1967	Mining Geophysics Vols. I and II - Society of Exploration Geophysicists
Telford, W. M.	1976	Applied Geophysics. Cambridge University Press, 860 p.
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Fraser, D.C.	1981	A review of Some Useful Algorithums in Geophysics - CIM Bulletin, Vol. 74 No. 828
Fraser D. C.	1969	Contouring of VLF-EM Data Geophysics Vol. 34 No. 6 - p. 958-967
Madden-Vozoff		Selected Plots from the Madden-Vozoff VLF Model Suite (Surface data)
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APPENDIX I

EM16

VLF Electromagnetic Unit

Pioneered and patented exclusively by Geonics Limited, the VLF method of electromagnetic surveying has been proven to be a major advance in exploration geophysical instrumentation.

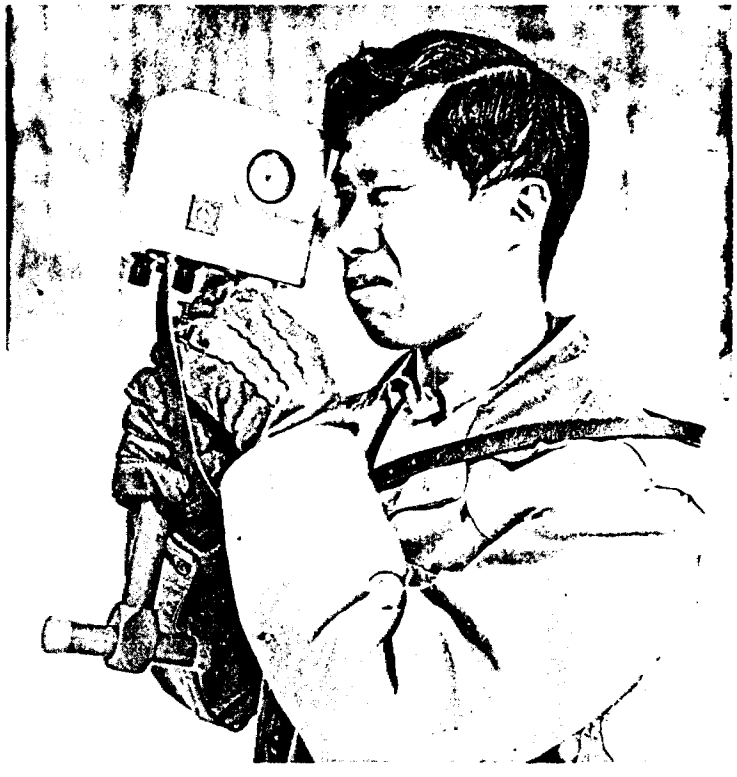
Since the beginning of 1965 a large number of mining companies have found the EM16 system to meet the need for a simple, light and effective exploration tool for mining geophysics.

The VLF method uses the military and time standard VLF transmissions as primary field. Only a receiver is then used to measure the secondary fields radiating from the local conductive targets. This allows a very light, one-man instrument to do the job. Because of the almost uniform primary field, good response from deeper targets is obtained.

The EM16 system provides the *in-phase* and *quadrature* components of the secondary field *with the polarities indicated.*

Interpretation technique has been highly developed particularly to differentiate deeper targets from the many surface indications.

Principle of Operation
The VLF transmitters have vertical antennas. The magnetic signal component is then horizontal and concentric around the transmitter location.



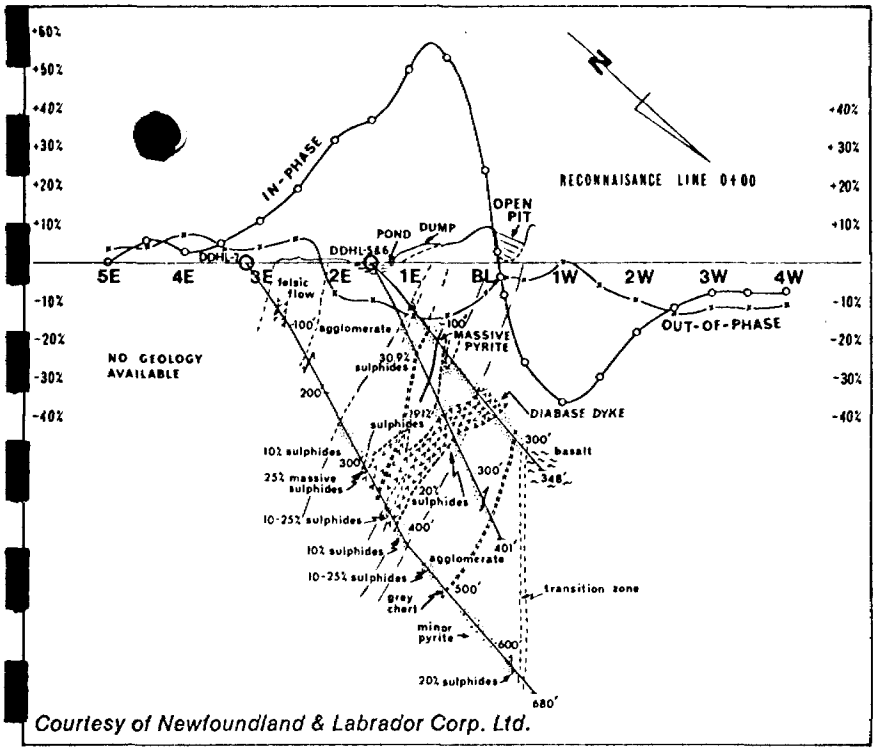
Specifications

Source of primary field	VLF transmitting stations.
Transmitting stations used	Any desired station frequency can be supplied with the instrument in the form of plug-in tuning units. Two tuning units can be plugged in at one time. A switch selects either station.
Operating frequency range	About 15-25 kHz.
Parameters measured	(1) The vertical in-phase component (tangent of the tilt angle of the polarization ellipsoid). (2) The vertical out-of-phase (quadrature) component (the short axis of the polarization ellipsoid compared to the long axis).
Method of reading	In-phase from a mechanical inclinometer and quadrature from a calibrated dial. Nulling by audio tone.
Scale range	In-phase ± 150%; quadrature ± 40%.
Readability	± 1%.
Reading time	10-40 seconds depending on signal strength.
Operating temperature range	−40 to 50° C.
Operating controls	ON-OFF switch, battery testing push button, station selector, switch, volume control, quadrature, dial ± 40%, inclinometer dial ± 150%.
Power Supply	6 size AA (penlight) alkaline cells. Life about 200 hours.
Dimensions	42 x 14 x 9 cm (16 x 5.5 x 3.5 in.)
Weight	1.6 kg (3.5 lbs.)
Instrument supplied with	Monotonic speaker, carrying case, manual of operation, 3 station selector plug-in tuning units (additional frequencies are optional), set of batteries.
Shipping weight	4.5 kg (10 lbs.)

GEONICS LIMITED
Designers & manufacturers of geophysical instruments

subsidiary of
Deering Milliken Inc.

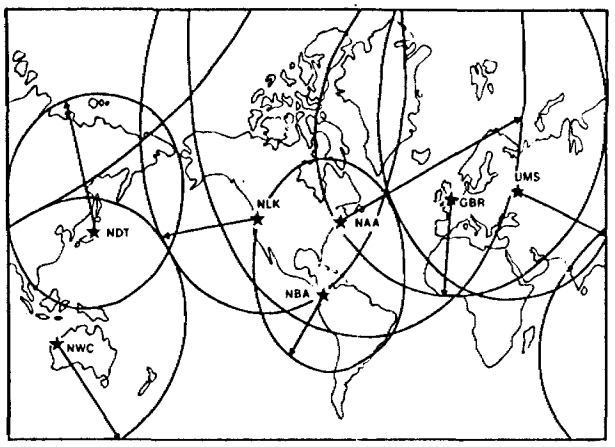
2 Thorncliffe Park Drive,
Toronto/Ontario/Canada
M4H 1H2
Tel: 425-1824
Cables: Geonics



Courtesy of Newfoundland & Labrador Corp. Ltd.

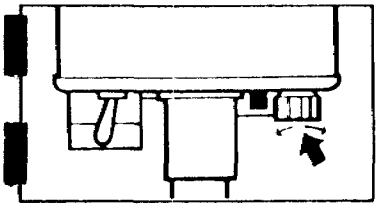
EM 16 Profile over Lockport Mine Property, Newfoundland

Additional case histories on request.



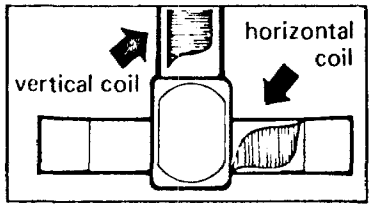
Areas of VLF Signals

Coverage shown only for well-known stations. Other reliable, fully operational stations exist. For full information regarding VLF signals in your area consult Geonics Limited. Extensive field experience has proved that the circles of coverage shown are very conservative and are actually much larger in extent.



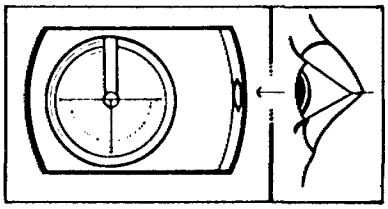
Station Selector

Two tuning units can be plugged in at one time. A switch selects either station.



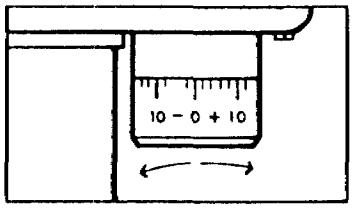
Receiving Coils

Vertical receiving coil circuit in instrument picks up any vertical signal present. Horizontal receiving coil circuit, after automatic 90° signal phase shift, feeds signal into quadrature dial in series with the receiving coil.



In-Phase Dial

shows the tilt-angle of the instrument for minimum signal. This angle is the measure of the vertical in-phase signal expressed in percentage when compared to the horizontal field.



Quadrature Dial

Is calibrated in percentage markings and nulls the vertical quadrature signal in the vertical coil circuit.

By selecting a suitable transmitter station as a source, the EM 16 user can survey with the most suitable primary field azimuth.

The EM 16 has two receiving coils, one for the pick-up of the horizontal (primary) field and the other for detecting any anomalous vertical secondary field. The coils are thus orthogonal, and are mounted inside the instrument "handle".

The actual measurement is done by first tilting the coil assembly to minimize the signal in the vertical (signal) coil and then further sharpening the null by using the reference signal to buck out the remaining signal. This is done by a calibrated "quadrature" dial.

The tangent of the tilt angle is the measure of the vertical in-phase component and the quadrature reading is the signal at right angles to the total field. All readings are obtained in per centages and do not depend on the absolute amplitude of the primary signals present.

The "null" condition of the measurement is detected by the drop in the audio signal emitted from the patented resonance loudspeaker. A jack is provided for those preferring the use of an earphone instead.

The power for the instrument is from 6 penlight cells. A battery tester is provided.

GP-70 Proton Magnetometer

Measures absolute magnitude of total magnetic field

1 gamma sensitivity.

10 scale ranges: 20,000 to 100,000 gammas

Digital readout with long life, light emitting diodes.

Noise cancelling toroidal sensor.

Wide operating temperature range.

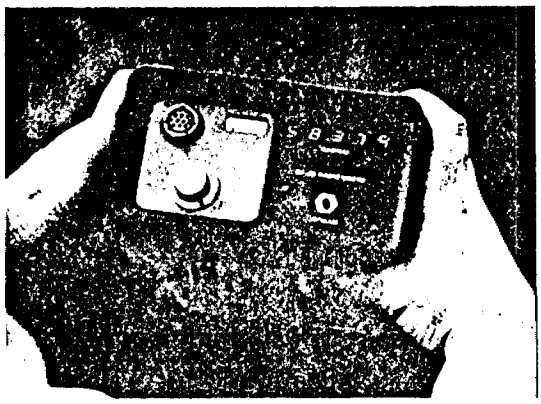
Model GP-70 is a reliable, light weight, proton magnetometer designed for field operation under widely varying environmental conditions. It measures the absolute magnitude of the total magnetic field within the range of 20,000 to 100,000 gammas to an absolute accuracy of ± 1 gamma and ± 15 parts per million of the field under measurement, over the temperature range of -30° to + 50° C.

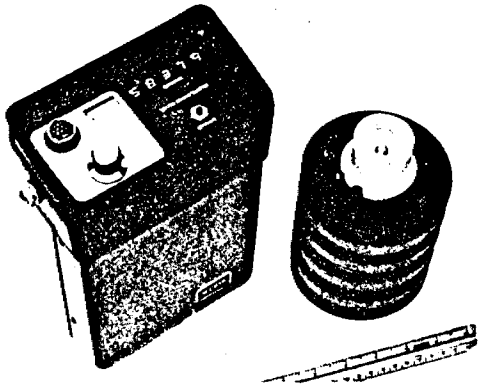
The instrument is simple to operate. A complete reading is obtained in 3.5 seconds by depressing a push button. The field intensity is read directly in gammas from a five digit display consisting of light emitting diodes. A 10 position switch sets the appropriate range.

The instrument is powered by internally mounted size "D" alkaline batteries (standard) or by non-ferrous rechargeable batteries (optional). The rechargeable batteries have virtually zero magnetic effect and permit full use of the magnetometer sensitivity even with close spacing between the sensor and console.

A battery meter shows condition of batteries at all times and allows

Back packed sensor allows for hands-free operation





anticipation of when batteries should be replaced.

The GP-70 noise cancelling toroidal sensor minimizes effect of external interference from man made sources. In high electrical noise areas, further improvement in signal to noise ratio can be achieved by keeping the push button depressed during a reading. This procedure automatically doubles the sensor polarize time, creating a higher signal output from the sensor.

Model GP-70 comes complete and ready for use with console, carrying strap, sensor, extending aluminum staff, spare batteries, instruction manual; all in a sturdy transit case.

An optional feature of the GP-70 is the back pack sensor harness. This option allows for a hands-free operation of the magnetometer, a major benefit in areas of rough terrain or thick vegetation.

Specifications

Sensitivity: 1 gamma

Range: 20,000 to 100,000 gammas in ten switch positions.

Operating Temperature: -40° to 55° C.

Absolute Accuracy: ± 1 gamma and ± 15 parts per million of measured field over range of -30° to + 50° C.

Sensor: Noise cancelling toroidal coil is electro-statically balanced to minimize interference between sensor and console.

Read Out: 3.5 seconds total - by push button. Double polarizing time by keeping button depressed.

Display: 5 digits on long life, light emitting diodes.

Electronic Circuits: Integrated circuits complying with military specifications used throughout.

Console: Sturdy aluminum housing with rubber light shield and shock guard.

Dimensions: Console - 3" x 6" x 9.5" (7.5 x 15 x 24 cm)
Sensor - 4.5" x 5" (10.5 x 12.7 cm)
Staff - 5 ft. (1.5 m) extended
2 ft (0.6 m) collapsed

Weights:
Console 3.8 lbs. (1.7 kg)
Sensor and cable 5 lbs. (2.3 kg)
Aluminum staff 1 lb. (0.45 kg)
12 Alkaline "D" cells 3 lbs (1.1 kg)

Power Supply: Standard - 12 internally mounted alkaline "D" cells provide over 10,000 readings at 25° C. decreasing to approximately 1,000 readings at -30°C. **Optional:** Internally mounted rechargeable non-ferrous batteries and charger. Over 3,000 readings between charges.

Battery Indicator: A miniature meter monitors battery life and helps predict battery replacement time.

McPhar Instrument Corporation

Head Office:

55 Tempo Avenue,
Willowdale, Ontario, Canada M2H 2R9
Tel: (416) 497-1700 Telex: 0623541
Cable: McPHAR TOR

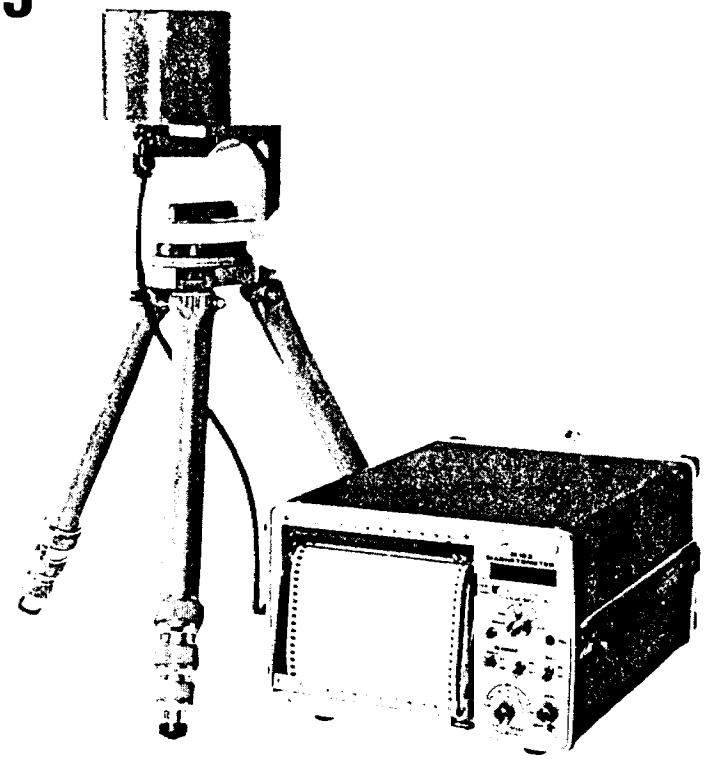
Sales agents in:

Africa, Asia, Australia, Europe, North & South America

Contact McPhar Instrument Corp. head office for the agent in your area.

BARRINGER RESEARCH

BASE STATION MAGNETOMETER
Model BM-123



DESCRIPTION

The Barringer BM-123 magnetometer system uses the proton precession principle to measure the earth's total magnetic field intensity. There is no need for levelling or calibration of the sensor and it is unaffected by external influences such as temperature, etc.

FEATURES

- Magnetometer neatly combined with analog recorder in console measuring only 17" x 12" x 8" (43.2 cm x 30.5 cm x 20.3 cm)
- powered by mains AC or 24 Volts DC
- Full 1 gamma or 0.5 gamma sensitivity
- Fully adjustable cycling rate from 2 seconds to 99 minutes in 1 second stages
- BCD output readily adaptable to digital cassette or other magnetic type recording
- To save power chart recorder can be made to operate only when magnetometer cycles

APPLICATIONS

- Storm monitoring
- Diurnal variation monitoring
- Observatory measurements including three component measurements with the use of Helmholtz coils

TYPICAL SYSTEM COMPONENTS

- Magnetometer console, including 5-inch chart recorder
- Toroidal sensor
- Connecting cable
- Tripod
- Power supply (optional)

ADVANCED TECHNIQUES AND INSTRUMENTATION FOR THE EARTH SCIENCES

SPECIFICATIONS

CONSOLE MODEL M-123-1

Sensitivity	1 gamma throughout the range
Accuracy	± 1 gamma at 24 volts dc
Range	20,000 to 100,000 gammas in 12 overlapping settings
Cycle Rates:	
Continuous Cycling	0.6, 0.8, 1.2 and 1.9 seconds
Automatic Cycling	2 seconds to 99 minutes in 1 second steps
Manual Cycling	pushbutton single cycling at 1.9 seconds
External Cycling	actuated by a 2.5 to 12 volt pulse longer than 1 millisecond
Outputs:	
Analog	front panel select 0 to 99 gammas or 0 to 990 gammas
Fiducial Marker	internal selection of 1 second to 99 minutes in 1 second steps
Visual	5 digit numeric display directly in gammas
External Outputs:	
Analog	2 channels, 0 to 99 gammas and 0 to 990 gammas at 1 milliamp or 1 volt Full Scale Deflection
Digital	BCD 1, 2, 4, 8 code, TTL compatible 0 State — 0 to 0.5 volts 1 State — 2.5 to 5 volts
Fiducial Mark	Relay closure or open state selected internally from 1 second to 99 minutes
Size	8" x 12" x 17" (20.3 cm x 30.5 cm x 43.2 cm) (fits under a commercial airline seat)
Weight	20 lbs (9.1 kg)
Operating Temperature	−28°C to +65°C
Power Requirements	Magnetometer 12 to 30 volts dc 60 to 200 milliamps maximum Recorder 12 to 30 volts dc 0.5 to 0.9 amps maximum
Options	Component Spares Kit — a selection of critical solid state components and fuses required for general console maintenance Board Spares Kit — a complete selection of plug-in PC boards for maintenance of the console on longer term surveys

HIGH SENSITIVITY CONSOLE MODEL M-123-2

Sensitivity	0.5 gammas at 1.9 seconds
Accuracy	±0.5 gammas at 1.9 seconds

All other specifications the same as Model M-123-1

MAGNETOMETER ELECTRONICS ONLY MODEL M-123-3

Size	6" high x 7" wide x 6" deep (15.2 cm x 17.8 cm x 15.2 cm) can fit a standard 19" (48.3 cm) rack
Weight	approximately 5 lbs (2.3 kg)
Outputs	5 digit display in gammas
External Outputs	same as model M-123-1 above

CONSOLE OPTIONS

Digital Cassette Recording — various systems available, details on request
Hewlett-Packard Recorder Spares
Hewlett-Packard Recording Supplies — chart paper and disposable pens

Barringer Research Limited
304 Carlingview Drive
Metropolitan Toronto
Rexdale, Ontario, Canada M9W 5G2
Phone: 416-675-3870
Telex: 06-968743

Representative:

41I10NE0179 2.4211 SCADDING

900

1983 02 03 2.4211

Mining Recorder
Ministry of Natural Resources
199 Larch Street
Sudbury, Ontario
P3E 5P9

Dear Sir:

RE: Geophysical (Electromagnetic & Magnetometer) Survey on Mining Claims S 346895 et al in the Township of Scadding.

The Geophysical (Electromagnetic & Magnetometer) Survey assessment work credits as listed with my Notice of Intent dated December 6, 1982 have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1380

A. Barr:sc

cc: Northgate Exploration Limited
Toronto, Ontario

cc: Resident Geologist
Sudbury, Ontario

Ministry of
Natural
Resources

Ontario

Dec 23, 1982

Your file:

1982 12 06

Our file: 2.4211

Mining Recorder
Ministry of Natural Resources
199 Larch Street
Sudbury, Ontario
P3E 5P9

Dear Sir:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.

Yours very truly,

E.F. Anderson
Director
Lands Administration Branch

Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1316

A. Barr:sc

For further information, if required, please contact Mr. F.W. Matthews at 416/965-1380.

cc: Northgate Exploration Limited
Toronto, Canada

cc: Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Ministry of Natural Resources

Ontario

Notice of Intent

for Technical Reports

1982 02 06

2.4211

An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the "Special Provision-Performance and Coverage" method and you are of the opinion that a re-appraisal under the "Man-days" method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Lands Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.4211

Recorded Holder: SCADDING GOLD MINES LIMITED

Township or Area: SCADDING TOWNSHIP

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	S 346895 346897 to 99 inclusive 357987 to 90 inclusive 357993 to 96 inclusive 346915 357990 357993 to 95 359343 to 45 359360 373196 346900 478823 to 32 incl. 538818 to 22 incl. 538824 538828 to 33 incl. 546805 to 24 incl. 546827-28 546831 551173-75 551178 S 373196
Electromagnetic _____ days	
Magnetometer 40 days	
Radiometric _____ days	
Induced polarization _____ days	
Section 86 (18) _____ days	
Geological _____ days	
Geochemical _____ days	
Man days ☐ Airborne ☐	
Special provision ☐ Ground ☐	
☐ Credits have been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 86 (15a) for the following mining claims

10 days	20 days
S 551179	S 538823 538825

No credits have been allowed for the following mining claims

☒ not sufficiently covered by the survey ☐ Insufficient technical data filed

S 538826-27

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 86(18)-60:

828

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.4211

Recorded Holder: SCADDING GOLD MINES LIMITED

Township or Area: SCADDING TOWNSHIP

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical Electromagnetic 20 days Magnetometer ____ days Radiometric ____ days Induced polarization ____ days Section 86 (18) ____ days Geological ____ days Geochemical ____ days Man days ☐ Airborne ☐ Special provision ☒ Ground ☒ ☐ Credits have been reduced because of partial coverage of claims. ☐ Credits have been reduced because of corrections to work dates and figures of applicant.	S 478916 478919 to 26 incl. 478976 to 79 incl. 539384 539389-90 539397 to 400 incl. 539403 346895 346897 to 99 incl. 357987 to 90 incl. 357993 to 95 incl. 346915 357990 357993 to 95 incl. 359343 to 45 incl. 359360 373196 346900 478823 to 32 incl. 538818 to 22 incl. S 538824 538828 to 33 incl 546805 to 24 incl. 546827-28 546831 551173 to 75 incl. 373196

Special credits under section 86 (15a) for the following mining claims

5 days	10 days	15 days
S 551179	S 478917-18 478927-28 538823 538825	S 478891
q		

No credits have been allowed for the following mining claims

☒ not sufficiently covered by the survey ☐ Insufficient technical data filed

S 539391 to 96 incl.
539401-02
538826-27

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 86(18)-60:

828

81-97

Ministry of Natural Resources
Ontario

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

SCADDING TWP. (M.1092)

The Mining Act

FILED 5960 PW

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.

Type of Survey(s)	Township or Area
GROUND MAGNETICS AND VLF EM.	SCADDING TWP (M.1092)
Claim Holder(s)	**Prospector's Licence No.**
SCADDING GOLD MINES LTD	T1024
Survey Company	**Survey Dates (linecutting to office)** Day / Mo. / Yr. — Day / Mo. / Yr.	**Total Miles of line Cut**
MPH CONSULTING LTD	11 / 80 — 4 / 81	271 Km
Name and Address of Author (of Geo-Technical report)	
DAVE JONES #706 141 ADELAIDE W. TORONTO	

Special Provisions Credits Requested

Instructions
For first survey: Enter 40 days. (This includes line cutting)
For each additional survey: using the same grid: Enter 20 days (for each)

	Days per Claim
Geophysical	
- Electromagnetic	20
- Magnetometer	40
- Radiometric	
- Other	
Geological	
Geochemical	

Man Days

Instructions
Complete reverse side and enter total(s) here

	Days per Claim
Geophysical	
- Electromagnetic	
- Magnetometer	
- Radiometric	
- Other	
Geological	
Geochemical	

Airborne Credits

Note: Special provisions credits do not apply to Airborne Surveys.

	Days per Claim
Electromagnetic	
Magnetometer	
Radiometric	

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.

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
	SEE (2) ATTACHED SHEETS	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

SUDBURY MINING DIV RECEIVED NOV 16 1981 A.M. P.M.

RECEIVED
NOV 1 8 1981
MINING LANDS SECTION

Total number of mining claims covered by this report of work. 105

For Office Use Only

Total Days Cr. Recorded 5620

Date Recorded Nov 16/81

Mining Recorder W.C. Miller

Date Approved as Recorded

Regional/Branch Director

Report Completed

Date of Report OCT/21/81

Recorded Holder or Agent (Signature) G. Harper

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

G. HARPER [illegible]

Date Certified

Certified by, (Signature) G. HARPER

REGISTERED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

1362 (81/2)

Claims in Scadding Township

ID IV	S478891	40 man days	(Ground Magnetics Only)
	S478916	40 "	"
	S478917	40 "	"
	S478918	40 "	"
	S478919	40 "	"
	S478920	40 "	"
	S478921	40 "	"
	S478922	40 "	"
	S478923	40 "	"
	S478924	40 "	"
	S478925	40 "	"
	S478926	40 "	"
	S478927	40 "	"
	S478928	40 "	"
	S478976	40 "	"
	S478977	40 "	"
	S478978	40 "	"
	S478979	40 "	"
	S539389	40 "	"
	S538398 S539398	40 "	"
	S539384	40 "	"
	S539390	40 "	"
	S539391	40 "	"
	S539392	40 "	"
	S539393	40 "	"
	S539394	40 "	"
	S539395	40 "	"
	S539396	40 "	"
	S539397	40 "	"
	S539399	40 "	"
	S539400	40 "	"
	S539401	40 "	"
	S539402	40 "	"
	S539403	40 "	"
ID I	S346895	60 "	" (Ground Magnetics and VLF-EM)
	S346897	60 "	"
	S346898	60 "	"
	S346899	60 "	"
	S357987	60 "	"
	S357988	60 "	"
	S357989	60 "	"
	S357990	60 "	"
	S357993	60 "	"
	S357994	60 "	"
	S357995	60 "	"
	S357996	60 "	"
ID II	S346915	Included in Grids I and III	
	S357990		
	S357993		
	S357994		
	S357995		
	S359343		
	S359344		
	S359360		
	S373196		

Claims in Scadding Township (Con't)

GRID III	S346900	60 man days (Ground Magnetics and VLF-EM)
	S478823	60 " "
	S478824	60 " "
	S478825	60 " "
	S478826	60 " "
	S478827	60 " "
	S478828	60 " "
	S478829	60 " "
	S478830	60 " "
	S478831	60 " "
	S478832	60 " "
	S359343	60 " "
	S359344	60 " "
	S359345	60 " "
	S538818	60 " "
	S538819	60 " "
	S538820	60 " "
	S538821	60 " "
	S538822	60 " "
	S538823	60 " "
	S538824	60 " "
	S538825	60 " "
	S538826	60 " "
	S538827	60 " "
	S538828	60 " "
	S538829	60 " "
	S538830	60 " "
	S538831	60 " "
	S538832	60 " "
	S538833	60 " "
	S546805	60 " "
	S546806	60 " "
	S546807	60 " "
	S546808	60 " "
	S546809	60 " "
	S546810	60 " "
	S546811	60 " "
	S546812	60 " "
	S546813	60 " "
	S546814	60 " "
	S546815	60 " "
	S546816	60 " "
	S546817	60 " "
	S546818	60 " "
	S546819	60 " "
	S546820	60 " "
	S546821	60 " "
	S546822	60 " "
	S546823	60 " "
	S546824	60 " "
	S546827	60 " "
	S546828	60 " "
	S546831	60 " "

Claims in Scadding Township (Con't)

III	S551173	60 man days (Ground Magnetics and VLF-EM)
n't	S551174	60 " "
	S551175	60 " "
	S551178	60 " "
	S551179	60 " "
	S373196	60 " "

TOTAL CLAIMS 105 TOTAL DAYS 5620

TOTAL CLAIMS AT 40 MAN DAYS 34 (Magnetometer Survey only)

TOTAL CLAIMS AT 60 MAN DAYS 71 (Magnetometer and VLF-EM Surveys)

Ministry of Natural Resources
Ontario

Geotechnical Report Approval

File 2.4211

Mining Lands Comments

☑ To: Geophysics Mr. Barlow.

Comments

☑ Approved ☐ Wish to see again with corrections | Date Oct 6/82 | Signature

☐ To: Geology - Expenditures

Comments

☐ Approved ☐ Wish to see again with corrections | Date | Signature

☐ To: Geochemistry

Comments

☐ Approved ☐ Wish to see again with corrections | Date | Signature

☐ To: Mining Lands Section, Room 6462, Whitney Block. (Tel: 5-1380)

1593 (81/10)

NORTHGATE EXPLORATION LIMITED

SUITE [redacted] P.O. BOX 143, 1 FIRST CANADIAN PLACE, TORONTO, CANADA M5X 1C7 • TELEPHONE (416) 362-6683 • TELEX 06-217768

RECEIVED
Land Management Branch
CIRCULATE ☐
COMMENTS PLEASE ☐
BY

JUL 29 1982

E. F. ANDERSON
J. R. MORTON
J. C. SMITH
[illegible]
J. M. SMALL

RETURN TO R.6450

July 28th, 1982

Your File: 2.4211

Mr. E. F. Anderson
Director
Land Management Branch
Whitney Block, Room 6450
Queen's Park
Toronto, Ontario M7A 1W3

Dear Mr. Anderson,

Re: Geophysical (Electromagnetic and Magnetometer) Survey re Mining Claims: S 346895 et al, Scadding Township

Enclosed, please find the V.L.F. maps for the above mentioned survey which have now had the values added as per your request. Furthermore, I enclose the Grid III maps, now showing the north direction.

For further assistance, please don't hesitate to contact me.

Yours truly,

NORTHGATE EXPLORATION LIMITED

A. Pelley
for

W. W. Weber
Manager of Exploration

/hp

cc: Mining Recorder
Sudbury, Ontario

Encl.

1982 06 21 2.4211

Northgate Exploration Limited
Suite 3140 - 1 First Canadian Place
P.O. Box 143
Toronto, Ontario
M5X 1C7

Attn: Mr. W.W. Weber

Dear Sir:

RE: Geophysical (Electromagnetic and Magnetometer) Survey submitted on Mining Claims: S 346895 et al in the Township of Scadding

Enclosed are the V.L.F. maps for the above-mentioned survey. These maps must show the values of the readings taken at each station point, i.e., raw data. Also the Grid III maps are missing the north direction.

For further information, please contact Mr. F.W. Matthews at 965-6918.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1316

A. Barr/amc

Encl.

cc: Mining Recorder
Sudbury, Ontario

NORTHGATE EXPLORATION LIMITED
SUITE 3140, P.O. BOX 143, 1 FIRST CANADIAN PLACE, TORONTO, CANADA M5X 1C7 • TELEPHONE (416) 362-6683 • TELEX 06-217766

RECEIVED
OCT 2 1 1981
MINING LANDS SECTION

Ministry of Natural Resources
Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A-1W3

Attention: Mr. Fred Matthews

Dear Mr. Matthews:

Enclosed please find the Mining Act of Work for the Magnetic and Electromagnetic Survey conducted over 105 claims in Scadding Township. Application is being made for 40 man days credit on 34 claims and 60 man days credit on 71 claims.

I hope this report is to your satisfaction. Should any further information be required please do not hesitate to contact me.

Yours truly

W.W. Weber
Manager of Exploration
North America

Enclosed: 2 copies of Geophysical Data Statement

1 copy of the Mining Act Report of Work including claims schedule and invoices

2 copies of the Geophysical Report on the Scadding Township Project Sudbury, Ontario . Report by MPH Consulting Ltd. for Northgate Exploration. (Volume 1 and Map Volume 2)

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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.

RECEIVED
OCT 2 1 1981
MINING LANDS SECTION

Type of Survey(s) Magnetometer, VLF-EM

Township or Area Scadding Township

Claim Holder(s) Northgate Exploration Limited
Toronto, Ontario

Survey Company MPH Consulting

Author of Report Dave Jones

Address of Author 706-141 Adelaide Street West, Toronto

Covering Dates of Survey November 1980 - April 1981
(linecutting to office)

Total Miles of Line Cut 271 km.

MINING CLAIMS TRAVERSED
List numerically

See list attached
(prefix) (number)

If space insufficient, attach list

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
--Electromagnetic	20
--Magnetometer	40
--Radiometric	
--Other	
Geological	
Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: October 20/81 SIGNATURE: W. J. Dickie
Author of Report or Agent

Res. Geol. _____ Qualifications 0.2759

Previous Surveys

File No.	Type	Date	Claim Holder

LD

TOTAL CLAIMS _____

OFFICE USE ONLY

837 (5/79)

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey

Number of Stations Mag 13,800, VLF 11,600 Number of Readings Mag 13,800, VLF 11,600

Station interval #1 100', #2 50', #3, 4 25 m Line spacing #1 100', #2 50', #3, 4 100 m

Profile scale 1 cm = 10%

Contour interval 100 gammas and 25 gammas

MAGNETIC

Instrument McPhar GP70 Proton Precession

Accuracy – Scale constant +- 1 gamma, +- 15 ppm of field under measurement

Diurnal correction method Barringer M123 Base Station

Base Station check-in interval (hours) 10 sec. intervals

Base Station location and value Base camp

ELECTROMAGNETIC

Instrument EM 16

Coil configuration Horizontal Loop

Coil separation As per grid

Accuracy +- 1%

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

Frequency Cutler Maine 17.8 khz
(specify V.L.F. station)

Parameters measured Tilt angle of axis of polarization ellipse

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

INDUCED POLARIZATION RESISTIVITY

Instrument

Method ☐ Time Domain ☐ Frequency Domain

Parameters -- On time Frequency

-- Off time Range

-- Delay time

-- Integration time

Power

Electrode array

Electrode spacing

Type of electrode

Claims in Scadding Township

GRID IV	S478891	40 man days	(Ground Magnetics Only)
	S478916	40 " "	
	S478917	40 " "	
	S478918	40 " "	
	S478919	40 " "	
	S478920	40 " "	
	S478921	40 " "	
	S478922	40 " "	
	S478923	40 " "	
	S478924	40 " "	
	S478925	40 " "	
	S478926	40 " "	
	S478927	40 " "	
	S478928	40 " "	
	S478976	40 " "	
	S478977	40 " "	
	S478978	40 " "	
	S478979	40 " "	
	S539389	40 " "	
	S538398	40 " "	
	S539384	40 " "	
	S539390	40 " "	
	S539391	40 " "	
	S539392	40 " "	
	S539393	40 " "	
	S539394	40 " "	
	S539395	40 " "	
	S539396	40 " "	
	S539397	40 " "	
	S539399	40 " "	
	S539400	40 " "	
	S539401	40 " "	
	S539402	40 " "	
	S539403	40 " "	
GRID I	S346895	60 " "	(Ground Magnetics and VLF-EM)
	S346897	60 " "	
	S346898	60 " "	
	S346899	60 " "	
	S357987	60 " "	
	S357988	60 " "	
	S357989	60 " "	
	S357990	60 " "	
	S357993	60 " "	
	S357994	60 " "	
	S357995	60 " "	
	S357996	60 " "	
GRID II	S346915	Included in Grids I and III	
	S357990		
	S357993		
	S357994		
	S357995		
	S359343		
	S359344		
	S359360		
	S373196		

Claims in Scadding Township (Con't)

GRID III	S346900	60 man days (Ground Magnetics and VLF-EM)
	S478823	60 " "
	S478824	60 " "
	S478825	60 " "
	S478826	60 " "
	S478827	60 " "
	S478828	60 " "
	S478829	60 " "
	S478830	60 " "
	S478831	60 " "
	S478832	60 " "
	S359343	60 " "
	S359344	60 " "
	S359345	60 " "
	S538818	60 " "
	S538819	60 " "
	S538820	60 " "
	S538821	60 " "
	S538822	60 " "
	S538823	60 " "
	S538824	60 " "
	S538825	60 " "
	S538826	60 " "
	S538827	60 " "
	S538828	60 " "
	S538829	60 " "
	S538830	60 " "
	S538831	60 " "
	S538832	60 " "
	S538833	60 " "
	S546805	60 " "
	S546806	60 " "
	S546807	60 " "
	S546808	60 " "
	S546809	60 " "
	S546810	60 " "
	S546811	60 " "
	S546812	60 " "
	S546813	60 " "
	S546814	60 " "
	S546815	60 " "
	S546816	60 " "
	S546817	60 " "
	S546818	60 " "
	S546819	60 " "
	S546820	60 " "
	S546821	60 " "
	S546822	60 " "
	S546823	60 " "
	S546824	60 " "
	S546827	60 " "
	S546828	60 " "
	S546831	60 " "

Claims in Scadding Township (Con't)

GRID III Con't	S551173	60 man days (Ground Magnetics and VLF-EM)
	S551174	60 " "
	S551175	60 " "
	S551178	60 " "
	S551179	60 " "
	S373196	60 " "

TOTAL CLAIMS 105 TOTAL DAYS 5620

TOTAL CLAIMS AT 40 MAN DAYS 34 (Magnetometer Survey only)

TOTAL CLAIMS AT 60 MAN DAYS 71 (Magnetometer and VLF-EM Surveys)

SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

_____

Corrections made _____

_____

RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

_____

Additional information (for understanding results) _____

_____

_____

AIRBORNE SURVEYS

Type of survey(s) _____

Instrument(s) _____

(specify for each type of survey)

Accuracy _____

(specify for each type of survey)

Aircraft used _____

Sensor altitude _____

Navigation and flight path recovery method _____

_____

Aircraft altitude _____ Line Spacing _____

Miles flown over total area _____ Over claims only _____

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken_____

Total Number of Samples_____

Type of Sample_____
(Nature of Material)

Average Sample Weight_____

Method of Collection_____

Soil Horizon Sampled_____

Horizon Development_____

Sample Depth_____

Terrain_____

Drainage Development_____

Estimated Range of Overburden Thickness_____

SAMPLE PREPARATION

(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis_____

General_____

ANALYTICAL METHODS

Values expressed in: per cent ☐
p. p. m. ☐
p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others_____

Field Analysis (_____tests)

Extraction Method_____

Analytical Method_____

Reagents Used_____

Field Laboratory Analysis

No. (_____tests)

Extraction Method_____

Analytical Method_____

Reagents Used_____

Commercial Laboratory (_____tests)

Name of Laboratory_____

Extraction Method_____

Analytical Method_____

Reagents Used_____

General_____

→ B. Copas.

MPH Consulting Limited

141 Adelaide Street W., Suite 706, Toronto, Canada M5H 3L5

March 31, 1981

RECEIVED
APR 10 1981

Northgate Exploration Ltd.
P.O. Box 143
First Canadian Place
Toronto, Ontario M5X 1C7

C429 Scadding

TO: Professional Services

D. Jones	3 hours at $40	$ 120.00
D. Hall	14 days at $150	2,100.00
M. Bickers	14 days at $125	1,750.00
D. Johnston	5 days at $125	625.00
T.R.Kraft	14 days at $125	1,750.00
M. Nadjiwan	4 days at $125	500.00
		$6,845.00

Up to March 23.

Equipment Rental:
VLF-EM Unit 13 days at $17 $ 221.00

Disbursements: Page Two $2,710.59

$9,776.59

...2

772 ?
723 ?
725 ?

all charges to be distributed in this fashion 40% 7% 27% 16% 10%

RB

CODE	AMOUNT	
~~722~~ 401	9776	59
722 - 401	4497	23
723 - 401	654	36
724 - 401	2639	48
725 - 401	1564	25
726 - 401 TOTAL	391	07
CHECKED		
13-4-81.		
APPROVED		

TOTAL

Rob - Please

Cable: GEOCONSUL

Telephone: (416) 363-6375
363-4002

C429

TO: Disbursements

College Copy Shop		$12.25 ✓
BPX Delivery		5.05 ✓
BPX Delivery		5.05 ✓
Bell Canada	R1767	10.22 ✓
McPhar Instruments	R1785	636.93 ✓
McPhar Instruments	R1786	432.55 ✓
Langridge	R1784	52.91 ✓
Project Truck	R1780	588.50 ✓
D. Hall Exp. Acct.	R1067	99.98 ✓
D. Hall Exp. Acct.	R1067	54.33 ✓
Geonics		566.40 ✓
		$2,464.17
Administration 10%		246.42
		$2,710.59

MPH Consulting Limited

Suite 706, 141 Adelaide St. W
Toronto, Canada M5H 3L5
(416) 363-6375
(416) 363-4002
Telex 06-219626

Peggy Martin.

April 30, 1981

Northgate Exploration Ltd.
P.O. Box 143
First Canadian Place
Toronto, Ontario
M5X 1C7

RECEIVED
MAY 14 1981

C-429 Scadding

TO: Professional Services

D. Jones	4.75 hours	@ $ 40	$ 190.00
D. Hall	14 days	@ $150	2,100.00
D. Johnston	13 days	@ $125	1,625.00
M. Bickers	13 days	@ $125	1,625.00
Tom Kraft	20 days	@ $125	2,500.00
			$8,040.00

Equipment Rental:

VLF-EM Unit	13 days	@ $ 17	$ 221.00
Disbursements			$1,345.79
			$9,606.79

...2

772 - 401 = 25% 2401-70
724 - 401 = 25% 2401-70
723 - 401 = 12 1/2%. 12[illegible]
725 - 401 = 12 1/2%. 12[illegible]
726 - 401 = 12 1/2% 12[illegible]
727 - 401 = 12 1/2 %. 12[illegible]

CODE	AMOUNT
TOTAL	
CHECKED	
9-6-81.	
APPROVED	

C-429 Scadding

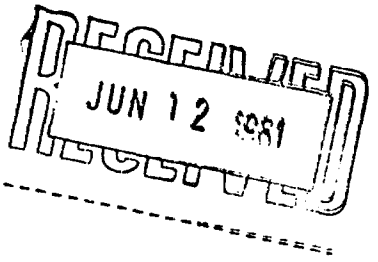
TO: Disbursements:

D. Johnston Expense Account		$ 27.25
Barringer Research	R1852	650.03
J. Siriunas Expense Account		1.07
D. Hall Expense Account	R1102	208.10
Barringer Research	R1882	325.01
D. Hall Expense Account		11.99
		$1,223.45
Administration 10%		122.34
		$1,345.79

MPH Consulting Limited

Suite 706, 141 Adelaide St. W.
Toronto, Canada M5H 3L5
(416) 363-6375
(416) 363-4002
Telex 06-219626

May 30, 1981



Northgate Exploration Ltd.
PO Box 143
First Canadian Place
Toronto, Ontario
M5X 1C7

C429 Scadding

TO: Professional Services

D. Jones	12.5 hours @ $40/hour	$ 500.00
T. Kraft	8 days @ $125/day	1000.00
		$1500.00

Disbursements

Geo Cartographic Services Ltd.	R1897	27.94
Geo Cartographic Services Ltd.	R1907	304.82
Project Truck Rentals Ltd.	R1929	974.30
Credit for D. Johnston Exp. Acct.- Invoiced in April		(27.25)
		$1279.81
Administration - 10%		127.98
		$1407.79

TOTAL: $2,907.79

CODE		AMOUNT	
723-401	20%		
724-401	30%		
725-401	20%		
726-401	20%		
727-401	10%		
	TOTAL		
CHECKED			
	19-6-81		
APPROVED			

Check insurance element on windshield repair.

MPH Consulting Limited

Date: June 30, 1981

Invoice No. 0115

Page No. C-429 Scadding Township

Northgate Exploration Co. Ltd.
P.O. Box 143
First Canadian Place
Toronto, Ontario M5X 1C7

TO: Professional Services

D. Jones	21.5 hours	at $40	$860.00	
D. Hall	1 day	at $150	150.00	
T.R.Kraft	9 days	at $125	1,125.00	$2,135.00

Disbursements:

Geo Cartographic Services	R2081	$3,095.64	
Geo Cartographic Services	R2080	52.00	
Geo Cartographic Services	R2079	107.86	
Bell Canada		2.43	
Geo Cartographic Services	R3069	2.41	
Geo Cartographic Services	R3067	20.54	
Geo Cartographic Services	R3066	106.57	
		$3,387.45	
Administration - 10%		338.75	$3,726.20
			$5,861.20

CODE	AMOUNT
123-401 - 260	117284
724-401 - 20	175838
725-401 - 20	117284
726-401 - 20	117224
727-401-10	56.10
TOTAL	561.20

CHECKED

16-7-81.

APPROVED

1981 10 22 2.4211

Mining Recorder's Office
Ministry of Natural Resources
199 Larch Street,
Sudbury, Ontario
P3E 5P9

Dear Sir;

We have received reports and maps for a Geophysical (Electromagnetic and Magnetometer) survey submitted under Special Provisions (credit for Performance and Coverage) on mining claims S 346895 et al in the Township of Scadding.

This material will be examined and assessed andaa staeement of assessment work credits will be issued.

Yours very truly

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6450
Queen's Park
Toronto, ontario
M7A 1W3
Phone 416/965-1380

Joan Skura

cc: Northgate Exploration Limited
Toronto, Ontario

MPH Consulting
Toronto, Ontario

FILE: 2.4211

GEOTECHNICAL REPORT APPROVAL

MINING LANDS COMMENTS: L.D

V.L.F. survey maps do not have readings [illegible] North direction [illegible]

☑ GEOPHYSICS Mr. Barlow.

- VLF maps need readings
- Grid III maps missing north direction

DATE: Feb 22/82		APPROVED
SIGNATURE: [signature]	✓	WISH TO SEE AGAIN WITH CORRECTIONS

☐ GEOLOGY - EXPENDITURES

DATE:		APPROVED
SIGNATURE:		WISH TO SEE AGAIN WITH CORRECTIONS

☐ GEOCHEMISTRY

DATE:		APPROVED
SIGNATURE:		WISH TO SEE AGAIN WITH CORRECTIONS

☐ RETURN TO F. W. MATTHEWS, ROOM 6452 WHITNEY BLOCK (5-1380)

Ministry of Natural Resources
Ontario

A separate form is required for each type of work to be recorded.

THE MINING ACT REPORT OF WORK

To the Recorder of Sudbury Mining Division

I, W. W. Weber, for Northgate Exploration Limited T835
name of Recorded Holder Prospector's Licence

P.O. Box 143, 1 First Canadian Place, Toronto, Ontario M5X 1C7
Post Office Address

do hereby report the performance of 5670 20 days of Geophysical type of work

not before reported to be applied on the following contiguous claims

Claim No.	Days	Claim No.	Days	Claim No.	Days
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....

All the work was performed on Mining Claim (s) See attached sheet
(In the case of geological and/or geophysical survey (s) where more than 18 claims are involved attach a schedule)

READ CAREFULLY: THE FOLLOWING INFORMATION IS REQUIRED BY THE MINING RECORDER.

For Manual Work, Stripping or Opening up of Mines, Sinking Shafts or Other Actual Mining Operations – Names and addresses of the men who performed the work and the dates and hours of their employment.
For Diamond and other Core Drilling - Footage, No. and angle of holes and diameter of core. Name and address of owner or operator of drill. Dates when drilling was done. Signed core log and sketch in duplicate.
For Compressed Air or Other Power Driven or Mechanical Equipment
Type of drill or equipment. Names and addresses of men engaged in operating equipment and the dates and hours of their employment.
For Power Stripping - Type of equipment. Name and address of owner or operator. Amount expended. Dates on which work was done. Proof of actual cost must be submitted within 30 days of recording.
With each of the above types of work sketches are required to show the location and extent of the work in relation to the nearest claim post. In the case of diamond or other core drilling the sketch must be submitted in duplicate.
For Geophysical, Geological, Geochemical Surveys and Expenditure Credits - the name of author of report. Covering dates of survey (linecutting & office). Type of instrument used. Total amount of expenditure. Technical reports, maps, expenditure breakdown, receipts must be filed in duplicate with the Minister within 60 days of recording.
For Land Survey - the name and address of Ontario Land surveyor.

The Required Information is as Follows: (Attach a list if this space is insufficient)

Contractor MPH Consulting, D. Jones
Date of Survey, Line cutting commenced October 1980, Geophysical report was submitted July 1981
VLF-EM survey - EM 16 instrument
Magnetometer survey - GP 70 Proton Magnetometer with BM 123 Base Station
Copies of line cutting charges and MPH billing enclosed.

Date October 20 1981 W. W. Weber
Signature of Recorded Holder or Agent

The Mining Act
Certificate Verifying Report of Work

I, W.W. Weber
202 Burbank Drive, Willowdale, Ontario M2K-1P7
(Post Office Address)

hereby certify:

1. 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.

2. That the annexed report is true.

Dated October 20, 1981 19 W. W. Weber
Signature

THE PENALTY FOR MAKING A FALSE STATEMENT IN THIS REPORT AND/OR CERTIFICATE IS $500. OR SIX MONTHS IMPRISONMENT OR BOTH

9[illegible] (3/77)

Rathbun Twp. - M.1071

Kelly Twp. -M.963-

Maclennan Twp. - M.841

Davis Twp. - M.748

Street Twp. - M.1145

NOTE

Mining Rights of the land and land under the waters of Wanapitei Lake are WITHDRAWN from staking out, under Sec 43 of the Mining Act, Order No 67/76 dated Nov. 17, 1976. File 7598 v.9

THE TOWNSHIP OF SCADDING

DISTRICT OF SUDBURY

SUDBURY MINING DIVISION

SCALE: 1-INCH 40 CHAINS

LEGEND

PATENTED LAND	● or Ⓟ
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.
PATENTED S.R.O.	
QUARRY PERMIT	Ⓠ

NOTES

400' Surface Rights Reservation along the shores of all lakes and rivers.

Flooding rights along the shore of Wanapitei Lake and islands therein to elevation 100.5' reserved to H.E.P.C. - L.O.6186. File: 43815.

Islands in Wanapitei Lake withdrawn from staking under Sec. 38 (c) R.S.O.1970 of Mining Act.

SAND AND GRAVEL

Ⓠ QUARRY PERMIT

2.4211

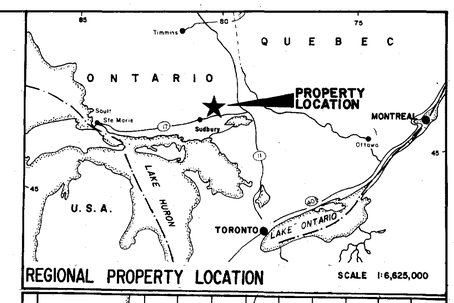
DATE OF ISSUE
OCT 29 1981
Ministry of Natural Resources
TORONTO

PLAN NO. M.1092

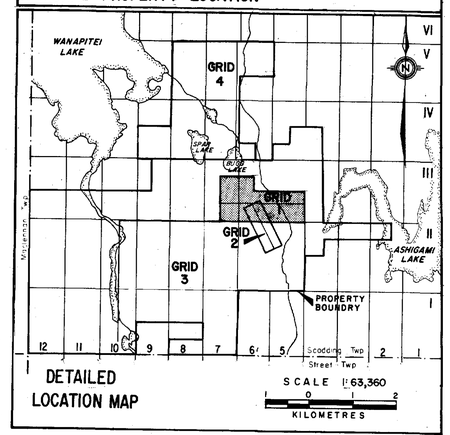
ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

41110NE0179 2.4211 SCADDING

200



REGIONAL PROPERTY LOCATION SCALE 1:6,625,000



DETAILED LOCATION MAP

N

396·24 N
365·76 N
335·28 N
304·80 N
274·32 N
243·84 N
213·36 N
182·88 N
152·40 N
121·92 N
91·44 N
60·96 N
30·48 N
BL 0
30·48 S
60·96 S
91·44 S
121·92 S
152·40 S
182·88 S
213·36 S
243·84 S
274·32 S
304·80 S
335·28 S
365·76 S
396·24 S
426·72 S
457·20 S
487·68 S

L 243·84 W
L 213·36 W
L 182·88 W
L 152·40 W
L 121·92 W
L 91·44 W
L 60·96 W
L 30·48 W
L 0
L 30·48 E
L 60·96 E
L 91·44 E
L 121·92 E
L 152·40 E
L 182·88 E
L 213·36 E
L 243·84 E
L 274·32 E
L 304·80 E
L 335·28 E
L 365·76 E
L 396·24 E
L 426·72 E
L 457·20 E
L 487·68 E
L 518·16 E
L 548·68 E
L 579·12 E
L 609·60 E
L 640·08 E
L 670·56 E
L 701·04 E
L 731·52 E
L 762·00 E

BASE LINE AZIMUTH 180°

SHEET INDEX

SCALE
50 0 50 100
METRES

L E G E N D

INSTRUMENT: McPhar GP-70 Proton Magnetometer

58722 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

Fault (interpreted)

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT
GRID I

MAGNETOMETER SURVEY

Project No: C429	By D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No 1	Date March, 1981

MPH Consulting Limited

J. 4211

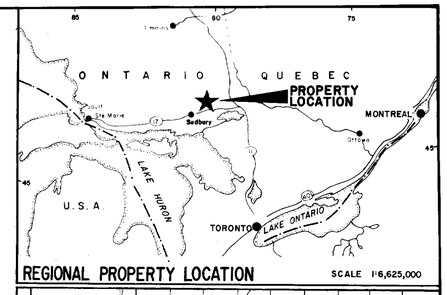
41110NE0179 2.4211 SCADDING

731 52 N
701 04 N
670 56 N
640 08 N
609 60 N
579 12 N
548 64 N
518 16 N
487 68 N
457 20 N
426 72 N
396 24 N
365 76 N
335 28 N
304 80 N
274 32 N
243 84 N
213 36 N
182 88 N
152 40 N
121 92 N
91 44 N
60 96 N
30 48 N
BL 0
30 48 S
60 96 S
91 44 S
121 92 S
BL 152 40 S
182 88 S
213 36 S
243 84 S
274 32 S
304 80 S
335 28 S
365 76 S
396 24 S
426 72 S
457 20 S
487 68 S

L 1249 68 W
L 1219 20 W
L 1188 72 W
L 1158 24 W
L 1127 76 W
L 1097 28 W
L 1066 80 W
L 1036 32 W
L 1005 84 W
L 975 36 W
L 944 88 W
L 914 40 W
L 883 92 W
L 853 44 W
L 822 96 W
L 792 48 W
L 762 00 W
L 731 52 W
L 701 04 W
L 670 56 W
L 640 08 W
L 609 60 W
L 579 12 W
L 548 64 W
L 518 16 W
L 487 68 W
L 457 20 W
L 426 72 W
L 396 24 W
L 365 76 W
L 335 28 W
L 304 80 W
L 274 32 W
L 243 84 W

BASE LINE AZIMUTH 180°

N



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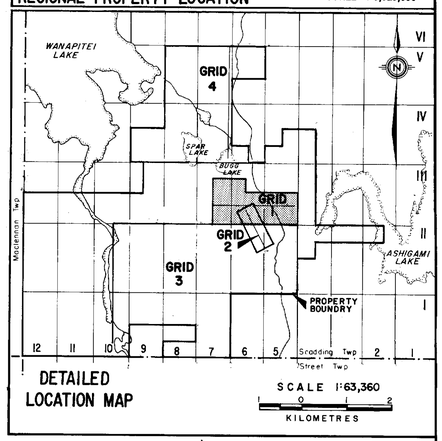


DETAILED LOCATION MAP SCALE 1:63,360
0 1 2 KILOMETRES

LEGEND

INSTRUMENT: McPhar GP-70 Proton Magnetometer

58722 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS Interval 100 gammas

500 gamma

100 gamma

Fault (interpreted)

SHEET INDEX

SCALE
50 0 50 100
METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT
GRID I

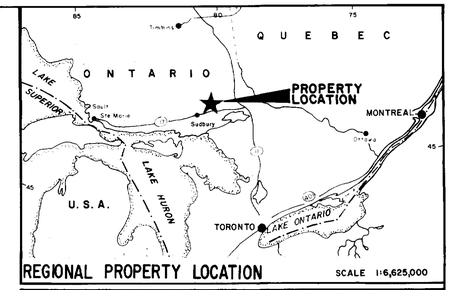
MAGNETOMETER SURVEY

Project No: C429	By D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 2	Date: March, 1981

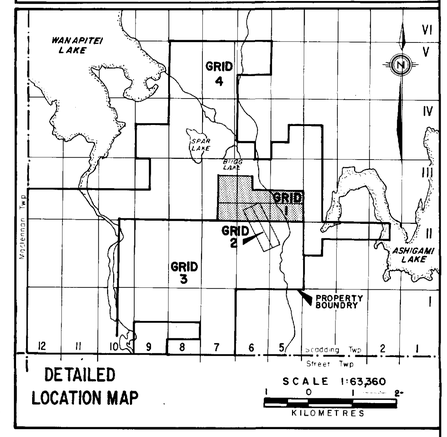
MPH Consulting Limited

41118NE8179 2.4211 SCADDING

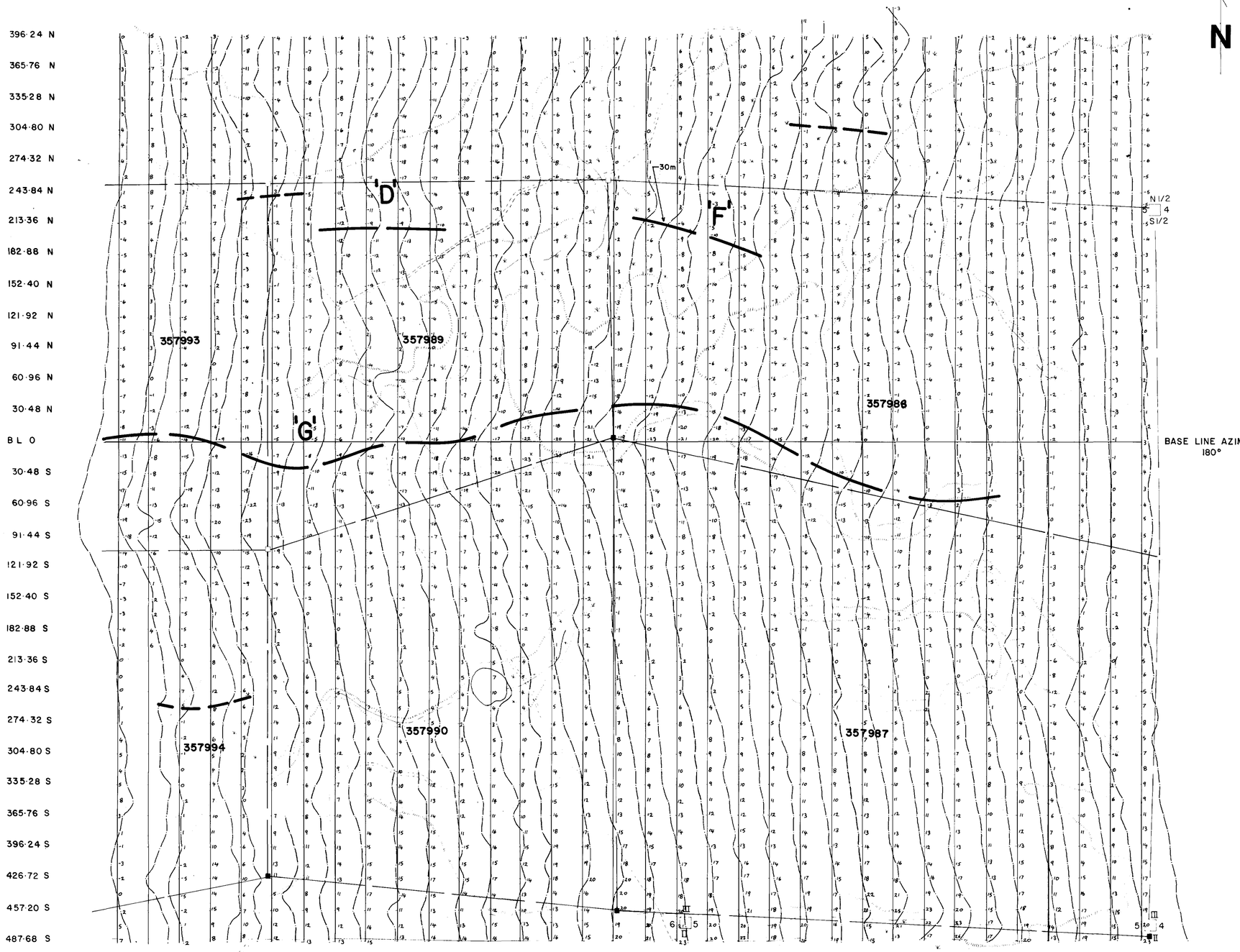
2.4211



REGIONAL PROPERTY LOCATION SCALE 1:6,625,000



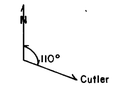
DETAILED LOCATION MAP SCALE 1:63,360 KILOMETRES



LEGEND

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz



- Inphase Profile
- +10% / 0 / −10% — Vertical Scale 1cm = 10%
- Concession Post
- Claim Post
- Claim Post (By Extrapolation)
- Claim Line
- Creek (Arrow Indicates Flow)
- Swamp
- Road
- Slope
- Lake, Pond
- Diabase Conductor Axis
- Moderate Conductor Axis
- Weak Conductor Axis
- Inphase Readings

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT
GRID I
VLF-EM PROFILES

Project No: C429	By D. JONES
Scale: 1:2000	Drawn D. H.
Drawing No 3	Date March, 1981

MPH Consulting Limited

41118NE0179 2.4211 SCADDING

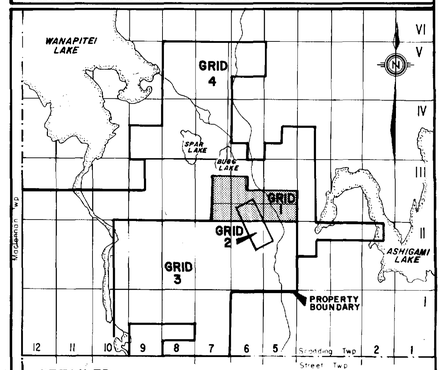
2.4211

731.52 N
701.04 N
670.56 N
640.08 N
609.60 N
579.12 N
548.64 N
518.16 N
487.68 N
457.20 N
426.72 N
396.24 N
365.76 N
335.28 N
304.80 N
274.32 N
243.84 N
213.36 N
182.88 N
152.40 N
121.92 N
91.44 N
60.96 N
30.48 N
BL 0
30.48 S
60.96 S
91.44 S
121.92 S
BL 152.40 S
182.88 S
213.36 S
243.84 S
274.32 S
304.80 S
335.28 S
365.76 S
396.24 S
426.72 S
457.20 S
487.68 S

346897
346898
346899
346895
357996
357995
357993
357994
E
E'
G
G'
BASE LINE AZIMUTH 180°

L 1249.68 W
L 1219.20 W
L 1188.72 W
L 1158.24 W
L 1127.76 W
L 1097.28 W
L 1066.80 W
L 1036.32 W
L 1005.84 W
L 975.36 W
L 944.88 W
L 914.40 W
L 883.92 W
L 853.44 W
L 822.96 W
L 792.48 W
L 762.00 W
L 731.52 W
L 701.04 W
L 670.56 W
L 640.08 W
L 609.60 W
L 579.12 W
L 548.64 W
L 518.16 W
L 487.68 W
L 457.20 W
L 426.72 W
L 396.24 W
L 365.76 W
L 335.28 W
L 304.80 W
L 274.32 W
L 243.84 W

REGIONAL PROPERTY LOCATION SCALE 1:6,625,000



DETAILED LOCATION MAP SCALE 1:63,360
KILOMETRES

LEGEND

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz

110° Cutler

Inphase Profile

+10% 0 -10% Vertical Scale 1cm=10%

Concession Post

Claim Post

Claim Post (By Extrapolation)

Claim Line

Creek (Arrow indicates Flow)

Swamp

Road

Slope

Lake, Pond

Diabase Conductor Axis

Moderate Conductor Axis

Weak Conductor Axis

Inphase Readings

SHEET INDEX

SCALE
50 0 50 100
METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT
GRID I

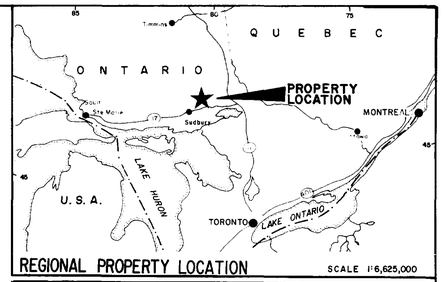
VLF-EM PROFILES

Project No: C429	By D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 4	Date: March, 1981

MPH Consulting Limited

41118NE0179 2.4211 SCADDING

2.4211



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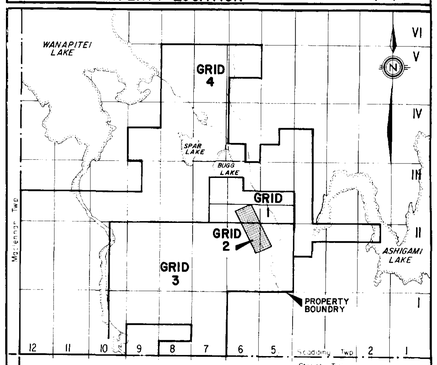


DETAILED LOCATION MAP SCALE 1:63,360

KILOMETRES 0 1 2

N

304·80 W
274·32 W
243·84 W
213·36 W
182·88 W
152·40 W
121·92 W
91·44 W
60·96 W
30·48 W
BL 0
30 48 E
60·96 E
91·44 E
121·92 E
152·40 E
182·88 E
213·36 E
243·84 E
274·32 E
304·80 E

L 304·80 S
L 274·32 S
L 243·84 S
L 213·36 S
L 182·88 S
L 152·40 S
L 121·92 S
L 91·44 S
L 60·96 S
L 30·48 S
L 0
L 30·48 N
L 60·96 N
L 91·44 N
L 121·92 N
L 152·40 N
L 182·88 N
L 213·36 N
L 243·84 N
L 274·32 N
L 304·80 N
L 335·28 N
L 365·76 N
L 396·24 N
L 426·72 N
L 457·20 N
L 487·68 N
L 518·16 N
L 548·64 N
L 579·12 N
L 609·60 N
L 640·08 N
L 670·56 N
L 701·04 N
L 731·52 N

BASE LINE AZIMUTH 335°

LEGEND

INSTRUMENT: McPhar GP-70 Proton Magnetometer

58722 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

Fault (interpreted)

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID II

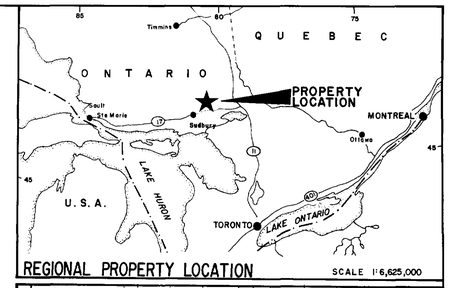
MAGNETOMETER SURVEY

Project No: C429	By D. JONES
Scale: 1:2000	Drawn D. H.
Drawing No 5	Date March, 1981

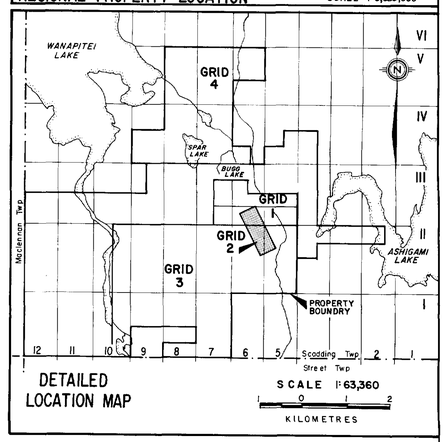
MPH Consulting Limited

41118NE0179 2.4211 SCADDING

2.4211

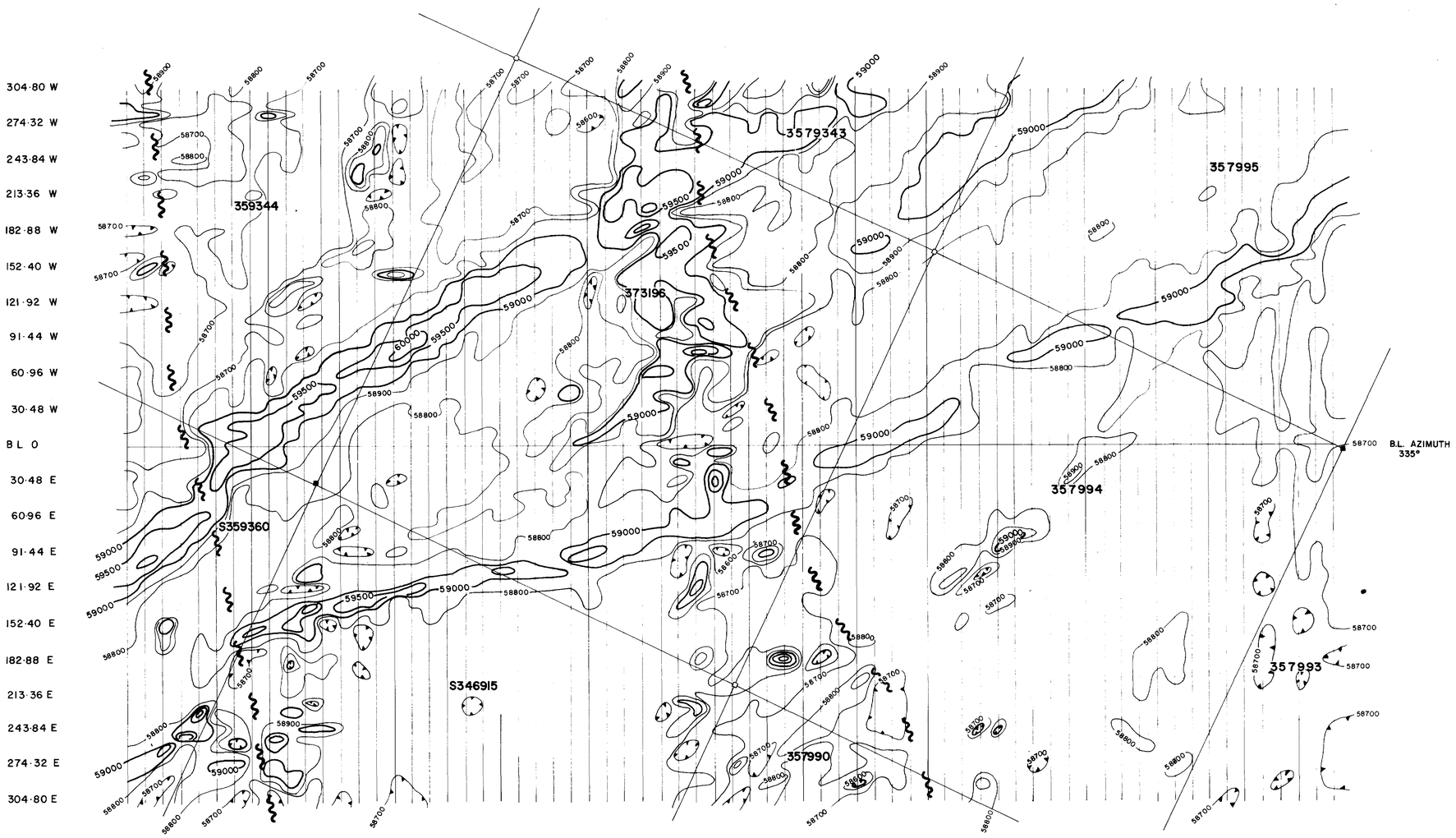


REGIONAL PROPERTY LOCATION SCALE 1"6,625,000



DETAILED LOCATION MAP SCALE 1"63,360

0 1 2 KILOMETRES



L E G E N D

- Magnetic Contour
- Magnetic Depression
- CONTOURS: Interval 100 gammas
- 500 gamma
- 100 gamma
- Fault (Interpreted)

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID II

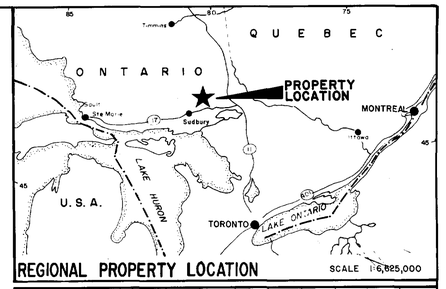
CONTOURED MAGNETOMETER

Project No: C429	By: D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 5A	Date: March, 1981

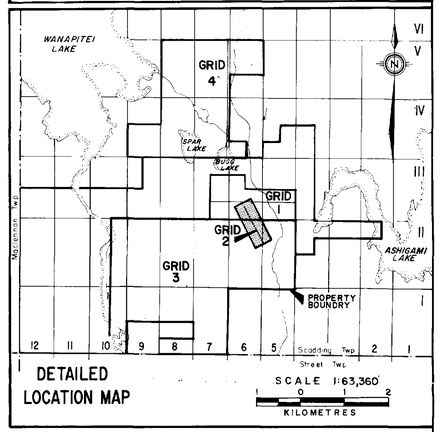
MPH Consulting Limited

41110NE8179 2.4211 SCADDING

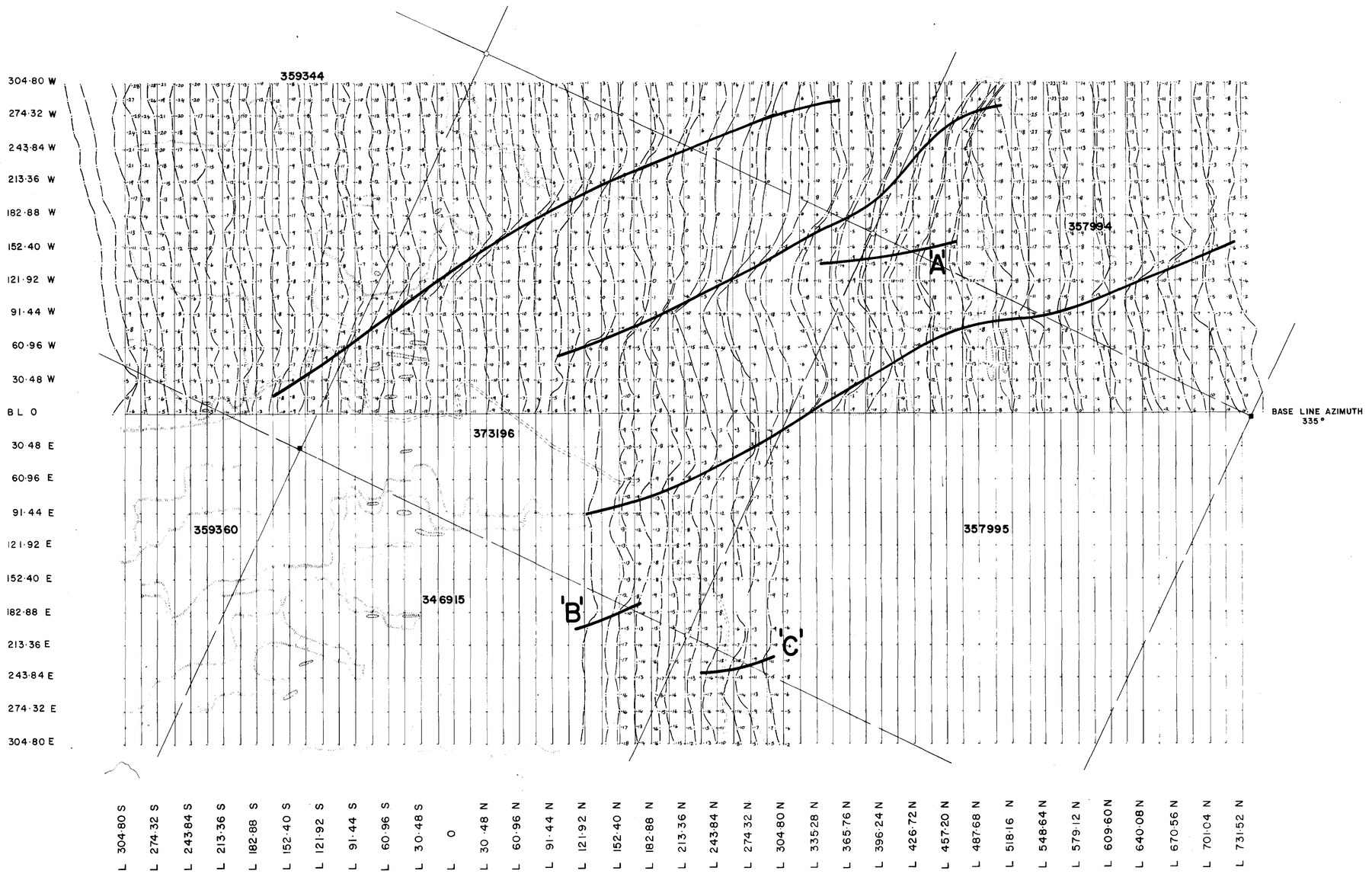
J. 4211



REGIONAL PROPERTY LOCATION SCALE 1:6,825,000



DETAILED LOCATION MAP SCALE 1:63,360 KILOMETRES



BASE LINE AZIMUTH 335°

BASE LINE AZIMUTH 335°

LEGEND

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz

110° Cutler

Inphase Profile

+10% 0 −10% Vertical Scale 1cm=10%

Concession Post

Claim Post

Claim Post (By Extrapolation)

Claim Line

Creek (Arrow Indicates Flow)

Swamp

Road

Slope

Lake, Pond

Diabase Conductor Axis

Moderate Conductor Axis

Weak Conductor Axis

+17 −12 Inphase Readings

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID II

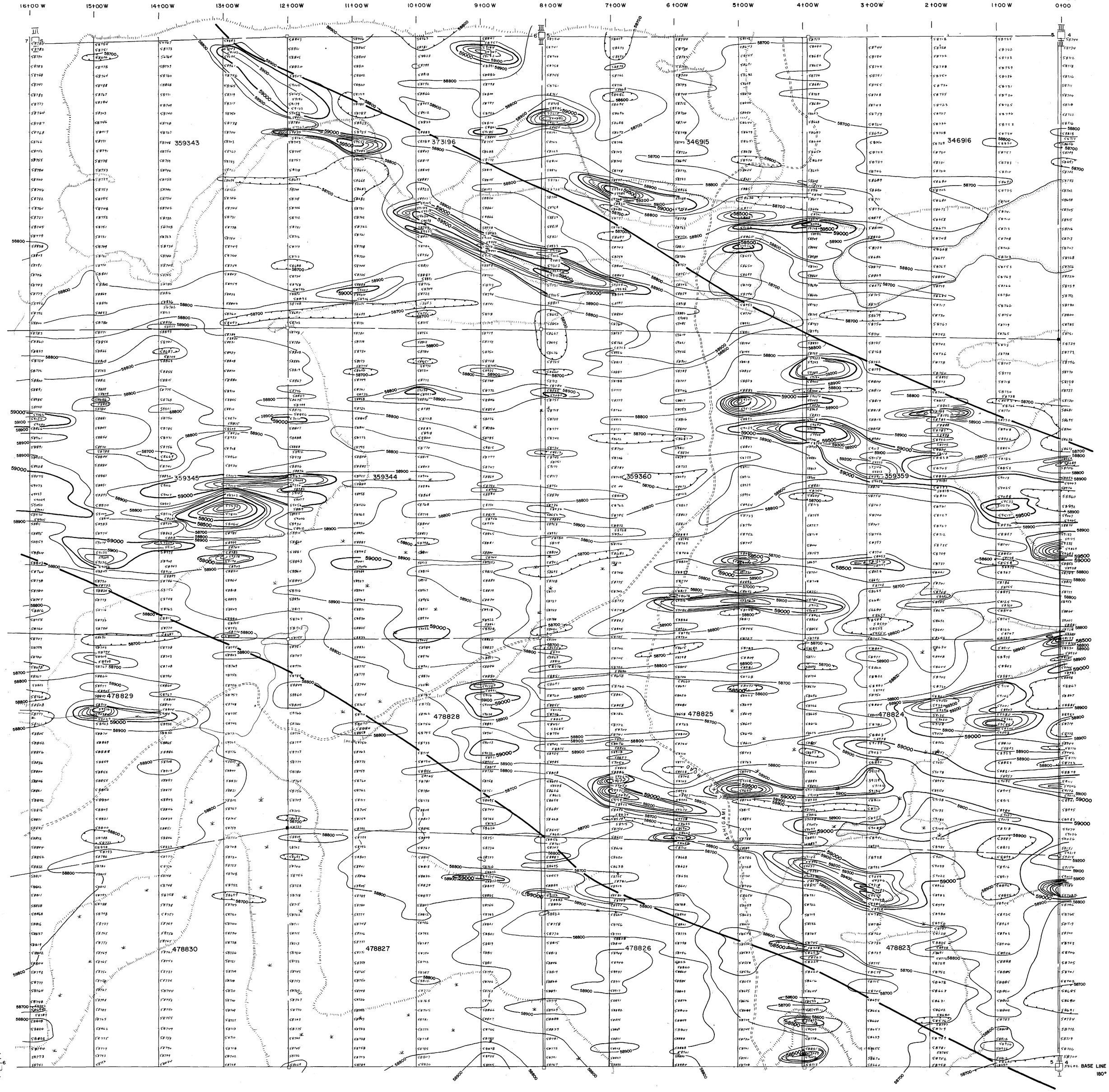
VLF-EM PROFILES

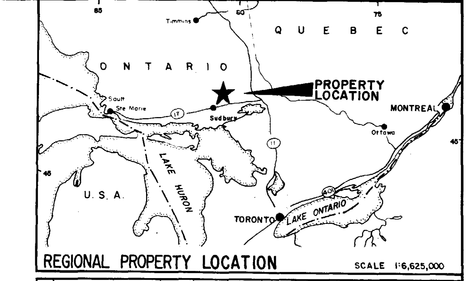
Project No: C.429	By D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No 6	Date: March, 1981

MPH Consulting Limited

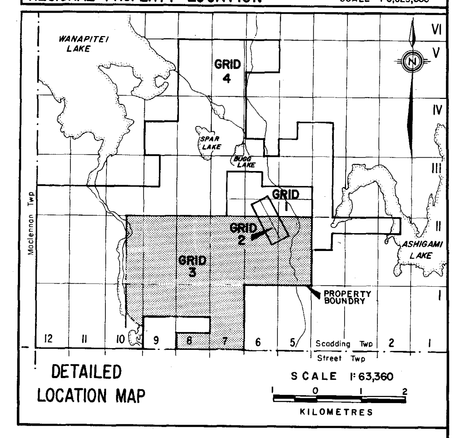
41116N80179 2.4211 SCADDING

2.4211





REGIONAL PROPERTY LOCATION SCALE 1:6,625,000



DETAILED LOCATION MAP SCALE 1:63,360 KILOMETRES

LEGEND

INSTRUMENT: McPhar GP-70 Proton Magnetometer

58742 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

Geological Contact

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

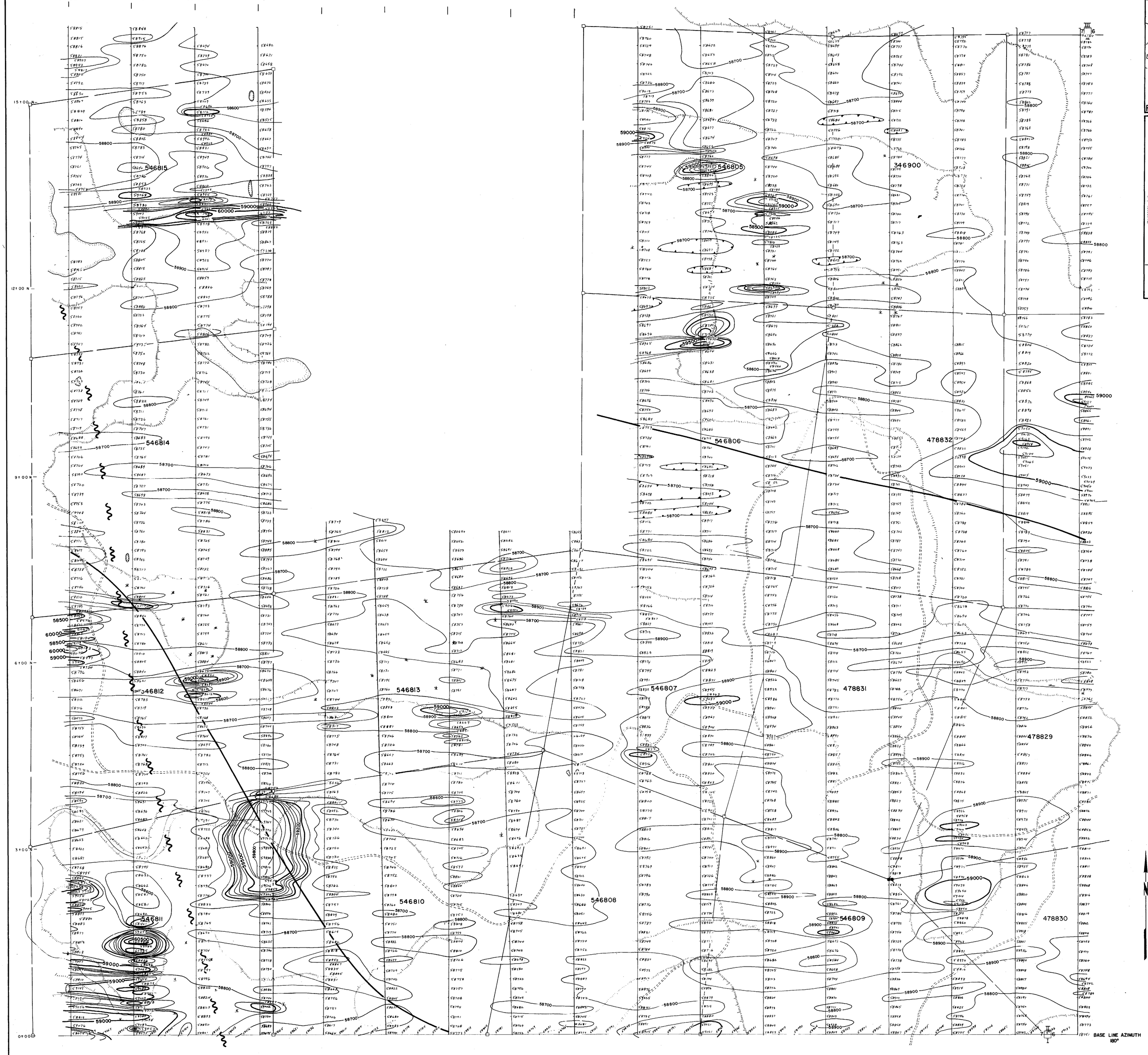
MAGNETOMETER SURVEY

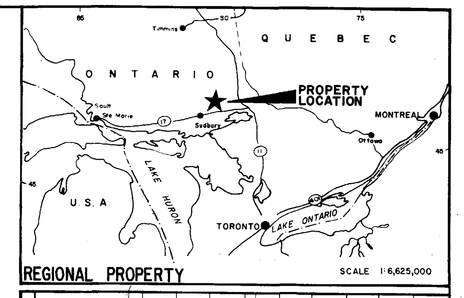
Project No: C429	By: D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No. 7	Date: March, 1981

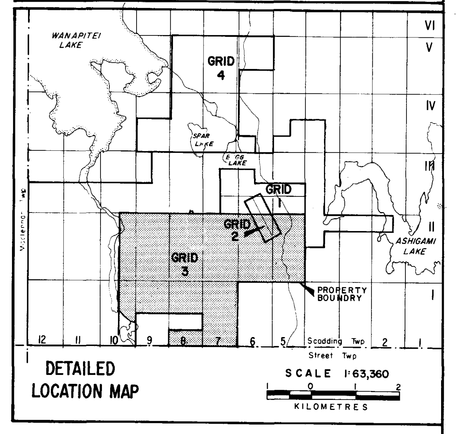
MPH Consulting Limited

41100NE179 2.4211 SCADDING

2.4211







LEGEND

INSTRUMENT: MPhar GP-70 Proton Magnetometer

58888 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

Geological Contact (interpreted)

Fault (interpreted)

SHEET INDEX

SCALE
50 0 50 100
METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

MAGNETOMETER SURVEY

Project No: C429	By: D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 8	Date: March, 1981

MPH Consulting Limited

41118MB179 D-4211 SCADDING

24211

45t00W 44t00W 43t00W 42t00W 41t00W 40t00W 39t00W 38t00W 37t00W 36t00W 35t00W 34t00W 33t00W 32t00W

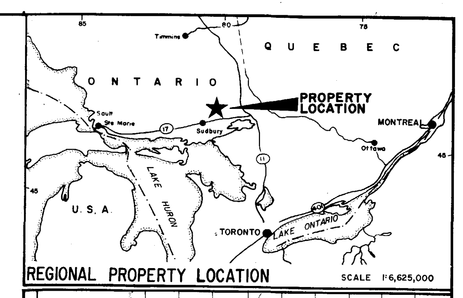
15t00N 12t00N 9t00N 6t00N 3t00N 0t00

WANAPITEI RIVER

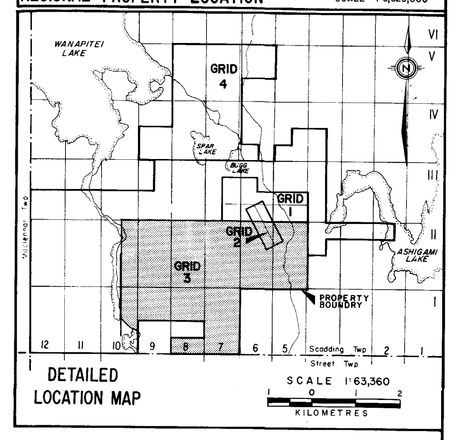
546831 546817 546816 546828 546818 546819 546827 546821 546820 546824 546822 546823

58500 58600 58700 58800 58900 59000 59500 60000 60500

58700 BASE LINE AZIMUTH 180°



REGIONAL PROPERTY LOCATION SCALE 1"6,625,000



DETAILED LOCATION MAP SCALE 1"63,360

KILOMETRES 1 0 1 2

LEGEND

INSTRUMENT: McPhar GP-70 Proton Magnetometer

58722 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

Geological Contact (interpreted)

Fault (interpreted)

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

MAGNETOMETER SURVEY

Project No: C429	By D JONES
Scale: 1:2000	Drawn: D. H.
Drawing No 9	Date March, 1981

MPH Consulting Limited

300

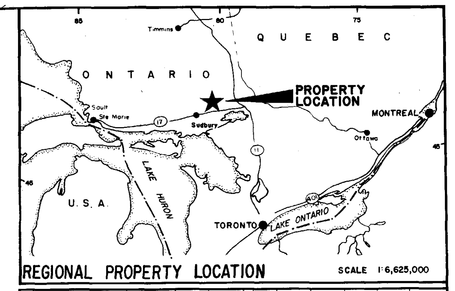
24211

31+00W 30+00W 29+00W 28+00W 27+00W 26+00W 25+00W 24+00W 23+00W 22+00W 21+00W 20+00W 19+00W 18+00W 17+00W 16+00W

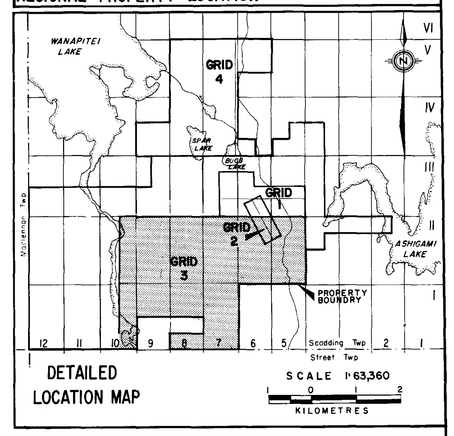
0+00 — 3+00 S — 6+00 S — 9+00 S — 12+00 S — 15+00 S —

BASE LINE AZIMUTH 180°

538830 538829 538819 538818 538831 538828 538820 538821 538823 538822 538825 538824



REGIONAL PROPERTY LOCATION SCALE 1:6,625,000



DETAILED LOCATION MAP SCALE 1:63,360 KILOMETRES

LEGEND

INSTRUMENT: McPhar GP-70 Proton Magnetometer

58722 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

Geological Contact (interpreted)

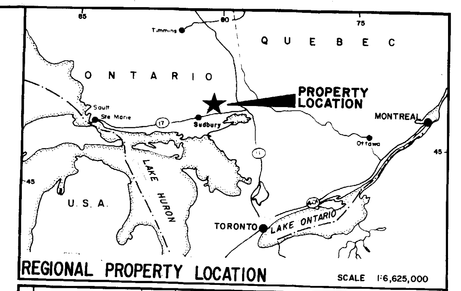
Fault (interpreted)

SHEET INDEX

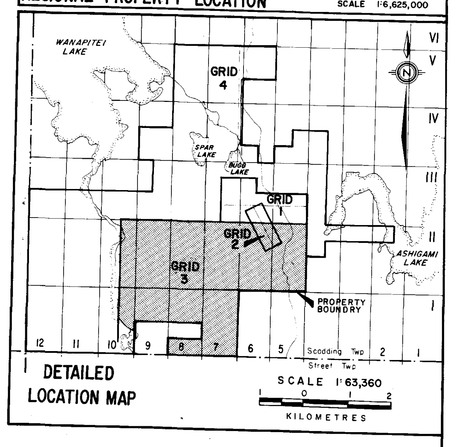
SCALE 50 0 50 100 METRES

Northgate Exploration Limited	
SCADDING TOWNSHIP PROJECT GRID III	
MAGNETOMETER SURVEY	
Project No: C429	By D. JONES
Scale: 1:2000	Drawn D. H.
Drawing No. 10	Date March, 1981
MPH Consulting Limited	

411186E6179 2.4211 SCADDING



REGIONAL PROPERTY LOCATION SCALE 1:6,625,000



DETAILED LOCATION MAP SCALE 1:63,360

KILOMETRES

45+00W 44+00W 43+00W 42+00W 41+00W 40+00W 39+00W 38+00W 37+00W 36+00W 35+00W 34+00W 33+00W 32+00W 31+00W

0+00

3+00 S

6+00 S

9+00 S

W A N A P I T E I R I V E R

BASE LINE AZIMUTE 180°

551175 551173 551178 551174 538833 538830 538832 538831

LEGEND

INSTRUMENT: McPhar GP-70 Proton Magnetometer

58xxx Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

Geological Contact (interpreted)

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

MAGNETOMETER SURVEY

Project No. C429	By D. JONES
Scale: 1:2000	Drawn D. H
Drawing No. 11	Date March, 1981

MPH Consulting Limited

41119NE8179 2.4211 SCADDING

16+00 W 15+00W 14+00W 13+00W 12+00W 11+00W 10+00W 9+00W 8+00W 7+00W 6+00W 5+00W 4+00W 3+00W 2+00W 1+00W 0+00

15+00 N

12+00 N

9+00 N

6+00 N

3+00 N

0+00

359343 373196 346915 346916

359345 359344 359360 359359

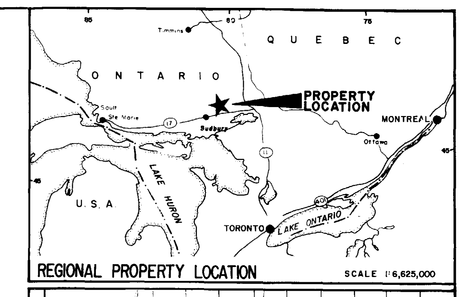
478829 478828 478825 478824

478830 478827 478826 478823

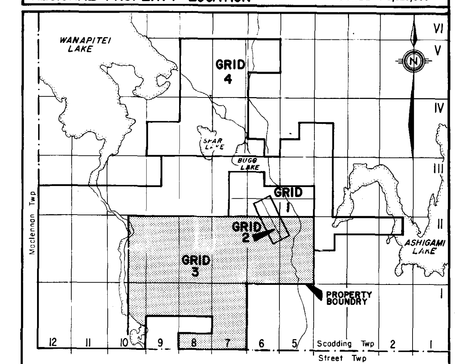
'H' 'I' 'J' 'K'

ASHIGAMI LAKE ROAD

BASE LINE AZIMUTH 180°



REGIONAL PROPERTY LOCATION SCALE 1"=6,625,000



DETAILED LOCATION MAP SCALE 1"=3,360 KILOMETRES

LEGEND

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz

110° Cutler

Inphase Profile

+10% 0 -10%

Vertical Scale 1cm=10%

Concession Post

Claim Post

Claim Post (By Extrapolation)

Claim Line

Creek (Arrow Indicates Flow)

Swamp

Road

Slope

Lake, Pond

Inphase Readings

Moderate Conductor Axis

Weak Conductor Axis

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT
GRID III

VLF-EM PROFILES

Project No: C429	By: D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 12	Date: March, 1981

MPH Consulting Limited

41119NE8179 2.4211 SCADDING

2.4211

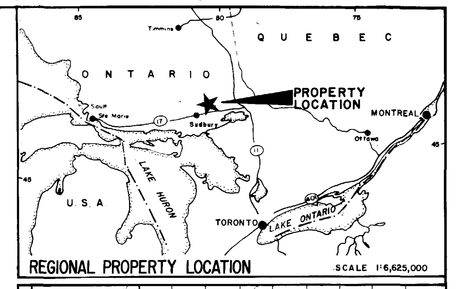
32+00 W | 31+00W | 30+00W | 29+00W | 28+00W | 27+00W | 26+00W | 25+00W | 24+00W | 23+00W | 22+00W | 21+00W | 20+00W | 19+00W | 18+00W | 17+00 W | 16+00W

15+00 N | 12+00 N | 9+00 N | 6+00 N | 3+00 N | 0+00

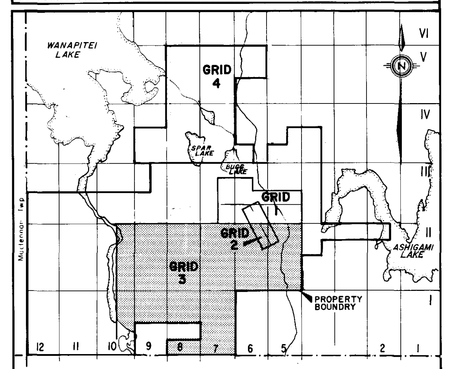
546815 | 546814 | 546805 | 546900 | 546806 | 478832 | 546812 | 546813 | 546807 | 478831 | 478829 | 546811 | 546810 | 546808 | 546809 | 478830

'H' | 'M'

BASE LINE AZIMUTH 180°



REGIONAL PROPERTY LOCATION SCALE 1"6,625,000



DETAILED LOCATION MAP SCALE 1:63,360 KILOMETRES

N

L E G E N D

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz

N 110° Cutler

Inphase Profile

+10% 0 −10% Vertical Scale 1cm=10%

Concession Post

Claim Post

Claim Post (By Extrapolation)

Claim Line

Creek (Arrow Indicates Flow)

Swamp

Road

Slope

Lake, Pond

Inphase Reading

Moderate Conductor Axis

Weak Conductor Axis

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

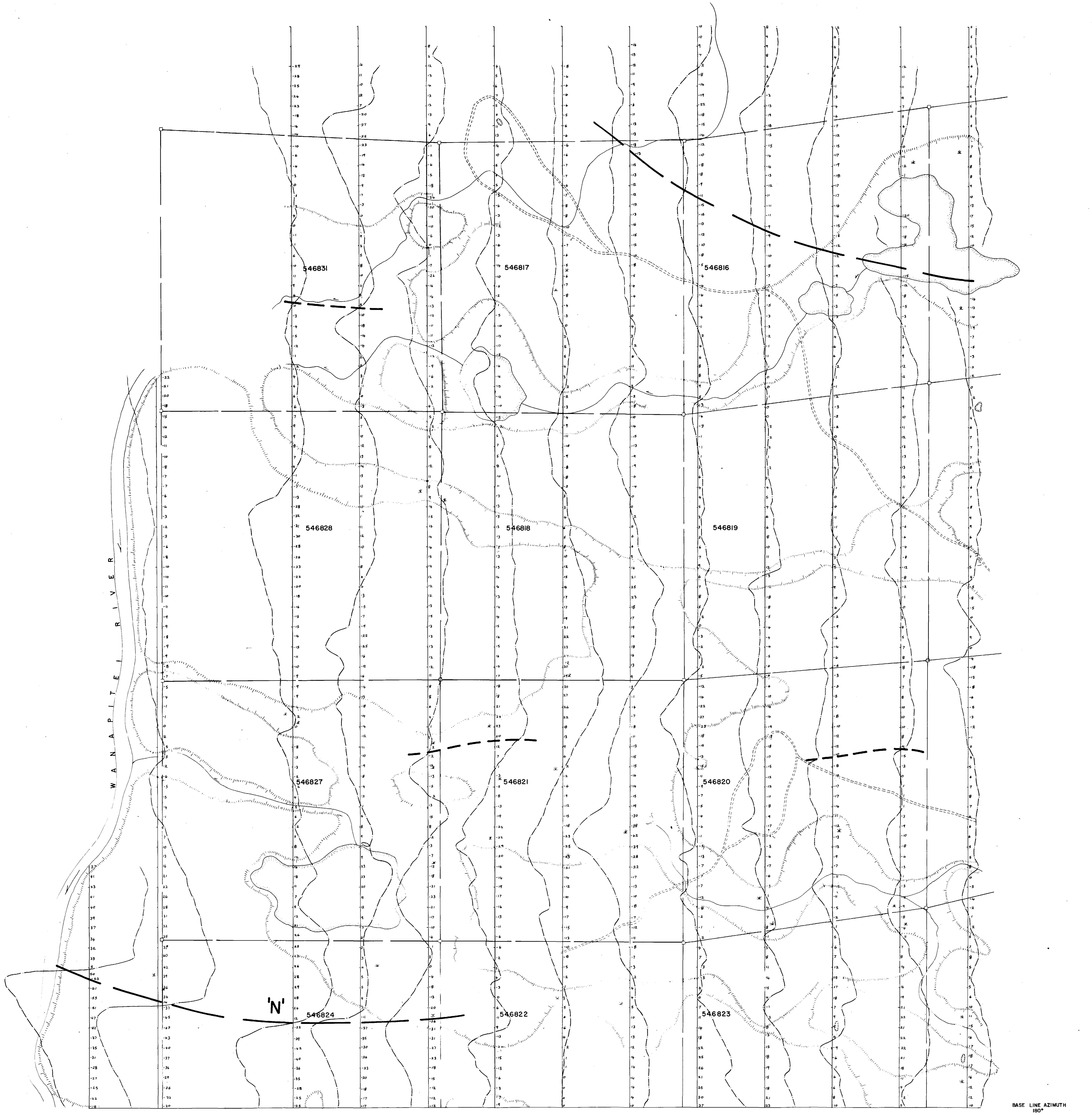
VLF-EM PROFILES

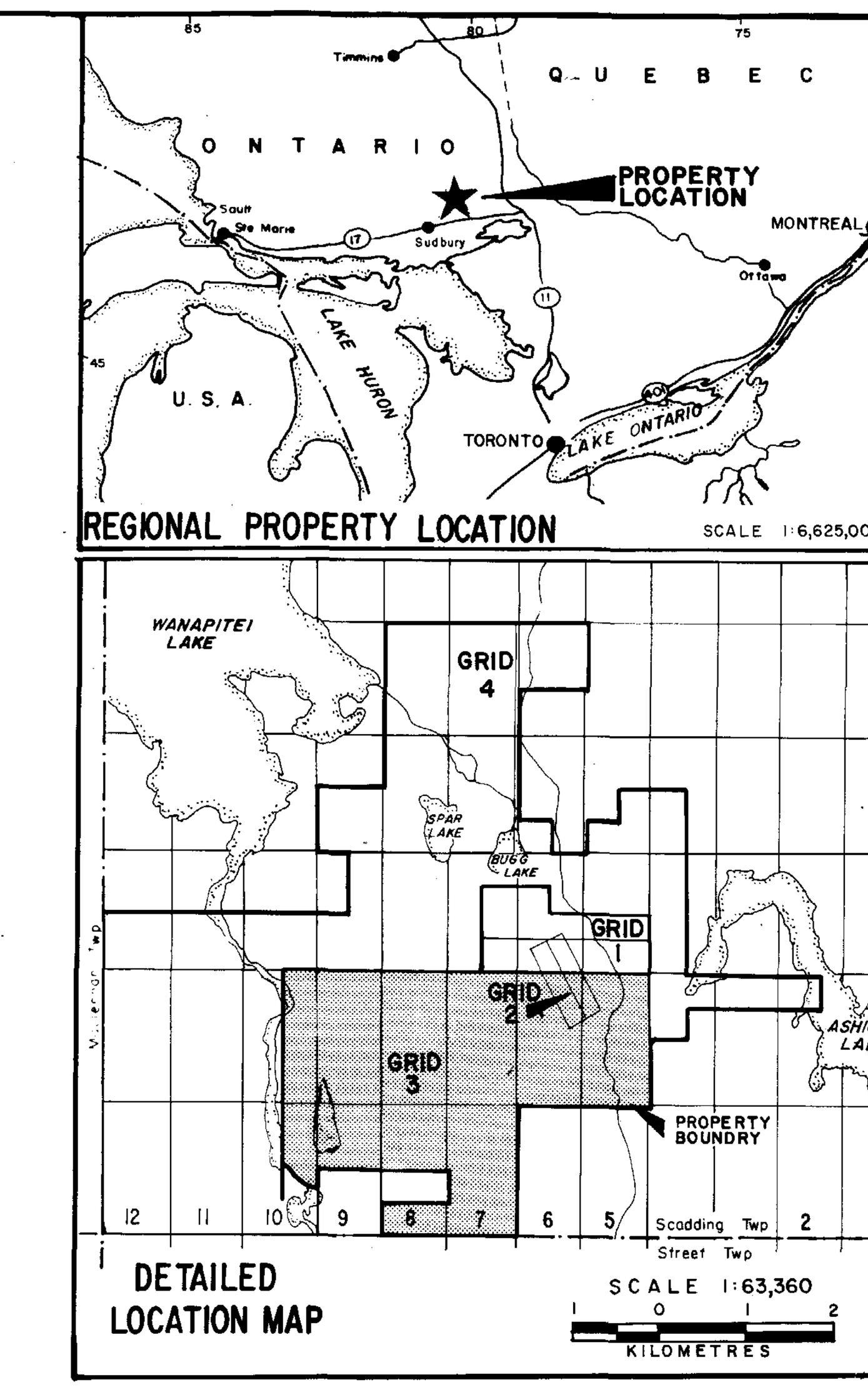
Project No: C429	By: D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 13	Date: March, 1981

MPH Consulting Limited

411196E8179 2.4211 SCADDING

2.4211





LEGEND

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz

110° Cutler

Inphase Profile

+10% 0 -10% Vertical Scale 1cm = 10%

Concession Post

Claim Post

Claim Post (By Extrapolation)

Claim Line

Creek (Arrow Indicates Flow)

Swamp

Road

Slope

Lake, Pond

Inphase Reading

Moderate Conductor Axis

Weak Conductor Axis

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

VLF-EM PROFILES

Project No.	C429	By	D. JONES
Scale	1:2000	Drawn	D. H.
Drawing No.	14	Date	March, 1981

MPH Consulting Limited

350

2.4211

31+00W 30+00W 29+00W 28+00W 27+00W 26+00W 25+00W 24+00W 23+00W 22+00W 21+00W 20+00W 19+00W 18+00W 17+00W 16+00W

0+00

3+00 S

6+00 S

9+00 S

12+00 S

15+00 S

BASE LINE AZIMUTH 180°

'M'

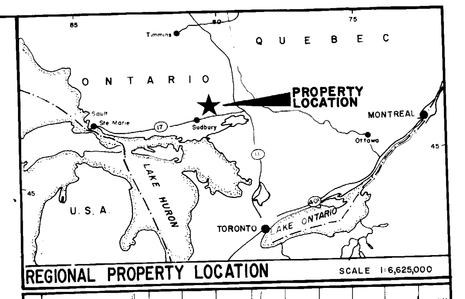
'L'

538830 538829 538819 538818

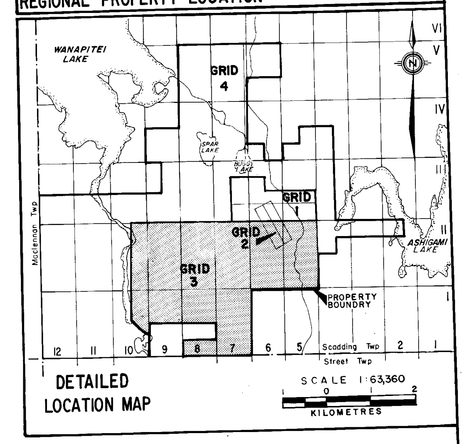
538831 538828 538820 538821

538823 538822

538825 538824



REGIONAL PROPERTY LOCATION SCALE 1:6,625,000



DETAILED LOCATION MAP SCALE 1:63,360 KILOMETRES

LEGEND

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz

110° Cutler

Inphase Profile

+10% 0 −10% Vertical Scale 1cm=10%

Concession Post

Claim Post

Claim Post (By Extrapolation)

Claim Line

Creek (Arrow Indicates Flow)

Swamp

Road

Slope

Lake, Pond

Inphase Readings

Moderate Conductor Axis

Weak Conductor Axis

SHEET INDEX

SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

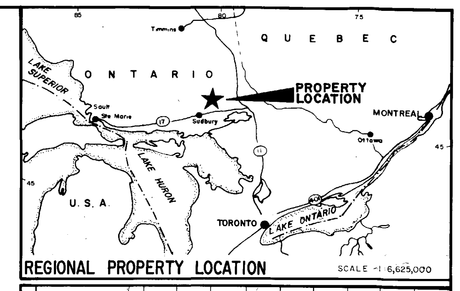
VLF-EM PROFILES

Project No: C429	By D. JONES
Scale: 1:2000	Drawn D. H.
Drawing No 15	Date March, 1981

MPH Consulting Limited

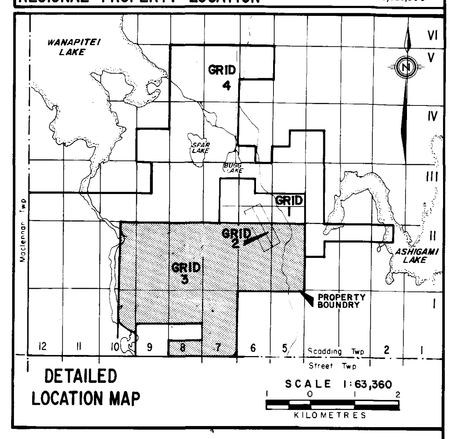
2.4211

41113NE9179 2.4211 SCADDING



REGIONAL PROPERTY LOCATION

SCALE 1:6,625,000



DETAILED LOCATION MAP

SCALE 1:63,360

KILOMETRES

45+00W 44+00W 43+00W 42+00W 41+00W 40+00W 39+00W 38+00W 37+00W 36+00W 35+00W 34+00W 33+00W 32+00W 31+00W

0+00

3+00 S

6+00S

9+00 S

BASE LINE AZMUTH 180°

WANAPITEI RIVER

5511175

5511173

538833

538830

5511178

5511174

538832

538831

'O'

'L'

LEGEND

INSTRUMENT: Geonics EM-16

STATION: Cutler Maine, Frequency, 17.8 KHz

110° Cutler

Inphase Profile

+10% 0 -10%

Vertical Scale 1cm=10%

Concession Post

Claim Post

Claim Post (By Extrapolation)

Claim Line

Creek (Arrow Indicates Flow)

Swamp

Road

Slope

Lake, Pond

Inphase Reading

Moderate Conductor Axis

Weak Conductor Axis

SHEET INDEX

SCALE

50 0 50 100

METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID III

VLF-EM PROFILES

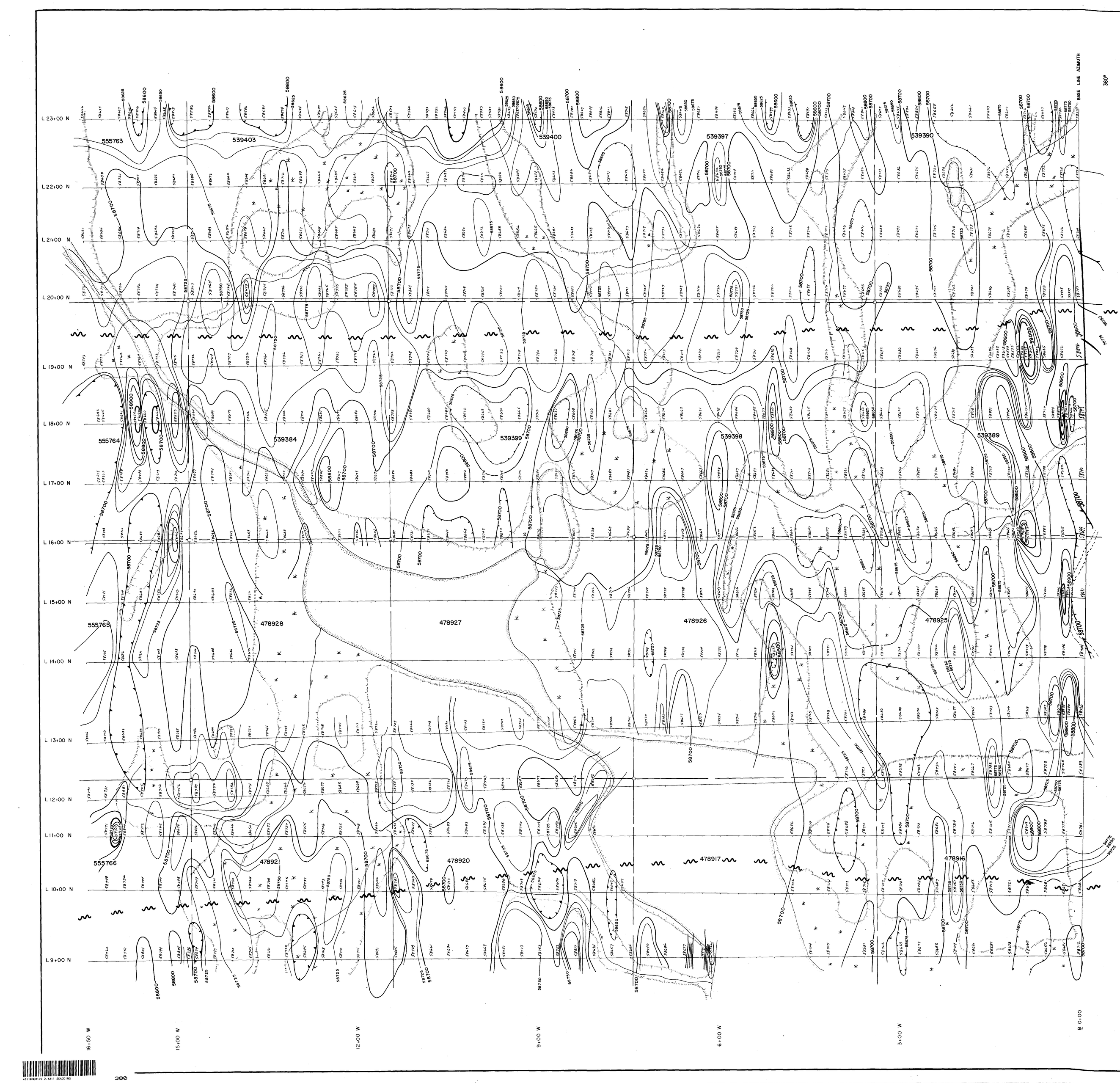
Project No: C429	By D JONES
Scale: 1:2000	Drawn D H
Drawing No 16	Date March, 1981

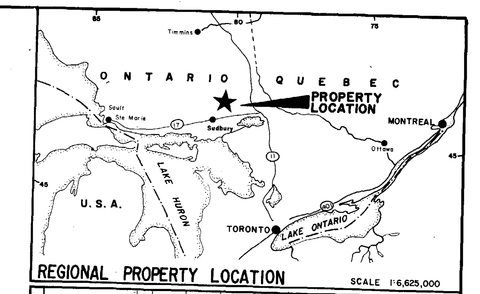
MPH Consulting Limited

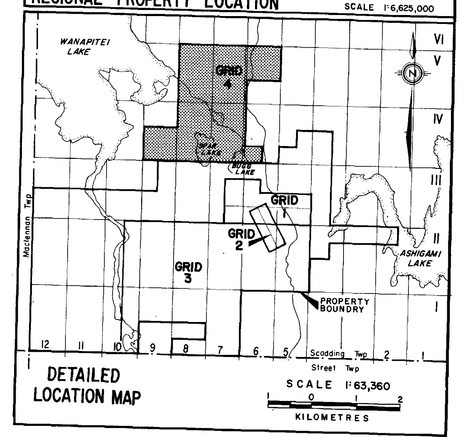
41110NE0175 2.4211 SCADDING

370

2.4211







LEGEND

INSTRUMENT: MEPhar GP-70 Proton Magnetometer

58725 Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

500 gamma

100 gamma

25 gamma

Fault (interpreted)

SHEET INDEX

SCALE

50 0 50 100

METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT
GRID IV

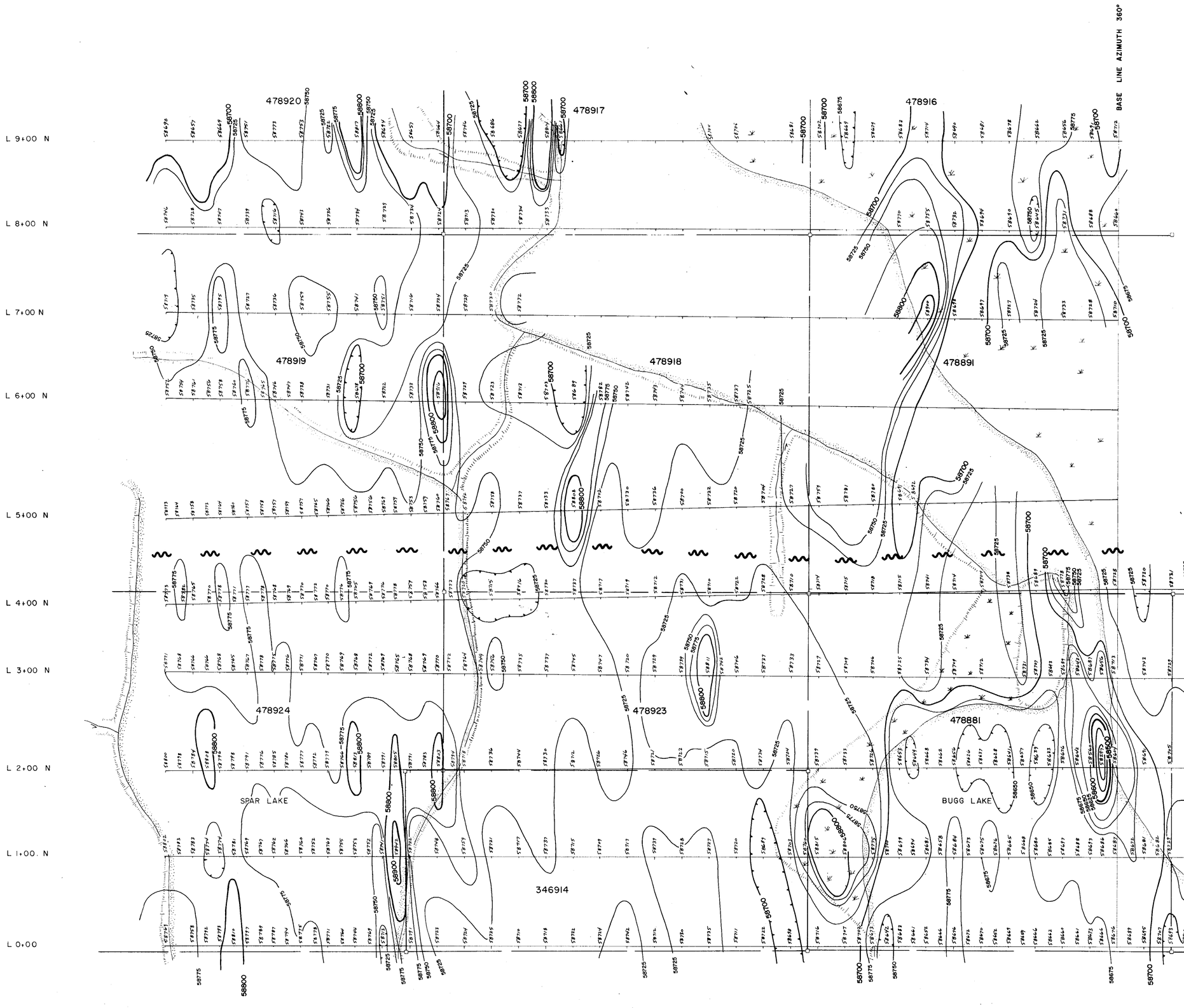
MAGNETOMETER SURVEY

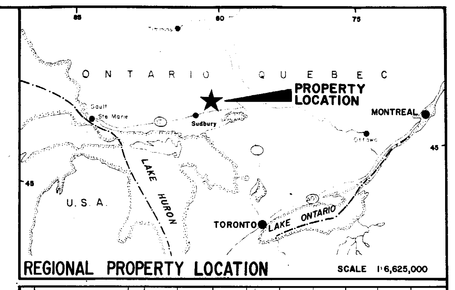
Project No: C-429	By: D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 17	Date: March, 1981

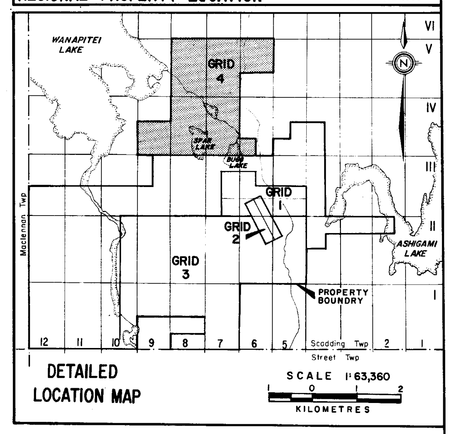
MPH Consulting Limited

41118NE0179 2.4211 SCADDING

2421







LEGEND

INSTRUMENT: McPhar GP-70 Proton Magnetometer

Absolute Magnetic Value (gammas)

Magnetic Contour

Magnetic Depression

CONTOURS: Interval 100 gammas

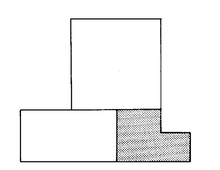
500 gamma

100 gamma

25 gamma

Fault (interpreted)

SHEET INDEX



SCALE

50 0 50 100

METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID IV

MAGNETOMETER SURVEY

Project No: C429	By: D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 18	Date: March, 1981

MPH Consulting Limited

2.4211

N

555766 478921 478920

L 9+00 N

L 8+00 N

L 7+00 N

L 6+00 N

512656 478978 478979

L 5+00 N

478922 478919

L 4+00 N

L 3+00 N

SPAR LAKE

L 2+00 N

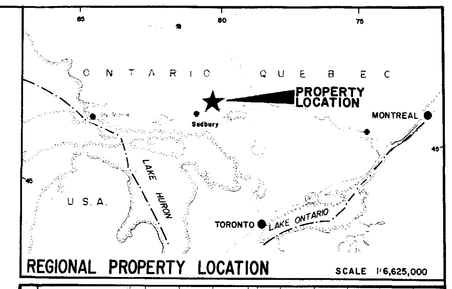
512657 478976 478977 357999 478924

L 1+00 N

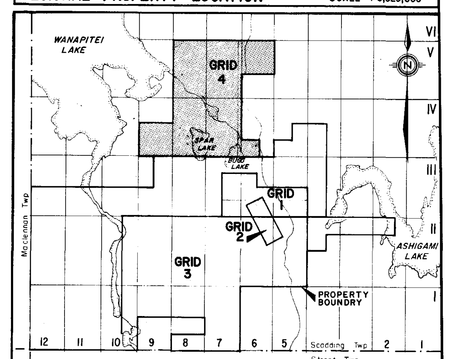
L 0+00

BASE LINE AZIMUTH 360°

24+00 W 21+00 W 18+00 W 15+00 W 12+00 W 9+00 W



REGIONAL PROPERTY LOCATION SCALE 1"=6,625,000



DETAILED LOCATION MAP SCALE 1"=3,360

LEGEND

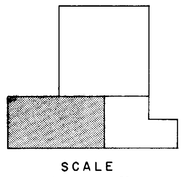
INSTRUMENT: McPhar GP-70 Proton Magnetometer

- Absolute Magnetic Value (gammas)
- Magnetic Contour
- Magnetic Depression

CONTOURS: Interval 100 gammas

- 500 gamma
- 100 gamma
- 25 gamma
- Fault (interpreted)

SHEET INDEX



SCALE 50 0 50 100 METRES

Northgate Exploration Limited

SCADDING TOWNSHIP PROJECT GRID IV

MAGNETOMETER SURVEY

Project No: C429	By D. JONES
Scale: 1:2000	Drawn: D. H.
Drawing No: 19	Date: MARCH, 1981

MPH Consulting Limited

411184E0179 2.4211 SCADDING

400

2.42 11