REPORT ON

VLF-EM AND SPECTROMETER SURVEYS

GAUTHIER TOWNSHIP, ONTARIO

by

R.A. MacGregor, P. Eng.

May 3, 1982

I. INTRODUCTION

VLF-EM and spectrometer surveys were carried out over previously cut lines in October-November 1981.

II. LOCATION, ACCESS AND OWNERSHIP

The property is located in the central part of Gauthier Township just north of the south boundary, Larder Lake Mining Division, District of Temiskaming, Ontario. The claims are numbered L544734 to 544738 inclusive and L565101 to 565106 inclusive. They are recorded in the name of R.A. MacGregor, 134 Palace Drive, Sault Ste. Marie, Ontario.

Highway 66, a paved highway passes through the north-east corner of the claims. A bush road passable to 4-wheel drive vehicles extends south from the highway near the east side of the claims. The claims are about 6 miles west of Larder Lake and 12 miles east of Kirkland Lake, both on Highway 66.

III. PREVIOUS EXPLORATION

There are a few old pits and trenches on parts of the claims, and evidence of trenching to reach bedrock in the drift covered areas which cover most of the claims. Previous operators are also reported to have put down a number of diamond drill holes.

IV. TOPOGRAPHY

Nearly all of the property is covered by Pleistocene sand, gravel or swamp. There are two low hills on which there is some outcrop located. In the sandy areas which cover a large part of the property, forest cover consists of jackpine, spruce and some poplar and labrador tea. The swampy areas are covered with

IV. Topography (Continued)

black spruce, alder, willow and some poplar. A stream runs through the east part of the claims, and is flooded for its entire length by a series of beaver ponds.

V. MAPPING PROCEDURE

A grid of picket lines were cut for the geological survey. A base line was cut south 45° east from the north boundary. Crosslines were cut every 400 feet north-east and south-west from the baseline. Two short baselines were cut from the most northerly and southerly crosslines to reach small angles in the claims. The picket lines were chained and picketed every 100 feet. The pickets were marked with flourescent red paint for easier observation.

A VLF-EM Survey was run with a Phoenix VLF-2 instrument set to the signal from Annapolis, Maryland (21.4 KHz). Readings were taken at 100-foot intervals along all the lines, using the procedure outlined in Appendix 1. The looping method was used for control of variation. In this method a base station is selected, and readings taken along lines describing a loop, arriving back at the starting base station in less than two hours. A second loop is then started using either the same base station or another which is tied to the previous loop. Readings are then corrected for diurnal variation by assuming the time between readings is the same and distributing any variation equally among the intervening readings. No correction was applied less than the accuracy of the base station readings.

..... 3

V. Mapping Procedure (Continued)

A spectrometer survey was run using a Scintrex GIS-5 Digital Intregating Spectrometer, with a reading time of 10 seconds. Readings were taken at 100-foot intervals, and the type of terrain noted at each station. The looping method was used for control of variation as in the VLF-EM Survey.

VI. GENERAL GEOLOGY

The general geology of Gauthier Township has been described by J.E. Thomson and Q.T. Giffis[1]. The area is underlain by early Precambrian volcanic, sedimentary and intrusive rocks. The area is crossed by the Larder Lake Break, a zone of carbonatization and shearing.

The classification used is the same as that for McVittie Township to the east. The volcanics are classified as Temiskaming or Keewating cut by later Algoman intrusives. The geological succession of the area as proposed by Thomson is given in the "Table of Formations".

VII. DISCUSSION OF RESULTS

VLF-EM

Response from the VLF-EM survey is generally weak. There is one anomaly parallel to the baseline and to the south-west. It is drift covered, but in an area of possible volcanics.

Spectrometer

The spectrometer readings are generally low in swampy areas, highest over outcrop and nearly as high as outcrop in areas of sand. The syenite body does not give a response which would allow it to be distinguished from other rocks.

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(1) O.D.M. Report Vol 50 part 8, 1941

TABLE OF FORMATIONS

QUATERNARY	
Recent and Pleistocene:	Clay, sand, gravel
	Great unconformity
PRECAMBRIAN	
Keweenawan or Matachewan:	Diabase
	Intrusive contact
Huronian (Cobalt Series)	Conglomerate, greywacke, arkose slate, quartzite.
	Great unconformity
Algoman:	Syenite; syenite porphyry; granite; granite porphyry; felsite; aplite; lamprophyre; basic syenite; hornblende syenite; hornblende diorite; amphibolite, hornblendite.
	Intrusive contact
Temiskaming:	Fine-grained sediments; greywacke, arkose, slate, iron formation. Conglomerate with interbedded greywacke.
	Great unconformity
Post-Keewatin:	Diorite, diabase, gabbro, serpentinized peridotite.
	Intrusive contact
Keewatin:	Early Intrusives: Quartz porphyry, feldspar porphyry, dacite porphyry.
	Basic and Intermediate Volcanics: Greenstone, pillow lava; diabasic, dioritic, and gabbroic lava, fragmental lava, agglomerate, pyroclastics, dacite, talc-chlorite schists, andesite, tuff, sheared basic lava.
	Acid Volcanics: Ryolite, cherty tuff, rhyolite tuff, tuff agglomerate, fragmental lavas, trachyte.

VIII. CONCLUSIONS

The surveys were not overly helpful in projecting geology into the large areas covered by overburdern on the property.

The VLF-EM Survey shows one anomaly which is weak, but possibly in volcanics. Overburden may be masking the response, and it should be checked by another method.

The spectrometer survey would appear to accurately define areas underlain by muck or swamp from areas of sand. The response from sand is not appreciably lower than from outcrop.

Respectfully submitted

May 3, 1982

R.A. MacGregor, P. Eng.

CERTIFICATE

I, Robert A. MacGregor, Certify:

1. I am a Mining Engineer residing at 134 Palace Drive Sault Ste. Marie, Ontario. I have worked as a mining engineer and geologist for the past 17 years.

2. I am a member of the Association of Professional Engineers of the Province of Ontario and a member of the Canadian Institute of Mining and Metallurgy.

3. I attended Queen's University for two years in the Mining Geology course.

4. I am the recorded holder of the mining claims in this report and have personal knowledge of the work performed.

May 3/82
Date

REGISTERED PROFESSIONAL ENGINEER
R.A. MacGREGOR
PROVINCE OF ONTARIO

Robert A. MacGregor

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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

Type of Survey(s) VLF-EM & SPECTROMETER

Township or Area Gauthier

Claim Holder(s) R.A. MacGregor

Survey Company COLEX EXPLORATIONS INC.

Author of Report R.A. MacGregor

Address of Author 134 Palace Dr. S.S. Marie P6B5H5

Covering Dates of Survey Sept./81 - May/82
(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	20
–Magnetometer	
–Radiometric	20
–Other	
Geological	
Geochemical	

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

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

DATE: May 3/82 SIGNATURE: R. MacGregor
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

OFFICE USE ONLY

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
L	544734
L	544735
L	544736
L	544737
L	544738
L	565101
L	565102
L	565103
L	565104
L	565105
L	565106

If space insufficient, attach list

TOTAL CLAIMS 11

837 (5/79)

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations Spec. 311 VLF 550 Number of Readings VLF 550 Spec. 311

Station interval 100 feet Line spacing 400 feet

Profile scale 1" = 40°

Contour interval

MAGNETIC

Instrument

Accuracy -- Scale constant

Diurnal correction method

Base Station check-in interval (hours)

Base Station location and value

ELECTROMAGNETIC

Instrument Phoenix VLF-2

Coil configuration N/A

Coil separation N/A

Accuracy ± 1/2°

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

Frequency Annapolis, Maryland (21.4 KHz)
(specify V.L.F. station)

Parameters measured Dip angle of the resultant field

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 Scintrex GIS - 5

Values measured Total count

Energy windows (levels) 10 second counting period

Height of instrument 3 feet Background Count _____

Size of detector 5.0 cu. in.

Overburden variable outcrop to swamp to sand plain

(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

_____

Additional information (for understanding results) _____

_____

_____

AIRBORNE SURVEYS

Type of survey(s) _____

Instrument(s) _____

(specify for each type of survey)

Accuracy _____

(specify for each type of survey)

Aircraft used _____

Sensor altitude _____

Navigation and flight path recovery method _____

_____

Aircraft altitude _____ Line Spacing _____

Miles flown over total area _____ Over claims only _____

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken _____

Total Number of Samples _____

Type of Sample _____
(Nature of Material)

Average Sample Weight _____

Method of Collection _____

Soil Horizon Sampled _____

Horizon Development _____

Sample Depth _____

Terrain _____

Drainage Development _____

Estimated Range of Overburden Thickness _____

SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis _____

General _____

ANALYTICAL METHODS

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

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

Others _____

Field Analysis (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Field Laboratory Analysis

No. (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Commercial Laboratory (_____ tests)

Name of Laboratory _____

Extraction Method _____

Analytical Method _____

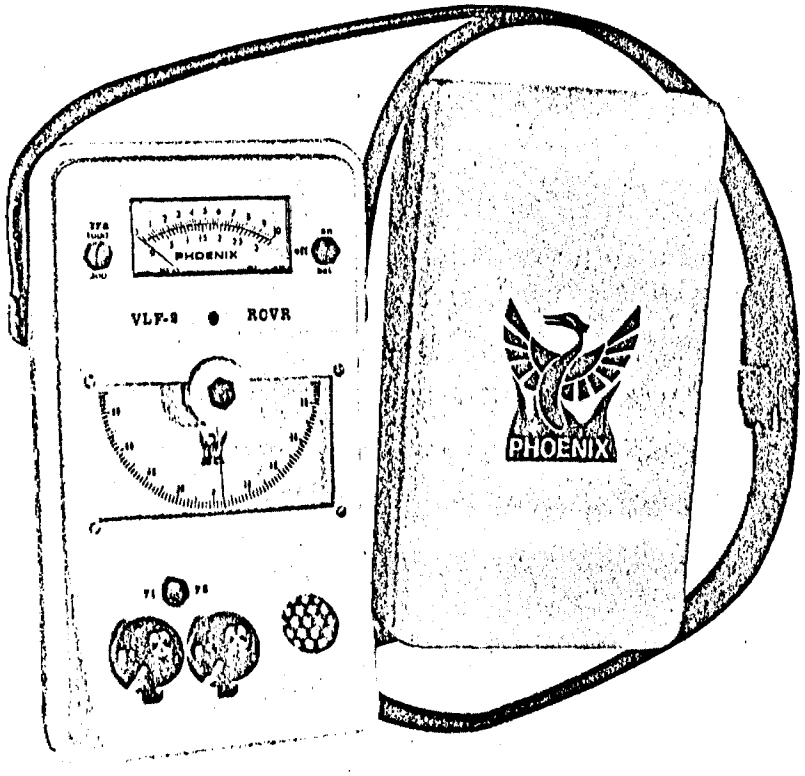
Reagents Used _____

General _____

VLF-2

Electromagnetic Unit

- Lightweight, low battery drain, rugged, simple to operate
- Two independent channels
- Each channel may select any station between 14.0 and 29.9 kHz
- Single crystal used for all frequencies
- Locking clinometer provides tilt-angle memory
- Superheterodyne detection and digital filtering provide extremely high selectivity and noise rejection



Military and time standard VLF transmitters are distributed over the world. These stations are used for geophysical EM surveying thus eliminating the need for a local transmitter and permitting one-man operation.

To ensure that a station excites the prospective conductor, two stations at approximately right angles are used during a survey (see data on back).

The choice of 160 frequencies in the range 14.0 to 29.9 kHz permits the use of a local EM transmitter when no suitable regular VLF station is available.

PHOENIX GEOPHYSICS LIMITED

Geophysical Consulting and Contracting, Instrument Manufacture, Sale and Lease.

Head Office: 200 Yorkland Blvd. Willowdale, Ont., Canada, M2J 1R6. Tel: (416) 493-6350
1424 - 355 Burrard St. Vancouver, B.C., Canada, V6C 2G8. Tel: (604) 684-2285
2430 N. Huachuca Dr. Tucson, Arizona, U.S.A. 85705. Tel: (602) 884-8542

Specifications

Parameter Measured	:	Orientation and magnitude of the major and minor axes of the ellipse of polarization.
Frequency Selection, Front Panel	:	Dual channel, front panel selectable (F1 or F2) each with independent precision 10-turn dial gain control.
Frequency Selection, Internal	:	F1 and F2 can be selected by internal switches within the range 14.0 to 29.9 kHz in 100 Hz increments.
Detection And Filtering	:	Superheterodyne detection and digital filtering provide a much narrower bandwidth and thus greater rejection of interfering stations and 60 cycle noise than conventional receivers.
Meter Display	:	2 ranges: 0 to 300 or 0 to 1000. Background is typically set at 100. Meter is also used as dip angle null indicator and battery test.
Audio	:	Crystal speaker. 2500 Hz used as null indicator.
Clinometer	:	±90°, +0.5° resolution. Normal locking, push button release.
Battery	:	One standard 9v transistor radio battery. Average life expectancy - 1 to 3 months (battery drain is 3 mA)
Temperature Range	:	-40° to + 60° C.
Dimensions	:	8 x 22 x 14 cm (3 x 9 x 6 inches).
Weight	:	850 grams (1.9 pounds).

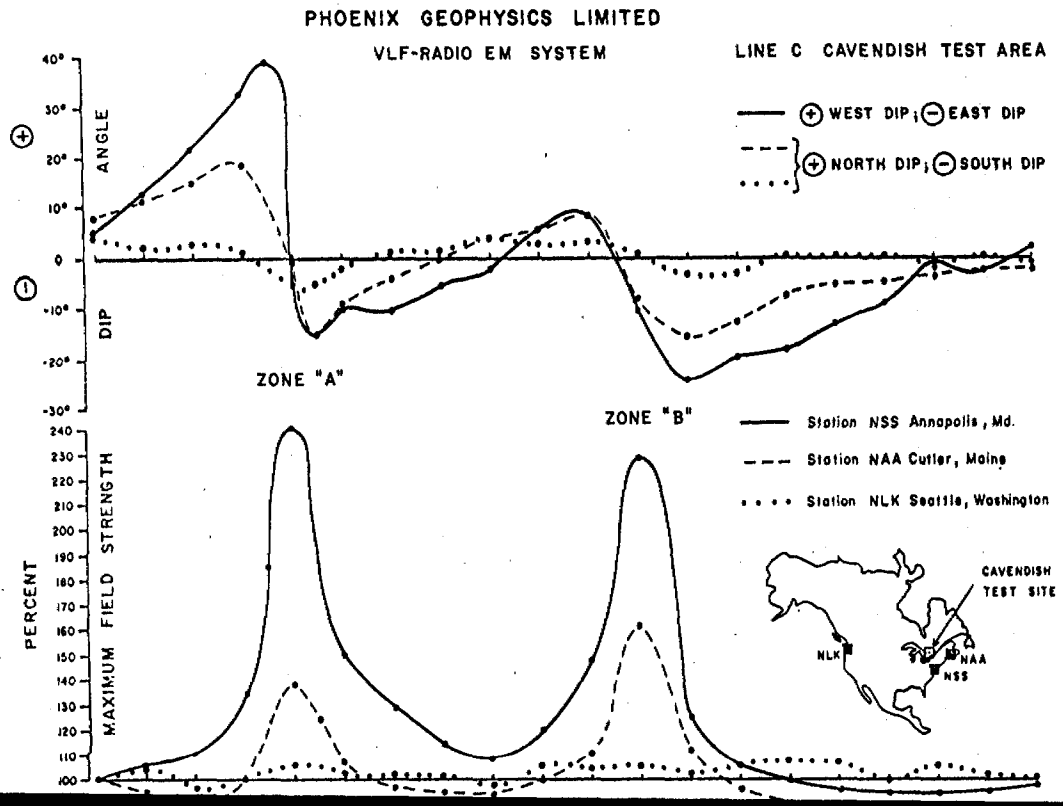
All of the established stations may be selected, or alternatively, a local VLF transmitter may be used which transmits at any frequency in the range 14.0 to 29.9 kHz.

VLF Station	Frequency (kHz)
Bordeaux, France	15.1
Odessa (Black Sea)	15.6
Rugby, U.K.	16.0
Moscow, U.S.S.R.	17.1
Yosamai, Japan	17.4
Hegaland, Norway	17.6
Cutler, Maine	17.8
Seattle, Washington	18.6
Malabar, Java	19.0
Oxford, U.K.	19.6
Paris, France	20.7
Annapolis, Maryland	21.4
Northwest Cape, Australia	22.3
Lauluolei, Hawaii	23.4
Buenos Aires, Argentina	23.6
Rome, Italy	27.2

Field Data

The results below illustrate the need for using two orthogonal stations when the strike of the prospective conductor is not well-known. The dip angle and amplitude data measured using station NLK in Seattle, Washington, show only a very weak anomaly associated with the two conductive sulphide zones at Cavendish, Ontario.

The results obtained using Cutler, Maine reveal a more prominent anomaly, but the best response was obtained using Annapolis, Maryland since the station lies almost due south and the transmitted electromagnetic field is thus maximum-coupled with the North-South trending conductors.



SCINTREX GIS-5 Integrating Gamma-ray Spectrometer

Function

The Scintrex GIS-5 Integrating Gamma-ray Spectrometer is designed specially as a portable field instrument for the detection and measurement of gamma radiation. Simple calibration procedures and switch selectable energy thresholds permit reliable differentiation between potassium (^{40}K), uranium (^{214}Bi) and thorium (^{208}Tl) radiation.

The instrument is mainly used in uranium exploration for reconnaissance prospecting, ground follow-up of airborne radiometric surveys, detailed ground radiometric surveys and semi-quantitative outcrop or laboratory assays. A secondary but important application is in geological mapping since the GIS-5 can detect changes in K, U and Th content of rocks not distinguishable by visual examination.

The GIS-5 has been designed along the lines of the successful Scintrex GIS-4 model, but with the following improvements: 1) 90 percent more crystal volume, 2) a fast-acting, loud, audio output whose pitch is proportional to the excess count rate over the threshold, rather than a constant pitch alarm, 3) a digital display with five rather than four digits, thus increasing tenfold the number of counts which can be processed in a counting period, 4) fastest display up-dating each second rather than each three seconds, 5) an improved, watertight, all metal housing, and 6) a simplified calibration procedure. Because of these improvements, the GIS-5 supersedes the GIS-4.

Operation Principle

The elements uranium, potassium and thorium as well as most of their daughter nuclides are naturally radioactive. This means that they constantly emit particles (alpha and beta) and energy (gamma rays) from their unstable nuclei. Gamma rays of specific energies are given off by the different nuclides.

Gamma rays striking the sodium iodide crystal of the GIS-5 give rise to flashes of light. These are sensed by a photomultiplier tube which converts them to electrical pulses. The amplitude of each pulse is in proportion to the energy of the incident gamma ray. These pulses are then amplified by a variable gain pulse amplifier. A digital scaler circuit counts the number of pulses during the selected counting period having amplitudes above the selected energy threshold level. This result is displayed on the front panel digital display until automatically updated by a new value at the end of the next counting period.

The GIS-5 has four different switch selectable threshold levels: Total Count, for the most sensitive, broadband detection measurements; K + U + Th, measuring energies from all three radioactive elements; U + Th, measuring energies from uranium and thorium; and Th, measuring energy from thorium only.

Semi-quantitative assays of K, U and Th in outcrops are simply made as follows: 1) At some point away from the anomalous source, calibrate the GIS-5 using the thorium oxide sample and front panel calibration control, then measure background radiation. 2) If possible, select an area of the outcrop about 1 m in diameter over which radiation levels do not vary greatly. 3) Select a counting time of 10 seconds or greater and measure the TC, K+U+Th, U+Th and Th. 4) Using the simple formulae given in the GIS-5 manual, the concentrations of K, U and Th can then be calculated.

Much more *quantitative* measurements can be made using the differential spectrometers and larger crystal detectors offered as part of the Scintrex line of radiometric instrumentation.

Qualitative measurements can easily be made with the GIS-5; for example, if only background counts are observed above the Th threshold, then the operator knows that there is little likelihood of the occurrence of thorium. Similarly, if only background counts are observed above the U + Th threshold, then the anomalous source contains neither uranium nor thorium and likely contains potassium only. Such determinations indicate the powerful advantage of using a simple instrument such as the GIS-5 rather than a scintillometer which is only capable of detecting total gamma radiation and can not distinguish the nature of the source.

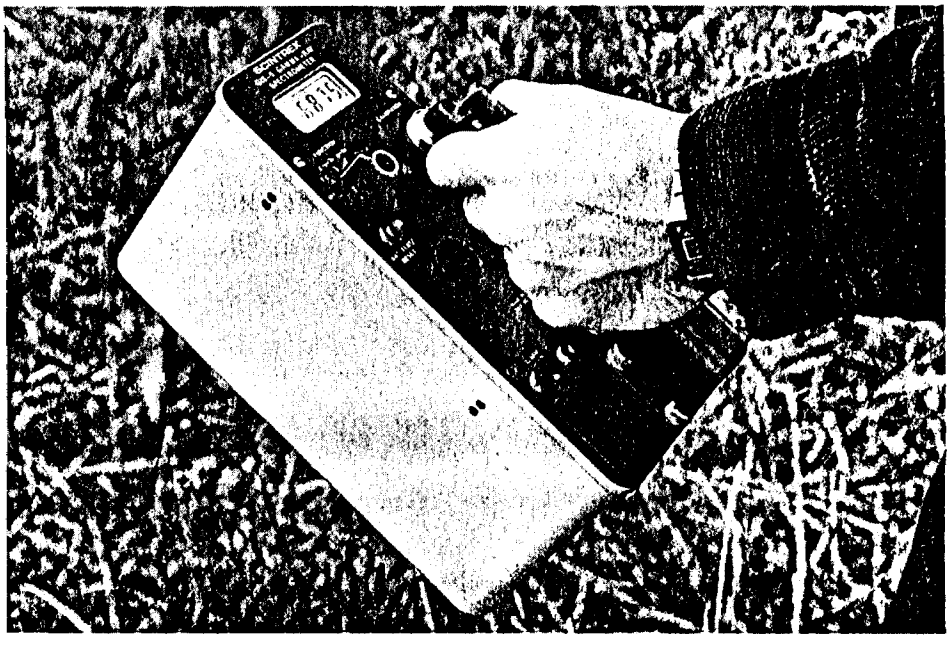
Features

Large Crystal Volume. The crystal-photomultiplier detector includes a 1.6" x 1.6" x 1.96" (5.0 cu. In, 82 cc) near-cubic, thallium activated sodium iodide crystal.

High Sensitivity. The 82 cc crystal volume and the fact that all energies above 0.05 MeV are measured in the Total Count mode provide sufficient sensitivity and statistical accuracy to detect very small changes from normal background radiation levels. Calibrations on the Geological Survey of Canada Radioactive Test Pads at Ottawa, indicate that the sensitivity of the GIS-5 in Total Count mode is 15 counts per second per ppm uranium equivalent. In comparison, an instrument containing a 1.5" x 1.5" (43 cc) cylindrical crystal with the same 0.05 MeV threshold has a sensitivity of only 5 cps per ppm U. These sensitivities are for infinite, half-space sources.

Statistical Accuracy. Good statistical accuracy for gamma-ray assaying of K, U and Th is ensured by the crystal volume, selection of counting times of up to 100 seconds and the digital readout up to 19,999 counts.

Rugged Detector. The detector is hermetically sealed, magnetically shielded and shock-mounted. It is also installed inside a sleeve of insulating foam to protect it from temperature and mechanical shocks. Instead of brittle epoxy, the photomultiplier-crystal interface bond consists of a special material of improved ruggedness and durability at low temperatures.



GIS-5 Integrating Gamma-ray Spectrometer

Loud Audio Output. The normal audio output is loud enough to attract attention even in noisy surroundings. However, when the novel resonator is screwed into place over the sound output port, the volume of the audio output is nearly doubled. Thus, the operator can control the volume of the audio output simply by deciding whether or not to use the resonator.

Fast Audio Indication. The audio output is connected directly to a precision ratemeter having a time constant of only ¼ second. This guarantees an instant response when local anomalous conditions are encountered.

Count-Rate Related Audio Output. The audio output varies in pitch with increasing count-rate above the threshold selected, providing the operator with a direct, audible, semi-quantitative indication of the relative radiation level at all times.

Variable Threshold Audio Output. The threshold level of the audio output is adjustable so that it can be operated to give a background sound continuously or to remain silent until sufficiently anomalous radiation is encountered.

LCD Digital Display. The Liquid Crystal Display consists of 4½ digits allowing displays up to 19,999, about 250 times background in Total Count. The readings are displayed continuously and updated at the end of each counting period, as fast as once per second. Compared to an analogue meter display, the GIS-5 digital display reduces operator errors in recording since there are no scale changes. The LCD has very low power consumption and is especially selected for low temperature operation. When used in rough conditions, the solid state digital display would be more rugged and reliable than an analogue meter. Another advantage of this display is its excellent legibility.

Operator/Display Interaction. If a counting period longer than one second is selected, a colon flashes each second so that the operator knows counting is under way. Each time the display updates, a bar is seen to indicate the display of a new value. An arrow indicates an overflow condition as soon as it occurs.

Convenient Package. The handle, proven in Scintrex designs over 15 years, makes it convenient to hold and point the GIS-5, even when wearing gloves. The instrument is light and its center of gravity is such that it feels like a natural extension of the arm. A carrying strap is supplied for hands-free operation. Alternatively, it can be carried in a packsack using the audio output as an indicator of above background radiation.

Robust Construction. The case construction is of strong aluminum; the face plate is milled from thick aluminum and the handle is ABS plastic for long service life. The internal mechanical design protects the detector from mechanical and thermal shock.

Waterproofing. Waterproofing is ensured through the following features: 1) Gasket seals where the faceplate meets both the housing and the battery cover; 2) all controls have dual seals; 3) the alarm sound port is covered by a screen, backed by plastic film, 'O' ring sealed to the faceplate; and 4) the display glass is permanently mounted with silicon rubber. Most importantly, however, if dropped in water, the GIS-5 will float, thus ensuring its recovery.

Advanced Electronic Design. The electronic design is modern and stable. Advanced high quality integrated circuits of the low power consumption C/MOS and Bi/MOS families have been used. Both high and low voltage supplies are accurately regulated to maintain precision. All wires leading from the main circuit board are attached with screwed down connectors for ease in servicing. The audio output transducer is a dual coil rocking armature device of very efficient design.

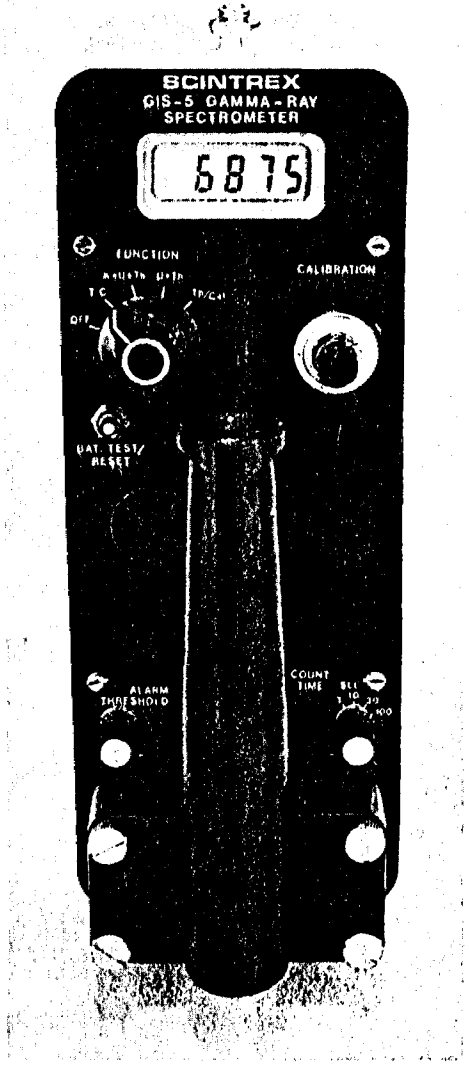
Batteries. The GIS-5 offers about 40 hours of operation from 4 'D' Cells. The batteries are housed in their own compartment, completely separate from the electronics, to ensure that instrument damage does not occur due to battery leakage. The battery condition can be read on the display so that it is easy to tell how much life is left in a set of batteries.

Selectable Counting Periods. There are five switch selectable counting periods increasing in a statistically meaningful manner from 1 to 100 seconds. The 1 second period gives rapid updating for reconnaissance work while the longer counting times ensure the appropriate statistical accuracies for assays. The reset feature allows counting to be stopped and restarted at any time.

Calibration Sample. A disc-shaped ThO_2 sample is included with each GIS-5. This sample is clipped firmly into place on the GIS-5 housing when a calibration is to be carried out.

Simple, Meaningful Calibration. The calibration procedure is simply done using a ThO_2 sample and the front panel gain control. Normally, the thorium threshold is used which has these advantages: 1) sufficient counts are received from the thorium peak to ensure a reasonably rapid calibration; 2) the calibration is made for a high energy threshold where the calibration is most accurate. Alternatively, the Total Count threshold can be used for a faster, if somewhat less accurate calibration.

Quality Control. Each GIS-5 is calibrated and tested by a Quality Control Department entirely separate from Manufacturing. This includes twenty-four hours of operation, complete visual inspection and, most importantly, a rigorous shake table test. Temperature and humidity tests are carried out in our environmental chamber on selected instruments in a production run. The Scintrex Quality Control Department represents many man-years of experience with geophysical instruments and has been accepted by the Atomic Energy of Canada Limited for the testing of electronic instrumentation for nuclear power stations.



Technical Description of the GIS-5 Integrating Gamma-Ray Spectrometer

Detector	Thallium Activated sodium iodide crystal and photomultiplier assembly, hermetically sealed, magnetically shielded and encapsulated to keep temperature and mechanical shocks to a minimum. Special ruggedized bond between crystal and photomultiplier tube.
Crystal Volume	5.0 cubic inches; 82 cc.
Crystal Dimensions	Near-cubic, 1.6" x 1.6" x 1.96". 40.5 x 40.5 x 48.5 mm.
High Voltage Supply	Generated by internal converter. Nominally 750 V.
Energy Thresholds	T.C.; all gamma energies above 0.05 MeV. K+U+Th; all energies above 1.38 MeV. U+Th; all energies above 1.66 MeV. Th+Cal; all energies above 2.44 MeV. The four thresholds are switch selectable.
Counting Periods	1, 3, 10, 30 or 100 seconds, switch selectable.
Time Base	Crystal oscillator control.
Equivalent Uranium Response For 2π Geometry	15 cps/ppm eU in T.C. 0.1 cps/ppm eU in U+Th.
Equivalent Thorium Response For 2π Geometry	5 cps/ppm eTh in T.C. 0.02 cps/ppm eTh in Th.
Equivalent Potassium Response For 2π Geometry	15 cps/% K in T.C. 1 cps/% K in K+U+Th.
Calibration	A ThO_2 calibration source is supplied. Calibration is carried out by front panel adjustment of a ten turn, calibrated and lockable potentiometer.
Audio Output	Response time constant is 1/4 second. The frequency of the output is proportional to the excess count-rate over the threshold. The threshold is continuously variable. The frequency will increase from a few counts per second to 2000 cps. The audio output is controlled by the threshold setting. Thus, if saturation (2000 cps) is reached in T.C., a higher threshold can be used to bring the audio output within range.
Digital Display	Liquid crystal display up to 19,999.

Technical Description of the GIS-5 Integrating Gamma-Ray Spectrometer

Temperature Range	With the exception of the display, all technical specifications are met over the range of −20° to +55°C. It is also recommended to store the instrument within this temperature range to protect the detector. The liquid crystal display digits may begin to change slowly at about −10°C and slow even more at lower temperatures.
Power Supply	4 'D' cells installed under removable handle assembly. Alkaline cells give 40 hours of continuous use at 20°C, without alarm. Battery condition displayed on digital display.
Dimensions	250 x 190 x 95 mm overall, including handle.
Weight	2.8 kg including batteries.
Standard Accessories	Clip-on shoulder strap for hands-free operation. Thorium test sample.
Optional Accessory	Foam-lined, fibre or metal carrying case.
Shipping Weight	Approximately 4 kg; 6 kg with carrying case.

SCINTREX

222 Snidercroft Road
Concord Ontario Canada
L4K 1B5

Telephone: (416) 669-2280
Cable: Scintrex Toronto
Telex: 06-964570

Geophysical and Geochemical
Instrumentation and Services

Ontario

(free - L565101) W8208Q0183 Lands

The Mining Ac

32D04SW0049 2.4761 GAUTHIER

900

Type of Survey(s)

VLF - EM AND Spectometer (Radiometric

Claim Ho[redacted]

R.A. MacGregor

Survey Company

Colex Explorations Inc.

Survey Dates (linecutting to office) Day 09 Mo. 81 Day 05 Mo. 82

K-15070

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

R.A. MacGregor, 134 Palace Dr., Sault Ste. Marie, Ontario P6B 5H5

Special Provisions Credits Requested

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

Man Days

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

Airborne Credits

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

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures $ ÷ 15 = Total Days Credits

Instructions

Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Report Completed

Date of Report May 3, 1982

Recorded Holder or Agent (Signature)

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	565101	
	565102	
	565103	
	565104	
	565105	
	565106	
	544734	
	544735	
	544736	
	544737	
	544738	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

RECEIVED

JUN 21 1982

MINING LANDS SECTION

LARDER LAKE MINING DIV.

RECEIVED

JUN - 1 1982

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

Revised Statement

Total number of mining claims covered by this report of work. 11

For Office Use Only

Total Days Cr. Recorded 440

Date Recorded JUN 1 1982

Date Approved as Recorded

Mining Recorder

Regional/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

R.A. MacGregor, Box 1110

SAULT STE. MARIE, Ontario

Date Certified May 3/82

Certified by (Signature)

1362 (81/2)

2.4761

183

1983 10 20

2.4761

Mr. George J. Koleszar
Mining Recorder
Ministry of Natural Resources
4 Government Road East
P.O. Box 984
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

RE: Geophysical (Electromagnetic and Radiometric) Survey on mining claims L 566101 et al in the Township of Gauthier 39D/4SW 17N-4007

The Geophysical (Electromagnetic & Radiometric) Survey assessment work credits as listed with my Notice of Intent dated September 14, 1983, have been approved as of the above date.

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

Yours very truly,

E.F. Anderson
Director
Land Management Branch

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

R. Pichette:mc

Encl.

cc: Colex Explorations Incorporated
134 Palace Drive
Sault Ste. Marie, Ontario
P6B 5H5
Attention: Mr. R. MacGregor

cc: Resident Geologist
Kirkland Lake, Ontario

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.4761

Date 1983 09 14

Mining Recorder's Report of Work No. 183

Recorded Holder: R.A. MAC GREGOR

Township or Area: GAUTHIER TOWNSHIP

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	For Electromagnetic only
Electromagnetic 20 days	L 565101 to 106 incl 544734 to 38 incl
Magnetometer ____ days	
Radiometric 20 days	For radiometric only
Induced polarization ____ days	L 565101 to 105 incl
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

For radiometric only

15 days credit

L 565106
544737

No credits have been allowed for the following mining claims

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

For radiometric only

L 544734 to 36 incl
544738

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

Oct 3, 1983

Your file: 183

1983 09 14

Our file: 2.4761

Mining Recorder
Ministry of Natural Resources
4 Government Road East
P.O. Box 984
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

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

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

R. Pichette:sc

Encls:

cc:Colex Explorations Incorporated
134 Palace Drive
Sault Ste. Marie, Ontario
P6B 5H5
Attention: Mr. R. MacGregor.

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

845 FILE

Ministry of Natural Resources

Ontario

Notice of Intent

for Technical Reports

1983 09 14

2.4761

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

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

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

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

Ministry of
Natural
Resources

Ontario

Your file:

Our file: 2.4761

August 19, 1983

MEMO: Roger Barlow
Chief Geophysics/Geochemistry Section
Ontario Geological Survey
77 Grenville Street 7th Floor

I am enclosing a file dealing with a radiometric survey submitted by Mr. R. A. MacGregor. Please note on the routing sheet that you requested a supplimentary outcrop map. Mr. MacGregor feels by stating the character of the ground where the reading was taken should be sufficient, (i.e. outcrop vs. swamp). Please review this again and inform me whether this type of format is acceptable.

F. W. Matthews
Mining Administrator
Mining Lands

FWM/as

Encl.

ok

August 4, 1983 2.4761

REGISTERED

Mr. R.A. MacGregor
134 Palace Drive
Sault Ste Marie, Ontario
P6B 5H5

Dear Sir:

RE: Geophysical (Electromagnetic & Radiometric) Survey submitted on Mining Claims L 565101 et al in the Township of Gauthier.

Enclosed is a copy of our letter dated February 14, 1983 requesting additional information for the above mentioned survey.

Unless you can provide the required data by August 18, 1983 the mining recorder will be directed to cancel the work credits recorded on June 1, 1982.

For further information, 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: 416/965-1380

S. Hurst:sc

Encls:

cc: Mining Recorder,
Kirkland Lake, Ontario

1983 02 14 2.4761

Mr. R.A. MacGregor
134 Palace Drive
Sault Ste. Marie, Ontario
P6B 5H5

Dear Sir:

RE: Geophysical (Electromagnetic & Radiometric) Survey submitted on Mining Claims L 565101 et al in the Township of Gauthier

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Radiometric surveys which are categorized as a geophysical survey must be supplemented by an outcrop map. Please forward such a map (in duplicate) to this office for the above mentioned survey.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

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

Diane Wice:sc

cc: Mining Recorder
Kirkland Lake, Ontario

Ministry of Natural Resources
Ontario

Geotechnical Report Approval

File 2.4761

Mining Lands Comments

- no outcrop map for Radiometric

☑ To: Geophysics

Comments Mr Barlow

- no outcrop maps for radiometric survey

☐ Approved ☐ Wish to see again with corrections | Date Jan 7/83 | Signature

☐ To: Geology - Expenditures

Comments

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

☐ To: Geochemistry

Comments

(1)

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

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

1593 (81/10)

1982 05 19 2.4761

Mining Recorder's Office
Ministry of Natural Resources
4 Government Road East
P.O. Box 984
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

We have received reports and maps for a Geophysical (Electromagnetic and Magnetometer) Survey submitted under Special Provisions (credit for Performance & Coverage) on Mining Claims L 544734 et al in the Township of Gauthier.

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

cc: Colex Explorations Inc.
Sault Ste. Marie, Ontario
Attention: Mr. R.A. MacGregor

FILE 2.4761

	Em	Rad.
L565101	✓	✓
102	✓	✓
103	✓	✓
104	✓	✓
105	✓	✓
106	✓	1/4
544734	✓	0
735	✓	0
736	✓	.0
737	✓	1/4
738	✓	0

Tlclam

ARNOLD TP. M.321

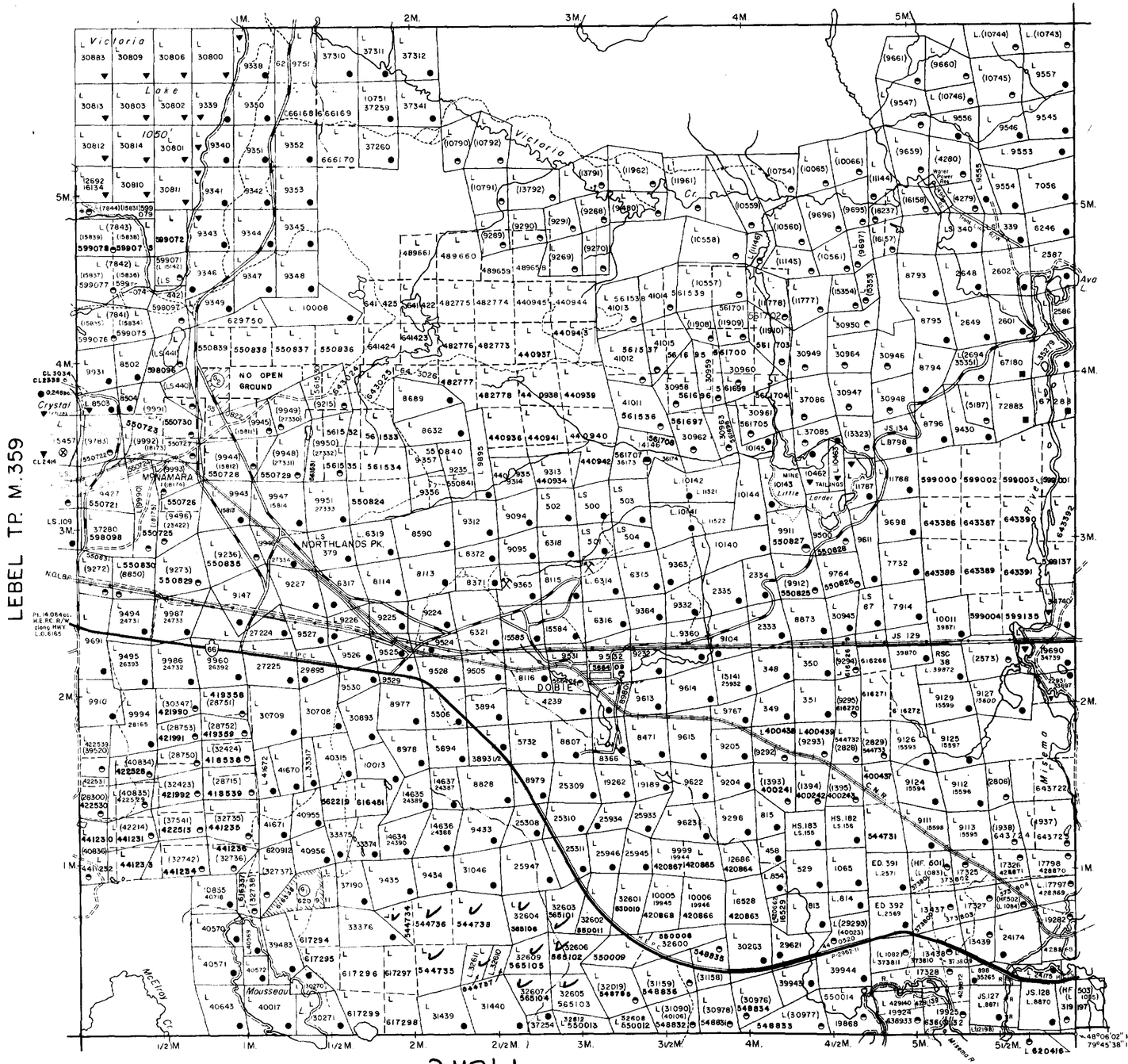
NOTES

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

SAND & GRAVEL

(S1) M.T.C. PIT No.1666 FILE 101421

(S2) M.T.C. PIT 3F-27



LEGEND

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

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT		SYMBOL
PATENT	SURFACE & MINING RIGHTS	●
"	SURFACE RIGHTS ONLY	◒
"	MINING RIGHTS ONLY	◓
LEASE	SURFACE & MINING RIGHTS	■
"	SURFACE RIGHTS ONLY	◨
"	MINING RIGHTS ONLY	◧
LICENCE OF OCCUPATION		▼
CROWN LAND SALE		C.S.
ORDER-IN-COUNCIL		OC
RESERVATION		⊛
CANCELLED		⊗
SAND & GRAVEL		⊛

SCALE : 1 INCH 40 CHAINS

FEET 0 500 1000 2000 4000 6000 8000

METRES 0 200 400 600 800 1 KM 2 KM

ACRES	HECTARES
40	16

TOWNSHIP

GAUTHIER

DISTRICT
TIMISKAMING

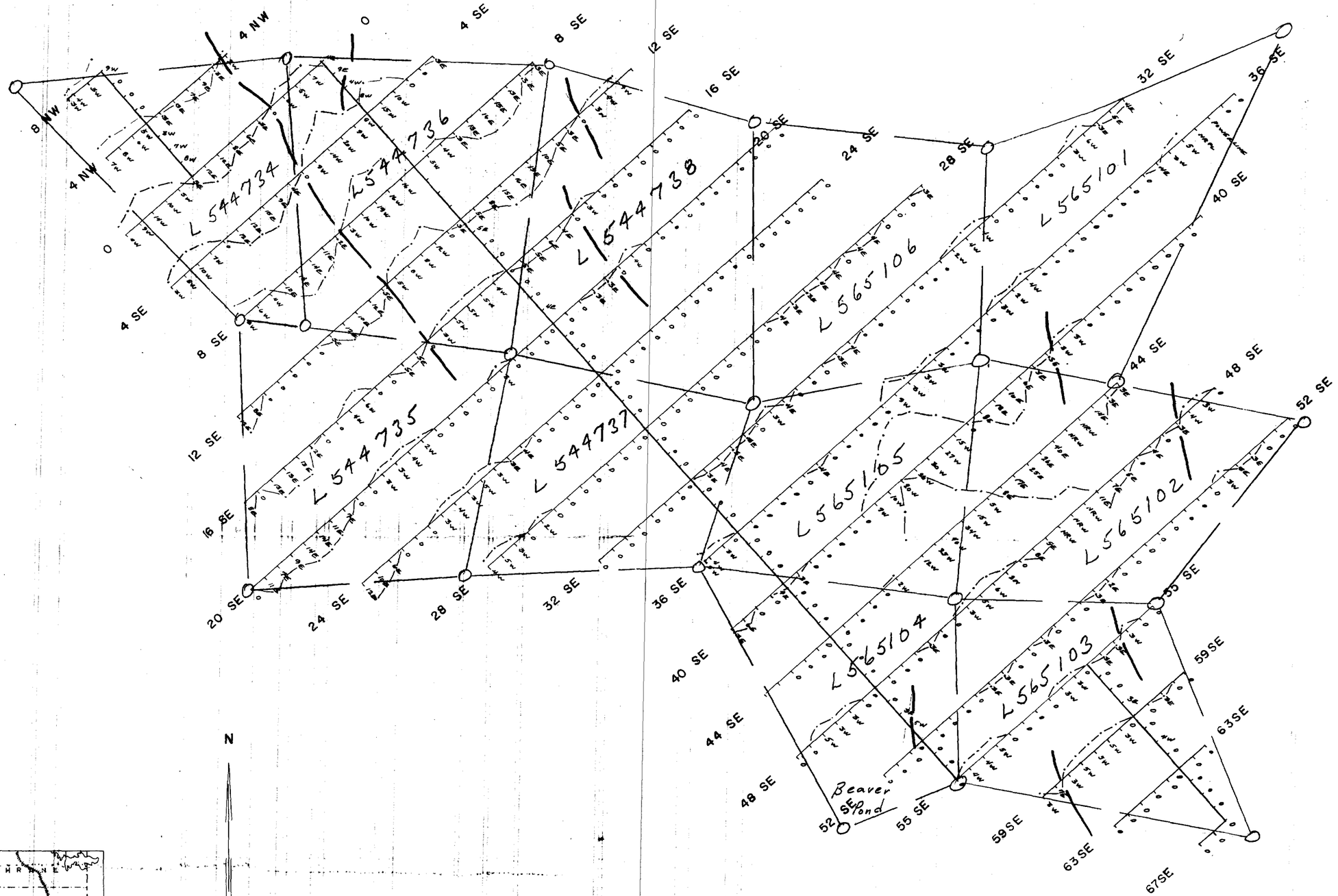
MINING DIVISION
LARDER LAKE

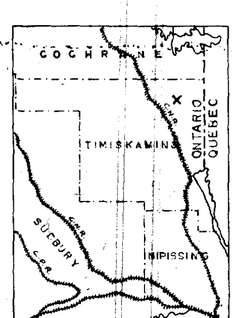
Ministry of Natural Resources
Ontario — Surveys and Mapping Branch

Date JAN. 1973
Whitney Block
Queen's Park, Toronto

Plan No. M.350

2.4761



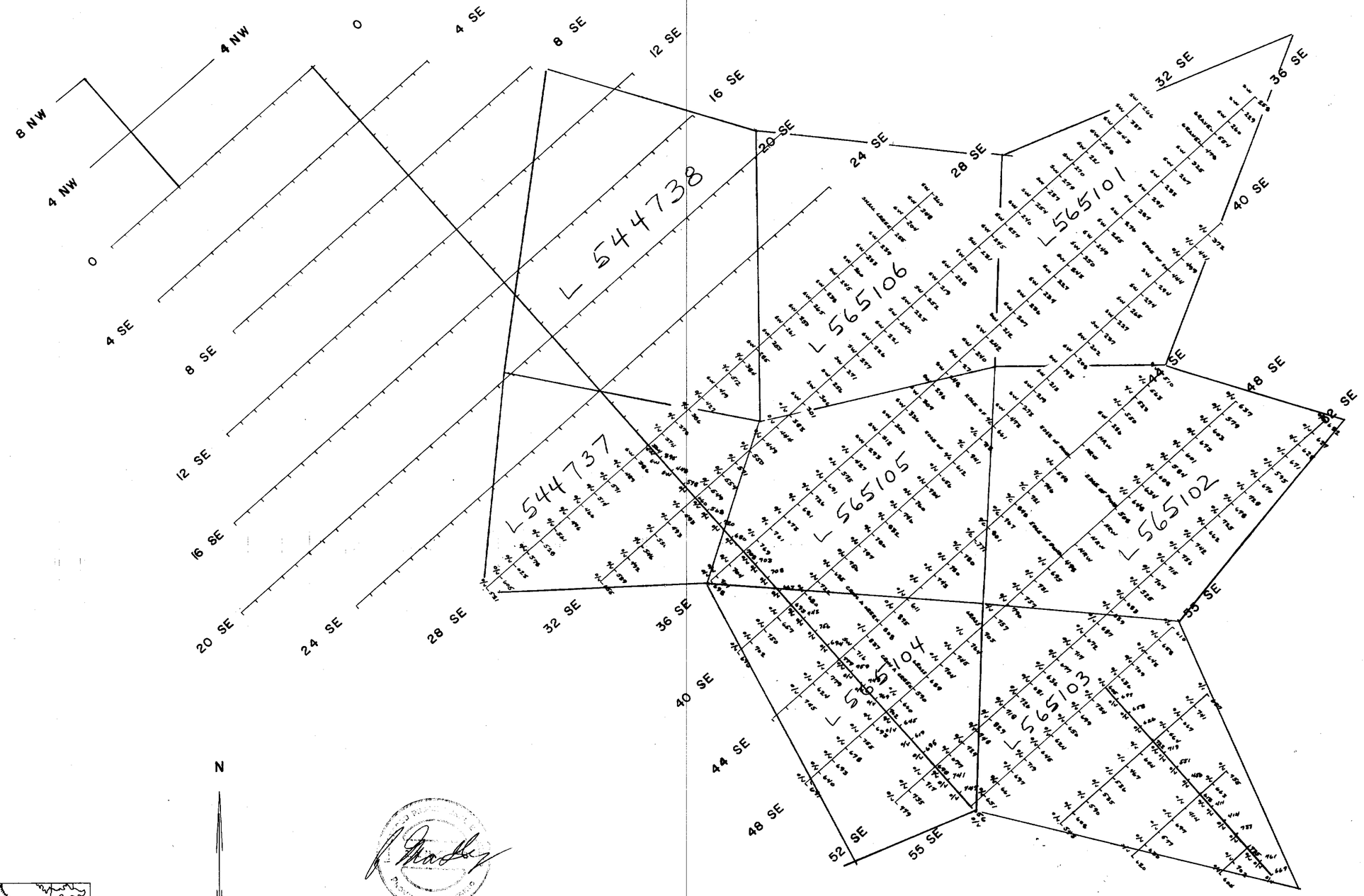


VLF - EM SURVEY
GAUTHIER SOUTH GRID
GAUTHIER TOWNSHIP
SCALE 1"= 400'

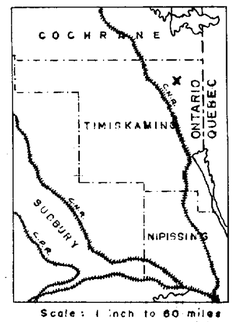
INSTRUMENT: PHOENIX VLF-2
STATION: ANNAPOLIS, MARYLAND (21.4 KHz)

REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

2.4761



N



Scale: 1 inch to 60 miles

RADIOMETRIC SURVEY
GAUTHIER SOUTH GRID
GAUTHIER TOWNSHIP
SCALE 1"= 400'

INSTRUMENT: SCINTREX GIS-5
TOTAL COUNT
READING TIME - 10 SECONDS