# GEOPHYSICAL REPORT <br> ON THE <br> ROBERTSON PROPERTY <br> ROBERTSON TOWNSHIP <br> LARDER LAKE MINING DIVISION <br> FOR <br> COMINCO LIMITED 



Prepared By:
J.C. Grant C.E.T., FGAC Exsics Exploration April 25, 1989

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## INTRODUCTION

Cominco Limited holds a group of 21 mining claims all of which are located in the central section of Robertson Township, District of Temiskaming in the Larder Lake Mining Division. (Figure 3, M.N.D.M. Plan Map M-310).

Exsics Exploration Limited was contracted by Cominco during the month of February 1989 to perform a geophysical program on the property.

The purpose of the program was to locate and define favorable structure suitable for base metal and or gold deposition.

## PERSONNEL

The people directly involved with the field surveys were all employed by Exsics and are as follows:

Wayne Pearson......Receiver Operator.........Timmins, ONT
Dan Collin.........Assistant Operator.........Timmins, ONT
Ted Anderson.......Magnetometer Operator.....Timmins, ONT
All of the work was carried out under the supervision of J.C. Grant.

## CLAIM GROUP

The claim group consisted of 21 contiguous, unpatented mining claims and all are located in Robertson Township. This report will deal with coverage on 14 of the 21 claims. They are as follows:

| L983163 | L983169 | L1073717 |
| :--- | :--- | ---: |
| L983164 | L983170 | L1073721 |
| L983165 | L1014348 |  |
| L983166 | L1073668 |  |
| L983167 | L1073669 |  |
| L983168 | L1073670 |  |
| (Refer to Figure 3, Plan Map M-310 of M.N.D.M.) |  |  |

## LOCATION AND ACCESS

The Robertson Property is located approximately 40 km southeast of the City of Timmins, or 20 km north of the Town of Matachewan. (Figure 1 \& 2). More specifically, the group is situated due north of East Whitefish Lake in the central section of Robertson Township.

The access to the grid during the survey period was ideal.
Working out of Matachewan, a short truck ride north along an all weather road into the Matachewan Indian Reserve $\$ 72$, to the end of the plowed road. Then a six to eight mile skidoo ride along an old road from the reserve to the centre west section of the claim group.



Matachewan is serviced by Highway 66 which runs east and west off of Highway 11 north; just south of the Village of Kenogami. (Refer to Figure 2).

## GEOPHYSICAL PROGRAM

This program consisted of a total field magnetic survey and a MaxMin II, horizontal loop, electromagnetic survey. Both of these surveys were completed over a cut grid which covered 14 of the 21 claims.

## Linecutting:

A detailed metric grid was first cut over the 14 claims which would provide good control of all the geophysical surveys. A baseline was established across the centre of the 14 claims at an azimuth of 120 degrees. Cross lines were then turned off of this baseline at 100 meter intervals and cut to the boundaries of the claim group. All of the crosslines and baselines were chained with 25 meter pickets. In all, a total of 23.2 km of grid lines were cut over the claim group.

## Magnetic Survey:

This survey was completed using the Scintrex MP-2 Portable Proton Magnetometer. Specifications for this unit can be found as Appendix $A$ of this report.

The survey was done by first reading the baseline and tying it into a fixed point. Then all of the cross lines were read off of this baseline and corrected to the baseline level. The diurnal variation was found not to exceed 20 gammas in $2-3$ hours throughout the day.

This collected, corrected data was then plotted directly onto a base map using a scale of $1: 5000$. Also, a base level of 58,000 gammas has been removed from each value for ease in ploting.

The plotted data was then contoured at 100 gamma intervals wherever possible. The base map for the magnetic survey can be found in the back pocket of this report.

## Horizontal Loop Survey:

This survey was completed using the MaxMin II system manufactured by Apex Parametrics of Toronto. Specifications for this unit can be found as Appendix $B$ of this report.

This survey is a two man continuously portable system which is designed to measure both the vertical and horizontal in-phase, (IP), and Quadrature, (QP), field from electrically conductive zones.

A coil seperation, the distance between the two operators, of 100 meters was used throughout the survey. This would give us a theoretical search depth of 50-60 meters. It was also decided to use three frequencies, the 3555,1777 and 444 Hz , which would deal effectively with a wide range of overburden and bedrock conductor conductivities.

The data was collected at the mid-point of the two operators over the entire grid. One in-phase and one quadrature value was recorded at each station.

This collected data was then plotted directly onto the base maps, one base map for each frequency.

Due to the rugged topography in the area, the in-phase reading on all three frequencies is somewhat more noisy than usual. The grid would have to be secant chained to correct for slope and to keep the coils coplaner.

## Base Maps:

These maps were set up at a scale of $1: 5000$ and all of the collected data was put on them.

For the magnetic data, 58000 gammas has been subtracted from each reading for ease in plotting. The data was then contoured at 100 gamma intervals wherever possible.

The MaxMin maps were profiled at 1 cm to $20 \%$ and one map was used for each frequency. The plot point is the mid-point between the operators which accounts for the 50 meter blanks at the ends of each line.

All of these maps can be found in the back pocket of this report.

## SURVEY RESULTS

The geophysical surveys were successful in outlining one conductive zone on the survey grid. This feature strikes across line 0 0t00 to line 3 t00ME at approximately 75 to 150 MN . The zone appears to represent a legitimate bedrock feature at a depth to source of -30 to -40 meters and with a conductivity range of 5 to 20 mhos.

There is a good magnetic, high, low correlation with the eastern tip of the feature, but little to no correlation with the western section.

The magnetic survey was successful in outlining two areas of ultramafic intrusions which also appear on the Timmins-Kirkland Geological Series Map 2205. (See Figure 4). The weak magnetic structure nosing into the grid from the south may in fact relate to the contact between the intermediate and Mafic metavalcanics and the felsic intrusions.


## RECOMMENDATIONS AND CONCLUSIONS

The surveys were successful in outlining one area of specific interest on the survey grid. The target does appear to represent a legitimate bedrock response well within the search depth capacity of the survey.

A recommended follow-up program should consist of detailed mapping and prospecting certainly in the vicinity of the EM target.

At this time, no further geophysics is recommended since the one target is quite well defined.

A short drill program should be considered to further test the EM target. Further work on the group would then be based on the results of the drilling.


## CERTIFICATE OF QUALIFICATIONS

I, John Charles Grant do hereby certify:

1. That I am a Geophysicist and reside at Lot 2 Martineau Avenue, Kamiskotia Lake, Timmins, Ontario.
2. That I am a Fellow of Geological Association of Canada.
3. That I am a member of the Certified Engineering Technologist Association.
4. That I graduated from Cambrian College of Applied Arts and Technology, Sudbury Campus, in 1975 with an Honour's Diploma in Geology Technology.
5. That I have practised my profession continuously for 13 years.
6. That my report on ROBERTSON TOWNSHIP, LARDER LAKE MINING DIVISION, for COMINCO LIMITED, is based on work carried out under my supervision.
7. I hold no specific or special interest in the described property. I have been retained as a Consulting Geophysicist for "the property".

Dated this 25 th day of April, 1989 at Timmins, Ontarig sSOCIA

John C. Grant,



#### Abstract

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APPENDICES


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APPENDIX A


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dotal field accuiracy
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## INIEIHAL MEASUIHNG PHOGHAMME

EXIEIITAL TIIGGEII
dISPLAY

HECOIIUEA OUIPUT (Opllomal)
ginadiehr tolemance POWEII SOUIICE
sensoll
lininess

OIEIAAIHAG TEMPEJAIUHE IANGE
SIZE

WEIGIIS

1 Gักเนดนล.
$\pm 1$ Ganma over full operalling range.
? 11,000 to 100,000 gammas in 25 nuninnmplini sleps.

Single rending -- 3.7 secouds. Inerye. Inalure permils nulomalic ropelitivo readinns 3.7 seconds intervals.

Extemmal tigger linul permils use of sampling linleivals longer liaan 3.7 seconds.

5 digit LED (Lig̣if Emilling Dlociṇ) ronclout dis. playling Iotal magnolic lleid lin gammas or normalized ballery vollage.

Milliplied precension frequency and gate limo oulpuls lor linterfacing willi licremental tapo incoldels (eg. lincrelogger) lor digilal recording. As an nedelilional opllon $n$ digilat in nualegue convoitor ls avallable lor use will nualoguo recorders.

Up to 5000 gammas/metic.
0 allenilun " $D$ " tenlls provico up to 25,000 rondlags al $25^{\circ}$ C under reasollable sliminl/nolse condilions lless al lowner Ieminninlungs). Premlum carboli-zlic cells provila aboul 10\% of lils number.

Ommidiroctionat, sililelded, nolsa-cnucelling dual coll, oplinized fur high gradienl tolerance.

Comploto for operallon willi slall or back pack selisur.
$-35^{\circ} \mathrm{C}$ to $180^{\circ} \mathrm{C}$.
Console, will lunlicies: $80 \times 160 \times 250 \mathrm{~mm}$. Snisor: $00 \times 150 \mathrm{~mm}$.
Stall: $30 \times 1550 \mathrm{~mm}$. (extended)
$30 \times 600 \mathrm{~mm}$. (collapsed)
Consule, will balleiles: 1.8 kg .
Sonsot: 1.3kg.
Slall: 0.6kg.

APPENIXB

## APEX <br> MAXIMIN II PORTABLE EIV

■ Five frequencies: Re2, 444, 888,1777 and 3555 Hz .
■ Maximum coupled (horizontal-loop) operation with reference cable.

- Minimum coupled operation with reference cable.
- Vertical-loop operation without reference cable.
- Coil separations: 25, 50, 100, 150, 200 and R50m (with cable ) on 100, 200,300,400,600 and 800 ft.
m Reliable data from depths of up to 180 m (GOD ft).
- Built-in voice communication circultry with cable.
- Tilt meters to control coll orientation.


ant:


## EPECIFICATIONS:

Frequencles:
2ee, 444, 888, 1777 and 3555 Hz .
Mades of Operation: MAX: Transmitten coilplane and receiver coil plane horizontal (Max-coupled; t-korizontal-loop model. Used with refen celle.

MIN: Transmitter coilplene havizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.
V.l. : Tranamitten coilplane vertical and receiver cail plane horizorital (Vertical-loop mode). Used without reference cable, in parallel lines.

Coll Eeparations:
25,50,100,150, 200 \& 250m (MMII) or 100, 200, 300, 400,600 and BOO ft. (MMIIF)
Coil separstions in V.L.mode not restricted to fixed values.

Parametars Paad: - In. Phase and Quedrature compoments of the secondary field in MAX and MIN modee.

- Tilt-angle of the total field in V.L. mode.

Readoute:

Ecale Ranges:

Readability:

- Autometic, direct readout on 90 mm ( 3.5 ") edgewise meters in MAX and MIN modes. No nulling or compensetion neceseary.
- Tift angle and null in gamm edgewise meters in V.L.mode.

In-Phase: $\pm 20 \%, \pm 100 \%$ by pushbutton switch.
Quadrature: $\pm 20 \%, \pm 100 \%$ by pushbutton switch.
Tilt: $\quad \pm 75 \%$ slope.
Null (V.L.): Sensitivity adjusteble by separation switch.

In-Phase and Quadreture: D.eS \%
to $0.5 \%$ : Tilt: $1 \%$.

Repeatabillty:
$\pm 0.25 \%$ to $\pm 1 \%$ normally, depending on conditions, frequencies and coil aeparation used.

Transmittar Output: - e2eHz : 2ea Atme
Transmittar Output: - 2e2Hz : 220Atm

- $444 \mathrm{~Hz}: 200$ Atm²
- $986 \mathrm{~Hz}: 120$ Atm²
- 17フ7Hz: BOAtm²
$-3555 \mathrm{~Hz}: 30 \Delta t \mathrm{~m}^{2}$
Recelver Batteries: $9 \vee$ trans. radio type batteries (4).
Life: apmox. 35 hra . continuous du-
ty (alkaline, 0.5 Ah ), less in cold
Life: apmox. 35 hra . continuous du-
ty (alkaline, 0.5 Ah ), less in cold weather.

Transmittor
Eatteries:

Reference Cable 1

Volce LInk:
12V GAh Gel-type rechargeable battery. (Charger supplied).

Indlcator Llghts: Built-in signal end reference waming lights to indicate erroneous readinge.

Temperature Range: $-40^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$ ( $-40^{\circ} \mathrm{F}$ to $+140^{\circ} \mathrm{F}$ ).
Peoelver Weight: Ekg (13 lbe.)
Transmitter Weight: 13 kg ( 29 Ibs.)
Bhlpping Walght: Typically GOkg (135lbs.), depending on quentities of reference cable and betteries included. Shipped in two field/ahipping ceses.

Specificetions eubject to change without notification

Ministry of Northern Development and Mines

## Geophysical-Geological-Geochemical Technical Data Statement

File $\qquad$

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.
 Township or Area Acizeryson Teuenswin


Survey Company $\qquad$
Author of Report $\qquad$
 Covering Dates of Survey Fie co $/ 5$
Total Miles of Line Cut $\qquad$

SPECIAL PROVISIONS
CREDITS REQUESTED

ENTER 40 days (includes
line cutting) for first survey.
ENTER 20 days for each additional survey using same grid.


AIRBORNE CREDITS (Special provision credits do not apply to pribornce (rivera)
Magnetometer
Electromagnetic


Res. Geol. $\qquad$ Qualifications $\qquad$ 2.5347


## MINING CLAIMS TRAVERSED List numerically

## 1

$\qquad$
$983 / 63$
(prefix)
$25,6 / 64$ (number)

583/65
383166
483/67. 483/68 983169
<8. 2.7.
K.....................
10.7 .36 .6
10736.6

1073470
$10 \cdot 9.371 .7$
1073721

GEOPHYSICAL TECHNICAL DATA

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

$$
\begin{aligned}
& \text { Number of Stations } \\
& 928 \\
& 25 \mathrm{~m} \text {. } \\
& \text { Line spacing } \\
& \text { Contour interval } \\
& \text { にひ~デ。 } \\
& \text { Instrument_. Senreper mp. } 2 \text { Peofon MAG. } \\
& \text { Accuracy - Scale constant } \quad \pm 1 \text { go alone }
\end{aligned}
$$

> Base Station check-in interval (hours) 2 Note RS.
> Base Station location and value CAMS LSNE w/RJ REAR d ToED Jd

Instrument
Coil configurati
Coil separation
Accuracy
Method：
Frequency
Parameters med
Instrument
Scale constant $\qquad$
Corrections made $\qquad$

Base station value and location $\qquad$

Elevation accuracy $\qquad$

Instrument $\qquad$
Method $\square$ Time DomainFrequency Domain
Parameters－On time $\qquad$ Frequency $\qquad$
－Off time $\qquad$ Range $\qquad$
－Delay time $\qquad$
－Integration time $\qquad$
Power $\qquad$
Electrode array $\qquad$
Electrode spacing $\qquad$
Type of electrode $\qquad$

## SELF POTENTIAL

Instrument
Survey Method

Corrections made $\qquad$

## RADIOMETRIC

Instrument $\qquad$
Values measured
Energy windows (levels) $\qquad$
Height of instrument
Background Count
Size of detector $\qquad$
Overburden (type, depth - include outcrop map)

OTHERS (SEISMIC, DRILL WELLL LOGGING ETC.)

Type of survey
Instrument $\qquad$
Accuracy
Parameters measured $\qquad$

Additional information (for understanding results)

## AIRBORNE SURVEYS

Type of survey(s)
Instrument(s) $\square$
Accuracy
(specify for each type of survey)
(specify for each type of survey)
Aircraft used
Sensor altitude
Navigation and flight path recovery method $\qquad$

Aircraft altitude Line Spacing
Miles flown over total area $\qquad$ Over claims only

Numbers of claims from which samples taken $\qquad$

Total Number of Samples
Type of Sample
(Nature of Material)
Average Sample Weight $\qquad$
Method of Collection $\qquad$

Soil Horizon Sampled $\qquad$
Horizon Development $\qquad$
Sample Depth $\qquad$
Terrain $\qquad$

Drainage Development $\qquad$
Estimated Range of Overburden Thickness $\qquad$
$\qquad$
$\qquad$

SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)
Mesh size of fraction used for analysis $\qquad$
$\qquad$
$\qquad$
$\qquad$

General $\qquad$

| ANALYTICAL METHODS |  |  |
| :---: | :---: | :---: |
| Values expressed in: | $\begin{aligned} & \text { per cent } \\ & \text { p.p. m. } \end{aligned}$ p.p.b. | $\square$ $\square$ $\square$ |
| $\mathrm{Cu}, \mathrm{Pb}, \mathrm{Zn}, \mathrm{Ni}, \mathrm{Co}$ | Ag, Mo, | As.-(circle) |
| Others. |  |  |
| Field Analysis (_______tests) |  |  |
| Extraction Method |  |  |
| Analytical Method |  |  |
| Reagents Used |  |  |

## Field Laboratory Analysis

No.
Extraction Method
Analytical Method $\qquad$
Reagents Used $\qquad$

Commercial Laboratory (___tests)
Name of Laboratory $\qquad$
Extraction Method $\qquad$
Analytical Method $\qquad$
Reagents Used

General $\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$






