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REPORT ON
COMBINED HELICOPTER-BORNE MAGNETIC, ELECTROMAGNETIC AND VLF SURVEY
BEG PROPERTY
KIRKLAND LAKE, ONTARIO

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FOR
LES RESSOURCES HALEX INC.
BY
AERODAT LIMITED
April 6, 1988

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TABLE OF CONTENTS

		Page No.
1.	INTRODUCTION	1-1
2.	SURVEY AREA LOCATION	2-1
3.	AIRCRAFT AND EQUIPMENT	
	3.1 Aircraft	3-1
	3.2 Equipment	3-1
	3.2.1 Electromagnetic System	3-1
	3.2.2 VLF-EM System	3-1
	3.2.3 Magnetometer	3-2
	3.2.4 Magnetic Base Station	3-2
	3.2.5 Radar Altimeter	3-2
	3.2.6 Tracking Camera	3-3
	3.2.7 Analog Recorder	3-3
	3.2.8 Digital Recorder	3-4
	3.2.9 Radar Positioning System	3-5
4.	DATA PRESENTATION	
	4.1 Base Map	4-1
	4.2 Electromagnetic Anomaly Map	4-1
	4.2.1 Flight Path	4-1
	4.2.2 Electromagnetic Data Compilation	4-2
	4.2.3 Airborne EM Survey Interpretation	4-3
	4.3 Total Field Magnetic Contours	4-3
	4.4 VLF-EM Total Field Contours	4-4
	4.5 EM Resistivity Contours	4-4
5.	INTERPRETATION	
	5.1 Geological Perspective	5-1
	5.2 Magnetic Interpretation	5-1
	5.3 Vertical Magnetic Gradient Contours	5-3
	5.4 VLF-EM Total Field Interpretation	5-4
	5.5 Electromagnetic Interpretation	5-5
	5.6 Resistivity Contours	5-18
6.	CONCLUSIONS	6-1
7.	RECOMMENDATIONS	7-1

APPENDIX I - General Interpretive Considerations
APPENDIX II - Anomaly List
APPENDIX III - Certificate of Qualifications
APPENDIX IV - Personnel

LIST of MAPS
(Scale 1:10,000)

Basic Maps: (As described under Appendix "A" of Contract)

1. PHOTOMOSAIC BASE MAP;
Showing registration crosses corresponding to NTS co-ordinates on survey maps, on stable cronaflex film.

2. FLIGHT LINES;
Photocombination of flight lines, anomalies and fiducials with base map.

3. AIRBORNE ELECTROMAGNETIC SURVEY INTERPRETATION MAP;
showing conductor axes and anomaly peaks along with in-phase and Quadrature amplitudes and conductivity thick-ness values; on a cronaflex base; Interpretation Report

4. TOTAL FIELD MAGNETIC CONTOURS;
showing magnetic values contoured at 2 nanoTesla intervals; on a cronaflex base map.

5. COMPUTED VERTICAL MAGNETIC GRADIENT CONTOURS;
showing vertical gradient values contoured at 0.1 nano-Tesla per metre intervals showing flight lines and fiducials; on a cronaflex base map.

6. RESISTIVITY CALCULATED FROM 4175 Hz COPLANAR COILS;
contoured data at logarithmic resistivity intervals (in ohm.m.), on a base map.

7. VLF EM TOTAL FIELD CONTOURS;
of the VLF Total field from the Cutler, Maine trans-mitter; as a cronaflex base map.

LIST OF MAPS CONT'D

Colour Maps (as described in Appendix A of Contract)

1. MAGNETICS - Colour of the total magnetic field with superimposed contours

2. MAGNETICS - Colour of the calculated Vertical Magnetic gradient with superimposed contours.

3. RESISTIVITY - Colour of apparent resistivity with superimposed contours.

4. VLF - Contour of Total Field VLF-EM with superimposed contours.

5. PROFILES - EM profile maps of in phase and quadrature components for each of the frequencies.

1. INTRODUCTION

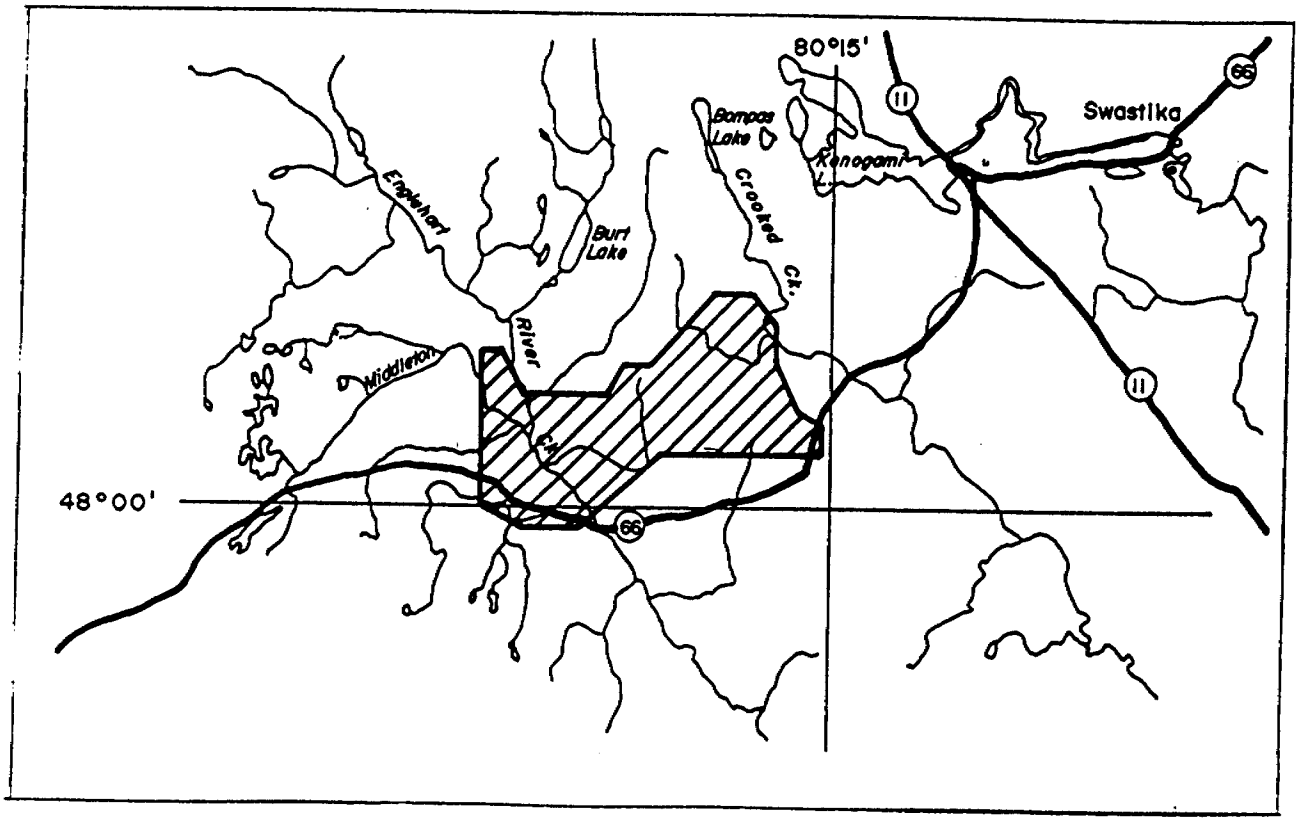
This report describes an airborne geophysical survey carried out on behalf of Les Ressources Halex Inc. by Aerodat Limited. Equipment operated included a 4 frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a dual frequency VLF-EM system, a video tracking camera, and an altimeter. Electromagnetic, magnetic and altimeter data were recorded both in digital and analog form. Positioning data was recorded on VHS video film, as well as being marked on the photomosaic base map by the operator while in flight.

The survey area, is comprised of 1 contiguous block in the Larder Lake Mining Division and is situated about 30 kilometres southwest of Kirkland Lake, Ontario. The survey was flown on March 1, 1988. Three flights were required to complete the survey with flight lines orientated at an azimuth of 180 - 360 degrees and flown at a nominal spacing of 100 m. Coverage and data quality were considered to be within the specifications described in the contract.

The purpose of the survey was to record airborne geophysical data over and around properties of Les Ressources Halex Inc. A total of 380 kilometres of the recorded data were compiled on 1 map sheet and are presented as part of this report according to specifications outlined by Les Ressources Halex Inc.

2. SURVEY AREA LOCATION

The survey area is outlined on the index map shown below. It is centred between latitudes 47 59′ 50" - 48 03′ 30" and longitudes 80 15′ - 80 25′. The area is located within 30 kilometres of Kirkland Lake, Ontario. The property is located along HWY # 66, which provides access to the southern half of the claim group. Hydro lines are present along the highway.



3. AIRCRAFT AND EQUIPMENT

3.1 Aircraft

An Aerospatiale A-Star 350 D helicopter, (C-GRGJ), piloted by K. McCrae, owned and operated by Ranger Helicopters Limited, was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey equipment was flown at a mean terrain clearance of 60 metres.

3.2 Equipment

3.2.1 Electromagnetic System

The electromagnetic system was an Aerodat 4 frequency system. Two vertical coaxial coil pairs are operated at 935 Hz and 4600 Hz and two horizontal coplanar coil pairs at 4175 Hz and 34 kHz. The transmitter-receiver separation was 7 metres. Inphase and quadrature signals were measured simultaneously for the 4 frequencies with a time constant of 0.1 seconds. the electromagnetic bird was towed 30 metres below the transmitter.

3.2.2 VLF-EM System

A Herz Totem 2A system was utilized. This instrument measures both the total field and quadrature

components of the selected frequency. The sensor was towed in a bird 12 metres below the helicopter. The transmitting station used was NAA, Cutler, Maine broadcasting at 24.0 kHz. This station is maximum coupled with E-W striking conductors and provides usable results for strikes + 45 degrees.

3.2.3 Magnetometer

The magnetometer employed a Scintrex Model VIW 2321 H8 cesium, optically pumped sensor. The sensitivity of this instrument was 0.1 nanoTeslas at a 0.2 second sampling rate. The sensor was towed in a bird 12 metres below the helicopter.

3.2.4 Magnetic Base Station

An IFG proton precession magnetometer was operated at the base of operations to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to facilitate later correlation.

3.2.5 Radar Altimeter

A Hoffman HRA-100 radar altimeter was used to record terrain clearance. The output from the instrument is a

linear function of altitude for maximum accuracy.

3.2.6 Tracking Camera

A Panasonic video flight path recording system was used to record the flight path on standard VHS format video tapes. The system was operated in continuous mode and the flight number, real time and manual fiducials were registered on the picture frame for cross-reference to the analog and digital data.

3.2.7 Analog Recorder

An RMS dot-Matrix recorder was used to display the data during the survey. In addition to manual and time fiducials, the following data was recorded:

Channel	Input	Scale
CXI1	Low Frequency Inphase	25 ppm/cm
CXQ1	Low Frequency Quadrature	25 ppm/cm
CXI2	High Frequency Inphase	25 ppm/cm
CXQ2	High Frequency Quadrature	25 ppm/cm
CPI1	Mid Frequency Inphase	100 ppm/cm
CPQ1	Mid Frequency Quadrature	100 ppm/cm
CPI2	High Frequency Inphase	200 ppm/cm

Channel	Input	Scale
CPQ2	High Frequency Quadrature	200 ppm/cm
VLT	VLF-EM Total Field, Line NAA	25%/cm
VLQ	VLF-EM Quadrature, Line NAA	25%/cm
VOT	VLF-EM Total Field,Ortho NLK	25%/cm
VOQ	VLF-EM Quadrature, Ortho NLK	25%/cm
RALT	Radar Altimeter, (150 m. at top of chart)	100 ft/cm
BALT	Barometric Altimeter	200 ft/cm
MAGF	Magnetometer, fine	25 nT/cm
MAGC	Magnetometer, coarse	250 nT/cm

3.2.8 Digital Recorder

A DGR 33 data system recorded the survey on magnetic tape. Information recorded was as follows:

Equipment	Recording Interval
EM System	0.1 seconds
VLF-EM	0.25 seconds
Magnetometer	0.25 seconds
Altimeter	0.25 seconds
Nav System	1.0 seconds
Power Line Monitor	0.25 seconds

3.2.9 Radar Positioning System

A Motorola Mini Ranger (MRS IV - Falcon) UHF radar navigation system was used for both navigation and flight path recovery. Transponders sited at fixed locations were interrogated several times per second and the ranges from these points to the helicopter are measured to a high degree of accuracy. A navigational computer triangulates the position of the helicopter and provides the pilot with navigation information. The range/range data was recorded on magnetic tape and on the analog records for subsequent flight path determination.

4. DATA PRESENTATION

4.1 Base Map and Flight Path

A photomosaic base at a scale of 1:10,000 was prepared from 1:20,000 scale air photos supplied by the Ontario Ministry of Natural Resources on an unscreened cronaflex base.

4.2 Electromagnetic Anomaly Map

4.2.1 Flight Path

The flight path was derived from the Mini Ranger UHF radar positioning system. The distance from the helicopter to two established reference locations was measured several times per second and the position of the helicopter calculated by triangulation. It is estimated that the flight path is generally accurate to about 10 metres with respect to the topographic detail on the base map.

The flight lines have the flight number as an additional reference and the camera frame, time, and the navigator's manual fiducials for cross reference to both analog and digital data.

4.2.2 Electromagnetic Data Compilation

The electromagnetic data was recorded digitally at a sample rate of 10 per second with a time constant of 0.1 seconds. A two stage digital filtering process was carried out to reject major sferic events to reduce system noise.

Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude, but leave a broader residual response that can be confused with geological phenomenon. To avoid this possibility, a computer algorithm searches out and rejects the major sferic events. The signal to noise ratio was further enhanced by the application of a low pass digital filter. It has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 0.25 seconds. This low effective time constant permits maximum profile shape resolution.

Following the filtering process, a base level correction was made. The correction amplitude of the

various inphase and quadrature components is zero when no conductive or permeable source is present. The filtered and leveled data was used in the interpretation of the EM data.

4.2.3 Airborne EM Interpretation

An interpretation of the electromagnetic data was prepared showing peak locations of anomalies and conductivity thickness ranges along with the inphase amplitudes (computed from the 4600 Hz coaxial response). The peak response symbols may be referenced by a sequential letter, progressing in the original flight direction. The EM response profiles are presented on a separate map with an expanded vertical scale.

4.3 Total Field Magnetic Contours

The aeromagnetic data was corrected for diurnal variations by adjustment with the digitally recorded base station magnetic values. No correction for regional variation (IGRF) was applied. The corrected profile data was interpolated onto a regular grid at a 25 metre true scale interval using a cubic spline technique. The grid provided the basis for threading the presented contours at a 5 nanoTesla interval. The

aeromagnetic data have been presented with flight path and electromagnetic information on a Cronaflex copy of the photomosaic base map.

4.4 VLF-EM Total Field

The VLF-EM signals from NAA, Cutler, Maine, broadcasting at 24.0 kHz, were compiled as contours in map form and presented on a Cronaflex overlay of the photomosaic base map along with flight lines and anomaly information. The orthogonal VLF data was not utilized in the compilation due to lower field strengths and higher noise levels. The data was recorded on the analog records and on digital tape.

4.5 EM Resistivity Contours

The apparent resistivity was calculated from the 4175 Hz coplanar coil pair. The calculations are based on a half space model. This is equivalent to a geological unit with more than 200 metres width and strike length. In practice, conductors, conductive lithologies and surficial conductors often have lesser dimensions, at least in one of the three dimensions. Apparent resistivities are usually underestimated for these sources.

5. INTERPRETATION

5.1 Geological Perspective

The BEG property is centred on a segment of greenstone belt between Matachewan and Kirkland Lake. The host rocks are predominantly mafic volcanics with intercalated iron formation. The unit is bounded to the south by felsic intrusives and to the north by mafic intrusives and Gowganda Formation sediments. There is almost no up-to-date public reference data for the survey area, and it is not covered by regional public airborne surveys. There are no known mineral prospects in the area of the claims, and there is almost no sign of exploration activity on the airphoto mosaics.

5.2 Magnetic Interpretation

The magnetic data from the high sensitivity cesium vapour magnetometer provided virtually a continuous magnetic reading when recorded at two-tenth second intervals. The system is also noise free for all practical purposes. The sensitivity of 0.1 nT allows for the mapping of very small inflections in the total field, resulting in a contour map that is comparable in quality to ground data. Both the fine and coarse magnetic traces were recorded on the survey analog records.

The magnetic trends closely match the known regional geological trends striking in an east northeast direction. There are four main magnetic textures (or lithologies) in the survey area: an iron formation, a granitic domain, the Cross Lake Fault and the mafic volcanics (including any intrusives). Diabase dykes have a north south strike through the area, and are found in every lithology but not across the fault zone.

The iron formation may be traced from the southwestern end of the survey area to the granites at the eastern perimeter. A secondary unit of iron formation follows the northern area boundary, but does not have the susceptibility contrast of the former.

Low gradient magnetics characterize the granitic rocks known to occur at the east end of the property. Amplitudes are typically less than 58550 nT, decreasing towards the middle of the intrusive.

The Cross Lake Fault runs at an oblique angle through the area. On surface it is linear topographic depression now occupied by the Englehart River. Extensive alteration has accompanied the fault which has relatively little lateral displacement. The width of the zone, where magnetite is totally

absent, is approximately 750 m. An additional kilometre of width appears to have been partially altered.

The host rocks of the survey area, mostly mafic flows and pyroclastics, are typically active. A proliferation of diabase dykes and cross faulting has destroyed the continuity of many of the weaker marker horizons. From the symmetry of the total field contours, near vertical formation inclinations may be anticipated throughout the block.

5.3 Vertical Magnetic Gradient Contours

The high magnetic gradients detected as total magnetic field strength, makes the recognition and exact positioning of subtle anomalies difficult. The vertical gradient data clearly removes the regional background levels and sharpens the residual anomalies. Closely spaced anomalies can be more easily separated, interpreted and modelled.

Breaks and offsets are more clearly defined and some faults and shears are recognizable as definite marker horizon displacements. These have been drafted on the interpretation maps and often have a physiographic linear expression. Strike slip faults are not easily defined. Sometimes, they occur at the contact of a major lithological units, such as volcanics and

sediments. A linear magnetic (and gradient) low can mark these zones.

The "zero" contour level is a close approximation of the width of the susceptibility sources. If required, vertical gradient contour trends can be compiled into a pseudo geological map.

5.4 VLF-EM Total Field Interpretation

The VLF system results responded mainly to conductive overburden edges. These often have a similar appearance to bedrock conductors, but their orientation may be oblique to bedrock magnetic lithologies. This lineation direction is radial to the transmitter location, in this case approximately east south east, somewhat oblique to the regional trends. The faults and shears which have a reliable magnetic characterization and often a physiographic linear, have no VLF-EM conductivity in this area. Many conductors, especially the weaker zones, do have VLF coincident responses. This implies that the lithologies hosting the conductor is relatively homogeneous, except where cross faulting and diabase are present.

On the interpretation map, only the conductors which occur in resistive areas and which are interpreted as possible or

definite bedrock conductors have been plotted as dotted axes.

5.5 Electromagnetics

The electromagnetic data was first checked by a line to line examination of the analog records. The record quality was good, with only local noise spikes affecting the coaxial channels. These were removed by an appropriate filter. Instrument noise was well within specifications. Geological noise, in the form of surficial conductors, is present on the 3 high frequency coil pair profiles and to a minor extent on the 935 Hz quadrature.

Anomalies were picked off the analog traces of the low and high frequency coaxial responses and then validated on the coplanar profile data. These selections were then digitized, edited and replotted on a copy of the profile map. This procedure ensured that every anomalous response spotted on the analog data was plotted on the final map and allowed for the rejection and inclusion if warranted - of less obvious bedrock conductors. Each conductor or group of conductors was evaluated on the basis of magnetic and lithologic correlations as well as man made or surficial features not obvious on the analog charts.

RESULTS

The survey results are composed of cultural conductors, surficial responses and bedrock conductors. The cultural conductors with a 60 Hz component were eliminated if roads and the power line monitor (PWRL) were coincident. In areas developed since the photos, a check of the VHS flight path image either showed roads and powerlines or verified the response in question as a potential exploration target. Only bedrock response symbols were plotted on the map, based on the coaxial coil data channel peaks.

In the survey area, there are power lines along the highway, but they do not emit any 60 Hz noise component. A linear conductive effect south of the highway in Range V of Gross Tp. is most likely the effect of a grounded power or telephone line. Verification of this is suggested. Otherwise, there are no cultural responses within the survey block.

Surficial conductivity is present in over 60 percent of the survey area, but is most severe near the Burt - Eby Townline. In this environment, the system could not penetrate through the cover, probably varved clays. Elsewhere, the resistivity contours less than 2000 ohm m. outline areas of surficial

problems. The penetration capabilities of the system can be gauged by the negative inphase amplitudes arising from the magnetic permeability effect. Where these responses diminish in amplitude, over magnetic peaks, it is doubtful if any other bedrock target can be detected under similar surficial cover. The surficial sediments are only marginally less conductive than many bedrock conductors. There are undoubtedly weak and moderate conductance targets under the conductive cover which the EM systems can not resolve. Weak but above background EM deflections occur over the resistive portion of the survey area. Some have been interpreted as bedrock conductors, while others remain unclassified. Where they coincide with bedrock outcrop, the significance and priority may be upgraded.

Almost every conductor has been selected for follow-up surveys. The location of the selected responses is reasonably well distributed over lithologies in the southern half of the area, although the northern half is barren of bedrock conductors. Many conductors have magnetic correlations, both from iron formations and isolated peaks. As the strike lengths are short, with conductances and amplitudes quite variable, graphitic explanations are not anticipated for most conductors, and sulphides sources should be anticipated for many conductors.

Targets have been prioritized by their geological setting and probability of encountering a bedrock source (as compared to a surficial source). In addition, the interpretation symbology reflects the source quality and our confidence in a bedrock source.

Priority 1 - definite bedrock solid axes
2 - weak bedrock dashed axes
3 - questionable bedrock no axes

CONDUCTOR I

Priority 3

Resistivity : 200 - 500 ohm m.

VLF-EM : direct VLF EM conductor

Magnetics : coincidence for Line 50 & 70 only

Structure : conductor is cut by diabase

Comments : The responses form a linear trend north of the iron formation, subparallel to local magnetic lithology and on the north side of a surficial conductive zone. The responses have low amplitudes and poor Quadrature to inphase ratios, and are best classed as a resistivity lows. The zone may be an edge effect of the surficial conductor.

CONDUCTOR IIabc

Priority 2

Resistivity : 300 ohm.m.

VLF-EM : -

Magnetics : direct - Iron Formation

Structure : 2 N-S faults and/or diabase cut the horizon in at least 2 locations

Comments : response amplitudes and quality improves westward, off the map sheet. The responses are probable bedrock, but have low apparent conductance values which are consistent along strike. The line 170 B response has the best inphase amplitude and should be the focus of ground surveys.

CONDUCTOR IIIab

Priority 1

Resistivity : 200 ohm.m.

VLF-EM : -

Magnetics : on south flank of northern IF horizon

Structure : same as zone II, at least 2 faults

Comments : A south dipping conductor with low apparent conductance, but a distinct improvement over surficial conductivities Sharp inphase re-

sponses occur between lines 150 and 170. Coplanar coil peaks are greater on the north side of the axis, implying a northward dip.

CONDUCTOR IV

Priority 3

Resistivity : 600 ohm.m.

VLF-EM : direct coincident anomaly

Magnetics : generally flat magnetics except for diabase dykes

Structure : very linear even where cut by diabase

Comments : The zone parallels the south side of the Highway exactly. Logic dictates that a zone such as this should be surficial, but there is no physical evidence of this on the profiles. The profiles are sharp but wide, and low conductance. There is no power line monitor response. A field check should be made for cultural conductors. Failing this, the source could be a lithologic conductor or graphitic zone.

CONDUCTOR V

Priority 2

Resistivity : 800 ohm.m.

VLF-EM : -

Magnetics : flanking to direct, on N side of the magnetic source

Structure : none, although a break is present in the IF to the north

Comments : on the edge of a surficial conductor, a definite, albeit weak bedrock conductor with a definitive coaxial and coplanar response. The zone has an apparent steep southward dip.

CONDUCTOR VI

Priority 2

Resistivity : 1000 ohm.m.

VLF-EM : -

Magnetics : flanking the main IF, but in a low.

Structure : same as V, may be cut by a fault

Comments : A short strike length zone south of the Iron formation, also characterized by low amplitudes and low apparent conductances. The zone has a strike extension to the west on lines 480 and 490 with a direct magnetic association. Dis-

continuous (disseminated) mineralization could cause this type of response.

CONDUCTOR VII

Priority 2

Resistivity : 1000 ohm.m.

VLF-EM : coincident at ends of zone but, surprisingly, not in the middle of the conductor

Magnetics : direct

Structure : the conductor lies between faults

Comments : Sharp quadrature profiles are present with this zone, and represent a possible bedrock conductor within the iron formation. The In-Phase amplitudes are negative due to the effects high magnetic permeabilities.

CONDUCTOR VIII

Priority 2

Resistivity : 3000 ohm.m.

VLF-EM : direct conductor coincidence, extends the strike length further to the west

Magnetics : magnetic low

Structure : -

Comments : The conductor is located in a relatively resistive environment and is one of the most northerly horizons with a conductor. This zone is best described as a resistivity low, but from a vertical body.

CONDUCTOR IX

Priority 2

Resistivity : 6000 ohm.m.

VLF-EM : direct; extends the strike length of the weak responses.

Magnetics : direct association with Iron Formation which has been broken by faulting and diabase dykes.

Structure : several faults and diabase dykes have segmented the zone, although there is little evidence in the VLF to support this concept.

Comments : Very subtle weak conductors which occur sporadically within a resistive host rock with out any overburden complexities. A higher priority has been assigned to this target due to its location within favourable environment for gold.

CONDUCTOR X

Priority 3

Resistivity : 6000 ohm.m.

VLF-EM : -

Magnetics : flanking to direct magnetic association

Structure : probability of complex faulting at either end.

Comments : A possible surficial edge effect, although the profiles of both coaxial and coplanar coils match vertical bedrock sources. It is characterized by very weak quadrature amplitudes.

CONDUCTOR XI

Priority 3

Resistivity : 2000 ? ohm.m.

VLF-EM : flanking? coincident with magnetic anomaly to the south.

Magnetics : possible magnetic association

Structure : complex magnetics infer faulting.

Comments : The conductor is similar to zone X in amplitude, and may be a strike extension although they are somewhat offset on different magnetic lithologies. There is a minor inphase coaxial peak at a surficial edge.

CONDUCTOR XII

Priority 1

Resistivity :

VLF-EM : coincident conductor joins up with IX

Magnetics : best EM response is just offset from a magnetic peak on strike to the west.

Structure : faulting is suspected east of the zone but its westward strike extension is uncertain

Comments : Response 761 A has a relatively high inphase to Quadrature ratio, a vertical to north dip source, high conductance and short strike length in a resistive environment.

CONDUCTOR XIV

Priority 2

Resistivity : 5000 ohm.m.

VLF-EM : direct coincident anomaly extends the strike length of the EM conductor.

Magnetics : all responses are coincident with magnetic peaks.

Structure : faults may offset the conductor at both ends.

Comments : The zone is linear and has consistent geophysical characteristics along its strike length. The amplitudes are low and the apparent

conductances are both low and consistent. A graphitic source would explain the conductance, but not the magnetics.

CONDUCTOR XV

Priority 2

Resistivity : 7000 ohm.m.

VLF-EM : -

Magnetics : magnetic low

Structure : its intermittent nature may be the result of both faulting and diabase dykes intersecting the zone regularly along its length.

Comments : there is no improvement in quality over more than 2 Km of intermittent strike length. Quadrature amplitudes predominate and apparent conductances are consistently low. Discontinuous mineralization can be anticipated.

CONDUCTOR XVI

Priority 1

Resistivity : < 50 ohm.m.

VLF-EM : no correlation

Magnetics : no magnetics

Structure : zone of faults and diabase dykes.

Comments : The conductor is situated at the edge of a surficial conductor, but the dominant inphase profile can only have a bedrock source. The geological environment is confused by the positioning of diabase dyke at the end of the zone, and the nearby contact of granite with mafic volcanics.

CONDUCTOR XVII

Priority 1

Resistivity : 1000 ohm.m.

VLF-EM : direct and exact duplication of curved conductive lithology detected with low frequency EM channels

Magnetics : direct low amplitude magnetic anomaly follows the EM conductor.

Structure : The zone appears to be cut off by a fault contact at its eastern end and a diabase dyke on the east. faults and diabase dykes.

Comments : A pyrrhotite source would explain all of the geophysical responses from this zone. The 980 B response intercept has characteristics normally associated with a narrow north dipping isolated

conductor. The zone is in a resistive environment.

There are other isolated single line responses not specifically addressed in this summary. These should be considered during geological mapping, but do not warrant ground followup on the basis of the airborne results alone.

5.6 Resistivity Contours

The resistivity contours approximate the profile amplitude trends only in particular situations. Resistivities vary over a wide range, with the thickness of the conductive layer modulating the responses over a substantial part of the survey area. It is interesting to note the variation of the surficial conductances throughout the area. From the calculated resistivities, it is difficult recognize favourable bedrock conductors and trends which might influence an exploration program. As expected, the zones with the lowest regional resistivities are almost devoid of bedrock conductors. Bedrock conductors, due to their short spatial wavelengths, often are seen as minor inflections in regional patterns of overburden resistivity lows. The resistivity lows extend the strike length of some conductors.

6. CONCLUSIONS

There are severe overburden problems over a significant fraction of the area. However, the airborne system has detected more than 15 unique conductors with a wide variety of geophysical response characteristics. These conductors span a range of sources from massive to disseminated mineralization. Magnetic associations are inconsistent, but quite clearly, pyrrhotite appears to be a minor constituent of the conductor explanations.

The magnetic survey and the calculated gradient provides a representation of the bedrock geology. Faults and diabase dykes add to the complexity of regional geology and may enhance possibilities of encountering gold mineralization. With the help of magnetics, it will be possible to extrapolate geology under the surficial cover and to identify additional cross faulting. VLF-EM was generally ineffective due to the abundance of surficial conductivity. Very few VLF-EM conductors do not have any associated bedrock conductor. Structures in the survey area do not as a rule have any VLF-EM responses associated. Resistivity processing and presentations delineate the surficial conductivity problem areas. Due to the narrow apparent range of bedrock conductances, this processing does not add any significant gain in the data interpretations.

7. RECOMMENDATIONS

Bedrock conductors have been prioritized into 3 classes for the purpose of qualifying further followup. Detailed geological mapping and sampling is recommended for every response. With additional information, the explorationists may be able to explain some conductors and reject unfavourable geological environments. Geophysical surveys are warranted on zones which can not be adequately tested by surface sampling.

Max Min with at least 4 frequencies should adequately resolve the selected targets. The frequency range should span 111 Hz through 14 kHz and a coil separation of 100 m should be sufficient to resolve the targets. A combined magnetic/gradiometer survey may help to resolve local structures, to pinpoint magnetic strata and to extrapolate mapping under areas obscured by surficial sediments.

The selected conductors should serve as a starting point in ground explorations. There are many types of gold deposits which have no detectable airborne EM or VLF-EM response.

The selected targets have been prioritized according to the following table :

Priority	1	2	3
	IIIab	IIab	I
	XII	V	IV
	XVI	VI	X
	XVII	VII	XI
		VIII	XIII
		IX	
		XIV	
		XV	



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APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat four frequency system utilizes two different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at two widely separated frequencies and the lower frequency horizontal coplanar coil pair is operated at a frequency approximately aligned with one of the coaxial frequencies.

The electromagnetic response measured by the helicopter system is a function of the "electrical" and "geometrical" properties of the conductor. The "electrical" property of a conductor is determined largely by its electrical conductivity, magnetic susceptibility and its size and shape; the "geometrical" property of the response is largely a function of the conductor's shape and orientation with respect to the measuring transmitter and receiver.

Electrical Considerations

For a given conductive body the measure of its conductivity or conductance is closely related to the measured phase shift between the received and transmitted electromagnetic field. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift results

in a large inphase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for a non-magnetic vertical half-plane model on the accompanying phasor diagram. Other physical models will show the same trend but different quantitative relationships.

The phasor diagram for the vertical half-plane model, as presented, is for the coaxial coil configuration with the amplitudes in parts per million (ppm) of the primary field as measured at the response peak over the conductor. To assist the interpretation of the survey results the computer is used to identify the apparent conductance and depth at selected anomalies. The results of this calculation are presented in table form in Appendix II and the conductance and inphase amplitude are presented in symbolized form on the map presentation.

The conductance and depth values as presented are correct only as far as the model approximates the real geological situation. The actual geological source may be of limited length, have significant dip, may be strongly magnetic, its conductivity and thickness may vary with depth and/or strike and adjacent bodies and overburden may have modified the response. In general the conductance estimate is less affected by these limitations than is the

depth estimate, but both should be considered as relative rather than absolute guides to the anomaly's properties.

Conductance in mhos is the reciprocal of resistance in ohms and in the case of narrow slab-like bodies is the product of electrical conductivity and thickness.

Most overburden will have an indicated conductance of less than 2 mhos; however, more conductive clays may have an apparent conductance of say 2 to 4 mhos. Also in the low conductance range will be electrolytic conductors in faults and shears.

The higher ranges of conductance, greater than 4 mhos, indicate that a significant fraction of the electrical conduction is electronic rather than electrolytic in nature. Materials that conduct electronically are limited to certain metallic sulphides and to graphite. High conductance anomalies, roughly 10 mhos or greater, are generally limited to sulphide or graphite bearing rocks.

Sulphide minerals, with the exception of such ore minerals as sphalerite, cinnabar and stibnite, are good conductors; sulphides may occur in a disseminated manner that inhibits electrical

conduction through the rock mass. In this case the apparent conductance can seriously underrate the quality of the conductor in geological terms. In a similar sense the relatively non-conducting sulphide minerals noted above may be present in significant consideration in association with minor conductive sulphides, and the electromagnetic response only relate to the minor associated mineralization. Indicated conductance is also of little direct significance for the identification of gold mineralization. Although gold is highly conductive, it would not be expected to exist in sufficient quantity to create a recognizable anomaly, but minor accessory sulphide mineralization could provide a useful indirect indication.

In summary, the estimated conductance of a conductor can provide a relatively positive identification of significant sulphide or graphite mineralization; however, a moderate to low conductance value does not rule out the possibility of significant economic mineralization.

Geometrical Considerations

Geometrical information about the geologic conductor can often be interpreted from the profile shape of the anomaly. The change in shape is primarily related to the change in inductive coupling among the transmitter, the target, and the receiver.

In the case of a thin, steeply dipping, sheet-like conductor, the coaxial coil pair will yield a near symmetric peak over the conductor. On the other hand, the coplanar coil pair will pass through a null couple relationship and yield a minimum over the conductor, flanked by positive side lobes. As the dip of the conductor decreased from vertical, the coaxial anomaly shape changes only slightly, but in the case of the coplanar coil pair the side lobe on the down dip side strengthens relative to that on the up dip side.

As the thickness of the conductor increases, induced current flow across the thickness of the conductor becomes relatively significant and complete null coupling with the coplanar coils is no longer possible. As a result, the apparent minimum of the coplanar response over the conductor diminishes with increasing thickness, and in the limiting case of a fully 3 dimensional body or a horizontal layer or half-space, the minimum disappears completely.

A horizontal conducting layer such as overburden will produce a response in the coaxial and coplanar coils that is a function of altitude (and conductivity if not uniform). The profile shape will be similar in both coil configurations with an amplitude ratio (coplanar:coaxial) of about 4:1*.

In the case of a spherical conductor, the induced currents are confined to the volume of the sphere, but not relatively restricted to any arbitrary plane as in the case of a sheet-like form. The response of the coplanar coil pair directly over the sphere may be up to 8* times greater than that of the coaxial pair.

In summary, a steeply dipping, sheet-like conductor will display a decrease in the coplanar response coincident with the peak of the coaxial response. The relative strength of this coplanar null is related inversely to the thickness of the conductor; a pronounced null indicates a relatively thin conductor. The dip of such a conductor can be inferred from the relative amplitudes of the side-lobes.

Massive conductors that could be approximated by a conducting sphere will display a simple single peak profile form on both coaxial and coplanar coils, with a ratio between the coplanar to coaxial response amplitudes as high as 8*.

Overburden anomalies often produce broad poorly defined anomaly profiles. In most cases, the response of the coplanar coils closely follows that of the coaxial coils with a relative amplitude ratio of 4*.

Occasionally, if the edge of an overburden zone is sharply defined with some significant depth extent, an edge effect will occur in the coaxial coils. In the case of a horizontal conductive ring or ribbon, the coaxial response will consist of two peaks, one over each edge; whereas the coplanar coil will yield a single peak.

* It should be noted at this point that Aerodat's definition of the measured ppm unit is related to the primary field sensed in the receiving coil without normalization to the maximum coupled (coaxial configuration). If such normalization were applied to the Aerodat units, the amplitude of the coplanar coil pair would be halved.

Magnetics

The Total Field Magnetic Map shows contours of the total magnetic field, uncorrected for regional variation. Whether an EM anomaly with a magnetic correlation is more likely to be caused by a sulphide deposit than one without depends on the type of mineralization. An apparent coincidence between an EM and a magnetic anomaly may be caused by a conductor which is also magnetic, or by a conductor which lies in close proximity to a magnetic body. The majority of conductors which are also magnetic are sulphides containing pyrrhotite and/or magnetite. Conductive and magnetic

bodies in close association can be, and often are, graphite and magnetite. It is often very difficult to distinguish between these cases. If the conductor is also magnetic, it will usually produce an EM anomaly whose general pattern resembles that of the magnetics. Depending on the magnetic permeability of the conducting body, the amplitude of the inphase EM anomaly will be weakened, and if the conductivity is also weak, the inphase EM anomaly may even be reversed in sign.

VLF Electromagnetics

The VLF-EM method employs the radiation from powerful military radio transmitters as the primary signals. The magnetic field associated with the primary field is elliptically polarized in the vicinity of electrical conductors. The Herz Totem uses three coils in the X, Y, Z configuration to measure the total field and vertical quadrature component of the polarization ellipse.

The relatively high frequency of VLF (15-25) kHz provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measureable VLF signals. For the same reason, poor conductors such as sheared contacts, breccia zones, narrow faults, alteration zones and porous flow tops normally produce VLF anomalies. The method can therefore be used effectively for geological mapping. The only

relative disadvantage of the method lies in its sensitivity to conductive overburden. In conductive ground the depth of exploration is severely limited.

The effect of strike direction is important in the sense of the relation of the conductor axis relative to the energizing electromagnetic field. A conductor aligned along a radius drawn from a transmitting station will be in a maximum coupled orientation and thereby produce a stronger response than a similar conductor at a different strike angle. Theoretically, it would be possible for a conductor, oriented tangentially to the transmitter to produce no signal. The most obvious effect of the strike angle consideration is that conductors favourably oriented with respect to the transmitter location and also near perpendicular to the flight direction are most clearly rendered and usually dominate the map presentation.

The total field response is an indicator of the existence and position of a conductivity anomaly. The response will be a maximum over the conductor, without any special filtering, and strongly favour the upper edge of the conductor even in the case of a relatively shallow dip.

The vertical quadrature component over steeply dipping sheet-like

conductor will be a cross-over type response with the cross-over closely associated with the upper edge of the conductor.

The response is a cross-over type due to the fact that it is the vertical rather than total field quadrature component that is measured. The response shape is due largely to geometrical rather than conductivity considerations and the distance between the maximum and minimum on either side of the cross-over is related to target depth. For a given target geometry, the larger this distance the greater the depth.

The amplitude of the quadrature response, as opposed to shape is function of target conductance and depth as well as the conductivity of the overburden and host rock. As the primary field travels down to the conductor through conductive material it is both attenuated and phase shifted in a negative sense. The secondary field produced by this altered field at the target also has an associated phase shift. This phase shift is positive and is larger for relatively poor conductors. This secondary field is attenuated and phase shifted in a negative sense during return travel to the surface. The net effect of these 3 phase shifts determine the phase of the secondary field sensed at the receiver.

A relatively poor conductor in resistive ground will yield a net positive phase shift. A relatively good conductor in more conductive ground will yield a net negative phase shift. A combination is possible whereby the net phase shift is zero and the response is purely in-phase with no quadrature component.

A net positive phase shift combined with the geometrical cross-over shape will lead to a positive quadrature response on the side of approach and a negative on the side of departure. A net negative phase shift would produce the reverse. A further sign reversal occurs with a 180 degree change in instrument orientation as occurs on reciprocal line headings. During digital processing of the quadrature data for map presentation this is corrected for by normalizing the sign to one of the flight line headings.

APPENDIX II

ANOMALY LIST

BEG PROPERTY J8762

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
1	10	A	0	8.4	24.7	0.2	0	200
1	20	A	0	6.3	25.2	0.1	0	188
1	31	A	0	6.8	26.6	0.1	0	186
1	40	A	0	6.8	29.5	0.1	0	173
1	50	A	0	6.7	14.0	0.3	0	231
1	50	B	0	5.1	26.0	0.0	0	189
1	50	C	0	18.6	27.2	0.7	0	200
1	60	A	0	8.4	18.3	0.3	0	223
1	60	B	0	8.6	21.5	0.2	0	206
1	61	A	0	3.2	28.3	0.0	0	180
1	70	A	0	4.0	24.7	0.0	0	195
1	70	B	0	9.4	32.5	0.1	0	189
1	80	A	0	6.4	21.6	0.1	0	212
1	90	A	0	13.3	24.5	0.4	0	209
1	110	A	0	2.6	5.5	0.1	0	199
1	120	A	0	13.1	30.3	0.3	0	201
1	130	A	0	14.6	33.9	0.3	0	169
1	130	B	0	17.2	50.2	0.3	0	181
1	140	A	0	16.6	59.4	0.2	0	174
1	140	B	0	11.6	34.1	0.2	0	184
1	150	A	0	0.1	10.8	0.0	0	192
1	150	B	0	23.9	44.3	0.6	0	177
1	150	C	0	14.0	48.2	0.2	0	176
1	150	D	0	15.2	69.3	0.1	0	171
1	160	A	0	4.4	14.5	0.1	0	203
1	160	B	0	8.7	26.9	0.2	0	188
1	160	C	0	12.3	23.9	0.4	0	218
1	160	D	0	19.8	24.8	0.9	0	211
1	170	A	0	18.6	31.7	0.6	0	178

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

BEG PROPERTY J8762

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
1	170	B	0	18.5	40.3	0.4	0	174
1	170	C	0	9.4	31.1	0.1	0	168
1	180	A	0	7.7	25.9	0.1	0	202
1	180	B	0	9.0	26.4	0.2	0	189
1	190	A	0	7.8	16.6	0.3	0	210
1	190	B	0	10.9	25.2	0.3	0	201
1	190	C	0	13.5	39.9	0.2	0	177
1	200	A	0	6.8	25.0	0.1	0	201
1	200	B	0	11.1	30.3	0.2	0	200
1	200	C	0	6.4	14.6	0.2	0	215
1	200	D	0	2.6	13.5	0.0	0	171
1	210	A	0	9.1	14.8	0.4	0	211
1	210	B	0	10.6	33.2	0.2	0	182
1	220	A	0	9.7	36.8	0.1	0	190
1	230	A	0	12.9	43.5	0.2	0	175
1	240	A	0	9.5	33.7	0.1	0	188
1	240	B	0	11.5	42.8	0.1	0	151
1	250	A	0	8.6	33.1	0.1	0	172
1	260	A	0	4.1	15.1	0.1	0	203
1	270	A	0	7.6	31.3	0.1	0	164
1	280	A	0	6.9	18.2	0.2	0	214
1	290	A	0	14.0	34.2	0.3	0	178
1	300	A	0	11.9	19.3	0.5	0	232
1	310	A	0	15.3	26.1	0.5	0	199
1	330	A	0	10.9	17.8	0.5	0	201
1	340	A	0	14.0	19.4	0.7	0	242
1	440	A	0	7.0	13.4	0.3	0	172
1	480	A	0	7.2	16.2	0.2	0	198

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

BEG PROPERTY J8762

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
1	490	A	0	4.0	8.9	0.2	0	229
2	500	A	0	0.3	3.8	0.0	0	208
2	500	B	0	-2.2	1.7	0.0	0	198
2	510	A	0	3.2	13.7	0.0	0	186
2	520	A	0	1.7	8.7	0.0	0	166
2	520	B	0	4.1	10.9	0.1	0	191
2	520	C	0	7.6	35.2	0.1	0	172
2	530	A	0	4.2	8.6	0.2	0	170
2	530	B	0	1.1	5.7	0.0	0	176
2	540	A	0	1.8	7.1	0.0	0	157
2	540	B	0	2.7	8.1	0.1	0	163
2	550	A	0	5.2	12.9	0.2	0	163
2	550	B	0	2.4	8.2	0.0	0	187
2	560	A	0	2.1	17.2	0.0	0	205
2	570	A	0	0.5	11.8	0.0	0	203
2	580	A	0	-6.5	8.6	0.0	0	185
2	580	B	0	2.4	25.3	0.0	0	182
2	590	A	0	-13.5	6.8	0.0	0	175
2	681	A	0	0.4	3.8	0.0	0	200
2	690	A	0	0.3	5.7	0.0	0	192
2	700	A	0	-1.3	2.6	0.0	0	174
2	710	A	0	0.8	5.5	0.0	0	174
2	710	B	0	-1.5	3.9	0.0	0	173
2	710	C	0	-0.4	2.4	0.0	0	190
2	720	A	0	0.9	5.1	0.0	0	172
2	720	B	0	4.0	4.6	0.5	0	182
2	730	A	0	4.7	10.3	0.2	0	168
2	730	B	0	7.2	22.3	0.1	0	181

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

BEG PROPERTY J8762

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
2	730	C	0	0.0	5.9	0.0	0	182
2	740	A	0	-3.0	7.1	0.0	0	160
2	740	B	0	2.5	17.0	0.0	0	180
2	750	A	0	3.2	8.5	0.1	0	193
2	750	B	1	10.5	10.4	1.0	0	189
2	761	A	2	20.8	14.3	2.1	0	172
2	781	A	0	1.1	6.2	0.0	0	188
2	781	B	1	19.7	20.2	1.2	0	188
2	791	A	0	2.4	9.4	0.0	0	195
2	791	B	0	-0.3	2.9	0.0	0	193
2	800	A	0	-1.6	2.1	0.0	0	179
2	800	B	0	-0.9	3.7	0.0	0	193
2	810	A	0	-0.2	1.9	0.0	0	195
2	810	B	0	-2.5	2.6	0.0	0	189
2	820	A	0	-1.3	5.6	0.0	0	179
2	820	B	0	-1.1	2.2	0.0	0	160
2	830	A	0	-1.8	3.5	0.0	0	178
2	840	A	0	-2.2	2.4	0.0	0	187
2	850	A	0	-0.9	2.1	0.0	0	183
2	850	B	0	-3.0	4.2	0.0	0	199
2	860	A	0	-5.3	4.9	0.0	0	183
2	860	B	0	-0.5	3.6	0.0	0	193
2	860	C	0	-2.8	1.8	0.0	0	170
3	870	A	0	2.5	7.6	0.1	0	190
3	870	B	0	6.1	24.1	0.1	0	201
3	870	C	0	5.6	26.7	0.0	0	186
3	880	A	0	-1.3	2.1	0.0	0	189
3	900	A	0	0.0	1.4	0.0	0	163
3	900	B	0	-1.4	1.3	0.0	0	178
3	910	A	0	-1.5	5.9	0.0	0	182

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

BEG PROPERTY J8762

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
3	910	B	0	-0.6	1.4	0.0	0	192
3	910	C	0	0.2	2.8	0.0	0	184
3	910	D	0	1.1	13.6	0.0	0	179
3	920	A	0	5.1	28.3	0.0	0	182
3	920	B	0	-0.4	3.9	0.0	0	169
3	920	C	0	-1.2	0.6	0.0	0	195
3	920	D	0	-1.9	3.6	0.0	0	188
3	930	A	0	-0.1	0.7	0.0	0	205
3	930	B	0	1.4	14.5	0.0	0	190
3	940	A	0	7.1	28.8	0.1	0	195
3	960	A	0	0.9	16.1	0.0	0	168
3	960	B	0	1.8	11.9	0.0	0	179
3	960	C	2	31.1	16.2	3.6	0	162
3	960	D	0	-0.9	3.1	0.0	0	173
3	970	A	0	1.6	4.0	0.1	0	184
3	970	B	0	2.6	15.7	0.0	0	190
3	970	C	0	2.5	17.7	0.0	0	178
3	980	A	0	5.9	28.8	0.0	0	173
3	980	B	2	26.3	15.2	2.9	0	172
3	990	A	0	0.0	4.3	0.0	0	193
3	990	B	1	6.4	5.6	1.0	0	178
3	1010	A	0	2.4	20.1	0.0	0	191
3	1020	A	0	3.8	21.7	0.0	0	179
3	1020	B	0	3.5	23.8	0.0	0	184
3	1030	A	0	-1.6	2.4	0.0	0	158
3	1060	A	0	4.3	36.3	0.0	0	144
3	1060	B	0	5.2	21.9	0.0	0	191
3	1070	A	0	5.2	22.0	0.0	0	164
3	1070	B	0	4.1	26.6	0.0	0	170
3	1080	A	0	2.7	19.1	0.0	0	172
3	1090	A	0	5.1	18.9	0.1	0	182

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

APPENDIX III

CERTIFICATE OF QUALIFICATIONS

I, Marcel H. Konings Certify that:

1) I reside at R.R. # 1, (Part E 1/2-L9-C6 Adjala Twp), Colgan, Ontario, L0G 1G0.

2) I am a qualified Geological Engineer, having received my academic training at the University of Toronto, specializing in Exploration Geophysics and having graduated in 1974.

3) I am a registered Professional Engineer of the Province of Ontario, in good standing.

4) I have been professionally engaged in my profession, the application of Mining Geophysical Methods to mineral exploration, continuously for 14 years in Canada and internationally.

5) I have been an active member of the Society of Exploration Geophysicists since 1977 and hold memberships in other professional societies involved in the mineral exploration industry.

5) The accompanying report was prepared from data supplied by Aerodat.

6) I have no interest, direct or indirect, in the property described nor do I hold securities in Les Ressources Halex Inc.

7) I hereby consent to the use of this report in a Statement of Material Facts of the Company and for the preparation of a prospectus for submission to the Ontario Securities Commission and/or other regulatory authorities.

Signed



Marcel H. Konings, P. Eng.

April 6, 1988
Colgan, Ontario
(416) 936-4853

APPENDIX IV

PERSONNEL

FIELD

Flown - March, 1988

Pilot - K. McCrae

Operator - Kevin McCart

OFFICE

Processing - Kevin Killin, Geophysicist

Report - Marcel Konings, P. Eng.

Ontario

42A01SW0012 2.11516 EBY

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Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

October 27, 1988

Your file: W8808-271
Our file: 2.11516

Mining Recorder
Ministry of Northern Development and Mines
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

ONTARIO GEOLOGICAL SURVEY
ASSESSMENT FILES
OFFICE
NOV 7 1988
RECEIVED

Dear Sir:

Re: Notice of Intent dated October 12, 1988 - Geophysical (Magnetometer, Electromagnetic and Resistivity) Survey submitted on Mining Claims L 981669 et al in Burt Township

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

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

Yours sincerely,

W.R. Cowan
Provincial Manager, Mining Lands
Mines & Minerals Division

WRM:pl
Enclosure

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

Resident Geologist
Kirkland Lake, Ontario

Raven Resources Inc.
139 Carter Ave.
Kirkland Lake, Ontario
P2N 2A1

Ministry of Northern Development and Mines
Ontario

Technical Assessment Work Credits

File 2.11516

Date October 12, 1988

Mining Recorder's Report of Work No. W8808-271

Recorded Holder: Raven Resources Inc.

Township or Area: Burt

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	L 981669 to 672 inclusive
Electromagnetic 39 days	
Magnetometer 19 days	
Radiometric ____ days	
Induced polarization ____ days	
Other Resistivity 19 days	
Section 77 (19) See "Mining Claims Assessed" column	
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 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each clair exceed the maximum allowed as follows: Geophysical - 80; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

828 (85/12)

Ontario

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

October 31, 1988

Your file: W8808-270
Our file: 2.11516

Mining Recorder
Ministry of Northern Development and Mines
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

Re: Notice of Intent dated October 12, 1988 - Geophysical (Electromagnetic, Magnetometer and Resistivity) Survey submitted on Mining Claims L 943101 et al in the Townships of Burt, Eby and Gross

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

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

Yours sincerely,

W.R. Cowan
Provincial Manager, Mining Lands
Mines & Minerals Division
RM
RM:pl
Enclosure

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

Resident Geologist
Kirkland Lake, Ontario

Ressources Halex Inc.
15 Gamble Est.
Rouyn-Noranda, Quebec
J9X 3B6

Ministry of Northern Development and Mines
Ontario

Technical Assessment Work Credits

File: 2.11516

Date: October 12, 1988

Mining Recorder's Report of Work No.: W8808-270

Recorded Holder: Ressources Halex Inc.

Township: Burt, Eby, Gross

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	L 943101 to 150 inclusive 895406 to 489 inclusive 854986 to 855000 inclusive
Electromagnetic 39 days	
Magnetometer 19 days	
Radiometric ____ days	
Induced polarization ____ days	
Other Resistivity 19 days	
Section 77 (19) See "Mining Claims Assessed" column	
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 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

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; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

Ministry of Natural Resources
Ontario

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

Mining Act

DOCUMENT No. W8808.271

Aug 11

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 GEOPHYSICAL	Township or Area: BURT Twp
Claim Holder(s): RAVEN RESOURCES Inc	Prospector's Licence No.: T 4869
Address: 139 CARTER Ave Kirkland Lake Ont P2N 2A1	
Survey Company: AERODAT 3883 NASHUA DRIVE	Date of Survey (from & to): 01 03 88 (Day Mo. Yr.) — (Day Mo. Yr.)
Total Miles of line Cut: 380 KM	
Name and Address of Author (of Geo-Technical report): AERODAT - 3883 NASHUA DRIVE, MISSISSAUGA Ont L4V 1R3	

Credits Requested per Each Claim in Columns at right

		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	Days per Claim
	· Electromagnetic	
	· Magnetometer	
	· Radiometric	
	· Other	
	Geological	
	Geochemical	
Airborne Credits: Note: Special provisions credits do not apply to Airborne Surveys.		Days per Claim
	Electromagnetic	40
	Magnetometer	20
	RESISTIVITY ~~Radiometric~~	20

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	981669	
	981670	
	981671	
	981672	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

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MINING LANDS SECTION

LARDER LAKE MINING DIV.
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AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

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.

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

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
320	June 22/88	M.C. Werner
Z.P.	Date Approved as Recorded: See Revised	Branch Director: Disallowed

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 Ont	Date Certified: June 22/88	Certified by (Signature): Michael Leahy

1362 (81/9)

Aug 11 P1-4

Ministry of Northern Development and Mines
Ontario

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

Lands Management — Mining Act

DOCUMENT No. W8808.270

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 GEOPHYSICAL	Township or Area: BURT, Eby, GROSS
Claim Holder(s): RESSOURCES HALEX INC 2.11516	Prospector's Licence No.: T-4935
Address: 15 GAMBLE EST. ROUYN-NORANDA Quebec J9X 3B6	
Survey Company: AERODAT	Date of Survey (from & to): 10 03 88 (Day Mo. Yr.) – (Day Mo. Yr.)
Total Miles of line Cut: 380 KM	
Name and Address of Author (of Geo-Technical report): AERODAT 3883 NASHUA DRIVE, MISSISSAUGA, Ont. L4V 1R3	

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

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MINING LANDS SECTION

Expenditures (excludes power stripping)

Type of Work Performed	
Performed on Claim(s)	

LARDER LAKE MINING DIV.
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AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

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.
L	943101	
	943102	
	943103	
	943104	
	943105	
	943106	
	943107	
	943108	
	943109	
	943110	
	943111	
	943112	
	943113	
	943114	
	943115	
	943116	
	943117	
	943118	
	943119	
	943120	
	943121	
	943122	
	943123	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	943124	
	943125	
	943126	
	943127	
	943128	
	943129	
	943130	
	943131	
	943132	
	943133	
	943134	
	943135	
	943136	
	943137	
	943138	
	943139	
	943140	
	943141	
	943142	
	943143	
	943144	
	943145	
	943146	

Total number of mining claims covered by this report of work: 149 ME

SEE ATTACHED LIST

For Office Use Only		
Total Days Cr. Recorded: 11,920 L.P.	Date Recorded: June 22/88	Mining Recorder: Mr. G. Wearmouth
	Date Approved as Recorded: See Remarks	Branch Director: H. Lovett

Date	Recorded Holder or Agent (Signature)
June 22/88	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 Ont. P2N 2A1

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

1362 (85/12)

P2-4

Ministry of Northern Development and Mines
Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

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

Claim Holder(s)	Prospector's Licence No.
HALEY	

Address

Survey Company	Date of Survey (from & to) Day | Mo. | Yr. | Day | Mo. | Yr.	Total Miles of line Cut

Name and Address of Author (of Geo-Technical report)

Credits Requested per Each Claim in Columns at right

		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	Days per Claim
	· Electromagnetic	
	· Magnetometer	
	· Radiometric	
	· Other	
	Geological	
	Geochemical	
Airborne Credits Note: Special provisions credits do not apply to Airborne Surveys.		Days per Claim
	Electromagnetic	
	Magnetometer	
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	943147	
	943148	
	943149	
	943150	
	895406	
	895407	
	895408	
	895409	
	895410	
	895411	
	895412	
	895413	
	895414	
	895415	
	895416	
	895417	
	895418	
	895419	
	895420	
	895421	
	895422	
	895423	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	895424	
	895425	
	895426	
	895427	
	895428	
	895429	
	895430	
	895431	
	895432	
	895433	
	895434	
	895435	
	895436	
	895437	
	895438	
	895439	
	895440	
	895441	
	895442	
	895443	
	895444	
	895445	
	895446	

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

Expenditures (excludes power stripping)

Type of Work Performed	
Performed on Claim(s)	

LARDER LAKE MINING DIV.
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JUN 22 1988
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

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)

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
		M. G. Warner
	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

	Date Certified	Certified by (Signature)

1362 (85/12)

P3-4

Ministry of Northern Development and Mines
Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

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
Claim Holder(s) HALEX	Prospector's Licence No.
Address	
Survey Company	Date of Survey (from & to) Day | Mo. | Yr. | Day | Mo. | Yr. — Total Miles of line Cut
Name and Address of Author (of Geo-Technical report)	

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	
	Magnetometer	
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.	Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	895447		L	895470	
	895448			895471	
	895449			895472	
	895450			895473	
	895451			895474	
	895452			895475	
	895453			895476	
	895454			895477	
	895455			895478	
	895456			895479	
	895457			895480	
	895458			895481	
	895459			895482	
	895460			895483	
	895461			895484	
	895462			895485	
	895463			895486	
	895464			895487	
	895465			895488	
	895466			895489	
	895467				
	895468				
	895469				

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

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures $ ____ + 15 = Total Days Credits ____

LARDER LAKE MINING DIV. RECEIVED JUN 22 1988 AM PM

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)

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
	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

	Date Certified	Certified by (Signature)

1362 (85/12)

P 4-4

Ministry of Northern Development and Mines
Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

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

Claim Holder(s)	Prospector's Licence No.
HALEY	

Address

Survey Company	Date of Survey (from & to) Day | Mo. | Yr. | Day | Mo. | Yr.	Total Miles of line Cut

Name and Address of Author (of Geo-Technical report)

Credits Requested per Each Claim in Columns at right

		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	Days per Claim
	· Electromagnetic	
	· Magnetometer	
	· Radiometric	
	· Other	
	Geological	
	Geochemical	
Airborne Credits Note: Special provisions credits do not apply to Airborne Surveys.		Days per Claim
	Electromagnetic	
	Magnetometer	
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	854986	
	854987	
	854988	
	854989	
	854990	
	854991	
	854992	
	854993	
	854994	
	854995	
	854996	
	854997	
	854998	
	854999	
	855000	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

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

Expenditures (excludes power stripping)

Type of Work Performed	
Performed on Claim(s)	
Calculation of Expenditure Days Credits	

LARDER LAKE MINING DIV. RECEIVED JUN 22 1988 AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

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)

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
		M. C. Warman
	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		
	Date Certified	Certified by (Signature)

1362 (85/12)

Ministry of Northern Development and Mines

Ontario

Geophysical-Geological-Geochemical Technical Data Statement

File 2.11516

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

Type of Survey(s) AIRBONE GEOPHYSICAL

Township or Area Burt, Eby, Gron

Claim Holder(s) _____

_____

Survey Company AERODAT

Author of Report M. Konings

Address of Author 3883 Nashua Drive, Mississauga, Ont, L4V1R3

Covering Dates of Survey _____ (linecutting to office)

Total Miles of Line Cut _____

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	
--Magnetometer	
--Radiometric	
--Other	
Geological	
Geochemical	

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

Magnetometer 40 Electromagnetic 20 Radiometric ~~20~~ Resistivity 20
(enter days per claim)

DATE: 28/09/1988 SIGNATURE: _____
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

OFFICE USE ONLY

837 (85/12)

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

L 943101
L 943102
L 943103
L 943104
L 943105
L 943106
L 943107
L 943108
L 943109
L 943110
L 943111
L 943112
L 943113
L 943114
L 943115
L 943116
L 943117
L 943118
L 943119
L 943120
L 943121
see attach list

TOTAL CLAIMS 149

If space insufficient, attach list

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations _____ Number of Readings _____

Station interval _____ Line spacing _____

Profile scale _____

Contour interval _____

MAGNETIC

Instrument _____

Accuracy – Scale constant _____

Diurnal correction method _____

Base Station check-in interval (hours) _____

Base Station location and value _____

_____

ELECTROMAGNETIC

Instrument _____

Coil configuration _____

Coil separation _____

Accuracy _____

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

Frequency _____
(specify V.L.F. station)

Parameters measured _____

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 _____

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) Magnetic / Electromagnetic / V.L.F.

Instrument(s) Scintrex MdVIW 2321 HS Ce. / Aerodat 4 frequencies system / Hertz Totem 2A system
(specify for each type of survey)

Accuracy .1 nanoTeslas / 7m separation /
(specify for each type of survey)

} see report

Aircraft used helicopter

Sensor altitude see report

Navigation and flight path recovery method derived from Ranger UHF radar positions (see report)

_____

Aircraft altitude 60m Line Spacing 100m

Miles flown over total area # 380 Km Over claims only #240 Km

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 _____

_____

_____

_____

_____

_____

_____

_____

_____

Les Ressources
HALEX inc.

15, Gamble est, Rouyn-Noranda
(Québec) J9X 3B6 (819) 762-2880

Mining Claim	
Prefix	Number
	943122
	943123
L	943124
	943125
	943126
	943127
	943128
	943129
	943130
	943131
	943132
	943133
	943134
	943135
	943136
	943137
	943138
	943139
	943140
	943141
	943142
	943143
	943144
	943145
	943146

Mining Claim	
Prefix	Number
L	895447
	895448
	895449
	895450
	895451
	895452
	895453
	895454
	895455
	895456
	895457
	895458
	895459
	895460
	895461
	895462
	895463
	895464
	895465
	895466
	895467
	895468
	895469

Mining Claim	
Prefix	Number
L	895470
	895471
	895472
	895473
	895474
	895475
	895476
	895477
	895478
	895479
	895480
	895481
	895482
	895483
	895484
	895485
	895486
	895487
	895488
	895489

Mining Claim	
Prefix	Number
L	943147
	943148
	943149
	943150
	895406
	895407
	895408
	895409
	895410
	895411
	895412
	895413
	895414
	895415
	895416
	895417
	895418
	895419
	895420
	895421
	895422
	895423

Mining Claim	
Prefix	Number
L	895424
	895425
	895426
	895427
	895428
	895429
	895430
	895431
	895432
	895433
	895434
	895435
	895436
	895437
	895438
	895439
	895440
	895441
	895442
	895443
	895444
	895445
	895446

Mining Claim		Expend. Days Cr.
Prefix	Number	
L	854986	
	854987	
	854988	
	854989	
	854990	
	854991	
	854992	
	854993	
	854994	
	854995	
	854996	
	854997	
	854998	
	854999	
	855000	

Grenfell Twp. M.351

Burt Twp. M.334

Otto Twp. M.379

Blain Twp. M.418

M.N.R. FILE 16864

VI

V

IV

III

II

I

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

THE TOWNSHIP OF

EBY

DISTRICT OF TIMISKAMING

LARDER LAKE MINING DIVISION

SCALE: 1-INCH=40 CHAINS

LEGEND

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

NOTES

400' surface rights reservation along the shores of all lakes and rivers.

AREAS WITHDRAWN FROM STAKING
under Sec. 43 of The Mining Act (R.S.O. 1970).

Order No.	File	Date	Disposition

N½ Lot 7, Con. 3 - Cert. of Forfeiture - Sept 17/85

NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE
TIMISKAMING MANAGEMENT UNIT
AND MAY BE SUBJECT TO FORESTRY OPERATIONS.
THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: P.O. BOX 129
SWASTIKA, ONT.
POK 1TO
705-642-3222

DATE

PR

#

LA MINING D

PLAN NO. M-345

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

42A01SW0012 2.11516 EBY

200

K

Burt Twp.

Flavelle Twp.

Blain Twp.

Davidson Twp.

VI

V

IV

III

II

I

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

THE TOWNSHIP OF

GROSS

DISTRICT OF TIMISKAMING

LARDER LAKE MINING DIVISION

SCALE: 1-INCH=40 CHAINS

LEGEND

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

NOTES

400' Surface rights reservation around all lakes and rivers

Flooding Rights Reserved To Contour 3H File 1788 Vol 2

Areas withdrawn from staking under Section 43 of the Mining Act (R.S.O. 1970).

Order No.	File	Date	Disposition
84 Public Access Point	168322	4/2/80	S.R.O. Revoked 1980.

NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE _____ PLONSKI FOREST MANAGEMENT UNIT

AND MAY BE SUBJECT TO FORESTRY OPERATIONS. THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: P.O. BOX 129
SWASTIKA, ONT.
POK 1TO
705-642-3222

PLAN NO.- M.487

ONTARIO

MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

42A01SW0012 2.11516 EBY

210

Devon R.

BURT TOWNSHIP

LARDER LAKE MINING DIVISION

DISTRICT OF TIMISKAMING

SCALE 40 CHAINS TO ONE INCH

M.334

LEGEND

PATENTED LAND	(P)
CROWN LAND SALE	CS
LEASES	(L)
LICENSE OF OCCUPATION	L.O.
LOCATED LAND	Loc.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
CANCELLED	C.

Mining & Surface rights withdrawn from staking out, prospecting sale, or lease Sec 36, The Mining Act, R.S.O. 1980
Order No NRW 29/82 Nov 29, 1982 1:40 pm

400' surface rights reservation along the shores of all lakes and rivers.

Areas withdrawn from staking under Section 43 of the Mining Act (R.S.O. 1970).

Order No.	File	Date	Disposition
(R1)	W.7/74	104317	21/2/74	S.R.O.
(R2)	W.71/76	100581	15/12/76	S.R.O.
(R3)	NRW 33/79	139857	14/5/79	S.R.O.
(R4)	NRW 92/80	129365	9/7/80	S.R.O.
(R5)	W 29/82	188522	29/11/82	S.R.O. & M.R.

BOMPAS TWP.

HOLMES TWP.

EBY TWP.

GROSS TWP.

Portage 3 Miles

Bud Lake

AREA WITHDRAWN FROM STAKING SECTION 43 MINING ACT

FILE 164266

T.S.R. TOWER SITE S.R.O. RESERVED

CABIN SITE

Gravel File: 186049

D.H.O. PIT SF-40 1315

VI V IV III II I

NOTICE OF FORESTRY ACTIVITY.

THIS TOWNSHIP / AREA FALLS WITHIN THE ____ PLONSKI FOREST MANAGEMENT UNIT

...RESTRY OPERATIONS. ...R THIS AREA CAN BE ... ONT.

ONTARIO

MINISTRY OF NATURAL RESOURCES

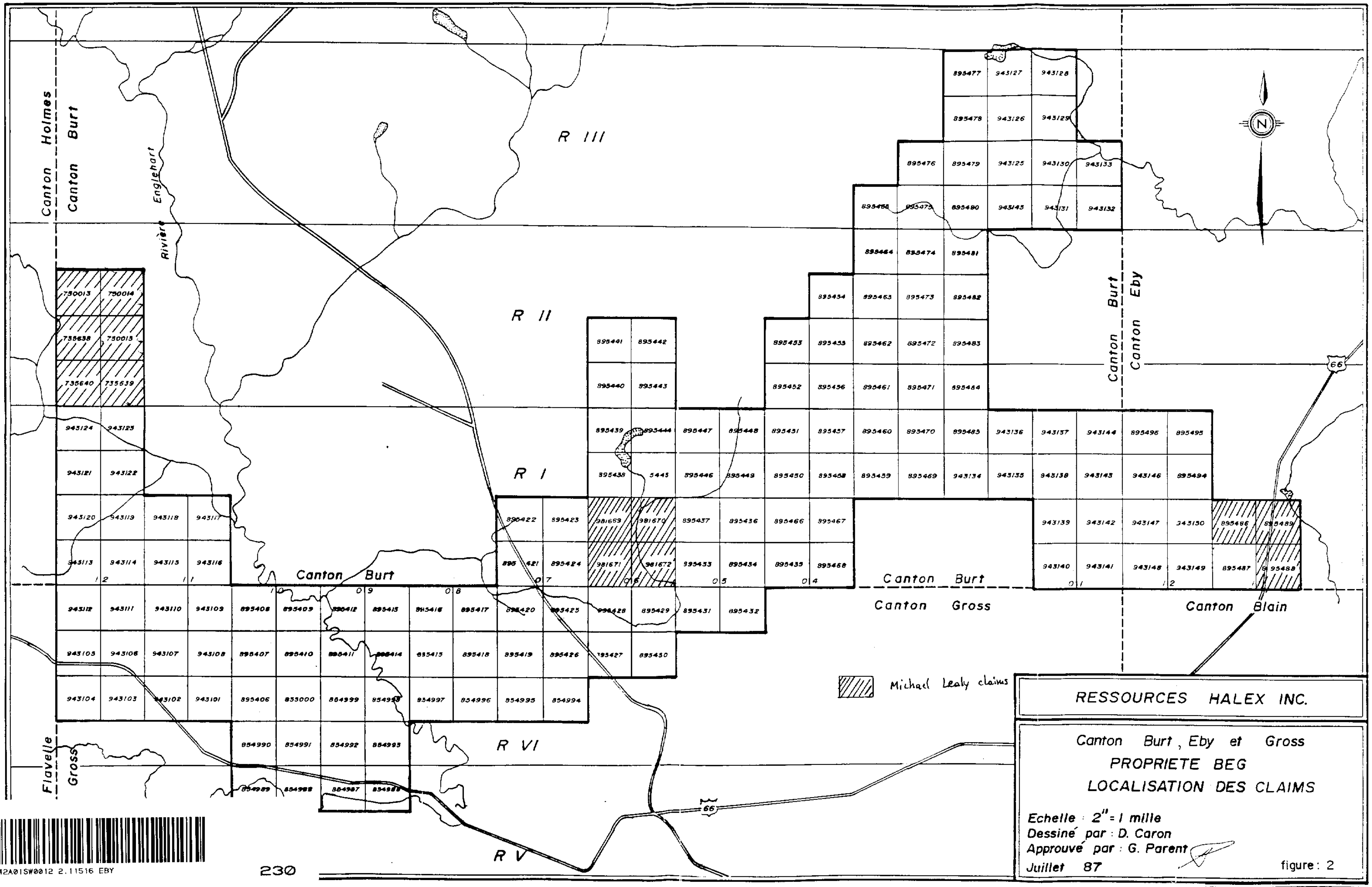
SURVEYS AND MAPPING BRANCH

42A01SW0012 2.11516 EBY

220 222

BURT TWP.

M.334



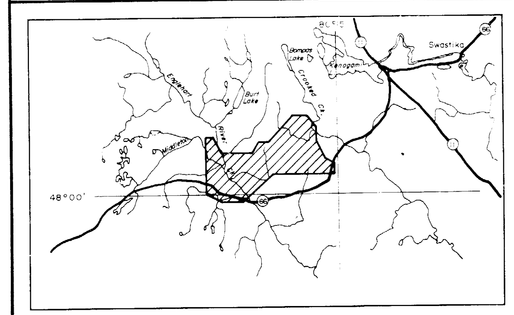
42A01SW0012 2.11516 EBY

St Michel géoconseil

546522
5319648

554297
5318175

546874
5315349



LES RESSOURCES HALEX INC.

BASE MAP

BEG PROPERTY

ONTARIO

AERODAT LIMITED

DATE: MARCH 1988

NTS NO: 41P/16, 42A/01

MAP NO: 1 J8782

546522
5319648

553-124

555-297
5318

SERR74
5318.50

Flight Path

Navigation and recovery using
Motorola Mini-Ranger (MRD IV - FALCON)
radar navigation system

Average terrain clearance 80m
Line Spacing = 100m

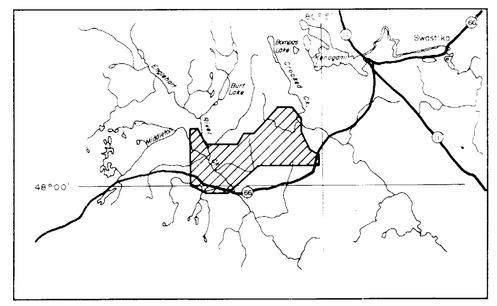
EM Anomalies

Conductivity Thickness
(Relative)

- 0
- 1 - 2
- 2 - 4
- 4 - 8
- 8 - 15
- 15 - 30
- + 30

Cultural response

EM Anomaly A: 4800 hz response amplitude 7.99% - Conductivity thickness 152 mhos (see close)



LES RESSOURCES HALEX INC.

FLIGHT PATH

BEG PROPERTY 2 715 1

ONTARIO

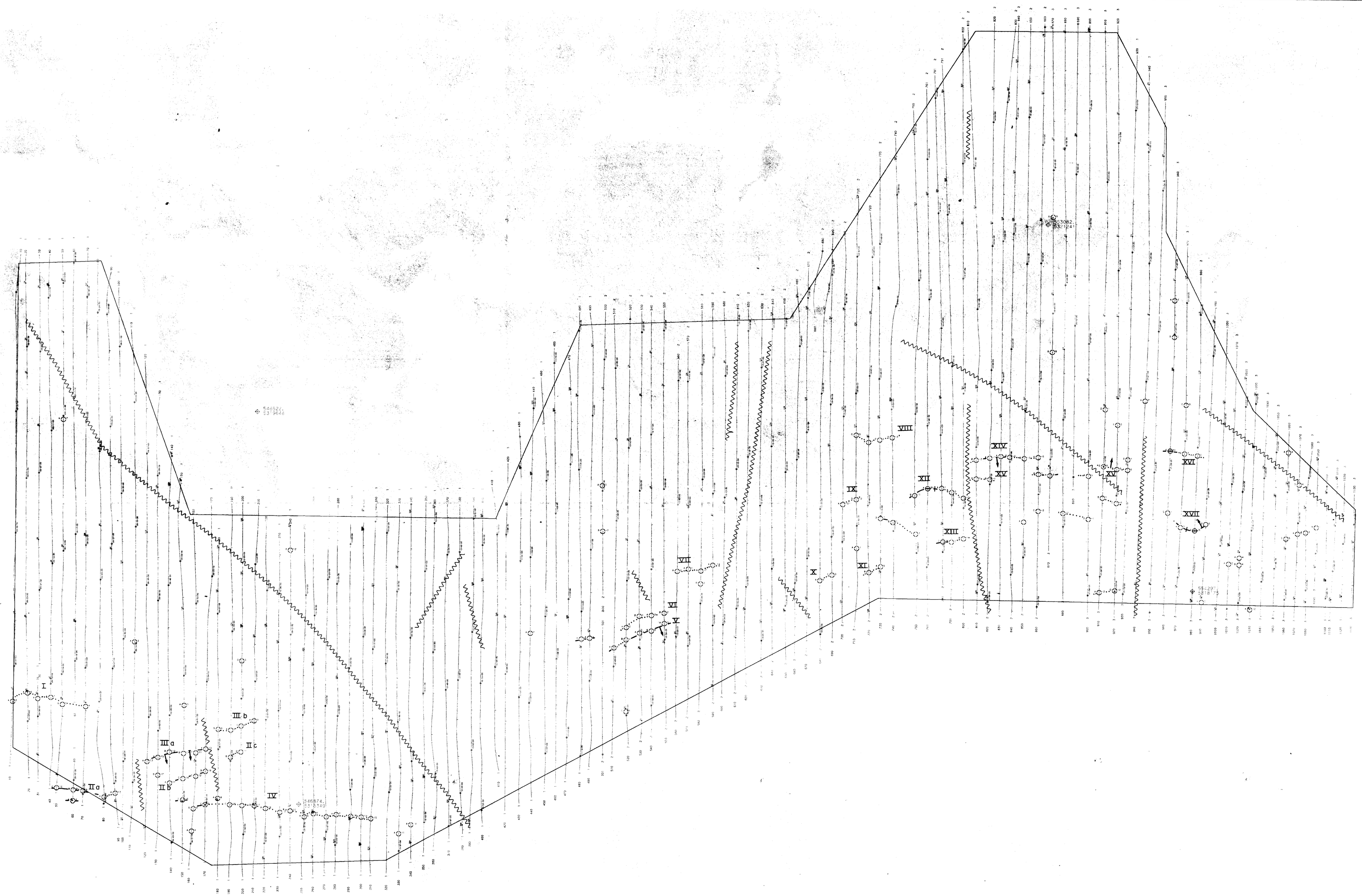
AERODAT LIMITED

DATE: MARCH 1988

NTS No: 41P/16, 42A/01

MAP No: 2 J8762

250



N

Flight Path

Navigation and recovery using Motorola Mini-Ranger (MRS IV - FALCON) radar navigation system

Average terrain clearance 60m
Line spacing - 100m

EM Anomalies

Conductivity Thickness (metres)

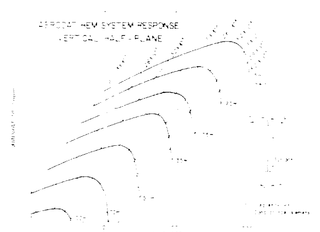
- 0 - 1
- 1 - 2
- 2 - 4
- 4 - 8
- 8 - 15
- 15 - 30
- + 30

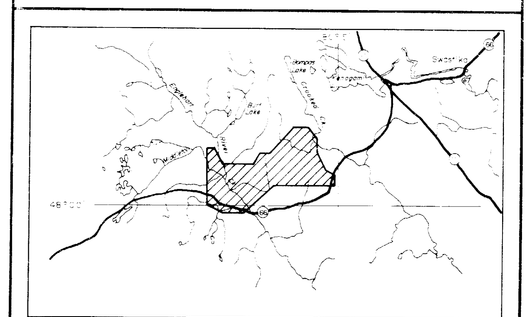
Cultural response

EM Anomaly A, 4600 Hz inphase amplitude 7 conductivity thickness 12 metres (see model)

INTERPRETATION LEGEND

- Flight path
- Geological contact
- Fault
- Shear zone





LES RESSOURCES HALEX INC.

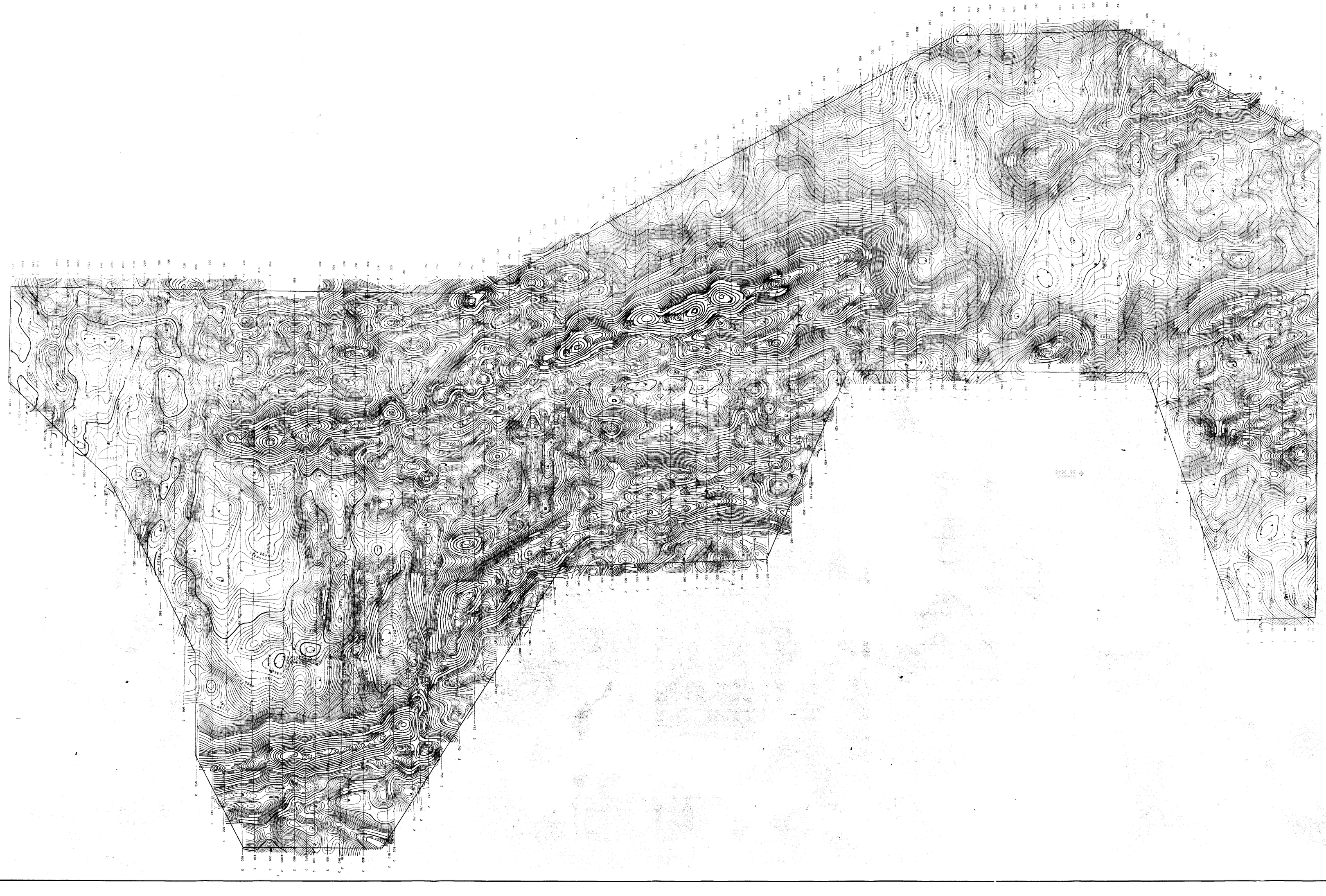
INTERPRETATION

BEG PROPERTY
ONTARIO

AERODAT LIMITED

DATE: MARCH 1988
NTS No: 41P/16, 42A/01
MAP No: 3 J8762

270



LES RESSOURCES HALEX INC.

TOTAL FIELD MAGNETIC CONTOURS

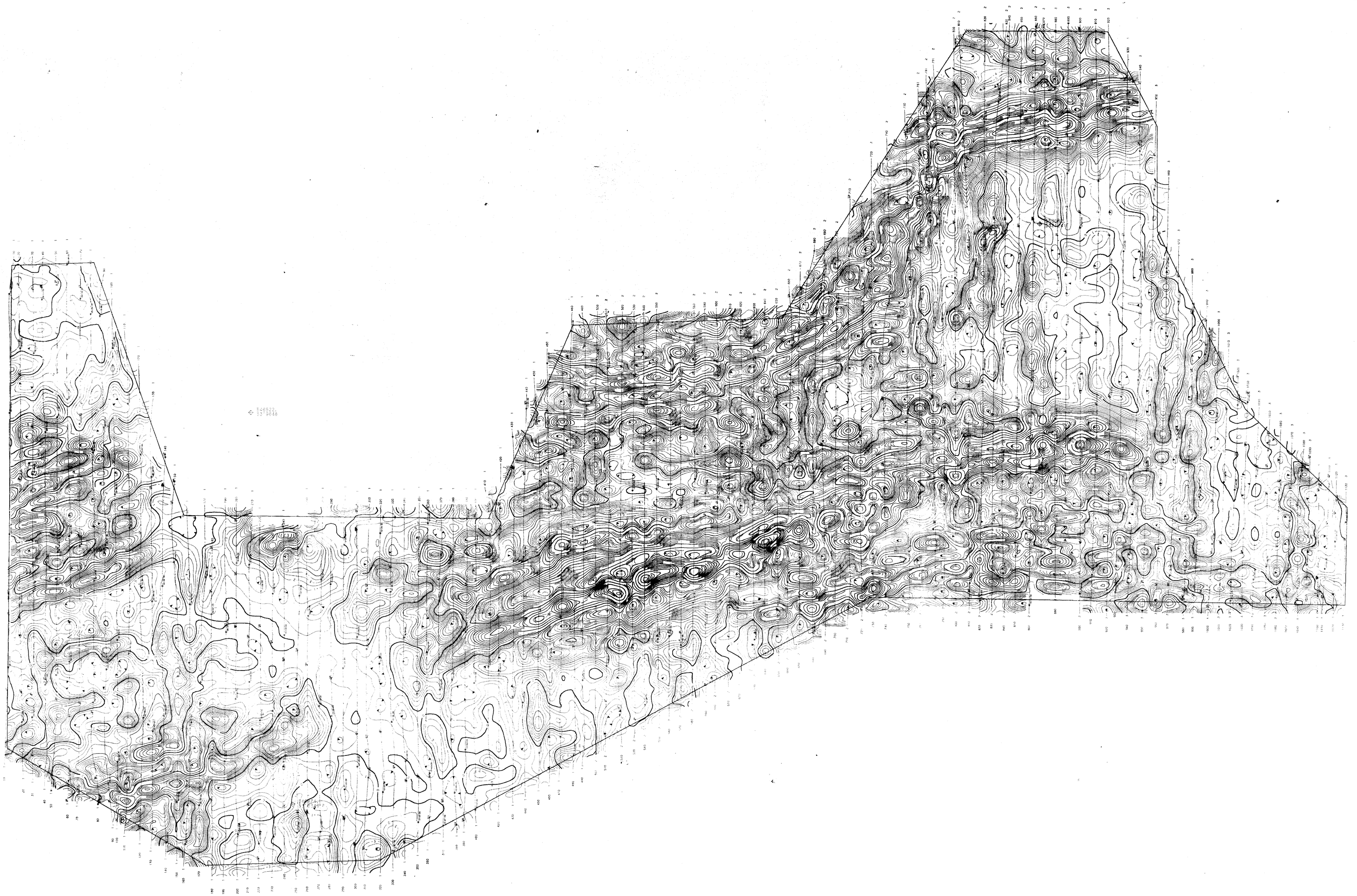
BEG PROPERTY

ONTARIO

AERODAT LIMITED	DATE: MARCH 1988
	JOB No: 4 J8762
	FILE No: 41P/16, 42A/01

Flight Path

Magnetics



Flight Path

Navigation and recovery using
Motorola Mini-Ranger (MRS VI) - FALCON
Aircraft navigation system

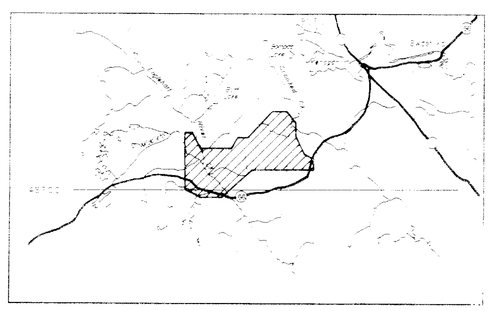
Average terrain clearance 80m
Line spacing = 100m

Vertical Gradient

Vertical magnetic gradient
calculated from the total
magnetic field intensity

Contours in nT/m

Geometrics high sensitivity magnetometer
Sensor elevation 48m



LES RESSOURCES HALEX INC.

CALCULATED VERTICAL MAGNETIC GRADIENT

BEG PROPERTY

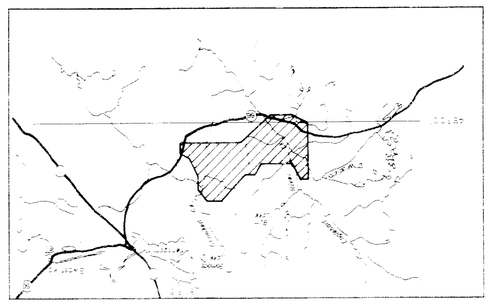
ONTARIO

AERODAT LIMITED

DATE: MARCH 1988

NTS NO: 41P/16, 42A/01

MAP NO: 5 JB762



LES RESSOURCES HALEX INC.

VLF-EM TOTAL FIELD CONTOURS

BEG PROPERTY

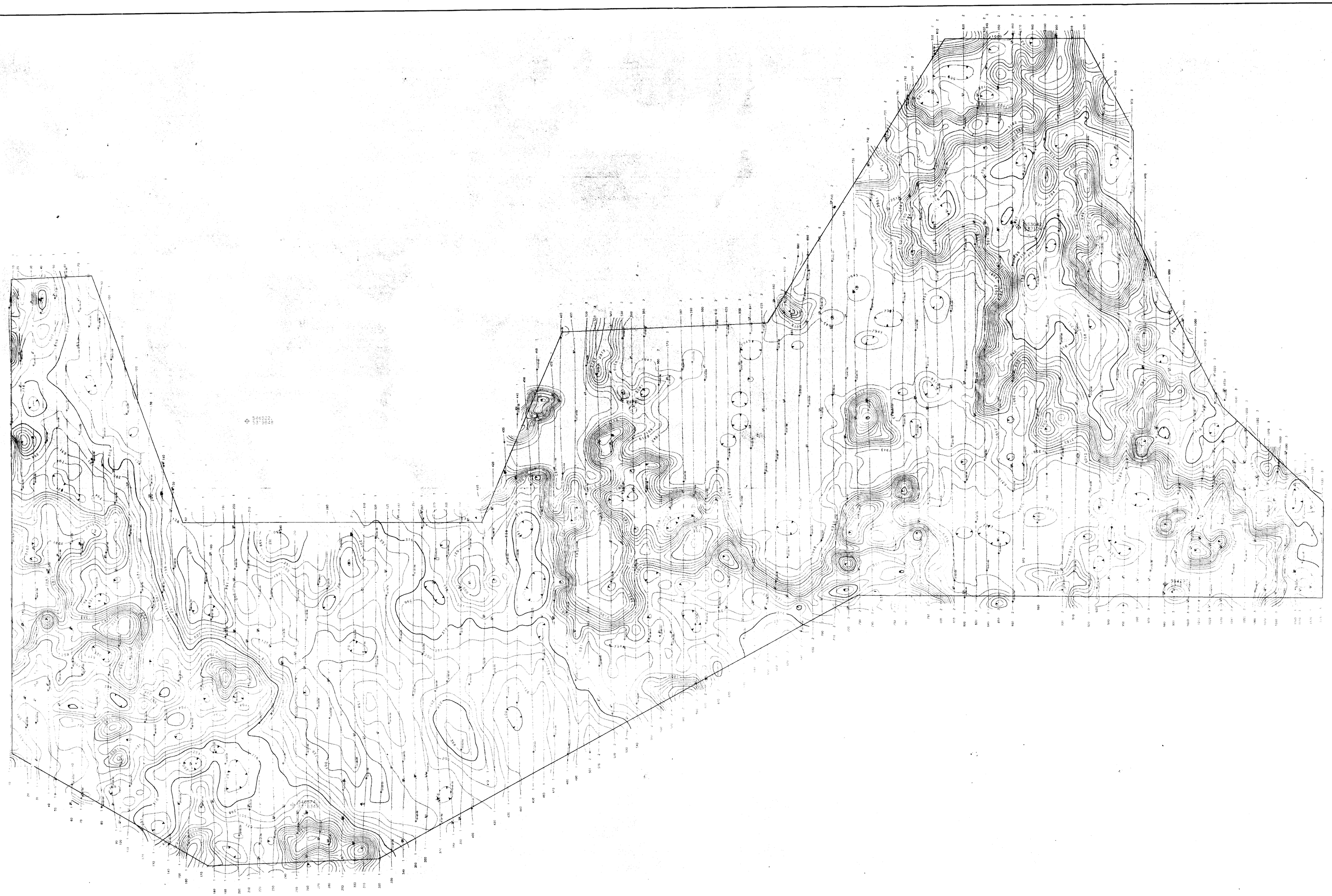
ONTARIO

AERODAT LIMITED	DATE: MARCH 1988
	DWG. NO: 41P/16, 42A/01
	JOB NO: 6 JB/62

Flight Path

VLF-EM

N



N

Flight Path

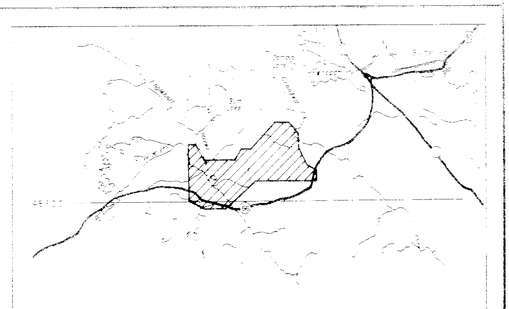
Navigation and recording of the Motorola Mini-Ranger (MRS) III - Falcon radar navigation system

Average terrain clearance 60m
Line spacing = 100m

Apparent Resistivity

Contouring in common logarithmic intervals of

Calculated from 4175 hz coplanar EM response assuming a 200 m conductive layer.
Sensor elevation 30m



LES RESSOURCES HALEX INC.

APPARENT RESISTIVITY CONTOURS

BEG PROPERTY
ONTARIO

AERODAT LIMITED	DATE: MARCH 1988
	FIGURE: 41P/16, 42A/01
	MAP No. 7 J8762

360