## REPORT ON GEOPHYSICAL WORK

ON
CARS-41/42
CARSCALLEN TOWNSHIP


PROJ\#:



## SUMMARY AND RECOMMENDATIONS

HLEM and magnetic surveys were carried out on the Cars-41 and Cars-42 properties for Falconbridge Limited in June 2004.

The magnetic survey mapped north-south striking diabase dikes and east-west striking zones of pyrrhotite. The HLEM survey outlined a number of conductors. Anomalies ' $A$ ' and ' $B$ ' have been previously tested by diamond drilling, on strike to the east. It is recommended that the grid is extended to the west to determine the extent of anomalies ' $F$ ' and ' $G$ '.

## TABLE OF CONTENTS

page
Summary and Recommendations ..... i
Introduction ..... 1
General Geology ..... 1
Previous Work ..... 3
Survey Descriptions ..... 5
Magnetic Results ..... 5
EM Results ..... 7
References ..... 11

## LIST OF FIGURES

page
1.(a) Location Map ..... 2
(b) Claim Map ..... 2
2. Total Magnetic Field ..... 6
3. HLEM Results, 444 Hz ..... 8
LIST OF TABLES
page

1. Property Description ..... 1
2. Summary of Previous Work ..... 4
3. EM Anomaly ' $A$ ' Interpretation ..... 9
4. EM Anomaly ' $F$ ' Interpretation ..... 10
5. EM Anomaly ' $G$ ' Interpretation ..... 10

## LIST OF MAPS

1. Total Magnetic Field
2. HLEM Results, 222 HZ, 200 metre Coil Separation
3. HLEM Results, 444 HZ, 200 metre Coil Separation
4. HLEM Results, 1777 HZ, 200 metre Coil Separation

## INTRODUCTION

During June 2004, magnetic and horizontal loop electromagnetic (HLEM) surveys were run on the Cars-41 and Cars-42 properties for Falconbridge Limited. This work was part of a larger exploration program which included seven grids in Carscallen, Whitesides, Turnbull and Godfrey Townships.

The property is located 30 kilometres west southwest of the city of Timmins in the northwest quadrant of Carscallen Township and the northeast quadrant of Whitesides Township, Porcupine Mining Division (Figure 1(a)). It was accessed from a gravel road which run north between Highway 101 to the south and the Malette Lumber Road to the north.

The magnetic survey was carried out by J. DerWeduwen and the HLEM survey was run by B. Pigeon and the author of this report.

| CLAIM \# | \# of UNITS | RECORDING DATE | RECORDED HOLDER | DESCRIPTION | TOWNSHIP |
| :---: | :---: | :---: | :---: | :---: | :---: |
| P 1201230 | 2 | Oct 13, 2003 | Falconbridge Limited |  | Carscallen |
| P 3002972 | 11 | Nov 29, 2002 | Huot, John |  | Carscallen |
| P 3002999 | 16 | Nov 29, 2002 | Huot, John |  | Carscallen |
| P 3010648 | 12 | Apr 22, 2003 | Falconbridge Limited |  | Carscallen |
| P 3010649 | 5 | Apr 22, 2003 | Falconbridge Limited |  | Carscallen |
| P 3010654 | 5 | Apr 22, 2003 | Falconbridge Limited |  | Carscallen |

Table 1 : Property Description

## GENERAL GEOLOGY

Carscallen Township is located near the west end of the Abitibi greenstone belt which consists of predominantly east-west striking, steeply dipping Archean sediments and ultramafic to felsic volcanics. These
COT

Figure 1(a) : Location Map


Figure 1(b): Claim Map
rocks have been intruded by ultramafic to felsic bodies, north-south striking Matachewan diabase dikes and northeast striking Keweenawan diabase dikes.

The geology of Carscallen Township is given on preliminary map 0023 (S.A. Ferguson, etal 1959) at a scale of 1 inch to $1 / 4$ mile, on preliminary map 3379 (Ayer, etal, 1998) at a scale of 1:100,000 and on regional geological map 2205 (D. R. Pyke, etal 1972) at a scale of 1 inch to 4 miles.

The government geology maps and previous drill holes to the south and east of the survey area suggest that the north half of the Cars-41 and Cars-42 properties are underlain by mafic intrusives and the south half is underlain by intermediate to felsic volcanics. All of the rocks in the area are cut by north-south striking diabase dikes.

## PREVIOUS WORK

The following is a description of previous exploration work carried out on the Cars-41 and Cars-42 properties (Table 2).

In 1964, Lucky Strike Explorations Limited ran magnetic, VLEM (vertical loop electromagnetic) and detail HLEM surveys over a block of 24 mining claims along the western edge of Carscallen Township. The property covered the portion of the present Cars-41 survey area which is located in Carscallen Township. The grid on the property consisted of north-south lines spaced every 400 feet and picketed every 100 feet. The magnetic survey was run with a vertical field, fluxgate magnetometer. In 1964, four holes were drilled to test EM anomalies to the south of the present survey area.

In 1966, Mespi Mines Limited carried out a Crone JEM survey over a block of seventy-five claims which included the present Cars-42 survey area. In 1967, at least 7 diamond drill holes were sunk to test EM anomalies.

In 1968, Claw Lake Molybdenum Mines Ltd. ran magnetic and VLF (very low frequency) electromagnetic surveys over a block of ten claims directly to the south of the present CARS-41 survey area. The grid on the property consisted of north-south lines spaced every 200 feet and picketed every 100 feet.

The magnetic survey was run with a vertical field fluxgate magnetometer and the VLF survey was run using

| YEAR | COMPANY | GEOPHYSICS | DRILL <br> HOLES | AFRI <br> FILE |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & 1964 \\ & 1964 \end{aligned}$ | Lucky Strike Explorations Limited | Mag, VLEM, HLEM | DDH-1 to 4 | $\begin{aligned} & \text { 42A05NE0354 } \\ & \text { 42A05NE0362 } \end{aligned}$ |
| $\begin{aligned} & 1966 \\ & 1967 \end{aligned}$ | Mespi Mines Limited | JEM | WC1 to 5, wc7,7A | 42A05NE0348 <br> 42A05NE0361 |
| $\begin{aligned} & 1968 \\ & 1969 \end{aligned}$ | Claw Lake Molybdenum Mines Ltd. | Mag, VLF-EM | 69-1 to 69-4 | $\begin{aligned} & \text { 42A05NE0346 } \\ & \text { 42A05NE0355 } \end{aligned}$ |
| 1972 | Texas Gulf Sulphur Company | Mag, HLEM |  | 42A05NE0343 |
| 1989 | F.Zoebelein | Mag, VLF-EM |  | 42A05NE0307 |
| 1994 | Falconbridge Limited | Mag, HLEM |  | 42A05NE0068 |

Table 2. Summary of previous assessment work.

Seattle Washington as the transmitter station. In 1969, four holes were drilled to test EM anomalies.
In 1972, Texas Gulf Sulphur Company ran magnetic and HLEM surveys over a block of 14 contiguous mining claims which included the present Cars-42 survey area and the eastern portion of the Cars41 survey area. The surveys were conducted along north-south lines spaced every 300 feet. The magnetic readings were taken with a fluxgate magnetometer and the HLEM survey was run with a 200 foot coil separation and a frequency of 1600 Hertz.

In 1987, the Geological Survey of Canada flew an airborne magnetic and EM survey over the Timmins area which included Carscallen Township (OGS, 1988). This survey was flown along north-south lines spaced approximately every 200 metres.

In 1989, F. Zoebelein ran magnetic and VLF-EM surveys over a block of 23 contiguous mining claims which included the present Cars-42 survey area. The surveys were conducted along north-south lines spaced every 400 feet. The magnetic readings were taken with a total field, proton precession magnetometer.

In 1994, Falconbridge Limited ran magnetic and HLEM surveys over a large claim block which straddled the Whitesides/Carscallen Township Line and included most of the present Cars-41 survey area. The surveys were conducted along lines oriented at $20^{\circ} \mathrm{Az}$, spaced every 100 feet and picketed every 20
metres. The magnetic readings were taken with a proton precession magnetometer and the HLEM survey was run with a 150 metre coil separation and frequencies of 444 and 1777 Hertz.

## SURVEY DESCRIPTIONS

The Cars-41 grid consists of north-south lines spaced every 100 metres and picketed every 25 metres (Figure 1(b)). The grid on the Cars-42 property consists of lines oriented at $45^{\circ} \mathrm{Az}$, spaced every 100 metres and picketed every 25 metres.

The magnetic readings were taken every 12.5 metres with a Scintrex IGS-2/MP-4. This instrument is a proton precession magnetometer which measures the earth's total magnetic field to an accuracy of 0.1 nT . Diurnal variations were monitored every 10 seconds with a Scintrex MP-3 base station magnetometer, located off both properties. A total of 1357 readings were taken along 16.8 kilometres of line on the Cars- 41 property and 660 readings were taken along 8.2 kilometres of line on the Cars-42 property.

The horizontal loop EM survey was carried out with the Apex Parametrics MaxMin 1-5. This instrument measures the in-phase and quadrature components of the secondary field as a percentage of the primary field; the depth of penetration is approximately one half of the coil separation. Readings were taken every 25 metres using a coil separation of 200 metres and frequencies of 222,444 and 1777 Hertz. A total of 530 stations were sampled along 16.4 kilometres of line on the Cars-41 property and 219 stations were read along 7.8 kilometres of line on the Cars-42 property.

## MAGNETIC RESULTS

The magnetic results are contoured every 100 nT on map 1 at a scale of 1:5000. The results are also presented in Figure 2 at a scale of 1:12,500.

Two linear magnetic high anomalies, which strike north-south through the CARS-42 property, are


Figure 2 : Total Magnetic Field, CARS-41/42
typical responses from a diabase dike. One is located between the north end of Line 1600 East and 1200 North on Line 1800 East and the other is located between 1100 North on Line 1300 East and 650 North on Line 1800 East. A linear magnetic anomaly on the Cars-42 property strikes east-west from 1075 North on Line 1800 East to 975 North on Line 1600 East. This high magnetic anomaly is associated with EM anomalies ' $A$ ' and ' $B$ ' and is likely pyrrhotite mineralization. Isolated readings on the south half of Lines 1000,1100 and 1200 East are located in a circular pattern which may be a magnetic halo around an intrusive centered at 875 North on Line 1100 East.

A north-south striking magnetic high anomaly along Line 1600 East on the CARS-41 property is also, no doubt, a diabase dike. Discontinuous magnetic high anomalies on the east half of the CARS-42 grid also likely reflect diabase dikes which strike north-south close to Lines 2300,2500 and 2700 East. EM anomalies ' $C$ ' and ' $E$ ' coincide with magnetic high anomalies in this area which appear to have short east-west strike lengths.

## EM RESULTS

The results of the HLEM survey are profiled on maps 1,2 and 3 at a scale of 1:5000; the profile scale used for all of the frequencies is $1 \mathrm{~cm}=10 \%$. The results using 444 Hertz are also presented in Figure 3 at a scale of $1: 12,500$. The following is a description of bedrock conductors which were detected in the survey.

Anomaly 'A' strikes east-west between 1090 North on Line 1800 East and 900 North on Line 1400 East. The source of the anomaly is very good conductivity on Lines 1700 and 1800 East and poor conductivity on Lines 1400 and 1600 East (Table 3). The depth to the conductor varies from 44 metres on Line 1700 East to 84 metres on Line 1800 East.

Anomaly 'B' strikes east-west between 1050 North on Line 1800 East and 975 North on Line 1700

Figure 3 : HLEM Results, 444 Hertz, Cars-41/42

East. It is centered 70 metres south of anomaly ' A ' on Line 1700 East and 35 metres to the south on Line 1800 East. Anomalies ' $A$ ' and ' $B$ ' may represent two separate sources or one wide zone. The readings in the center of the anomaly, between ' $A$ ' and ' $B$ ' on Line 1700 East, are inverted. This does not appear to be due to the combination of the anomalies from two separate bodies but more likely due to a limited depth extent; the fact that the readings are not above zero, however, suggests that the width of the source is not greater than the depth extent (ie. a flat lying body). Re-surveying Line 1700 East with a shorter coil separation would help define conductors ' $A$ ' and ' $B$ '.

| LINE | ANOMALY CENTER | ANOMALY <br> wiom <br> (m) | $\left.\frac{\mathrm{P}}{\mathrm{~F}} \mathbf{(}\right)$ | 0 <br> (\%) | DEPTH (m) | CONDUCTVIT THICRNESS (mhos) | COMmENTS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1400 E | 900 N | narrow | $?$ | $?$ | $?$ | $?$ |  |
| 1600 E | 995 N | 10 | -1 | -2 | 60 | 3 |  |
| 1700 E | 1012 N | ? | -27 | -9 | 44 | 56 |  |
| 1800 E | 1090 N | ? | -11 | -5 | 84 | 34 |  |

Table 3: Anomaly 'A' Interpretation, $444 \mathrm{~Hz}, 200$ metre coil separation.

Anomalies ' $C$ ', ' $D$ ' and ' $E$ ' are one line responses centered at 1075 North on Line 2700 East, 1000 North on Line 2700 East and 1150 North on Line 2500 East, respectively. These anomalies are only negative spikes when the transmitter and receiver are located over the source. There can be little interpreted about the sources other than the fact that they are very small conductors.

Anomaly ' $F$ ' is a one line response on Line 1400 East which reflects good conductivity at a depth of 60 metres (Table (4)). The north edge of the conductor is at 1000 North, however, the width can not be determined because of the presence of anomaly ' $G$ ' to the south.


Table 4: Anomaly 'F' Interpretation, $444 \mathrm{~Hz}, 200$ metre coil separation.

Anomaty ' ${ }^{\prime}$ ' is also a one fine response located 200 metres to the south of enomaly 'F' on Lire 1400 East. The source of the anomaly is poor conductivity at a depth of © b metres (Table (5)). The south edige of the conductor is at 800 North, however, the width can not be determined because of the presence of anomaty ' $F$ ' to the north. The survey would have to be continued to the west to determine the extent of conductors ' $F$ ' and ' $G$ '.


Tabfe 5: Anomaly ' $G$ ' Interpretation, $444 \mathrm{~Hz}, 200$ metre coil separation.

The increase in the readings at the gouth end of Lines 1700 East to 2300 East, inclusive, is due to a conductor located by previous surveys directly to the south of the survey area.


## REFERENCES

## AYER, J.A. and TROWELL, N.F.

1998: Geological Compilation of the Timmins Area, Abitibi Greenstone Belt; Ontario Geological Survey, Preliminary Map P.3379, Scale 1:100,000.

## Ferguson, S.A. and Hawley, J.E.

1959: Geology of Carscallen Township; Ontario Department of Mines Survey, Preliminary Map P.0023, Scale 1 inch to $1 / 4$ mile.

## ONTARIO GEOLOGICAL SURVEY

1988: Airborne Electromagnetic and Total Intensity Survey, Timmins Area, Carscallen Township, Districts of Cochrane and Timiskaming Ontario; by Geoterrex Limited, for Ontario Geological Survey, Geophysical/Geochemical Series Map 81084. Scale 1:20,000. Survey and Compilation from March 1987 to October 1987.

1988: Airborne Electromagnetic and Total Intensity Survey, Timmins Area, Whitesides
Township, Districts of Cochrane and Timiskaming Ontario; by Geoterrex Limited, for Ontario Geological Survey, Geophysical/Geochemical Series Map 81085. Scale 1:20,000. Survey and Compilation from March 1987 to October 1987.

PYKE, D.R., AYRES, L.D. and INNES, D.G.
1973: Timmins-Kirkland Lake Sheet, Districts of Cochrane, Sudbury and Timiskaming; Ontario Div. Mines, Map 2205, Geol. Comp. Ser., Scale 1 inch to 4 miles.

## Work Report Summary

Transaction No: W0460.01399
Recording Date: 2004-SEP-08
Approval Date: 2004-SEP-10

Status: APPROVED
Work Done from: 2004-JUN-14
to: 2004-JUN-19

Client(s):
130679 FALCONBRIDGE LIMITED

Survey Type(s):
EM LC MAG

| Work Report Details: |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Claim\# | Perform | Perform Approve | Applied | Applied Approve | Assign | Assign Approve | Reserve | Reserve Approve Due Date |
| P 1115751 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-SEP-08 |
| P 1115752 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-SEP-08 |
| P 1115753 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-SEP-08 |
| P 1115754 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-SEP-08 |
| P 1115757 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-SEP-08 |
| P 1115758 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-SEP-08 |
| P 1182867 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-SEP-26 |
| P 1201229 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-OCT-13 |
| P 1201230 | \$1,756 | \$1,756 | \$800 | \$800 | \$0 | 0 | \$956 | \$956 2005-OCT-13 |
| P 1201279 | \$0 | \$0 | \$400 | \$400 | \$0 | 0 | \$0 | \$0 2005-NOV-12 |
| P 3010648 | \$7,389 | \$7,389 | \$0 | \$0 | \$3,600 | 3,600 | \$3,789 | \$3,789 2005-APR-22 |
| P 3010649 | \$1,098 | \$1,098 | \$0 | \$0 | \$0 | 0 | \$1,098 | \$1,098 2005-APR-22 |
| P 3010654 | \$732 | \$732 | \$0 | \$0 | \$0 | 0 | \$732 | \$732 2005-APR-22 |
|  | \$10,975 | \$10,975 | \$4,400 | \$4,400 | \$3,600 | \$3,600 | \$6,575 | \$6,575 |

External Credits:
\$0
Reserve:
\$6,575 Reserve of Work Report\#: W0460.01399
\$6,575
Total Remaining

Status of claim is based on information currently on record.

Ministry of
Northern Development and Mines

Ministère du
Développement du Nord et des Mines

GEOSCIENCE ASSESSMENT OFFICE 933 RAMSEY LAKE ROAD, 6th FLOOR SUDBURY, ONTARIO P3E 6B5

FALCONBRIDGE LIMITED
800-207 QUEEN'S QUAY WEST
TORONTO, ONTARIO
M5J 1A7 CANADA

Tel: (888) 415-9845
Fax:(877) 670-1555

Submission Number: 2.28390
Transaction Number(s): W0460.01399
Dear Sir or Madam

## Subject: Approval of Assessment Work

We have approved your Assessment Work Submission with the above noted Transaction Number(s). The attached Work Report Summary indicates the results of the approval.

At the discretion of the Ministry, the assessment work performed on the mining lands noted in this work report may be subject to inspection and/or investigation at any time.

If you have any question regarding this correspondence, please contact BRUCE GATES by email at bruce.gates@ndm.gov.on.ca or by phone at (705) 670-5856.

Yours Sincerely,


Ron C. Gashinski
Senior Manager, Mining Lands Section
Cc: Resident Geologist
Falconbridge Limited
Assessment File Library
(Claim Holder)
Falconbridge Limited (Assessment Office)

Dean Rogers
(Agent)






