CONWEST EXPLORATION CO. LTD.

ELECTROMAGNETIC AND MAGNETIC

SURVEYS

BURCHELL LAKE AREA

ONTARIO

BY:

H. SCOTT SWINDEN, B.Sc.

TORONTO, ONTARIO

May 5, 1972
Summary:

During the winter of 1971 - 72, VLF EM and magnetometer surveys were carried out on Conwest's claim group in the Burchell Lake area, Western Ontario. The purpose of the survey was to detect concentrations of sulfide minerals along a favourable geologic contact which traverses the property, mainly under overburden.

Seven untested conductors were interpreted from the survey as being deserving of further work. Limited geophysical and geological mapping is recommended prior to diamond drilling.
Introduction:

During the winter of 1971-72, electromagnetic and magnetometer surveys were carried out over 87 claims held by Conwest Exploration Co. Ltd. in and near Moss Township, Western Ontario. The surveys were carried out over approximately 75 miles of cut and chained lines on the following claims:

- T.B. 303352 - 303365
- T.B. 303367 - 303385
- T.B. 296852 - 296862
- T.B. 296864 - 296886
- T.B. 303389 - 303398
- T.B. 310635 - 310644

The Ronka E.M.-16 VLF EM unit and the Sharpe MF-1 and MF-2 fluxgate magnetometers were used for the survey.

Location and Access:

The property is located in the south-east quadrant of Moss Township, Western Ontario. It is approximately centered at co-ordinates 48°31'N Lat; 90°43'W Long. and is within N.T.S. quadrangles 52.B.10 and 52.B.7. It lies about 66 miles west of Thunder Bay and 44 miles ESE of Atikokan.

Access to the property is best accomplished by float or ski-equipped light aircraft to Fountain and Snodgrass Lakes at the north end of the property. Ontario highway 11 passes eight miles north of the property and an all-weather gravel road to the village of Burchell Lake ends within 5.5 miles of the property to the north-east.

Geology:

This claim group lies along the south flank of a 4½ mile wide belt of NE/SW trending metavolcanics. The centre of this belt consists of felsic to intermediate volcanics. These rocks range from dacitic crystal tuff and
aphanitic extrusives in the north end central portions of the belt to felsic volcanic breccias and banded rhyolites, mainly in the south. This sequence occupies most of the north-west part of the property.

The north and south edges of the volcanic belt are made up of mafic to intermediate volcanics. These rocks, on the south flank, are thought to be in contact with felsic volcanics along a NE/SW line which runs approximately through the centre of the property. They are made up mainly of aphanitic basalt to dacite with considerable agglomerate and minor tuffs, pillow lavas, amygdaloidal lavas and diabasic flows.

Intermediate to ultra mafic intrusives are present throughout the volcanic belt and several small bodies are present on the property.

Extensive shearing and faulting has taken place - generally in a north-easterly direction. One major structure, the Knife Lake fault, separating volcanics from the Myrt Lake granite batholith on the south may cut the south-east corner of the property.

Mineralization is known to occur in the area. Pyrite and pyrrhotite are common in both acid and mafic volcanics. Copper deposits have been located, mainly in the acid volcanics near the mafic contact. One deposit, that of North Coldstream Mines on Burchell Lake, produced 102,300,000 lb. of Copper until its closing in 1967.

Instruments and Survey Methods:

The Ronka EM-16 VLF unit measures the in-phase and quadrature components of secondary fields within the earth. These secondary fields are generated when the magnetic fields produced by powerful VLF stations around the world meet conductive bodies in the ground.

The instrument itself is a sensitive receiver which can pick up, amplify and measure the vertical field components within the frequency band of the VLF stations. It has two coils, one horizontal and one vertical, each
with its own amplifier. By tilting the instrument in the vertical plane at right angles to the primary field, the signal from the vertical coil can be minimized and the tangent of the tilt angle of the secondary field is read directly as a percentage. To completely null the signal, a measured percentage of the signal from the horizontal coil (after a 90° phase shift) is applied to compensate the voltage in the vertical coil. A calibrated dial measures the percentage of the signal used in compensation.

Assuming that secondary signals are weak compared to the primary horizontal field, the tilt angle will be an accurate measure of the ratio of the vertical real component of the secondary field to the horizontal primary field. Further, the compensation 1/2 signal from the horizontal coil is a close approximation to the ratio of the quadrature component of the vertical secondary field to the horizontal primary field.

A conductor within the earth, when traversed by this instrument, will show progressively higher in-phase readings when approaching it which go to zero over the conductor and down to negative values as it is passed over.

The magnetic survey was carried out using two instruments, the Sharpe MF-1 and MF-2 fluxgate magnetometers. These instruments measure the variations of the vertical component of the earth's magnetic field. Uncorrected readings were plotted in profile as gammas on a separate map.

Both surveys were carried out over cut and chained picket lines. 3,975 picketed stations were established and readings taken at every station. Where anomalous values were encountered in either survey, the reading interval was reduced to fifty feet.

Results of Survey and Interpretation:

All data from the VLF EM survey were submitted to John E. Betz, Geophysical Consultant who carried out the interpretation.
While a large number of crossovers were found in the course of the EM surveys, most of these were dismissed by reference to the field notes as being due to topographic or overburden features. A total of seven conductors were interpreted as being possibly of bedrock origin and worthy of further study.

Zone "1" occurs on lines 40W and 44W. It is a fair conductor and may be associated with a weak magnetic feature. This conductor may also be present on line 48W and this seems to be indicated by the magnetics.

Zone "3" is a one-line conductor on L. 60E. It is associated with a strong magnetic high that extends almost 2,000 feet to the west. This conductor is quite likely caused by sulfides - probably in iron formation.

Zone "5" is a fairly weak response on lines 76E and 78E. It lies on the north flank of a strong, broad magnetic feature which probably is indicative of a mafic or ultra-mafic intrusive. The conductor may be caused by sulfides along the sheared contact of this body with the country-rock volcanics.

Zones "4", "6", and "7" are all quite strong conductors but have little or no magnetic expression. It seems likely that these conductors are caused by graphite or by shear zones in the country rock. Either of these features could be accompanied by sulphides.

Zone "2" is a fair to weak response which also has no magnetic expression. It too may be caused by graphite or shearing possibly accompanied by sulfides.

Conclusions and Recommendations:

This survey has outlined a number of possible bedrock conductors near a geologic contact which has proven productive.

It is recommended that these conductors be tested with a more discriminatory EM instrument such as horizontal loop to further estimate their potential.

This should be accompanied by geologic mapping in the vicinity of the
conductors to establish their relation to the favourable contact and set priorities for diamond drilling.

Respectfully submitted,

H. Scott Swinden

May 5, 1972.
APPENDIX A

Personnel:

Line Cutting - July 10, 1971 - Sept. 18, 1971

Audet Bros. - Line Cutting
P.O. Box 42,
Val D'Or, P.Q.


Party Chief - J. Halonen
Apt. 303,
Wilshire Towers
111 Tarinton Rd. E.,
Oshawa, Ontario.

- Jan. 10 - Feb. 25, 1972

Party Chief - M. Brunelle
34 Edward St.
Penetanguishene, Ont.

Magnetometer Survey - Feb. 25 - Mar. 22, 1972

Party Chief - M. Brunelle


John E. Betz,
7 Boxbury Rd.,
Etobicoke, Ont.

Report Writing - S. Swinden
C/O Conwest Exploration Co. Ltd.,
Tenth Floor, 85 Richmond St. W.,
Toronto 1, Ontario
APPENDIX I

Personnel:

Line Cutting - July 10, 1971 - Sept. 18, 1971

Audet Bros. - Line Cutting
P.O. Box 42,
Val D'Or, P.Q.


Party Chief - J. Halonen
Apt. 303,
Wilshire Towers
111 Tarinton Rd. E.,
Oshawa, Ontario.

- Jan. 10 - Feb. 25, 1972

Party Chief - M. Brunelle
34 Edward St.
Penetanguishene, Ont.

Magnetometer Survey - Feb. 25 - Mar. 22, 1972

Party Chief - M. Brunelle


John E. Betz,
7 Boxbury Rd.,
Etobicoke, Ont.

Report Writing - S. Swinden
C/O Conwest Exploration Co. Ltd.,
Tenth Floor, 85 Richmond St. W.,
Toronto 1, Ontario
APPENDIX II

HAROLD SCOTT SWINDEN

SUMMARY OF QUALIFICATIONS

POSITION: Geologist

EMPLOYER: Conwest Exploration Company Limited

EDUCATION: Bachelor of Science
           Honour in Geology
           Dalhousie University
           Halifax, Nova Scotia

EXPERIENCE TO GRADUATION:

Nova Scotia Department of Mines
- May to April, 1967
- helper on geologic mapping survey, Cape Breton, N.S.

Conwest Exploration Co. Ltd.
- May to Sept. 1968
- Prospecting and geologic mapping, N.W.T.

Imperial Oil Enterprises
- May - Sept. 1969
- Compilation and interpretation of geologic data
- Geologic mapping, Yukon Territory

EXPERIENCE AFTER GRADUATION:

Conwest Exploration Co. Ltd.
- May 1970 - present
- Supervision, operation and interpretation of geophysical work in Canadian Shield, especially VLF EM, Horizontal Loop EM and magnetometer.
- Supervising Diamond Drilling.

...../2
Appendix II

- Geochemical programs and geologic mapping parties in Cordillera and Canadian Shield.

H. Scott Swinden
**Type of Survey:** Magnetometer

**Township or Area:** Fort Arthur

**Claim holder(s):** Conquest Expl. Co. Ltd., 85 Richmond St W, 10th Fl, Toronto

**Author of Report:** Scott Swinden

**Address:** 85 Richmond St W, 10th Fl, Toronto

**Covering Dates of Survey:** Feb 25 - March 22, 1972

**Total Miles of Line cut:** 4/4

**SPECIAL PROVISIONS**

<table>
<thead>
<tr>
<th>Credits Requested</th>
<th>Days per Claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geophysical</td>
<td>40</td>
</tr>
<tr>
<td>Electromagnetic</td>
<td>20</td>
</tr>
<tr>
<td>Magnetometer</td>
<td></td>
</tr>
<tr>
<td>Radiometric</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Geological</td>
<td></td>
</tr>
<tr>
<td>Geochemical</td>
<td></td>
</tr>
</tbody>
</table>

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

- Magnetometer
- Electromagnetic
- Radiometric

**DATE:**

**SIGNATURE:** Author of Report

---

**PROJECTS SECTION**

**Res. Geol.** J. D.

**Qualifications:** See attached file

**Previous Surveys**

---

**CHECKED BY:**

**DATE:**

---

**GEOLOGICAL BRANCH**

---

**APPROVED BY:**

**DATE:**

---

**GEOLOGICAL BRANCH**

---

**APPROVED BY:**

**DATE:**

---

**TOTAL CLAIMS:** 87
## GEOPHYSICAL TECHNICAL DATA

### GROUND SURVEYS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Stations</td>
<td>8975</td>
</tr>
<tr>
<td>Station interval</td>
<td>100'</td>
</tr>
<tr>
<td>Line spacing</td>
<td>400'</td>
</tr>
<tr>
<td>Profile scale or Contour intervals</td>
<td>1&quot; = 500 GAMMAS</td>
</tr>
</tbody>
</table>

### MAGNETIC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td>MF 1 - MF 2</td>
</tr>
<tr>
<td>Accuracy - Scale constant</td>
<td></td>
</tr>
<tr>
<td>Diurnal correction method</td>
<td>SERIES OF BASE STNS.</td>
</tr>
<tr>
<td>Base station location</td>
<td>BASE LINE</td>
</tr>
</tbody>
</table>

### ELECTROMAGNETIC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td></td>
</tr>
<tr>
<td>Coil configuration</td>
<td></td>
</tr>
<tr>
<td>Coil separation</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td></td>
</tr>
<tr>
<td>Fixed transmitter</td>
<td></td>
</tr>
<tr>
<td>Shoot back</td>
<td></td>
</tr>
<tr>
<td>In line</td>
<td></td>
</tr>
<tr>
<td>Parallel line</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Parameters measured</td>
<td></td>
</tr>
</tbody>
</table>

### GRAVITY

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td></td>
</tr>
<tr>
<td>Scale constant</td>
<td></td>
</tr>
<tr>
<td>Corrections made</td>
<td></td>
</tr>
<tr>
<td>Base station value and location</td>
<td></td>
</tr>
<tr>
<td>Elevation accuracy</td>
<td></td>
</tr>
</tbody>
</table>

### INDUCED POLARIZATION - RESISTIVITY

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td></td>
</tr>
<tr>
<td>Time domain</td>
<td></td>
</tr>
<tr>
<td>Frequency domain</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td></td>
</tr>
<tr>
<td>Electrode array</td>
<td></td>
</tr>
<tr>
<td>Electrode spacing</td>
<td></td>
</tr>
<tr>
<td>Type of electrode</td>
<td></td>
</tr>
</tbody>
</table>
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.

FILE

MAY 24 1972

PROJECTS SECTION

Type of Survey: ELECTROMAGNETIC

Township or Area: PORT ARTHUR

Claim holder(s): CONWESS Expl. Co. Ltd.

Author of Report: SCOTT SWINDEN

Address: 85 Richmond St. W. – 10th Fl. – TORONTO

Covering Dates of Survey: OCT 1 – OCT 30, 1971

(linecutting to office)

Total Miles of Line cut: 75 MILES

SPECIAL PROVISIONS CREDITS REQUESTED

Geophysical

Electromagnetic: 40

Magnetometer

Radiometric

Other

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

Magnetometer

Electromagnetic

Radiometric

DATE: [Signature: Author of Report]

PROJECTS SECTION

Res. Geol. ______ Qualifications

Previous Surveys

Checked by: [Signature] date

GEOLOGICAL BRANCH

Approved by: [Signature] date

GEOLOGICAL BRANCH

Approved by: [Signature] date

TOTAL CLAIMS: 87

RECEIVED

File

MINING CLAIMS TRAVERSED

List numerically

(prefix) (number)

[Blank space for list]
GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS
Number of Stations: 3975  
Station interval: 100'
Line spacing: 400'
Profile scale or Contour intervals: 50%

MAGNETIC
Instrument:  
Accuracy - Scale constant:  
Diurnal correction method:  
Base station location:  

ELECTROMAGNETIC
Instrument: Royco EM-10  
Coil configuration: HORIZONTAL LOOP & VERTICAL LOOP  
Coil separation: N/A  
Accuracy:  
Method:  
Frequency: ULF - CUTLER, MAINE  
Parameters measured: VERTICAL FIXED COMPONENTS

GRAVITY
Instrument:  
Scale constant:  
Corrections made:  
Base station value and location:  
Elevation accuracy:  

INDUCED POLARIZATION – RESISTIVITY
Instrument:  
Time domain:  
Frequency domain:  
Frequency:  
Range:  
Power:  
Electrode array:  
Electrode spacing:  
Type of electrode:  