MAGNETOMETER SURVEY

on the

REDSTONE RIVER CLAIMS
GEIKIE TOWNSHIP

Porcupine Mining Division

N.T.S. - 42-A-3

J. A. Kelly, P.Eng
1) **PROPERTY:**
   a) Total number of claims - Seventeen (17)
   b) Recorded numbers - P-307757 to P-307773
   c) Staked by - Roland Collins
   d) Date of recording - February 15, 1971
   e) Status - Twenty days (20) per claim (due February 15, 1971)

2) **LOCATION:**
   a) Township - Giekie
   b) N.T.S. Map - 42-A-3
   c) Latitude - 48° 12'
   d) Longitude - 81° 09'
   e) Mining Division - Porcupine
   f) Distance from Timmins - Twenty One (21) miles south

3) **OWNERSHIP AND/OR TITLE:**
   a) Owned by - Falconbridge Nickel Mines Limited, 7 King Street East, Toronto 2, Ontario.
   b) Interest - One hundred (100) percent transferred to Falconbridge Nickel Mines Limited on February 15, 1971.

4) **ACCESS:**
   a) Summer - Via all-weather road to Texmont Mine pump house, then by canoe on the Redstone River; one portage is necessary.
   - Via float-equipped aircraft to Giekie Lake.
   b) Winter - Via snow machine on bush trail from Texmont Mine to Giekie Lake.
   - Via ski/wheel equipped aircraft to Giekie Lake.
5) HISTORY:

For the past twenty years exploration activities in the general vicinity of the claim group have been directed towards the asbestos and, later, the nickel sulfide potential of the Kenoran ultramafic rocks occurring along the eastern border of the Bartlett dome.

Initial work by Dominion Gulf Limited in this area located the nickel sulfide orebody now being developed by Texmont Mines Limited. Interestingly enough, Dominion Gulf was investigating the asbestos potential of the peridotite bodies at the time. Subsequent to the sulfide discovery a new company, Fatima Mine, was formed and underground development proceeded. Evidently the shaft and two levels were completed prior to the takeover by P. Sheridan et al. Following re-organization, the company now known as Texmont Mines Limited, has proceeded with underground development to a production stage. No production has commenced at this writing however.

The geological setting of the area as well as the activities, rumors and announcements associated with the Texmont property have served to attract companies into the area. Ontario Department of Mines and N. D. assessment files show that geological and geophysical work were conducted in the area of our claim group but mainly west of the Redstone River. The magnetic high extending east of the river (see Fig. 3) has been staked on numerous occasions but no technical reports
on any follow-up surveys have been reported. Northeast of the claims some geophysical activities were conducted on properties probably acquired during the 1965 T. G. S. rush. Falconbridge mapped and sampled an ultramafic some two miles north in the south part of Douglas Township in 1963. (Richardson et al). Figure 2 shows the locations of previous work. An annotated history of the various programs is given in the following table.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>COMPANY</th>
<th>PROGRAM</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950-1952</td>
<td>Dominion</td>
<td>Airborne &amp; ground mag &amp; E.M. Dia. Drilling</td>
<td>1 positive conductor 1 blank hole</td>
</tr>
<tr>
<td>1959</td>
<td>Ultrashawkey Mines Ltd.</td>
<td>Vertical Loop E.M.</td>
<td>3 conductors of unknown origin; no follow-up</td>
</tr>
<tr>
<td>1960</td>
<td>Noranda Mines</td>
<td>Geol. map</td>
<td>vague map showing 4 rock types mainly peridotite (see Fig. 2)</td>
</tr>
<tr>
<td></td>
<td>(option from R. Allerston)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1963-1964</td>
<td>Falconbridge</td>
<td>Geol. map Sampling</td>
<td>Located peridotite zone to NE of present claim group no follow-up</td>
</tr>
<tr>
<td>1965</td>
<td>Silverton Mines Ltd.</td>
<td>mag &amp; E.M.</td>
<td>mag high (3x background) ¼ mi. north of Geikie Lake.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>surveys between Geikie &amp; Baloney Lakes</td>
<td></td>
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</table>

6) GENERAL GEOLOGY:

(a) Topography - low boggy and swamp areas border the Redstone River where it traverses the property. Eastward, the ground rises gently to a broad, wooded ridge trending northeast parallel to the river. There appears to be none of the
FIG. 2

LOCATION OF PREVIOUS WORK VICEINITY OF REDSTONE GP.
N.I.V. GEIKIE TWP.

FALCONBRIDGE NICKEL MINES LTD.

SCALE 1" = 1/4 mile  DRAWN J.R.K.
DATE Dec. 15/11  TRACED
a thought ridge type of topography often exhibited by other ultramafic occurrences in the Porcupine area. (e.g. - Dundonald-Clergue Townships, Carman-Langmuir Townships, Bartlett ... et al).

(b) Table of Formations

<table>
<thead>
<tr>
<th>Precambrian-Archean</th>
<th>acid intrusive group</th>
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<tbody>
<tr>
<td></td>
<td>..? ?? ..? ?? ..? ??</td>
</tr>
<tr>
<td>basic and ultrabasic group</td>
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<td>--- intrusive contact</td>
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<tr>
<td>basic volcanic group</td>
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</table>

Geological mapping by Noranda Mines Limited (1960) outlined a serpentenized peridotite bordered by an "amphibolite" margin trending northeast from Bartlett into Geikie Township. (See Fig. 2). O.D.M. and N.D. (Map 2046) have projected this "ultrabasic" east of the Redstone River. The location of this "plug" is based on aeromagnetic evidence owing to the lack of ground geological data in Geikie Township.

Reconnaissance mapping by Falconbridge Nickel Mines Limited (private company report - 1972) of the few outcrops within the claim group verified the existence of coarse meta-gabbros and possibly meta-pyroxenites (altered to amphibolites ??). Aeromagnetic contours over the east-central portion of the claim group (see Fig. 3) have a peak intensity (total field) in the 1500-2000 gamma range with a maximum peak value of 2000 gammas. Magnetic (total field) intensities over known peridotite bodies in the area appear to fall within the 2000 to 3000 gamma range. It is therefore not possible, in the view of this writer, to positively determine the presence or absence of a serpentinized peridotite body within the claim group on the basis of
FIG. 3

AEROMAGNETIC DATA
N.W. CORNER–GEIKIE TWP.
from E.M.&R. MAD 8447-G

SCALI: 1 in = 1/4 mi
DRAWN: JAE
DATE: Dec. 8/71
TRACED: J.R.K.
Existing published data. In view of the paucity of outcrop our geological investigations is incomplete hence it became necessary to fall back to a detailed ground magnetometer survey in order to assess the exploration potential of these claims.

7) MAGNETOMETER SURVEY:

a) **Objective**: To delineate and define the extent of any altered peridotite within the claim group. To assess anomalous zones within or adjacent to any such ultrabasic with respect to follow-up geophysical techniques. Although this may seem to be a case of the blind leading the blind, we have no other alternative due to lack of geological control.

b) A geological/geophysical line grid of some 16 line/miles was laid out as follows:

(i) Baseline - length 7200'; bearing N 90° E

(ii) Crosslines - 19 crosslines at 400' spacings; bearing N 000° E (at point of origin); picketed at 100' intervals.

(iii) Station Intervals: 100' Intervals

(iv) Number of Stations: 319

(v) **Tie-In**: The grid is NOT tied to any survey

(vi) **Personnel**: The lines were cut under the direct supervision of John J. Johnson of Timmins Ontario.

(vii) **Date Performed**: Between August 1 to 7, 1971 inclusive
c) MAGNETOMETER SURVEY:

(i) Instrument - **Sharpe MF-2 fluxgate magnetometer** - a battery operated, transistorized, direct reading instrument which measures the vertical component of the earth's magnetic field via a second harmonic fluxgate system.

(ii) - to (+) or (-) 20 gammas per scale division at 1000 scale.

(iii) Theory of Method - The fluxgate magnetometer employs a saturable core system which consists essentially of two highly permeable metallic strips about which primary coils are wound. A low frequency field (1 KH Z) is applied to these primary coils through an oscillator. The field is sinusoidal and drives the strip into saturation during each half cycle resulting in an even rate of change of permeability of the cores or strips (at 2 KH Z). Any ambient field acting on this system yields a flux or phase variation which when gated at the proper frequency (in this instrument - the second harmonic) induces voltage pulses in an adjacent secondary winding. These pulses are amplified and fed into a phase detector and emerge a D.C. signal. This signal is directly proportional to the strength of the ambient field thus the strength of the field can be read on a voltmeter calibrated in gammas. The accuracy of the MF-2 is within 0.5% of full scale.
between the 1,000 and 10,000 gamma ranges and within 1.0% between 30,000 to 10,000 gamma ranges.

(iv) Procedure: A magnetic base station was established on the baseline at 0+00 W. From here auxiliary base stations were established and tied to the main base station. Readings were then taken at 100' stations along the crosslines with traverses so arranged that the auxiliary stations on the baseline could be read at least every two hours. In this manner the diurnal and instrument drift variations could be checked at regular intervals with a minimum loss of time. A total of 819 readings were taken at 100 foot intervals on all crosslines and the baseline. These values were corrected for diurnal and instrument drift variations and plotted on a one inch to 200 foot base plan of the claims. The plots were contoured at 100 gamma intervals. The completed survey map is presented as Fig. 4 of this report.

(v) Personnel: Contractor - Mr. R. Collins, 26 Maple St. N., Timmins, Ontario.

Instrument Operator - Mr. I. Collins, 26 Maple St. N., Timmins, Ontario.

Supervised By - Mr. James A. Kelly, P. Eng. 724 Churchill Street, Timmins, Ontario.

(vi) Date of Survey - January 10 - 18, 1972
January 20 - 23, 1972

(vii) Assessment Credits Applied For: Forty (40) days each on the claims listed on Page 1 of this report or a total of 680 days.
d) RESULTS:

As expected a more detailed resolution of the aero- magnetic data was obtained. East and west of the river zones of magnetic intensity (vertical component) greater than 3000 gammas were delineated.

East of the river a wedge like anomalous pattern is defined. This zone lies parallel to and slightly south of the baseline. It appears to pinch out to the east. North and northeast the zone is rather abruptly bordered by a flat rather uneventful area of less than 1500 gammas.

West of the river the survey delineated two anomalously high zones striking southwest and east-west respectively. These 'anomalies' appear to be superimposed on an area where the magnetic contours exceed 2500 gammas. The south-west-striking zone in claim P-307773 is bordered on the west by a linear trough which may be a dipolar effect.

The zones of high magnetic relief east and west of the river are truncated by a trough of relatively low values trending parallel to the Redstone River where it transects the claim group.

8) INTERPRETATION:

As this survey essentially constitutes a preliminary assessment of the claims, the interpretations presented below are, at best, tentative. The writer recognizes that use of magnetic data alone to draw empirical conclusions with respect to the structure and stratigraphy is blatant sophistry.
(a) **Stratigraphy:**

Rocks of mafic to ultramafic composition (pyroxene-rich gabbro, pyroxenites and peridotite) probably underlie zones delineated by magnetic contours exceeding 3000 gammas. This would include the wedge shaped zones east of the river and the two zones to the west. To the northeast the ultramafic units appear to be in contact with intermediate to basic volcanic flows. The linear trough bordering the northeast portion of the 'wedge' (line 00 W to line 20 W) could be interpreted as an intrusive contact. The low values in the extreme southeast portion of the ground delineate a granitic area.

West of the river, the two magnetic highs are possibly caused by ultramafic zones in mafic flows. Previous mapping of this area by Dominion-Gulf indicated an area of intercalated serpentenites, greenstones, pillow flows, gabbros etc. Geological work by Noranda showed peridotite, greenstone and 'amphibolite'. In any event the zones delineated by contours exceeding 4500 to 5000 gammas possibly indicate areas of excess magnetite associated with serpenotization of pyroxene and/or olivine-rich rocks.

(b) **Structure:**

Again only tentative interpretations can be offered. Assuming the magnetic highs indicate ultrabasic rocks, these rocks are in all probability a series of intrusive lenses which have been folded. Certainly the zone east
of the river could be interpreted as an antiform structure plunging east. West of the river the two highs could be interpreted as the limbs of a folding ultramafic lense. The fold is anticlinal and plunges southwest.

A striking feature of the magnetic map is the abrupt truncation of the magnetic highs by the low zone trending parallel to the river. Possibly this zone is indicative of a north-south regional fault zone now covered with a deep layer of overburden. If so, there was undoubtedly some horizontal displacement associated with the fault and hence the magnetic zones on each side of the river are probably not continuous.

9) CONCLUSIONS AND RECOMMENDATIONS:

The three anomalous zones probably indicate the presence of ultramafic rocks which have been serpentenized. Interestingly enough, the Texmont orebody is located in a series of serpentenized dunites and peridotites which, despite the high pyrrhotite content, do not exhibit magnetic contours much greater than 8,000 gammas. There the serpentinite contact was defined at the 3,000 gamma contour. This 'pick' was verified by Geological mapping and later drilling. Using these data as a guide the zones in our survey should be investigated.

Further exploration on the claims should include the following work:

(1) Detailed magnetometer survey of the anomalous zones on 100 line spacing at 50 ft. or 25 ft. intervals.

(2) A VLF-EM survey. The objective of this survey would be
to try to define or delineate the contacts of the ultramafics. In view of the finely disseminated nature of the sulfides in the Texmont zone it is not expected that any similar zones which might be present under our claims would yield a definitive E.M. response.

(3) Continuation of the detailed geological mapping initiated last fall. Additional crosslines will be required.

(4) A soil or leaf geochemical survey of the anomalous zones.

(5) I.P. check where warranted.

The above work can be conducted from a camp situated on the Redstone River or on Geikie Lake. The former is preferable as access is easy and, most important, cheap.

Respectfully submitted by

James W. Kelly, P.Eng.
Senior Geologist
Falconbridge Nickel Mines Limited
167 Wilson Avenue,
Timmins, Ontario.

Dated: January 28, 1972
**ASSESSMENT WORK DETAILS**

**Type of Survey**
- A separate form is required for each type of survey.

**Township or Area**
- GEIKIE TWP.

**Chief Line Cutter or Contractor**
- John J. Johnson

**Party Chief**
- 112 Second Ave., Timmins, Ontario
- I. Collins Address

**Consultant**
- 26 Maple St. NW, Timmins, Ontario
- James A. Kelly Address

**Geological field mapping by**
- 724 Churchill St., Timmins, Ontario

**COVERING DATES**
- **Line Cutting**
  - August 1 to 7, 1972
- **Field**
  - January 10 to 23, 1972
- **Office**
  - January 24 to February 3, 1972

**MINING CLAIMS TRAVESED**

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**TOTAL CLAIMS**

- 27

**INSTRUMENT DATA**
- **Make, Model and Type**
  - Sharpe MF-2
- **Scale Constant or Sensitivity**
  - 20 gammas

Or provide copy of instrument data from Manufacturer's brochure.

**Radiometric Background Count**
- 819

**Number of Stations Within Claim Group**
- 819

**Number of Readings Within Claim Group**
- 16

**Number of Miles of Line cut Within Claim Group**

**Number of Samples Collected Within Claim Group**

**CREDITS REQUESTED**

<table>
<thead>
<tr>
<th>20 DAYS</th>
<th>40 DAYS</th>
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<tbody>
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<td>per claim</td>
<td>per claim</td>
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</tbody>
</table>
- Geological Survey
- Geophysical Survey
- Geochemical Survey

**Send in Duplicate to:**
- FRED W. MATTHEWS
- SUPERVISOR-PROJECTS SECTION
- DEPARTMENT OF MINES & NORTHERN AFFAIRS
- WHITNEY BLOCK
- QUEEN'S PARK
- TORONTO, ONTARIO

Performance and coverage credits do not apply to airborne surveys.
SUBMISSION OF GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS

AS ASSESSMENT WORK

In order to simplify the filing of geological, geochemical and ground geophysical surveys for assessment work, the Minister has approved the following procedure under Section 84 (8a) of the Ontario Mining Act. This special provision does not apply to airborne geophysical surveys.

If, in the opinion of the Minister, a ground geophysical survey meets the requirements prescribed for such a survey, including:

(a) substantial and systematic coverage of each claim
(b) line spacing not exceeding 400 foot intervals
(c) stations not exceeding 100 foot intervals or
(d) the average number of readings per claim not less than 40 readings

it will qualify for a credit of 40 assessment work days for each claim so covered. It will not be necessary for the applicant to furnish any data or breakdown concerning the persons employed in the survey except for the names and addresses of those in charge of the various phases (linecutting contractor, etc.). It will be assumed that the required number of man days were spent in producing the survey to qualify for the specified credit.

Each additional ground geophysical survey using the same grid system and otherwise meeting these requirements will qualify for an assessment work credit of 20 days.

A geological survey using the same grid system, and meeting the requirements for submission of geological surveys for maximum credits will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geological survey a credit of 40 days per claim will be allowed for the survey.

Similarly, a geochemical survey using the same grid system with the average number of collected samples per claim being not less than 40 samples, and meeting the requirements for the submission of geochemical surveys for maximum credits, will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geochemical survey a credit of 40 days per claim will be allowed for the survey.

Credits for partial coverage or for surveys not meeting requirements for full credit will be granted on a pro-rata basis.

If the credits are reduced for any reason, a fifteen day Notice of Intent will be issued. During this period, the applicant may apply to the Mining Commissioner for relief if his claims are jeopardized for lack of work or, if he wishes, may file with the Department, normal assessment work breakdowns listing the names of the employees and the dates of work. The survey would then be re-assessed to determine if higher credits may be allowed under the provisions of subsections 8 and 9 of section 84 of the Mining Act.

If new breakdowns are not submitted, the Performance and Coverage credits are confirmed to the Mining Recorder at the end of the fifteen days.
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: MAGNETOMETER

Township or Area: GETKIE

Claim holder(s): FALCONBRIDGE NICKEL MINES LIMITED

Author of Report: JAMES A. KELLY P. ENG.

Address: 724 CHURCHILL ST. TIMMINS, ONTARIO

Covering Dates of Survey: AUG. 1-7/71; JAN. 10-23/71;
(linecutting to office) JAN. 24 - FEB. 3/72

Total Miles of Line cut: 16

SPECIAL PROVISIONS
CREDITS REQUESTED

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<tbody>
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<td>Magnetometer</td>
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<tr>
<td>Radiometric</td>
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<td>Geological</td>
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AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

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

DATE: FEB. 4, 1972 SIGNATURE: J. ________

PROJECTS SECTION
Res. Geol. TIMMINS Qualifications: ________

Previous Survey: ________

Checked by: ________ date: ________

GEOLOGICAL BRANCH

Approved by: ________ date: ________

GEOLOGICAL BRANCH

Approved by: ________ date: ________

MINING CLAIMS TRAVERSED
List numerically

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TOTAL CLAIMS: 17
# Geophysical Technical Data

## Ground Surveys

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<thead>
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<th>819</th>
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<tbody>
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<td>Number of Readings</td>
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<tr>
<td>Station interval</td>
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<td>Line spacing</td>
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<tr>
<td>Profile scale or Contour intervals</td>
<td>100 gammas</td>
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*(specify for each type of survey)*

## Magnetic

- **Instrument**: Sharpe MF-2
- **Accuracy**: Scale constant 20 gamma/scale div.
- **Diurnal correction method**: correction curve from auxiliary base station checks
- **Base station location**: 0+0ON and 0+0OW

## Electromagnetic

- **Instrument**:
- **Coil configuration**:
- **Coil separation**:
- **Accuracy**
- **Method**: [ ] Fixed transmitter  [ ] Shoot back  [ ] In line  [ ] Parallel line
- **Frequency**
- **Parameters measured**

## Gravity

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

## Induced Polarization - Resistivity

- **Instrument**:
- **Time domain**: Frequency domain
- **Frequency**
- **Power**:
- **Electrode array**:
- **Electrode spacing**:
- **Type of electrode**:

*(specify V.L.F. station)*