REPORT ON
COMBINED HELICOPTER-BORNE
MAGNETIC, ELECTROMAGNETIC,
AND VLF-EM SURVEY
MACASSA CREEK CLAIMS
ONTARIO

for

HARBINSON MINING AND OIL GROUP

by

AERODAT LIMITED

JUNE 1983

42C04SE0057 42C04SE0013 DAVID LAKES 010C

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(Scale: 1/15,840)

Map 1	Interpreted Conductive Units
Map 2	Airborne Electromagnetic Survey Profile Map (955 Hz. coaxial)
Map 3	Total Field Magnetic Map
Map 4	VLF-EM Total Field Contours

Data provided but not included in report:

1 - master map (2 colour) of coaxial and coplanar profiles with flight path

2 - anomaly list providing estimates of depth and conductivity thickness

3 - analogue records of data obtained in flight

1. INTRODUCTION

This report describes an airborne geophysical survey carried out on behalf of Harbinson Mining & Oil Group by Aerodat Limited. Equipment operated included a 3 frequency electromagnetic system, a VLF-EM system, and a magnetometer.

The survey was flown on February 10 to February 22, 1983 from an operations base at Wawa, Ontario. A total of 702 line miles were flown, at a nominal line spacing of 660 feet. Of the total flown, this report describes 129 line miles.

2. SURVEY AREA/CLAIM NUMBERS AND LOCATIONS

The mining claim numbers and locations covered by this survey are indicated on the map in the following pocket.

3. AIRCRAFT EQUIPMENT

3.1 Aircraft

The helicopter used for the survey was an Aerospatial Astar 350D owned and operated by North Star Helicopters. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey aircraft was flown at a nominal altitude at 60 meters.

3.2 Equipment

3.2.1 Electromagnetic System

The electromagnetic system was an Aerodat/ Geonics 3 frequency system. Two vertical coaxial coil pairs were operated at 955 and 4130 Hz and a horizontal coplanar coil pair at 4500 Hz. The transmitter-receiver separation was 7 meters. In-phase and quadrature signals were measured simultaneously for the 3 frequencies with a time-constant of 0.1 seconds. The electromagnetic bird was towed 30 meters below the helicopter.

3.2.2 VLF-EM System

The VLF-EM System was a Herz 2A. This instrument measures the total field and vertical quadrature component of two selected frequencies. The sensor was towed in a bird 15 meters below the helicopter.

The sensor aligned with the flight direction is designated as "LINE", and the sensor perpendicular to the line direction as "ORTHO". The "LINE" station used was NAA, Cutler Maine, 17.8 KHz or NLK, Jim Creek Washington, 24.8 KHz. The "ORTHO" station was NSS, Annapolis Maryland, 21.4 KHz. The NSS transmitter was operating on a very limited schedule and was not available during a large part of the survey.

3.2.3 Magnetometer

The magnetometer was a Geometrics G-803 proton precession type. The sensitivity of the instrument was 1 gamma at a 1.0 second sample rate. The sensor was towed in a bird 15 meters below the helicopter.

3.2.4 Magnetic Base Station

An IFG proton precession type magnetometer was operated at the base of operations to record diurnal variations of the earths 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.

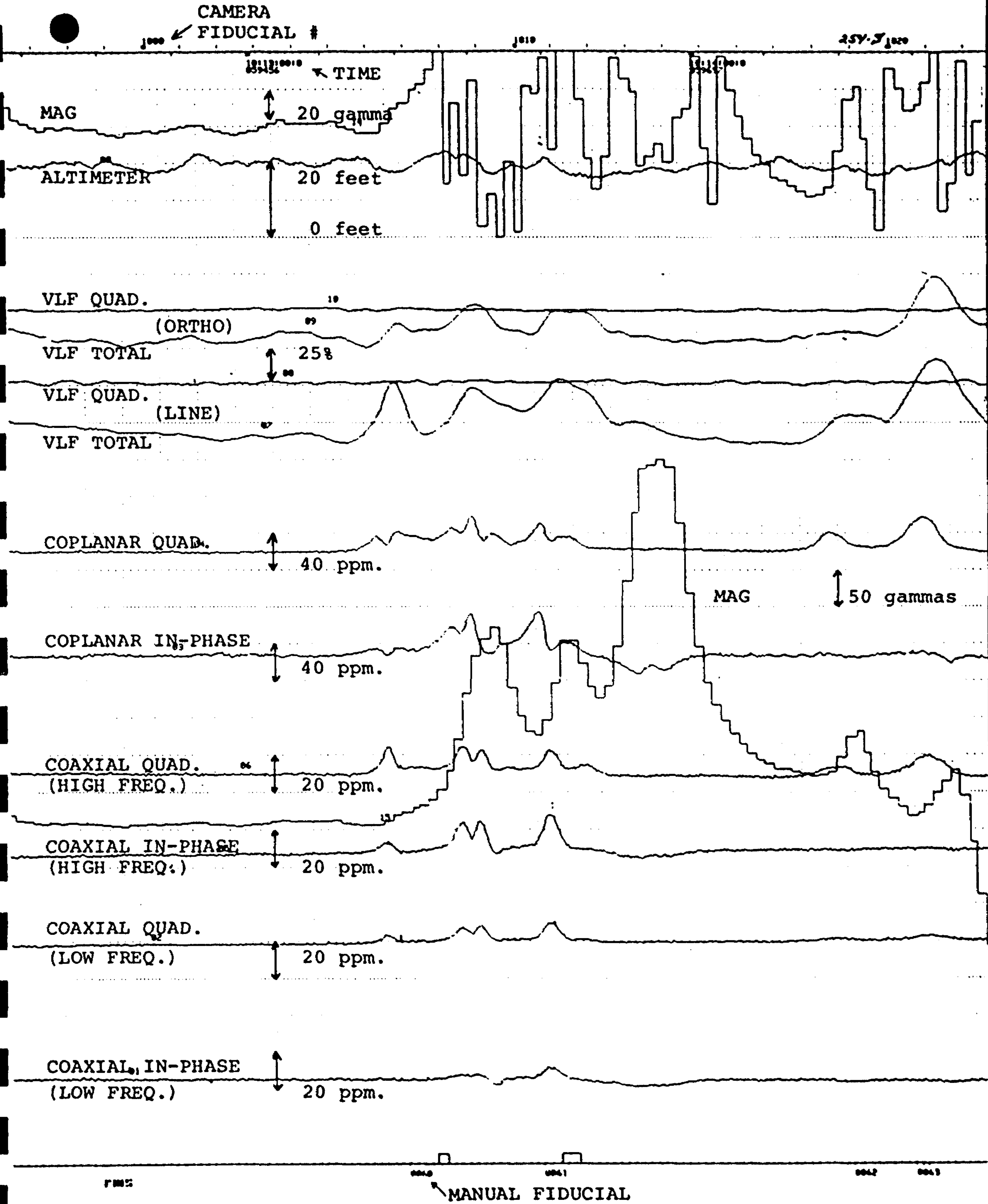
3.2.6 Tracking Camera

A Geocam tracking camera was used to record flight path on 35 mm film. The camera was operated in strip mode and the fiducial numbers for cross reference to the analog and digital data were imprinted on the margin of the film.

3.2.7 Analog Recorder

A RMS dot-matrix recorder was used to display the data during the survey. A sample record with channel identification and scales is presented on the following page.

ANALOG CHART



3.2.8 Digital Recorder

A Perle DAC/NAV data system recorded the survey data on cassette magnetic tape. Information recorded was as follows:

Equipment	Interval
EM	0.1 second
VLF-EM	0.5 second
magnetometer	0.5 second
altimeter	1.0 second
fiducial (time)	1.0 second
fiducial (manual)	0.2 second

4. DATA PRESENTATION

4.1 Base Map and Flight Path Recovery

The base map photomosaic at a scale of 1/15,840 was constructed from available aerial photography. The flight path was plotted manually on this base and digitized for use in the computer compilation of the maps. The flight path is presented with fiducials for cross reference to both the analog and digital data.

4.2 Electromagnetic Profile Maps

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

Local atmospheric 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 a geological phenomenon. To avoid this possibility, a computer algorithm searches out and rejects the major "sferic" events.

The signal to noise was further enhanced by the application of a low pass filter. The filter was applied digitally. It has zero phase shift which prevents any lag or peak displacement from occurring and it suppresses only variation with a wavelength less than about 0.25 seconds. This low effective time constant permits maximum profile shape resolution.

Following the filtering processes, a base level correction was made. The correction applied is a linear function of time that ensures that the corrected amplitude of the various inphase and quadrature components is zero when no conductive or permeable source is present. This filtered and levelled data was then presented in profile map form.

The in-phase and quadrature responses of the coaxial 955 Hz configuration are plotted with the flight path and presented on the photomosaic base.

The in-phase and quadrature responses of the coaxial 4500 Hz and the coplanar 4130 Hz configuration are plotted with flight path and are available as a two colour overlay.

4.3 Magnetic Contour Maps

The aeromagnetic data was corrected for diurnal variations by subtraction of the digitally recorded base station magnetic profile. No correction for regional variation is applied.

The corrected profile data was interpolated onto a regular grid at a 2.5 mm interval using a cubic spline technique. The grid provided the basis for threading the presented contours at a 10 gamma interval.

4.4 VLF-EM Contour and Profile Maps

The VLF-EM "LINE" signal, was compiled in map form. The mean response level of the total field signal was removed and the data was gridded and contoured at an interval of 2%. When the "ORTHO" signal was available it was compiled in a similar fashion.

4.5 Electromagnetic Conductor Symbolization

The electromagnetic profile maps were used to identify those anomalies with characteristics typical of bedrock conductors. The in-phase and quadrature response amplitudes at 4130 Hz were digitally applied to a phasor diagram for the vertical half-plane model and estimates of conductance (conductivity thickness) were made. The conductance levels were divided into categories as indicated in the map legend; the higher the number, the higher the estimated conductivity thickness product.

As discussed in Appendix I the conductance should be used as a relative rather than absolute guide to conductor quality. A conductance value of less than 2 mhos is typical for conductive overburden material and electrolytic conductors in faults and shears. Values greater than 4 mhos generally indicate some electronic conduction by certain metallic sulphides and/or graphite. Gold, although highly conductive, is not expected to occur in sufficient concentration to directly produce an electromagnetic anomaly; however, accessory mineralization such as pyrite or graphite can produce a measurable response.

With the aid of the profile maps, responses of similar characteristics may be followed from line to line and conductor axes identified.

The distinction between conductive bedrock and overburden anomalies is not always clear and some of the symbolized anomalies may not be of bedrock origin. It is also possible that a response may have been mistakenly attributed to overburden and therefore not included in the symbolization process. For this reason, as geological and other geophysical information becomes available, reassessment of the significance of the various conductors is recommended.

4.6 INTERPRETATION MAPS

The conductive trends are shown and discriminated for descriptive purposes.

These conductors are described below:

1 A weak conductor with associated magnetic minerals, mapped as volcanics.

2 A weak conductor in a magnetic trough near sediment-volcanic contact.

3 A weak conductor near a magnetic high, probably iron formation

4 A weak conductor near sediment-volcanic contact

5 A moderate conductor associated with an isolated magnetic feature in volcanics.

6 Lineal conductor at contact, broken up by diabase dyke.

7,8 Weak to moderate variable conductor trend along sediment-volcanic contact.

9 Isolated, sharp conductor on north flank of magnetic feature in volcanics.

10 Moderate to fair conductor in sediments

11 Weak formational conductor in sediments, conductivity improves to west

12 Weak, intermittent conductors in magnetic low, mapped as Rhyolite.

13 Isolated, weak conductor associated with isolated magnetic high.

14 Continuation on trend of 11

15 Moderate, multiple conductor on broad magnetic high.

16 Weak isolated conductor in sediments

Respectfully submitted,

June 22, 1983

Fenton Scott, P. Eng.

APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat 3 frequency system utilizes 2 different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at 2 widely separated frequencies and the 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 conductivity and its size and shape; the "geometrical" property of the response is largely a function of the conductors 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 in-phase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for a 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 ppm 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 I and the conductance and in-phase 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, 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 the depth estimate but both should be considered a relative rather than absolute guide to the anomalies 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 sphalerite, cinnabar and stibnite are good conductors; however, they may occur in a disseminated manner that inhibits electrical conduction through the rock mass. In this case the apparent conductance can seriously under rate 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 concentration in association with minor conductive sulphides, and the electromagnetic response only relate to the minor associate 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 decreases 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 coil 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 infered 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 follow 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 measurable 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.

REPORT ON
COMBINED HELICOPTER-BORNE
MAGNETIC, ELECTROMAGNETIC,
AND VLF-EM SURVEY
MACASSA CREEK CLAIMS
ONTARIO

for

HARBINSON MINING AND OIL GROUP

by

AERODAT LIMITED

JUNE 1983

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LIST OF MAPS

(Scale: 1/15,840)

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Map 3	Total Field Magnetic Map
Map 4	VLF-EM Total Field Contours

Data provided but not included in report:

1 - master map (2 colour) of coaxial and coplanar profiles with flight path

2 - anomaly list providing estimates of depth and conductivity thickness

3 - analogue records of data obtained in flight

1. INTRODUCTION

This report describes an airborne geophysical survey carried out on behalf of Harbinson Mining & Oil Group by Aerodat Limited. Equipment operated included a 3 frequency electromagnetic system, a VLF-EM system, and a magnetometer.

The survey was flown on February 10 to February 22, 1983 from an operations base at Wawa, Ontario. A total of 702 line miles were flown, at a nominal line spacing of 660 feet. Of the total flown, this report describes 129 line miles.

2. SURVEY AREA/CLAIM NUMBERS AND LOCATIONS

The mining claim numbers and locations covered by this survey are indicated on the map in the following pocket.

42C04SE0057 42C04SE0013 DAVID LAKES

900

1984 02 16

Our File: 2.5853

Mrs. M.V. St. Jules
Mining Recorder
Ministry of Natuall Resources
875 Queen Street East
P.O. Box 669
Sault Ste. Marie, Ontario
P6A 5N2

Dear Madam:

RE: Airborne Geophysical (Electromagnetic, Magnetometer and V.L.F.) Survey on Mining Claims SSM 637848 et al in the area of David Lakes

---

The Airborne Geophysical (Electromagnetic, Magnetometer and V.L.F.) Survey assessment work credits as listed with my Notice of Intent dated January 16, 1984 have been approved as of the above date.

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

Yours very truly,

J.R. Morton
Acting Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1380

D. Kinvig:sc

cc: Wasabi Resources Ltd
916 - 111 Richmond St W
Toronto, Ont
M5H 2G4

cc: 547475 Ontario Ltd
1712 - 130 Adelaide St W
Toronto, Ont
M5H 3P5

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

cc: Resident Geologist
Sault Ste. Marie, Ont

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File
2.5853

Date	Mining Recorder's Report of Work No.
1984 01 16	

Recorded Holder	547474 ONTARIO LIMITED
Township or Area	DAVID LAKES

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	
Electromagnetic 21 days	SSM 609252-53
Magnetometer 21 days	609257 to 86 incl
Radiometric VLF 21 days	637797 to 847 incl
Induced polarization ____ days	637972-73
Other ____ days	637975-76
Section 77 (19) See "Mining Claims Assessed" column	664265
Geological ____ days	664302 to 06 incl
Geochemical ____ days	664326
Man days ☐ Airborne ☐	664427
Special provision ☐ Ground ☐	664501 to 07 incl
☐ Credits have been reduced because of partial coverage of claims.	664757
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	664787 to 807 incl

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

SSM 637971

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77 (19) — 60.

828 (83/6)

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File
2.5853

Date	Mining Recorder's Report of Work No.
1984 01 16	

Recorded Holder
WASABI
Township or Area
DAVID LAKES

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	SSM 637848 to 970 inclusive 637974
Electromagnetic 21 days	
Magnetometer 21 days	
Radiometric VLF 21 days	
Induced polarization ___ days	
Other ___ 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; Geological — 40; Geochemical — 40; Section 77(19)—60:

828 (83/6)

Ministry of
Natural
Resources
Ontario

Feb 6, 1984

Your file:
Our file: 2.5853

1984 01 16

Mrs. M.V. St. Jules
Mining Recorder
Ministry of Natural Resources
875 Queen Street East
P.O. Box 669
Sault Ste. Marie, Ontario
P6A 5N2

Dear Madam:

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

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

Yours very truly,

E.F. Anderson
Director
Land Management Branch

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

D. Kinvig:sc

Encls:

cc: Wasabi Resources Ltd
Toronto, Ontario

cc: 547475 Ontario Limited
Suite 1712
130 Adelaide Street West
Toronto, Ontario

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

845

FILE

Ministry of Natural Resources
Ontario

Notice of Intent for Technical Reports

1984 01 16

2.5853

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

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

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

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

Ministry of Natural Resources Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

The Mining Act

2.5853

Nov. 12

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 EM, Magnetic, VLF

Township or Area: David Lakes Area

Claim Holder(s): 1) Wasabi Resources Ltd. 2) 547475 Ontario Ltd.

Prospector's Licence No.: 1) T986 2) T1422

Address: 1) 916 - 111 Richmond St. W. Toronto, Ont. M5H 2G4 2) 1712 - 130 Adelaide St. W. Toronto, Ontario M5H 3P5

Survey Company: Aerodat Limited

Date of Survey (from & to): 10 02 83 | 22 02 83 (Day | Mo. | Yr. | Day | Mo. | Yr.)

Total Miles of line Cut: 129

Name and Address of Author (of Geo-Technical report): Fenton Scott, 17 Malabar Place, Don Mills, Ontario M3B 1A4

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
MINING LANDS SECTION

SAULT STE. MARIE MINING DIV.
RECEIVED
SEP 13 1983
A.M. 7,8,9,10,11,12,1,2,3,4,5,6 P.M.

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	21
	Magnetometer	21
	VLF ~~Radiometric~~	21

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: Sept. 9/83

Recorded Holder or Agent (Signature): [signature]

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
Wasabi			SSM	637870	
SSM	637848			71	
	49			72	
	50			73	
	51			74	
	52			75	
	53			76	
	54			77	
	55			78	
	56			79	
	57			80	
	58			81	
	59			82	
	60			83	
	61			84	
	62			85	
	63			86	
	64			87	
	65			88	
	66			89	
	67			90	
	68			91	
	69			92	

See Revised work statement

Total number of mining claims covered by this report of work: 249

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
15,687	Sept. 13/83	M. L. St Jules
	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: Charles E. Page, 1454 Westbury Ave. Burlington, Ontario

Date Certified: Sept. 9/83

Certified by (Signature): [signature]

... SSM 609252

Wasabi Resources Ltd.

SSM

637893
637894
95
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SSM 637924
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SSM637954
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637974

547474 Ontario Ltd.

SSM 664787	664501	609281	SSM 637813
88	02	82	14
89	03	83	15
90	04	84	16
91	05	85	17
92	06	86	18
93	07	609257	19
94	664326	58	20
95	664427	59	21
96	664757	60	22
97	664265	61	23
98	609263	62	24
99	64	609252	25
800	65	53	26
01	66	637797	
02	67	98	
03	68	99	
04	69	800	
05	70	01	
06	71	02	
07	72	03	
664302	73	04	
03	74	05	
04	75	06	
05	76	07	
06	77	08	
	78	09	
	79	10	
	80	11	
		12	

RECEIVED
[illegible]
MINING LANDS SECTION

SAULT STE. MARIE MINING DIV.
RECEIVED
SEP 13 1983
A.M. P.M.
7,8,9,10,11,12,1,2,3,4,5,6

SAULT STE. MARIE MINING DIV.
RECEIVED
SEP 6 1983
A.M. P.M.
7,8,9,10,11,12,1,2,3,4,5,6

547474 Ontario Ltd.

SSM637827

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637971

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76

Ministry of Natural Resources
Ontario

Geotechnical Report Approval

File 2.5853

Nov. 9/83

Mining Lands Comments

☑ To: Geophysics   Mr. Barlow.

Comments

☐ Approved   ☐ Wish to see again with corrections   Date Dec 5/83   Signature

☐ To: Geology - Expenditures

Comments

☐ Approved   ☐ Wish to see again with corrections   Date   Signature

☐ To: Geochemistry

Comments

LD

☐ Approved   ☐ Wish to see again with corrections   Date   Signature

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

1593 (81/10)

1983 10 07 2.5853

Mrs. M.V. St. Jules
Mining Recorder
Ministry of Natural Resources
875 Queen Street East
P.O. Box 669
Sault Ste. Marie, Ontario
P6A 5N2

Dear Madam:

We have received reports and maps for an Airborne Geophysical (Electromagnetic and Magnetometer) survey submitted on mining claims SSM 637848 et al in the Area of David Lakes.

This material will be examined and assessed and a statement of assessment work credits will be issued.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-1380

A. Barr:mc

cc: Wasabi Resources Ltd
Suite 916
111 Richmond Street West
Toronto, Ontario
M5H 2G4

cc: 547475 Ontario Ltd
Suite 1712
130 Adelaide Street West
Toronto, Ontario
M5H 3P5

TELEPHONE
(416) [illegible]-3182

SUITE 916
111 RICHMOND ST. WEST
TORONTO, ONTARIO
M5H 2G4

CABLE: PROMANS
TELEX: 06-219521

September 30, 1983

Mr. J. Smith,
Supervisor,
Mining Lands,
Ministry of Natural Resources,
Room 6451, Whitney Block,
Queens Park, Toronto
M7A 1W3

Dear Sir:

Re: <u>Technical Data Statement</u>

Please find enclosed a Technical Data Statement covering an Airborne geophysical survey carried out on claims held by Wasabi Resources Ltd. A work report has been filed with the Mining Recorder in Sault Ste. Marie on September 9, 1983.

Yours very truly,

WASABI RESOURCES LTD.

C.E. Page
V.P. Explorations

CEP:pw
Encl.

File________

Ontario

Ministry of Natural Resources

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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

Type of Survey(s) Airborne Magnetic, EM, VLF
Township or Area David Lakes
Claim Holder(s) Wasabi Resources Ltd.
547474 Ontario Inc.
Survey Company Aerodat Limited
Author of Report Fenton Scott
Address of Author 17 Malabar Place, Don Mills, Ontario
Covering Dates of Survey Feb. 10/83 to Feb. 22/83 (linecutting to office)
Total Miles of Line Cut 129

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 21 Electromagnetic 21 ~~Radiometric~~ VLF 21
(enter days per claim)

DATE: Sept 30/83 SIGNATURE: [signature]
Author of Report or Agent

Res. Geol. ________ Qualifications 2.4871

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

Wasabi

(prefix)	(number)
SSM	637848
	49
	50
	51
	52
	53
	54
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	56
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	58
	59
	60
	61
	62
	63
	64
	65
	66
	67
	68

TOTAL CLAIMS 249

If space insufficient, attach list

)

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, VLF, Electromagnetic

Instrument(s) Geometrics G-803 Proton Precission Mag., Herz 2A VLF, Aerodat Geonics
(specify for each type of survey)

Accuracy 1 gamma, ± 2%, 1 ppm
(specify for each type of survey)

Aircraft used Aerospatial Astar 350D

Sensor altitude 45 meters (MAG), 45 meters (VLF), 30 meters (EM).

Navigation and flight path recovery method Flight path plotted manually on base phomosaic map from a Geocam tracking camera.

Aircraft altitude 60 meters Line Spacing 660 feet

Miles flown over total area 702 Over claims only 129

Wasabi Resources Ltd.

SSM	637869	637870	637893	637924	637954
		71	637894	25	55
		72	95	26	56
		73	96	27	57
		74	97	28	58
		75	98	29	59
		76	99	30	60
		77	900	31	61
		78	01	32	62
		79	02	33	63
		80	03	34	64
		81	04	35	65
		82	05	36	66
		83	06	37	67
		84	07	38	68
		85	08	39	69
		86	09	40	70
		87	10	41	637974
		88	11	42	
		89	12	43	
		90	13	44	
		91	14	45	
		92	15	46	
			16	47	
			17	48	
			18	49	
			19	50	
			20	51	
			21	52	
			22	53	
			23		

SSM

547474 Ontario Ltd.

664787	664501	609281	637813	637827
88	02	82	14	28
89	03	83	15	29
90	04	84	16	30
91	05	85	17	31
92	06	86	18	32
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99	64	609252	25	39
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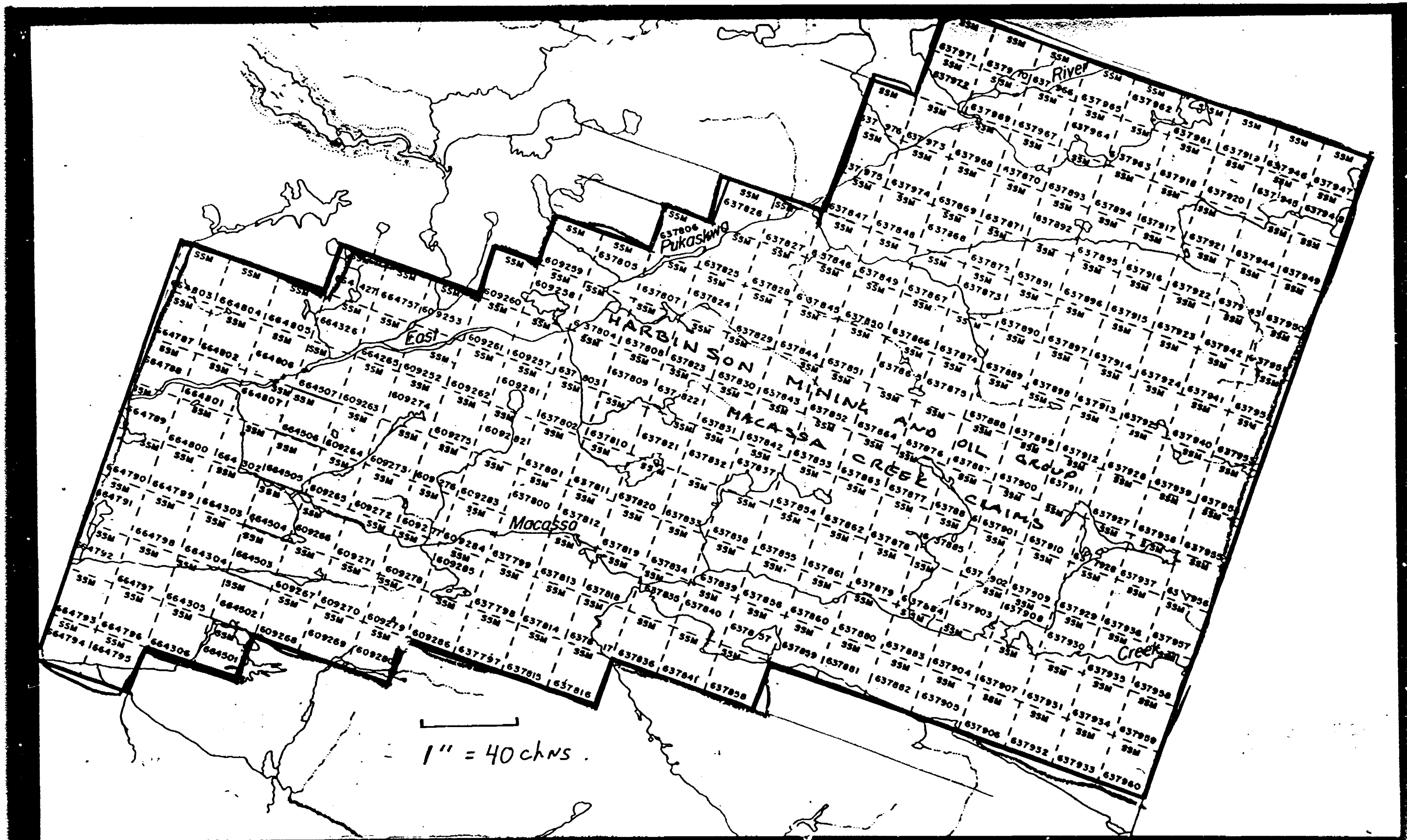
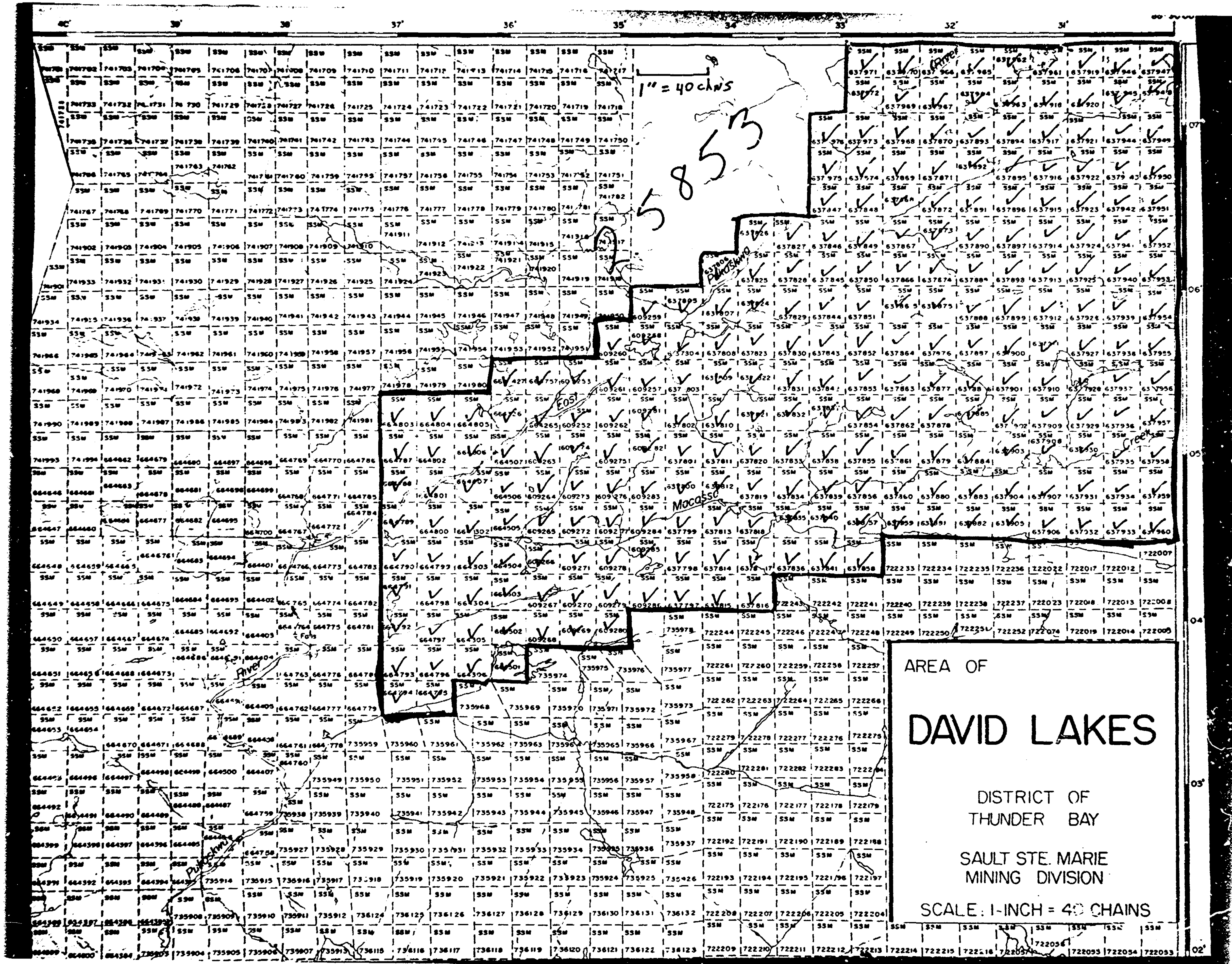
02	67	98		42
03	68	99		43
04	69	800		44
05	70	01		45
06	71	02		46
07	72	03		47
664302	73	04		637971
03	74	05		72
04	75	06		73
05	76	07		75
06	77	08		76
	78	09		
	79	10		
	80	11		
		12		

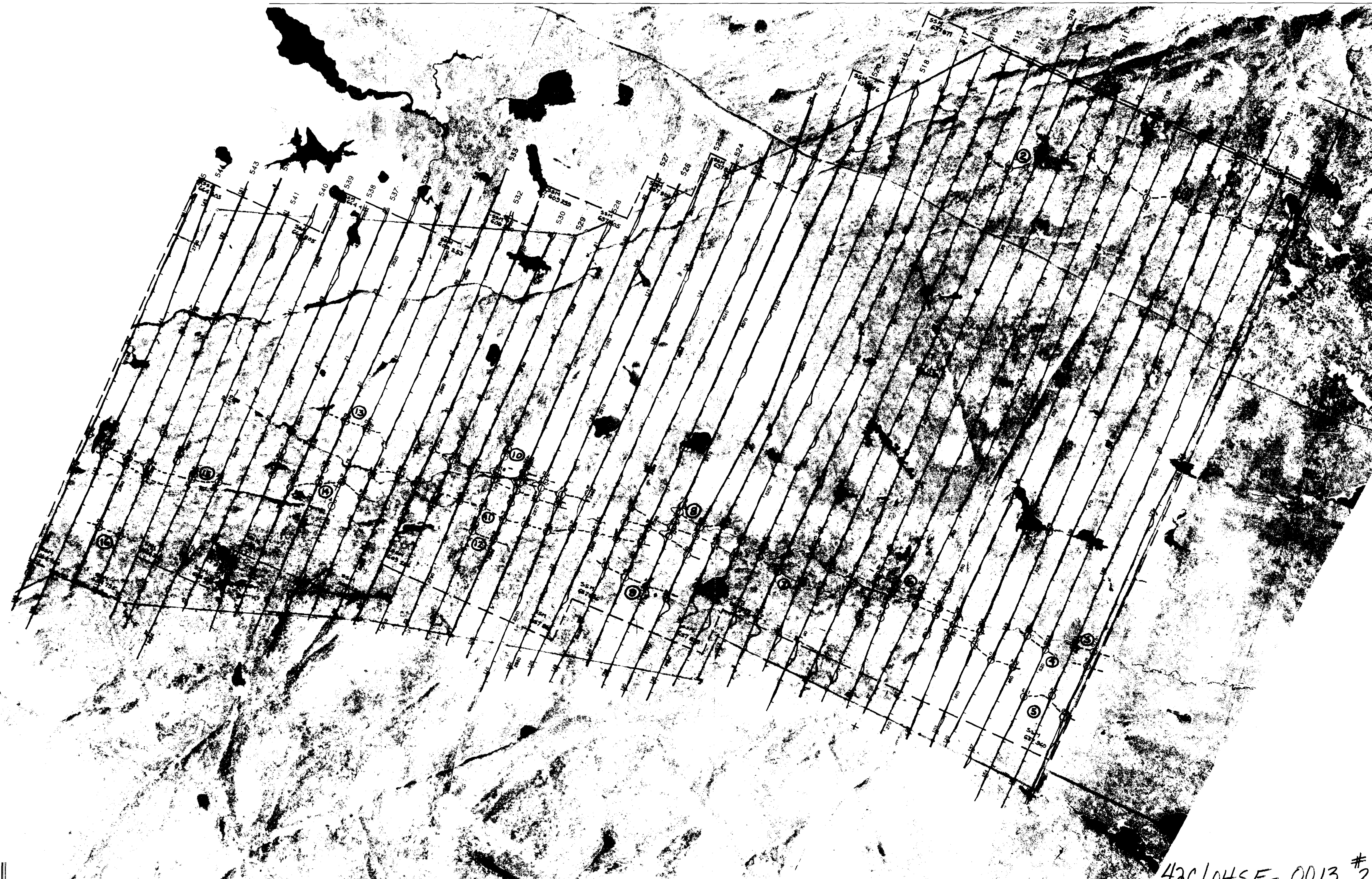

HARBINSON MINING AND OIL GROUP
MACASSA CREEK CLAIMS
Pukaskwa
River
East
Macassa
Creek
1" = 40 chns.



AREA OF
DAVID LAKES
DISTRICT OF
THUNDER BAY
SAULT STE. MARIE
MINING DIVISION
SCALE: 1-INCH = 40 CHAINS
1" = 40 chns
5853
East
Macassa
River
Creek
Falls

FOR ADDITIONAL INFORMATION SEE MAPS:

42C/04SE-0013 #1-4



PROSPECTING GEOPHYSICS LTD

ELECTROMAGNETIC INTERPRETATION

HARBINSON MINING AND OIL GROUP
WAWA AREA
ONTARIO

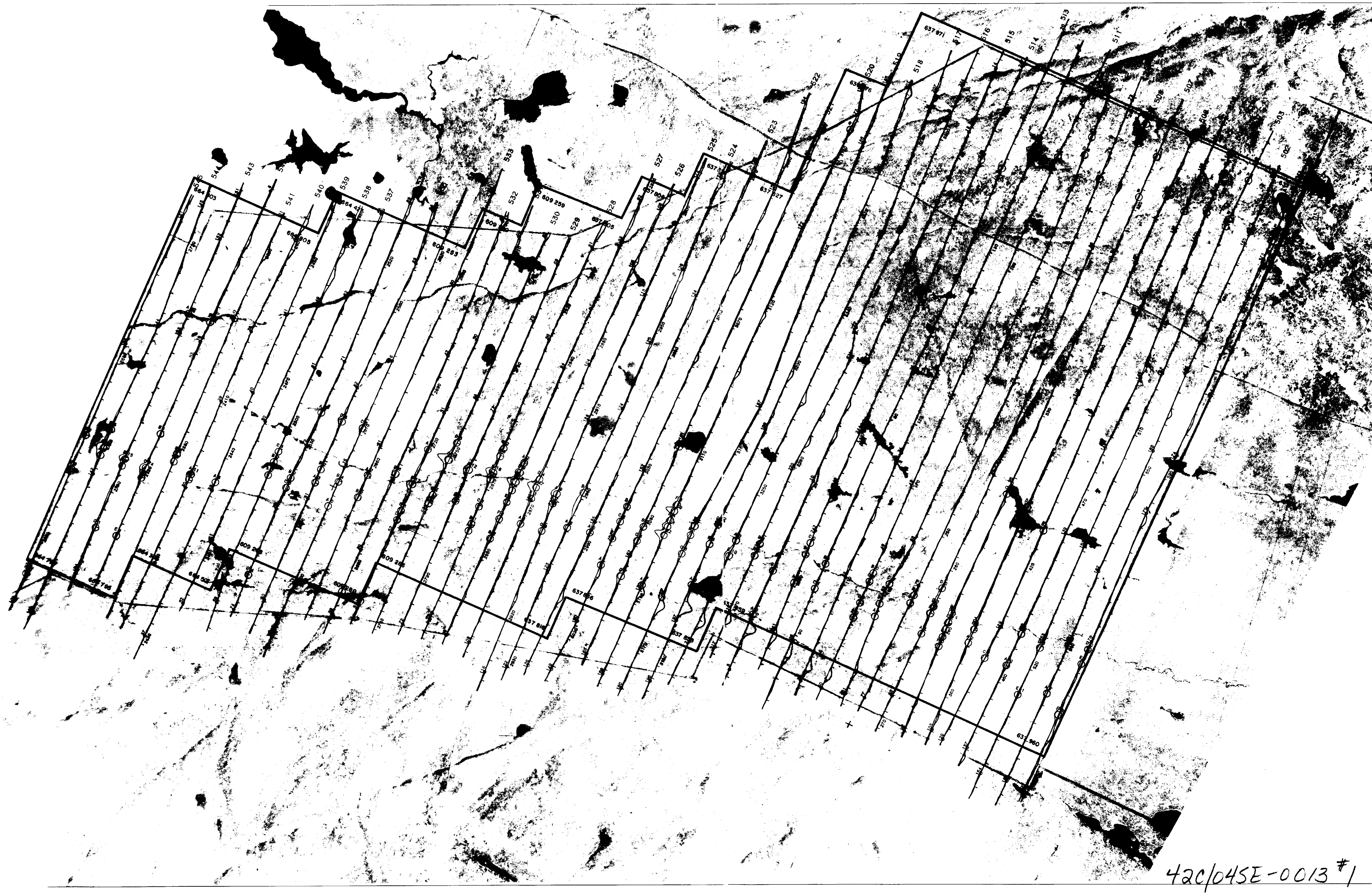
▼ AERODAT LIMITED

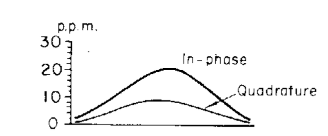
DATE February, March 1983

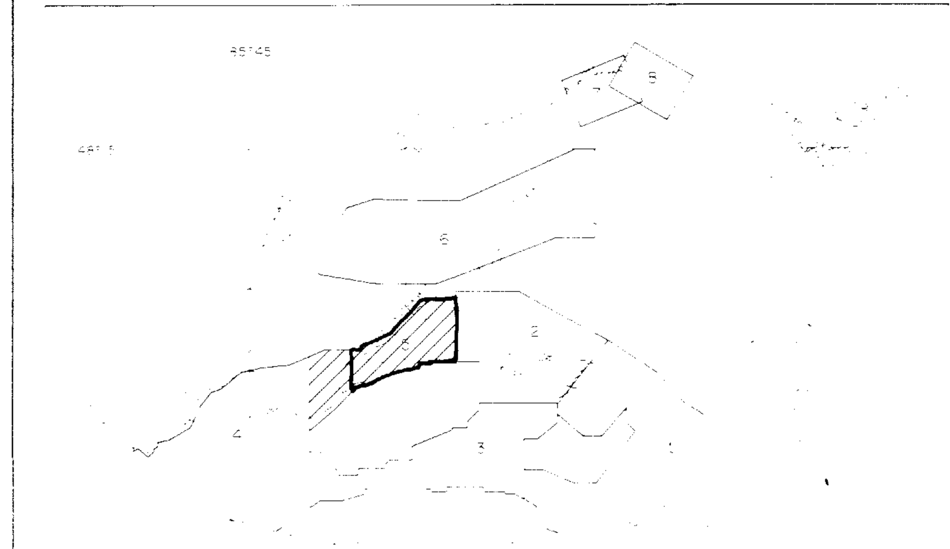
41N, 42C

42C/04SE-0013 #2

200







PROSPECTING GEOPHYSICS LTD.

AIRBORNE ELECTROMAGNETIC SURVEY

PROFILES

HARBINSON MINING AND OIL GROUP

MACASSA CREEK CLAIMS

ONTARIO

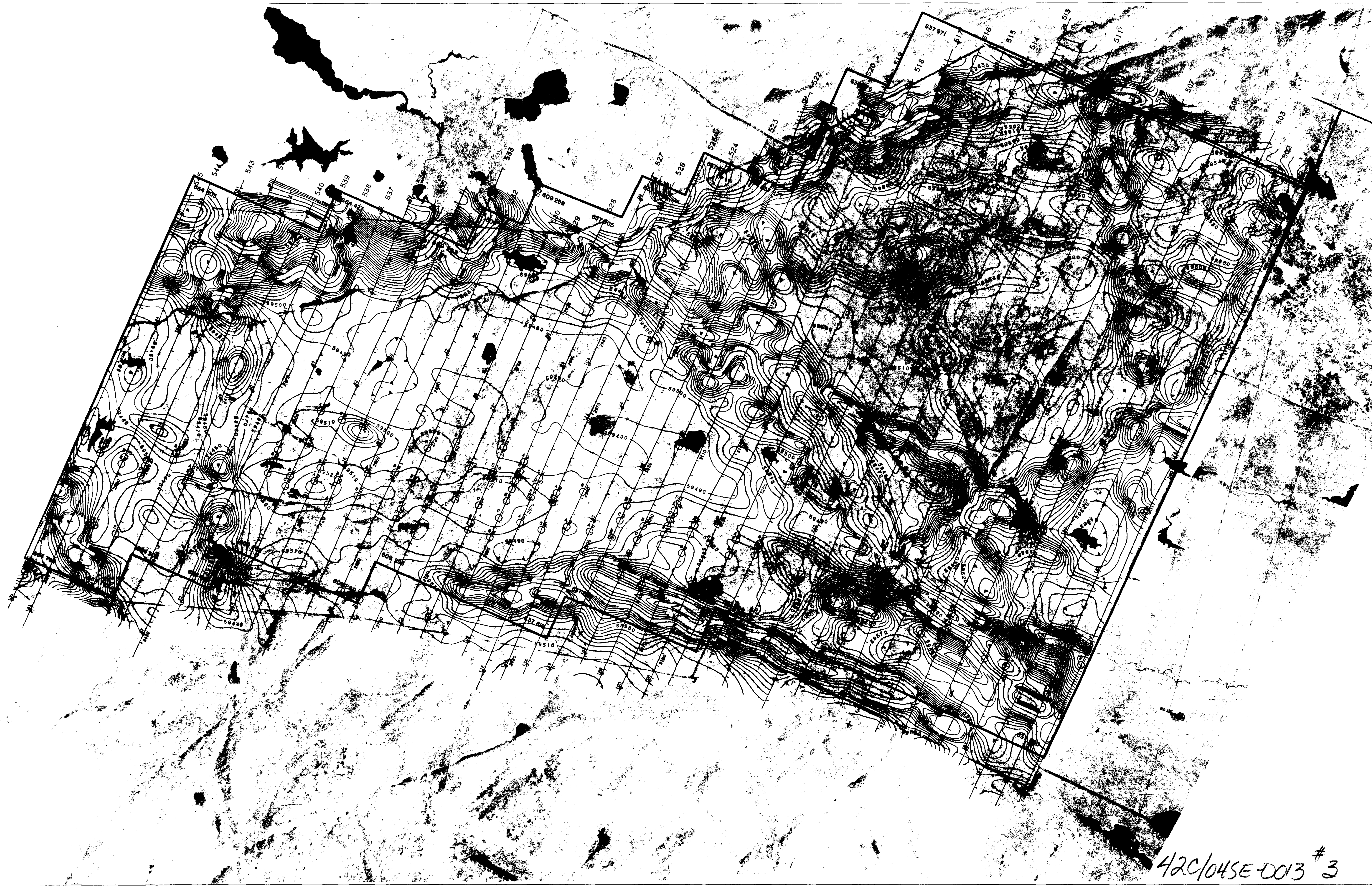
SCALE 1:15,840

▼ AERODAT LIMITED

DATE: February, March 1983

N.T.S. No.: 41N, 42C

MAP No.: 2



PROSPECTING GEOPHYSICS LTD.

TOTAL FIELD MAGNETIC MAP

HARBINSON MINING AND OIL GROUP

MACASSA CREEK CLAIMS

ONTARIO

February, March 1983

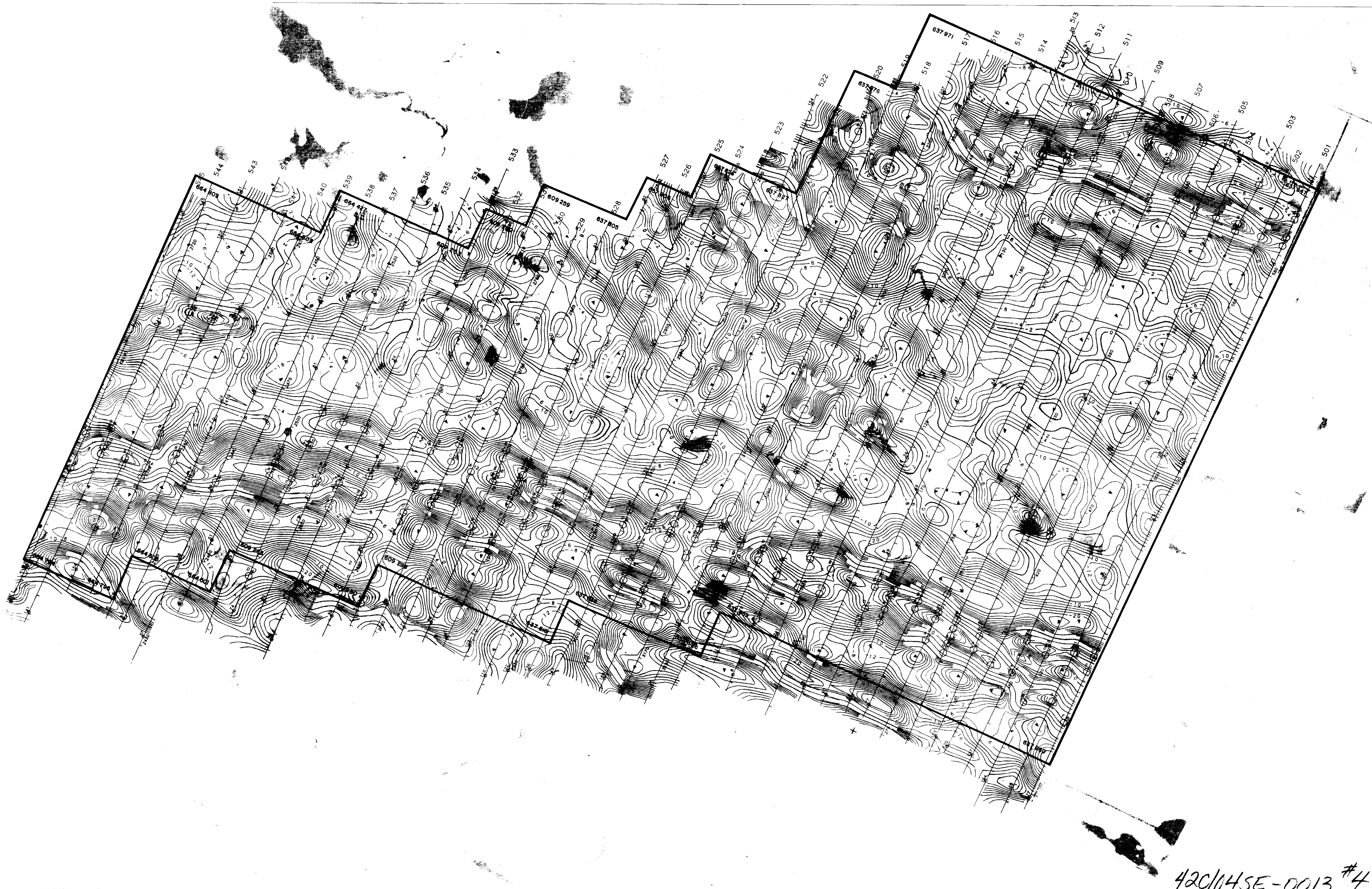
41N, 42C

3

▼AERODAT LIMITED

42C/04SE-D013 #3

220



LEGEND
100%
50%
10%

PROSPECTING GEOPHYSICS LTD

VLF-EM
"LINE" NAA (MAINE) 17.8 KHz

HARBINSON MINING AND OIL GROUP

MACASSA CREEK CLAIMS

ONTARIO

▼ AERODAT LIMITED

February, March 1983
41N, 42C
4

420/04SE-0013 #4

230