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GAME LAKE PROJECT

BRIDGES TOWNSHIP, ONTARIO

N.T.S. 52-F-7

July, 1986

H. Beckmann

N.T.S. 52-F-13

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REPORT ON A VLF-EM SURVEY

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INTRODUCTION

An examination of reported mineral showings in the Game Lake area of Bridges Township indicated that the mineralization was in fact conductive (less resistive) as well as magnetic.

Following the establishment of an extensive metric grid in January 1985, a dual frequency horizontal loop max-min EM survey was carried out at a coil seperation of 150 metres to gain penetration and to search for massive sulphide concentrations.

At the same time, a reconnaissance IP survey was attempted to gather information on less conductive mineral targets; but, the data was unreliable due to the very high contact resistances of the frozen ground. Since some of the targets are under or adjacent to fairly deep lakes it would also be difficult to do such a survey at any other time.

A combined VLF-EM and total field magnetometer survey carried out in February-March 1985 did provide additional information.

This report describes the results and the interpretation of the VLF-EM survey employing the Scintrex IGS-2 integrated geophysical system.

LOCATION AND ACCESS

The property was staked on behalf and is held in good standing by Rio Algom Exploration Inc. It consists of 52 contiguous mineral claims numbered K803827, K803829 to K803841 inclusive, K803843 and K803844, K818145 to K818162 inclusive, K818165 to K818168 inclusive and K818170 to K818183 inclusive.

The claims are located in the west central part of Bridges Township, Kenora Mining Division, approximately 25 kilometres west of Vermilion Bay, Ontario as shown on the Location map Dwg. - L2877.

Access is gained via Highway No. 17 which passes through the southern part of the claim block.

GENERAL GEOLOGY

Map 2303 published by the Ministry of Natural Resources shows the geological setting of Bridges and Docker Townships at a scale of ½ mile per 1 inch as mapped in 1968 by A.P. Pryslak.

The original showing located by Noranda is also well described by A.P. Pryslak on pages 46 to 48 of the Geoscience Report 130, Geology of the Bruin Lake - Edison Lake Area, District of Kenora.

Aeromagnetic Map 1171G "Feist Lake" N.T.S.52-F-13 shows a noticeable positive magnetic trend north and west of Game Lake within the area covered by this survey.

PREVIOUS WORK

A rusty sulphide zone containing minor sphalerite, chalcopyrite, galena, gold, silver, pyrite-pyrrhotite and magnetite was located by a prospector employed by Noranda Mines in 1967.

Limited geophysical surveys lead to five test drill holes by Noranda in 1969 the results of which are available in the assessment files.

SURVEY PROCEDURE

VLF-EM Survey

A Scintrex IGS-2 integrated geophysical system was employed for this survey carried out in combination with a total field magnetometer survey during the period of March 2 to March 19, 1985 by D. N. Sexsmith, a member of the geophysical staff of Rio Algom Exploration Inc.

The IGS-2 consists of a battery powered field compatible microprocessor, programmed to operate a variety of geophysical sensors, either individually or in combination and to record, edit, correct, print and or plot data obtained from such sensors or manually entered by the operator.

This particular survey combined the MP-4 proton magnetometer with the VLF-4 receiver.

Tuned to the Seattle, Washington station NLK at 24.8 KHz, the instrument measures the horizontal amplitude, the vertical in-phase and the vertical quadrature component of the VLF magnetic field, it has a range of ± 150% and a resolution of 1% or less.

Daily data retreival provided a suitable print out of profiles and "Fraser Filter" values for field analysis.

Throughout, readings were obtained on an in-line spacing of 12.5 metres for a total of 6088 readings on 74.85 line kilometres.

Upon completion of the survey all data were forwarded to Toronto for clean presentation, contouring and interpretation.

PRESENTATION AND DISCUSSION OF RESULTS

The VLF-EM survey data was profiled to provide not only information on the anomaly amplitude, in-phase to quadrature ratios, potential depth and dip of the detected source but also to aid the overall structural interpretation of the area.

The profiles are presented on Drawings E-4823-1 and 2 and E-3831 at a scale of 1:2500. While the contoured "Fraser Filter" values of the in-phase component are shown on Drawings F-4825-1, 2 and F-3833.

An attempt was made to utilize the recorded field strength. While this is feasible on a line to line basis, it was found that the actual transmitter signal varies in strength over time and monitoring on the base station recorder would be necessary in order to apply corrections.

As expected, local VLF conduction is widespread, no doubt in part influenced by the rugged topography of the area. It ranges from short strike-length anomalies with indicated bedrock or surficial sources to formational conductive horizons along projected shear zones or contacts, with or without direct magnetic correlation.

Three formational VLF conductive horizons stand out, they have been traced over a considerable east-west strike length and all follow pronounced topographical lows.

The southern horizon correlates with the known mineralized shear zone and while the central part of this zone appears to be confined to a single conductor, but not necessarily to a single source, dual, parallel conduction is indicated at the eastern and in particular the western end of the horizon. Just how much this can be attributed to the influence of topography remains to be seen since very few conductor segments have actual negative quadrature correlation and these are mostly under lakes. Of the three conductor segments that display direct magnetic correlation, two actually are on or near the exposed mineral showings.

The second, central formational conductive zone follows a horizon which is also magnetically very active. The detected conductivity is not nearly as strong but perhaps dual over a wider shear and more fragmented. As such it might be a better target for precious metals associated with minor sulphides in a sheared environment.

The third formational VLF conductive zone follows a topographical low of a stream leading into the northwestern tip of Game Lake. Although the area displays considerable magnetic activity, this is attributed to the more mafic volcanic setting and not as the source of the VLF conduction.

Apparent surficial VLF conduction is indicated under the western bay of Game Lake which might also explain the low amplitude max-min conduction in the same area.

CONCLUSION

Fortunately there is sufficient outcrop on the property for a detailed mapping programme to examine the conductive trends more closely and to explain some of the magnetic anomalies but it would be beneficial to have a VLF unit handy while mapping.

RECOMMENDATION

Following the mapping programme, selective IP surveys should be reconsidered if the work can be done during the summer season knowing full well that the topography will also influence the IP results.

July 25, 1986

H. Beckmann

H. Beckmann

July, 1986
HB/sw

CERTIFICATE

I, HERWART K. F. BECKMANN, of the County of Peel, City of Mississauga, Province of Ontario do hereby certify:

1. That I am a geophysical technician and reside at 1086 Albertson Crescent, Mississauga, Ontario.

2. That I graduated from the Radio College of Canada at Montreal in 1955 with a degree in Electronic Engineering.

3. That I am a member of the European Association of Exploration Geophysicists.

4. That I am an associated member of the American Society of Exploration Geophysicists.

5. That I have been practising my profession for a period of twenty-five years.

6. That I am employed by Rio Algom Exploration Inc., as Geophysicist, Eastern Region.

7. That I supervised this survey.

July 25, 1986
Date

H. Beckmann

H. Beckmann
Geophysicst Eastern Region

SCINTREX IGS

Integrated Portable Geophysical System

Scintrex has used low power consumption microprocessors and high density memory chips to create the IGS Integrated Portable Geophysical System; instrumentation which will change the way you do ground geophysics.

Here are the main benefits which you will derive from the IGS family of instrumentation:

1. You will save time and money in the acquisition, processing and presentation of ground geophysical survey data.

2. You will achieve an improvement in the quality of data through enhanced reading resolution, an increase in the number of different parameters measured and/or a higher density of observations.

3. Your operator will appreciate the simplicity of operation achieved through automation.

4. Since add-on sensors are relatively less expensive, your investment in a range of IGS instrumentation may be much less than it would be with a number of different instruments, each dedicated to a different measurement.

The Scintrex IGS-2/MP-4/VLF-4 permits one operator to efficiently measure both magnetic and VLF fields and to record data in computer compatible solid-state memory.

Description

The heart of this system is the IGS-2 System Control Console which contains a powerful CMOS microprocessor, EPROM and RAM memory and peripheral electronics which permit a single operator to execute three major functions. First, he can control a variety of sensors, either individually or in certain combinations. Second, at the push of a button, he can record data in solid-state memory. Then, at the end of a day's surveying, he can use the IGS to playback, calculate, list and plot data on a simple digital printer, often to report level quality.

Alone, the IGS-2 System Control Console is an electronic notebook into which geophysical, geological or other data may be manually entered. With the addition of an inexpensive conversion kit it can be used to record data directly from older generation magnetometers such as the Scintrex MP-2. Most importantly, however, especially designed IGS Sensor Options can be selected which permit the IGS-2 to become a magnetometer or a VLF receiver, or both.

Many Applications

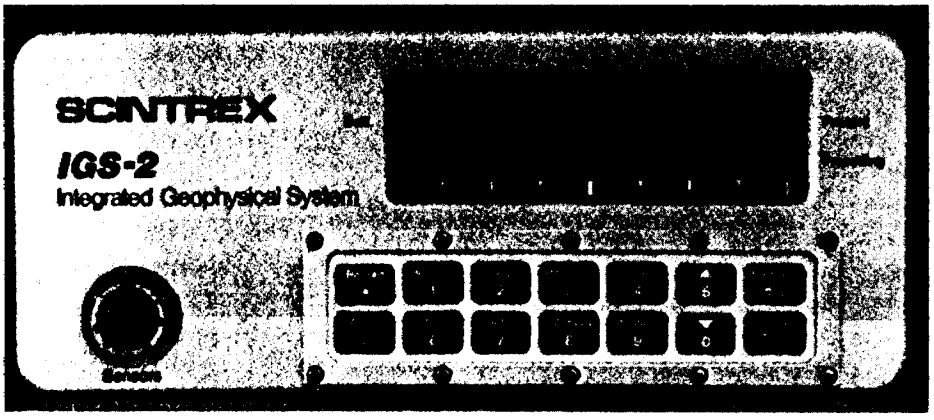
IGS-2. Alone, the System Control Console can be used for manual entry and storage of data. For example, electromagnetic, gravity or other information can be entered along with station coordinates and time for later outputting as listings or profiles on a digital printer, to a microcomputer, magnetic tape recorder or modem.

IGS-2/MP-2. A proton magnetometer such as the Scintrex MP-2 can be attached to the IGS-2 Console for automatic recording of the magnetometer outputs in the solid-state memory of the IGS-2. In this way an existing investment can be utilized, albeit at the expense of additional weight and degraded resolution, compared to the Scintrex MP-3 or IGS-2/MP-4 Magnetometers. For this application the Conversion Kit for Standard Proton Magnetometers must be purchased. This option consists of external mounting brackets for the magnetometer, a cable and a minor modification to the magnetometer.

IGS-2/MP-4. The MP-4 Proton Magnetometer Sensor Option can be added to the IGS-2 System Control Console. This IGS-2/MP-4 combination is a 0.1 gamma magnetometer and/or vertical gradiometer with a performance identical to the Scintrex MP-3 Proton Magnetometer.

IGS-2/VLF-4. The IGS-2 can be used for VLF electromagnetic measurements by the addition of the VLF-4 VLF Electromagnetic Sensor Option. The combination, designated as IGS-2/VLF-4, performs identically to the Scintrex VLF-3.

IGS-2/MP-4/VLF-4. The MP-4 and VLF-4 Sensor Options can be employed simultaneously with the IGS-2, to permit one operator to efficiently carry out both magnetometer and VLF surveying. This combining of sensors is not possible with the MP-3 and VLF-3 instruments unless they are returned to Scintrex for upgrading.



MP-4 Proton Magnetometer Sensor Option

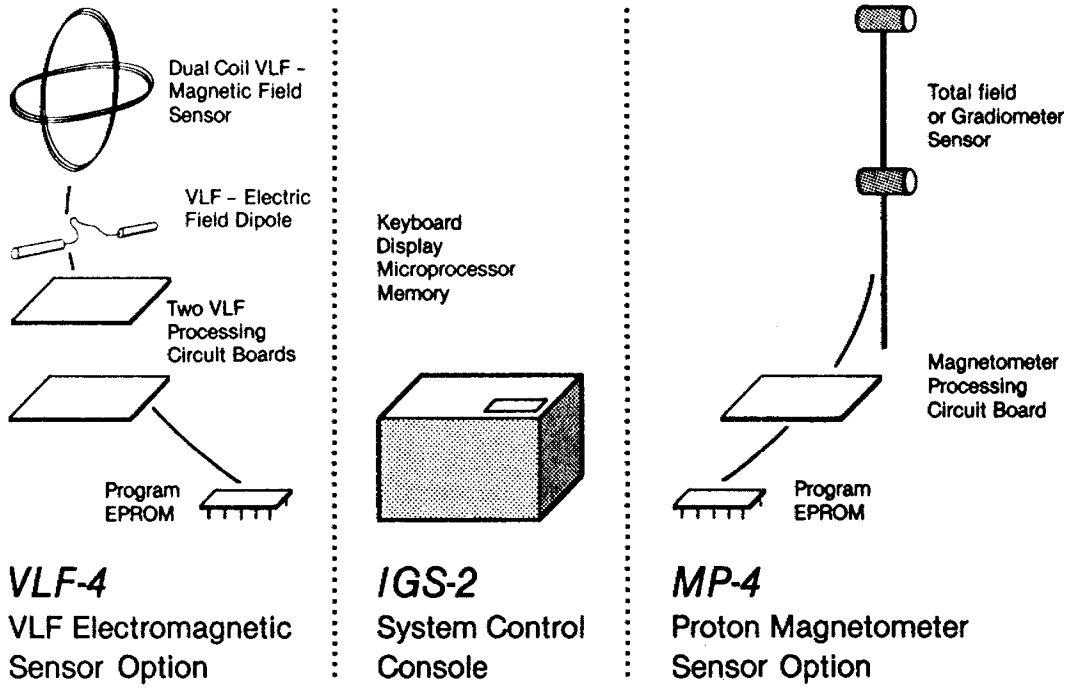
The MP-4 Proton Magnetometer Sensor Option consists of: 1) a choice of portable, base station or gradiometer sensors, 2) an electronic circuit board, and 3) a program EPROM. The circuit board and EPROM can be installed inside an IGS-2 Console either at the Scintrex plant or by the end user. The resulting IGS-2/MP-4 combination has a performance identical to the MP-3 Proton Magnetometer which is fully described in another Scintrex brochure. The advantage that the IGS-2/MP-4 has over the MP-3 is that it is designed to permit the additional use of a VLF sensor.

VLF-4 VLF Electromagnetic Sensor Option

The VLF-4 VLF Electromagnetic Sensor Option can be used with the IGS-2 or with the IGS-2/MP-4 combination for VLF surveying. This standard option consists of: 1) a dual coil backpack mounted sensor for VLF-magnetic measurements, 2) two electronic circuit boards, and 3) a program EPROM. An additional choice is to add a dipole with capacitive electrodes in order to measure VLF-electric fields. The circuit boards and EPROM are easily installed inside the IGS Console. The combination designated as IGS-2/VLF-4 functions identically to the Scintrex VLF-3 VLF Electromagnetic Receiver which is the subject of another Scintrex brochure. While the VLF-3 is dedicated to VLF measurements, the owner of an IGS-2 based system can later add an MP-4 Proton Magnetometer Sensor Option for use with the IGS-2, with or without the VLF-4.

Description

Block diagram showing how the IGS-2 can be complemented by VLF-4 and MP-4 options to function as a VLF receiver and/or magnetometer.



VLF-4
VLF Electromagnetic Sensor Option

IGS-2
System Control Console

MP-4
Proton Magnetometer Sensor Option

Summary of Important Features of Scintrex MP-3, VLF-3 and IGS Based Instrumentation

Common Features

- Simple operation via keypad
- 32 character LCD display
- Displays present and previous data
- Alarm and warning messages ensure data quality
- 'Speaks' any language with Latin characters
- Solid-state memory expandable to hold several days' data
- Records actual coordinates
- Records time
- Records header information
- Records ancillary data
- Permits revision of data
- Outputs to commonly available printers, modems, tape recorders and microcomputers
- Prints data lists and plots profiles directly on a digital printer
- Organizes data by grid, line and station number, regardless of the order in which data were taken
- Several power supply options
- Wide operating temperature range

Magnetics

Additional features found in both MP-3 and IGS-2/MP-4.

- 0.1 gamma resolution over 20K to 100K gamma range
- Total field and vertical gradient measurements
- High gradient tolerance
- Same console for portable, base station or mobile survey applications
- Keyboard selectable automatic or manual tuning
- Automatic diurnal correction without a microcomputer

Additional features found only in IGS-2/MP-4.

- The VLF-4 VLF Electromagnetic Sensor Option can be added so that one operator can make both magnetic and VLF readings

VLF

Additional features found in both VLF-3 and IGS-2/VLF-4.

- Measures both VLF-magnetic and VLF-electric fields
- Values are normalized by the horizontal vector amplitude, to overcome errors due to varying primary field strengths
- Calculates resistivity and phase angle
- Digital tuning to any VLF station
- Automatic measurement of up to three VLF stations
- Automatic tilt compensation
- Signal/noise enhancement through automatic signal stacking
- Automatic gain adjustment

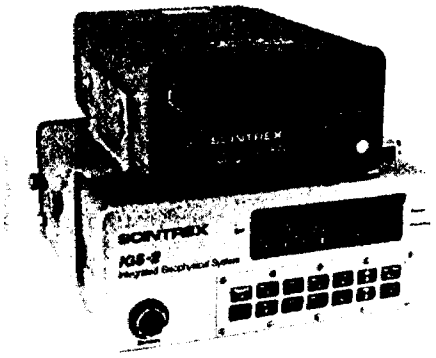
Additional feature found only in IGS-2/VLF-4

- The MP-4 Proton Magnetometer Sensor Option can be added so that one operator can make both magnetic and VLF readings

IGS-2

Features

Choice of sensors. The IGS-2 can be used alone as an electronic notebook or it can automatically record data from magnetometer and/or VLF sensors. This flexibility allows the instrument to be configured for most efficient use and keeps your investment in instrumentation low, compared to purchasing a variety of dedicated instruments.



When the Conversion Kit for Standard Proton Magnetometers is used, the IGS-2 can be used to enhance the utility of earlier magnetometers.

Intelligent microprocessor. Due to its software controlled, microprocessor based design, the IGS-2 can be configured to fulfill a wide variety of tasks in ground geophysical surveying. In addition to controlling measurement and storage of data, the microprocessor's intelligence is used to process it. For example, from measured VLF EM parameters, the IGS-2 can calculate resistivity and phase angle then output these values as listings or profiles, direct to a digital printer.

Simple keypad operation. The 14 keys permit numbers or commands to be entered. With few keystrokes, numerous operations are performed on this weather and dirtproof keypad. For example, in routine surveys as few as two keys have to be pressed to increment the station coordinates, measure and file data in memory.

Every keystroke engenders an "echo" from the display for simple, unambiguous operation. To maintain a positive tactile feel when keys are depressed, a flexible diaphragm covers the keyboard. If this wears out, it can be easily replaced by removing a few screws.

32 character LCD display. Messages and data are spelled out unambiguously in two lines of 16 characters each, on a display which is highly visible in either bright sunlight or in dim conditions. In some applications, such as VLF, the display is also used in a pseudo-analog fashion to facilitate operation.

Displays present and previous data. After a measurement, the newly acquired data value is shown in the upper line of the display while the value for the previous station is shown in the bottom line. This allows the operator to compare values, an important consideration in maintaining data quality. For example, if the difference between the readings is great, he can decide to verify the new measurement and/or to return to an intermediate station for a fill-in value.

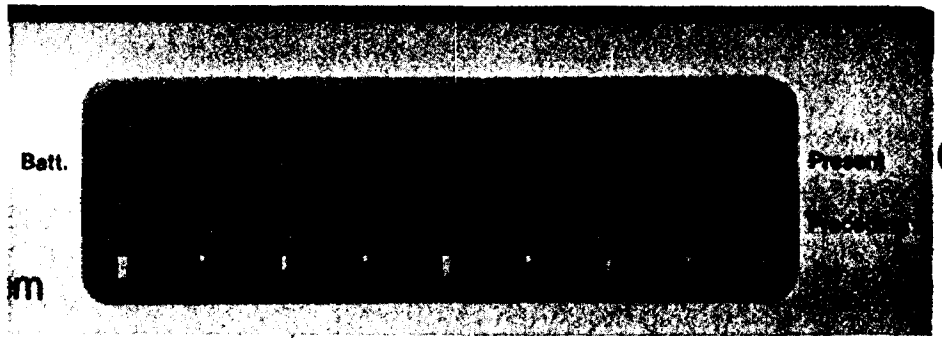
Alarm messages ensure data quality. The IGS-2 will warn you about improper measurement conditions by displaying warnings on the LCD display. The actual warnings depend upon the sensors used.

Speaks your language. The IGS-2 can 'speak' a number of languages, provided they use Latin characters. Unless another language is specified, the IGS-2 is delivered with the capablity of displaying messages in either English or French, at the choice of the operator. If another language is required, this can be easily supplied, in conjunction with English.

Computer compatible data recording. The IGS-2 records header information, observed values, station number, line number and time for each observation. The standard, internal 16K RAM solid-state memory is large enough for storage of a full day of data in most applications.

Memory expansion. To store more data on existing circuit boards, the memory can be expanded in 16K RAM increments to a maximum of 48K RAM. A further expansion, requiring an additional circuit board, can be made to raise the total memory capacity to 144K RAM. In some special configurations the memory can be additionally expanded to a total of 192K RAM.

The IGS-2 can be supplied with the ability to display messages in English plus any language using Latin characters.



Features

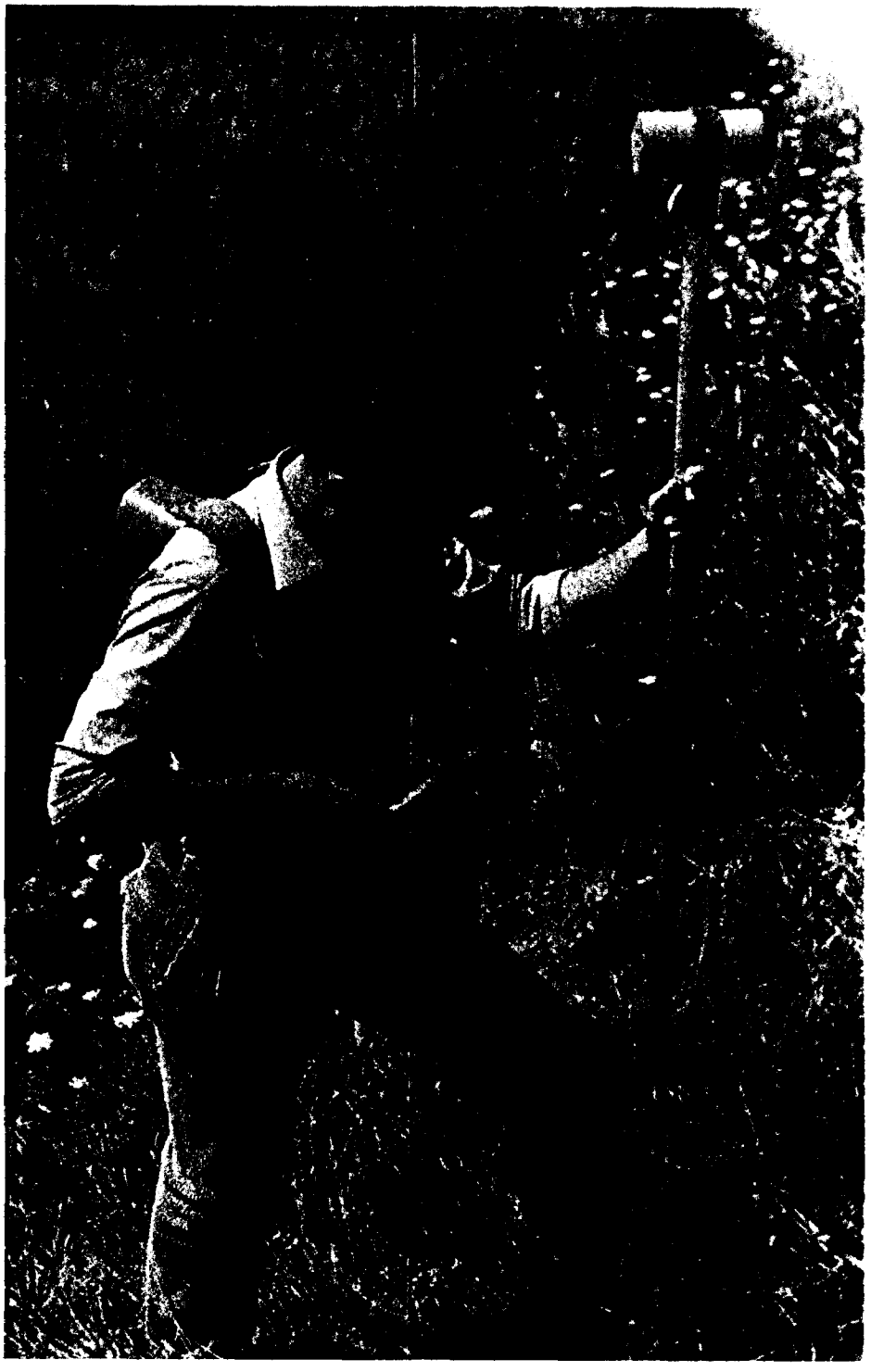
Fail-safe memory. The percentage of free memory can be displayed at any time, after two keystrokes. The memory can only be erased by a series of keystrokes which would be virtually impossible to duplicate accidentally. If the IGS-2 battery pack becomes discharged or is removed, there is no loss of data in memory since a set of built-in miniature batteries, charged from the main batteries, keep the memory intact for weeks. Additionally, the IGS-2 has been environmentally tested to be sure that the memory storage will be safe under all vibration, temperature and humidity conditions.

Records actual coordinates. Time and station numbers can be displayed and recorded as numbers of up to 5 digits with a decimal point at any location. Exact coordinates down to 1 unit, such as a meter or a foot, can therefore be recorded.

By pushing a few keys, the MP-3 can be initialized with the nominal line and station intervals to be used on the survey. Then, by pushing the proper keys, the line and/or station numbers can be either incremented or decremented by the initialized intervals. If a reading is to be taken at a different station interval and/or off one of the nominal profiles, then the actual coordinates of the observation point are easily entered. Line and station coordinates are automatically recorded each time an observation is filed, for accuracy and ease in data processing.

Choice of grid system. Both line and station coordinates can be recorded either as compass directions (N, S, E, or W) or as Cartesian coordinates using positive and negative signs.

Records time. When each measured value is filed in memory, the time is recorded so that, for example, diurnal magnetic corrections can be made by comparing data from portable and base station magnetometers. The clock built into the IGS-2 shows day, month and year as well as hour, minute and second. It is accurate to one second over 12 hours over the full operating temperature range of the instrument. It is easily reset, if required. Time can be shown on the display, after two keystrokes.



Features

Records header information. At the beginning of a survey, or of a day of surveying, header information such as: 1) instrument serial number, 2) grid number, 3) job number, 4) date and 5) operator code can be entered into the IGS-2. When data are output, this header information is repeated at the beginning of the data list or profile for each line, to ensure that all data are properly and unambiguously labelled.

Accepts ancillary data. In addition to automatically recorded geophysical parameters such as magnetometer and VLF values, a great deal of ancillary data can be manually entered. Such data is entered in up to eight blocks of up to five digit, signed decimal numbers. This feature means that the IGS-2 is useful, without any sensor installed, as an electronic notebook.

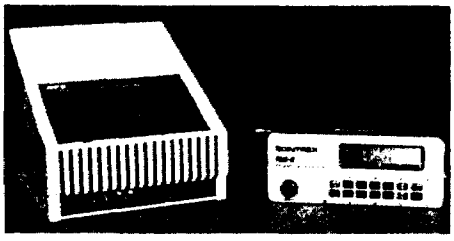
Recalls data. By keystroke entry, any recorded value can be called up on the display. For example, over an anomaly it might be useful to compare values recorded on an adjacent line. To do this, the operator enters the adjacent line and station numbers and depresses a memory key. Instantly, the recalled value appears on the lower line of the display. Once one value is recalled, he can move up or down the line recalling data, station by station, with a single keystroke per station.

Permits revision of data. It is not necessary to record every measured value. Several readings can be taken before one is selected for recording. Alternatively, more than one value can be recorded with identical coordinates at different times.

To change information already in the memory, the Edit Mode can be used to change line and station numbers or header data. If it is desired to repeat a measurement, a new reading can be recorded and the old one deleted.

Outputs to many peripheral devices. The RS-232C port of the IGS-2 plus keypad selectable baud rates and carriage return delays, permit data to be output to many commonly available devices. A digital printer can be used to print data as listings or as profile plots. A modem can be used to transmit data from the IGS-2 to head office via a telephone line or a magnetic tape recorder can store data for future computer processing.

The IGS-2 can output its data directly into portable microcomputers so that data archiving on floppy disk or additional processing can be done in the field. Some microcomputers with which the IGS-2 has been interfaced include Apple IIe, Apple III, Osborne, IBM PC and HP-85. Several data dumps can be made sequentially from the IGS-2 memory.



When the IGS-2 data are output to a cassette recorder, they are stored in a computer compatible medium for future processing.

Simple, automatic field plots. To plot data in the field, you do not need a computer. A printer is all that is required to output header information as well as data listings or profile plots. This immediate, error-free output enhances in-field quality control and saves time and effort, compared to manual data compilation.

When pseudo-analog profiles are output onto a printer, any two parameters can be selected for simultaneous plot printing. One of five full scale sensitivities can be selected for each profile. The scales can be either zero centered or have their zero at the left-hand side of the space allotted to the profile. In the profile displays, the actual station numbers and data values are also printed numerically.

In some cases, these digital printer outputs may be sufficient for presentation in reports, eliminating the expense of further data processing or drafting.

Examples of data listings and plots of magnetic and VLF data respectively, are given in the Scintrex MP-4 and VLF-4 brochures.

Organizes data. When the IGS-2 outputs its data, whether as listings or profiles, they are first sorted by grid number, then in order of increasing line number and, within each line, by increasing station number. In this way the data are properly organized, regardless of the sequence in which they were taken, for easy comparison. For example, printer output profiles can be easily 'stacked' by placing them side by side.

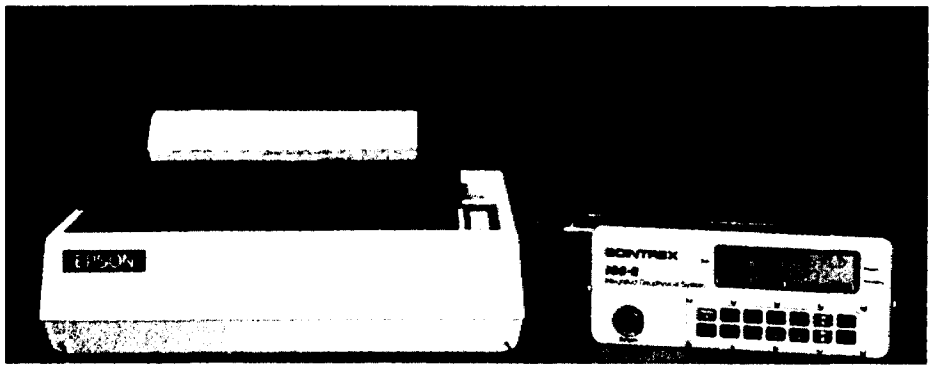
Four power supply options. For base station magnetometry the IGS-2 can be powered from a 12 V DC external source such as a vehicle battery or from a specially designed Heavy Duty Rechargeable Battery Pack with built-in charger. For portable applications, the Non-rechargeable Battery Pack includes a battery holder and 10 disposable C cell batteries. The Rechargeable Battery Pack is entirely non-magnetic and so is recommended for most magnetometer applications as well as for work at low temperatures.

Fail-safe power supply. The battery voltage can be checked anytime to be sure that there is enough power left. When the batteries are almost exhausted, a warning indicator will appear on the display during a measurement. If the batteries are not replaced or recharged, then the IGS-2 will eventually stop measuring in order to eliminate the chance of corrupted data being measured and recorded.

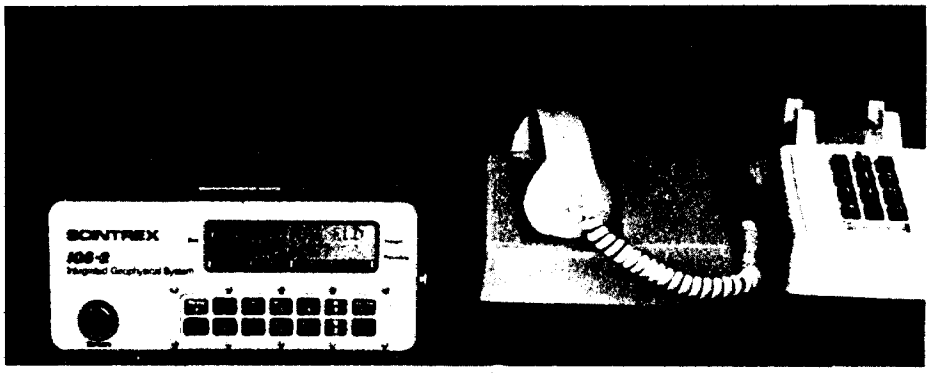
Energy efficient solar panel. An optional Solar Panel Power Source can be used to charge the Rechargeable Battery Pack. This lightweight device is ideal for areas where grid power is not available or where a motor-generator is too cumbersome to transport or is unwanted because of its noise.

Wide operating temperature range. All IGS-2 specifications are met over the range -40°C to +50°C. For use below -20°C, the Display Heater Option and Rechargeable Battery Pack should be ordered when the IGS-2 is purchased, although these can be installed later, at greater cost.

Technical Description of the IGS-2 System Control Console



Coupled directly to a digital printer, the IGS-2 can output data as listings or profiles.



A modem unit can be used to transmit data directly from the IGS-2 to head office over a telephone line.

A microcomputer such as the Apple IIe, Apple III, HP-85, IBM PC or Osborne can be interfaced with the IGS-2 for archiving or processing data.

Standard Control Console Specifications

Digital Display
32 character, 2 line LCD display

Keyboard Input
14 keys for entering all commands, coordinates, header and ancillary information.

Languages
English plus French is standard.

Standard Memory
16K RAM. More than sufficient for a day's data in most applications.

Clock
Real time clock with day, month, year, hour, minute and second. One second resolution, ± 1 second stability over 12 hours. Needs keyboard initialization only after battery replacement.

Digital Data Output
RS-232C serial interface for digital printer, modem, microcomputer or cassette tape recorder. Data outputs in 7 bit ASCII, no parity format. Baud rate is keyboard selectable at 110, 300, 600 and 1200 baud. Carriage return delay is keyboard selectable in increments of one from 0 through 999. Handshaking is done through X-on/X-off protocol.

Trigger Output
Allows IGS-2 to act as a master for other instrumentation.

Analog Output
For a strip chart recorder. 0 to 999 mV full scale with keyboard selectable sensitivities of 10, 100 or 1000 units full scale.

Console Dimensions
240 x 90 x 240 mm includes mounted battery pack.

Weights
Console: 2.2 kg
Console with Non-rechargeable Battery Pack: 3.2 kg.
Console with Rechargeable Battery Pack: 3.6 kg.

Operating Temperature Range
-40°C to +50°C provided optional Display Heater is used below -20°C.

Technical Description of the IGS-2 System Control Console

Power Requirements
Can be powered by external 12 V DC or one of the Battery Pack Options listed below.

Sensor Options

MP-4 Proton Magnetometer Sensor Option
Can be used with IGS-2 or IGS-2/VLF-4 to make total field and vertical gradient magnetic measurements.

VLF-4 VLF Electromagnetic Sensor Option
Can be used with IGS-2 or IGS-2/MP-4 to make VLF-magnetic and VLF-electric field measurements.

Conversion Kit for Standard Proton Magnetometers
Consists of brackets for mounting a magnetometer such as the Scintrex MP-2 on the IGS-2 Console, a cable and a minor modification to the magnetometer.

Battery Pack Options

Battery Pack lifetime depends on which Battery Pack is selected, sensor(s) used, reading time and ambient temperature. Life expectancy would be 1 to 10, eight hour survey days.

Non-Rechargeable Battery Pack
Includes battery holder and 10 disposable 'C' cell batteries for installation on console. Used in low sensitivity total field magnetometry or VLF in temperatures above 0°C. Weight is 0.9 kg.

Rechargeable Battery Pack and Charger
Includes battery holder, 6 rechargeable, non-magnetic, sealed lead-acid batteries and charger for installation on console. Best for high sensitivity total field measurements, all gradient measurements and operation below 0°C. Pack weighs 1.3 kg. Charger specifications are: 140 x 95 x 65 mm, 115/230 V AC, 50/60Hz, 20 VA, overload protected.

Heavy Duty Rechargeable Battery Pack
Includes heavy duty rechargeable batteries installed in a console with a built-in charger. Used for rapid cycling base station or mobile applications. Total weight is 7.6 kg. Dimensions are 240x 90 x 240 mm. Power requirements: 115/230 V AC, 50/60 Hz, 20 VA. Overload protected.

Optional Accessories

Language Options
In addition to English, a second language using Latin characters can replace French.

RS-232 Cable and Adapter
Used for communicating between IGS-2 and peripheral devices such as an MP-3 magnetometer, a second IGS-2, digital printer, microcomputer, cassette recorder or modem.

Minor Spare Parts Kit
Includes 2 keyboard diaphragms and 2 fuses.

Carrying Cases
A variety of carrying cases is available to suit different combinations of console and sensor options.

Display Heater
Required for cold weather operation. Powered by main batteries, thermostatically controlled to turn off above -20°C.

Solar Panel Power Source
The panel measures 30 x 550 x 550 mm. Self-contained circuits output 14 V DC to charge the batteries. For rapid charging, two sources can be used in parallel.

Peripheral Devices
Scintrex is prepared to recommend or supply digital printers, modems, cassette tape recorders, analog recorders and microcomputers with software.

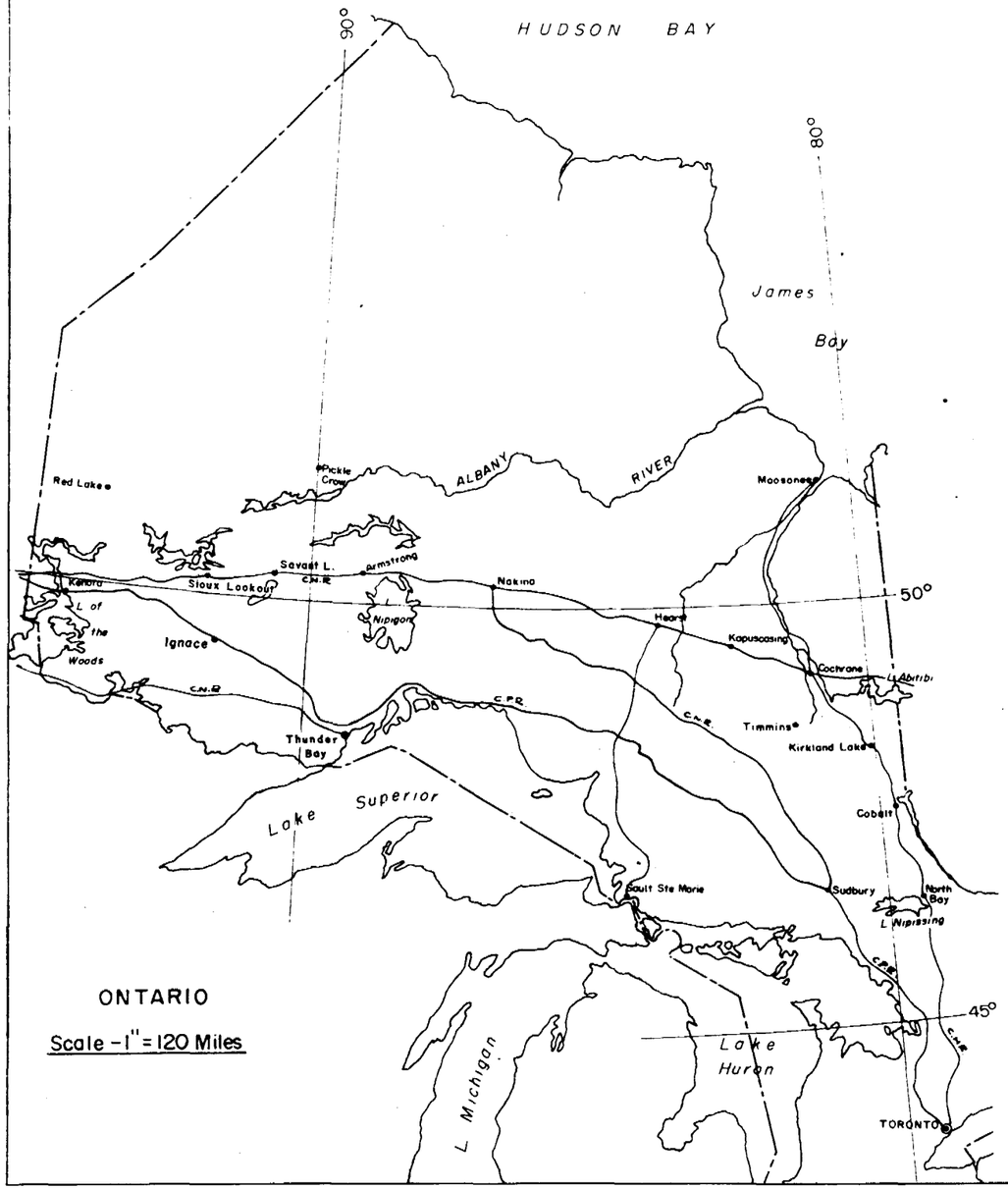
Memory Expansion
IGS Memory Expansion I increases memory to 32K RAM. Expansion II increases memory to 48K RAM. Expansion III permits a system total of up to 144K RAM. Further expansion to 192K RAM is feasible for some applications.

SCINTREX

222 Snidercroft Road
Concord Ontario Canada
L4K 1B5

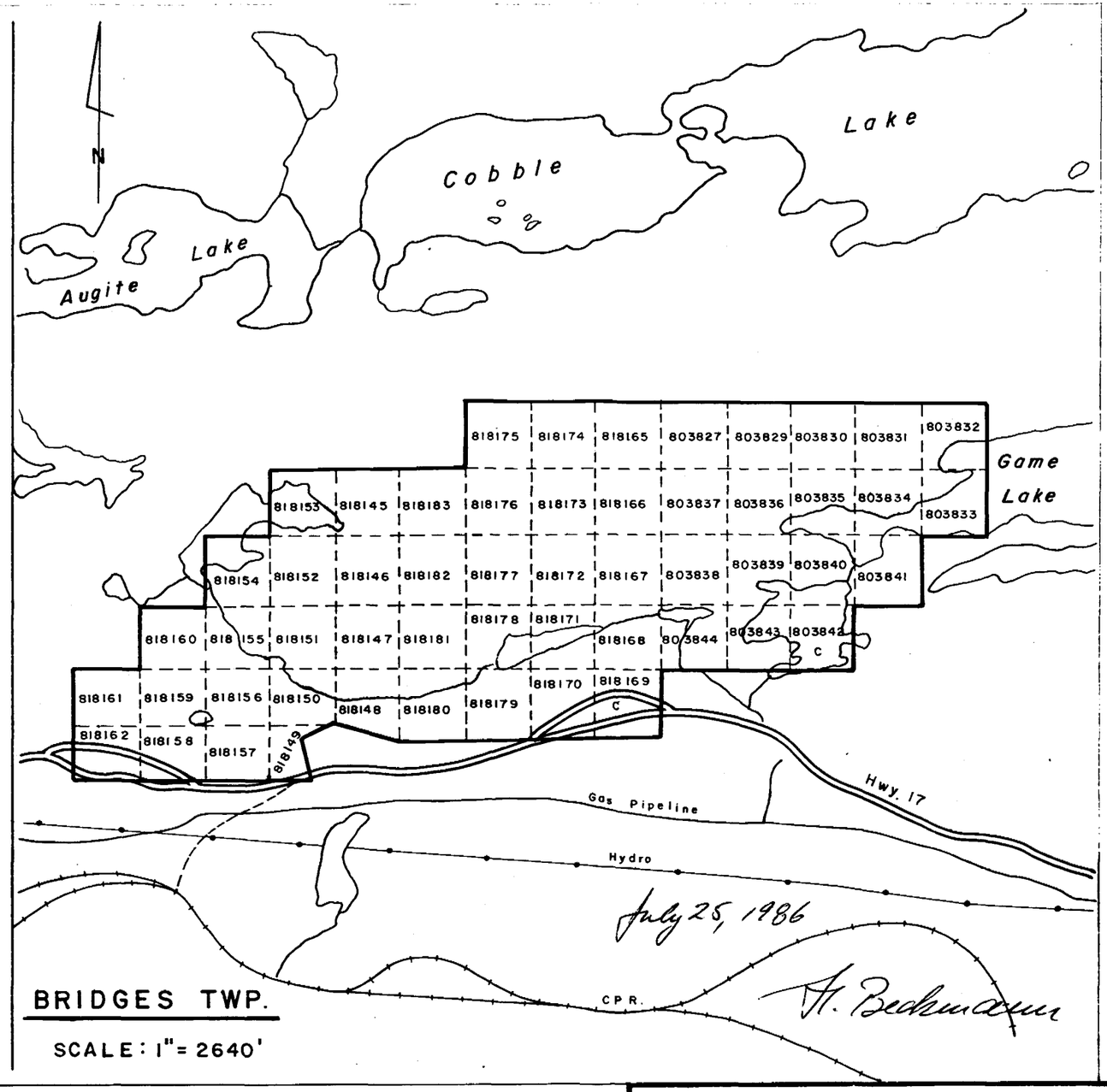
Telephone: (416) 669-2280
Cable: Geoscint Toronto
Telex: 06-964570

Geophysical and Geochemical
Instrumentation and Services



ONTARIO

Scale - 1" = 120 Miles



BRIDGES TWP.

SCALE: 1" = 2640'

N. T. S.
52 - F - 13

Note : All Claims have prefix 'K'

C - Canceled

RIO TINTO CANADIAN EXPLORATION LTD.

GAME LAKE PROJECT - ONT.

LOCATION MAP

Aug. - 1984 | W.B / e.b. | DWG. L 2877

900

September 19, 1986

Your File: 97-86
Our File: 2.9352

Mining Recorder
Ministry of Northern Development and Mines
808 Robertson Street
Box 5080
Kenora, Ontario
P9N 3X9

Dear Sir:

RE: Notice of Intent dated August 28, 1986
Geophysical (Electromagnetic) Survey
on Mining Claims K 803827, et al, in
Bridges Township

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

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

Yours sincerely,

J.C. Smith, Supervisor
Mining Lands Section

Whitney Block, 6th Floor
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

SH/mc
cc: Rio Algom Exploration Inc
Suite 2400
120 Adelaide Street West
Toronto, Ontario
M5H 1W5
Attention: Wayne Benham

Encl.

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

Resident Geologist
Kenora, Ontario

Ministry of Northern Development and Mines
Ontario

Technical Assessment
Work Credits

File: 2.9352

Date: August 28, 1986

Mining Recorder's Report of Work No.: 97-86

Recorded Holder: RIO ALGOM EXPLORATION INC

Township or Area: BRIDGES TOWNSHIP

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	K 803827 803832 to 840 inclusive 818146 to 148 inclusive 818150 to 152 inclusive 818154 to 162 inclusive 818165 to 168 inclusive 818171 to 174 inclusive 818176 to 178 inclusive 818180 to 183 inclusive
Electromagnetic 20 days	
Magnetometer ____ days	
Radiometric ____ 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

15 DAYS	10 DAYS	5 DAYS
K 803830-31 818145-75	K 803829-41-44 818149-53-79	K 803843 818170

No credits have been allowed for the following mining claims

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

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

Ministry of Natural Resources
Ontario

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

R.P. 2.9352

Mining Act

#97-86

Instructions: – Please type or print.
– If number of mining claims traversed exceeds space on this form, attach a list.
Note: – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s)	Township or Area
VLF – EM-16 Electromagnetic	Bridges Twp. M-1951

Claim Holder(s)	Prospector's Licence No.
Rio Algom Exploration Inc.	A30260

Address: Suite 2400, 120 Adelaide St. W., Toronto, Ontario M5H 1W5

Survey Company	Date of Survey (from & to)	Total Miles of line Cut
Rio Algom Exploration Inc.	2 Day / 1 Mo. / 85 Yr. – 28 Day / 6 Mo. / 85 Yr.	94.25 km

Name and Address of Author (of Geo-Technical report)
H. Beckmann c/o Rio Algom Exploration Inc.

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	20
	· Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	· Radiometric	
	· Other	
	Geological	
	Geochemical	

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

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

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.	Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
See Attached List					

RECEIVED
AUG 11 1986
MINING LANDS SECTION

KENORA
MINING DIV.
JUL 29 1986
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

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.

803827

Total number of mining claims covered by this report of work: 52

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
1010	July 29/86	
	Date Approved as Recorded	Branch Director
	See Revised Statement	

Date	Recorded Holder or Agent (Signature)
28/7/86	W. Benham

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
Wayne Benham c/o Rio Algom Exploration Inc.
120 Adelaide St. W., Toronto, Ontario

Date Certified	Certified by (signature)
28/7/86	W. Benham

1362 (81/9)

97-86

Mining Claims Traversed

Mining Claim Prefix	Number	Mining Claim Prefix	Number
K	803827	K	818156
	803829		818157
	803830		818158
	803831		818159
	803832		818160
	803833		818161
	803834		818162
	803835		818165
	803836		818166
	803837		818167
	803838		818168
	803839		818170
	803840		818171
	803841		818172
	803843		818173
	803844		818174
	818145		818175
	818146		818176
	818147		818177
	818148		818178
	818149		818179
	818150		818180
	818151		818181
	818152		818182
	818153		818183
	818154		
	818155		

Total Claims 52

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 Survey

Township or Area Bridges Township, Ontario

Claim Holder(s) Rio Algom Exploration Inc.

2400/120 Adelaide St. W., Toronto, M5H 1W5

Survey Company Rio Algom Exploration Inc.

Author of Report H.K.F. Beckmann

Address of Author 2400/120 Adelaide St. W., Toronto

Covering Dates of Survey Jan-20/85 to July 25/86
(linecutting to office)

Total Miles of Line Cut 94.25 kilometres

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		
VLF	–Electromagnetic	20
	–Magnetometer	
	–Radiometric	
	–Other	
Geological		
Geochemical		

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

Magnetometer_____ Electromagnetic_____ Radiometric_____
(enter days per claim)

DATE: July 25,1986 SIGNATURE: H. Beckmann
Author of Report or Agent

Res. Geol._____ Qualifications 2.144

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

RECEIVED
AUG 21 1986
MINING LANDS SECTION

(See Attached List)

If space insufficient, attach list

TOTAL CLAIMS 52

OFFICE USE ONLY

837 (5/79)

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 2994 (6088) Number of Readings 6088

Station interval 25m (12.5m) Line spacing 100 metres.

Profile scale 20% cm In-Phase / Quadrature

Contour interval 20% Fraser Filter Values

MAGNETIC

Instrument

Accuracy – Scale constant

Diurnal correction method

Base Station check-in interval (hours)

Base Station location and value

ELECTROMAGNETIC

Instrument Scintrex IGS-2 - VLF-4 Receiver

Coil configuration

Coil separation

Accuracy + - 1% or less

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

Frequency NLK 24.8 KHz Seattle Washington
(specify V.L.F. station)

Parameters measured Vertical in-phase and quadrature component of magnetic 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 _____

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) _____

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 _____

_____

_____

_____

_____

_____

_____

_____

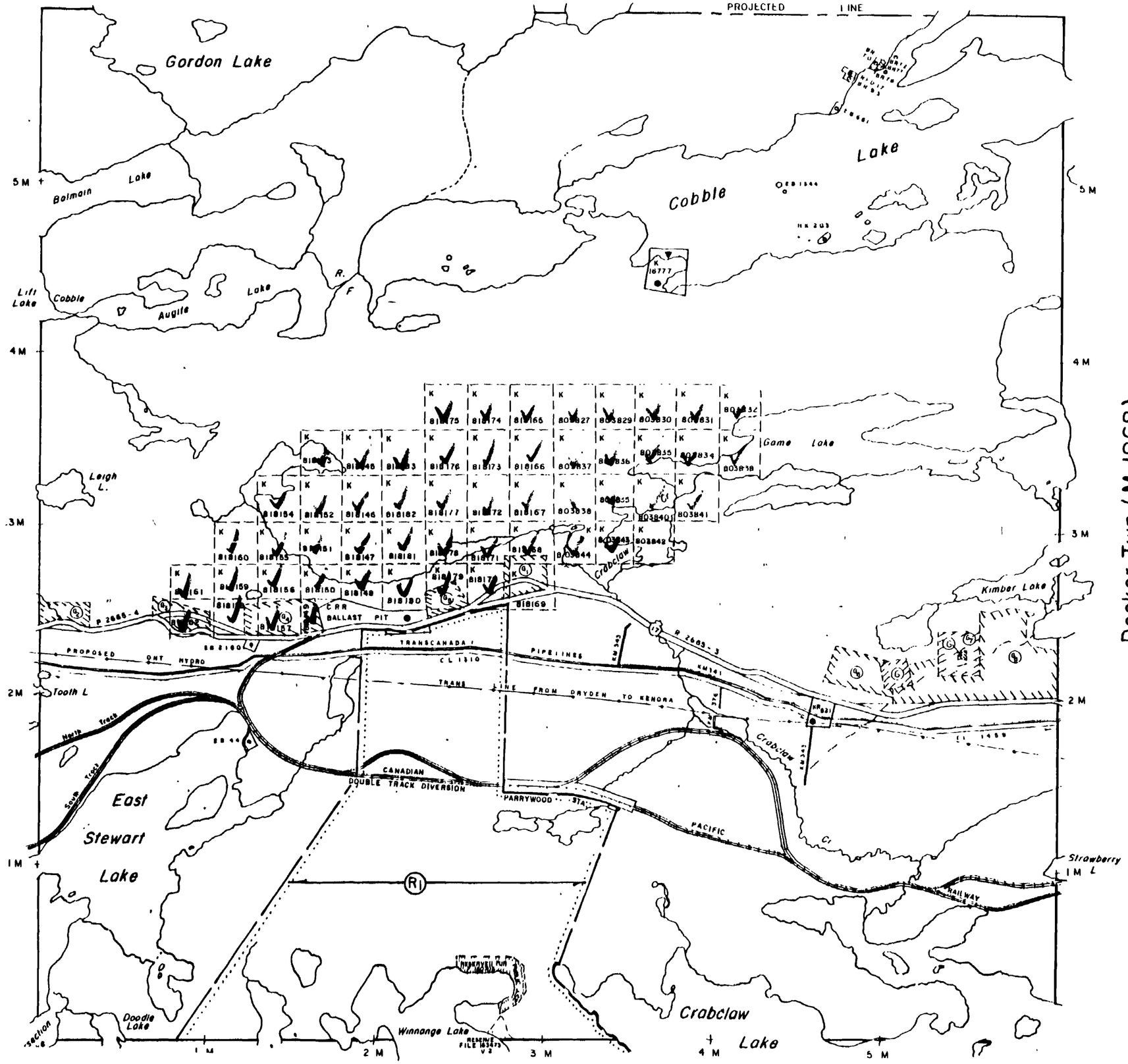
_____

Mining Claims Traversed

Mining Claim Prefix	Number	Mining Claim Prefix	Number
K	803827	K	818156
	803829		818157
	803830		818158
	803831		818159
	803832		818160
	803833		818161
	803834		818162
	803835		818165
	803836		818166
	803837		818167
	803838		818168
	803839		818170
	803840		818171
	803841		818172
	803843		818173
	803844		818174
	818145		818175
	818146		818176
	818147		818177
	818148		818178
	818149		818179
	818150		818180
	818151		818181
	818152		818182
	818153		818183
	818154		
	818155		

Total Claims 52

GORDON LAKE M.2040



Tustin Twp. (M.2048)

Docker Twp. (M.1968)

Crabclaw Lake Area (M.1971)

200

THE TOWNSHIP
OF

BRIDGES

DISTRICT OF
KENORA

KENORA
MINING DIVISION

SCALE: 1-INCH 40 CHAINS

DISPOSITION OF CROWN LANDS

PATENT, SURFACE AND MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LEASE, SURFACE AND MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LICENCE OF OCCUPATION
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

SAND & GRAVEL

(G) Quarry Permit
(G1) Gravel Reserve, File 136316
(G2) Gravel Pit No 31, File 123912
(G3) " " " 32 " "
(G4) " " " 33 " "
(G5) " " " 34 " "
(G6) MTC Gravel Pit 753A, File 136316
(G7) " " " 655 " "
(G8) MTC Gravel Pit 625, File 136316

AREAS WITHDRAWN FROM DISPOSITION

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

	Description	Order No.	Date	Disposition	File
(R1)	PARK RESERVE	W 36/83	83/8/25	S & M	186815

PLAN NO. M.1951

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

T L. -10 N

T.L. - 5 N

Base Line (070°)

818161

818162

818159

818158

L - 2 W

L - 0

L - 2 E

L - 4 E

KEY

N.T.S.
52 - F - 13

SCALE · 1 · 2500

0 100 200 300

METRES

July 25, 1986

B. Beckmann

29352

210

52F13SE0007 2.0352 BRIDGES

Rio Algom Exploration Inc.

GAME LAKE PROJECT - BRIDGES TWP. - ONT.

VLF - EM PROFILES

Feb - 1985 H.B., D.S./e.b. DWG. E 3831

818153 818154 818145 818175 818174 818152 818163 818176 818173 818146 818182 818155 818151 818177 818172 818147 818181 818156 818150 818167 818148 818178 818157 818171 818149 818180 818179 818168 818170 818169

Trans Canada Hwy

T.L.-5 S

L-6 E L-8 E L-10 E L-12 E L-14 E L-16 E L-18 E L-20 E L-22 E L-24 E L-26 E L-28 E L-30 E L-32 E

July 25, 1986
A. Beckmann

KEY

N.T.S.
52-F-13

29352

SCALE - 1:2 500
0 100 200 300
METRES

Rio Algom Exploration Inc.

GAME LAKE PROJECT - BRIDGES TWP. - ONT.

VLF-EM PROFILES

Feb. - 1985 | H.B., D.S./e.b. | DWG E 4823-2

220

T.L. - 10 N

818165

803827

803829

803830

T.L - 5N

818166

803837

803836

803831

803832

803835

Base Line (070°)

803838

803839

803834

803840

Game

Lake

803833

803841

T.L. - 5S

803843

803844

803842

L-34 E | L-36 E | L-38 E | L-40 E | L-42 E | L-44 E | L-46 E | L-48 E | L-50 E | L-52 E | L-54 E | L-56 E

29352

July 25, 1986

T. Beckmann

LEGEND:

Instrument: Scintrex IGS-2 system
Transmitter: Seattle, Washington (NLK)
Frequency: 24.8 kHz
Conductor: ——— — — —

Quadrature | In Phase

+40% 0 -40%

KEY

N.T.S. 52-F-13

SCALE 1:2500

0 100 200 300

METRES

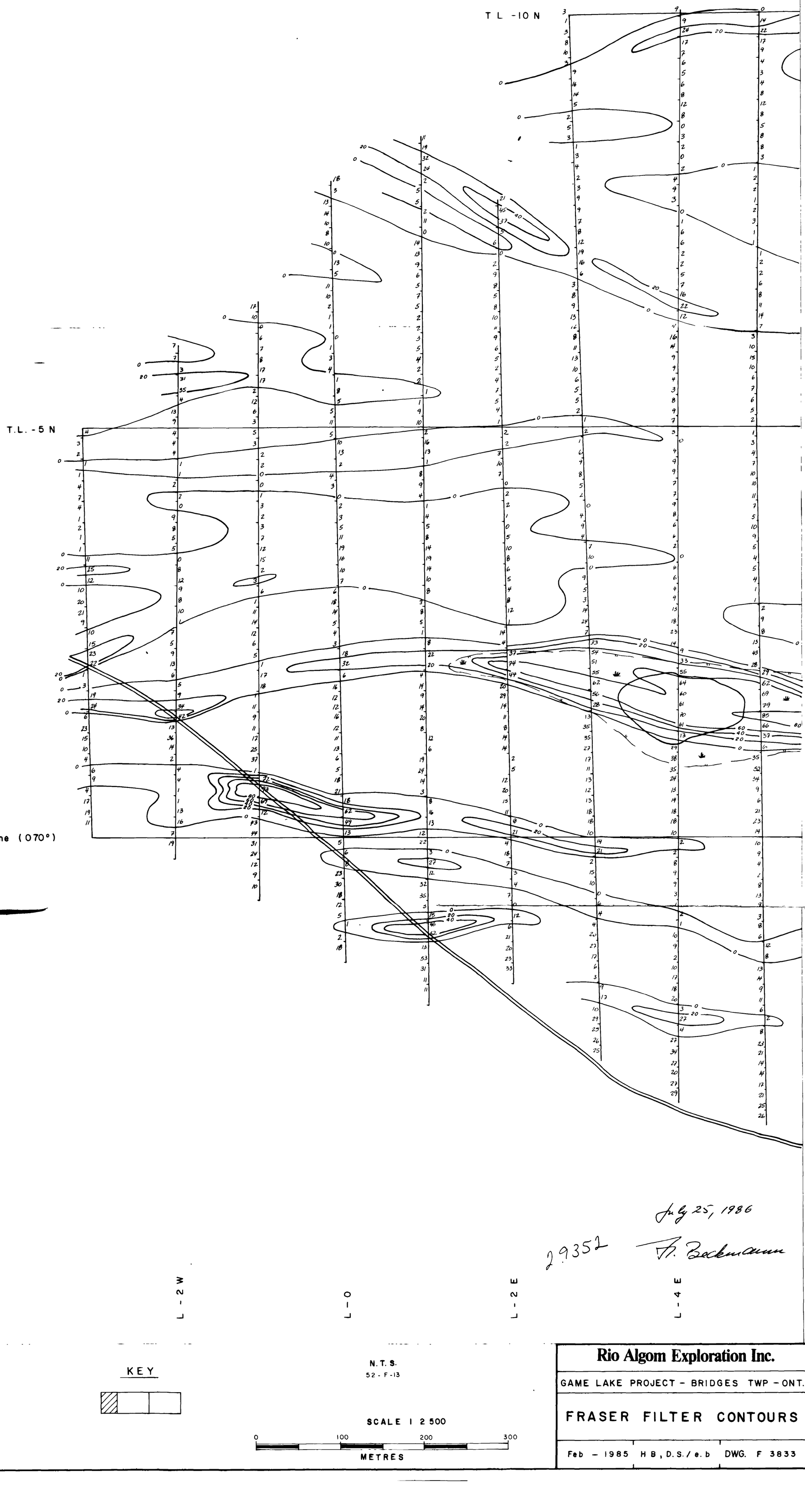
Rio Algom Exploration Inc.

GAME LAKE PROJECT - BRIDGES TWP. - ONT

VLF-EM PROFILES

Feb. - 1985 | H.B., D.S./e.b. | DWG E 4823-1

230



L - 2 W

L - 0

L - 2 E

L - 4 E

KEY

N

N. T. S.
52 - F - 13

SCALE 1 2 500

0 100 200 300

METRES

240

52F13SE0007 2.9352 BRIDGES

July 25, 1986

29352

F. Beckmann

Rio Algom Exploration Inc.

GAME LAKE PROJECT - BRIDGES TWP - ONT.

FRASER FILTER CONTOURS

Feb - 1985 H B, D.S./e.b DWG. F 3833

Trans Canada Hwy

T.L.-5 S

L-6 E
L-8 E
L-10 E
L-12 E
L-14 E
L-16 E
L-18 E
L-20 E
L-22 E
L-24 E
L-26 E
L-28 E
L-30 E
L-32 E

July 25, 1986
H. Beckmann
29352

KEY

N.T.S.
52-F-13

SCALE - 1:2500
0 100 200 300
METRES

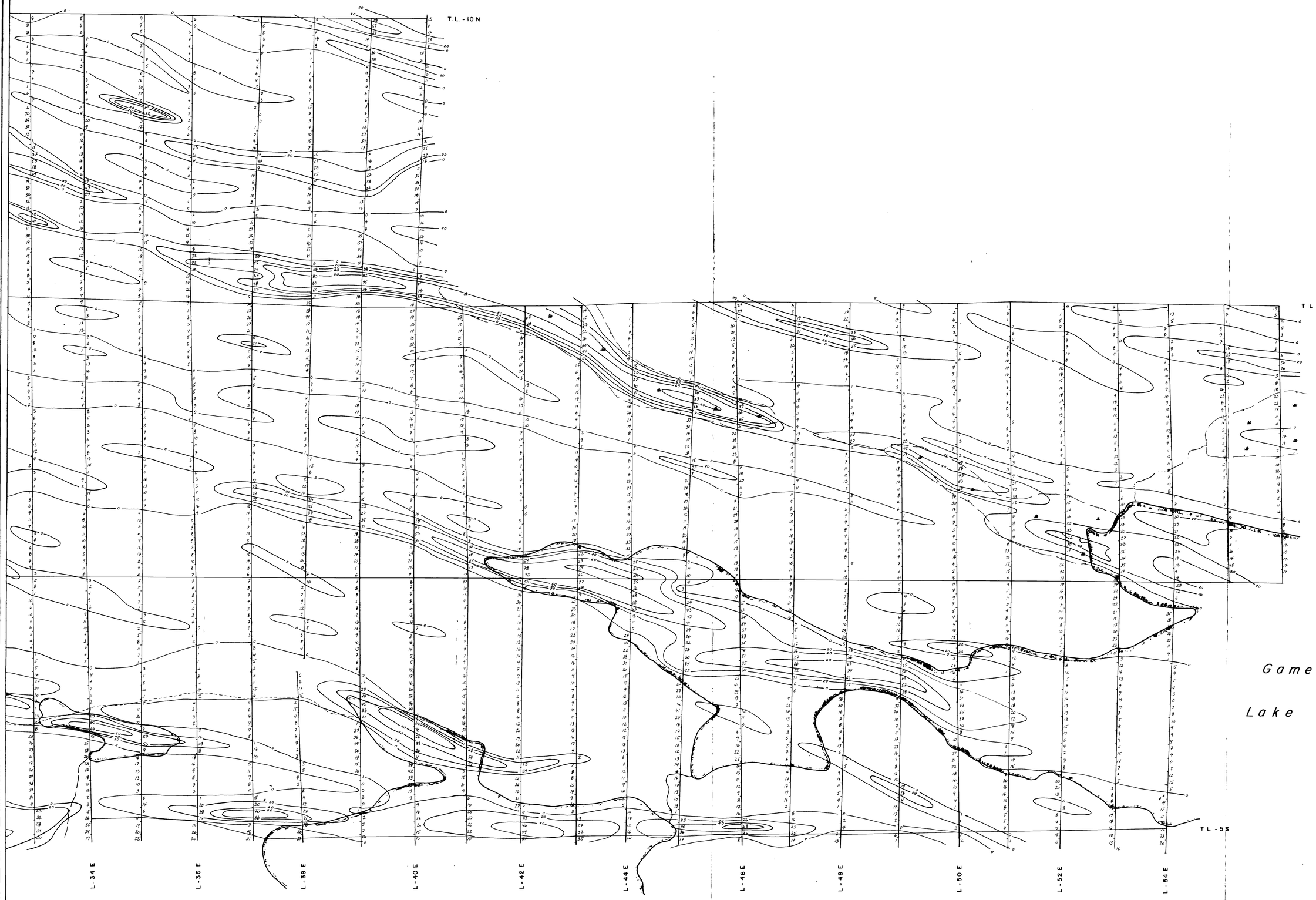
250

Rio Algom Exploration Inc.

GAME LAKE PROJECT - BRIDGES TWP. - ONT.

FRASER FILTER CONTOURS

Feb. - 1985 | H.B., D.S./e.b | DWG F 4825-2



J9352

July 25, 1986

H. Beckmann

LEGEND

Quantity	Filtered In Phase data
Contour Interval	20 filter %
Instrument	Scintrex IGS-2 system
Transmitter	Seattle, Washington (NLK)
Frequency	24.8 kHz

Filter data

12
23
20
3
27
56
69
74
− +

KEY

N.T.S.
52-F-13

SCALE 1:2 500

0 100 200 300
METRES

Rio Algom Exploration Inc.

GAME LAKE PROJECT - BRIDGES TWP.-ONT.

FRASER FILTER CONTOURS

Feb. - 1985 | H.B., D.S./e.b. | DWG F 4825-1

52F13SE0007 2.9352 BRIDGES