GROUND MAGNETIC SURVEY REPORT

SPRUCE BAY PROPERTY

WHITE LAKE AREA (North Part)

THUNDER BAY MINING DIVISION, ONTARIO

HOMESTAKE CANADA INC.

Ikram (Ike) A. Osmani, M. Sc. (Geology), M. Sc. (Geophysics)

Allan MacTavish, M. Sc., F.G.A.C.

Jacques Samson, B. Sc.

March 25, 1997
Thunder Bay, Ontario
Table of Contents

Introduction .............................................. 1
Location .................................................. 1
Access ..................................................... 1
Property ................................................... 1
Regional Geology ....................................... 5
Property Geology ........................................ 5
Exploration History .................................... 6
Linecutting ................................................ 8
Magnetic Survey ......................................... 8
Magnetic Survey Methodology .......................... 9
Results of the Survey .................................. 9
Conclusions .............................................. 10
Recommendations ....................................... 11
Certificate of Qualifications: Ikram (Ike) A. Osmani 12
Certificate of Qualifications: Allan MacTavish ....... 13
Certificate of Qualifications: Jacques Samson ....... 14
References ................................................ 15
Appendix 1: GEM GSM-19 Specifications ................. 16

List of Figures

Figure 1: Location Map .................................. 2
Figure 2: Property Location Map ....................... 3
Figure 3: Claim Location Map ........................... 4

List of Maps

Map 1: Numeric Magnetic Survey Data ................. Back Pocket
Map 2: Contoured Total Field Magnetic Map (Black and White) Back Pocket
Map 3: Contoured Total Field Magnetic Map (Coloured) Back Pocket
Introduction

Homestake Canada Inc. (HCI) optioned the Spruce Bay property from Winslow Gold Corp. in April 1995. This report summarizes linecutting and a ground magnetometer survey completed between September and November, 1996, by Magnum Explorations Inc.

Location

The Spruce Bay property is located about 23 and 50 km northeast of Hemlo and Marathon, respectively (see Figure 1 and 2). The northeastern portion of the property straddles Spruce Bay located in the northwestern part of White Lake. The centre of the property is situated in NTS 42C/13SE, within UTM Zone 16, at 596000E, 5404000N.

Access

Access (see Figure 2) to the eastern portion of the property is by boat/snowmobile, depending on the season, for approximately 9 km on White Lake north from the public boat launch site situated at the White Lake narrows near Highway 17. The western portion of the property may be accessed by truck/snowmobile along the Wabikoba Lake road for a distance of 14.1 km east from Highway 614 to the Theresa Lake dam, and from there 3 km south by trail (ATC/snowmobile/foot).

Property

The Spruce Bay Property consists of eight contiguous, unpatented mining claims (42 units, ~680 hectares) in the Wabikoba Lake Area (Claim Map G-622) of the Thunder Bay Mining Division, Ontario (see Figure 3). It is flanked to the northwest and north by the Wabikoba and White Lake properties, respectively, which are also held by HCI. The claims are held under option from Winslow Gold Corp. and are numbered as follows:

<table>
<thead>
<tr>
<th>Claim #</th>
<th>No. of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1097947</td>
<td>1</td>
</tr>
<tr>
<td>1183294</td>
<td>1</td>
</tr>
<tr>
<td>1186730</td>
<td>12</td>
</tr>
<tr>
<td>1186978</td>
<td>4</td>
</tr>
<tr>
<td>1186979</td>
<td>14</td>
</tr>
<tr>
<td>1195626</td>
<td>5</td>
</tr>
<tr>
<td>1210344</td>
<td>4</td>
</tr>
<tr>
<td>1210345</td>
<td>1</td>
</tr>
<tr>
<td>8 claims</td>
<td>42 units</td>
</tr>
</tbody>
</table>
Figure 1: Northwestern Ontario Location Map
Spruce Bay Property.
HOMESTAKE CANADA INC.

FIGURE 2
SPRUCE BAY PROPERTY
LOCATION AND ACCESS

DAVID BELL

GOLDEN GIANT

WILLIAMS

Bomby
Regional Geology

The Spruce Bay property is underlain by the North Limb portion of the Archaean Schreiber-Hemlo greenstone belt (2.71 Ga to 2.688 Ga, Corfu and Muir 1989) of the Wawa Subprovince, of the Superior Province, situated along the north shore of Lake Superior. The greenstone belt extends from near the town of White River, in the east, to the town of Schreiber, in the west. The eastern, or Hemlo portion of the belt, underlies the Spruce Bay property and is separated from the western, Schreiber portion by the Middle Proterozoic, Coldwell alkalic complex (1.1 Ga, Heaman and Machado 1987). The Hemlo portion of the belt is bound to the north by the composite Black-Pic batholith/Gowan Lake Pluton (2.678 Ga, Corfu and Muir 1989), to the south by the Heron Bay Pluton and the Pukaskwa batholith (2.71 Ga, Corfu and Muir 1989), and to the east and northeast by the Dotted Lake Pluton. The eastern half of the Hemlo portion of the belt is split by the Cedar Lake Pluton (2.688 Ga, Corfu and Muir 1989), the Musher Lake Pluton, the Cedar Creek Stock (2.684 Ga, Corfu and Muir 1989)) and a number of smaller, unnamed stocks and plugs.

Supracrustal rocks within the Hemlo greenstone belt consist of tholeiitic to calc-alkaline volcanic and aluminous metasedimentary rocks. Mafic metavolcanic rocks consist of massive to pillowed, often plagioclase-phyric flows and associated fragmental rocks. Banded mafic to felsic calc-alkalic flows and pyroclastic rocks succeed the mafic metavolcanic rocks and are apparently transitional into metasedimentary rocks consisting of wacke, ironstone, argillite, and conglomerate (Williams et al. 1991).

Synvolcanic mafic to ultramafic intrusions (gabbro to peridotite) and intermediate to felsic hypabyssal intrusive bodies (e.g., feldspar and quartz-feldspar porphyries) are emplaced subconcordantly to concordantly within the supracrustal sequences. Internally, the supracrustal rocks are intruded by the late Archaean, mainly undeformed Heron Bay and Cedar Lake granitoid plutons and the Cedar Creek, Melgund, and Satellite stocks. Northwest and north-northeast-striking diabase dikes of Matachewan-Hearst and Marathon dike swarms, respectively, transect all of the above rock types (Osmani 1991).

Property Geology

The Spruce Bay property is within a southeast-trending portion of the North Limb of the eastern portion of the Schreiber-Hemlo greenstone belt. The claims are underlain by amphibolitized mafic metavolcanics with subordinate amounts of wacke, conglomerate, and paragneiss (Milne 1969, Siragusa 1985). These rocks are intruded by altered gabbro, pyroxenite, and peridotite. These supracrustal rocks have been deformed by the contact strain aureoles of the late Archaean Dotted and Musher lakes plutons occur adjacent to the property. All rock-types are crosscut by north-northeast-trending quartz diabase dikes, possibly of the Marathon swarm (Osmani 1991).
The supracrustal rocks may have been folded about an east-west-striking, west-plunging syncline proposed by Milne (1968). The northeast-striking White Lake Fault crossects the eastern portions of the claims and truncates most of the supracrustal and mafic to ultramafic intrusive rocks.

This property is located approximately 11 km southeast and apparently along strike of the North Limb property, now owned by Battle Mountain Canada Ltd. The 1995 Annual Report of the former owner, Hemlo Gold Limited, states that results from North Limb Property were encouraging. Diamond drilling has intersected a number of interesting, although subeconomic, gold intercepts within strongly altered rocks interpreted as similar to those observed within the Hemlo gold deposit.

**Exploration History**

The earliest recorded exploration in the Spruce Bay area was completed in 1976 and work since that time has been sporadic. All known exploration and the past geological mapping have been summarized below.

1976: *Noranda Exploration Company Limited* completed linecutting, Crone horizontal loop electromagnetic (CEM), vertical loop electromagnetic (VLEM), and magnetometer surveys over a 40 claim group including the east-central part of the present property. The CEM and VLEM surveys detected numerous weak conductive zones that were not considered worthy of follow-up.

1983: *Aerodat Limited* completed a helicopter-borne multi-frequency, multi-coil EM, VLF-EM, and cesium vapour magnetometer survey over the Hemlo area. This data was purchased and submitted for assessment by a number of companies in the Spruce Bay area during the same year. *Brass Ring Resources Ltd. and Sunexco Energy Corporation* submitted this data, but no other work, on adjacent properties that included the northeast and north-central portions of the present Spruce Bay claims.

1983: *Trident Resources Inc.* filed the Aerodat airborne data described above on a 22 claim property adjacent to, and north of, the western portion of the present group. Trident, through contractor Agilis Engineering Ltd., then proceeded with linecutting, geological mapping, rock sampling, soil geochemistry, and ground VLF-EM surveys. The VLF-EM survey delineated 5 major conductive zones within the eastern part of the claims that were thought to have bedrock sources. The geochemical survey detected numerous Au-in-soil anomalies with values ranging from between 20 and 310 ppb. The better soil anomalies roughly coincide with ground VLF-EM conductors. No rock samples returned significant Au or Mo values.
1983: ventilor Resources Limited filed the Aerodat data and completed a reconnaissance grid (200 m line-spacing), preliminary geological mapping, and a soil geochemistry survey on 37 claims overlapping the western 30% of the Spruce Bay claims. The soil survey detected a few weakly anomalous Mo, As, and Zn values; however these were not thought to be significant and no other work was done.

1984: A reconnaissance grid (200 m line-spacing) and ground magnetometer and VLF-EM surveys were completed by David Burda on an 18 claim group straddling the centre of the present property. Numerous short strike-length VLF-EM conductors were detected, most associated with the volcano-sedimentary contact or diabase dykes. One conductor ('A') was thought to represent a fault located along the granitoid-sedimentary contact in the south part of the claims.

1989 to 1994: Considerable prospecting, outcrop stripping, bedrock trenching, and rock sampling was completed by Daniel Carroll on 6 claims, including TB 1097947 of the present Spruce Bay claim group. Samples of pyritic metasedimentary rocks, taken in 1990 from adjacent trenches, returned analyses of 6850 ppb Au (0.20 ounces/ton) and 79 ppm Ag from one sample (DC-SB100) and 5400 ppm Zn from another (SB-3). Another pyritic metasediment sample, taken in 1991 from a trench located approximately 150 m to the south of the 2 samples above, contained 745 ppb Au, 6730 ppm Zn, 2.4 ppm Ag, and 54 ppm Mo. Oracle Minerals Inc. optioned the claims in 1994 and completed geological mapping and sampling. The results of the rock sampling were negative. No further work was submitted.

1992: A 25 claim property, which included claims that now form the eastern portion of the Spruce Bay property, was explored by Brian Fowler and Angus MacDonnell. Work completed included geological mapping, prospecting, trenching and sampling.

1993 to 1994: Work was completed on the Spruce Bay property, almost in its present form, by Brian Fowler, Mike Shuman, George Daniels, and Doug Kakeeway. In 1993 they completed prospecting, sampling, and a beep mat survey. One sample of altered pyritic metasediments, taken from a 2 m wide gossanous zone exhibiting coincident ground VLF-EM, and magnetometer anomalies, returned an analysis of 2132 ppm Zn. The owners attempted to drill this zone, but collared the hole too far north and missed the target. Exploration in 1994 consisted of linecutting (winter grid, 200 m line-spacing), ground magnetometer, VLF-EM, MaxMin-II (HLEM), and limited IP surveys. The HLEM survey was completed over the entire claim block and outlined 4 conductors of various strengths and strike-lengths. The VLF-EM survey was completed over the western portion of the group in order to aid in better defining geology and structure. The survey
outlined several east-west-trending conductive zones thought to have bedrock sources. The property was optioned to Winslow Gold Corp. in 1995, but there is no record of any work being done until Homestake Canada Inc. optioned the claims late in April 1996.

### Linecutting

Linecutting was completed by the Magnum Explorations Inc., of Thunder Bay, Ontario, between September 10 and November 20, 1996. Baselines and tielines were surveyed in for greater grid control and all cross-lines were turned at 90° from the baseline using the survey theodolite. The linecutting personnel are listed below:

- Scott Christianson, Thunder Bay, Ontario, Supervisor
- Mike Fischer, Sault Ste Marie, Ontario
- J.P. Gervais, Sault Ste Marie, Ontario
- Mike Duguay, Thunder Bay, Ontario
- Pat Heino, Thunder Bay, Ontario
- Kevin Loranger, Kenora, Ontario
- Kent Buckler, Ear Falls, Ontario
- Al Loranger, Thunder Bay, Ontario
- Pat Barr, Thunder Bay, Ontario
- Dave Boyko, Thunder Bay, Ontario
- Frank Holmes, Kenora, Ontario
- Yves St. Germaine, Thunder Bay, Ontario
- Robert Lyght, Thunder Bay, Ontario
- Don Fredrickson, Thunder Bay, Ontario
- Robert Laliberte, Thunder Bay, Ontario
- David Pykari, Thunder Bay, Ontario

### Magnetic Survey

The magnetic survey was completed by Magnum Explorations Inc. between November 18 and 30, 1996. The instrument particulars and the operators are listed below (see Appendix 1 for detailed instrument specifications):

**Instruments:**

- **Field Units:**
  - GEM GSM-19WV Serial# 166565
  - GEM GSM-19GWV Serial# 66573
- **Base Station:**
  - GEM GSM-19 Serial# 66565
**GEM GSM-19 Instrument Performance:**

Resolution: 0.01 nT  
Relative sensitivity: 0.02 nT  
Absolute accuracy: 0.2 nT  
Range: 20,000 to 120,000 nT  
Gradient tolerance: over 10,000 nT/m

**Personnel:**


**Magnetic Survey Methodology**

The magnetic survey was performed with a GEM advanced Overhauser System (GSM-19 “Walking Mag” model). The GSM-19 “Walking Mag” is a unique option which enables acquisition of nearly continuous data on survey lines. Similar to an airborne survey in principle, magnetic readings are recorded at discrete time intervals (up to 2 readings/second) as the instrument travels along the line. The “Walking Mag” automatically assigns a linearly interpolated coordinate to all intervening readings. Benefits of the “Walking” option are the high sample density which improves definition of geologic features and increases the survey efficiency and minimizes the field costs.

The present survey was run along 100 m spaced grid lines with 25 m stations. Data was collected by the continuous recording of readings taken at 1 second intervals. The recorded values plotted on the posting map (see back pocket) represent every 5th reading, because it is a physical impossibility to plot all of the readings taken during the survey on a 1:5000 scale map. Readings are expressed in nanoTeslas (nT) and each recorded value, as shown on the map, was obtained after subtracting the observed value from the threshold magnetic intensity of 57,000 nT. These recorded readings were contoured using GEOSOFT imaging software at a 100 nT interval.

**Results of the Survey**

The ground magnetic survey results are present as black and white contour and coloured total field magnetic maps (see back pocket). Most of the area surveyed exhibits a magnetic intensity of 56,500-57,000 nT (background), which corresponds well with known mafic intrusive and amphibolitized mafic metavolcanic rocks. The highest measured magnetic intensity, ranging between 57,000 to 60,700 nT, is centred on Spruce Bay of White Lake. The highest magnetic relief (up to 3,700 nT) occurs along southeastern shore of Spruce Bay. This relatively higher magnetic intensity corresponds well with a serpentinized peridotite body exposed along the shoreline of Spruce Bay.

Several small- and large-scale shear/fault zones are recognized on the property using some of the rationale of Osmani et al. (1989). These structures are characterized
on the basis of: long, linear zones of low or high magnetic intensity; rotation of magnetic anomaly trends, which are comparable to foliation trajectories; contrast of magnetic patterns on either side of a linear anomaly; and truncation of units and magnetic anomalies.

Two of the most interesting magnetic features are a northeast-trending magnetic lineament, located within the southeastern portion of the property, and a west-northwest-trending linear anomaly, coincident with the northwest-trending arm of Spruce Bay.

The northeast-trending anomaly is coincident with the White Lake Fault (Milne 1968) which is characterized by the contrasting magnetic patterns on either side of a coincident, northeast-striking magnetic lineament. Elliptical to linear anomalies of higher magnetic intensity (up to 60,700 nT) situated to the northwest of the White Lake Fault, are truncated and separated from flat-lying, weaker and diffuse patterns (57,000 nT) south of the fault. The higher intensity anomalies north of the fault correspond with mapped serpentinized peridotite and mafic metavolcanic rocks (Milne 1968), whereas the weaker, diffuse anomalies south of the fault show good correspondence with known granitoid rocks.

The west-northwest-trending anomaly is coincident with the contact between serpentinized peridotite and mafic metavolcanic rocks (Milne 1968) and may represent a sheared contact zone. The right-handed deflection of the eastward magnetic trend lines into parallelism to the contact zone, represented by the linear magnetic anomaly, suggests that the contact zone is cut by a dextral, brittle to ductile shear/fault zone.

North-trending, short, linear to annular magnetic highs (up to 59,000 nT) are scattered throughout the property. In some instances these magnetic highs, (e.g. the Spruce Bay area), join-up with similar-trending, low to medium strength, magnetic anomalies and together form long, linear anomalies which may represent diabase dikes.

Conclusions

In general, the property exhibits a flat magnetic signature; however there are a few exceptions. The magnetic high (magnetic relief of 3,700 nT) coincident with the shoreline of Spruce Bay and a previously unknown, west-northwest-trending, bifurcating, linear anomaly of relatively higher magnetic intensity coincident with the possibly sheared peridotite/mafic metavolcanic contact described above. This interpreted shear zone may have gold and base metal potential, similar to the Cu-Ni mineralization observed at the Shebandowan Cu-Ni Mine (Osmani 1997) and should be explored by appropriate geological and geophysical methods.
Recommendations

Recommendations for further work on the property are:

1) Reconnaissance Dipole-dipole IP at a 200 m line-spacing;

2) 1:5000 scale geological mapping and lithogeochemical sampling, with outcrop stripping, trenching, and channel sampling if warranted.

3) A thorough digital compilation of all existing data to assist in the generation of diamond drill targets.
Certificate of Qualifications

I, Ikram (Ike) A. Osmani of 2640 South Lane Road, Sudbury, Ontario, do hereby certify that:

1) I am a graduate of the Lucknow University, Lucknow, India, with a Bachelor of Science Degree in Geology (1971).

2) I hold a Master of Science Degree in Geology from Aligarh Muslim University, Aligarh, India (1973).

3) I hold a Master of Science Degree in Geophysics from University of Windsor, Windsor, Ontario (1982).

4) I have been practising my profession in India and Ontario since 1974.

5) I have been employed by the University of Windsor, MPH Consulting Ltd., Citadel Gold Mines, the Ontario Geological Survey, and am currently employed by Homestake Canada Inc. as a Project Geologist.

6) I am a member of the Sudbury Geological Discussion Group and Prospectors and Developers Association of Canada.

7) I have based this report, and the conclusions therein, on information provided by the survey contractor, published data, and assessment data contained in the files of the Resident Geologist's Office, Thunder Bay, and interpretation of the ground magnetic maps.

8) I do not have directly or indirectly, nor do I expect to receive, any interest in the subject property.

Dated this 25th day of March, 1997 at Thunder Bay, Ontario.

Ikram (Ike) A. Osmani, M.Sc. (Geology), M.Sc. (Geophysics)
Project Geologist
Certificate of Qualifications

I, Allan D. MacTavish of 548 McMaster St., Thunder Bay, Ontario, do hereby certify that:

1.) I hold a Bachelor of Science (Honours) Degree in Geology (1977) from Laurentian University, Sudbury, Ontario.

2.) I hold a Master of Science Degree in Geology (1992) from Lakehead University, Thunder Bay, Ontario.

3.) I am a Fellow, in good standing, of the Geological Association of Canada.

4.) I have been practising my profession in Ontario, the Northwest Territories, and Manitoba since 1975.

5.) I have been employed directly by Noranda Exploration Company Limited, Canadian Superior Exploration Co. Ltd., Amax Minerals Inc., Kerr Addison Mines Ltd., St. Joe Canada Inc./Bond Gold Canada Inc./LAC Minerals Ltd., the Ontario Geological Survey, Falconbridge Limited, and am currently employed by Homestake Canada Inc. as a Senior Project Geologist.

6.) I hold no interest, directly or indirectly, in this property, nor do I expect to receive any interest or considerations from the same.

Dated this 25th day of March, 1997 at Thunder Bay, Ontario.

Allan D. MacTavish, M.Sc., FGAC
Senior Project Geologist
Certificate of Qualifications

I, Jacques Samson of 213 Balmoral St., Mattice, Ontario, do hereby certify that:

(1) I hold a Bachelor of Science (Honours) Degree in Geology (1986) from the University of Ottawa, Ottawa, Ontario.

(2) I have been practising my profession in Ontario and Quebec since 1986.

(3) I have worked for Newmont Exploration of Canada Ltd. and am currently employed by Homestake Canada Inc. as a Project Geologist

(4) I do not have directly or indirectly, nor do I expect to receive any interest in the subject property.

Dated this 25th day of March, 1997 at Thunder Bay, Ontario.

Jacques Samson, H.B.Sc. (Geology),
Project Geologist
Corfu, F. and Muir, T.L.  

Heaman, L.M. and Machado, H.  

Milne, V.G.  
1968: White Lake Sheet, Ontario Department of Mines Geological Map 2147, Scale 1:31,680 or 1 inch to one-half mile.

Osmani, I.A.  

Osmani, I.A.  

Osmani, I.A., Stott, G.M., Sanborn-Barrie, M., and Williams, H.R.  

Siragusa, G. M.  

APPENDIX 1

GEM GSM-19 Specifications
Simultaneous Gradiometer

Many mining, environmental, and archaeological applications call for high-sensitivity gradiometer surveys. The GSM-19 meets these needs in several ways. For example, simultaneous measurement of the magnetic field at both sensors eliminates diurnal magnetic effects. And Overhauser proton precession improves data accuracy and precision. The net result is a true gradient reading that resolves even weak anomalies (less than 0.25 gamma).

Omnidirectional VLF

With GEM's omnidirectional VLF option, up to three stations of VLF data can be acquired without orienting. Moreover, the operator is able to record both magnetic and VLF data with a single stroke on the keypad.

A 12-bit A/D converter has also been incorporated in the VLF instrumentation to enhance resolution of near-surface electromagnetic conductors.

"Walking" Magnetometer / Gradiometer

GEM's unique "Walking" option enables acquisition of nearly continuous data on survey lines. Similar to an airborne survey in principle, data is recorded at discrete time intervals (up to 2 readings per second) as the instrument travels along the line. At each major survey picket (fiducial), the operator touches a designated key. The "Walking Mag" automatically assigns a linearly interpolated coordinate to all intervening readings.

A main benefit of the "Walking" option is that the high sample density improves definition of geologic structures. And because the operator can record data on a near-continuous basis, the "Walking Mag" increases survey efficiency and minimizes field expenditures -- especially for highly detailed ground-based surveys.

Near-Continuous Surveys Improve Definition of Magnetic Anomalies

As shown below, near-continuous measurements increase definition. Results from the GSM-19 "Walking Mag" (273 readings over 150 m with 2 sec. cycle time) were compared with results from a standard magnetometer (13 readings over 150 m).
GSM-19 Magnetometer / VLF System

The GSM-19 is a state-of-the-art magnetometer / VLF system that delivers both the quality of data and the extensive capabilities required to perform a broad spectrum of applications. Whether the application calls for detailed ground surveys, high-resolution marine surveys, or remotely controlled magnetic observatory measurements, you can count on the GSM-19 system to meet your goals.

The GSM-19 can be configured as either an Overhauser effect proton precession magnetometer or a conventional proton unit.

GEM's advanced Overhauser version employs continuous radiofrequency polarization and special sensors to maximize the signal-to-noise ratio. Instrument sensitivity (0.05 gamma), resolution (0.01 gamma) and absolute accuracy (0.2 gamma) set new performance standards. Moreover omnidirectional sensors ensure a high quality of data even in low magnetic latitudes.

You can also take advantage of versatile options that reduce field costs and increase survey productivity. And the lightweight Overhauser unit is easy to transport and operate in the field (console with rechargeable batteries weighs only 2.1 kilograms).

The modular design of the GSM-19 Overhauser magnetometer ensures that the system can be upgraded as workloads change. You can select from a number of building blocks, including:

- Simultaneous gradiometer.
- Continuous profiling "Walking" magnetometer / gradiometer.
- Very fast sampling (up to 5 readings per second) magnetometer/gradiometer.
- Omnidirectional VLF.
- Shallow or deep marine operation.
- Remote control for observatory and airborne base station applications.

If your application does not yet require the extended capabilities or the cost benefits of an Overhauser unit, conventional GSM-19 unit is available. This dedicated proton magnetometer can be equipped with gradiometer or VLF options, and is upgradable to an Overhauser magnetometer.

The Overhauser and conventional magnetometers share many powerful features:

- Easy to learn interactive menu.
- Streamlined grid coordinate system with "end of line" quick change capability.
- 128 kilobyte basic memory, expandable to 2 Megabytes.
- Programmable RS-232 high-speed data transfer (to 19.2 kilobaud).
- 50 and 60 Hz filters, user selectable.
- Automatic tuning and base station synchronization.

<table>
<thead>
<tr>
<th>Type of Magnetometer</th>
<th>Gradiometer</th>
<th>&quot;Walking&quot; Mag</th>
<th>&quot;Walking&quot; Grad</th>
<th>Hip-Chain Mag</th>
<th>Hip Chain Grad</th>
<th>VLF</th>
<th>Shallow Marine</th>
<th>Remote Cont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Proton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhauser Proton</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Total Field</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>&quot;Walking&quot;</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hip-Chain</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A Proton Total Field system may be upgraded to an Overhauser system, which allows further upgrade to "Walking" and Hip Chain models.
Fast Sampling Magnetometer / Gradiometer

The GSM-19 fast sampling option allows you to collect data at rates as high as 5 readings per second. Fast sampling provides the high spatial resolution needed in detailed marine, or vehicle-borne surveys, and in anomalous magnetic terrains.

This fast sampling capability is also used in the Hip Chain magnetometer/gradiometer -- developed primarily for environmental and archaeological applications.

The Hip Chain system minimizes the need for pickets and reduces line preparation costs. Operators simply affix a cord at one end of the survey line, attach the Hip Chain to the waist, and walk along the line. Readings are triggered automatically as the cord unwinds.

Remote Control Operation

Targeted to observatory, marine, and airborne base station applications, this option allows users to set parameters and initiate measurements from a computer terminal using standard RS-232 commands.

A real-time transmission capability is provided so that data quality can be monitored while marine or vehicle-borne surveys are in progress.

And to ensure that the GSM-19 is fully compatible with existing marine or airborne data acquisition systems, GEM has included one and two-channel analog output capabilities.

Shallow and Deep Marine

GEM has developed two marine versions of the GSM-19 Overhauser magnetometer to meet the highly specialized requirements of petroleum explorationists. The maximum depth for the shallow unit is 100 metres, and deep marine units are routinely operated at depths exceeding 400 metres.

With a shallow marine unit, a sealed fish houses an Overhauser sensor. Signals are transferred via a tow cable to a console where they are counted into magnetic field data, and stored in memory, or transmitted via ASCII serial output.

An important advantage of the shallow marine unit is its low power consumption. A standard 12 or 24 Volt battery is sufficient to run the magnetometer for days at a rate of two readings per second.

The deep marine fish houses both an Overhauser sensor, and microprocessor-based electronics. Complete measurement is performed within the fish, and data are sent digitally through a tow cable that also supplies power.

The main benefits of the deep marine unit include high resolution (signals up to 0.01 gamma resolution can be acquired using a sensor of only 0.2 litre volume), virtually unlimited cable length, ease of operation, and reliability. Temperature and pressure sensors can also be provided.
<table>
<thead>
<tr>
<th>Performance</th>
<th>Overhauser</th>
<th>Proton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution:</td>
<td>0.01 nT</td>
<td>0.01 nT</td>
</tr>
<tr>
<td>Relative Sensitivity:</td>
<td>0.02 nT</td>
<td>0.2 nT</td>
</tr>
<tr>
<td>Absolute Accuracy:</td>
<td>0.2 nT</td>
<td>1 nT</td>
</tr>
<tr>
<td>Range:</td>
<td>20,000 to 120,000 nT</td>
<td>20,000 to 120,000 nT</td>
</tr>
<tr>
<td>Gradient Tolerance:</td>
<td>Over 10,000 nT/m</td>
<td>Over 7,000 nT/m</td>
</tr>
</tbody>
</table>

### Operating Modes

<table>
<thead>
<tr>
<th>Manual</th>
<th>Coordinates, time, date and reading stored automatically at min. 3 second interval.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Station</td>
<td>Time, date and reading stored at 3 to 60 second interval (higher speeds available).</td>
</tr>
<tr>
<td>&quot;Walking&quot;</td>
<td>Time, date and reading stored at coordinates of fiducial with 1 or 2 sec. cycle time.</td>
</tr>
<tr>
<td>Hip Chain</td>
<td>Equidistant coordinates, time, date and reading stored automatically. Distance interval of readings is programmable.</td>
</tr>
<tr>
<td>Remote Control</td>
<td>Optional remote control using RS-232 interface.</td>
</tr>
<tr>
<td>Input/Output</td>
<td>RS-232 or analog (optional) output using 6 pin weatherproof connector.</td>
</tr>
</tbody>
</table>

### Operating Parameters

<table>
<thead>
<tr>
<th>Power Consumption</th>
<th>Only 2 Ws per reading for Overhauser, and 12 Ws per reading for Proton magnetometer. Will operate continuously for 45 hours on standby.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Source</td>
<td>12V 1.9 Ah sealed lead acid battery standard, other batteries available.</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +60°C.</td>
</tr>
</tbody>
</table>

### Storage Capacity

<table>
<thead>
<tr>
<th>Manual Operation</th>
<th>8,000 readings standard, 131,000 optional. With 3 VLF stations 3,100 standard, 58,000 optional.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Station</td>
<td>43,000 readings standard, 700,000 optional (580 hour or 24 day uninterrupted operation with 3 sec. interval).</td>
</tr>
<tr>
<td>Gradiometer</td>
<td>6,800 readings standard, 110,000 optional. With 3 VLF stations 2,900 standard, 46,000 optional.</td>
</tr>
</tbody>
</table>

### Omnidirectional VLF

<table>
<thead>
<tr>
<th>Performance Parameters</th>
<th>Resolution 0.5% and range to +/- 200% of total field. Frequency 15 to 30 kHz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured Parameters</td>
<td>Vertical in-phase &amp; out-of-phase, 2 horizontal components, coordinates, date, and time.</td>
</tr>
<tr>
<td>Features</td>
<td>Up to 3 stations measured automatically, in-field data review, displays station field strength continuously, and tilt correction for up to +/- 10° tilts.</td>
</tr>
</tbody>
</table>

### Dimensions and Weight

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>93 x 143 x 150 mm and weighs only 1.0 kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>• Console 223 x 69 x 240 mm.</td>
</tr>
<tr>
<td></td>
<td>• Sensor 170 x 71 mm diameter cylinder.</td>
</tr>
<tr>
<td></td>
<td>• Console 2.1 kg.</td>
</tr>
<tr>
<td></td>
<td>• Sensor and staff assembly 2.0 kg.</td>
</tr>
<tr>
<td></td>
<td>• Console with batteries, harness, charger, and case.</td>
</tr>
<tr>
<td></td>
<td>• Sensor with cable, connector and staff.</td>
</tr>
</tbody>
</table>
An instrument's effectiveness is measured by its ability to handle highly specialized user demands. With the GSM-19, these requirements can be met through a number of advanced features.

Compatible With Different Magnetometers
To protect our customers' investments in purchased equipment, GEM has adopted an Open Systems approach. The lightweight Overhauser magnetometer can be used as a field unit in combination with another manufacturer's base station.

Memory Expandable to 2 Megabytes
A GSM-19 field magnetometer can store up to 8,000 readings with 128 kb memory, and 131,000 readings with 2 Mb. A base station will store, respectively, between 43,000 and 700,000 readings. A “Walking” magnetometer will store 21,000 readings with 128 kb memory, and 340,000 with extended memory.

Automatic Tuning
Tuning is automatic in all modes of operation with initial preset. An override option is also provided for manual and remote modes. Tuning steps are 1,000 gammas wide.

Adaptability to High Gradients
In standard instruments, a gradient in the magnetic field across the sensor volume can shorten the decay time of the proton precession signal. However, the GSM-19 monitors the signal decay, and calculates the optimal time interval for measurement. Warning messages appear on the display when the measuring interval becomes too short.

Alphanumeric Display and Keyboard
The GSM-19 has a comfortable 4 x 20 character alphanumeric display and a 16 key keypad with tactile feedback. Operation is menu driven, and simple enough for a beginner to operate with confidence. The keypad enables operators to enter fully worded comments with no limit in the length of text.

With Overhauser proton precession, an electron-rich fluid (containing free radicals) is added to a standard hydrogen-rich fluid. This mixture increases the polarization by a factor of 5000 in comparison with standard liquids. And in contrast to conventional proton precession methods, Overhauser proton precession uses a radiofrequency (RF) magnetic field -- and requires only a fraction of a Watt of RF power, rather than a high-power direct current field.

Overhauser magnetic systems therefore maximize resolution and minimize power consumption. Another advantage is that polarization and measurement can occur simultaneously. GEM has used this capability to develop its “Walking” magnetometer / gradiometer and Fast Sampling options.

GEM Systems Inc.
With more than a decade of research and development incorporated into the GSM-19 Overhauser and proton precession magnetometers, GEM Systems is committed to providing its customers with state-of-the-art instrumentation.

In addition to offering the GSM-19, GEM also designs and builds solar-powered proton magnetometers for land-based applications, and optically pumped potassium magnetometers for airborne and other applications.
Declaration of Assessment Work Performed on Mining Land

Ministry of Northern Development and Mines

Instructions:  
- For work performed on Crown Lands before recording a claim, use form 0240. 
- Please type or print in ink.

1. Recorded holder(s) (Attach a list if necessary)

<table>
<thead>
<tr>
<th>Name</th>
<th>Client Number</th>
<th>Telephone Number</th>
<th>Fax Number</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winslow Gold Corp</td>
<td></td>
<td>(403) 264-6161</td>
<td></td>
<td>Suite 1200, 112 - 4th Avenue S.W. Calgary, Alberta T2P 0H3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Client Number</th>
<th>Telephone Number</th>
<th>Fax Number</th>
<th>Address</th>
</tr>
</thead>
</table>

RECEIVED

MAY 8 1997

MINING LANDS BRANCH

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

- Geotechnical: prospecting, surveys, assays and work under section 18 (regs)
- Physical: drilling, stripping, trenching and associated assays
- Rehabilitation

Work Type: Line cutting and Magnetometer Survey

<table>
<thead>
<tr>
<th>Dates Work Performed</th>
<th>Township/Area</th>
<th>NTS Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0.02. 96</td>
<td>White Lake Area (North)</td>
<td></td>
</tr>
<tr>
<td>30.11. 96</td>
<td>G-629</td>
<td></td>
</tr>
</tbody>
</table>

Global Positioning System Data (if available)

4. Certification by Recorded Holder or Agent

<table>
<thead>
<tr>
<th>Name</th>
<th>Telephone Number</th>
<th>Fax Number</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allan MacAvish</td>
<td>(807) 768-3972</td>
<td></td>
<td>777 Red River Road, Thunder Bay, Ont.</td>
</tr>
</tbody>
</table>

Signature of Recorded Holder or Agent

Allan MacAvish

Date: March 27, 1997

Instructions: - obtain a work permit from the Ministry of Natural Resources as required; - provide proper notice to surface rights holders before starting work; - complete and attach a Statement of Costs, form 0212; - provide a map showing contiguous mining lands that are linked for assigning work; - include two copies of your technical report.

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required; - provide proper notice to surface rights holders before starting work; - complete and attach a Statement of Costs, form 0212; - provide a map showing contiguous mining lands that are linked for assigning work; - include two copies of your technical report.
5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

<table>
<thead>
<tr>
<th>Mining Claim Number</th>
<th>Number of Claim Units</th>
<th>Value of work performed on this claim or other mining land</th>
<th>Value of work applied to this claim</th>
<th>Value of work assigned to other mining claims</th>
<th>Bank. Value of work to be distributed at a future date.</th>
</tr>
</thead>
<tbody>
<tr>
<td>eg</td>
<td>1234567</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>eg</td>
<td>1234568</td>
<td>2</td>
<td>$ 8,892</td>
<td>$ 4,000</td>
<td>$ 4,892</td>
</tr>
<tr>
<td>1</td>
<td>TB 1097447</td>
<td>1</td>
<td>$ 754</td>
<td>$ 900</td>
<td>$ 354</td>
</tr>
<tr>
<td>2</td>
<td>TB 1183294</td>
<td>1</td>
<td>$ 754</td>
<td>$ 900</td>
<td>$ 354</td>
</tr>
<tr>
<td>3</td>
<td>TB 1186730</td>
<td>12</td>
<td>$ 9,015</td>
<td>$ 13,000</td>
<td>$ 4,215</td>
</tr>
<tr>
<td>4</td>
<td>TB 1186778</td>
<td>4</td>
<td>$ 300,7</td>
<td>$ 159,5</td>
<td>$ 141,2</td>
</tr>
<tr>
<td>5</td>
<td>TB 1186799</td>
<td>14</td>
<td>$ 105,16</td>
<td>$ 500</td>
<td>$ 49,16</td>
</tr>
<tr>
<td>6</td>
<td>TB 1195626</td>
<td>5</td>
<td>$ 3758</td>
<td>$ 2000</td>
<td>$ 1358</td>
</tr>
<tr>
<td>7</td>
<td>TB 1210344</td>
<td>4</td>
<td>$ 300,7</td>
<td>$ 1600</td>
<td>$ 14,07</td>
</tr>
<tr>
<td>8</td>
<td>TB 1210345</td>
<td>1</td>
<td>$ 754</td>
<td>$ 400</td>
<td>$ 354</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Column Totals</td>
<td>$ 3,156</td>
<td>$ 1,6795</td>
<td>$ 1,477</td>
</tr>
</tbody>
</table>

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- [ ] 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- [ ] 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- [ ] 3. Credits are to be cut back equally over all claims listed in this declaration; or
- [ ] 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.
## Statement of Costs for Assessment Credit

**Ontario**

**Ministry ofNorthern Development and Mines**

**Spruce Bay Property**

### Transaction Number (office use)

<table>
<thead>
<tr>
<th>Work Type</th>
<th>Units of Work</th>
<th>Cost Per Unit of work</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linecutting</td>
<td>74.36 line kilometres</td>
<td>$354.02</td>
<td>$26,325</td>
</tr>
<tr>
<td>Magnetometer Survey</td>
<td>61.72 line kilometres</td>
<td>$24.90</td>
<td>$5,240</td>
</tr>
</tbody>
</table>

**Associated Costs (e.g. supplies, mobilization and demobilization).**

**Transportation Costs**

**Food and Lodging Costs**

**Total Value of Assessment Work**

<table>
<thead>
<tr>
<th>Cost Per Unit of work</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>$31,565</td>
<td></td>
</tr>
</tbody>
</table>

### Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

\[
\text{TOTAL VALUE OF ASSESSMENT WORK} \times 0.50 = \text{Total value of worked claimed.}
\]

### Note:

- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted.

---

**Certification verifying costs:**

Allan MacIvor, do hereby certify, that the amounts shown are as accurate as may reasonably be determined and the costs were incurred while conducting assessment work on the lands indicated on the accompanying Declaration of Work form and the record holder is

Thunder Bay Mining Division

APR 01 1997

Signature: [Signature]

Date: [Mar 27, 1997]
Dear Sir or Madam:

Submission Number: 2.17244

Transaction Number(s): W9740.00129

Deemed Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

NOTE: This correspondence may affect the status of your mining lands. Please contact the Mining Recorder to determine the available options and the status of your claims.

If you have any questions regarding this correspondence, please contact Steve Beneteau by e-mail at beneteau_s@torv05.ndm.gov.on.ca or by telephone at (705) 670-5855.

Yours sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Section
Mines and Minerals Division

Original Signed by

Correspondence ID: 10864
Copy for: Assessment Library
### Work Report Assessment Results

**Submission Number:** 2.17244  
**Date Correspondence Sent:** May 23, 1997  
**Assessor:** Steve Beneteau

<table>
<thead>
<tr>
<th>Transaction Number</th>
<th>First Claim Number</th>
<th>Township(s) / Area(s)</th>
<th>Status</th>
<th>Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>W9740.00129</td>
<td>1097947</td>
<td>WHITE LAKE (NORTH)</td>
<td>Deemed Approval</td>
<td>May 21, 1997</td>
</tr>
</tbody>
</table>

**Section:**  
14 Geophysical MAG

**Correspondence to:**  
- Mining Recorder  
  Thunder Bay, ON  
- Resident Geologist  
  Thunder Bay, ON  
- Assessment Files Library  
  Sudbury, ON

**Recorded Holder(s) and/or Agent(s):**  
- Allan MacTavish  
  THUNDER BAY, ONTARIO  
- WINSLOW GOLD CORP.  
  CALGARY, ALBERTA
HOMESTAKE CANADA INC.

MAGNETOMETER SURVEY
SPRUCE BAY PROPERTY
BASELINE AZIMUTH : 90 Deg.

DATE: 22/02/97
NTS: 42 C 13/SE
SCALE 1:5000
SURVEY BY : MEI

Instrument: GSM-19
Format: Walking
Contour Interval : 100 nT

MAGNUM EXPLORATIONS INC.