Report on a Helicopter-Borne Magnetic Gradiometer & VLF-EM Survey

Project Name: Kirkland Lake
Project Number: 2008-001

Client: WALLBRIDGE MINING COMPANY LIMITED

Contractor: CMG canadian mining geophysics ltd

Date: March 15th 2008
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1.0 Introduction

Canadian Mining Geophysics Ltd (CMG) has flown a helicopter-borne magnetic gradiometer and VLF-EM survey for Wallbridge Mining Company Limited (Wallbridge) near the Kirkland Lake Area.

The survey, consisting of 1,031 line-kilometers (l-km), was started on February 25th 2008 and was completed on February 29th 2008.

The survey was flown using the WGS-84 Datum and UTM Projection, Zone 17 North. The final database was converted to the NAD-83 Datum and UTM Projection, Zone 17 North using Geosoft Oasis Montaj. All map products were processed and are presented in the NAD-83 Datum.

The CMG magnetic gradiometer consists of three (3) potassium magnetometer sensors separated approximately three (3) meters (m) apart. Measured gradients include the vertical and transverse (cross-line) horizontal. The parallel (in-line) horizontal gradient is calculated and is possible because of the close separation of the magnetometer readings (~3 m) along the flight line.

The CMG system also records two VLF-EM measurements from approximately orthogonal VLF transmitting stations – normally Cutler, Maine and Jim Creek, Seattle, both in the United States.

This report describes the Survey Area in Section 2, Survey Procedures & Personnel in Section 3, Equipment in Section 4, Deliverables in Section 5, Processing in Section 6, and Interpretation in Section 7.

Appendix A contains a list of the survey outline points in NAD-83, Zone 17 N.

Appendix B contains a list of the digital database columns, the database of which is included with this report to Wallbridge.
2.0 Survey Area

Kirkland Lake is one of the most prolific gold camps in Ontario. This mining and lumbering community of 10,000 people is located 500 km north of Toronto and is assessable by paved highways and roads. From 1910 to 1999 the camp has produced 37.3 million oz. of gold from 25 mines and collectively amounts to 100 million tonnes mined at a recovered grade of 12.74 g/t. Gold was first discovered in 1906, in Swastika and Larder Lake and the first gold was produced from the Swastika mine in 1910. Production was continuous for 90 years, when in 2000 the Macassa Mine was closed. In 2002, Kirkland Lake Gold Inc. re-opened Macassa and plans to produce gold at a rate of 80,000 oz/year in 2008. (www.queenston.ca)

The survey area (Figure 1) is located approximately 38 km east-northeast of Kirkland Lake, Ontario at latitude 48° 13’ 18” and longitude 79° 33’ 1” and about 8 km north of Highway 101.

The survey polygon covered a number of mineral claims which are contiguous (Figure 2). Both Kirkland Lake (south) and Ben Nevis (North) property claims are held by:

Wallbridge Mining Company Limited
129 Fielding Road
Lively, Ontario, P3Y 1L7

The survey area was accessible by helicopter from the Kirkland Lake airport located 32 km to the west.

Fuel for the helicopter was obtained at the Kirkland Lake airport.

The survey terrain was a combination of small hills with numerous cliffs, with maximum elevation changes of 200 m.

The base of operations was the Comfort Inn in Kirkland Lake. The crew traveled to the airport daily by truck, about 8 km each way.
Figure 1 - The Survey Area
3.0 Survey Procedures & Personnel

The survey was flown according to the specifications outlined in Table One. The survey lines (as flown) were trimmed within a Geosoft database to the survey polygon. This resulted in the number of 1-km as described in Table One.

Nominal bird height was 50 m. In some cases the bird height was higher, especially in areas where the cliffs made it difficult to climb and descend quickly. Over low lying areas, the bird height was closer to 35 m.

Nominal survey speed was approximately 100 km/hr. Sampling of all data, including GPS, occurred at a 10 Hz rate. Therefore the approximate lateral distance between readings was 2.5-3.0 m.

Real-time navigation was possible using the AgNav system. GPS positioning was provided using a Novatel 10-channel receiver set to the CD-GPS mode. This mode is considered the most accurate in Canada and provides real-time accuracy of ~1-5 m. The GPS antenna was installed on top of the gradiometer bird, near the center (length-wise) of the housing.

A radar altimeter was connected to the skid plate of the helicopter and provided a measurement of distance above ground for the pilot to navigate to. Inside the helicopter the radar altimeter had a digital readout attached to the helicopter dash board.

Approximately one hour before the survey was started the base station magnetometer was turned on and a VLF sensor attached. All available transmitting VLF stations were scanned and the two stations with the most signal that were also roughly orthogonal (the transmitted field direction is dependent upon the transmitter location. The two selected transmitter stations were then relayed to the operator who set them in the helicopter setup for recording during flight. The base station was turned off after the crew landed and contacted the processor.

Final data processing was carried out under the supervision of:

Steve Balch
President of CMG
11500 Fifth Line
Rockwood, Ontario
Canada, NOB 2K0.

<table>
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<th>Table 1 - Survey Area Specifications</th>
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The personnel involved in the survey are summarized in Table 2.

**Table 2 - List of Survey Personnel**

<table>
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<tr>
<th>Individual</th>
<th>Position</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Mark Thompson</td>
<td>Pilot</td>
<td>Fly the helicopter (also a helicopter engineer) and ensure helicopter maintenance is performed.</td>
</tr>
<tr>
<td>Chris Kozak</td>
<td>Operator</td>
<td>In-flight quality control &amp; maintenance of the system and ancillary equipment.</td>
</tr>
<tr>
<td>Steve Balch</td>
<td>Processor</td>
<td>On-site data processing.</td>
</tr>
<tr>
<td>Sean Scrivens</td>
<td>Final Processing</td>
<td>Integration of field data into Geosoft database and generation of grids, profiles and map products.</td>
</tr>
<tr>
<td>Steve Balch</td>
<td>Interpretation</td>
<td>Preliminary discussions with Client and final report write-up.</td>
</tr>
<tr>
<td>Josh Bailey</td>
<td>Client Representative</td>
<td>Geologist with Wallbridge Mining, Provided the mineral claim outlines, Reviewed survey data with interpreter.</td>
</tr>
</tbody>
</table>
4.0 Equipment

4.1 The Helicopter

The helicopter used was a Bell 206LR (or Long Ranger) with registration C-GKCW, owned and operated by Gateway Helicopters Limited (Gateway). A Long Ranger is shown in Figure 3.

Installation of the ancillary equipment was performed at Gateway's hangar in North Bay, Ontario. Two short test flights were performed to ensure the system was operational. The bird was then towed to the Kirkland Lake airport for surveying the following day.

The gradiometer system was attached to the helicopter by a 30 m long tow cable. The tow cable contains a Kevlar strength member and a weak link. The tow cable also contains the power and signal wires as well as the radar altimeter signal wire.
4.2 The Gradiometer

The CMG magnetic gradiometer (Figure 4) is based on GEM System potassium magnetometers. These sensors are preferred over the cesium optically pumped sensors because they have a lower effective noise level (better for gradient measurements) and a much lower heading error (less absolute correction required from line to line).

Three sensors are also preferred over the normal four sensor arrays featured on systems that measure all three magnetic gradients. CMG measures the vertical gradient from two sensors located 2.95 m apart and the cross-line (or transverse) gradient from two sensors located 3.45 m apart. The in-line gradient is actually calculated from previous and successive measurements given the fact that measurements along the flight line are acquired at approximately the same distance as the sensor separation of the bird.

Computing the in-line gradient as opposed to measuring it directly using an additional sensor has some important advantages. Firstly, and most importantly, by having only three magnetometer sensors, they can all be placed at the front of the bird and the magnetically noisy electronics (including the tow cable) can all be placed at the back of the bird so that the distance between sensors and electronics is maximized. Secondly, the computed in-line measurement has effectively no heading error (the readings are from the same magnetometer and are constant across such a short distance), and is relatively free from diurnal variations in the magnetic field, given the short time interval (0.1 sec) between readings.

The magnetometer data is collected at a rate of 10 Hz. The frequency from each sensor is counted separately within the digital electronic section located approximately 4.5 m away from the sensors near the back of the bird. The mag-console then transmits the data in digital format along the tow cable to the data acquisition system in the helicopter. Specifications for the magnetometer sensors are given in Table Two.

| Table 3 - Specifications for the CMG Magnetometer Section |
|-----------------|------------------|
| Sensitivity      | +/- 0.001 nT     |
| Absolute accuracy| +/- 0.5 nT over operating range maximum |
| Sample rate      | 10 Hz (0.1 sec)  |
| Dynamic range    | 30,000 to 90,000 nT, 5,000 nT/m gradient |
| Heading error    | +/-0.15 nT maximum for all sensor orientations |
| Operating temperature | -32° C to +40° C normally |
| Tuning method    | Dynamic re-starting at 30,000 nT |
| Volume of sensor | 70 mm            |
4.3 The Magnetometer Bird

The magnetometer bird is constructed from fiberglass. The magnetometer housings are made from Kevlar. The horizontal displacement between magnetometer sensors is 3.45 m. The vertical separation is 2.95 m. The length of the bird is 5.3 m. It weighs 180 Kg approximately. The bird can be separated into two sections and the magnetometer arms removed for easy transportation.

4.4 The VLF-EM System

The CMG gradiometer contains two VLF (very low frequency) EM receivers that can be tuned to any of the operational VLF transmitters worldwide. In general, two orthogonal stations are chosen such as Cutler Maine (24.0 kHz) and Jim Creek Seattle (24.8 kHz).

Measurements of the in-phase, quadrature-phase and total field are taken at a 10 Hz sample rate. The in-phase measurement is easily affected by variations in the sensor orientation and may not be useful in areas of rugged topography or where bird movement is significant. The quadrature-phase measurements are dependent on bird direction so alternating lines are sign inverted. The results can be gridded and provide the locations of weak conductors, given the high relative frequency of the transmitter station.

The measured VLF components are converted into a digital signal and then appended to the data string in the main magnetometer console. This entire data string is then transmitted along the logging cable to the data acquisition system in the helicopter.

4.5 The Magnetometer Base Station

A GSM-19 base station was used to record variations in the earth’s magnetic field. This system is based on the Overhauser principle and records total magnetic field to within +/- 0.02 nT at a one (1) second time interval.

The GSM-19 is portable and can be placed in a remote location without the need for extra batteries or cabling. On this survey the unit was placed about 60 m away from the parking lot at the Comfort Inn in Kirkland Lake within a field.

On this survey the GSM-19 stopped working in the early afternoon (a battery problem is thought to have occurred). This happened on two separate days. Given the very low levels of diurnal variation, the total magnetic field maps were derived from tie-line leveling corrections and did not have diurnal corrections applied. This does not affect the measured and computed gradients.
4.6 The Radar Altimeter

The CMG system uses two radar altimeters both modulated frequency radio versions manufactured by Sperry. The radar altimeter in the helicopter is used by the pilot to estimate terrain clearance by the helicopter. The second altimeter, mounted directly on the bird, provides an accurate measurement of bird height. The approximate accuracy of these devices is +/- 2 m.

4.7 GPS Navigation

CMG uses the AgNav Incorporated (AgNav-2 version) GPS navigation system for real-time locating while surveying and for final positioning. The AgNav unit is connected to a Honeywell GPS system that uses the CD-GPS system – considered to be the most accurate in Canada and valid right to the North Pole.

CD-GPS is a national standard providing accurate and reliable GPS corrections for meter and sub-meter accuracy for all of Canada. The service uses 14 IGS stations for real-time corrections.

4.8 Data Acquisition System

Data is collected by the main magnetometer console in the gradiometer bird and includes GPS timing and positional information, magnetometer readings, VLF readings, and radar altimeter. This information is digitized inside the console, all at a rate of 10 Hz. The resulting data string is transmitted in digital format along the tow cable into a laptop computer inside the helicopter that is running the GEM Systems DAS software. All data is stored on the hard-drive in ASCII format using a simple column by row format.
5.0 **Deliverables**

From the survey, a number of deliverable products are generated including a set of hard-copy maps, a final report (this document), and a digital archive of the data with digital copies of map products.

5.1 **Hardcopy Products**

Hardcopy map products are provided at 1:20,000 scale and include a topographic back-drop. Each map contains a scale bar, north arrow, coordinate outlines (easting & northing), flight lines with line number and direction and geophysical data.

Where provided, claim outlines and numbers are also shown.

Each map contains a technical summary of specifications and a colour bar that describes the geophysical data.

5.2 **Digital Products**

The geophysical data is provided in a Geosoft GDB database. At the Client’s request an xyz archive of the same database in ASCII format can also be provided.

The contents of the database are described more fully in Appendix B.

A copy of the GDB database is kept by CMG as a courtesy to the Client but can be deleted at the Client’s request.

In addition to the GDB file database, copies of all geophysical grids are provided as GRD files (also in Geosoft format). The cell size used for gridding is nominally ¼ of the flight line spacing.

Map files in Geosoft MAP format are also provided as deliverables. The Client can use a free viewer available from Geosoft Limited ([www.geosoft.com](http://www.geosoft.com)) for viewing and plotting map files, but not for editing or changing them.
5.3 Delivered Products

The following map products were delivered in hard-copy and digital format:

- Colored, shaded total magnetic field with flight lines over topographic backdrop;
- Colored, measured vertical magnetic field derivative with contours and flight lines over topographic backdrop;
- Colored, calculated vertical magnetic field derivative with contours and flight lines over topographic backdrop;
- Colored, VLF-EM quadrature-phase component with flight lines over topographic backdrop;

The following map products were delivered in digital format only (in addition to those above):

- Colored, shaded digital terrain model with flight lines and topographic backdrop;
- Analytic signal of the magnetic field gradients with flight lines and topographic backdrop;

The following additional products were delivered in digital format:

- Copy of this report in .pdf format;
- Geosoft database GDB of all collected data;
- Geosoft grid files of selected geophysical data (listed above);
6.0 Processing

Preliminary data processing is performed using CMG proprietary software (MgPRO). This includes calculation of the magnetic gradients from the three sensors (MAG1, MAG2 and MAG3), digital terrain model, bird height, and merging of the base station magnetics (sampled at 1.0 sec) with the survey data (sampled at 0.1 sec).

The raw ASCII survey data files, merged with the raw ASCII base station data files and processed, are then imported into a Geosoft GDB (database) file, for further processing.

The magnetic data (both the total magnetic field from the three sensors and the computed gradients) are not filtered. All data issued on the digital database is unfiltered, unless specifically mentioned.

6.1 Base Maps

All base maps are presented in the Datum and Projection defined in the Introduction of this report. All map coordinates refer to projected easting and northing in meters. All maps contain the actual flight paths as recorded during surveying and have been clipped to the survey polygon.

The topographic vector data has been obtained from Natural Resources Canada.

Topographic shading has been derived from 90 m resolution digital elevation model (DEM) data provided by the NASA Shuttle Radar Topography Mission (SRTM).

6.2 Flight Path

The helicopter used "ideal" flight lines as guidance during surveying as displayed on the real-time AgNav system. A GPS was used to record actual position. The sample rate of the GPS was 10 Hz, the same as all the other data collected in flight.

The GPS outputted both latitude and longitude values and easting and northing values, all in the WGS84 Datum, using the UTM Projection Zone 17 North. There has been no interpolation of the positional data, nor has there been any filtering of the data.

6.3 Terrain Clearance

A radar altimeter, the transmitter of which was located on the skid plate of the helicopter, was used to maintain terrain clearance by the pilot. A digital indicator was mounted on the dashboard of the helicopter. This work was performed by a licensed helicopter engineer provided by Gateway.
The digital terrain model (DTM) was derived by subtracting the radar altimeter value from the GPS z position (mean point above sea level). The DTM values were further corrected for a lag value of 1.0 sec. The DTM values are to be considered relative as they have not been tied into any surveyed geodetic point.

6.4 Magnetic Data Processing

The magnetic data were collected without any lag time, therefore a lag time correction was not applied. In areas where one magnetometer sensor has become unlocked, the total magnetic field values for that sensor were replaced with a dummy value ("*"). The lock and heater settings are both imported into the Geosoft database so it is easy to find the areas where one or more sensors lost lock or were not heating correctly. Locking errors occur almost entirely on turn-arounds.

Diurnal magnetic corrections were applied only to the one sensor that was used to generate a total magnetic field map. The MAG1, MAG2, and MAG3 sensor values were used to generate the gradients and do not require diurnal correction. The base station data was linearly interpolated from a 1.0 sec sample rate to 0.1 sec to correspond to the flight data.

The horizontal gradients are sensitive to line direction. Positive polarity is defined as to the north and east. On south- and/or west-facing lines the horizontal gradients are multiplied by -1.

The magnetic data (total field and gradients) were not filtered. The data were line-leveled and the resulting grids micro-leveled, but the profile data were unfiltered and are presented in the final database as such.

6.5 VLF-EM Data Processing

The VLF data is strongly affected by motion of the bird (during ascent and descent during surveying) and is strongly affected by rough topography. The in-phase component (and hence the total field) is most affected. For this project only the quadrature-phase was processed and interpreted.

The VLF data is directional therefore alternate flight lines are inverted for polarity. The positive direction is considered north and east. Because the noise is fairly high frequency, the data was left unfiltered. Trends are easily recognized in the gridded VLF quadrature-phase and filtering makes little difference to the gridded data.

7.0 Results

The total magnetic field (TMI) is shown in Figure 4. The TMI has been color imaged with contours superimposed in black to enhance regions of high gradient. The profile data was tie-line leveled and then the grid was further micro-leveled (both processes were performed using Geosoft).
The measured vertical magnetic gradient (M-VMG) is shown in Figure 5. The M-VMG image is shown in shaded color with a sun angle of 45° inclination and 315° declination.

The calculated vertical magnetic gradient (C-VMG) is shown in Figure 6. The C-VMG image is shown in shaded color with a sun angle of 45° inclination and 315° declination. The grid was filtered using a 9 x 9 symmetric convolution filter and 2 passes in Geosoft to eliminate the effects of variable flight height above ground.

The measured horizontal in-line magnetic gradient (HIMG) is shown in Figure 7. The HIMG image is shown in shaded color with a sun angle of 45° inclination and 315° declination.

The digital terrain model (DTM) is shown in Figure 8 also using a sun angle of 45° inclination and 315° declination, but with the "elevation" color transform. A lag of 1.0 sec was applied to the profile data before the grid was generated.

The VLF quadrature-phase data from station #2 (24.8 kHz) is shown in Figure 9 as a color image. Note that on some flights the VLF station was not transmitting.

8.0 Interpretation

The Wallbridge exploration claims are located directly north of a major gold discovery by Queenston Mining known as their Upper Beaver Property. The Property was mined periodically over the years from 1913 to 1972. During this time gold and copper production was significant with grades averaging 7-10 g/t Au and 0.39-1.03 % Cu.

Geology near the Upper Beaver consists of volcanics and meta-sediments. Mineralization within these units is confined along hydrothermally altered shear zones containing disseminated to semimassive pyrite bands. The mineralization is divided in two by a north trending diabase dike.

On the Wallbridge claims the diabase dike that intersects the Upper Beaver mineralization also intersects a syenite plug in the southeast of the survey grid. The plug is further cross-cut by a series of east to northeast trending faults. A surface sample was taken from along one of these faults and returned over 4 oz/t of Au. A single drillhole interested approximately 8 g/t over 5.5 ft and was drilled to a depth of 45 ft.

The magnetic survey has identified a number of distinct linear features that are thought to be faults. These structures also cross-cut the north trending diabase dike. Moreover the surface sample that assayed high in Au is also located along one of these structures.

The magnetic features are possible structures for hydrothermal gold emplacement and should be subject to an induced polarization survey (covering the entire syenite unit) to detect any disseminated pyrite.
Further to north there is a second magnetic feature that has a similar response to the known syenite in the southeast. This area should be prospected and mapped and a induced polarization survey performed if warranted from the ground review.

Respectively Submitted,

Stephen J. Balch
Canadian Mining Geophysics Ltd.
March, 2008
Certificate of Author

I, Stephen James Balch do hereby certify that:

I am a graduate of the University of Western Ontario and hold a BSc (with honors) in Applied Geophysics (1985).

I have been a practicing geophysicist since 1985, as a Field Geophysicist (1985-1989), as a Staff Geophysicist (1989-1995), as an Area and Senior Geophysicist (1995-2001) and as a Consultant (since 2001).

I have been the President of Balch Exploration Consulting Inc since 2001.

I live at 11,500 Fifth Line, Rockwood, Ontario, Canada, NOB 2K0.

I own no direct shares in Wallbridge Mining Company Limited, but I do have 250,000 options in the company at a strike price of 0.50 per share.

I was responsible for the acquisition, supervision, and interpretation of the data collected for this technical report.

Dated at Rockwood, Ontario this 10th day of April, 2008.
APPENDIX B
LIST OF SURVEY OUTLINE POINTS

The following survey polygon was produced by CMG and approved by the Client.

The Datum is NAD-83.

The Projection is UTM, Zone 17 North.

<table>
<thead>
<tr>
<th>North Claim (Ben Nevis)</th>
<th>South Claim (Kirkland Lake)</th>
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</thead>
<tbody>
<tr>
<td>Northing</td>
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### APPENDIX C

**LIST OF DATABASE COLUMNS**

Geosoft GDB Data Format

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<th>Channel Name</th>
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</tr>
<tr>
<td>ywgs84</td>
<td>Y positional data (metres – WGS84, UTM zone 17 north)</td>
</tr>
<tr>
<td>x</td>
<td>X positional data (metres – NAD83, UTM zone 17 north)</td>
</tr>
<tr>
<td>y</td>
<td>Y positional data (metres – NAD83, UTM zone 17 north)</td>
</tr>
<tr>
<td>lon_wgs84</td>
<td>Longitude data (degree – WGS84)</td>
</tr>
<tr>
<td>lat_wgs84</td>
<td>Latitude data (degree – WGS84)</td>
</tr>
<tr>
<td>flight</td>
<td>Flight number</td>
</tr>
<tr>
<td>date</td>
<td>Flight date</td>
</tr>
<tr>
<td>radalt</td>
<td>Radar altimeter height above ground (metres - AGL)</td>
</tr>
<tr>
<td>gpstime</td>
<td>GPS time</td>
</tr>
<tr>
<td>dtm</td>
<td>Helicopter terrain clearance from radar altimeter (metres - AGL)</td>
</tr>
<tr>
<td>Mag1</td>
<td>Sensor 1 - Total Magnetic field data (nT)</td>
</tr>
<tr>
<td>Mag2</td>
<td>Sensor 2 - Total Magnetic field data (nT)</td>
</tr>
<tr>
<td>Mag3</td>
<td>Sensor 3 - Total Magnetic field data (nT)</td>
</tr>
<tr>
<td>TMI</td>
<td>Leveled Total Magnetic field data (nT)</td>
</tr>
<tr>
<td>C_VMG</td>
<td>Calculated Vertical Magnetic Gradient</td>
</tr>
<tr>
<td>M1_HMG</td>
<td>Measure In-Line Horizontal Magnetic Gradient</td>
</tr>
<tr>
<td>M_VMG</td>
<td>Measure Vertical Magnetic Gradient</td>
</tr>
<tr>
<td>vlf_quad1</td>
<td>VLF Quadrature Station #1</td>
</tr>
<tr>
<td>vlf_quad2</td>
<td>VLF Quadrature Station #2</td>
</tr>
</tbody>
</table>
Survey Specifications:

Base: Kirkland Lake Airport  
Date Flown: February 25 - 29, 2008  
Aircraft: BELL 206LR  
Registration: C-GKCW  
Flight Line Spacing: 50 m  
Tie Line Spacing: 500 m  
Tie Line Direction: 45 DEG (NE)  
Nominal Bird Height: 45 m  
Sensor Position: 30 m below aircraft  

Instrumentation:

Data Acquisition: CMG DAS SYSTEM: CMG Magnetic Gradiometer and VLF-EM 
Magnetometers: 3 GEM Potassium Total Field  
Vertical Separation: 2.95 m  
Horizontal Separation: 3.45 m  
Sensitivity: +/- 0.001 nT  
Heading Error: +/- 0.15 nT or less  
Gradient Tolerance: 5,000 nT/m maximum  
VLF Station: #1: Cutler Maine 24.0 kHz  
VLF Station: #2: Jim Creek Seattle 24.8 kHz  
VLF Sensitivity: +/- 5 pT  
Radar Altimeter: Sperry AA-300 @10 Hz, +/- 5% on bird  
GPS System: Novatel v4.0 @10 Hz, 1-5 m  
Base Station: GSM-19 @1 Hz, +/- 0.01 nT  

Navigation:

System: CD-GPS (Canadian Differential)  
Equipment: AgNav and Novatel v 4.0  
Elevation: Sperry AA-300 radar altimeter in helicopter  

Data Processing:

Total Magnetic Field: Diurnal correction, tie-line, micro-leveling  
Magnetic Gradients: Heading error, micro-leveling  
VLF: DC bias, line direction  

Coordinate System:

Datum: NAD83  
Major Axis: 6378137.000  
Eccentricity: 0.81819191  
Projection: Universal Transverse Mercator  
Central Meridian: 81°W  
Central Scale Factor: 0.9996  
False Easting: 500,000 mE  

2000 metres
Survey Specifications:
- **Base:** Kirkland Lake Airport
- **Date Flown:** February 25 - 29, 2008
- **Aircraft:** BELL 206LR
- **Registration:** C-GKCW
- **Flight Line Spacing:** 50 m
- **Flight Line Direction:** 315 DEG (NW)
- **Tie Line Spacing:** 500 m
- **Tie Line Direction:** 45 DEG (NE)
- **Nominal Bird Height:** 45 m
- **Sensor Position:** 30 m below aircraft

Instrumentation:
- **Data Acquisition:** CMG DAS SYSTEM, CMG Magnetic Gradiometer and VLF-EM Magnetometers, 3 GEM Potassium Total Field
- **Vertical Separation:** 2.95 m
- **Horizontal Separation:** 3.45 m
- **Sensitivity:** +/- 0.001 nT or less
- **Heading Error:** +/- 0.15 nT or less
- **Gradient Tolerance:** 5,000 nT/m maximum
- **VLF Station #1:** Cutler Maine 24.0 kHz
- **VLF Station #2:** Jim Creek Seattle 24.8 kHz
- **VLF Sensitivity:** +/- 5 pT
- **Radar Altimeter:** Sperry AA-300 @10 Hz, +/- 5% on bird
- **GPS System:** Novatel v4.0 @10 Hz, 1-5 m

Navigation:
- **System:** CD-GPS (Canadian Differential)
- **Equipment:** AgFlow and Novatel v 4.0
- **Elevation:** Sperry AA-300 radar altimeter in helicopter

Data Processing:
- **Total Magnetic Field:** Diurnal correction, tie-line, micro-leveling
- **Magnetic Gradients:** Heading error, micro-leveling
- **VLF:** DC bias, line direction

Coordinate System:
- **Datum:** NAD83
- **Reference Ellipsoid:** 6378737.000
- **Eccentricity:** 0.81819191
- **Projection:** Universal Transverse Mercator
- **Central Meridian:** 81°W
- **Central Scale Factor:** 0.9996
- **False Easting:** 500,000 mE

**Figure 5**
- **Grid North**
- **NAD83 UTM Zone 17**

**Legend:**
- **M-VMG nT**
- **Scale:** 2000 metres
Survey Specifications:
Base: Kirkland Lake Airport
Date Flown: February 25 - 29, 2008
Aircraft: BELL 206LR
Registration: C-GKCW
Flight Line Spacing: 50 m
Flight Line Direction: 315 DEG (NW)
Tie Line Spacing: 500 m
Tie Line Direction: 45 DEG (NE)
Nominal Bird Height: 45 m
Sensor Position: 30 m below aircraft

Instrumentation:
Data Acquisition: CMG DAS
System: CMG Magnetic Gradiometer and VLF-EM
Magnetometers: 3 GEM Potassium Total Field
Vertical Separation: 2.95 m
Horizontal Separation: 2.45 m
Sensitivity: +/- 0.001 nT
Heading Error: +/- 0.15 nT or less
VLF Station # 1: Cutler Maine 24.0 kHz
VLF Station # 2: Jim Creek Seattle 24.5 kHz
VLF Sensitivity: +/- 5 pT
Radar Altimeter: Sperry AA-300 @10 Hz, +/- 5% on bird
GPS System: Novatel v4.0 @10 Hz, 1-5 m
Base station Unit: GSM-19 @1 Hz, +/- 0.01 nT

Navigation:
System: CD-GPS (Canadian Differential)
Equipment: AgNav and Novatel v4.0
Elevation: Sperry AA-300 radar altimeter in helicopter

Data Processing:
Total Magnetic Field: Diurnal correction, line, micro-leveling
Magnetic Gradients: Heading error, micro-leveling
VLF: DC bias, line direction

Coordinate System:
Datum: NAD83
Major Axis: 6378737.000
Eccentricity: 0.8181919
Projection: Universal Transverse Mercator
Central Meridian: 81W
Central Scale Factor: 0.9996
False Easting: 500,000 mE

2000 metres