A-785.1

REPORT ON AN

AIRBORNE MAGNETIC AND VLF-EM SURVEY

BLACK CREEK GOLD PROPERTY
BLACK TOWNSHIP
LARDER LAKE MINING DIVISION, ONTARIO

for

MELBA GOLD LIMITED
(731530 ONTARIO LIMITED)

by: ***TERRAQUEST LTD.***
Toronto, Canada
August 2, 1988

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Introduction

This report describes the specifications and results of a geophysical survey carried out for Melba Gold Limited, Box 790

Kirkland Lake, Ontario, E2N 3K4 by Terraquest Ltd., 240 Adelaide Street West, Toronto, Canada. The field work was performed on June 20, 1988 and the data processing, interpretation and reporting from June 21 to August 2, 1988.

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

2. The Property

The property is located along the eastern side of Black Township, in the Larder Lake Mining Division of Ontario about 25 kilometres northwest of Kirkland Lake. The property can be accessed by bush road, leading less than two kilometres eastward to Highway 11.

The latitude and longitude are 48 degrees 19 minutes, and 80 degrees 17 minutes respectively, and the N.T.S. reference is 42A/8.

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

L	892093-892099 ✓	(7)
	935288-935306 ✓	(19)
	980242-980243 ✓	(2)
	Total of 28 claims.	

3. Geology

Map References

1. Map 295G (revised): Aeromagnetic series, Ramore Area, Sheet 42A/8, Scale 1:63,360, G.S.C. 1970
2. Map 2205: Timmins-Kirkland Lake, Geological Compilation Series, Scale 1:253,440, O.D.M. 1973
3. Map 2213: Tolstoy and Black Townships, Scale 1:31,680, O.D.M. 1971
4. Map 2321: Bouguer Gravity, Timmins-Matheson, Scale 1:250,00, O.D.M. 1975
5. Map 2322: Interpretation of Bouguer Gravity, Timmins-Matheson, Scale 1:250,000, O.D.M. 1975
6. Map P.3052: Raymore Area, Southwestern Part, Scale 1:15,840, O.G.S. 1986
7. Private Report: Black Creek Gold Property, Black Township, Ontario, by CH 4 International Ltd., Calgary February 1988

The survey area is underlain predominantly by a series of northwest trending tholeiitic basalts with minor associated turbidite metasediments. The basalts form an alternating series of iron-rich and magnesium-rich horizons. These have been intruded by a small plug of tholeiitic gabbro in the north central part of the property and beyond the property to the east. A north-northwest trending diabase dyke occurs in the middle of the property.

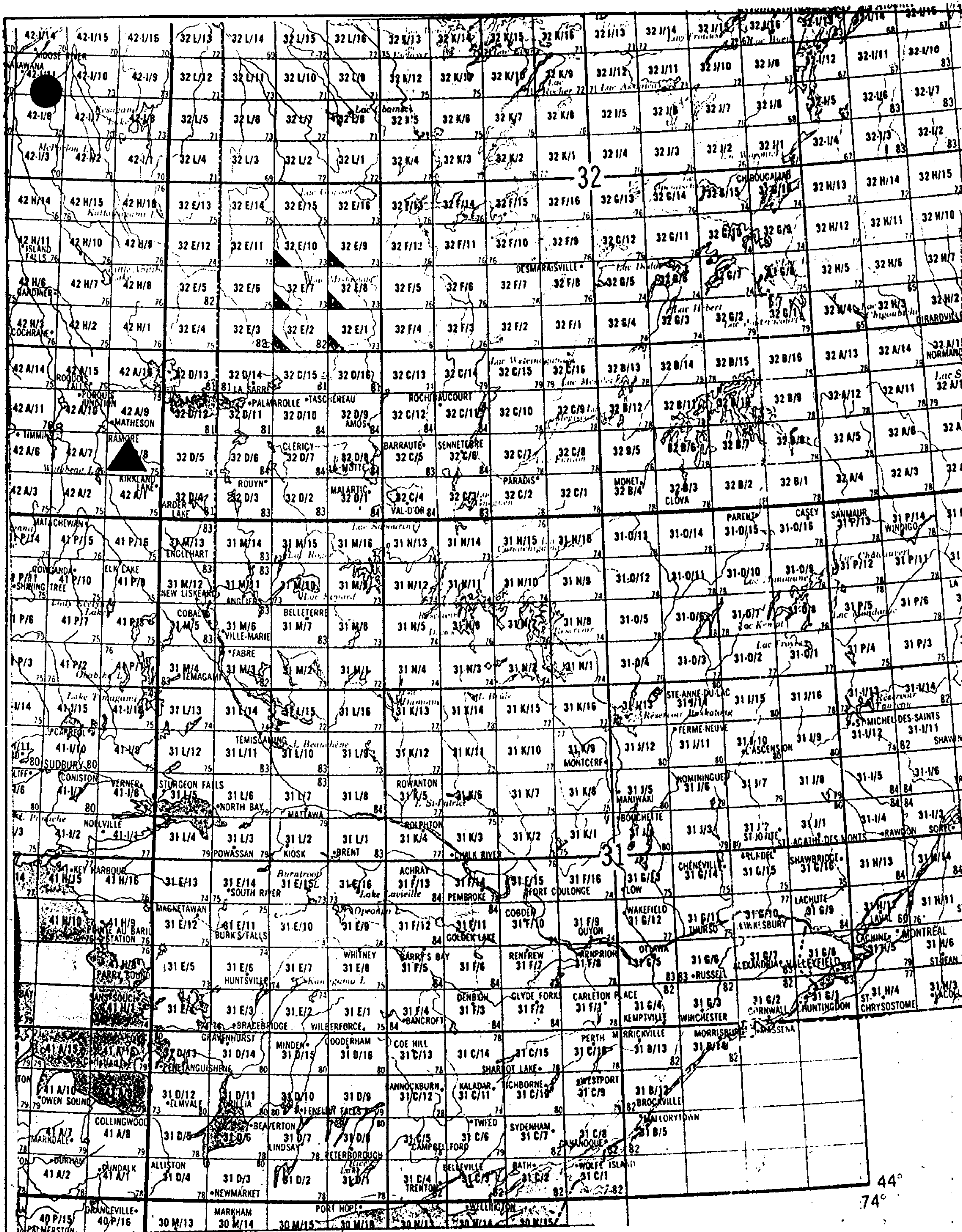

FIGURE 1. General Location

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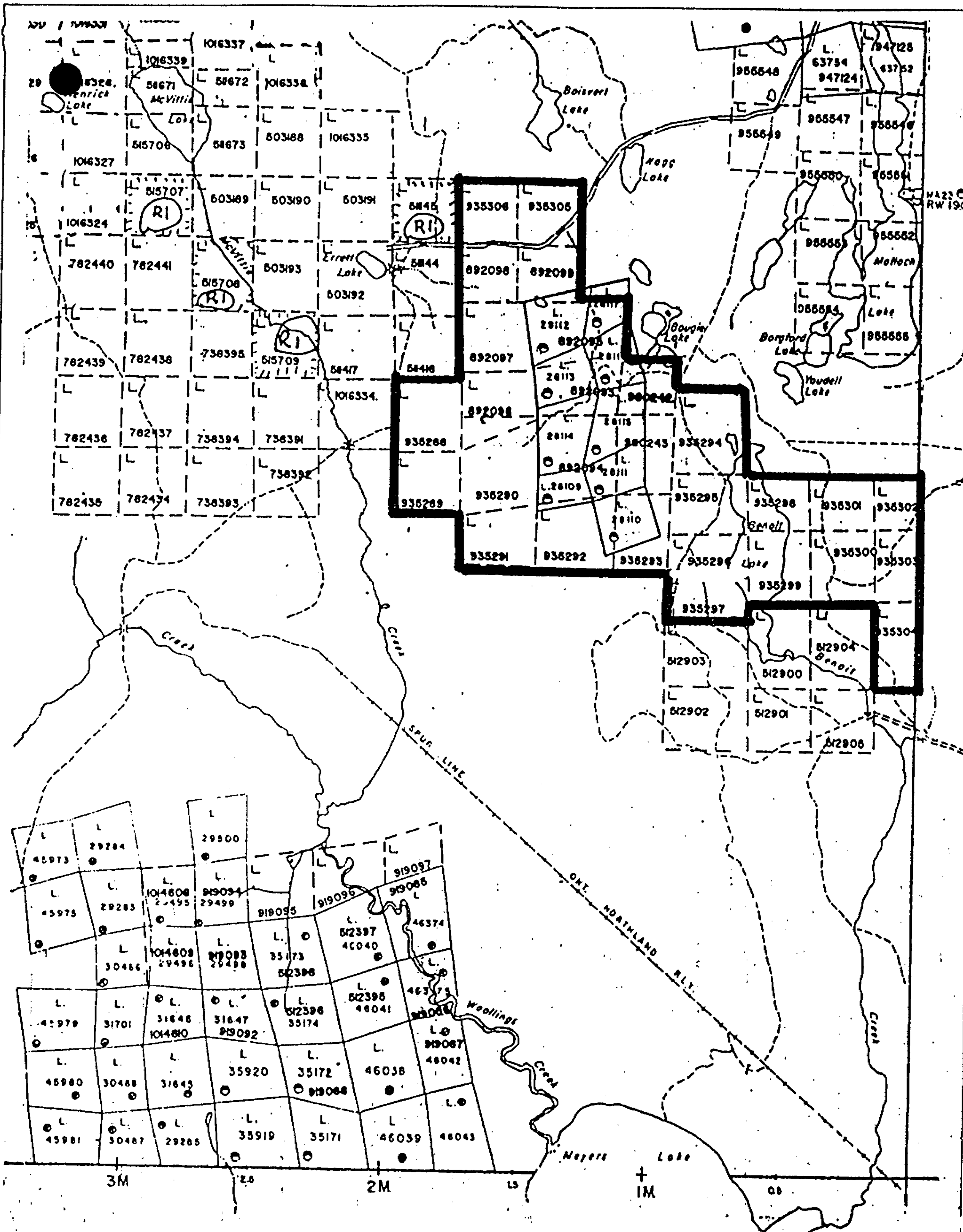

FIGURE 2. Claim Location Map
(exact locations not certified)

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o north trending faults along Benoit Lake and Malloch Lake to the east form a narrow graben. Several outcrops within the graben indicate that the overburden is not thick.

Extensive gold mineralization has been observed within the metavolcanic sequence, both within and surrounding the property.

4. Survey Specifications

4.1 Instruments

The survey was carried out using a Cessna 206 aircraft, registration C-GGLS, which carries a magnetometer and a VLF electromagnetic detector.

The magnetometer is a high sensitivity, optically pumped cesium vapour magnetometer mounted in a stinger attached to the tail of the aircraft. Its specifications are as follows:

Working range:	20,000-100,000 gammas
Sensitivity:	0.001 gammas
Sampling Rate:	0.2 seconds
Model:	BIW 2321H8
Manufacturer:	Scintrex, Concord Ontario.

The magnetometer processor is a PMAG 3000 and the data acquisition system is a PDAS 1000, both manufactured by Picodas Group Inc.

The signal to noise ratio of the magnetic response is improved by a real time compensation technique provided by Picodas Limited.

The sources of compensated noise are permanent, induced and petty current effects of the airframe and the heading effects. The system uses three fluxgate magnetometers to measure the aircraft attitude with respect for the earth magnetic field vector. A mathematical model is used to solve this interference effect.

The VLF-EM unit uses three orthogonal detector coils to measure (a) the total field strength of the time-varying EM field and (b) the phase between the vertical coil and both the "along line" coil (LINE) and the "cross-line" coil (ORTHO). The LINE coil is tuned to a transmitter station (Channel 1) that is ideally positioned at right angles to the flight lines, while the ORTHO coil transmitter (Channel 2) should be in line with the flight lines. It's specifications are:

Model:	TOTEM 2A
Manufacturer:	Herz Industries, Toronto, Canada
Accuracy:	1%
Reading interval:	0.5 second

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

Other instruments are:

- King KRA-10A radar altimeter
- PBAS 9000 portable field base station; fully IBM PCXT compatable with 5.25" and 3.5" floppy drives.
- Geocam video camera and recorder for flight path recovery, manufactured by Geotech Ltd., Markham, Ontario.

4.2 Lines and Data

Line spacing:	100 metres
Line direction:	035 degrees
Terrain clearance:	100 m
Average ground speed:	156 km/hr
Data point interval:	
Magnetic:	11 metres
VLF-EM:	11 metres
Tie Line interval:	2 km
Channel 1 (LINE):	NLK Seattle, 24.8 kHz
Channel 2 (ORTHO):	NSS Annapolis, 21.4 kH
Line km over claim groups:	
Magnetic survey totals:	117 line km
VLF-EM survey totals:	58 line km

4.3 Tolerances

Line spacing: Any gaps wider than twice the line spacing and longer than 10 times the line spacing were filled in by a new line.

Terrain clearance: Portions of line which were flown above 125 metres for more than one km were reflown if safety considerations were acceptable.

Diurnal magnetic variation: Less than ten gammas deviation from a smooth background over a period of two minutes or less as seen on the base station analogue record.

Manoeuvre noise: nil

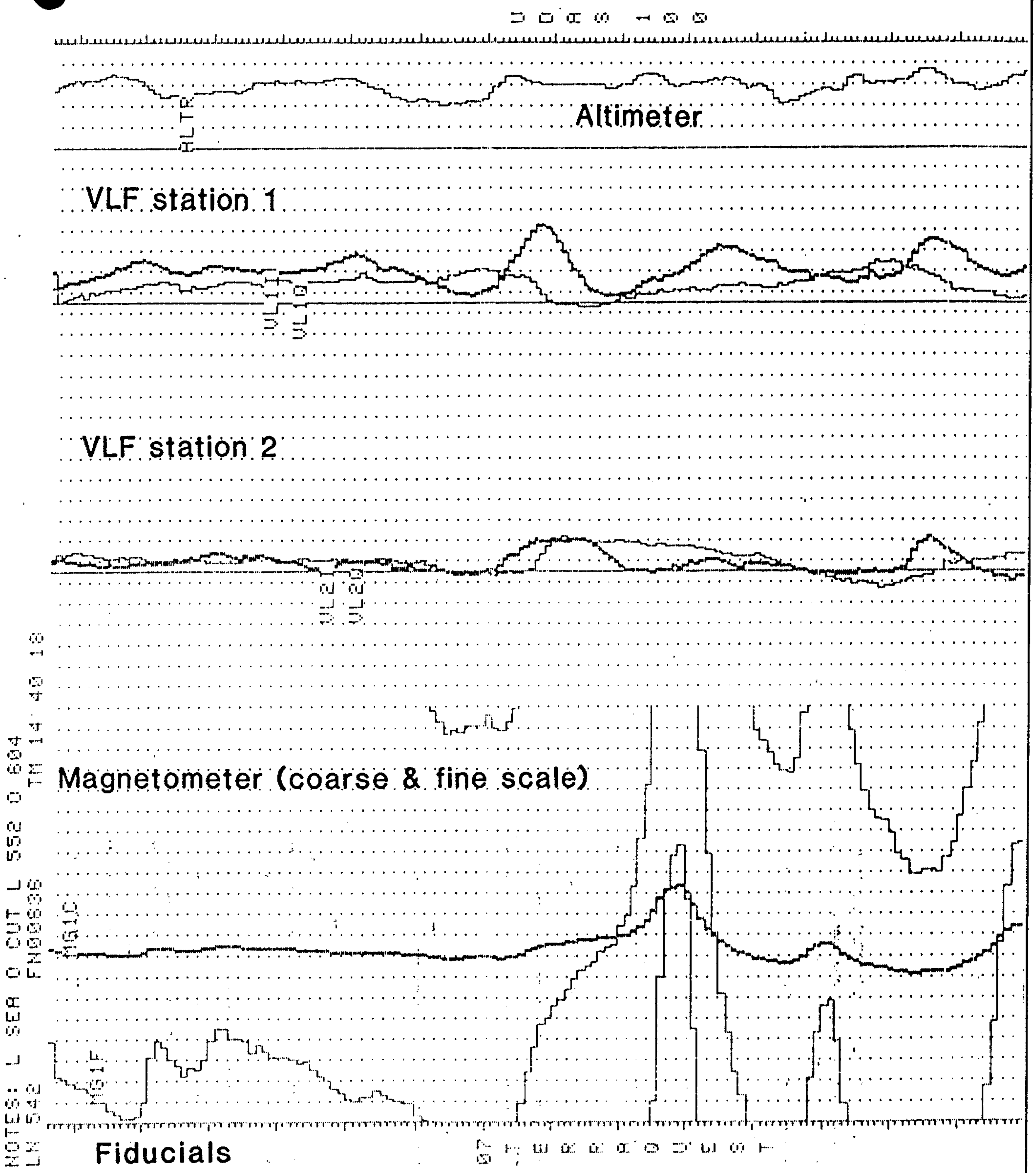

FIGURE 3. Sample of analogue data

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4.4 Photomosaics

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

Each photograph forming the mosaic was adjusted to conform to the NTS map system before the mosaic was assembled.

5. Data Processing

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

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

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

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

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

Grant, F.S. and Spector A., 1970: Statistical Models for Interpreting Aeromagnetic Data; Geophysics, Vol 35

Grant, F.S., 1972: Review of Data Processing and Interpretation Methods in Gravity and Magnetics; Geophysics Vol 37-4

Spector, A., 1968: Spectral Analysis of Aeromagnetic maps; unpublished thesis; University of Toronto.

6. Interpretation

6.1 General Approach

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

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

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

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

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FIGURE 4

TERRAQUEST CLASSIFICATION OF VLF-EM CONDUCTOR AXES

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

NOTES

1 - Upper case symbols denote a relatively strong total field strength

2 - Underlined symbols denote a relatively strong quadrature response

3 - Mineralogic origins include sulphides, graphite, and in fault zones, gouge

4 - Electrolytic origins imply conductivity related to porosity or high moisture content

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

6.2 Interpretation

The magnetic and VLF-EM data are shown in contoured format on maps at a scale of 1:10,000 in the back pocket. An interpretation map is also provided. The following notes are intended to supplement these maps.

The total magnetic field has a relief of approximately 900 gammas across the entire survey area, but only 450 gammas within the claim block itself. The total magnetic field is consistent with a general northwest trend of the lithologies. The vertical magnetic gradient improves the resolution of the magnetic anomalies and has been used to delineate the stratigraphy and structure.

The tholeiitic gabbro (Unit 5) east of the claim block correlates with the strongest magnetic responses with a relief of 800 to 900 gammas. The small plug of gabbro in the north central part of the claim block does not correlate with a similiar magnetic response. This may be a function of (a) a different original magmatic composition, (b) the small total of the mass of the body, or (c) depletion of magnetic character by alteration.

These possibilities should be verified by ground mapping.

The outline of this gabbroic plug can not be outlined by magnetic mapping at this scale because the responses are overwhelmed by those from adjacent lithologies.

The diabase dyke (Unit 7) correlates with narrow, weak north- trending magnetic responses that are best outlined by the vertical magnetic gradient data. Similiar responses to the south and west may also be related to diabase dykes.

Most of the remaining responses are associated with the tholeiitic basalts. The iron-rich member (Unit 3b) correlates with broad magnetic anomalies with reliefs of up to 400 gammas.

The magnesium-rich members (Unit 3a) correlates with weaker magnetic responses. Detailed magnetic mapping indicates that there are considerably more of these units than on the geological map.

The turbidite metasediments (Unit 1) correlate with weak magnetic responses and can not be resolved the magnesium-rich tholeiitic basalts.

The two north-trending faults toward the east end of the survey area are barely discernable by magnetic mapping, indicating minor lateral displacement. Numerous north-east trending faults have been interpreted from the magnetic data and coincide well with air photo, topographical linements. It is cautioned that some of the faults may represent fold axis. Northwest-southeast trending faults are suspected but are difficult to identify as they would parallel the magnetic trends.

The VLF-EM survey shows numerous conductor axes trending to the northwest consistent with both the general trend of the lithology and the orientation of the VLF transmitter. The broad conductors to the southwest correlate with swampy areas and are probably related to conductive overburden. Note, however, that the larger lakes to the east do not appear to be associated with conductive overburden.

Several conductor axes are related to statigraphy as they are either parallel to or coincident with the magnetic units. These bear potential for stratabound bedrock origins such as sulphides or graphite and should be followed up on the ground using EM or IP techniques.

Several conductor axes trend to the northeast and are generally consistent with the northeast trending magnetically mapped faults. Conductivity associated with structure may be related to (a) minerals such as sulphides, gouge, or graphite along the structure, or (b) an ionic effect created by water or porosity along the structure or to conductive overburden in an overlying topographic depression. Structures identified by magnetic mapping or VLF-EM conductivity should be investigated for potential epithermal-type mineralization.

SUMMARY

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

The magnetic data has been used to modify and update the existing geology and has shown a number of new contacts and faults. A number of VLF-EM conductor axes were found of which most are associated with conductive overburden. Several possess potential for stratabound bedrock origins such as sulphideor graphite and have been recommended for ground follow up.Northeast trending conductor axes are probably related to structural sources which bear potential for epithermal-type mineralization.

TERRAQUEST LTD.

Charles Q. Barrie, M.Sc.
Geologist

GEOLOGICAL ASSOCIATION OF CANADA
CHARLES Q. BARRIE
FELLOW

REPORT ON AN

AIRBORNE MAGNETIC AND VLF-EM SURVEY

BENOIT AND MELBA TOWNSHIPS

LARDER LAKE MINING DIVISION, ONTARIO

for

NORDEX EXPLOSIVES LTD.

by: ***TERRAQUEST LTD.***
Toronto, Canada
August 19, 1988

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Introduction

This report describes the specifications and results of a geophysical survey carried out for Nordex Explosives Ltd. of P.O. Box 790, Kirkland Lake, Ontario, P2N 3K4 by Terraquest Ltd., 240 Adelaide Street West, Toronto, Canada. The field work was performed between June 20 and 21, 1988 and the data processing, interpretation and reporting from June 22 to August 19, 1988.

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

2. The Property

The property is located along the eastern half of Benoit township and the western half of Melba township, in the Larder Lake Mining Division of Ontario about 18 kilometres northwest of the town of Kirkland Lake. The property can be accessed directly from township roads to the west and from bush roads from the east.

The average latitude and longitude are 48 degrees 20 minutes, and 80 degrees 08 minutes respectively, and the N.T.S. reference is 42A/8.

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

L	981292-981293	(2)
	981836	(1)
	981840(1)	
	981843-981844	(2)
	983215-983234	(20)
	997417-997420	(4)
	998342	(1)
	1014825-1014859	(35)
	1014867-1014869	(3)
	1026070-1026075	(6)
	1045392-1045405	(14)
	1045410-1045415	(6)
	1045417-1045435	(19)
	1025930-1025965	(36)
	1025986-1026000	(15)

Total of 165 claims

Additional claims

L	884080-884082	(3)
	982583-982586	(4)
	992204-992205	(2)
	992254-992255(2)	

Total of 11 additional claims

3. Geology

Map References

1. Map 295G: Ramore Magnetic Map
   Scale 1:63,360
   G.S.C. 1970
2. Map 2215: Benoit and Maisonville Townships
   Scale 1:31,680 (map and report)
   O.D.M. 1971
3. Map 2252: Melba and Bisley Townships
   Scale 1:31,680 (map and report)
   O.D.M. 1972
4. Map 2321: Timmins-Matheson Bouguer Gravity.
   Scale 1:250,000
   O.D.M. 1975
5. Map 2322: Timmins-Matheson Interpretation of Bouguer Gravity
   Scale 1:250,000
   O.D.M. 1975
6. Map P.3053: Ramore Area, Southeastern Part
   Scale 1:15,840
   O.G.S. 1986

Reports

1. Open File Report 5356: Deep Overburden Drilling and Geochemical Sampling in Benoit, Melba, Bisley, Maisonville, Morrisette, Arnold, Grenfell, LeBel, Eby, Otto, Boston and McElroy Townships. O.G.S. 1981.
2. Report on Combined Helicopter Borne Magnetic, Electromagnetic and VLF Survey of Benoit and Melba Townships for Canreos Minerals, (1980) Ltd., by Aerodat Ltd., January 1988.
3. Geology and Geochemistry of Melba and Bisley Townships, by L. Jensen. Thesis at Depart-

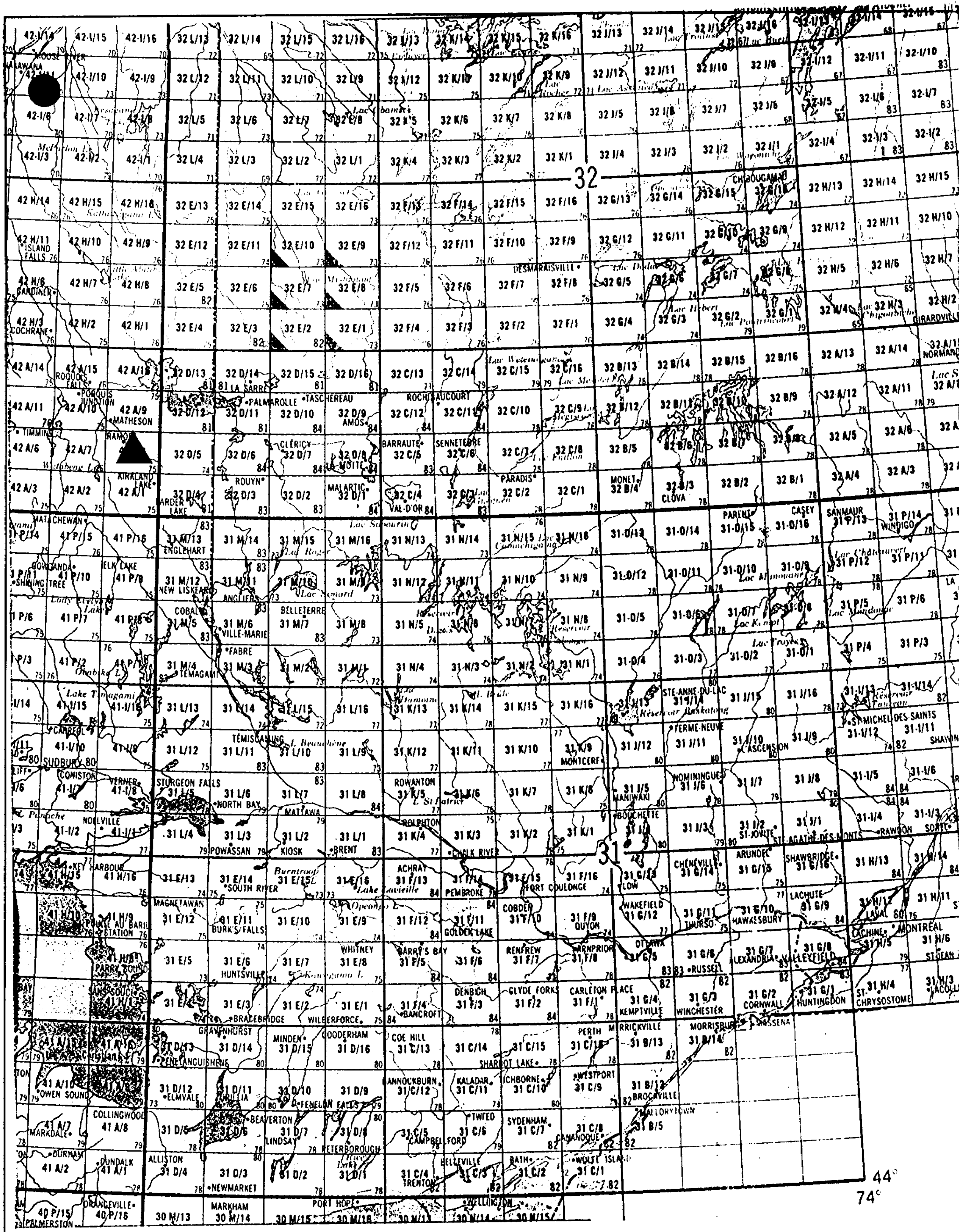

FIGURE 1. General Location

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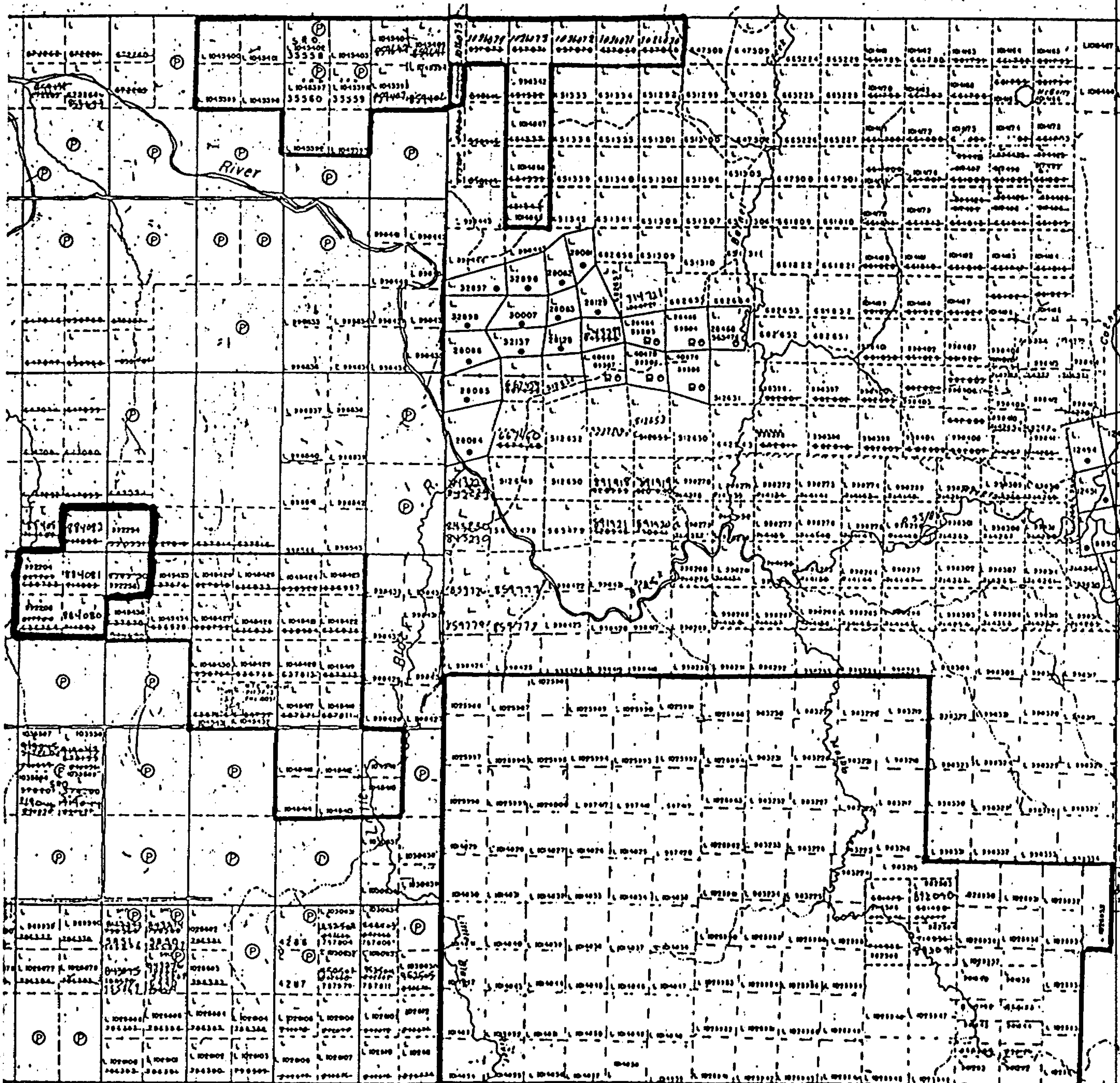

FIGURE 2. Claim Location Map
(exact locations not certified)

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ment of Geology, University of Saskatchewan, 1971.

The survey area is underlain predominantly by west to northwest trending calc-alkalic and tholeiitic metavolcanics. The calc-alkalic metavolcanics range from mafic to intermediate in composition and occupy the central portion of the survey area. The tholeiitic metavolcanics occupy the northern and southern extremities and are subdivided into magnesium rich and iron rich members. The oldest and least representative rocks in the survey area are turbiditic sedimentary rocks belonging to the Porcupine Group and occur only in the immediate vicinity of the Melba Gold Mine in the north central part of the survey area.

Semi-conformable gabbroic intrusives occur along the western edge of the survey area and in the southeastern corner. Minor porphyritic granitoid rocks occur in the central part of the survey area, particularly around Melba Gold Mine. Numerous diabase dykes form a north trending swarm throughout the western half of the survey area.

The lithologies have been folded about anti-clinal and synclinal axes parallel to the stratigraphy. Faults trend variably to the north, northeast and northwest.

The gold at the Melba Gold Mine is associated with quartz calcite veins that trend to the northwest and may bear a genetic relationship with the porphyritic granitoid rocks.

4. Survey Specifications

4.1 Instruments

The survey was carried out using a Cessna 206 aircraft, registration C-GGLS, which carries a magnetometer and a VLF electromagnetic detector.

The magnetometer is a high sensitivity, optically pumped cesium vapour magnetometer mounted in a stinger attached to the tail of the aircraft. It's specifications are as follows:

Working range:	20,000-100,000 gammas
Sensitivity:	0.001 gammas
Sampling rate:	0.2 seconds
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Manufacturer:	Scintrex, Concord Ontario.

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Accuracy:	1%
Reading Interval:	1/2 second
Model:	TOTEM 2A
Manufacturer:	Herz Industries, Toronto, Canada

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

Other instruments are:

- King KRA-10A radar altimeter
- UDAS-100 data processor with Digidata nine track tape recorder, manufatured by Urtec Ltd., Markham, Ontario.
- Geocam video camera and recorder for flight path recovery, manufactured by Geotech Ltd., Markham, Ontario.

4.2 Lines and Data

Line spacing:	100 metres
Line direction:	040 degrees
Terrain clearance:	100 m
Average ground speed:	193 km/hr
Data point interval:	
Magnetic:	11 metres
VLF-EM:	11 metres

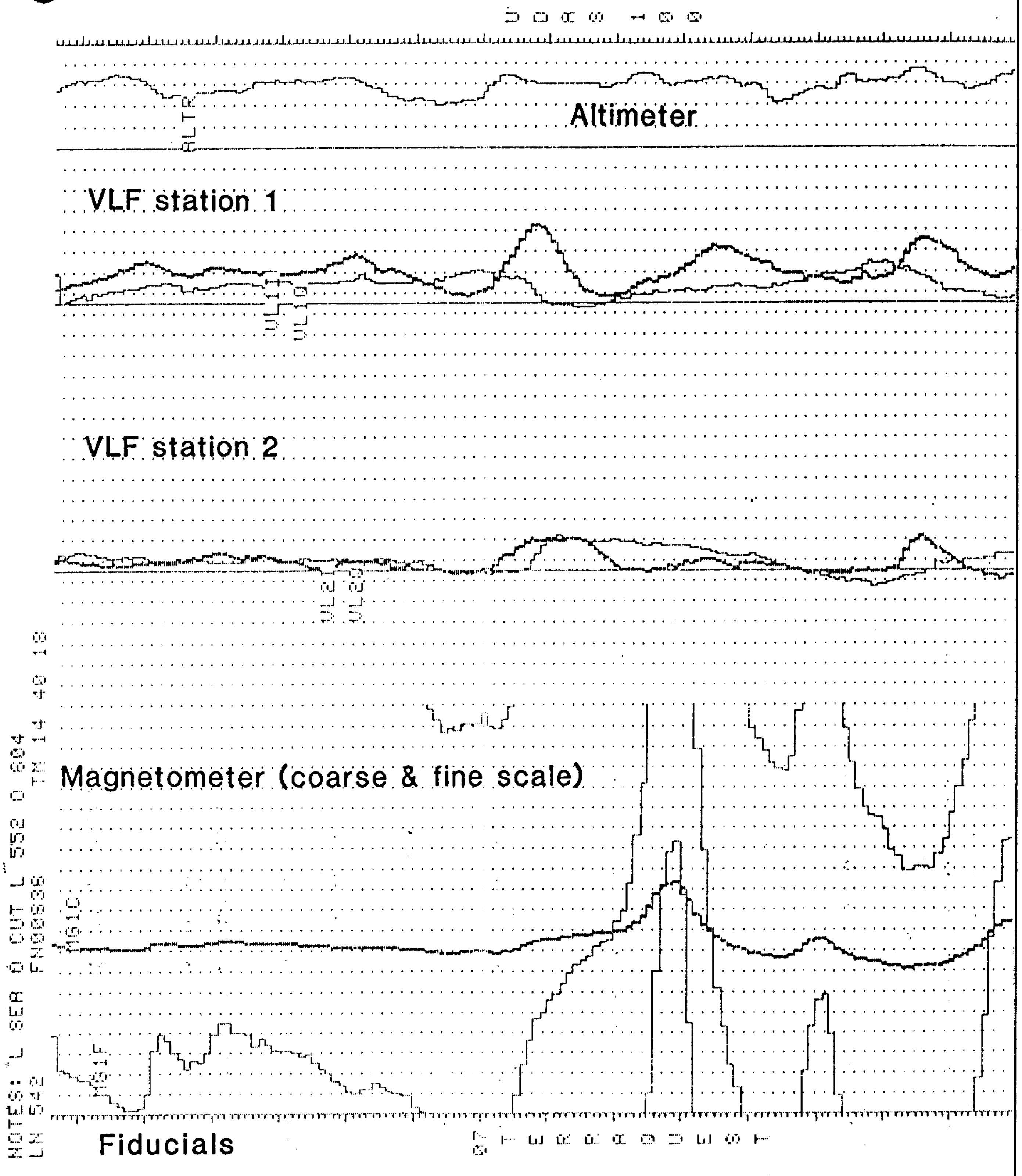

FIGURE 3. Sample of analogue data

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Tie Line interval:	2 km
Channel 1 (LINE):	NAA Cutler, 24.0 kHz
Channel 2 (ORTHO):	NSS Annapolis, 21.4 kHz
Line km over total survey area:	577 line km
Line km over claim groups:	252 line km

4.3 Tolerances

Line spacing: Any gaps wider than twice the line spacing and longer than 10 times the line spacing were filled in by a new line.

Terrain clearance: Portions of line which were flown above 125 metres for more than one km were reflown if safety considerations were acceptable.

Diurnal magnetic variation: Less than ten gammas deviation from a smooth background over a period of two minutes or less as seen on the base station analogue record.

Manoeuvre noise: nil

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5. Data Processing

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

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Grant, F.S., 1972: Review of Data Processing and Interpretation Methods in Gravity and Magnetics; Geophysics Vol 37-4

Spector, A., 1968: Spectral Analysis of Aeromagnetic maps; unpublished thesis; University of Toronto.

6. Interpretation

6.1 General Approach

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FIGURE 4

TERRAQUEST CLASSIFICATION OF VLF-EM CONDUCTOR AXES

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

NOTES

1 - Upper case symbols denote a relatively strong total field strength

2 - Underlined symbols denote a relatively strong quadrature response

3 - Mineralogic origins include sulphides, graphite, and in fault zones, gouge

4 - Electrolytic origins imply conductivity related to porosity or high moisture content

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

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

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

6.2 Interpretation

The magnetic and VLF-EM data are shown in contoured format on maps at a scale of 1:10,000 in the back pocket. An interpretation map is also provided. The following notes are intended to supplement these maps.

The total magnetic field has a relief of approximately 800 gammas over the entire survey area, the stronger responses have been located at the northern and southern ends. At these locations the magnetic responses are consistent with the general trend of the lithologies. The magnetic relief across the central part of the survey area is approximately 250 gammas and shows prominent north, trending narrow magnetic trends consistent with the diabase dykes.

The vertical magnetic gradient format improves the resolution of the east-west trending anomalies at the north and south ends of the survey area, and the north-south trending anomalies across the centre of the map. These north-south trending anomalies dominate and overwhelm the other responses in the central part of the survey area. The contour level of the vertical magnetic gradient has been reduced to 0.05 gammas per metre in order to emphasize the east-west trending metavolcanics. This has been partially successful. It is recommended that a trend de-enhancement program may be useful to obliterate the effects of the north trending magnetic anomalies in order to enhance the east-west trends.

All of the north trending magnetic anomalies have been interpreted as diabase dykes (Unit 16). This is consistent with the 5% magnetite as reported by Jensen (1971). Several geologically mapped diabases do not appear to possess a significant magnetic response either because (a) they are too small, (b) they have a different original composition, or (c) they have been altered by metasomatism or metamorphism.

The iron rich tholeiitic basalts (Unit 6) correlate with the very strong magnetic responses whereas the magnesium rich tholeiitic basalts (Unit 5) correlate with weak to moderate magnetic responses. Generally these two units occur in proximity and the responses from the iron rich basalts overwhelm and dominate those from the magnesium rich basalts. The west trending magnesium rich tholeiitic basalts in the extreme northwest corner of the survey correlate with strong magnetic responses that trend to the north and northeast. These responses may be related to a sub-member of the magnesium rich tholeiitic basalts (Unit 5m) that is characterized by an increased concentration of magnetic minerals. Alternatively it may be related to a deeper or buried mafic intrusive.

The calc-alkalic mafic to intermediate metavolcanics (Unit 8) correlate with moderate strength magnetic responses. Magnetically active horizons with this unit (Unit 8m) are probably related to more mafic compositions or possibly to an increase in concentration of magnetite or pyrrhotite. It is cautioned that the interpreted 8m horizons across the central part of the survey area are highly subjective primarily due to the fact that (a) the magnetic contrast is very low and (b) there is considerable magnetic interference from the north trending diabase dykes.

Exposures of gabbro (Unit 13) correlate with weak to moderate magnetic responses and in general cannot be discriminated from the metavolcanic horizons. However, several localized zones exhibit strong magnetic responses and suggest that the gabbroic intrusives are not homogeneous. This variation may be related to initial composition or alteration.

The strong magnetic anomaly in the vicinity of Melba Gold Mine coincides with outcrops of metasediments (Unit 1), porphyritic granitoid rocks (Unit 15) and peripherally, the calc-alkalic mafic to intermediate metavolcanics (Unit 8). It is anticipated that the clastic metasediments, as described in the geological reports, would not possess a significant magnetic response. Similarly, the orientation of the magnetic responses is not consistent with the trend of the calc-alkalic metavolcanics (Unit 8). Therefore it is suggested that these strong responses are related to the porphyritic granitoid rocks (Unit 15) which intrude the metasediments. The strength and dimensions of this anomaly suggest a buried source at considerable depth with two separate lobbs extending to the south. The attenuated responses over these lobbs may be related to either a thinning of the intrusives at these locations or to an increasing depth beneath the surface. The narrow exposures of the porphyritic granitoid rocks are not by themselves sufficient to create these magnetic responses and are thought to be apophyses from a deeper granitoid plug.

Most of the magnetically interpreted faults trend to the northwest and show considerable continuity. Numerous northeast trending faults generally show less continuity despite the fact that northeast trending faults at the Melba Gold Mine have been reported to cross-cut the northwest trending faults. Several east-west trending faults have been identified by the displacements of the diabase dykes. Several north trending faults identified by displacement of the iron rich tholeiitic basalts are parallel to the diabase dykes and may be related to the same deformational event. Many of the magnetically interpreted faults correlate with air photo lineaments.

The VLF-EM survey has identified numerous weak to moderate strength conductive zones and a few strong conductor axes. Most of these are associated with structural sources, either faults or shear zones based on the general trend identified by the magnetic mapping. This type of conductivity may be related to (a) minerals such as sulphides, graphite or gouge within the structure, or (b) an ionic effect created by water or porosity along the structure or to conductive overburden in an overlying topographic depression. Structures identified by either magnetic mapping or VLF-EM methods bear potential for epithermal type mineralization. For example, the Melba Gold Mine correlates with coincident northwest trending magnetically interpreted fault and a VLF-EM conductor axis.

Several conductor axes appear to be related to the stratigraphy as they are either coincident or parallel to the magnetic units. These bear potential for stratabound bedrock origins such as sulphides, graphite or porous flowtops. These should be followed up on the ground using EM or IP methods.

7. Summary

An airborne combined magnetic and VLF-EM survey has been carried out at 100 metre line intervals with data reading stations at 11 metres along the flight lines. All data is produced on maps at a scale of 1:10,000.

The magnetic data has been used to modify and update the existing geology and has shown a number of new contacts and faults. Numerous VLF-EM conductor axes were found most of which were associated with structural sources, some of which bear potential for epithermal type mineralization. A few conductor axes are associated with the stratigraphy and have potential for sulphide or graphite origins and have been recommended for additional investigation.

TERRAQUEST LTD.

Charles Q. Barrie, M.Sc.

Geologist

GEOLOGICAL ASSOCIATION OF CANADA
CHARLES Q. BARRIE
FELLOW

#273

Ministry of Northern Development and Mines

Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

DOCUMENT W8808-

42A08SE0019 2.11558 BLACK 900

Type of Survey(s)	Township or Area
AIRBORNE MAGNETIC + VLF/EM	MELBA TWP.

Claim Holder(s)	Prospector's Licence No.
RAVEN RESOURCES Inc	T 4869

Address: 139 Carter Ave Kirkland Lake Ont P2N2A1

Survey Company	Date of Survey (from & to)	Total Miles of line Cut
TERRAQUEST Ltd	21 06 88 – 22 06 88 (Day Mo. Yr.)	

Name and Address of Author (of Geo-Technical report): C Q Barrie 240 Adelaide West

Credits Requested per Each Claim in Columns at right

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

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

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

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Number	Expend. Days Cr.
[redacted]	982583	
	982584	
	982585	
	982586	

LARDER LAKE MINING DIV.

RECEIVED

JUN 22 1988

AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

210

RECEIVED

JUN 27 1988

MINING LANDS SECTION

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

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.

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
320	June 22/88	M. G. Weyrme
ZP.	Date Approved as Recorded: 88/11/25	Branch Director: [signature]

A23

Date	Recorded Holder or Agent (Signature)
22/06/88	Michael Leahy

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: Michael LEAHY 139 Carter Ave Kirkland Lake

Date Certified	Certified by (Signature)
22/06/88	Michael Leahy

1362 (85/12)

Land Management

Ontario — Ministry of Northern Development and Mines

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

DOCUMENT No. W8808·318

2.11558

Instructions: – Please type or print. Page ① of 2 Aug /91
– 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.

Field	Entry
Type of Survey(s)	AIRBORNE MAGNETICS AND EM/VLF
Township or Area	BLACK / BENOIT / MELBA
Claim Holder(s)	731530 ONTARIO LIMITED (MELBA GOLD LIMITED)
Prospector's Licence No.	T-4994
Address	P.O. BOX 283, KIRKLAND LAKE, ONTARIO P2N 3M6
Survey Company	TERRAQUEST LTD.
Date of Survey (from & to)	20 6 88 (Day Mo. Yr.)
Total Miles of line ~~Cut~~ Flown	329 km.
Name and Address of Author (of Geo-Technical report)	CHARLES BARRIE, MSc, % TERRAQUEST LTD, 240 ADELAIDE ST.W., TORONTO M5H 1W7

Credits Requested per Each Claim in Columns at right

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

RECEIVED
JUL 26 1988
MINING LANDS SECTION

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.

Date	Recorded Holder or Agent (Signature)
June 30/88	Cyrus A. Ross

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
L	980242		L	892094	
	980243			892095	
	935298			892096	
	935299			892097	
	935300			892098	
	935301			892099	
	935302			continued →	
	935303				
	935304				
	935305				
	935306				
	935288				
	935289				
	935290				
	935291				
	935292				
	935293				
	935294				
	935295				
	935296				
	935297				
	892093				

ONTARIO GEOLOGICAL SURVEY
ASSESSMENT FILES OFFICE
SEP 8 1988
RECEIVED

LARDER LAKE MINING DIV.
RECEIVED
JUN 30 1988
4:25 PM
9 10 11 12 1 2 3 4 5 6

Total number of mining claims covered by this report of work: 28 (Total 193)

continued page ②

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
15440	June 30/88	M.G. Weimer
	Date Approved as Recorded: 7 Sept 88	Branch Director: [signature]

Certification Verifying Report of Work

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

Name and Postal Address of Person Certifying: C. A. ROSS, 90 - 2nd St., KIRKLAND LAKE, Ont P2N 1R9

Date Certified: June 30/88

Certified by (Signature):

1362 (85/12)

Ministry of Northern Development and Mines
Ontario

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

Mining Act

DOCUMENT No. W8808·318

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.

Field	Entry
Type of Survey(s)	AIRBORNE MAGNETICS AND EM/VLF
Township or Area	MELBA
Claim Holder(s)	731530 ONTARIO LIMITED (MELBA GOLD LIMITED)
Prospector's Licence No.	T-4994
Address	P.O. BOX 283, KIRKLAND LAKE, ONTARIO P2N 3M6
Survey Company	TERRAQUEST LIMITED.
Date of Survey (from & to)	20 6 88 (Day Mo. Yr.) – Day Mo. Yr.
Total Miles of line Cut	FLOWN
Name and Address of Author (of Geo-Technical report)	CHARLES BARRIE, M.Sc. c/o TERRAQUEST LTD., 240 ADELAIDE ST W, TORONTO M5H 1W7

Credits Requested per Each Claim in Columns at right

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

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
	981836			1025946	✓
	981840			1025947	✓
	981843			1025948	✓
	981844			1025949	
	981292			1025950	
	981293			1025951	
	1025930	✓		1025952	
	1025931			1025953	
	1025932			1025954	
	1025933			1025955	
	1025934	✓		1025956	
	1025935			1025957	
	1025936			1025958	
	1025937			1025959	
	1025938			1025960	
	1025939			1025961	
	1025940			1025962	
	1025941			1025963	
	1025942			1025964	
	1025943			1025965	
	1025944			continued	
	1025945				

Total number of mining claims covered by this report of work: 42

Continued on Page 2

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.

Date	Recorded Holder or Agent (Signature)
June 30/88	Cyrus A. Ross

For Office Use Only		
Total Days Cr. Recorded	Date Recorded	Mining Recorder: M. A. Wenne
	Date Approved as Recorded	Branch Director

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: C. A. Ross, 90 - 2nd St., Kirkland Lake, Ont P2N 1R9

Date Certified: June 30/88

Certified by (Signature):

1362 (85/12)

Ministry of Northern Development Mines
Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

Mining Act

DOCUMENT No. W8808·318

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): AIRBORNE MAGNETICS AND EM/VLF	Township or Area: MELBA
Claim Holder(s): 731530 ONTARIO LIMITED (MELBA GOLD LIMITED)	Prospector's Licence No.: T-4994
Address: P.O. BOX 283, KIRKLAND LAKE, ONTARIO P2N 3M6	
Survey Company: TERRAQUEST LTD.	Date of Survey (from & to): 20 6 88 Day Mo. Yr. / Day Mo. Yr. — Total Miles of line ~~Cut~~ FLOWN
Name and Address of Author (of Geo-Technical report): CHARLES BARRIE, MSc. c/o TERRAQUEST LTD., 240 ADELAIDE ST. W., TORONTO M5H 1W7	

Credits Requested per Each Claim in Columns at right

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

Date	Recorded Holder or Agent (Signature)
June 30/88	Cyrus A. Ross.

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
	983215	✓		997420	✓
	983216	✓		1014825	✓
	983217	✓		1014826	
	983218	✓		1014827	
	983219	✓		1014828	
	983220	✓		1014829	
	983221	✓		1014830	✓
	983222			1014831	
	983223	✓		1014832	
	983224	✓		1014833	✓
	983225			1014834	
	983226	✓		1014835	✓
	983227			1014836	✓
	983228			1014837	✓
	983229			1025990	✓
	983230	✓		1025991	✓
	983231	✓		1025992	✓
	983232	✓		1025993	✓
	983233	✓		1025994	✓
	983234	✓		1025995	✓
	997418	✓		1025996	✓
	997419			1025997	✓
				continued	

Total number of mining claims covered by this report of work. 44

Continued on Page 4

For Office Use Only		
Total Days Cr. Recorded	Date Recorded	Mining Recorder: M. A. Weeme
	Date Approved as Recorded	Branch Director

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		
C. A. Ross, 90 - 2nd St., Kirkland Lake, Ont. P2N 1R9	Date Certified: June 30/88	Certified by (Signature)

1362 (85/12)

Ministry of Northern Development and Mines
Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

Mining Act

DOCUMENT No. W8808·318

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): AIRBORNE MAGNETICS AND EM/VLF	Township or Area: MELBA
Claim Holder(s): 731530 ONTARIO LIMITED (MELBA GOLD LIMITED)	Prospector's Licence No.: T-4994
Address: P.O. BOX 283, KIRKLAND LAKE, ONTARIO P2N 3M6	
Survey Company: TERRAQUEST LTD.	Date of Survey (from & to): 20 6 88 (Day Mo. Yr.) – (Day Mo. Yr.); Total Miles of line Cut: FLOWN
Name and Address of Author (of Geo-Technical report): CHARLES BARRIE, MSc., % TERRAQUEST LTD., 240 ADELAIDE ST. W., TORONTO M5H 1W7	

Credits Requested per Each Claim in Columns at right

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

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
	1025998	✓		1014856	✓
	1025999	✓		1014857	✓
	1026000	✓		1014858	✓
	997417	✓		1014859	✓
	1014838	✓		1025986	✓
	1014839	✓		1025987	✓
	1014840	✓		1025988	✓
	1014841	✓		1025989	✓
	1014842	✓		continued →	
	1014843	✓			
	1014844	✓			
	1014845	✓			
	1014846	✓			
	1014847	✓			
	1014848	✓			
	1014849	✓			
	1014850	✓			
	1014851	✓			
	1014852	✓			
	1014853	✓			
	1014854	✓			
	1014855	✓			

Total number of mining claims covered by this report of work: 30

continued on page 5

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.

Date	Recorded Holder or Agent (Signature)
June 30/88	Cyrus A. Ross.

For Office Use Only		
Total Days Cr. Recorded	Date Recorded	Mining Recorder: M. A. Wellman
	Date Approved as Recorded	Branch Director

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: C. A. ROSS, 90-2nd St., Kirkland Lake, Ont. P2N 1R9

Date Certified: June 30/88

Certified by (Signature):

1362 (85/12)

Ministry of Northern Development and Mines
Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

DOCUMENT No. W8808·318

Mining Act

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
AIRBORNE MAGNETICS AND EM/VLF	MELBA

Claim Holder(s)	Prospector's Licence No.
NORDEX EXPLOSIVES LTD.	T-4977

Address: P.O. BOX 790, KIRKLAND LAKE, ONTARIO P2N 3K4

Survey Company	Date of Survey (from & to)	Total Miles of line cut
TERRAQUEST LTD.	20 / 6 / 88 (Day / Mo. / Yr.) – Day / Mo. / Yr.	FLOWN

Name and Address of Author (of Geo-Technical report): CHARLES BARRIE, M.Sc. c/o TERRAQUEST LTD., 240 ADELAIDE ST.W., TORONTO M5H 1W7

Credits Requested per Each Claim in Columns at right

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

Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

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

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.
L	998342	✓
	1014867	✓
	1014868	✓
	1014869	✓
	1026070	✓
	1026071	✓
	1026072	✓
	1026073	✓
	1026074	✓
	1026075	✓
	continued.	

Total number of mining claims covered by this report of work: 10

continued on Page 6

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.

For Office Use Only		
Total Days Cr. Recorded	Date Recorded	Mining Recorder: M. A. Wellman
	Date Approved as Recorded	Branch Director

Date	Recorded Holder or Agent (Signature)
June 30/88	Cyrus A. Ross

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: C. A. Ross, 90 - 2nd St., Kirkland Lake, Ont P2N 1R9

Date Certified	Certified by (Signature)
June 30/88	

1362 (85/12)

Ministry of Northern Development and Mines
Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

Mining Act

DOCUMENT No. W8808·318

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.

Field	Entry
Type of Survey(s)	AIRBORNE MAGNETICS AND EM/VLF
Township or Area	BENOIT
Claim Holder(s)	NORDEX EXPLOSIVES LTD.
Prospector's Licence No.	T-4977
Address	P.O. BOX 790 KIRKLAND LAKE, ONTARIO P2N 3K4
Survey Company	TERRAQUEST LTD.
Date of Survey (from & to)	29 / 6 / 88 — Day / Mo. / Yr.
Total Miles of line ~~cut~~ FLOWN	
Name and Address of Author (of Geo-Technical report)	CHARLES BARRIE, M.Sc. c/o TERRAQUEST LTD. 240 ADELAIDE ST. W., TORONTO, M5H 1W7

Credits Requested per Each Claim in Columns at right

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

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	· Electromagnetic	
	· Magnetometer	
	· Radiometric	
	· Other	
	Geological	
	Geochemical	

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

Date	Recorded Holder or Agent (Signature)
June 30/88	Cyrus A. Ross

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
L	1045392		L	1045419	
	1045393			1045420	
	1045394			1045421	
	1045395			1045422	
	1045396			1045423	
	1045397			1045424	
	1045398			1045425	
	1045399			1045426	
	1045400			1045427	
	1045401			1045428	
	1045402			1045429	
	1045403			1045430	
	1045404			1045431	
	1045405			1045432	
	1045410			1045433	
	1045411			1045434	
	1045412			1045435	
	1045413				
	1045414				
	1045415				
	1045417				
	1045418				

Total number of mining claims covered by this report of work. **39**

For Office Use Only		
Total Days Cr. Recorded	Date Recorded	Mining Recorder
	Date Approved as Recorded	Branch Director

Signature: M. C. Weerme

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	Date Certified	Certified by (Signature)
C. A. Ross 90 - 2nd St., Kirkland Lake, Ont P2N 1R9	June 30/88	

1362 (85/12)

XEROX TELECOPIER 495-1;29-12-88;10:15AM ; 17055675621→ 4169216926;# 3

SENT BY:LARDER LK MINING RECOR;12-29-88 10:10AM ; 17055675621→ 4169216926;# 2

Ministry of Natural Resources Ontario

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

DOCUMENT No. W8808·399

The Mining Act 2.11558

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): AIR SURVEY REF:#A-1852

Township or Area: BENOIT TWP

Claim Holder(s): JOHN K. JASPERSON

Prospector's Licence No.: A44875

Address: 18 BYRON ST. RR#2 STOUFFVILLE ONT L4A 7X3

Survey Company: TERRAQUEST

Date of Survey (from & to): 20 6 88 – 21 6 88 (Day Mo. Yr.)

Total Miles of line Cut:

Name and Address of Author (of Geo-Technical report): CHARLES BARRIE, TERRAQUEST

Credits Requested per Each Claim in Columns at right

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

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	• Electromagnetic	
	• Magnetometer	
	• Radiometric	
	• Other	
	Geological	
	Geochemical	

RECEIVED SEP 12 1988 10.56 a.m.

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	40
	Magnetometer	40
	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)

Prefix	Number	Expend. Days Cr.		Prefix	Number	Expend. Days Cr.
L	884080	17.5 17.5	Airborne		E.M. Mag.	
	884081	15. 15.	Airborne		E.M. Mag.	
	884082	15. 15.	Airborne		E.M. Mag.	
	884083	7. 7.	Airborne		E.M. Mag.	
	992204					
	992205					
	992254					
	992255					

Total number of mining claims covered by this report of work: 8

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
429	Sept 12/88	M. G. Weume
	Date Approved as Recorded: 3 Jan 89	Branch Director: [signature]

Date: Sept 1/88 — Recorded Holder or Agent (Signature): [signature]

Certification Verifying Report of Work

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

Name and Postal Address of Person Certifying: JOHN K. JASPERSON 18 BYRON ST. RR#2 STOUFFVILLE ONT L4A 7X3

Date Certified: SEPT 1 1988 — Certified by (Signature): [signature]

1362 (81/9)

Ministry of Natural Resources
Ontario

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

DOCUMENT No. W8808·399

The Mining Act

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): AIR SURVEY REF:#A-7852
Township or Area: BENOIT TWP
Claim Holder(s): JOHN K. JASPERSON
Prospector's Licence No.: A44875
Address: 18 BYRON ST. RR#2 STOUFFVILLE ONT L4A 7X3
Survey Company: TERRAQUEST
Date of Survey (from & to): 20 6 88 – 21 6 88 (Day Mo. Yr. Day Mo. Yr.)
Total Miles of line Cut:
Name and Address of Author (of Geo-Technical report): CHARLES BARRIE, TERRAQUEST

Credits Requested per Each Claim in Columns at right

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

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

RECEIVED
SEP 12 1988
10.56 am

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

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.		Prefix	Number	Expend. Days Cr.
L	884080	17.5 / 17.5	Airborne		E.M. / Mag	
	884081	15. / 15.	Air		E.M. / Mag	
	884082	15. / 15.	Air		E.M. / Mag	
	884083	7. / 7.	Airborne		E.M. / Mag	
	992204					
	992205					
	992254					
	992255					

Total number of mining claims covered by this report of work: 8

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.

For Office Use Only		
Total Days Cr. Recorded: 429	Date Recorded: Sept 12/88	Mining Recorder: M. G. Weume
	Date Approved as Recorded	Branch Director

Date: Sept 1/88 Recorded Holder or Agent (Signature): [signature]

Certification Verifying Report of Work

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

Name and Postal Address of Person Certifying: JOHN K. JASPERSON 18 BYRON ST. RR#2 STOUFFVILLE ONT L4A 2X3

Date Certified: SEPT 1 1988 Certified by (Signature): [signature]

1362 (81/9)

REFERENCES

AREAS WITHDRAWN FROM DISPOSITION

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

Description	Order No.	Date	Disposition	File
SEC. 36/80	W 8/86	80/01/20	M & S	
SEC. 36/80	O 34/86	86/07/07	M & S	

NOTES:

400' frontage on Butler Lake withdrawn from disposition for proposed summer resort development, July 6, 1986

FILE 164586

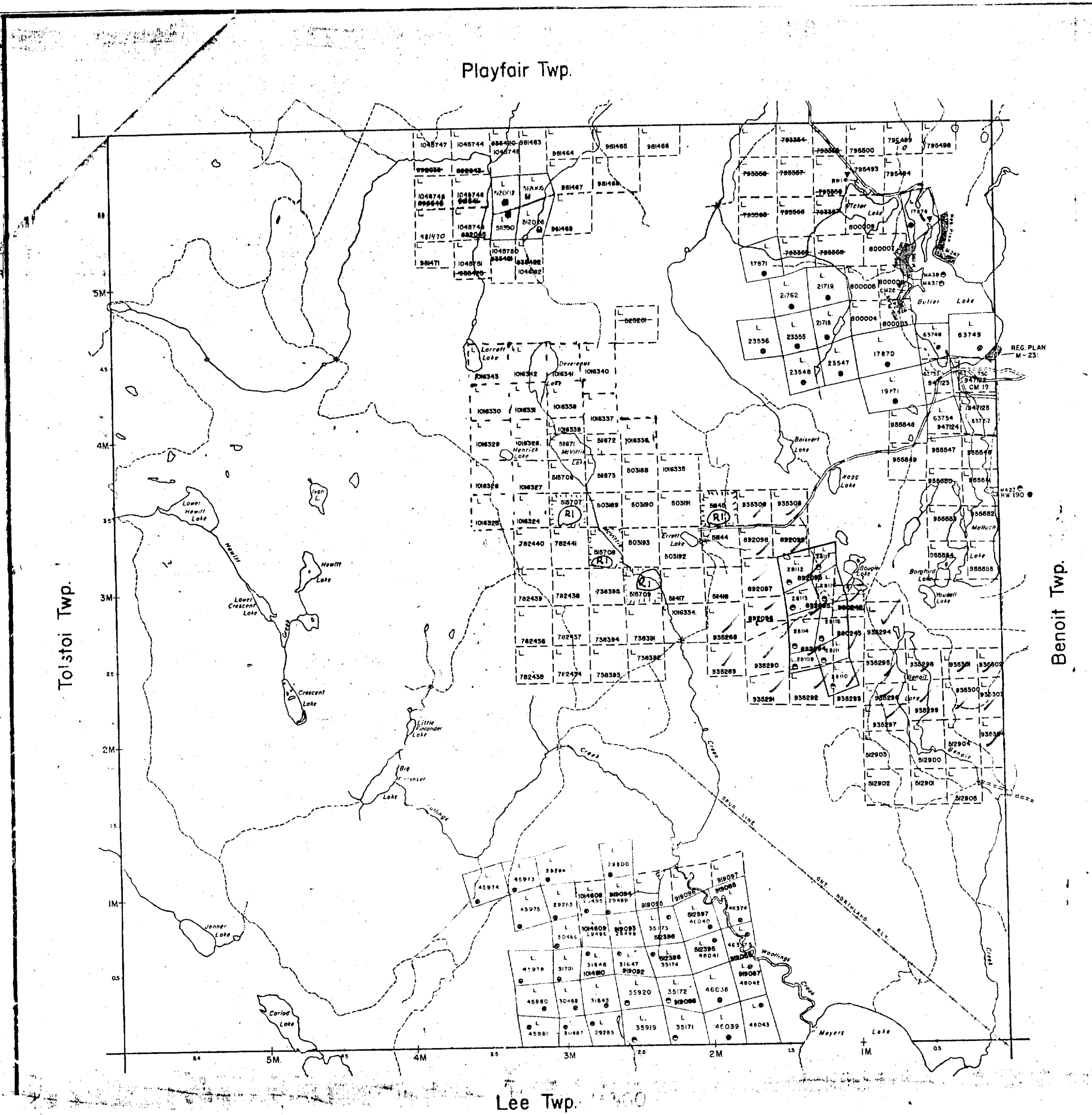
CIRCULATED MAY 2/88

NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE

42A08SE0019 2.11558 BLACK

200



LEGEND

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

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" , SURFACE RIGHTS ONLY	◐
" , MINING RIGHTS ONLY	○
LEASE, SURFACE & MINING RIGHTS	■
" , SURFACE RIGHTS ONLY	◧
" , MINING RIGHTS ONLY	□
LICENCE OF OCCUPATION	▼
ORDER-IN-COUNCIL	OC
RESERVATION	⊙
CANCELLED	⊗
SAND & GRAVEL	⊛

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

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000

METRES 0 200 1000 (1 KM) 2000 (2 KM)

DATE OF ISSUE

MAY 13 1988

LARDER LAKE MINING RECORDER'S OFFICE

TOWNSHIP

BLACK

M.N.R. ADMINISTRATIVE DISTRICT

KIRKLAND LAKE

MINING DIVISION

LARDER LAKE

LAND TITLES / REGISTRY DIVISION

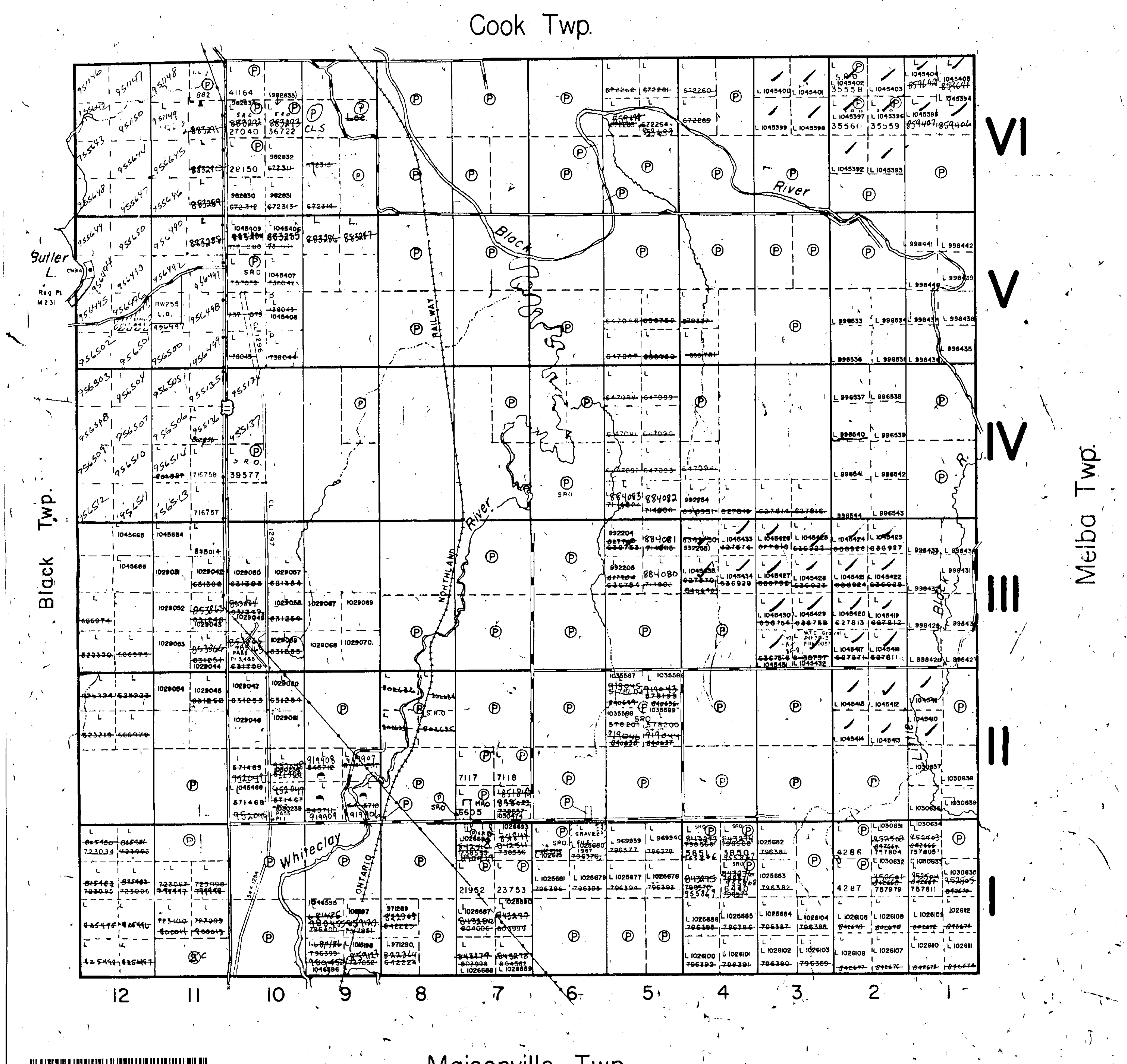
COCHRANE

Ministry of Natural Resources — Land Management Branch

Ontario

Date JANUARY 1985

Number G-3197



THE TOWNSHIP OF BENOIT

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	● or Ⓟ
CROWN LAND SALE	Ⓢ or 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	
PATENTED S.R.O.	
CANCELLED	

NOTES

400' Surface rights reservation around all lakes & rivers.

Gravel Reserve Shown Thus:

400' frontage on Butler Lake withdrawn from disposition for proposed summer resort development. File 164586

Areas withdrawn from staking under Section of the Mining Act

File	Date	Disposition

PLAN NO.- M.326#10

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

42A08SE0019 2.11558 BLACK

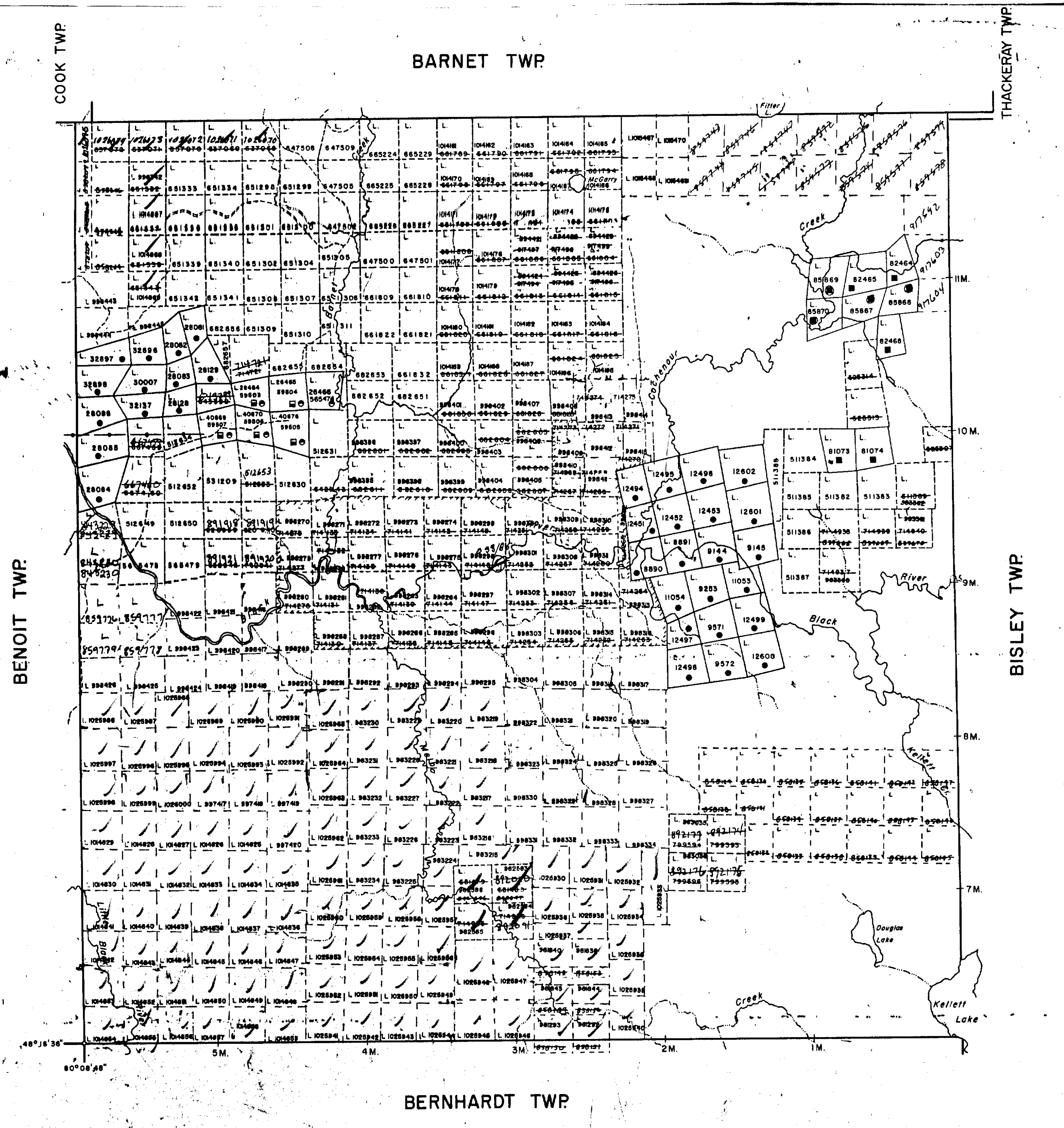
210

REFERENCES

AREAS WITHDRAWN FROM DISPOSITION

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

Description	Order No.	Date	Disposition	File
~~Sec. 36/80~~	~~W 9/86~~	~~24/10/85~~	~~S+M~~	
Sec 36/80	039/86	07/07/86 9:00 a.m.	S+M	



LEGEND

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

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" , SURFACE RIGHTS ONLY	
" , MINING RIGHTS ONLY	
LEASE, SURFACE & MINING RIGHTS	■
" , SURFACE RIGHTS ONLY	
" , MINING RIGHTS ONLY	
LICENCE OF OCCUPATION	▼
ORDER-IN-COUNCIL	OC
RESERVATION	
CANCELLED	
SAND & GRAVEL	

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

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000
METRES 0 200 1000 (1 KM) 2000 (2 KM)

DATE OF ISSUE
AUG 5 1986
LARDER LAKE
MINING RECORDER'S OFFICE

TOWNSHIP
MELBA

M.N.R. ADMINISTRATIVE DISTRICT
KIRKLAND LAKE
MINING DIVISION
LARDER LAKE
LAND TITLES / REGISTRY DIVISION
COCHRANE

Ontario — Ministry of Natural Resources — Land Management Branch

Date JANUARY, 1985 — Number G-3216

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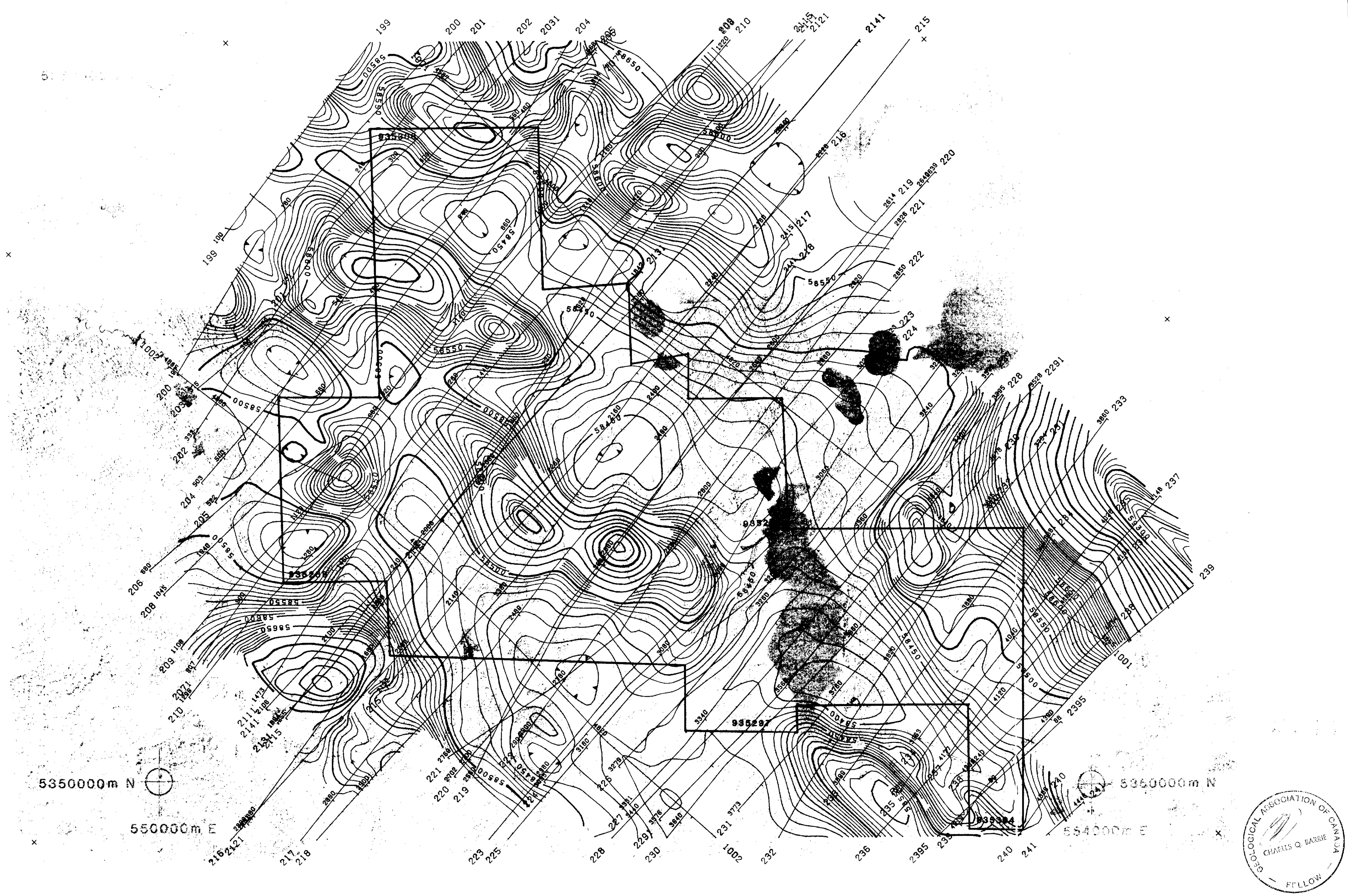
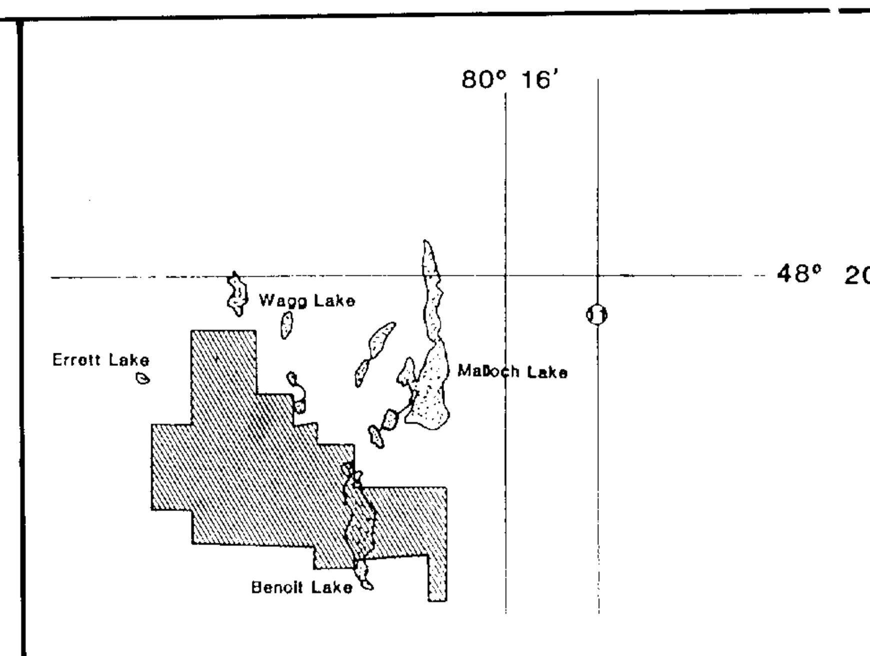
220



LEGEND

Terrain Clearance	100 metres
Line Spacing	100 metres
Property Boundary	

TOTAL MAGNETIC FIELD
- 1000 gammas
- 250 gammas
- 50 gammas
- 10 gammas



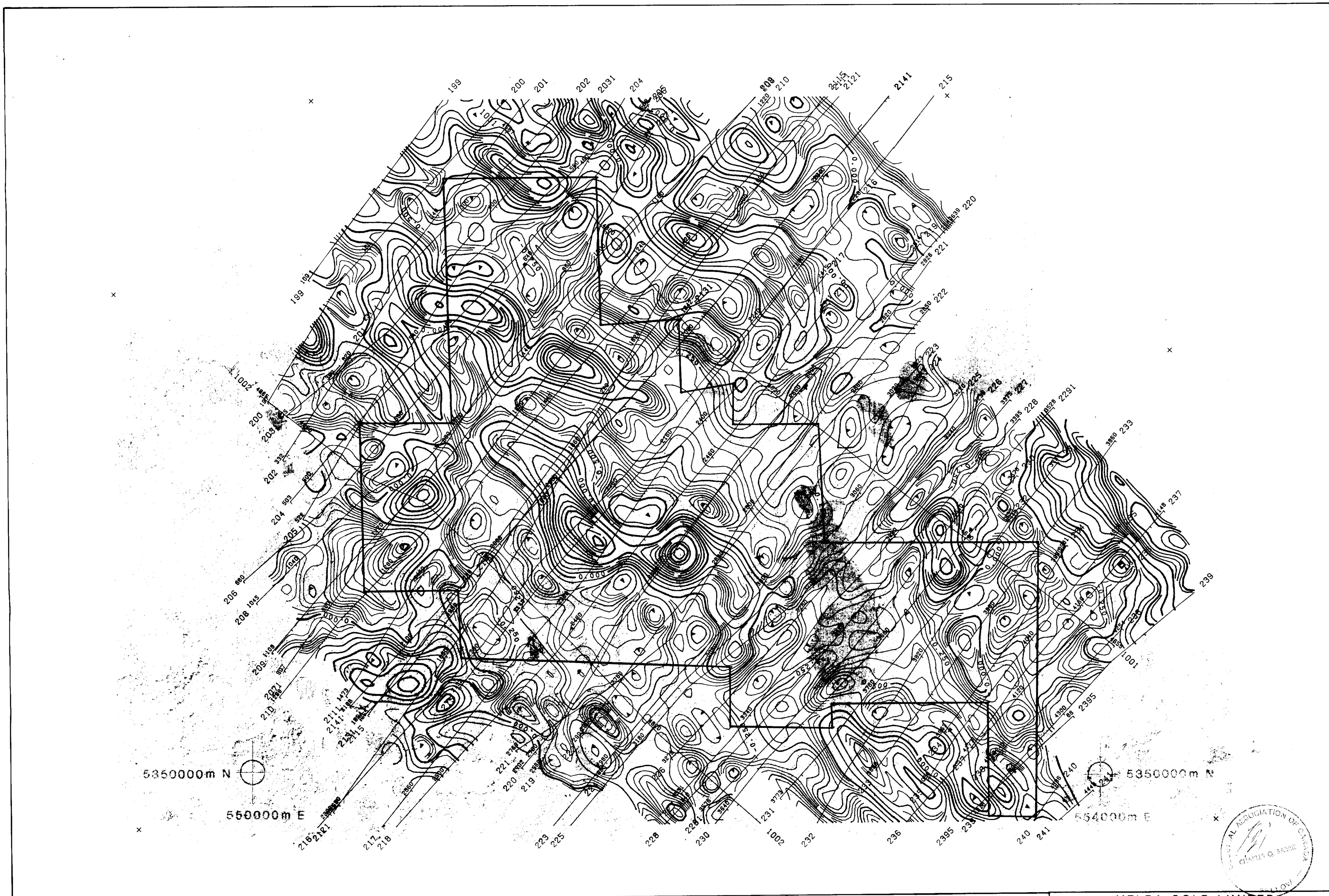
MELBA GOLD LIMITED
(731530 ONTARIO LIMITED)

AIRBORNE MAGNETIC SURVEY
TOTAL MAGNETIC FIELD

BLACK CREEK GOLD PROPERTY
BLACK TWP., ONTARIO

N.T.S. NO.	42A/8	DRAWING NO.	A-785.1-1
SCALE:	1:10,000	DATE:	July 1988

TERRAQUEST LTD.
TORONTO, CANADA

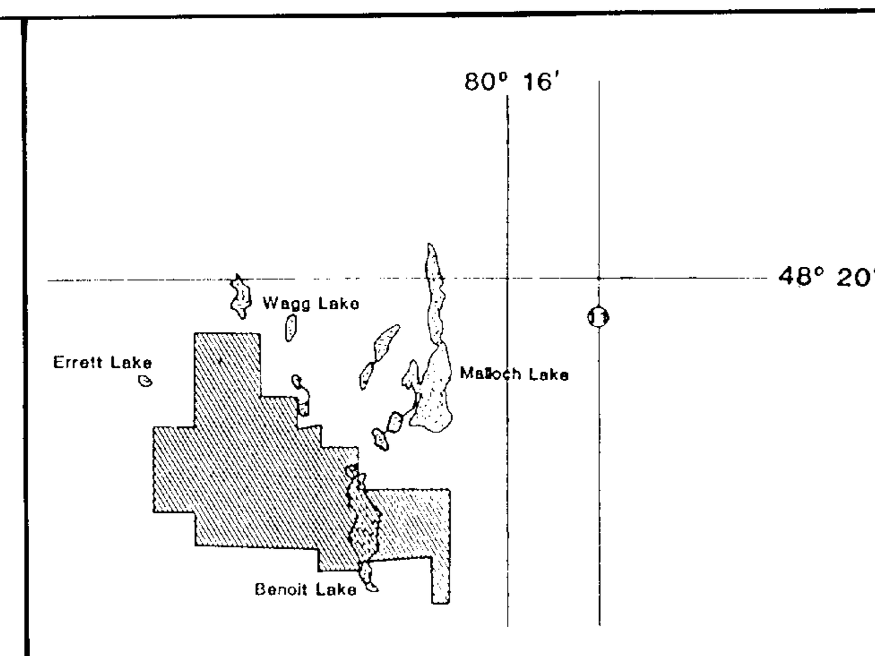


LEGEND

Terrain Clearance	100 metres
Line Spacing	100 metres
Property Boundary	

VERTICAL MAGNETIC GRADIENT

- 5.00 gammas/metre
- 1.00 gammas/metre
- 0.25 gammas/metre
- 0.05 gammas/metre



MELBA GOLD LIMITED
(731530 ONTARIO LIMITED)

AIRBORNE MAGNETIC SURVEY

VERTICAL MAGNETIC GRADIENT

Calculated From Total Field

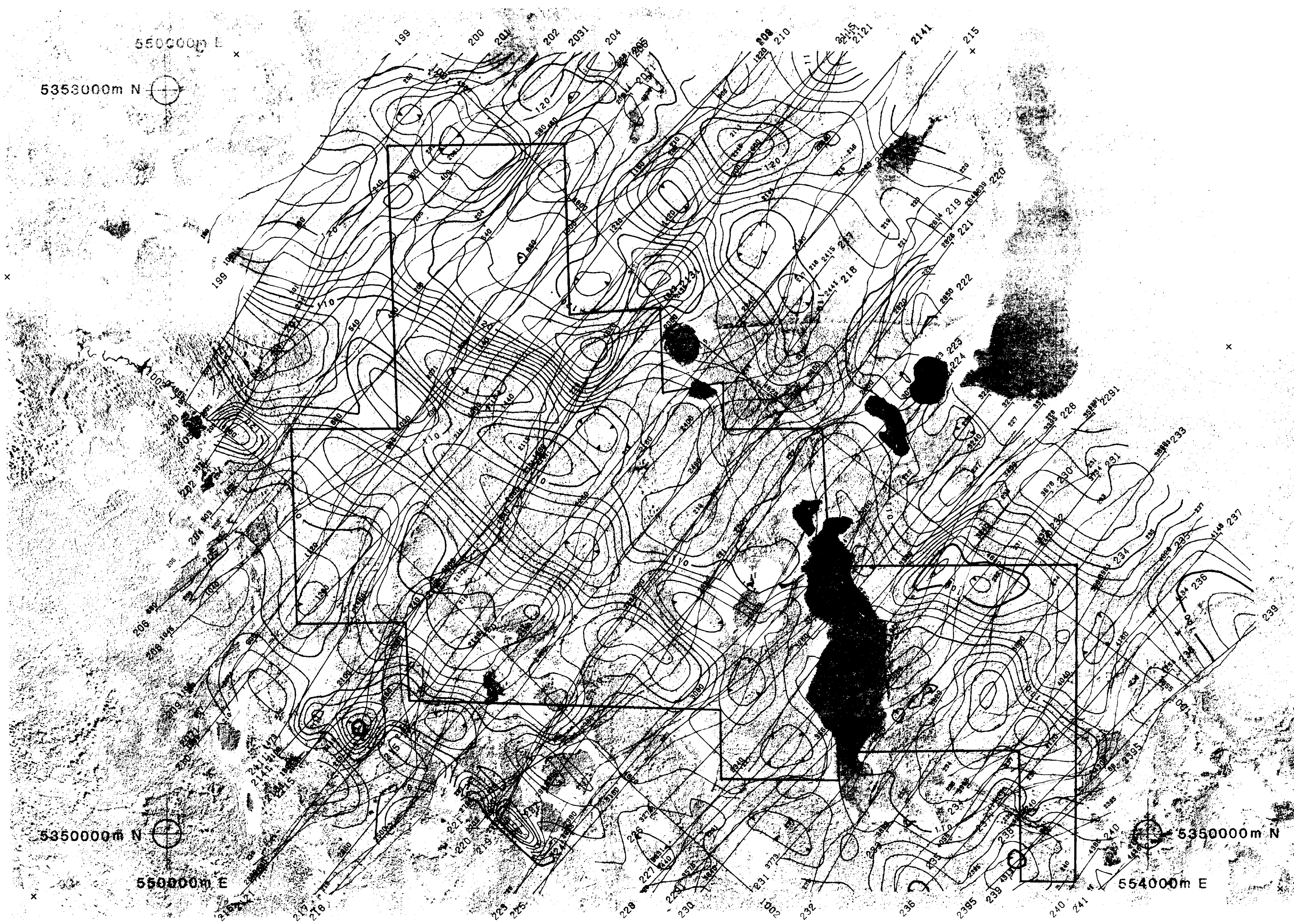
BLACK CREEK GOLD PROPERTY
BLACK TWP., ONTARIO

N.T.S. NO.	42A/8	DRAWING NO.	A-785.1-2
SCALE:	1:10,000	DATE:	July 1988

TERRAQUEST LTD.
TORONTO CANADA

42A08SE0019 2.11558 BLACK

240



VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 108

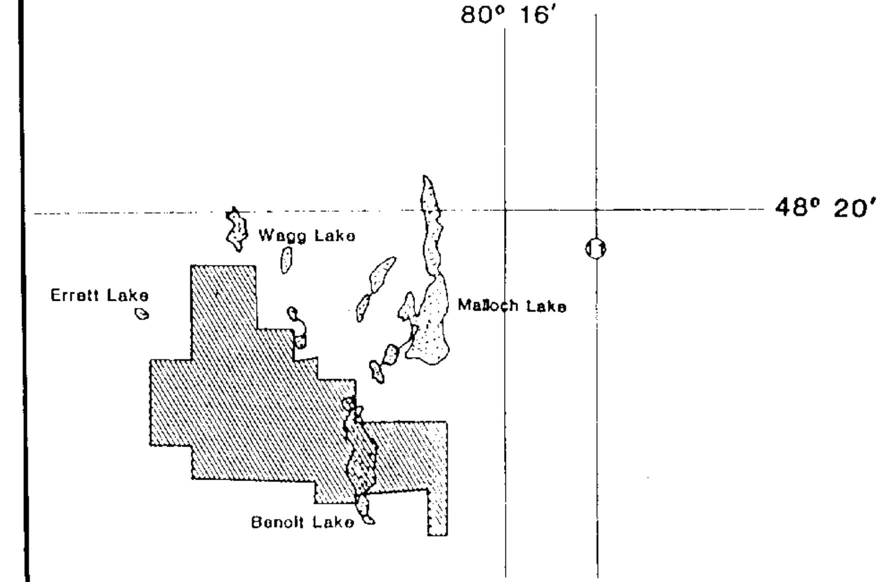
LEGEND

Terrain Clearance .... 100 metres
Line Spacing .... 100 metres
Property Boundary

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

QUADRATURE (Profiles Along Flight Lines)
Normal Slope — Reverse Slope

+10% / Flight Line / −10%



MELBA GOLD LIMITED
(731530 ONTARIO LIMITED)

AIRBORNE VLF-EM SURVEY

CONTOURS OF TOTAL FIELD STRENGTH
PROFILES OF QUADRATURE

BLACK CREEK GOLD PROPERTY
BLACK TWP., ONTARIO

N.T.S. NO.	42A/8	DRAWING NO.	A-785.1-3
SCALE:	1:10,000	DATE:	July 1988

TERRAQUEST LTD.
TORONTO, CANADA

VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 108

LITHOLOGY

7	Diabase Dyke
5	Tholeiitic Gabbro
3b	Iron Rich Tholeiitic Basalts
3a	Magnesium Rich Tholeiitic Basalts
1	Turbidite Metasediments

LEGEND

Terrain Clearance .... 100 metres
Line Spacing .... 100 metres
Property Boundary

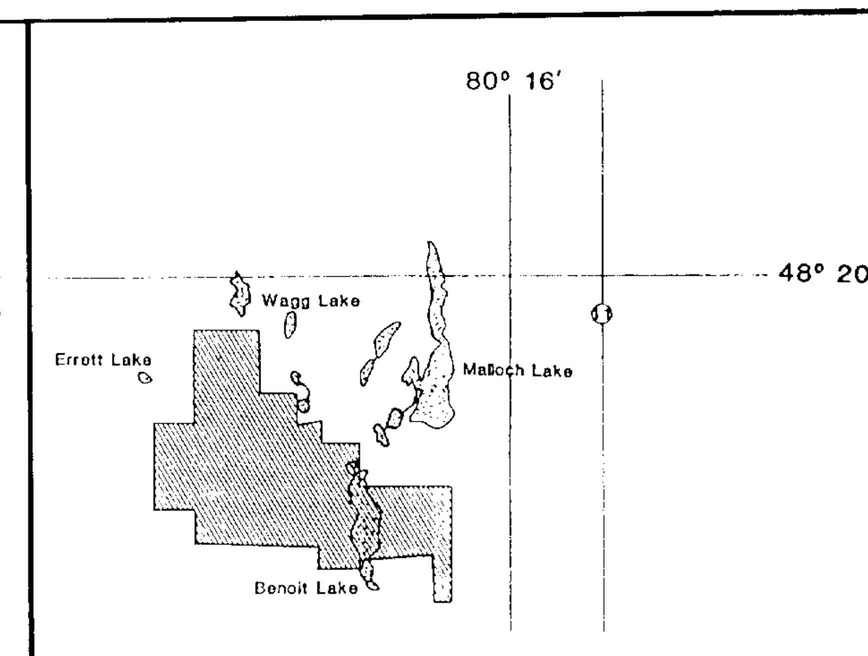
INTERPRETATION

Contact
Fault

VLF-EM Conductor Axes

Normal Quadrature
Reverse Quadrature
Total Field Only

See text for classification of VLF-EM conductor axes



MELBA GOLD LIMITED
(731530 ONTARIO LIMITED)

INTERPRETATION

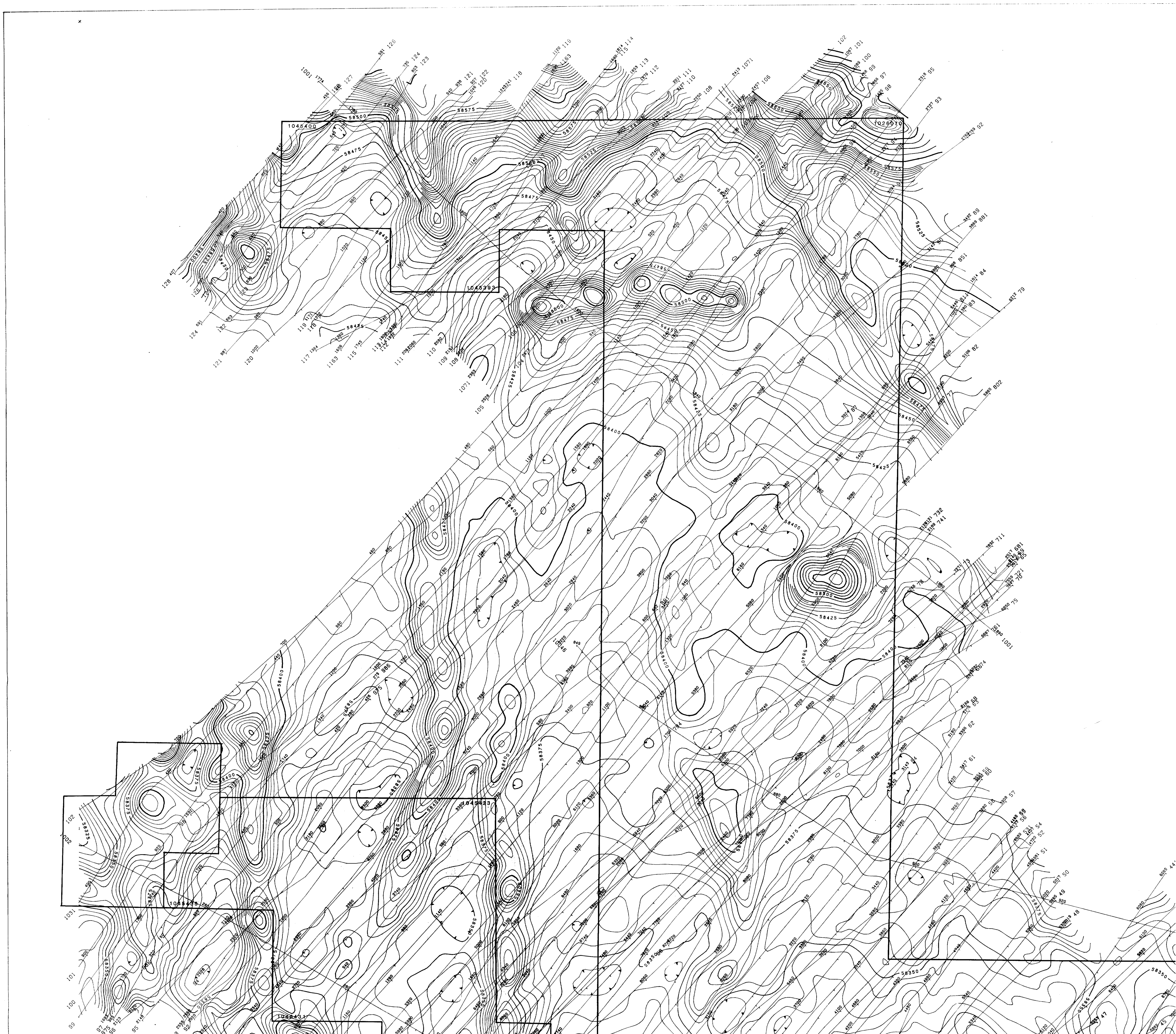
BLACK CREEK GOLD PROPERTY
BLACK TWP., ONTARIO

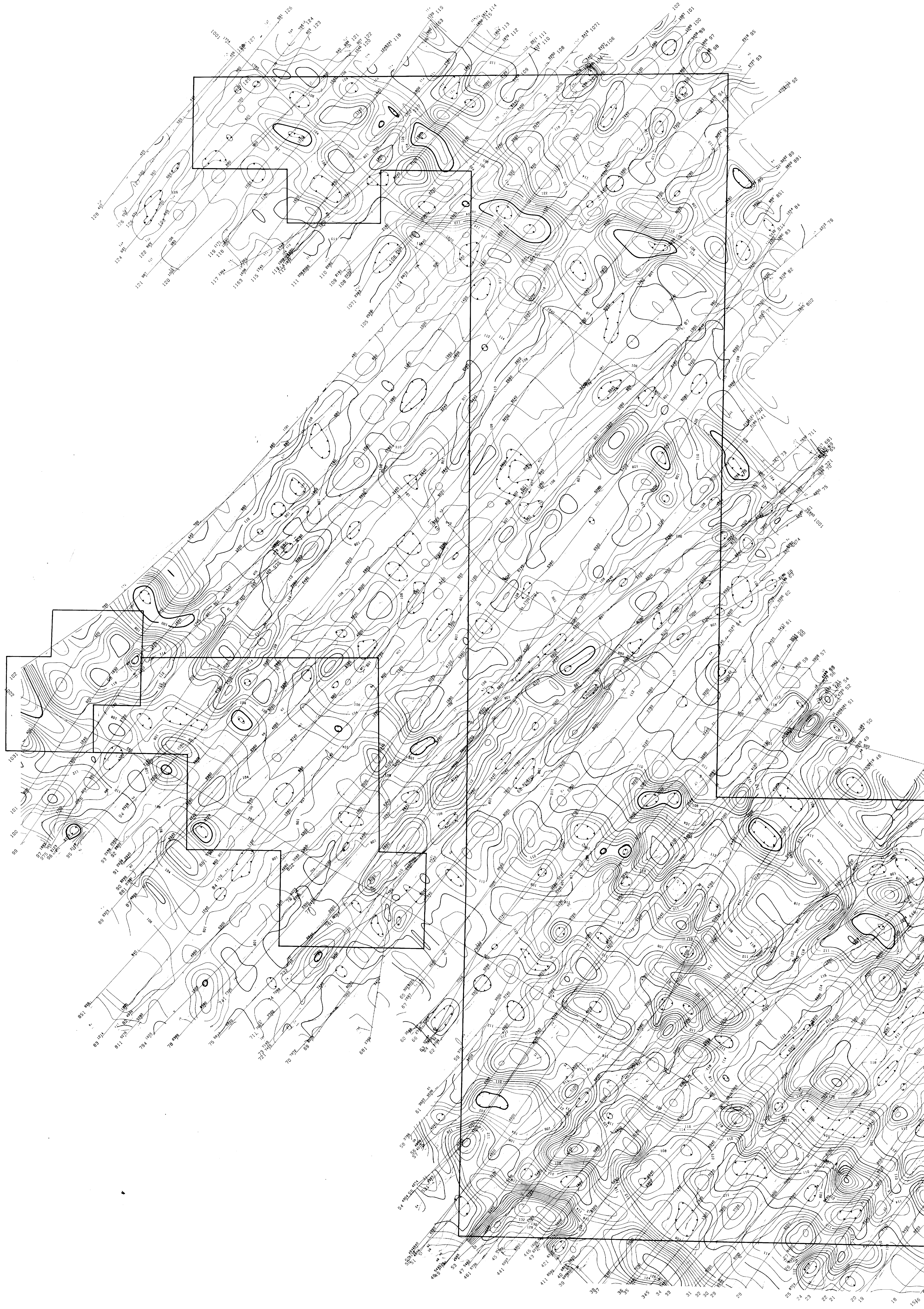
N.T.S. NO.	42A/8	DRAWING NO.	A-785.1-4
SCALE:	1:10,000	DATE:	July 1988

TERRAQUEST LTD.
TORONTO, CANADA

42A08SE0019 2.11558 BLACK

260






MELBA GOLD MINE
Au,cp,sp
Au,cp,gn,py
Au,Py
Au,cp,mo
py,mar

EXPLOSIVES LTD.
ONTARIO LIMITED
AIRBORNE MAGNETIC SURVEY
TOTAL MAGNETIC FIELD
BENOIT & MELBA TWP. ONTARIO
NTS NO. 42A/8
DRAWING NO. A-785-2
SCALE 1:10 000
DATE August 1988
TERRAQUEST LTD.
TORONTO CANADA
LEGEND
Terrain Clearance 100 metres
Line Spacing 100 metres
Property Boundary
TOTAL MAGNETIC FIELD
500 gammas
100 gammas
25 gammas
5 gammas
N

NORDEX EXPLOSIVES LTD.
MELBA GOLD LTD.(731530 ONTARIO LIMITED)
AIRBORNE MAGNETIC SURVEY
VERTICAL MAGNETIC GRADIENT
Calculated From Total Field
BENOIT & MELBA TWP., ONTARIO
N.T.S. NO. 42A/8
DRAWING NO. A 785
SCALE 1:10 000
DATE August 1988
TERRAQUEST LTD.
LEGEND
Terrain Clearance 100 metres
Line Spacing 100 metres
Property Boundary
VERTICAL MAGNETIC GRADIENT
2.500 gammas/metre
0.500 gammas/metre
0.100 gammas/metre
0.025 gammas/metre
N

NORDEX EXPLOSIVES LTD.

(731530 ONTARIO LIMITED)

AIRBORNE VLF-EM SURVEY

CONTOURS OF TOTAL FIELD STRENGTH
PROFILES OF QUADRATURE

BENOIT & MELBA TWP., ONTARIO

42A/8 | DRAWING NO. A 785 2 3

SCALE 1:10,000 | August 1988

TERRAQUEST LTD

LEGEND

Terrain Clearance .... 100 metres
Line Spacing .... 100 metres
Property Boundary

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

QUADRATURE (Profiles Along Flight Lines)
Normal Slope | Reverse Slope

+10% | +10%
-10% | -10%

N

VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 108


NORDEX EXPLOSIVES LTD
MELBA GOLD LTD (731530 ONTARIO LIMITED)
INTERPRETATION
BENOIT & MELBA TWP. ONTARIO
NTS NO 42A/8
SCALE 1:10,000
DRAWING NO A 785 2 4
DATE August 1988
TERRAQUEST LTD.
TORONTO, CANADA
LEGEND
Terrain Clearance 100 metres
Line Spacing 100 metres
Property Boundary
INTERPRETATION
Contact
Outline of magnetic unit at depth
Fault
VLF-EM Conductor Axes
Normal Quadrature
Reverse Quadrature
Total Field Only
See text for classification of VLF-EM conductor axes
LITHOLOGY
16 Diabase
15 Porphyritic Granitoid Rocks
13m Magnetic Unit Within 13
13 Gabbro
8m Magnetic Unit Within 8
8 Calc-Alkalic Mafic to Intermediate Metavolcanics
6 Iron-Rich tholeiitic Basalt
5m Magnetic Unit Within 5
5 Magnesium Rich tholeiitic Basalt
1 Metasediments
Note: parentheses indicate magnetic unit at depth
N
VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 108
MELBA GOLD MINE
Au,cp,sp
Au,Py
Au,cp,mo