REPORT ON A HELICOPTER-BORNE MAGNETIC AND ELECTROMAGNETIC SURVEY

"featuring the AeroQuest AeroTEM® System"

Nairn Property
Nairn Township, Sudbury Area, Ontario

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April, 2004
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MAPS

The results of the survey are presented in a series of black line and colour maps at a scale of 1:10,000. Map products are as follows:

- Plate 1. Flight path.
- Plate 2. Total Magnetic Intensity (TMI) colour grid w/line contours.

All the maps show the flight path, skeletal topography, and where identified, EM anomalies. The anomalies are represented by symbols classified according to the number of responding conventional EM channels. An anomaly identifier label and the Z3 off-time channel peak amplitude, if applicable, is posted alongside the anomaly symbol. Colour contour maps show colour fill plus superimposed line contours.

DIGITAL DATA on CD-ROM

The results of the survey are archived on a single CD-ROM as Geosoft GDB (binary) databases and XYZ (ASCII) export files as well as Geosoft maps and magnetic grids. A readme.txt file may be found on the CD which describes the contents in more detail.

For the reader's convenience, a copy of Geosoft's Oasis Montaj Ver 5.0 Free Interface is included on the CD. To install the interface, unzip the two files and follow the instructions in the PDF format (Adobe Reader) guide.

The CD also contains a digital version of this report in PDF (Adobe Acrobat) format including the technical paper by Balch, et al, which is re-printed in the appendix of this report. Adobe Acrobat Reader Ver 5.0 has been included on the CD.
1. INTRODUCTION

This report describes a helicopter-borne geophysical survey carried out on behalf of Mustang Minerals Corp. on the Nairn property, in Nairn Township, in the Sudbury area of Ontario.

The Nairn Property was acquired in 2002 by Mustang Minerals Corp. because of its exploration potential to host (1) offset dike hosted Cu-Ni-PGE mineralization similar to that discovered by Tearlach Resources on its Mystery Offset Dike Property located 3 km northeast of the property; and, (2) Ni-Cu-PGE mineralization similar in style to that currently being explored by Ursa Major Minerals in a northeast trending gabbro sill at its Shakespeare Property in Shakespeare Township approximately 10 km west of the property.

Principal geophysical sensors included AeroQuest's exclusive AeroTEM® time domain helicopter electromagnetic system and a high sensitivity cesium vapour magnetometer. Ancillary equipment included a GPS navigation system with GPS base station, radar altimeter, video recorder, and a base station magnetometer. Raw streaming EM data, consisting of 126 channels of Z and X component sampled at 300 times per second during both on-current and off-current times, was recorded. A second RMS "analogue" acquisition system recorded 6 Z-component and one X-component channels of semi-processed EM data at 7.5 times per second, in addition to recording GPS position, magnetic field, and terrain clearance.

Appendix 1 lists the UTM corner co-ordinates for the survey area. The total line kilometres (unwindowed) flown was 97.6 km. The survey flying described in this report took place on April 12, 2004.

Where identified, bedrock EM anomalies were picked from the conventional RMS Off-Time data and graded according to the number of channels of response. This report describes the survey, the data processing and presentation.

2. SURVEY AREA and PHYSIOGRAPHY

The Nairn property is located in Nairn Township in northeastern Ontario. The property is situated approximately 50 km southwest of the city of Sudbury and immediately south of the town of Nairn (Figure 1). Access is by numerous ATV trails south from the town of Nairn. The centre part of the property is located 0.5 km south of Highway #17 and 0.5 km northwest of Wabagishik Lake at 46°19'N latitude, 81°36'W longitude.
The Nairn Property consists of 3 unpatented mining claims for a total of 32 units covering 512 hectares. The mining claims comprising the property were acquired from Goldwright Explorations through an option agreement.

<table>
<thead>
<tr>
<th>Claim #</th>
<th>Units</th>
<th>Township</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1199016</td>
<td>16</td>
<td>Nairn</td>
<td>Aug. 30, 2004</td>
</tr>
<tr>
<td>1199015</td>
<td>8</td>
<td>Nairn</td>
<td>May 16, 2004</td>
</tr>
<tr>
<td>1199014</td>
<td>8</td>
<td>Nairn</td>
<td>May 16, 2004</td>
</tr>
</tbody>
</table>

The major topographic feature of the area is Wabagishik Lake located immediately south of the property (Figure 2). The property itself has rocky, east-northeast trending ridges separated by valleys filled with glacial material, swamps and streams. Local relief is commonly 10 to 30 m, although locally there are ridges up to 100 m high. Vegetation is typical for the Sudbury area with mixed second growth forest of spruce, pine, poplar, birch, oak and maple. The swampy, low lying areas contain abundant tag alders.

The survey crew resided at the Comfort Inn Motel on Highway 17 at Second Ave on the east side of Sudbury. Survey specification details may be found in the next section of the report.
Fig 2. The Nairn Property Claims
3. SURVEY SPECIFICATIONS AND PROCEDURES

The survey specifications are summarised in the following table:

<table>
<thead>
<tr>
<th>Area Name</th>
<th>Line Spacing (m)</th>
<th>Line Direction</th>
<th>Unwindowed Total Survey (km)</th>
<th>Windowed Total Survey (km)</th>
<th>Dates Flown (2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nairn Survey</td>
<td>100</td>
<td>N-S</td>
<td>97.6</td>
<td>55.9</td>
<td>April 12</td>
</tr>
</tbody>
</table>

The unwindowed kilometres flown is calculated by adding up the survey and control (tie) line lengths as presented in the database. The windowed kilometres is determined in the same manner but after masking the database with an outline of the claims boundary, as found in the appendix of this report. All the survey lines were flown in the UTM grid North/South direction. The control (tie) lines were flown perpendicular to the survey lines.

Nominal EM bird terrain clearance was ~30m (100 ft). The magnetometer sensor was mounted in a smaller bird connected to the tow rope 21 metres above the EM bird and 17 metres below the helicopter. Nominal survey speed was 75 km/hr. Scan rates for data acquisition was 0.1 second for the magnetometer, electromagnetics and altimeter and 0.2 second for the GPS determined position. This translates to a geophysical reading about every 2-3 metres along flight track.

Navigation was assisted by a GPS receiver and the RMS data acquisition system which reports GPS co-ordinates as NAD83 latitude/longitude and directs the pilot over a pre-programmed survey grid. The x-y-z position of the aircraft, as reported by the GPS, is recorded at 0.2 second intervals.

Unlike frequency domain electromagnetic systems, the AeroTEM® system has negligible drift due to thermal expansion. The system static offset is removed by high altitude zero calibration lines and employing local levelling lines.

The operator was responsible for ensuring the instrument was properly warmed up prior to departure and that the instruments operated properly throughout the flight. He also maintained a detailed flight log during the survey noting the times of the flight as well as any unusual geophysical or topographic features.

On return of the aircrew to the base camp, the RMS acquisition system survey data on FlashCard was downloaded to the data processing work station. The MDAS recorded data, on removable hard-drive, was also downloaded to the processing station and archived onto DVD. In-field processing included flight preparation, transfer of the RMS acquired data to Geosoft GDB database format and production of preliminary EM, magnetic contour, and flight path maps. Survey lines which showed excessive deviation from the intended flight path were re-flown.
4. AIRCRAFT AND EQUIPMENT

4.1 Aircraft

A Eurocopter (Aerospatiale) AS350B2 "A-Star" helicopter - registration C-FAVI was used as survey platform. The helicopters was owned and operated by Abitibi Helicopters Ltd., LaSarre, P.Q. Installation of the geophysical and ancillary equipment was carried out by AeroQuest Limited at the Gateway Helicopters Base in North Bay, Ont. then ferried to the survey area. The survey aircraft was flown at a nominal terrain clearance of 220 ft (70 m).

4.2 Magnetometer

The AeroQuest airborne survey system employed the Geometrics G-823A cesium vapour magnetometer sensor installed in a two metre towed bird airfoil attached to the main tow line, 17 metres below the helicopter. The sensitivity of the magnetometer is 0.001 nanoTesla at a 0.1 second sampling rate. The nominal ground clearance of the magnetometer bird was 51 metres (170 ft.). The magnetics data is recorded at 10Hz by the RMS DGR-33.

4.3 Electromagnetic System

The electromagnetic system employed was an AeroQuest AeroTEM© Time Domain towed bird system. A triangular transmitter on-time pulse of 1.150 millisecond is employed, at a base frequency of 150 Hz. During every tx on-off cycle (300 per second), 126 contiguous channels of raw x and z component (as well as a transmitter current monitor, itx) of the received waveform are measured. Each channel width is 26.455 microsec starting at the beginning of the Tx pulse on. This 126 channel data is referred to as the raw streaming data.

Fig.3 The mag bird (foreground) and EM bird
The AeroTEM system has two separate EM data recording streams, the conventional RMS DGR-33 and the MDAS system.

**RMS DGR-33 Acquisition System**

In addition to the magnetics, altimeter and position data, six time channels of on-board real time processed off-time EM decay in the Z direction and one in the X direction are recorded by the RMS DGR-33 acquisition system at 7.5 samples per second. These channels are derived by a real-time binning, stacking and filtering procedure on the raw streaming data. The RMS data (Z1 to Z6, X1) is also sent to the analogue chart recorder and is often referred to as the analogue data. The channel window timing of the RMS DGR-33 6 channel system is described in the table below.

<table>
<thead>
<tr>
<th>RMS Channel</th>
<th>Start time (microsec)</th>
<th>End time (microsec)</th>
<th>Width (microsec)</th>
<th>Streaming Channels</th>
<th>Noise tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z1, X1</td>
<td>1269.8</td>
<td>1322.8</td>
<td>52.9</td>
<td>48-50</td>
<td>20 ppb</td>
</tr>
<tr>
<td>Z2</td>
<td>1322.8</td>
<td>1455.0</td>
<td>132.2</td>
<td>50-54</td>
<td>20 ppb</td>
</tr>
<tr>
<td>Z3</td>
<td>1428.6</td>
<td>1587.3</td>
<td>158.7</td>
<td>54-59</td>
<td>15 ppb</td>
</tr>
<tr>
<td>Z4</td>
<td>1587.3</td>
<td>1746.0</td>
<td>158.7</td>
<td>60-65</td>
<td>15 ppb</td>
</tr>
<tr>
<td>Z5</td>
<td>1746.0</td>
<td>2063.5</td>
<td>317.5</td>
<td>66-77</td>
<td>10 ppb</td>
</tr>
<tr>
<td>Z6</td>
<td>2063.5</td>
<td>2698.4</td>
<td>634.9</td>
<td>78-101</td>
<td>10 ppb</td>
</tr>
</tbody>
</table>

**MDAS Acquisition System**

The 126 channels of raw streaming are recorded by the MDAS acquisition system onto a removeable hard drive. The streaming data may undergo post-survey processing to yield 32 stacked and binned on-time and off-time channels at a 10 Hz sample rate.

Fig.4 Instrument Rack
The timing of those reduced streaming channels is described in the following table.

<table>
<thead>
<tr>
<th>Processed Channel</th>
<th>Start (microsec)</th>
<th>Stop (microsec)</th>
<th>Mid (microsec)</th>
<th>Width (microsec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ON</td>
<td>725</td>
<td>750</td>
<td>737.5</td>
<td>25</td>
</tr>
<tr>
<td>2 ON</td>
<td>750</td>
<td>775</td>
<td>762.5</td>
<td>25</td>
</tr>
<tr>
<td>3 ON</td>
<td>775</td>
<td>800</td>
<td>787.5</td>
<td>25</td>
</tr>
<tr>
<td>4 ON</td>
<td>800</td>
<td>825</td>
<td>812.5</td>
<td>25</td>
</tr>
<tr>
<td>5 ON</td>
<td>825</td>
<td>850</td>
<td>837.5</td>
<td>25</td>
</tr>
<tr>
<td>6 ON</td>
<td>850</td>
<td>875</td>
<td>862.5</td>
<td>25</td>
</tr>
<tr>
<td>7 ON</td>
<td>875</td>
<td>900</td>
<td>887.5</td>
<td>25</td>
</tr>
<tr>
<td>8 ON</td>
<td>900</td>
<td>925</td>
<td>912.5</td>
<td>25</td>
</tr>
<tr>
<td>9 ON</td>
<td>925</td>
<td>950</td>
<td>937.5</td>
<td>25</td>
</tr>
<tr>
<td>10 ON</td>
<td>950</td>
<td>975</td>
<td>962.5</td>
<td>25</td>
</tr>
<tr>
<td>11 ON</td>
<td>975</td>
<td>1000</td>
<td>987.5</td>
<td>25</td>
</tr>
<tr>
<td>12 ON</td>
<td>1000</td>
<td>1025</td>
<td>1012.5</td>
<td>25</td>
</tr>
<tr>
<td>13 ON</td>
<td>1025</td>
<td>1050</td>
<td>1037.5</td>
<td>25</td>
</tr>
<tr>
<td>14 ON</td>
<td>1050</td>
<td>1075</td>
<td>1062.5</td>
<td>25</td>
</tr>
<tr>
<td>15 ON</td>
<td>1075</td>
<td>1100</td>
<td>1087.5</td>
<td>25</td>
</tr>
<tr>
<td>16 ON</td>
<td>1100</td>
<td>1125</td>
<td>1112.5</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 OFF</td>
<td>1175</td>
<td>1200</td>
<td>1187.5</td>
<td>25</td>
</tr>
<tr>
<td>2 OFF</td>
<td>1200</td>
<td>1225</td>
<td>1212.5</td>
<td>25</td>
</tr>
<tr>
<td>3 OFF</td>
<td>1225</td>
<td>1250</td>
<td>1237.5</td>
<td>25</td>
</tr>
<tr>
<td>4 OFF</td>
<td>1250</td>
<td>1275</td>
<td>1262.5</td>
<td>25</td>
</tr>
<tr>
<td>5 OFF</td>
<td>1275</td>
<td>1300</td>
<td>1287.5</td>
<td>25</td>
</tr>
<tr>
<td>6 OFF</td>
<td>1300</td>
<td>1325</td>
<td>1312.5</td>
<td>25</td>
</tr>
<tr>
<td>7 OFF</td>
<td>1325</td>
<td>1350</td>
<td>1337.5</td>
<td>25</td>
</tr>
<tr>
<td>8 OFF</td>
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<td>1375</td>
<td>1362.5</td>
<td>25</td>
</tr>
<tr>
<td>9 OFF</td>
<td>1375</td>
<td>1450</td>
<td>1412.5</td>
<td>75</td>
</tr>
<tr>
<td>10 OFF</td>
<td>1450</td>
<td>1525</td>
<td>1487.5</td>
<td>75</td>
</tr>
<tr>
<td>11 OFF</td>
<td>1525</td>
<td>1600</td>
<td>1562.5</td>
<td>75</td>
</tr>
<tr>
<td>12 OFF</td>
<td>1600</td>
<td>1800</td>
<td>1700</td>
<td>200</td>
</tr>
<tr>
<td>13 OFF</td>
<td>1800</td>
<td>2000</td>
<td>1900</td>
<td>200</td>
</tr>
<tr>
<td>14 OFF</td>
<td>2000</td>
<td>2200</td>
<td>2100</td>
<td>200</td>
</tr>
<tr>
<td>15 OFF</td>
<td>2200</td>
<td>2400</td>
<td>2300</td>
<td>200</td>
</tr>
<tr>
<td>16 OFF</td>
<td>2400</td>
<td>3000</td>
<td>2700</td>
<td>600</td>
</tr>
</tbody>
</table>

The picked EM anomalies plotted on the survey maps were generated from the conventional EM channel data logged by the RMS acquisition system.
The current AeroTEM® Transmitter Dipole moment is 38.8 kNIA. The AeroTEM® bird was towed 38 metres (125 ft) below the helicopter. More technical details of the system may be found in the technical paper in the Appendix.

![Schematic of Tx and Rx waveforms](image)

**Fig. 5** Schematic of Tx and Rx waveforms

### 4.4 Ancillary Systems

**Magnetometer and GPS Base Station**

An integrated GPS and magnetometer base station was set up to monitor the static position GPS errors to permit differential post-processing and to record the diurnal variations of the earth’s magnetic field. Each sensor, GPS and magnetic, receiver/signal processor was attached to a dedicated laptop computer for purposes of instrument control and/or data display and recording. The laptops were, in turn, linked together to provide a common recording time reference using the GPS clock.

The base magnetometer was a Scintrex CS-2 cesium precession magnetometer coupled with a Picodas MEP-710 frequency counter/decoupler. Data logging and magnetometer control was provided by the Picodas `basemag.exe` software. The logging was configured to measure at 0.5 second intervals. Digital recording resolution was 0.1 nT. The sensor was placed on a tripod away from potential noise sources at the Sudbury Airport. A continuously updated profile plot of the base station values was available for viewing on the base station display.

The GPS base station employed a Leica Mx9212 12 channel GPS receiver with external antenna mounted near the magnetometer sensor. Although the GPS receiver was controlled by the Picodas `cdw510.exe` software, logging was not engaged as the aircraft employed a real-time differential GPS receiver. The base GPS was used only for the GPS clock for synchronisation purposes.
Radar Altimeter

A Terra TRA 3500/TRI-30 radar altimeter was used to record terrain clearance. The antenna was mounted on the outside of the helicopter beneath the cockpit. The recorded data represented the height of the antenna, i.e. helicopter, above the ground. The Terra altimeter has an altitude accuracy of +/- 1.5 metres.

Video Tracking and Recording System

A high resolution colour VHS/8mm video camera was used to record the helicopter ground flight path along the survey lines. The video is digitally annotated with GPS position and time and can be used to verify ground positioning information and cultural causes of anomalous geophysical data.

GPS Navigation System

The navigation system consisted of an Ag-Nav Inc. AG-NAV2 GPS navigation system comprising a PC based acquisition system, navigation software, a deviation indicator in front of the aircraft pilot to direct the flight, a full screen display with controls in front of the operator, a Trimble AgGPS132 WAAS enabled GPS receiver mounted on the instrument rack and a Trimble antenna mounted on the magnetometer bird.

WAAS (Wide Area Augmentation System) consists of approximately 25 ground reference stations positioned across the United States that monitor GPS satellite data. Two master stations, located on either coast, collect data from the reference stations and create a GPS correction message. This correction accounts for GPS satellite orbit and clock drift plus signal delays caused by the atmosphere and ionosphere. The corrected differential message is then broadcast through one of two geostationary satellites, or satellites with a fixed position over the equator. The corrected position has a published accuracy of under 3 metres. A recent static ground test of the Trimble WAAS GPS yielded a standard deviation in x and y of under 0.6 metres and for z under 1.5 metres over a two hour period.

Survey co-ordinates are set-up prior to survey and the information is fed into the airborne navigation system. The co-ordinate system employed in the survey design was NAD83 UTM. The real-time differentially corrected GPS positional data was recorded by the RMS DGR-33 in NAD83 latitude and longitude at 0.2 second intervals directly in the analogue geophysical data file. The datum of the recorded latitude/longitude depended on the datum defined in the navigation file used to guide the survey aircraft.
Digital Acquisition System

The RMS Instruments DGR33A data acquisition system was used to collect and record the analogue data stream, i.e. the geophysical and positional data, including processed 6 channel EM, magnetic, radar altimeter, GPS position, and time. The data was recorded on 128Mb capacity FlashCard. The RMS output was also directed to a thermal chart recorder.

The AeroTEM received waveform sampled during on and off-time at 126 channels per decay, 300 times per second, was logged in parallel by the proprietary MDAS data acquisition system. The channel sampling commences at start of the Tx cycle and the width of each channel is 26.445 microseconds. The streaming data was recorded on a removable hard-drive and was later backed-up onto DVD-ROM on the field-processing computer.

5. PERSONNEL

The following AeroQuest personnel were involved in the project

Field -
   Party Chief: Bert Simon           Data Processor: Neil Fiset
   Operator: Chris Kozak

Office -
   Data Processing and Report: Neil Fiset

The survey pilot, Joel Breton was employed directly by the helicopter operator - Abitibi Helicopters Ltd.

6. DELIVERABLES

The report includes a set of five geophysical maps plotted at 1:10,000 scale. The map types are as follows:

- Plate 1. Flight path.
- Plate 2. Total Magnetic Intensity (TMI) colour grid w/line contours.

The basic map coordinate/projection system used is NAD83 Universal Transverse Mercator Zone 17. For reference, the latitude and longitude are also noted on the maps.
All the maps show flight path trace with time reference fiducials marked at a 10 second interval, skeletal topography, and conductor picks represented by an anomaly symbol classified according to the number of RMS EM Z component channels of response. The anomaly symbol is accompanied by an anomaly identifier label and, where applicable, the Z3 channel amplitude in ppb. The anomaly symbol legend may be found in the margin of the maps. Colour contour maps show colour fill plus superimposed line contours.

The geophysical profile data is archived digitally in a Geosoft GDB binary format database as well as an exported Geosoft Ascii format XYZ file. A description of the various channels found in the database may be found in the appendices of this report.

An archive CD complements the hard copy report and maps. It contains the digital databases as well as the geophysical maps and grids in Geosoft format.

7. DATA PROCESSING AND PRESENTATION

All in-field and post-field data processing was carried out using Geosoft Montaj as well as AeroQuest proprietary data processing software. Plotting was on a 36 inch wide HP650C ink-jet plotter.

7.1 Base Map

The geophysical maps accompanying this report are based on positioning in the datum of NAD83. The survey geodetic GPS positions have been map projected using the Universal Transverse Mercator projection in Zone 17.

A summary of the map datum and projection specifications are as follows:
Ellipse: WGS84
Ellipse major axis: 6378137.0m  eccentricity: 0.081819191
Datum: North American 1983
Datum Shifts (x,y,z): 0, 0, 0 metres
Map Projection: Universal Transverse Mercator Zone 17 (Central Meridian 81°W)
Central Scale Factor: 0.9996
False Easting, Northing: 500,000m, 0m

The skeletal topography, provided by Mustang Minerals Corp., was derived from the digital Ontario Base Map (OBM) 1:20,000 map series.
7.2 Flight Path & Terrain Clearance

The position of the survey helicopter was directed by use of the Global Positioning System (GPS). Positions were updated five times per second (5Hz) and expressed as NAD83 latitude and longitude calculated from the raw pseudorange derived from the C/A code signal.

The instantaneous GPS flight path, after conversion to the local datum UTM co-ordinates, is drawn using linear interpolation between the x/y positions. The time reference fiducials are drawn on the map at appropriate intervals and are used to reference the digital data files to the plan map.

The raw Digital Terrain Model (DTM) was derived by simply taking the satellite position altitude and subtracting the radar altimeter. The calculated values are relative and are not tied into to surveyed geodetic heights.

7.3 Electromagnetic Data

The six Z-component and single X-component conventional RMS EM channel underwent a two stage digital filtering process to reject major sferic events and to reduce system noise.

Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major sferic events. The filter used was a 0.4 sec non-linear filter.

The signal to noise ratio was further improved by the application of a low pass linear digital filter. This filter has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 1 second or 30 metres over the ground. This filter is referred to as a 10 point linear filter.

The EM channels have been levelled to remove the residual zero offset by the use of a short background line at the beginning and end of each flight. The background line is flown at high altitude (>1000 ft), theoretically far enough away from any ground conductivity response. Any residual response is therefore a system offset and can be removed from the on-line response by virtue of linear interpolation between the start and end of flight checks. If any non-linear drift remains in the data then artificial local levelling lines were employed.

During the high elevation checks, an internal 5 second wide calibration pulse in all EM channels was generated in order to ensure that the gain of the system remained constant and within specifications.
If identified, apparent bedrock EM anomalies have been manually picked from the analogue profiles. Each anomaly has been given a letter label and is graded according to the channels in which the anomaly is discernible. The anomalies are plotted on the plan maps with a symbol denoting the number of channels of response and the polarity of that response. Beside the symbol is posted the Z3 channel amplitude. EM Anomalies that are discernible but questionable as they lie within the noise envelope are plotted with an x-symbol.

No EM anomalies, that may be related to bedrock mineralisation, were identified on the Nairn block. The anomalous EM activity along the northern edge of the survey area is caused by cultural features along the highway corridor.

7.4 Magnetic Data

Prior to any levelling the magnetic data was subjected to a lag correction of -0.3 seconds and a spike removal filter. The filtered aeromagnetic data were then corrected for diurnal variations using the magnetic base station and the intersections of the tie lines. No corrections for the regional reference field (IGRF) were applied. The corrected profile data were interpolated on to a grid using a random grid technique with a grid cell size of 25 metres. The final levelled grid provided the basis for threading the presented contours which have a minimum contour interval of 5 nT.

The northern half of the Nairn survey block is marked by a number of moderately strong, isolated, circular to oval shaped magnetic anomalies. Across the southern part of the block is an east west band of very strong (500 to >1000nT) magnetic anomalies. The geology is known to be intruded by numerous 2.2 Ga gabbroic sill-like intrusions, which are the likely source of the anomalies.

These individual magnetic anomalies are superimposed on a general northeast-southwest trending magnetic fabric, which is particularly evident in the north half of the grid. This fabric reflects the Huronion metasediments that underlie the area.

Respectfully submitted,

Neil Fiset, B.Sc.,
AeroQuest Limited
April 28, 2004
**APPENDIX 1**

Survey and Claim Block corner co-ordinates (NAD83-UTM Zone 17)

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APPENDIX 2 Description of Database Fields

The GDB file is a Geosoft binary database. The RMS database has been exported to a Geosoft XYZ ASCII format file.

In the databases the Survey lines, Tie Lines, and High Altitude/Internal Q coil lines are prefixed with an "L" or "Line", "T" or "Tie", and "S" or "Test", respectively.

RMS Database (Nairn.gdb & Nairn.xyz):

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<td>y</td>
<td>Zone 17 UTM Northing in metres (NAD83)</td>
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<td>Chart Recorder Fiducial</td>
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<tr>
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<td>Fiducial counter for streaming data synchronisation</td>
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<td>Smoothed and levelled RMS Off-Time EM-Z component of channels 1 to 6 in ppb</td>
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Appendix 4: Technical Paper

Mineral Exploration with the AeroTEM System
S.J. Balch, W.P. Boyko, G. Black, and R.N. Pedersen, AeroQuest Limited, Presented at the SEG Int'l Exposition and 72nd Annual Meeting, Salt Lake City, Utah, October 6-11, 2002
Mineral Exploration with the AeroTEM System

Summary
AeroTEM is a concentric-loop time-domain EM system designed for mineral exploration and geologic mapping. The high dipole moment of the transmitter in combination with the unique superimposed dipole coil geometry allows the system to achieve a depth of exploration similar to fixed-wing systems, but with the resolution and target response symmetry that is typical of conventional helicopter-towed EM systems. AeroTEM has flown over 20,000 line-km since its introduction in 1999. Ground follow-up geophysical surveys and drilling programs have confirmed the depth of exploration to be in excess of 200 m with high spatial resolution of target conductors confirmed. The compact, rigid system geometry should provide for a true on-time measurement of secondary fields from highly conductive sources often associated with Ni-Cu-PGE mineralization, thereby gaining a considerable advantage over all towed-receiver fixed-wing airborne EM systems, which are known to be blind to such targets (Hanneson, 1998).

Introduction
Airborne EM systems, as they have evolved since the 1940’s generally fall into one of two categories, namely, (1) the loosely coupled towed-bird systems on fixed-wing aircraft, and (2) the rigid transmitter-receiver configuration towed by helicopters (e.g., Fountain, 1998). The fixed-wing systems operate in the time domain and are characterized by a wideband high-moment transmitter to maximize depth penetration, especially in a resistive environment. The rigid helicopter systems operate in the frequency domain and are characterized by multiple narrow-band low-moment transmitters and closely spaced receivers to maximize spatial resolution and provide moderate depth penetration. Thus one system seeks to maximize signal while the other strives to minimize noise, both attempting to increase the signal-to-noise-ratio...this being the only determining factor of an EM system’s level of performance.

The AeroTEM system is a wide-band time-domain EM design that draws on the rigid design of the frequency-domain systems and the high-moment transmitter design of the fixed-wing platforms. The system attempts to both maximize signal and minimize noise by incorporating the two major advantages of airborne EM systems – transmitter power and rigid coil geometry. As Duckworth (1993) so succinctly states, the optimum coupling to a target by a transmitter-receiver coil pair is achieved by only two possible coil configurations. The first optimum coupling is achieved when the coil separation is 0.6 times the distance to the target; the second optimum coupling is achieved when the coils are coincident. Because target depth cannot be known a priori, the coincident coil geometry is obviously preferred.

Method
The system (Figure 1) consists of a 3-axis receiver coil mounted centrally within a large 5-m diameter transmitter loop. The transmitter waveform is a triangular current pulse of 1.15 ms duration at a base frequency of 150 Hz with a peak current of 260 A for a total transmitter moment of 40,000 Am. The mutually orthogonal receiver coils are mounted with the X-axis along the flight line, Y transverse, and Z vertical. System waveforms and typical conductor responses are shown in Figure 2.

The system is towed 40 m below the helicopter at a nominal terrain clearance of 30 m. The present transmitter produces a peak primary field of 300 nT vertically below the transmitter at ground level. Because both the transmitter and receiver are located close to the ground, AeroTEM produces a stronger target response in the upper 50 m of the earth compared to a fixed-wing aircraft with a peak dipole moment of 500,000 Am² and a peak primary field of 55 nT at ground surface. The strength of the primary field from an EM transmitter decreases rapidly with distance from the transmitter location. High moment transmitters on fixed-wing aircraft, such as GEOTEM, tend to have better depth penetration because the strength of the primary field - even at 300 m -
The AeroTEM System

is sufficiently high to energize a conductor and produce a measurable secondary field. Large loop ground EM systems have even greater depth penetration, owing to the lower rate at which the primary field falls off with distance from the transmitter for distances on the order of the loop dimensions. The strength of the primary field from the AeroTEM transmitter is compared with that of some common systems in Figure 3.

Although the fixed-wing and ground EM systems gain an advantage in primary field at depth, this energy is diffused over a larger volume, thus reducing their effectiveness in energizing smaller conductors. For large loop ground EM systems, this is especially a problem where large regional conductors can mask the more subtle responses of smaller isolated targets.

Example One: Spatial Resolution

The vertical (Z-axis) component produces responses that are independent of the flight line direction. The close proximity of the transmitter and receiver coils produces very sharp anomaly edges. These two factors combine to produce images of the Z component channels that have high spatial resolution.

In the following example, the amplitude of the earliest off-time channel for the Z component receiver coil is shown in Figure 4. The survey was conducted for Numinco Resources in the Lac Rocher area of Quebec during an exploration program for Ni-Cu-PGE deposits.

One discrete anomaly detected from the Lac Rocher survey, and represented by the black outline in Figure 4, is shown in profile format in Figure 5. The approximate lateral extent of the conductor response is 50 m on the earliest time channel (width at half-maximum). The narrow response of this isolated conductor compares favorably with the spatial resolution achieved with conventional HEM systems.
The AeroTEM System

An expanded view of the airborne response is shown in Figure 7. The Crone early-time response is shown in Figure 8. The conductor was located within an area of favorable geology. Modeling of the Crone response suggested a sub-horizontal conductor dipping at $-25^\circ$ below the horizontal and located approximately 100 m below surface. The AeroTEM response also suggested a flat-lying conductor because of the symmetric Z component response.

**Example Two: Airborne - Ground Comparison**

Aurogin Resources, in joint venture with Heron Mines, flew an 800 line-km AeroTEM survey over the Belledune Property in New Brunswick in the search for Cu-Zn-Pb deposits. Several AeroTEM airborne EM conductors were identified from that survey over two separate areas.

A ground follow-up program of Crone Pulse EM was conducted over one selected target in Area Two. The AeroTEM early-time Z component response is shown in Figure 6. The anomaly subjected to the ground follow-up program is outlined in black (Figure 6).

![Figure 5: The high spatial resolution of AeroTEM is demonstrated by the EM response of an isolated conductor. The width of the response is less than 50 m on the earliest time channel (peak amplitude at half-maximum).](image)

![Figure 6: Early-time Z component AeroTEM response over the Belledune Survey Area Two. A detailed ground follow-up survey was centered over the response outlined in black.](image)

![Figure 7: AeroTEM earliest time-channel Z component response, Belledune Property, New Brunswick. The survey was flown with a line spacing of 100 m.](image)

![Figure 8: Crone Pulse EM vertical component, amplitude of time channel 10, from the Belledune Property, New Brunswick. The survey was performed in-loop with a 100 m line spacing.](image)
Two boreholes were drilled to then evaluate the EM responses and both intersected up to 15% sulphide containing significant Au-Ag-Cu within a volcanic rhyolite. Downhole Pulse EM surveys confirmed the intersection of a conductor approximately 170 m downhole, coincident with the intersected mineralization, and corresponding to a vertical depth of 145 m. The peak response in the earliest AeroTEM time channel was 90 ppb, or roughly 200 times above the system noise level. The peak response in the Crane survey was 110 nT/s, about 200 times above the system noise level. This is an example of a drilling program that could have proceeded directly from the airborne survey without the added expense of ground geophysics.

**Example Three: Airborne – Airborne Comparison**

Nuinsco Resources conducted GEOTEM and AeroTEM surveys over the Lac Rocher property covering both the known mineralized area and a larger area of unexplored claims. In one area of the survey both GEOTEM (Figure 9) and AeroTEM (Figure 10) recorded responses that were coincident with a large magnetic anomaly.

Both systems clearly show a distinct, multi-channel anomaly. Nuinsco drilled the conductor in 1999 and intersected 2.2 m of massive sulphide at a depth of 200 m below surface. The AeroTEM peak response was 3 ppb or 10 times the system noise level, while the GEOTEM peak response was 400 ppm or 40 times system noise level. While noise levels are dependent upon the level of filtering, the higher apparent signal-to-noise-ratio of the GEOTEM response can be attributed to its higher moment transmitter and the depth of the conductor.

**Conclusions**

AeroTEM shows a high spatial resolution, due to its unique coil configuration. The system produces responses that compare well with existing ground and airborne systems. The present depth of exploration is estimated to be up to 250 m with a typical noise level of ±0.5 ppb.

Improvements to the system will come in the form of larger transmitter moments, decreased noise levels and the development of true on-time measurements through full waveform recording. There are numerous advantages of using helicopter-towed time-domain systems with a depth penetration approaching that of the fixed-wing platforms. The success of these systems will no doubt be dictated by the perceived needs of the mineral exploration industry for such techniques.
Author's Statement of Qualifications

I, Neil Fiset, of 15 Valley Ridge St., Nepean, Ont, do hereby certify that:

1. I hold a Bachelor of Science degree in Geology (1976) from the University of New Brunswick, Fredericton, New Brunswick.

2. I am a member of the Canadian Exploration Geophysicists Society.


4. I have been a self-employed consultant since 1996.

5. I am presently a consulting Geophysicist, practising in Canada and overseas.

6. Permission is granted to Mustang Minerals Corp. to use this report in a prospectus or other financial offering.

6. I have not received, directly or indirectly, nor do I expect to receive any interest, direct or indirect, in the properties of Mustang Minerals Corp. or any affiliate thereof, nor do I beneficially own, directly or indirectly, any securities in Mustang Minerals Corp. or any affiliate thereof.

Date on this 29th day of April, 2004 at Nepean, Ont.

Neil Fiset, BSc.
Consulting Geophysicist
Appendix 5: Instrumentation Specification Sheets

AEROTEM Helicopter Electromagnetic System

System Characteristics
Transmitter: Triangular Pulse Shape Base Frequency 30 or 150 Hz.
Tx On Time - 5,750 (30Hz) or 1,150 (150Hz) microsec.
Tx Off Time - 10,915 (30Hz) or 2,183 (150Hz) microsec.
Loop Diameter - 5 m.
Peak Current - 250 A.
Peak Moment - 38,800 NIA.
Typical Z Axis Noise at Survey Speed = 8 ppb peak.
Sling Weight: 270 Kg.
Length of Tow Cable: 40 m.
Bird Survey Height: 30 m or less nominal.

Receiver
Three Axis Receiver Coils (x, y, z) positioned at centre of transmitter loop.
Selectable Time Delay to start of first channel 21.3 , 42.7, or 64.0 msec.

Analogue Display & Acquisition
Six Channels per Axis.
Analogue (RMS) Channel Widths: 52.9, 132.3, 158.7, 158.7, 317.5, 634.9 microsec.
Recording & Display Rate = 10 readings per second.
MDAS Digital recording at 126 sample per decay curve at a maximum of 300 curves per second (26.455 microsec channel width).

System Considerations
Comparing a fixed wing time domain transmitter with a typical moment of 500,000 NIA flying at an altitude of 120 m with a Helicopter TDEM at 30 m, notwithstanding, the substantial moment loss in the airframe of the fixed wing, the same penetration by the lower flying helicopter system would only require a sixty-fourth of the moment. Clearly the AeroTEM system with nearly 40,000 NIA has more than sufficient moment.

The airframe of the fixed wing presents a response to the towed bird, which must be compensated for dynamically. This problem is non-existent for AeroTEM since transmitter and receiver positions are fixed. The AeroTEM system is completely portable, and can be assembled at the survey site within half a day.
# Work Report Summary

**Transaction No:** W0470.00734  
**Status:** APPROVED

**Recording Date:** 2004-MAY-14  
**Work Done from:** 2004-APR-12  
**to:** 2004-APR-30

**Approval Date:** 2004-MAY-18  
**Client(s):** 303574  
GOLDWRIGHT EXPLORATIONS INC

**Survey Type(s):** AEM  AMAG

## Work Report Details:

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Total: $13,275 $13,275 $12,800 $12,800 $0 $0 $475 $475

**External Credits:** $0

**Reserve:** $475  
Reserve of Work Report#: W0470.00734

**Total Remaining:** $475

Status of claim is based on information currently on record.
Dear Sir or Madam

Subject: Approval of Assessment Work

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

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

If you have any question regarding this correspondence, please contact STEVEN BENETEAU by email at steve.beneteau@ndm.gov.on.ca or by phone at (705) 670-5855.

Yours Sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Section

Cc: Resident Geologist
Ken J. Lapierre
(Agent)

Mustang Minerals Corp.
(Claim Holder)

Assessment File Library
Goldwright Explorations Inc
(Claim Holder)

Mustang Minerals Corp.
(Assessment Office)
Thou wishing to stake mining claims should consult with the Provincial Mining Recorder’s Office of the Ministry of Northern Development and Mines for additional information and limitations on the status of the lands shown hereon. This map is not intended for navigational, survey, or land title determination purposes. Contact Information:

- Tel: 1 (888) 415-9846
- Fax: 1 (877) 670-1441
- Topographic Data Source: Land Information Ontario
- Mining Land Tenure Source: Provincial Mining Recorder’s Office

Extra information may also be obtained through the Provincial Mining Recorder’s Office, local Land Titles or Registry Office, or the Ministry of Natural Resources.

TOWNSHIP 7 AREA PLAN
NAIRN G-2976
ADMINISTRATIVE DISTRICTS / DIVISIONS
- Mining Division
- Land Titles/Registry Division
- Ministry of Natural Resources District

TOPOGRAPHIC
- Administrative Boundaries
- Township
- Concession, lot
- Provincial Park
- Indian Reserve
- Cliff, Pit, Mine
- Contour
- Mine Headframe
- Structures
- Roads, Trails
- Natural Gas pipeline
- Tower

LAND TENURE
- Freehold Patent
- Surface And Mining Rights
- Surface Rights Only
- Mining Rights Only
- Licence of Occupation

IMPORTANT NOTICES
- LAND TENURE WITHDRAWALS
- ORDER IN COUNCIL WITHDRAWALS
- LAND USER PERMITS
- WATER POWER USE AGREEMENTS
- MINING CLAIMS

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This map may not show all rights and interests in land, including certain public lands. Additional information may be obtained through the Ministry of Natural Resources and other agencies.
SURVEY SPECIFICATIONS:
Survey flown: April 12, 2004
Traverse line spacing: 100 metres
Traverse line direction: N-S
Nominal EM bird height: 30 metres
Aircraft: Aerospatiale AStar 350B2 (C-FAVI)

INSTRUMENTATION:
Data acquisition: MDAS2 & HRM (DR-33)
Magnetometer: Geometrics G-822A cesium vapour
Installation: Towed bird 21 m above EM bird
Resolution: .001 nT/axis
Electromagnetics: AEROTEM Mk-II System
Configuration: Towed bird

NAVIGATION:
Navigation: Global Positioning System (DGPS)
Navigation equipment: Trimble AgGPS132
Radar Altimeter: Terra TRA3000/TRI-30

DATA PROCESSING:
Magnetic: Base station leveling applied
EM smoothing: Non-linear-Apte, Low Pass 10pt

POSITIONING:
Ellipsoid: NAD83
Major Axis: 6378137.000
Eccentricity: 0.081819191
Projection: Universal Transverse Mercator
Central Meridian: 81W (Zone 17)
Central Scale Factor: 0.9996
False Easting/Northing: 300.000m/20m

scale 1:10,000

Mustang Minerals Corp.
Nairn Township, Ontario

FLIGHT PATH
Nairn Block
NTS 411/5

Survey flown by:
AEROQUEST LIMITED
4-045 Main St. East
Milton, Ont., CANADA L9T 3Z3
Tel. (905) 693-9129 Fax (905) 693-9128
www.aeroquestsurveys.com
April, 2004
Plate 1
SURVEY SPECIFICATIONS:
Survey flown: April 12, 2004
Traverse line spacing: 100 metres
Traverse line direction: N-S
Nominal EM bird height: 30 metres
Aircraft: Aerospatiale AStar 350B2 (C-FAVI)
INSTRUMENTATION:
Data Acquisition: MDAS2 & SGR-33
Magnetometer: Geomelrics G-822A cesium vapour
Installation: Towed bird 21 m above EM bird
Resolution: .001 nanoTesla
Electromagnetics: AEROTEM Mk-II System
NAVIGATION:
Navigation: Global Positioning System (DGPS)
Navigation equipment: Trimble AgGPS132
Radar Altimeter: Terra TRA2000/TRA-30
DATA PROCESSING:
Magnetics: Base station levelling applied
EM smoothing: Non-linear, 4-point Low Pass, 10-point
POSITIONING:
Ellipsoid: NAD83
Major Axis: 6378137.000
Eccentricity: 0.081819191
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000.000m

Contour interval: 5, 25 & 100 mT
scale 1:10,000

Mustang Minerals Corp.
Nairn Township, Ontario
TOTAL MAGNETIC INTENSITY
Nairn Block
NTS 419/5

Survey flown by:
AEROQUEST LIMITED
4-045 Main St, East
Milton, Ont., CANADA L9T 3Z3
(905) 693-9129
www.aerquestsurveys.com
April, 2004
Plate 2
SURVEY SPECIFICATIONS:
Survey flown: April 12, 2004
Traverse line spacing: 100 metres
Traverse line direction: N-S
Nominal EM bird height: 30 metres
Aircraft: Aerospatiale AStar 350B2 (C-FAVt)

INSTRUMENTATION:
Data acquisition: MDAS2 4 RMS DGR-33
Magnetometer: Geometrics G-822A cesium vapour
Installation: Towed bird 21 m above EM bird
Resolution: 0.01 nanoTesla
Electromagnetics: AEROTEM Mk-II System
Configuration: Towed bird

NAVIGATION:
Navigation: Global Positioning System (DGPS)
Navigation equipment: Trimble AgGPS132
Radial Altimeter: Terra TRA2000/3TR-30

DATA PROCESSING:
Magnetics: Base station levelling applied
EM smoothing: Non-linear-4pt, Low Pass-1pt

POSITIONING:
Ellipsoid: NAD83
Major Axis: 6378137.000
Eccentricity: 0.0818\(\text{19191}\)
Projection: Universal Transverse Mercator
Central Meridian: 61°W (Zone 17)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000 m

Contour interval: 5, 25 & 100 nT
scale: 1:10,000

Total Magnetic Intensity
Nairn Block
NTS 411/S

Survey flown by
AEROQUEST LIMITED
4-049 Main St East
Milton, Ont., CANADA L9T 3Z3
Tel: (905) 878-3553
Fax: (905) 878-6661
www.aeroquestlimited.com

April, 2004
Plates 1 & 2
SURVEY SPECIFICATIONS:
Survey flown: April 12, 2004
 Traverse line spacing: 100 metres
 Traverse line direction: N-S
 Nominal EM bird height: 30 metres
 Aircraft: Aerospatiale Albatross 306B (C-FAV)
 INSTRUMENTATION:
 Data acquisition: MOAS2 & RMS DGR-33
 Magnetometer: Geometrics G-622A cesium vapour
 Installation: Towed bird 21 m above EM bird
 Resolution: 0.01 nanoTesla
 Electromagnetics: AEROTEM Mk II System
 Configuration: Towed bird
 NAVIGATION:
 Navigation: Global Positioning System (DGPS)
 Navigation equipment: Trimble AgPS132
 Radar Altimeter: Terra TRA3000/TRI-30
 DATA PROCESSING:
 Magnetics: Base station levelling applied
 EM smoothing: Non-linear, 4-pt. Low Pass-10pt
 POSITIONING:
 Ellipsoid: NA03
 Major Axis: 6378137.000
 Eccentricity: 0.081819191
 Projection: Universal Transverse Mercator
 Central Meridian: 81° W (Zone 17)
 Central Scale Factor: 0.9996
 False Easting/Northing: 500,000 metres

AEROTEM PROFILES
RMS Z1 & Z3 Channels
Nairn Block
NTS 4115

Survey flown by:
AEROTEM LIMITED
Milton, Ont., CANADA L9T 3Z3
Tel (905) 693-9129 Fax (905) 693-9128
www.aeroquestsurveys.com
April, 2004
Plate 3