42B09SW0024 2.909 NOVA

010

RECEIVED

JUN 23 1972

PROJECTS SECTION

AIRBORNE ELECTROMAGNETIC SURVEY

NOVA TOWNSHIP AREA

ONTARIO

AMAX POTASH LIMITED

7 King Street East, Suite 1302,

Toronto, Ontario

Jeremy Roth

I. INTRODUCTION

An airborne electromagnetic survey was conducted for Amax Exploration, Inc., by Geoterrex Limited of Ottawa, Ontario in March, 1971. The major part of the survey covered the western half of Nova Township; small segments in Belford, Oates and Oswald Townships were also included (See Figure 1). The purpose of the AEM survey was to detect electromagnetic conductors in the Precambrian bedrock.

A total of 463.1 line miles were flown in the Nova Area covering approximately 58 square miles. Lines were flown approximately north 50° west with a spacing of 1/8th mile at a mean altitude of 175 feet. The claims covered in the course of the survey, for which assessment credit is requested, are listed in Appendix A. They comprise Nova Group 1, Nova Group 3 and Nova-Oates Group 2. Coverage over these claim groups was -

33.2 mi. (Nova Gp 1, Nova Gp 3)
13.1 mi. Nova-Oates Gp 2.

II. PERSONNEL

The following personnel were involved in this survey:

A. Field Operation:

Pilot	Mr. J. Whiteduck, Maniwacki, Ontario
Navigator	Mr. R. Bolivar, Ottawa, Ontario
Operators	Mr. R. Stone, Ottawa, Ontario Mr. R. Youngberg, Ottawa, Ontario
Data Compilers	Mr. G. McKnight, Ottawa, Ontario Mr. W. Couwenberghs, Ottawa, Ontario Mr. R. Stone, Ottawa, Ontario.
Geophysicist	Mr. B. Anderson, Ottawa, Ontario
Aircraft Engineer	Mr. W. McFadden, New Brunswick

B. Office Compilation:

Data	Mr. D. Sarazin, Ottawa, Ontario
Drafting	Mr. M. Dostaler, Ottawa, Ontario
Geophysics	Mrs. R. Dowse, Ottawa, Ontario Mr. D.M. Wagg, Manotick, Ontario

C. Field Supervision:

Geophysicist	Mr. J. Roth, Amax Exploration, Inc., 7 King Street East, Toronto, Ontario.
Geologist	B.I. MacDonald, Amax Exploration, Inc.

III. EQUIPMENT

The survey was conducted with an Otter Aircraft CF-AYR, owned and operated by Geoterrex and equipped with an in-phase out-of-phase electromagnetic system operating at 320 Hz, as well as a Geometrics G-803 high performance proton resonance magnetometer, and other auxiliary survey equipment. A detailed description of this system and the procedures employed is included in Appendix B to this report.

IV. DATA PRESENTATION

The AEM anomalies detected along with the flight lines, are plotted in Figs. 2 & 3 on a topographic base at a scale of 1" = 1320'.

The peak values of the in-phase and out-of-phase components of the anomalies detected are plotted alongside each anomaly. Also indicated are the values in gammas of any associated magnetic anomaly (either direct correlation or flanking) and the aircraft height at the time the anomaly was recorded. The boundaries and numbers of the claims for which assessment credit is requested are also shown in Figures 2 and 3.

V. GEOLOGY

The most recent geological work in this area is contained in the Geologic Report No. 78 of the Ontario Department of Mines by G. Bennett, 1969. It will be noted that within the area covered by the survey there are relatively few outcrops. In the central portion the outcrops are largely felsic volcanics, rather highly metamorphosed. This unit is bordered on the west by granitoid rocks of very high metamorphic level (Kapuskasing High structure), with extensive faulting indicated between these two units. To the east more intermediate to mafic volcanics occur with several granitic intrusive domes outlined.

VI. DISCUSSION OF AEM RESULTS

Nova Group 1

Several strong anomalous zones were detected falling partly or entirely within Nova Group 1 (Fig. 2). AEM anomaly zone #6, which flanks the Ivanhoe River, has a weak magnetic coincidence. Graphite, possibly accompanied by pyrrhotite, is inferred here. AEM anomaly zone #7 has direct magnetic coincidence of moderate amplitude, suggestive of sulphides, predominantly pyrrhotite. AEM anomaly #8 has a flanking magnetic anomaly of 200-400 gammas. This conductor could be caused by massive pyrite in an iron-formation type environment. AEM anomalous zone #9 has direct magnetic coincidence. Massive sulphides, predominantly pyrrhotite, is known here from drilling by Keevil Mines in 1964. AEM anomaly zone #4 also has direct magnetic coincidence. The two limbs of the anomaly may be the same horizon now folded into an anticline. Massive sulphides, predominantly pyrrhotite, are inferred here and are reported in previous drilling of the western limb (Keevil). All of the above anomalies are rated as definite bedrock conductors, and because of their magnetic correlation and short strike length, are rated as strongly deserving of further exploration.

Several other weaker anomalies were detected. Most of these cannot be confidently interpreted to reflect real bedrock conductors and consequently are not recommended for further work unless substantial encouragement is obtained in exploration of the high priority targets.

Nova Group 3 (1970)

One AEM anomalous zone of good strength and character was detected over Nova Group 3 (Fig. 2). This anomaly has a direct magnetic coincidence. Massive sulphides, predominantly pyrrhotite, are inferred here. A hole by McIntyre Mines may have tested this conductor.

Nova-Oates Group 2

Several AEM anomalies of moderate to strong intensity were detected lying partly or entirely within Nova-Oates Gp. 2 (Fig. 3). The strongest of these, AEM anomaly zone #12, is actually a double conductor with magnetic coincidence. Outcropping barren massive sulphides are exposed in the vicinity of the anomaly. AEM anomaly zone #13 also has direct magnetic coincidence. Drilling here by Amax has indicated that the conductor is caused by a graphitic horizon flanking magnetic serpentinite.

The other weak anomalies detected here cannot be confidently interpreted as bedrock conductors. Consequently further work is not recommended unless encouragement is obtained in exploring the priority targets.

CONCLUSIONS AND RECOMMENDATIONS

Definite conductors with magnetic correlation and short strike length were detected by the Geoterrex AEM survey in Nova Group 1 and Nova-Oates Group 2. Some of these conductors correlate with massive sulphides known from previous trenching or drilling. Ground follow-up is recommended on all definite targets. Those conductors not previously drilled or trenched will probably warrant drilling. Additional drilling of previously drilled conductors is dependent on evaluation of these results. The weaker, suspicious AEM anomalies detected probably do not warrant follow-up unless encouragement is obtained in exploring the more favourable targets.

Jeremy Roth

Following is a description of equipment and procedures used during this airborne geophysical survey.

A. EQUIPMENT

1) Aircraft:

The aircraft is a deHavilland Otter DHC-3 with Canadian registration CF-AYR. This aircraft is a single engine, slow speed, high performance type with a gross weight of 8,000 lbs. The aircraft may be equipped with wheels, skis, or floats, as required. Normal survey speed is 100 miles per hour.

2) Electromagnetometer:

The electromagnetic unit is a Rio Tinto type, measuring In-Phase and Out-of-Phase components of the secondary field at a frequency of 320 cycles per second. The unit was designed and built by Geoterrex, and carries Serial #1.

A transmitter generates a closely controlled sine wave of 320 cps which is amplified and fed to a transmitting coil mounted on the starboard wing-tip. This coil is iron cored and has vertical windings, with coil axis in the direction of flight. The circulating coil power is some 5000 volt amperes.

A receiving coil is mounted on the port wing, co-planar with, and 62 feet from, the transmitting coil. The voltage developed in the receiver coil due to the transmitted field is some 300 millivolts. In the absence of external conductors, this voltage is cancelled by a reference voltage derived directly from the transmitter voltage.

When the aircraft comes within range of a conductor, the normal (or primary) field is changed by a secondary field and the resultant voltage at the receiver coil is amplified and passed on to the EM receiver in the aircraft. This signal is filtered and split into one component in-phase and one component out-of-phase with reference to the transmitter voltage. The signals are then passed through phase-sensitive detectors where their amplitudes may be read on meters, or

recorded on a chart. A system of calibration is included so that amplitude of responses (anomalies) may be determined in "parts per million" of the primary receiver coil voltage prior to cancellation. Noise level of the system due to movement of the metal aircraft within the EM field is normally 50 parts per million or less. Significant conductors depending on distance and size, will produce anomalies of more than 50 parts per million.

The system is also equipped with a receiver noise channel operation at a frequency of 268 cps. This channel is not susceptible to the electromagnetic response, and is affected only by radiated noise such as power and telephone lines, and atmospheric discharges. It is frequently useful in determining the validity of electromagnetic anomalies.

An accelerometer is also installed and the output recorded on the 8-channel recorder. This indicates flexure on the aircraft and enables discarding of false anomalies which could result from the aircraft motion.

Calibration marks are displayed on the eight-channel chart, and are approximately 15 millimeters for 200 parts per million.

Any anomalies noted are listed in Appendix A of this report, indicating position, (fiducial number on the path recovery camera), amplitudes, aircraft altitude, magnetic relationship if any, relative anomaly rating, and comments which may be of significance.

The anomalies are then plotted on the base map in coded form, according to the legend accompanying this Appendix. Anomaly groups which reflect probable ground conductors are circled and numbered. These are described and discussed in the report in the context of geophysical and where possible, geological significance.

3) Magnetometer:

The magnetometer used is a Geometrics Model G-803 Proton Resonance type incorporating a High Performance option. Recording times are variable, from three times per second to once per 2 seconds, with respective sensitivities of 2 gammas to 0.5 gamma. In normal use readings are obtained

once per second with a sensitivity of 1 gamma.

The sensing head is a torvidal coil immersed in a special hydrocarbon fluid and mounted beneath the port wing.

The magnetometer is a digital readout unit and output is used to drive a paper recorder (Hewlett Packard Model 5050-B). In addition analogue outputs are fed to the 8-channel recorder for direct comparison with the electromagnetic results, and to a Hewlett-Packard Model 680 - six inch rectalinear strip recorder.

Full scale deflection usually used in mineral surveys is 1000 gammas although other sensitivities are available. Automatic stepping of the full scale analogue deflection is incorporated. Recordings made on the paper tape are the values of the total field intensity.

Contouring of results is accomplished as desired.

4) Spectrometer:

An Exploranium DGRS-1000 spectrometer is normally carried on the Otter, along with a sensing head containing three 6" x 4" Sodium Iodide crystals.

This is a four channel differential gamma-ray unit measuring energy levels of potassium 40, bismuth 214 thallium 208 plus total count.

Time constants and full scale ranges are variable and are selected to suit the conditions and background of the survey area.

Depending on requirements of the survey, one or more channels may be recorded on the eight channel recorder.

Data presentation, if required, is usually in the form of plotted anomalies showing channel intensities and aircraft altitude. Contour maps of one or more channels may be produced in special circumstances.

5) Altimeter:

The altimeter is a GAR Model 10 wide band radar type.

One unit is carried on each wing. The output from the altimeter recorded on the eight channel recorder. The recording is linear and normally covers from 50 feet to 300 feet, or 25 feet per major division.

6) Camera:

The camera used for path recovery is a Hulcher continuous strip 35 millimeter type. It can accommodate 400 ft. lengths of film, good for some 250 line miles of survey. It is fitted with a special wide angle lens for low level work.

Fiducial numbers and markers are impressed on the film and controlled by the intervalometer.

7) Intervalometer:

This is a Geoterrex Model X-1 solid state unit which derives triggering from the magnetometer. Basic fiducial pulses are provided once for each two magnetometer readings, so that in usual operation one fiducial is recorded every two seconds. A long pulse is produced once for every ten normal fiducials.

These fiducial marks are impressed on the path recovery film, the eight channel recorder, the Hewlett Packard Model 680 recorder and the digital printer in order to identify and locate geophysical records with ground positions.

8) Eight Channel Recorder:

This recorder is a Gulton Industries Model TR-888. Records are made on heat sensitive paper of 16 inch width. Each channel has a width of 1.6 inches. Individual signal processors are included for each channel, selected according to requirements for each channel to be recorded.

Normal chart speed is 5.0 inches per minute giving a horizontal scale of approximately 1000 feet per inch.

A typical chart record is included with this appendix.

B. PROCEDURES

1) Photo Laydowns:

Prior to undertaking of the survey, air photos of the area are obtained from which a photo laydown is produced, to an appropriate scale, usually 1" = 1320 feet. Proposed lines are drawn on the laydown, in the appropriate direction and line spacing. These "flight-strips" are then used by the air crew for navigating the airplane visually along the proposed lines. This photo laydown is also used to produce the subsequent base maps.

2) Aircraft Operation:

The air crew consists of pilot, co-pilot (or navigator) and equipment operator. The aircraft is flown along the proposed lines at an altitude of some 200 feet, using the flight strips for navigation. Altitudes in excess of 300 feet are generally considered too high for effective penetration.

The operator records lines, direction of flight and starting and finishing fiducial numbers on a flight log. Equipment is normally left on during the whole of the survey flight, while the intervalometer is turned on only for the actual survey line. Thus, the appearance of fiducial marks on the charts indicates the extent of the survey line.

3) Field Reduction:

Upon completion of the flight, the film is developed and the actual path of the aircraft is plotted on the photo laydown. This is accomplished by comparing film points with the photo. For any given point, the appropriate fiducial number is placed on the photo laydown and the points joined to produce the actual flight path.

When field results are desired, anomalies are chosen and assigned appropriate fiducial numbers. The anomalies are then transferred to their correct position on the photo laydown.

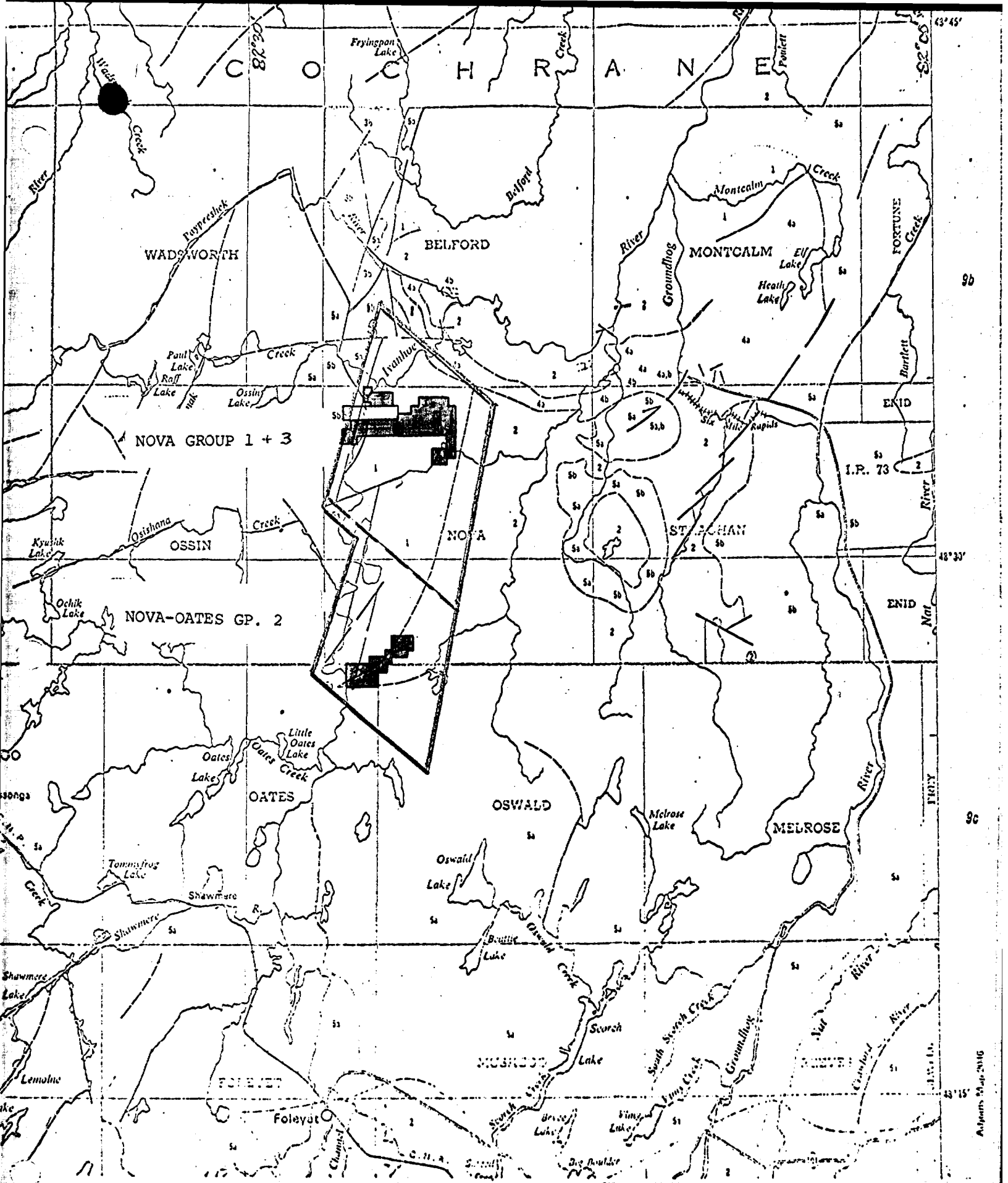
4) Office Reduction:

On completion of the survey, base maps are drawn using the photo laydown as a base. Flight lines and fiducial numbers are shown on this base map.

In the case of EM or radiometric results the anomalies are then plotted on the base map as boxes with symbols representing anomaly grade or amplitude (as noted on the legend accompanying each map). Anomaly "systems" are then outlined as conductive zones at which stage geological comparison and interpretation may be made.

In the case of magnetic results, the values noted on the Moseley chart are transcribed to a work sheet (overlay of the base map) after levelling or correcting for heading error, diurnal, etc. The values are then contoured on the work sheet and then drafted on a copy of the base map.

Since base maps use the photo laydown as a base, all geophysical results portrayed may be compared as overlays, and all features of interest may be identified on the appropriate photo for subsequent ground location.



AIRBORNE ELECTROMAGNETIC SURVEY

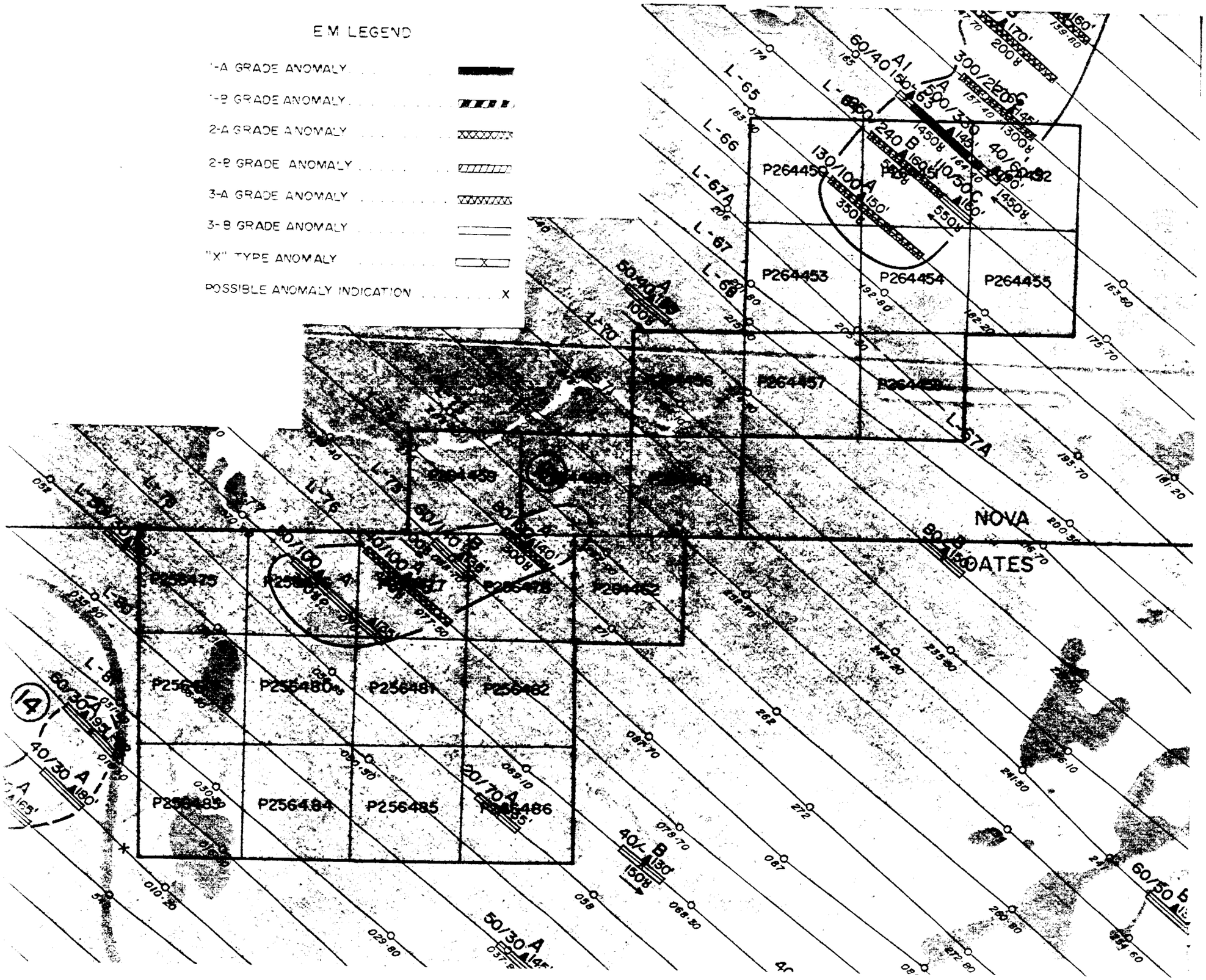
Nova Township Area

1" = 4 Mi.

Fig-1

E M LEGEND

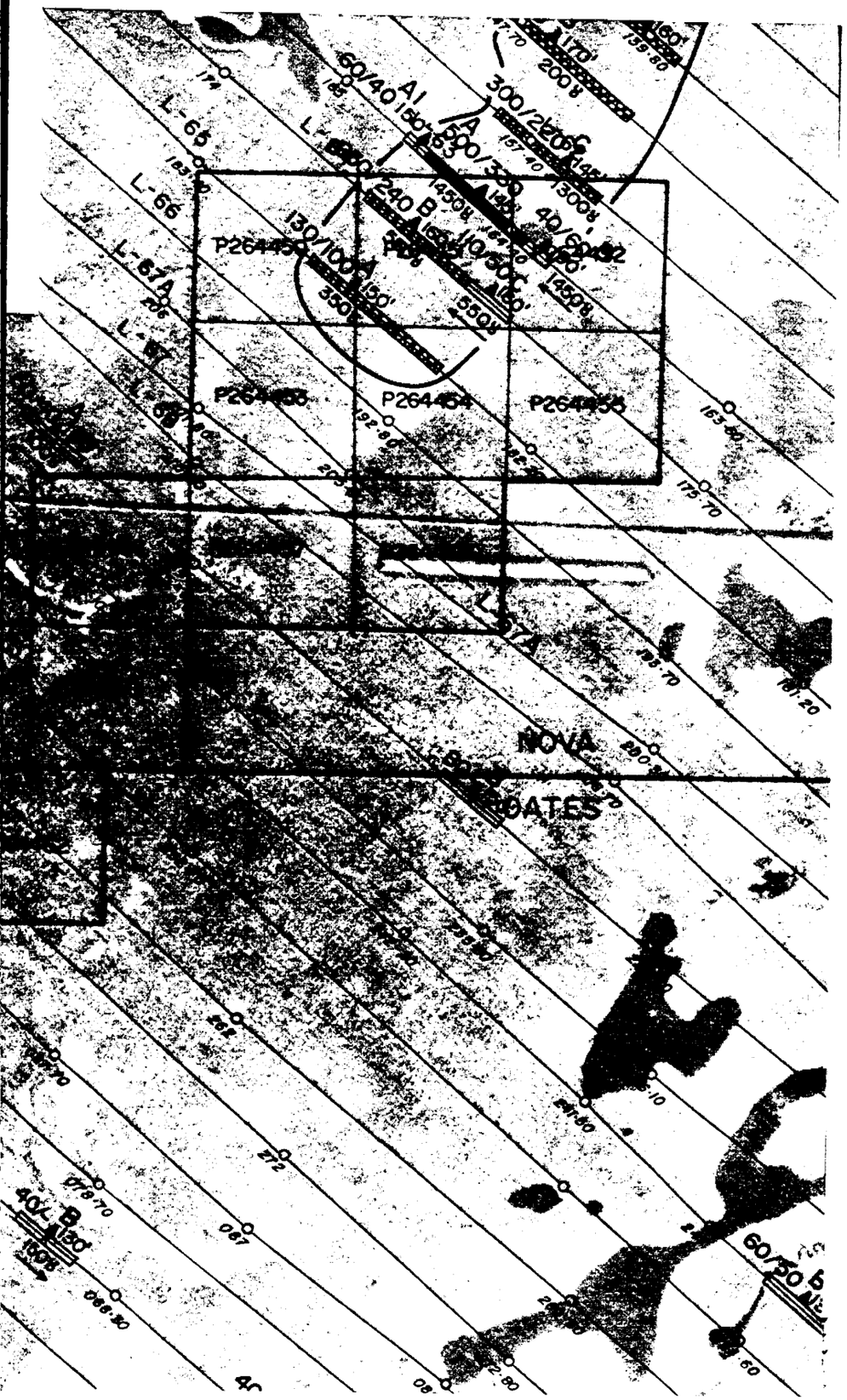
1-A GRADE ANOMALY	
1-B GRADE ANOMALY	
2-A GRADE ANOMALY	
2-B GRADE ANOMALY	
3-A GRADE ANOMALY	
3-B GRADE ANOMALY	
"X" TYPE ANOMALY	
POSSIBLE ANOMALY INDICATION	X



AIRBORN

AMA

FLOWN IN MARCH 197



AIRBORNE GEOPHYSICAL SURVEY

ELECTROMAGNETIC

FOR

AMAX EXPLORATION INC.

NOVA TOWNSHIP

ONTARIO

SHEET 2

SCALE : 1" = 1,320'

SURVEYED COMPILED & INTERPRETED BY

geoterrex limited

FLOWN IN MARCH 1971

GEOTERREX PROJECT No. 84-77

FIG. 3

42B09SW0024 2.909 NOVA

900

GEOPHYSICAL – GEOLOGICAL 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: Airborne Electromagnetic

Township or Area: Nova-Oates Oswald

Claim holder(s): Amax Potash Ltd.

Author of Report: B.I. MacDonald

Address: 153 Hemlock St., Timmins, Ont.

Covering Dates of Survey: March 1971
(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: Electromagnetic: 20 Radiometric:
(enter days per claim)

DATE: May 17/72 SIGNATURE: B. I. MacDonald
Author of Report

MINING CLAIMS TRAVERSED
List numerically

SEE APPENDIX I
(prefix) (number)

If space insufficient, attach list

TOTAL CLAIMS: 89

OFFICE USE ONLY

PROJECTS SECTION

Res. Geol.: Qualifications: 63.2232

Previous Surveys: 2.528 Air mag

Checked by: date:

GEOLOGICAL BRANCH

Approved by: date:

GEOLOGICAL BRANCH

Approved by: date:

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations _____ Number of Readings _____

Station interval _____

Line spacing _____

Profile scale or Contour intervals _____

(specify for each type of survey)

MAGNETIC

Instrument _____

Accuracy - Scale constant _____

Diurnal correction method _____

Base station location _____

_____

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 _____

Time domain _____ Frequency domain _____

Frequency _____ Range _____

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) Airborne Electromagnetic

Instrument(s) Rio Tinto type (In-Phase and Out of Phase) 320 CPS - Model #1

(specify for each type of survey)

Accuracy 150 parts per million

(specify for each type of survey)

Aircraft used De Havilland Otter DHC-3 Registration CEAYR

Sensor altitude 200 feet ± 50 feet

Navigation and flight path recovery method Photo lay down (Mosaic 1" = 1320')

Continuous 34 mm film strip (Hulcher) - Fiducial numbers on film

Aircraft altitude 200 feet ± 50 feet Line Spacing 1/8th mile

Miles flown over total area 463.1 Over claims only 13.5 Nova Oates 2

33.5 Nova 1 & 3

13·5+33·5×40=1880 ÷ 89 = 21 days per claim

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 _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX I

Airborne Electromagnetic Survey

P 256475	20	days
P 256476	20	"
P 256477	20	"
P 256478	20	"
P 256479	20	"
P 256480	20	"
P 256481	20	"
P 256482	20	"
P 256483	20	"
P 256484	20	"
P 256485	20	"
P 256486	20	"
P 264450	20	"
P 264451	20	"
P 264452	20	"
P 264453	20	"
P 264454	20	"
P 264455	20	"
P 264456	20	"
P 264457	20	"
P 264458	20	"
P 264459	20	"
P 264460	20	"
P 264461	20	"
P 264462	20	"

APPENDIX A (Nova Township)

P	264178	20 days	P	264568	20 days
	264179	20 "		267229	20 "
	264180	20 "		267230	20 "
	264181	20 "		267231	20 "
	264182	20 "		307244	20 "
	264294	20 "		307245	20 "
	264295	20 "		307246	20 "
	264296	20 "		307247	20 "
	264297	20 "		307248	20 "
	264298	20 "		307249	20 "
	264438	20 "		307250	20 "
	264439	20 "		307251	20 "
	264440	20 "		307252	20 "
	264441	20 "		307253	20 "
	264442	20 "		307260	20 "
	264443	20 "		307261	20 "
	264444	20 "		307262	20 "
	264445	20 "		307263	20 "
	264446	20 "		307264	20 "
	264447	20 "		307265	20 "
	264547	20 "		307266	20 "
	264549	20 "		307267	20 "
	264550	20 "		307268	20 "
	264551	20 "		307269	20 "
	264552	20 "			
	264553	20 "			
	264554	20 "			
	264555	20 "			
	264556	20 "			
	264557	20 "			
	264558	20 "			
	264559	20 "			
	264560	20 "			
	264561	20 "			
	264562	20 "			
	264563	20 "			
	264564	20 "			
	264565	20 "			
	264566	20 "			
	264567	20 "			

BELFORD TWP. (M.657)

OSSIN TWP. (M.1031)

STRACHAN TWP. (M.1142)

OATES TWP. (M.1033)

OSWALD TWP. (M.1042)

THE TOWNSHIP OF

Clam M.P.

NOVA

DISTRICT OF COCHRANE

PORCUPINE 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.

DATE OF ISSUE
JUN 30 1972
ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

2.909

PLAN NO.- M.1030

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

484821, 485821
484822, 485822

42B09SW0024 2.909 NOVA

200

TRIM LINE

Nova Twp. (M.1030)

Strachan Twp. (M.1142)

61M. 60M. 59M. BASE LINE surveyed in 1899 by O.L.S. A. NIVEN 58M. 57M. 56M. 55M. 54M. 53M.

264462

2409 Air

312979 312978

7.5M 6M 4.5M 3M 1.5M 9M

8M 7M 6M 5M 4M 3M 2M 1M

Oates Twp. (M.1033)

Melrose Twp. (M.861)

J. W. FITZGERALD 1919 by O.L.S. MERIDIAN LINE surveyed

Melrose Cr. Melrose Cr. Melrose Cr. Melrose Lake Cabin Site Reserve

S.R.O. Res. for Public Use

Oswald Lake

Oswald Creek

Beattie Lake

Melrose Cr.

7.5M. 6M. 4.5M. 3M. 1.5M

Muskego Twp. (M.881)

THE TOWNSHIP OF

OSWALD

DISTRICT OF SUDBURY

PORCUPINE 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.

DATE OF ISSUE
JUL 12 1972
ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

2.909

PLAN NO. M-1042

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

42B03SW0024 2.909 NOVA

Ossin Twp.- M.1041

Nova Twp.- M.1030

Shenango Twp.- M.1112

Oswald Twp.- M.1042

Foleyet Twp.- M.812

70M. 69M. 68M. 67M. 66M. 65M. 64M. 63M. 62M.

65M 64M 63M 62M 61M 60M 59M 58M 57M

75M 6M 45M 3M 15M 9M

Creek Oates Oates Oates Little Oates Lake Oates Creek Lake Creek River Ivanhoe River Tommyfrog Lake BALLAST PIT SRO Showmere L. STA. CANADIAN NATIONAL Showmere L. RAILWAY

S.R.O. RESERVED FOR PUBLIC USE FILE 163002

S.R.O. RESERVED FOR PUBLIC USE

320311 320312 320313 320314 320315 320316

256475 256476 256477 256478 256479 256480 256481 256482 256483 256484 256485 256486

2.909 AIR

THE TOWNSHIP OF Claim Map OATES

DISTRICT OF SUDBURY

PORCUPINE 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.

Areas withdrawn from staking under Section 42 of The Mining Act

File	Date	Disposition
(43) 163002	25/8/70	S R O

DATE OF ISSUE

JUL - 4 1972

ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

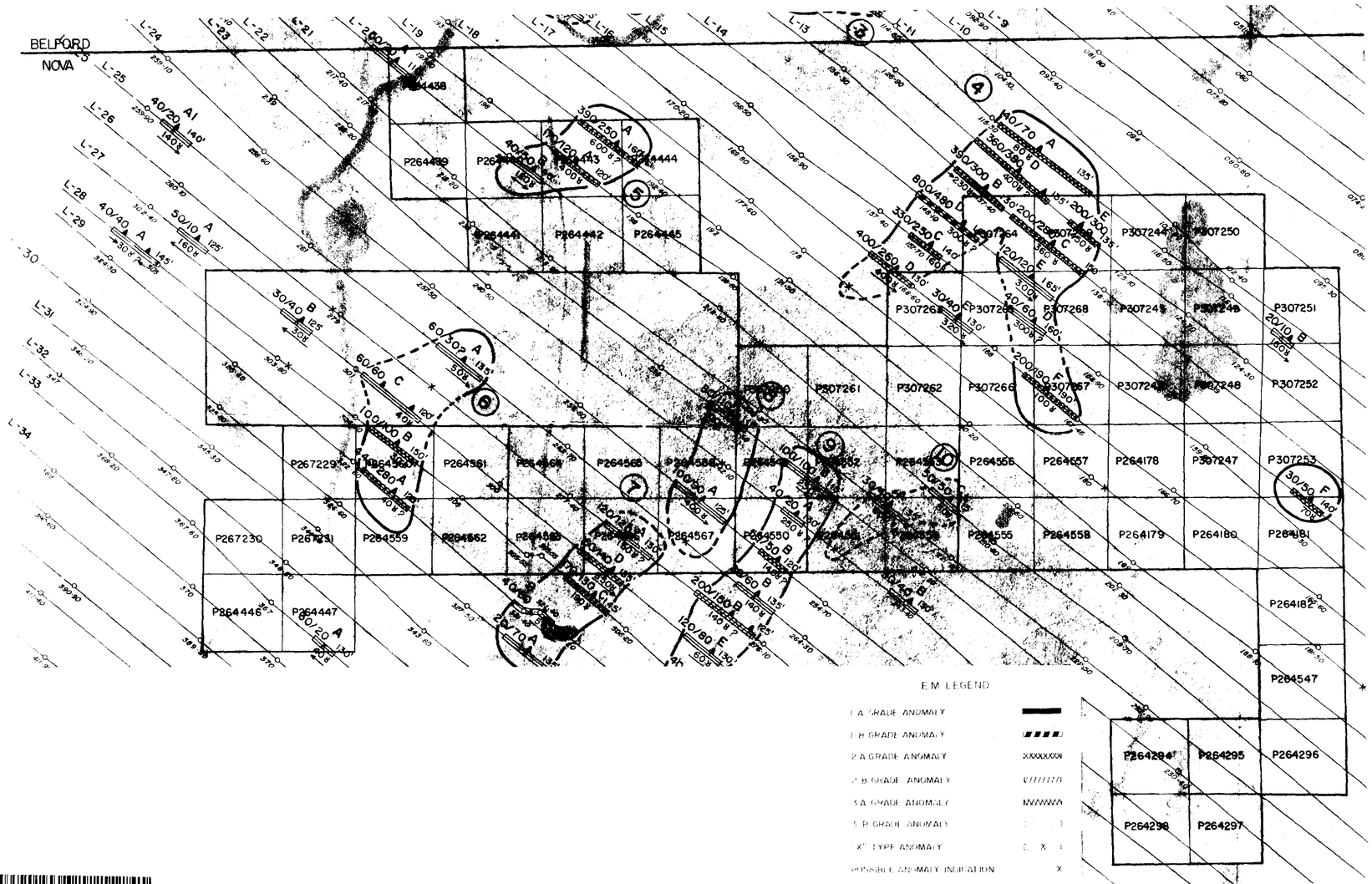
2.909

PLAN NO.- M.1033

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

42B09SW0024 2.909 NOVA

M.1033 OATES TWP.



AIRBORNE GEOPHYSICAL SURVEY

ELECTROMAGNETIC

FOR

AMAX EXPLORATION INC.

NOVA TOWNSHIP

ONTARIO

SHEET 1

SCALE 1" = 1,320'

FLOWN IN MARCH 1971

GEOTERREX PROJECT No. 84-77

4208085#2824 2.989 NOVA

Fig 2