

# Report on a Helicopter-Borne AeroTEM II Electromagnetic and Magnetic Survey

**Aeroquest Job # 05092 / 07011**  
**Enid-Massey Project**  
Timmins area, Ontario  
NTS 042A12

For



Suite 2600, Royal Bank Plaza  
200 Bay Street, South Tower  
Toronto, Ontario  
M5J 2J4

2.33945

by

**≡ AEROQUEST LIMITED**

4-845 Main Street East  
Milton, Ontario, L9T 3Z3  
Tel: (905) 693-9129 Fax: (905) 693-9128  
[www.aeroquestsurveys.com](http://www.aeroquestsurveys.com)  
July, 2006

# 1. TABLE OF CONTENTS

1.	TABLE OF CONTENTS.....	1
1.1.	List of Figures .....	1
1.2.	Appendices.....	2
1.3.	List of Maps (1:10,000) .....	2
2.	INTRODUCTION .....	3
3.	SURVEY AREA.....	3
4.	LOCAL GEOLOGY & PREVIOUS WORK.....	5
5.	SURVEY SPECIFICATIONS AND PROCEDURES .....	7
5.1.	Navigation.....	7
5.2.	System Drift .....	8
5.3.	Field QA/QC Procedures .....	8
6.	AIRCRAFT AND EQUIPMENT .....	8
6.1.	Aircraft.....	8
6.2.	Magnetometer .....	9
6.3.	Electromagnetic System.....	9
6.4.	AERODAS Acquisition System .....	11
6.5.	RMS DGR-33 Acquisition System .....	12
6.6.	Magnetometer Base Station .....	13
6.7.	Radar Altimeter.....	13
6.8.	Video Tracking and Recording System .....	13
6.9.	GPS Navigation System.....	13
6.10.	Digital Acquisition System .....	14
7.	PERSONNEL.....	14
8.	DELIVERABLES.....	14
9.	DATA PROCESSING AND PRESENTATION.....	15
9.1.	Base Map.....	15
9.2.	Flight Path & Terrain Clearance .....	15
9.3.	Electromagnetic Data.....	16
9.4.	Magnetic Data.....	16
10.	General Comments.....	17
10.1.	Magnetic Response .....	17
10.2.	EM Anomalies .....	18

## 1.1. List of Figures

Figure 1.	Regional location map of the project area.....	4
Figure 2.	Project Flight Paths and mining claims .....	5
Figure 4.	Survey helicopter C-FDEV .....	9
Figure 5.	The magnetometer bird (A) and AeroTEM II EM bird (B) .....	10
Figure 6.	Schematic of Transmitter and Receiver waveforms.....	10
Figure 7.	AeroTEM II Instrument Rack. Includes (AeroDAS system and RMS DGR-33 and AeroTEM power supply, data acquisition computer and AG-NAV2 navigation).....	12
Figure 8.	Digital video camera typical mounting location.....	13

Figure 7. AeroTEM response to a ‘thin’ vertical conductor..... 18  
Figure 8. AeroTEM response for a ‘thick’ vertical conductor..... 19  
Figure 9. AeroTEM response over a ‘thin’ dipping conductor..... 19

**1.2. Appendices**

- Appendix 1: Survey Block Co-ordinates
- Appendix 2: Mining Claims in the Area
- Appendix 3: Description of Database Fields
- Appendix 4: Technical Paper: "Mineral Exploration with the AeroTEM System"
- Appendix 5: Instrumentation Specification Sheet

**1.3. List of Maps (1:10,000)**

- MAG Coloured Total Magnetic Intensity (TMI) with line contours and EM anomalies
- ZOFF AeroTEM Off-Time Z3 colour grid with line contours and EM anomalies
- AeroTEM Off-Time Profiles (Z3-Z13) and EM anomalies

## 2. INTRODUCTION

This report describes a helicopter-borne geophysical survey carried out on behalf of Laurion Gold Inc. on the Enid-Massey Project, Timmins area, Ontario.

The principal geophysical sensor is Aeroquest's exclusive AeroTEM II time domain helicopter electromagnetic system which is employed in conjunction with a high-sensitivity cesium vapour magnetometer. Ancillary equipment includes a real-time differential GPS navigation system, radar altimeter, video recorder, and a base station magnetometer. Full-waveform streaming EM data is recorded at 38,400 samples per second. The streaming data comprise the transmitted waveform, and the X component and Z component of the resultant field at the receivers. A secondary acquisition system (RMS) records the ancillary data.

The total line kms presented in the maps and data totalled 1386.7, of which 1316.3 km fell within the project area. The survey flying described in this report took place on May 17-20<sup>th</sup> for the main area with additions and infills to the western and northern parts of the block flown on June 13<sup>th</sup> and 14<sup>th</sup>, 2006.

## 3. SURVEY AREA

The project area is located in Northern Ontario approximately 250km north of Sudbury. Local settlements include Timmins, 40km to the east and Cochrane 85km to the northeast (Figure 1). The area falls in NTS area 042A12. The survey consisted on one block – the Enid Massey Project with an area of approximately 102km<sup>2</sup> (10200ha) over flat and sometimes marshy terrain (Figure 2). There are over 60 mining claims in the project area (Figure 2) and these are outlined in Appendix 2. The project area was accessible by helicopter. The field crew were based at the Howard Johnson Hotel, Timmins and Timmins airport was the base of operations.



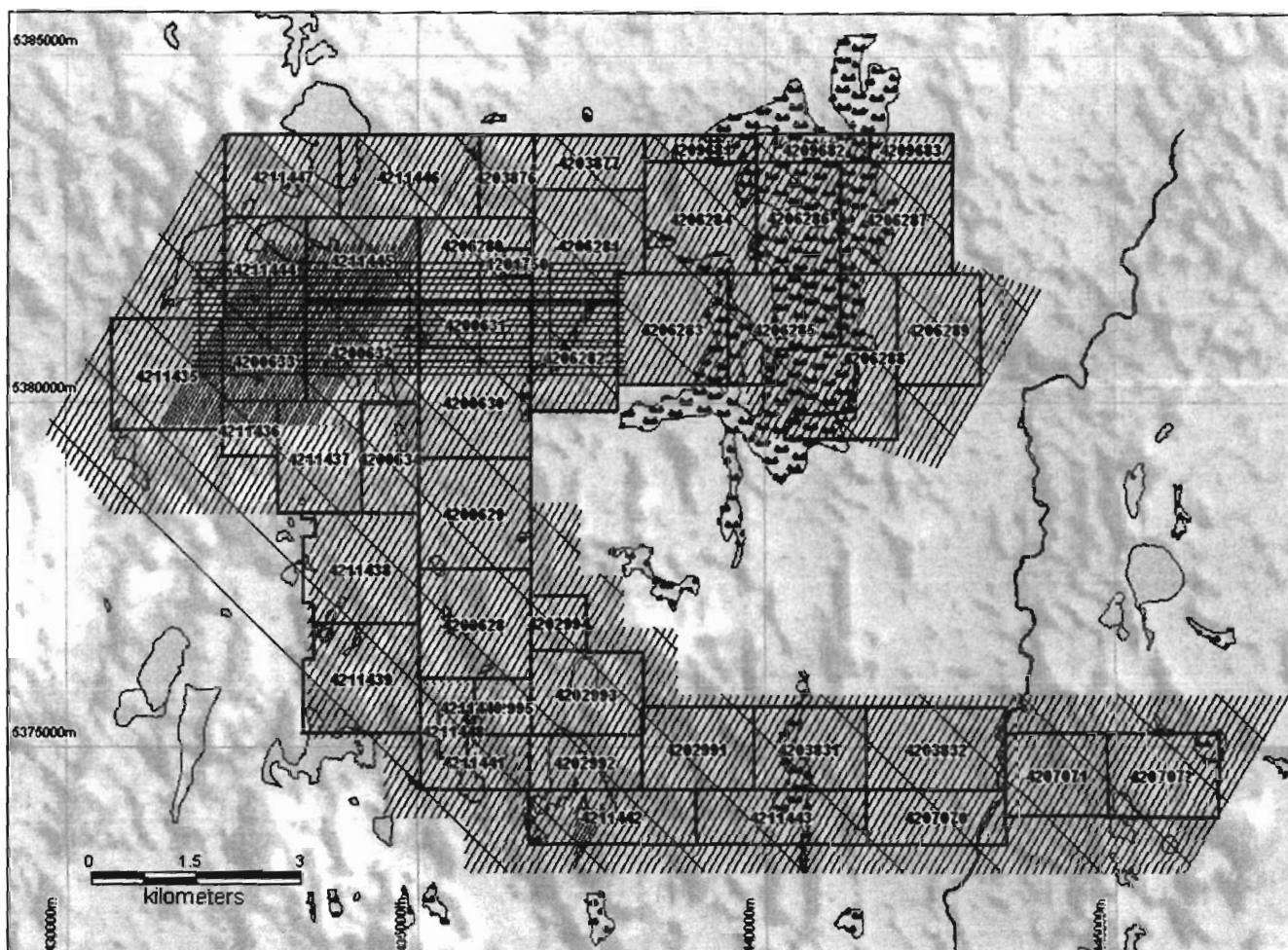


Figure 2. Project Flight Paths and mining claims

#### 4. LOCAL GEOLOGY & PREVIOUS WORK

(taken from Laurion Gold website [www.lauriongold.com](http://www.lauriongold.com), July, 2006)

##### Enid, Massey, Fortune, Cote and Turnbull Project

##### Discovery of Encouraging Ni/Cu/Pt/Pd Mineralization on the Enid-Massey Property

On 28 February 2006, Laurion announced that the re-evaluation of a historical nickel occurrence has produced encouraging nickel/copper/platinum/palladium mineralization on its Enid-Massey Property near Timmins, Ontario. Of particular interest is the presence of previously undocumented PGE's and gold associated with the nickel occurrence. During 2005 Laurion staked 14 mining claims (150 units) in Enid, Massey, Fortune and Coté Townships, approximately 60 km west-north-west of Timmins, Ontario.

Preliminary prospecting by Laurion on the Enid-Massey Property, including use of a BeepMat to detect conductive near surface sulphide mineralization, detected a cluster of gossanous, sulphide-rich outcrops in northeastern Enid Township proximal to historical trenches. The sulphide-bearing outcrops are found over an area trending roughly east west, approximately 8 metres wide and 25 metres in length. The true extent of the mineralization is not known as the sulphide zone disappears under overburden on all sides. Three composite samples of grabs from areas of best sulphide mineralization were sent to ALS Chemex for multi-element assay, which produced the following results:

	PGM-ICP24	PGM-ICP24	PGM-ICP24	ME-ICP81	ME-ICP81
SAMPLE DESCRIPTION	Au ppm	Pt ppm	Pd ppm	Cu %	Ni %
201	0.049	0.054	0.086	0.243	0.753
202	0.007	0.044	0.046	0.097	0.351
<203	0.001	0.006	0.012	0.062	0.106

These assays are especially encouraging in light of the occurrence of economic nickel mineralization in similar rocks at Falconbridge's Montcalm nickel mine, 20 km to the northwest of the Enid-Massey Property. The area around the Montcalm Mine is now the focus of major exploration programs being carried out by juniors in search of nickel deposits. The Falconbridge Montcalm Project has an estimated resource of 7 million tonnes of nickel/copper sulphide, of which an estimated 5.1 million tonnes grading 1.46% nickel and 0.7% copper are in the measured and indicated category and are expected to support a mine life of 8.5 years. (source Falconbridge)

The Enid-Massey Property covers a portion of a large mafic intrusive complex similar to that found at Montcalm. Currently, there has been no recent documented state of the art regional airborne EM surveys conducted out over this complex. The presence of known nickel occurrences within this complex suggests that there may be significant potential for new mineralization at depth or near surface in areas covered by overburden that may have not been detected by older airborne systems.

In the early 1950's, Dominion Gulf Company ("Dominion") carried out exploration in the area for nickel and copper associated with a large, zoned gabbro intrusive. In its report (T-614), Dominion stated that the intensely sheared and altered, very coarse-grained pyroxenitic gabbro is common in northeastern Enid Township and that typically the gabbro is strongly carbonatized and "Quartz veins and aplite dikes are especially abundant throughout this rock type." As these rock types and carbonate alteration are often associated with important gold deposits, Laurion's initial exploration efforts were aimed at searching for the bedrock source of the anomalous gold in till in the intensely altered zoned gabbro. Although initial prospecting produced only low anomalous gold values, Laurion was encouraged to find a very old trench, assumed to be one of Dominion Gulf's Ni showings, and to receive the Cu, Ni and PGM values shown in the table above. In December a 12 kilometre MaxMin II EM, VLF-EM and ground magnetic survey was completed over the area of the Dominion showings in order to further delineate the sulphide zones and to search for additional mineralization. These surveys did not show the Ni showings to be conductive. However, two coincident, multi-line MaxMin/VLF conductors were found nearby. Due to their proximity to sub-economic mineralization, the two new conductors warrant follow-up by prospecting, MMI geochem surveying and potentially diamond drilling.



Laurion's exploration program for the Enid-Massey Property will now begin to focus on nickel. The discovery of conductive zones in Ni-prospective terrain which has not been subjected to modern airborne geophysical methods justifies flying VTEM airborne surveys over a large part of the Enid-Massey Property. Prospecting, MMI sampling, and, where practical, mechanized stripping and trenching will test conductive zones. Finally, high priority targets, if any are found, are expected to be diamond drilled by Laurion. In addition to exploring the Cu/Ni/Pt/Pd potential of the Enid-Massey, Laurion continues prospecting for the bedrock source area of the gold-in-till reported in G.S.C. Open File 3675

## 5. SURVEY SPECIFICATIONS AND PROCEDURES

The survey specifications are summarized in the following table:

Survey Block	Line Spacing (m)	Line direction	Survey Coverage (line-km)	Dates Flown
Enid-Massey Main	100	NE-SW (30°)	861.5	May 17-20
Infills	100	E-W (90°)	116.6	June 13-14
Western Extension	100	NE-SW (30°)	338.2	

The survey coverage was calculated by adding up the along-line distance of the survey lines and control (tie) lines as presented in the final Geosoft database. The survey was flown with a line spacing of 100 m. The control (tie) lines were flown perpendicular to the survey lines with a spacing of 1 km. The nominal EM bird terrain clearance is 30m, but can be higher in more rugged terrain due to safety considerations and the capabilities of the aircraft. The magnetometer sensor is mounted in a smaller bird connected to the tow rope 17 metres above the EM bird and 21 metres below the helicopter (Figure 4). Nominal survey speed over relatively flat terrain is 75 km/hr and is generally lower in rougher terrain. Scan rates for ancillary data acquisition is 0.1 second for the magnetometer and altimeter, and 0.2 second for the GPS determined position. The EM data is acquired as a data stream at a sampling rate of 38,400 samples per second and is processed to generate final data at 10 samples per second. The 10 samples per second translates to a geophysical reading about every 1.5 to 2.5 metres along the flight path.

### 5.1. Navigation

Navigation is carried out using a GPS receiver, an AGNAV2 system for navigation control, and an RMS DGR-33 data acquisition system which records the GPS coordinates. The x-y-z position of the aircraft, as reported by the GPS, is recorded at 0.2 second intervals. The system has a published accuracy of under 3 metres. A recent static ground test of the Mid-Tech 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.



## 5.2. System Drift

Unlike frequency domain electromagnetic systems, the AeroTEM II system has negligible drift due to thermal expansion. The operator is responsible for ensuring the instrument is properly warmed up prior to departure and that the instruments are operated properly throughout the flight. The operator maintains a detailed flight log during the survey noting the times of the flight and any unusual geophysical or topographic features. Each flight included at least two high elevation 'background' checks. 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.

## 5.3. Field QA/QC Procedures

On return of the pilot and operator to the base, usually after each flight, the AeroDAS streaming EM data and the RMS data are carried on removable hard drives and FlashCards, respectively and transferred to the data processing work station. At the end of each day, the base station magnetometer data on FlashCard is retrieved from the base station unit.

Data verification and quality control includes a comparison of the acquired GPS data with the flight plan; verification and conversion of the RMS data to an ASCII format XYZ data file; verification of the base station magnetometer data and conversion to ASCII format XYZ data; and loading, processing and conversion of the streaming EM data from the removable hard drive. All data is then merged to an ASCII XYZ format file which is then imported to an Oasis database for further QA/QC and for the production of preliminary EM, magnetic contour, and flight path maps.

Survey lines which show excessive deviation from the intended flight path are re-flown. Any line or portion of a line on which the data quality did not meet the contract specification was noted and re-flown.

# 6. AIRCRAFT AND EQUIPMENT

## 6.1. Aircraft

A Eurocopter (Aerospatiale) AS350B2 "A-Star" helicopter - registration C-DEV was used as survey platform (Figure 3). The helicopter was operated by Gateway Helicopters, North Bay, Ontario. The survey aircraft was flown at a nominal terrain clearance of 220 ft (70 m).



Figure 3. Survey helicopter C-FDEV.

## 6.2. Magnetometer

The Aeroquest airborne survey system employs 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 (Figure 4A). The sensitivity of the magnetometer is 0.001 nanoTesla at a 0.1 second sampling rate. The nominal ground clearance of the magnetometer bird is 51 metres (170 ft.). The magnetic data is recorded at 10Hz by the RMS DGR-33.

## 6.3. Electromagnetic System

The electromagnetic system is an AeroQuest AeroTEM<sup>©</sup> II time domain towed-bird system (Figure 4B). The current AeroTEM<sup>©</sup> transmitter dipole moment is 38.8 kNIA. The AeroTEM<sup>©</sup> bird is towed 38 m (125 ft) below the helicopter. More technical details of the system may be found in Appendix 4.

The wave-form is triangular with a symmetric transmitter on-time pulse of 1.10 ms and a base frequency of 150 Hz (Figure 5). The current alternates polarity every on-time pulse. During every Tx

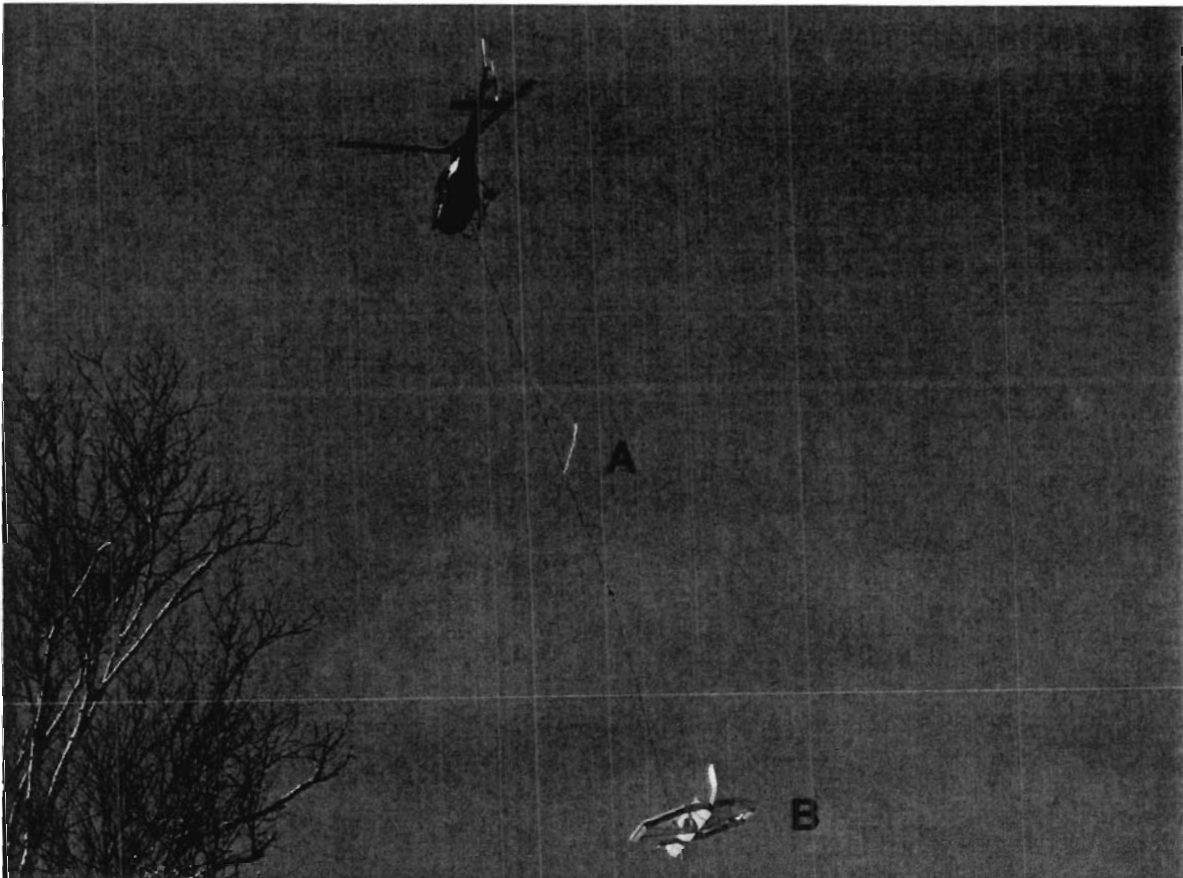


Figure 4. The magnetometer bird (A) and AeroTEM II EM bird (B)

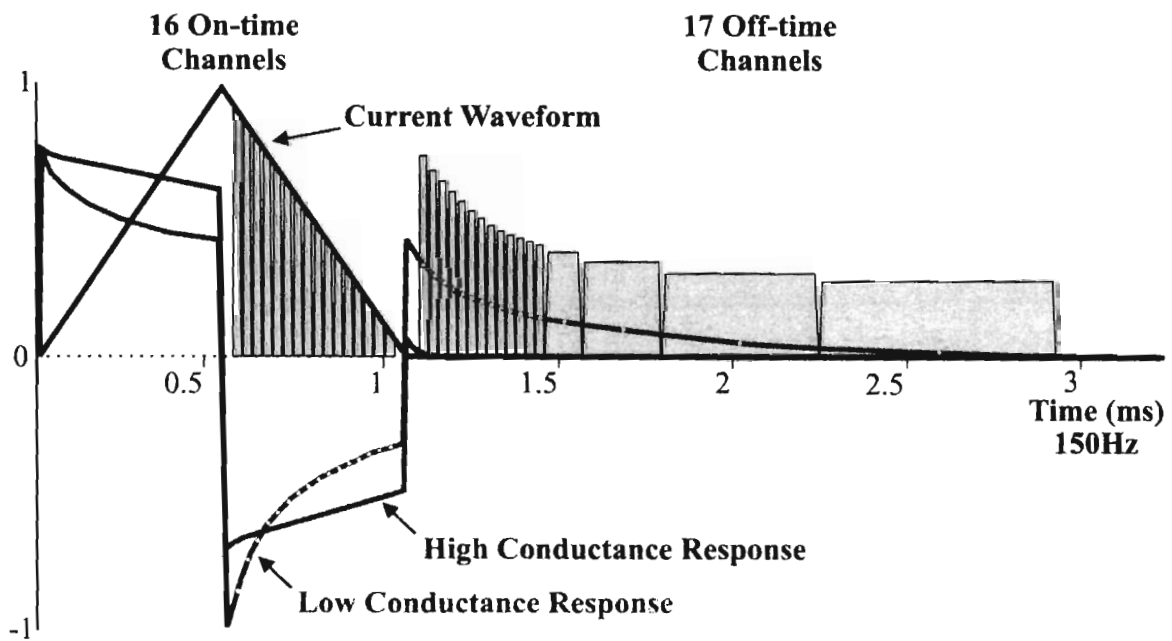


Figure 5. Schematic of Transmitter and Receiver waveforms

on-off cycle (300 per second), 128 contiguous channels of raw x and z component (and a transmitter current monitor, itx) of the received waveform are measured. Each channel width is 26.04 microseconds starting at the beginning of the transmitter pulse. This 128 channel data is referred to as the raw streaming data. The AeroTEM<sup>©</sup> system has two separate EM data recording streams, the conventional RMS DGR-33 and the AeroDAS system which records the full waveform.

**6.4. AERODAS Acquisition System**

The 128 channels of raw streaming data are recorded by the AeroDAS acquisition system (Figure 6) onto a removable hard drive. The streaming data are processed post-survey to yield 33 stacked and binned on-time and off-time channels at a 10 Hz sample rate. The timing of the final processed EM channels is described in the following table:

Channel:	Start Gate	End Gate	Start (us)	Stop (us)	Mid (us)	Width (us)
1 ON	25	25	651.0	677.0	664.0	26.0
2 ON	26	26	677.0	703.1	690.1	26.0
3 ON	27	27	703.1	729.1	716.1	26.0
4 ON	28	28	729.1	755.2	742.1	26.0
5 ON	29	29	755.2	781.2	768.2	26.0
6 ON	30	30	781.2	807.2	794.2	26.0
7 ON	31	31	807.2	833.3	820.3	26.0
8 ON	32	32	833.3	859.3	846.3	26.0
9 ON	33	33	859.3	885.4	872.3	26.0
10 ON	34	34	885.4	911.4	898.4	26.0
11 ON	35	35	911.4	937.4	924.4	26.0
12 ON	36	36	937.4	963.5	950.5	26.0
13 ON	37	37	963.5	989.5	976.5	26.0
14 ON	38	38	989.5	1015.6	1002.5	26.0
15 ON	39	39	1015.6	1041.6	1028.6	26.0
16 ON	40	40	1041.6	1067.6	1054.6	26.0
0 OFF	44	44	1145.8	1171.8	1158.8	26.0
1 OFF	45	45	1171.8	1197.8	1184.8	26.0
2 OFF	46	46	1197.8	1223.9	1210.9	26.0
3 OFF	47	47	1223.9	1249.9	1236.9	26.0
4 OFF	48	48	1249.9	1276.0	1262.9	26.0
5 OFF	49	49	1276.0	1302.0	1289.0	26.0
6 OFF	50	50	1302.0	1328.0	1315.0	26.0
7 OFF	51	51	1328.0	1354.1	1341.1	26.0
8 OFF	52	52	1354.1	1380.1	1367.1	26.0
9 OFF	53	53	1380.1	1406.2	1393.1	26.0
10 OFF	54	54	1406.2	1432.2	1419.2	26.0
11 OFF	55	55	1432.2	1458.2	1445.2	26.0
12 OFF	56	56	1458.2	1484.3	1471.3	26.0

13 OFF	57	60	1484.3	1588.4	1536.4	104.2
14 OFF	61	68	1588.4	1796.8	1692.6	208.3
15 OFF	69	84	1796.8	2213.4	2005.1	416.6
16 OFF	85	110	2213.4	2890.4	2551.9	677.0

**6.5. RMS DGR-33 Acquisition System**

In addition to the magnetics, altimeter and position data, six channels of 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 10 samples per second and plotted real-time on the analogue chart recorder. These channels are derived by a binning, stacking and filtering procedure on the raw streaming data. The primary use of the RMS EM data (Z1 to Z6, X1) is to provide for real-time QA/QC on board the aircraft.

The channel window timing of the RMS DGR-33 6 channel system is described in the table below.

RMS Channel	Start time (microsec)	End time (microsec)	Width (microsec)	Streaming Channels
Z1, X1	1269.8	1322.8	52.9	48-50
Z2	1322.8	1455.0	132.2	50-54
Z3	1428.6	1587.3	158.7	54-59
Z4	1587.3	1746.0	158.7	60-65
Z5	1746.0	2063.5	317.5	66-77
Z6	2063.5	2698.4	634.9	78-101



Figure 6. AeroTEM II Instrument Rack. Includes (AeroDAS system and RMS DGR-33 and AeroTEM power supply, data acquisition computer and AG-NAV2 navigation)

## 6.6. Magnetometer Base Station

The base magnetometer was a Geometrics G-858 cesium vapour magnetometer. Data logging and UTC time synchronisation was carried out within an external data logging computer, with an external GPS providing the timing signal. That data logging was configured to measure at 0.1 second intervals (10Hz). Digital recording resolution was 0.001 nT. The sensor was placed on a tripod in an area free of cultural noise sources. A continuously updated display of the base station values was available for viewing and regularly monitored to ensure acceptable data quality and diurnal levels.

## 6.7. Radar Altimeter

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

## 6.8. Video Tracking and Recording System

A high resolution colour digital video camera (Figure 7) is 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 responses.

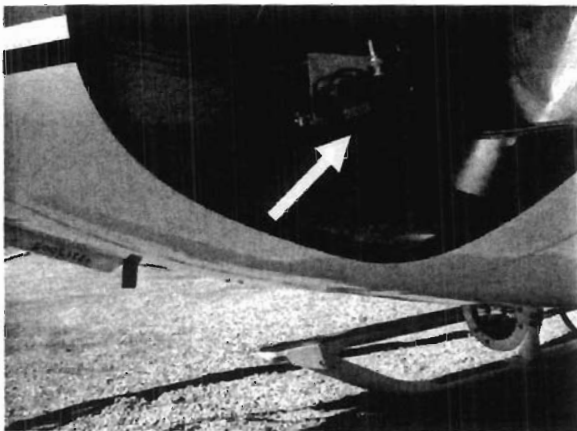


Figure 7. Digital video camera typical mounting location.

## 6.9. GPS Navigation System

The navigation system consists of an Ag-Nav Incorporated 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 Mid-Tech RX400p WAAS-enabled GPS receiver mounted on the instrument rack and an 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 the east and west coasts, 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



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 Mid-Tech 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 the survey and the information is fed into the airborne navigation system. The co-ordinate system employed in the survey design was WGS84 [World] using the UTM zone 17N projection. The real-time differentially corrected GPS positional data was recorded by the RMS DGR-33 in geodetic coordinates (latitude and longitude using WGS84) at 0.2 second intervals.

### **6.10. Digital Acquisition System**

The AeroTEM© received waveform sampled during on and off-time at 128 channels per decay, 300 times per second, was logged by the proprietary AeroDAS data acquisition system. The channel sampling commences at the start of the Tx cycle and the width of each channel is 26.04 microseconds. The streaming data was recorded on a removable hard-drive and was later backed-up onto DVD-ROM from the field-processing computer.

The RMS Instruments DGR33A data acquisition system was used to collect and record the analogue data stream, i.e. the positional and secondary geophysical data, including processed 6 channel EM, magnetics, 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.

## **7. PERSONNEL**

The following AeroQuest personnel were involved in the project:

- Manager of Operations: Bert Simon
- Field Data Processors: Chris Kozak
- Field Operator: Adam Smiarowski , Sean Scrivens
- Data Interpretation and Reporting: Jonathan Rudd, Sean Scrivens, Steve Balch, Marion Bishop

The survey pilots Bruno Prieur and Steeve Gros-Luis was employed directly by the helicopter operator – Gateway Helicopters, North Bay, Ontario.

## **8. DELIVERABLES**

The report includes a set of twelve (12) geophysical maps plotted at a scale of 1:10,000. Three data products are presented for each of the four map plates that cover the survey area (Figure 2).

- MAG Coloured Total Magnetic Intensity (TMI) with line contours and EM anomalies
- ZOFF AeroTEM Off-Time Z3 colour grid with line contours and EM anomalies
- EM AeroTEM Off-Time Profiles (Z3-Z13) and EM anomalies



The coordinate/projection system for the maps is NAD83 Universal Transverse Mercator Zone 17 (for Canada; Central America; Mexico; USA (ex Hawaii Aleutian Islands)). For reference, the latitude and longitude in WGS84 are also noted on the maps. All the maps show flight path trace, skeletal topography, and conductor picks represented by an anomaly symbol classified according to calculated on-time conductance. The anomaly symbol is accompanied by postings denoting the calculated on-time conductance, a thick or thin classification and an anomaly identifier label. The anomaly symbol legend is given in the margin of the maps. The magnetic field data is presented as superimposed line contours with a minimum contour interval of 75 nT. Bold contour lines are separated by 1000 nT.

The geophysical profile data is archived digitally in a Geosoft GDB binary format database. The database contains the processed streaming data, the RMS data, the base station data, and all processed channels. A description of the contents of the individual channels in the database can be found in Appendix 3. This digital data is archived at the Aeroquest head office in Milton.

## **9. DATA PROCESSING AND PRESENTATION**

All in-field and post-field data processing was carried out using Aeroquest proprietary data processing software, and Geosoft Oasis montaj software. Maps were generated using 36-inch wide Hewlett Packard ink-jet plotters.

### **9.1. Base Map**

The geophysical maps accompanying this report are based on positioning in the datum of NAD83. The survey geodetic GPS positions have been projected using the Universal Transverse Mercator projection in Zone 17N. A summary of the map datum and projection specifications are as follows:

- Ellipse: GRS 1980
- Ellipse major axis: 6378137m eccentricity: 0.081819191
- Datum: North American 1983 - Canada Mean
- 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

### **9.2. 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 WGS84 latitude and longitude calculated from the raw pseudo range derived from the C/A code signal. The instantaneous GPS flight path, after conversion to UTM co-ordinates, is drawn using linear interpolation between the x/y positions. The terrain clearance was maintained with reference to the radar altimeter. The raw Digital Terrain Model (DTM) was derived by taking the GPS survey elevation and subtracting the radar altimeter terrain clearance values. The calculated topography elevation values are relative to WGS84 (GPS) altitude and are not tied in to surveyed geodetic heights.

Each flight included at least two high elevation 'background' checks. 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.

### **9.3. Electromagnetic Data**

The raw streaming data, sampled at a rate of 38,400 Hz (128 channels, 300 times per second) was reprocessed using a proprietary software algorithm developed and owned by Aeroquest Limited. Processing involves the compensation of the X and Z component data for the primary field waveform. Coefficients for this compensation for the system transient are determined and applied to the stream data. The stream data are then pre-filtered, stacked, binned to the 33 on and off-time channels and checked for the effectiveness of the compensation and stacking processes. The stacked data is then filtered, leveled and split up into the individual line segments. Further base level adjustments may be carried out at this stage.

The final field processing step was to merge the processed EM data with the other data sets into a Geosoft GDB file. The EM fiducial is used to synchronize the two datasets. The processed channels are merged into 'array format; channels in the final Geosoft database as Zon, Zoff, Xon, and Xoff

The filtering of the stacked data is designed to remove or minimize high frequency noise that can not be sourced from the geology. Apparent bedrock EM anomalies were interpreted with the aid of an auto-pick from positive peaks and troughs in the on-time Z channel responses correlated with X channel responses. The auto-picked anomalies were reviewed and edited by a geophysicist on a line by line basis to discriminate between thin and thick conductor types. Anomaly picks locations were migrated and removed as required. This process ensures the optimal representation of the conductor centres on the maps.

At each conductor pick, estimates of the off-time conductance have been generated based on a horizontal plate source model for those data points along the line where the response amplitude is sufficient to yield an acceptable estimate. Some of the EM anomaly picks do not display a tau value; this is due to the inability to properly define the decay of the conductor usually because of low signal amplitudes. Each conductor pick was then classified according to a set of seven ranges of calculated off-time conductance values. For high conductance sources, the on-time conductance values may be used, since it provides a more accurate measure of high-conductance sources. Each symbol is also given an identification letter label, unique to each flight line. Conductor picks that did not yield an acceptable estimate of off-time conductance due to a low amplitude response were classified as a low conductance source. Please refer to the anomaly symbol legend located in the margin of the maps.

### **9.4. Magnetic Data**

Prior to any levelling the magnetic data was subjected to a lag correction of -0.1 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 20 metres. The final leveled grid provided the basis for threading the presented contours which have a minimum contour interval of 75 nT.

In order to enhance subtle magnetic trends a 'tilt' derivative grid was calculated from the total magnetic intensity (TMI) grid. **This product is included in the final digital archive.** The Tilt Derivative (TDR) of the TMI enhances low amplitude and small wavelength magnetic features which define shallow basement structures as well as potential mineral exploration targets. The TILT derivative can be thought of as a combination of the first vertical derivative and the total horizontal derivative of the total magnetic intensity.

Mathematically, the TDR is defined as:

$$TDR = \arctan\left(\frac{dT}{dz}\right) \quad , \text{ where VDR and THDR are first vertical and total horizontal derivatives, respectively, of the total magnetic intensity T.}$$

$$VDR = \frac{dT}{dz}$$

$$THDR = \sqrt{\left(\frac{dT}{dx}\right)^2 + \left(\frac{dT}{dy}\right)^2}$$

Due to the nature of the arctan trigonometric function in the filter, all amplitudes are restricted to  $+\pi/2$  and  $-\pi/2$  radians. This gives the Tilt derivative the added advantage of acting like an automatic gain control (AGC) filter. The calculated TDR grid is presented a colour sun-shaded image (illumination from the north-northeast). Line contours are also overlain which have a minimum contour interval of 0.05 radians.

## 10. General Comments

The survey was successful in mapping the magnetic and conductive properties of the geology throughout the survey area. Below is a brief interpretation of the results. For a detailed interpretation please contact Aeroquest Limited.

### 10.1. Magnetic Response

The magnetic data provide a high resolution map of the distribution of the magnetic mineral content of the survey area. This data can be used to interpret the location of geological contacts and other structural features such as faults and zones of magnetic alteration. The sources for anomalous magnetic responses are generally thought to be predominantly magnetite because of the relative abundance and strength of response (high magnetic susceptibility) of magnetite over other magnetic minerals such as pyrrhotite.

## 10.2. EM Anomalies

The EM anomalies on the maps are classified by conductance (as described earlier in the report) and also by the thickness of the source. A thin, vertically orientated source produces a double peak anomaly in the z-component response and a positive to negative crossover in the x-component response (Figure 8). For a vertically orientated thick source (say, greater than 10m), the response is a single peak in the z-component response and a negative to positive crossover in the x-component response (Figure 9). Because of these differing responses, the AeroTEM system provides discrimination of thin and thick sources and this distinction is indicated on the EM anomaly symbols (N = thin and K = thick). Where multiple, closely spaced conductive sources occur, or where the source has a shallow dip, it can be difficult to uniquely determine the type (thick vs. thin) of the source (Figure 10). In these cases both possible source types may be indicated by picking both thick and thin response styles. For shallow dipping conductors the 'thin' pick will be located over the edge of the source, whereas the 'thick' pick will fall over the downdip 'heart' of the anomaly.

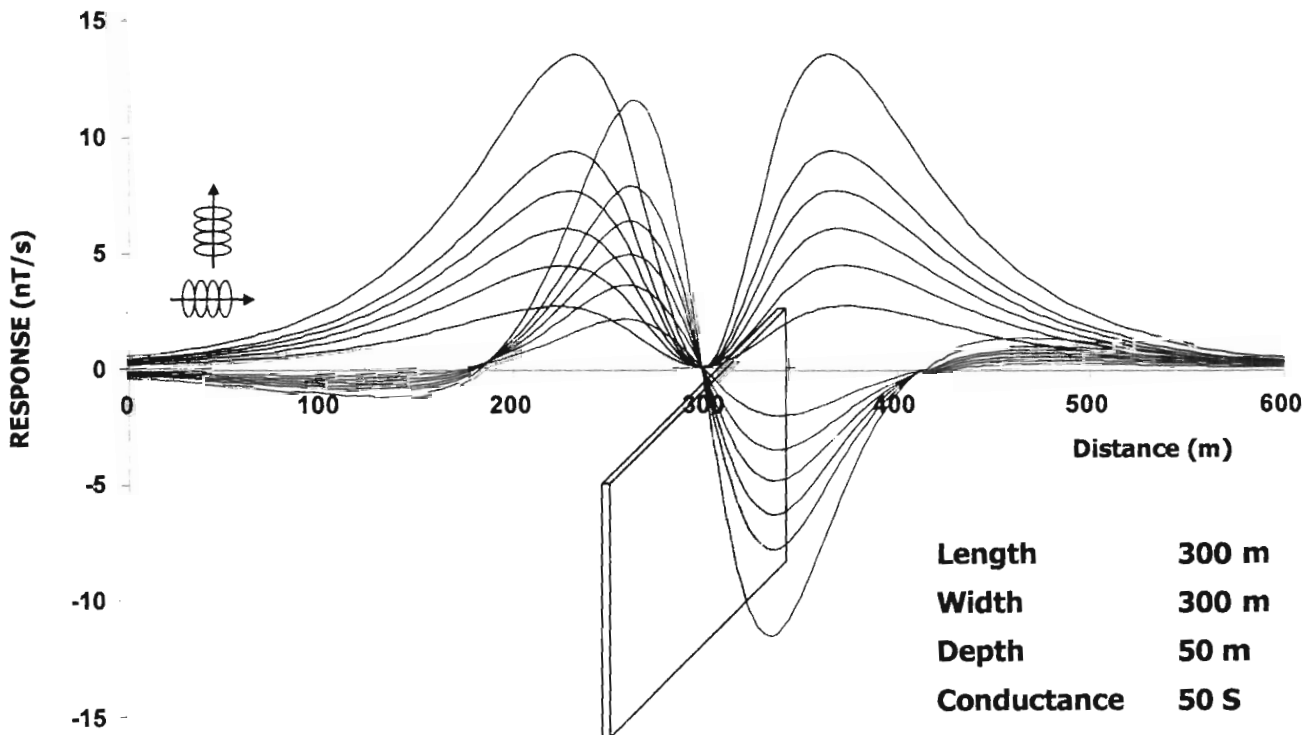


Figure 8. AeroTEM response to a 'thin' vertical conductor.

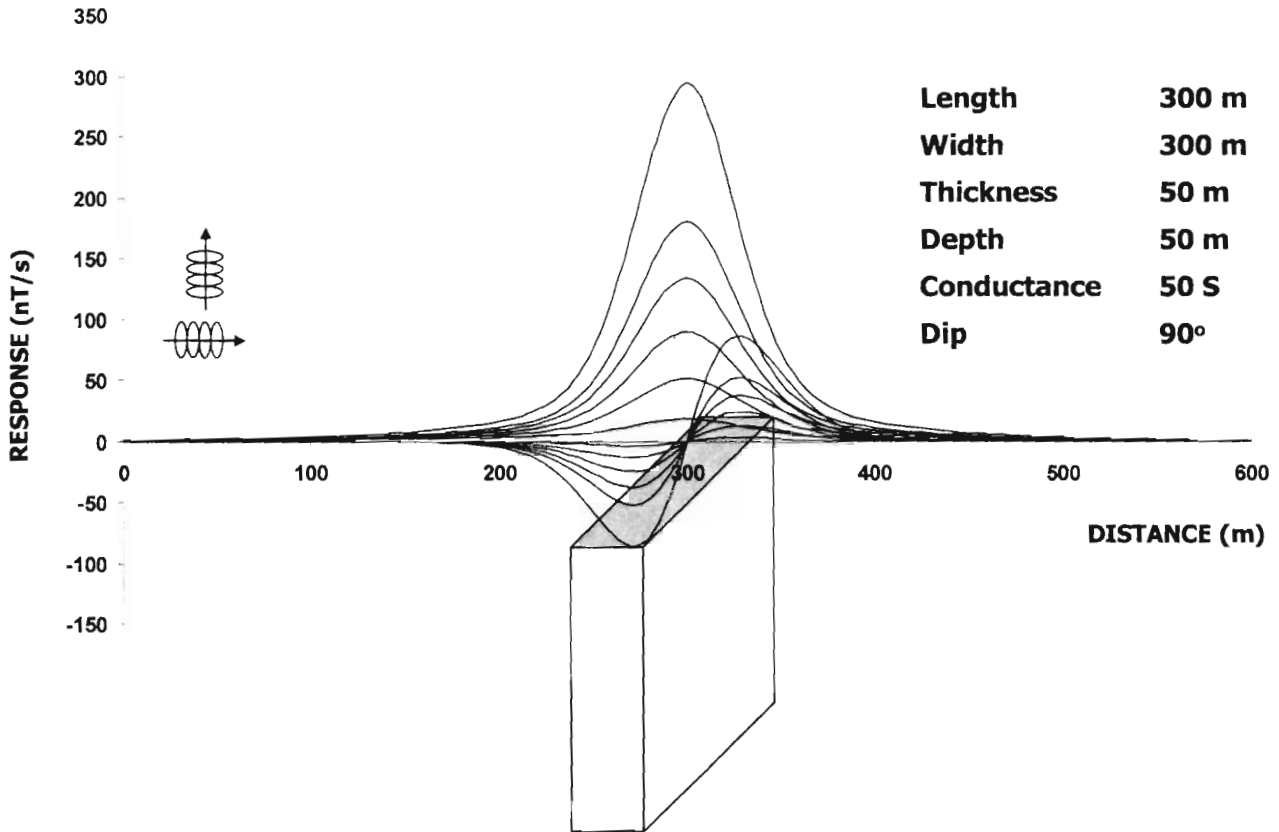


Figure 9. AeroTEM response for a 'thick' vertical conductor.

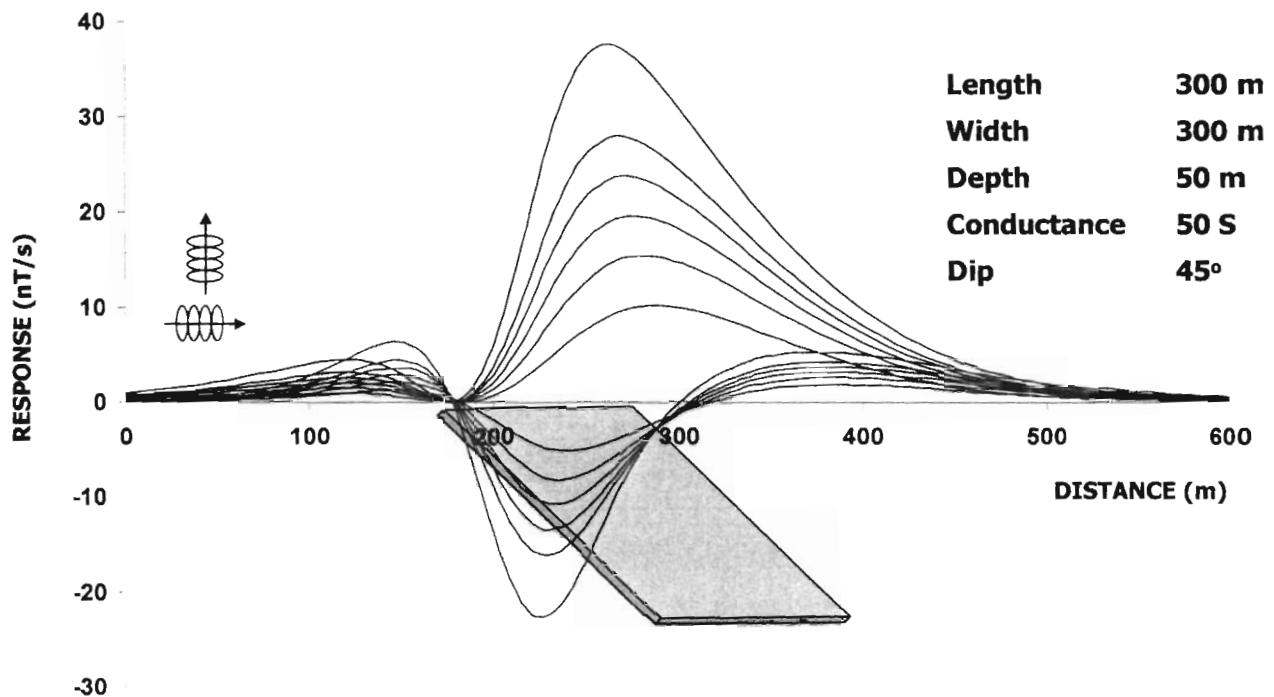


Figure 10. AeroTEM response over a 'thin' dipping conductor.

All cases should be considered when analyzing the interpreted picks and prioritizing for follow-up. Specific anomalous responses which remain as high priority should be subjected to numerical modeling prior to drill testing to determine the dip, depth and probable geometry of the source.

Respectfully submitted,



Sean Scrivens  
Aeroquest Limited  
August, 2006

**APPENDIX 1 – PROJECT CORNER COORDINATES**

The Project consists of three blocks, a main central block, a western extension and a central infill area. Boundaries as defined in the following table. Positions are in UTM Zone 17 – NAD83.

Main		West		Infill	
X	Y	X	Y	X	Y
432877.4	5382272.8	433491.3	5379672.4	431800.0	5382000.0
434837.3	5382278.5	434241.3	5379672.4	438000.0	5382000.0
435049.3	5382645.4	434248.8	5378369.1	438000.0	5380400.0
435233.0	5382650.0	435040.1	5378372.8	431800.0	5380400.0
435919.9	5383843.9	435049.0	5375957.4		
442690.7	5383860.8	435867.0	5375948.1		
442686.8	5382071.3	435857.9	5374918.9		
443959.7	5381666.3	436463.4	5374916.8		
442459.0	5379068.6	436470.3	5374162.1		
441186.1	5379473.6	437786.6	5374128.4		
439831.6	5379477.0	437252.4	5373191.0		
439717.2	5380221.2	435700.7	5373192.3		
437902.9	5380270.9	435700.7	5373978.2		
437887.9	5379846.4	434539.9	5373978.2		
436657.2	5379844.5	434539.9	5375138.9		
436649.0	5378561.5	433451.8	5375138.9		
437370.8	5378547.3	433490.1	5378401.0		
437362.7	5377514.7	430646.7	5378391.3		
437967.6	5377512.8	429676.1	5379573.6		
437974.2	5376757.5	432158.1	5383862.3		
438757.8	5376736.6	435960.9	5383843.9		
438759.9	5375782.0	435021.1	5382277.3		
447532.4	5375777.9				
446032.3	5373180.0				
437252.4	5373191.0				
437253.5	5374142.6				
436470.3	5374162.1				
436463.4	5374916.8				
435857.9	5374918.9				
435867.0	5375948.1				
435049.0	5375957.4				
435040.1	5378372.8				
434248.8	5378369.1				
434241.3	5379672.4				
431371.7	5379678.1				



**APPENDIX 2 – Mining Claims in Project Area**

Claim Number	Area (ha)	Township Area	Claim Due Date	Owner
4203831	192.548	MASSEY	2007-May-16	Laurion Gold Inc.
4211439	255.099	ENID	2008-Jun-22	Laurion Gold Inc.
4211445	193.728	FORTUNE	2008-Jun-22	Laurion Gold Inc.
4211446	237.853	FORTUNE	2008-Jun-22	Laurion Gold Inc.
4211447	193.795	FORTUNE	2008-Jun-22	Laurion Gold Inc.
1180899	24.4623	SHAW	2006-Dec-09	Laurion Gold Inc.
4200633	143.571	ENID	2007-Mar-11	Laurion Gold Inc.
1111376	16.0965	TISDALE	2010-Nov-27	Laurion Gold Inc.
4203832	239.899	MASSEY	2007-May-16	Laurion Gold Inc.
4209681	64.2199	COTE	2008-Mar-02	Laurion Gold Inc.
4211435	254.181	ENID	2008-Jun-22	Laurion Gold Inc.
4200634	127.831	ENID	2007-Mar-11	Laurion Gold Inc.
4207072	191.767	TURNBULL	2007-Nov-28	Laurion Gold Inc.
4203876	94.4172	FORTUNE	2007-Nov-28	Laurion Gold Inc.
4209682	64.1366	COTE	2008-Mar-02	Laurion Gold Inc.
4200630	255.664	ENID	2007-Mar-11	Laurion Gold Inc.
4202995	63.5256	ENID	2007-Mar-11	Laurion Gold Inc.
4200628	255.99	ENID	2007-Mar-11	Laurion Gold Inc.
4211436	60.8737	ENID	2008-Jun-22	Laurion Gold Inc.
4211448	31.9638	ENID	2008-Jun-22	Laurion Gold Inc.
4211444	173.984	FORTUNE	2008-Jun-22	Laurion Gold Inc.
4202991	192.062	MASSEY	2007-Mar-11	Laurion Gold Inc.
4211437	193.64	ENID	2008-Jun-22	Laurion Gold Inc.
4202994	64.0395	COTE	2007-Mar-11	Laurion Gold Inc.
4202993	194.28	MASSEY	2007-Mar-11	Laurion Gold Inc.
4202992	126.049	MASSEY	2007-Mar-11	Laurion Gold Inc.
4203877	126.937	COTE	2007-Nov-28	Laurion Gold Inc.
4207070	160.002	MASSEY	2007-Nov-28	Laurion Gold Inc.
4207071	172.131	MASSEY	2007-Nov-28	Laurion Gold Inc.
4200629	255.317	ENID	2007-Mar-11	Laurion Gold Inc.
4200631	108.03	FORTUNE	2007-Mar-11	Laurion Gold Inc.
4200632	234.983	FORTUNE	2007-Mar-11	Laurion Gold Inc.
4211438	255.13	ENID	2008-Jun-22	Laurion Gold Inc.
4209683	47.8082	COTE	2008-Mar-02	Laurion Gold Inc.
4206286	191.248	COTE	2007-May-02	2090720 Ontario Inc.
4206287	255.747	COTE	2007-May-02	2090720 Ontario Inc.
4211464	126.866	KIDD	2008-Jun-22	2090720 Ontario Inc.
1201750	15.7839	FORTUNE	2009-Aug-30	2090720 Ontario Inc.
4206283	255.652	COTE	2007-May-02	2090720 Ontario Inc.
4206289	191.887	COTE	2007-May-02	2090720 Ontario Inc.
4206284	255.167	COTE	2007-May-02	2090720 Ontario Inc.
4206285	204.561	COTE	2007-May-02	2090720 Ontario Inc.
4206280	178.621	FORTUNE	2007-May-02	2090720 Ontario Inc.
4206281	241.362	COTE	2007-May-02	2090720 Ontario Inc.
4206282	197.153	COTE	2007-May-02	2090720 Ontario Inc.
4211462	66.5217	KIDD	2008-Jun-22	2090720 Ontario Inc.
4206288	203.733	COTE	2007-May-02	2090720 Ontario Inc.
4211463	140.538	KIDD	2008-Jun-22	2090720 Ontario Inc.
4211461	63.4218	KIDD	2008-Jun-22	2090720 Ontario Inc.
4211459	95.5469	KIDD	2008-Jun-22	2090720 Ontario Inc.
4211460	33.2013	KIDD	2008-Jun-22	2090720 Ontario Inc.
4211442	190.773	MASSEY	2008-Jun-23	Jones, David V.
4211443	195.444	MASSEY	2008-Jun-23	Jones, David V.
4210220	192.539	FRIPP	2008-Mar-23	Jones, David V.
4210219	68.6693	FRIPP	2008-Mar-23	Jones, David V.
4210222	63.1265	FRIPP	2008-Mar-23	Jones, David V.
4210218	95.5613	FRIPP	2008-Mar-23	Jones, David V.
4210221	176.369	FRIPP	2008-Mar-23	Jones, David V.
4210223	132.464	FRIPP	2008-Mar-23	Jones, David V.
4211440	44.4546	ENID	2008-Jun-23	Jones, David V.
4211441	109.413	ENID	2008-Jun-23	Jones, David V.

**APPENDIX 3 - Description of Database Fields**

The GDB file is a Geosoft binary database. In the database, the Survey lines and Tie Lines are prefixed with an "L" for "Line" and "T" for "Tie".

Database (Laurion.gdb):

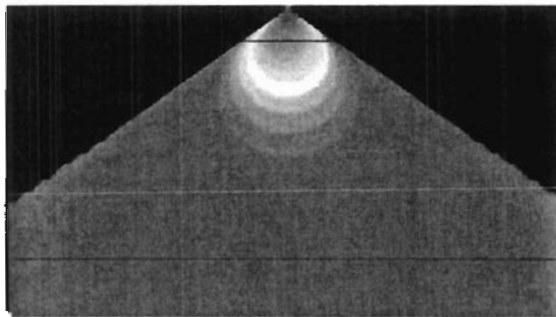
<b>Column</b>	<b>Units</b>	<b>Description</b>
emfid		AERODAS Fiducial
utctime	hh:mm:ss.ss	UTC time
x	m	UTM Easting (NAD83, zone 17N)
y	m	UTM Northing (NAD83, zone 17N)
Line		Geosoft line number
bheight	m	Terrain clearance of EM bird
dtmf	m	Digital Terrain Model
magonbird	nT	Total magnetic intensity of mag sensor mounted on EM system (Only present in infills and extension blocks)
magf	nT	Final leveled total magnetic intensity
basemagf	nT	Base station total magnetic intensity
ZOn1-ZOn16	nT/s	Processed Streaming On-Time Z component Channels 1-16
ZOff0-ZOff16	nT/s	Processed Streaming Off-Time Z component Channels 0-16
XOn1-XOn16	nT/s	Processed Streaming On-Time X component Channels 1-16
XOff0-XOff16	nT/s	Processed Streaming Off-Time X component Channels 0-16
Culture		Number label indicting a culture source such as powerline
Anom_labels		Letter label of conductor pick
Anom_ID		Letter label of conductor thickness (N or K)
off_tau	S	Off-time decay constant
on_con	S	On-time conductance
grade		Classification from 1-7 based on conductance of conductor pick

## APPENDIX 4: AEROTEM DESIGN CONSIDERATIONS

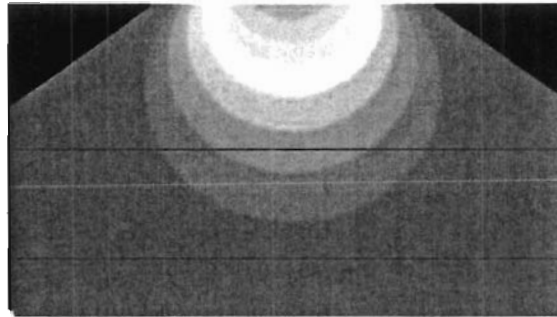
Helicopter-borne EM systems offer an advantage that cannot be matched from a fixed-wing platform. The ability to fly at slower speed and collect data with high spatial resolution, and with great accuracy, means the helicopter EM systems provide more detail than any other EM configuration, airborne or ground-based. Spatial resolution is especially important in areas of complex geology and in the search for discrete conductors. With the advent of helicopter-borne high-moment time domain EM systems the fixed wing platforms are losing their *only* advantage – depth penetration.

### **Advantage 1 – Spatial Resolution**

The AeroTEM system is specifically designed to have a small footprint. This is accomplished through the use of concentric transmitter-receiver coils and a relatively small diameter transmitter coil (5 m). The result is a highly focused exploration footprint, which allows for more accurate “mapping” of discrete conductors. Consider the transmitter primary field images shown in Figure 1, for AeroTEM versus a fixed-wing transmitter.



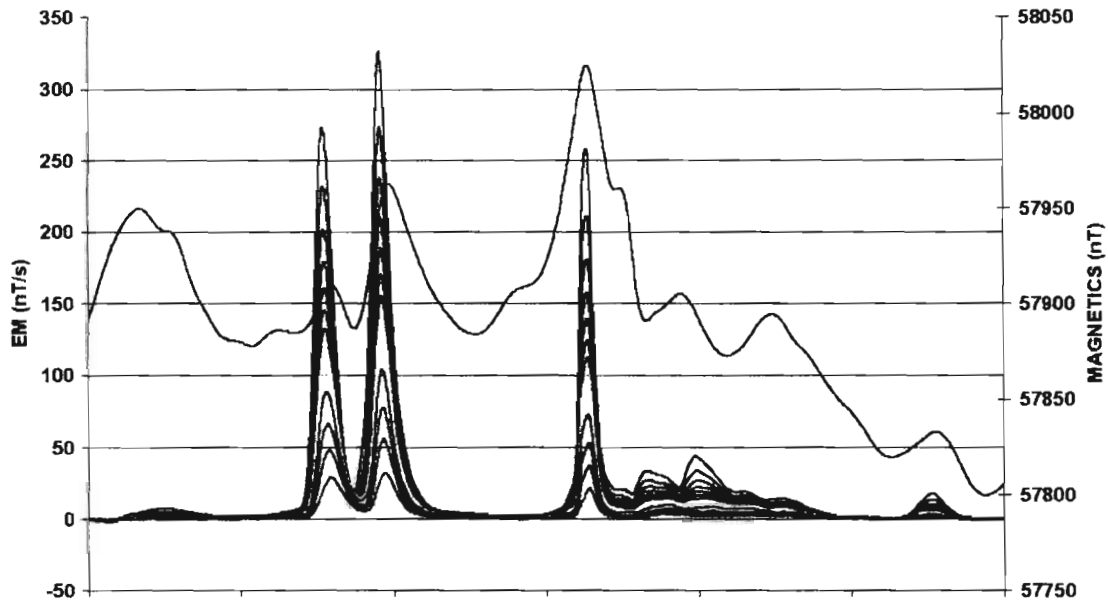
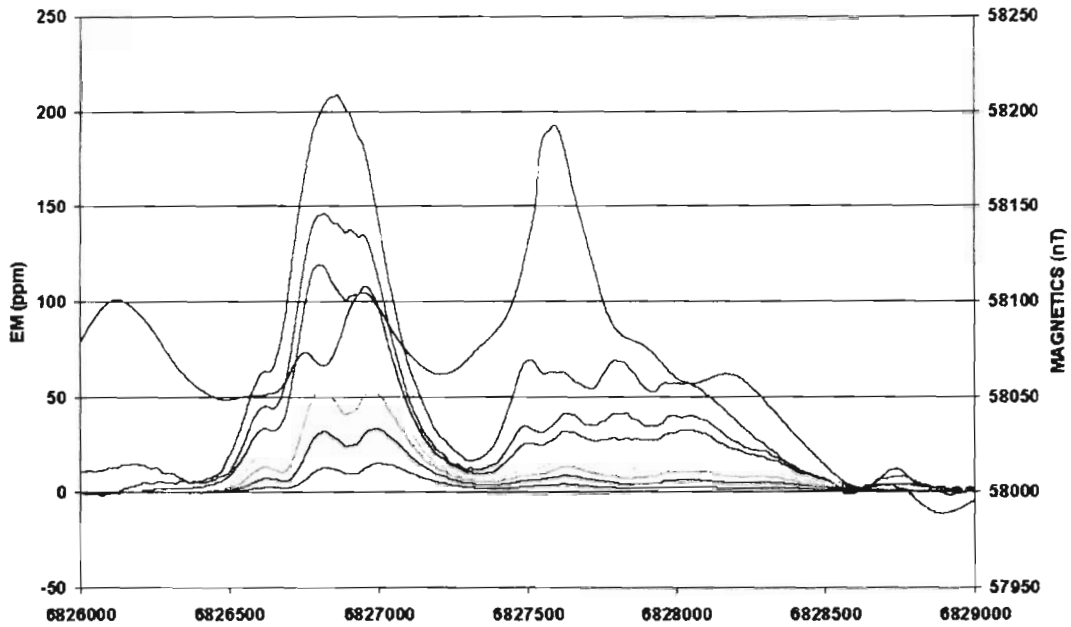
The footprint of AeroTEM at the earth's surface is roughly 50m on either side of transmitter



The footprint of a fixed-wing system is roughly 150 m on either side of the transmitter

**Figure 1. A comparison of the footprint between AeroTEM and a fixed-wing system, highlights the greater resolution that is achievable with a transmitter located closer to the earth's surface. The AeroTEM footprint is one third that of a fixed-wing system and is symmetric, while the fixed-wing system has even lower spatial resolution along the flight line because of the separated transmitter and receiver configuration.**

At first glance one may want to believe that a transmitter footprint that is distributed more evenly over a larger area is of benefit in mineral exploration. In fact, the opposite is true; by energizing a larger surface area, the ability to energize and detect discrete conductors is reduced. Consider, for example, a comparison between AeroTEM and a fixed-wing system over the Mesamax Deposit (1,450,000 tonnes of 2.1% Ni, 2.7% Cu, 5.2 g/t Pt/Pd). In a test survey over three flight lines spaced 100 m apart, AeroTEM detected the Deposit on all three flight lines. The fixed-wing system detected the Deposit only on two flight lines. In exploration programs that seek to expand the flight line spacing in an effort to reduce the cost of the airborne survey, discrete conductors such as the Mesamax Deposit can go undetected. The argument often put forward in favor of using fixed-wing systems is that because of their larger footprint, the flight line spacing can indeed be widened. Many fixed-wing surveys are flown at 200 m or 400 m. Much of the survey work performed by Aeroquest has been to survey in areas that were previously flown at these wider line spacings. One of the reasons for AeroTEM's impressive discovery record has been the strategy of flying closely spaced lines and finding all the discrete near-surface conductors. These higher resolution surveys are being flown within existing mining camps, areas that improve the chances of discovery.



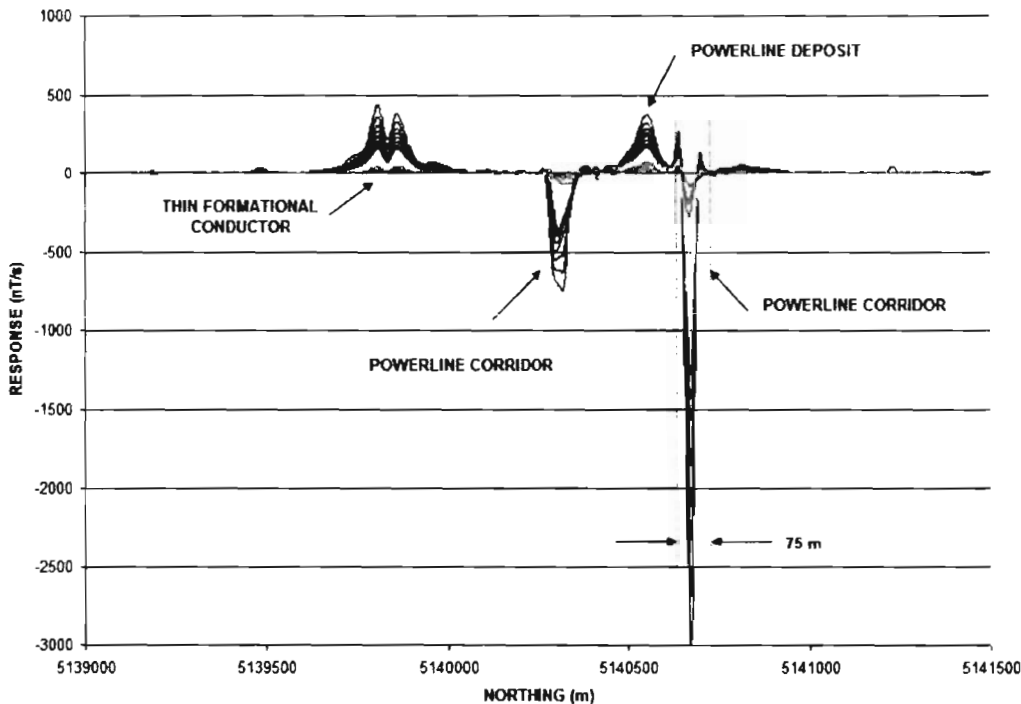
**Figure 2. Fixed-wing (upper) and AeroTEM (lower) comparison over the eastern limit of the Mesamax Deposit, a Ni-Cu-PGE zone located in the Raglan nickel belt and owned by Canadian Royalties. Both systems detected the Deposit further to the west where it is closer to surface.**

The small footprint of AeroTEM combined with the high signal to noise ratio (S/N) makes the system more suitable to surveying in areas where local infrastructure produces electromagnetic noise, such as power lines and railways. In 2002

Aeroquest flew four exploration properties in the Sudbury Basin that were under option by FNX Mining Company Inc. from Inco Limited. One such property, the Victoria Property, contained three major power line corridors.

The resulting AeroTEM survey identified all the known zones of Ni-Cu-PGE mineralization, and detected a response between two of the major power line corridors but in an area of favorable geology. Three boreholes were drilled to test the anomaly, and all three intersected sulphide. The third borehole encountered 1.3% Ni, 6.7% Cu, and 13.3 g/t TPMs over 42.3 ft. The mineralization was subsequently named the Powerline Deposit.

The success of AeroTEM in Sudbury highlights the advantage of having a system with a small footprint, but also one with a high S/N. This latter advantage is achieved through a combination of a high-moment (high signal) transmitter and a rigid geometry (low noise). Figure 3 shows the Powerline Deposit response and the response from the power line corridor at full scale. The width of power line response is less than 75 m.



**Figure 3. The Powerline Deposit is located between two major power line corridors, which make EM surveying problematic. Despite the strong response from the power line, the anomaly from the Deposit is clearly detected. Note the thin formational conductor located to the south. The only way to distinguish this response from that of two closely spaced conductors is by interpreting the X-axis coil response.**

**Advantage 2 – Conductance Discrimination**

The AeroTEM system features full waveform recording and as such is able to measure the on-time response due to high conductance targets. Due to the processing method (primary field removal), there is attenuation of the response with increasing conductance, but the AeroTEM on-time measurement is still superior to systems that rely on lower base frequencies to detect high conductance targets, but do not measure in the on-time.

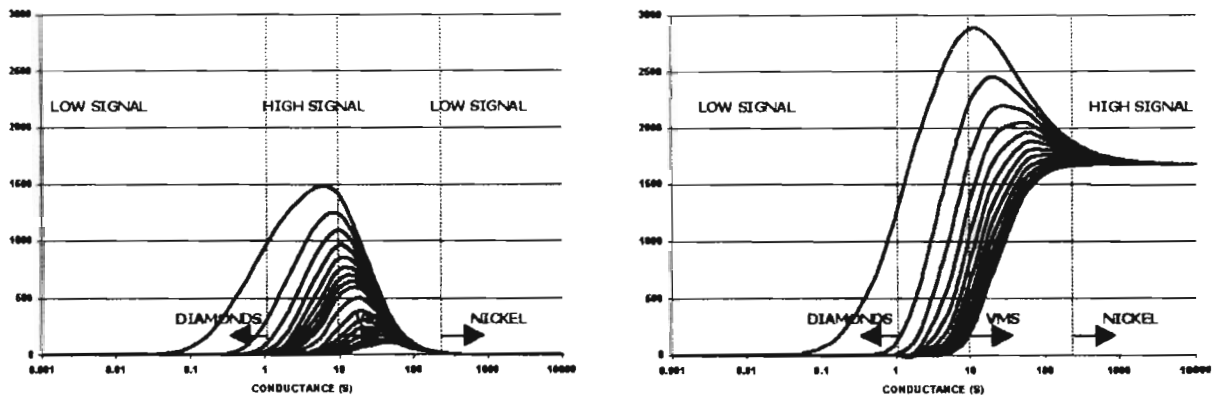
The peak response of a conductive target to an EM system is a function of the target conductance and the EM system base frequency. For time domain EM systems that measure only in the off-time, there is a drop in the peak response of a target as the base frequency is lowered for all conductance values below the peak system response. For example, the AeroTEM peak response occurs for a 10 S conductor in the early off-time and 100 S in the late off-time for a 150 Hz base frequency. Because base frequency and conductance form a linear relationship when considering the peak response of any EM system, a drop in base frequency of 50% will double the conductance at which an EM system shows its peak response. If

the base frequency were lowered from 150 Hz to 30 Hz there would be a fivefold increase in conductance at which the peak response of an EM occurred.

However, in the search for highly conductive targets, such as pyrrhotite-related Ni-Cu-PGM deposits, a fivefold increase in conductance range is a high price to pay because the signal level to lower conductance targets is reduced by the same factor of five. For this reason, EM systems that operate with low base frequencies are not suitable for general exploration unless the target conductance is more than 100 S, or the target is covered by conductive overburden.

Despite the excellent progress that has been made in modeling software over the past two decades, there has been little work done on determining the optimum form of an EM system for mineral exploration. For example, the optimum configuration in terms of geometry, base frequency and so remain unknown. Many geophysicists would argue that there is no single ideal configuration, and that each system has its advantages and disadvantages. We disagree.

When it comes to detecting and discriminating high-conductance targets, it is necessary to measure the pure inphase response of the target conductor. This measurement requires that the measured primary field from the transmitter be subtracted from the total measured response such that the secondary field from the target conductor can be determined. Because this secondary field is in-phase with the transmitter primary field, it must be made while the transmitter is turned on and the transmitter current is changing. The transmitted primary field is several orders of magnitude larger than the secondary field. AeroTEM uses a bucking coil to reduce the primary field at the receiver coils. The only practical way of removing the primary field is to maintain a rigid geometry between the transmitter, bucking and receiver coils. This is the main design consideration of the AeroTEM airframe and it is the only time domain airborne system to have this configuration.



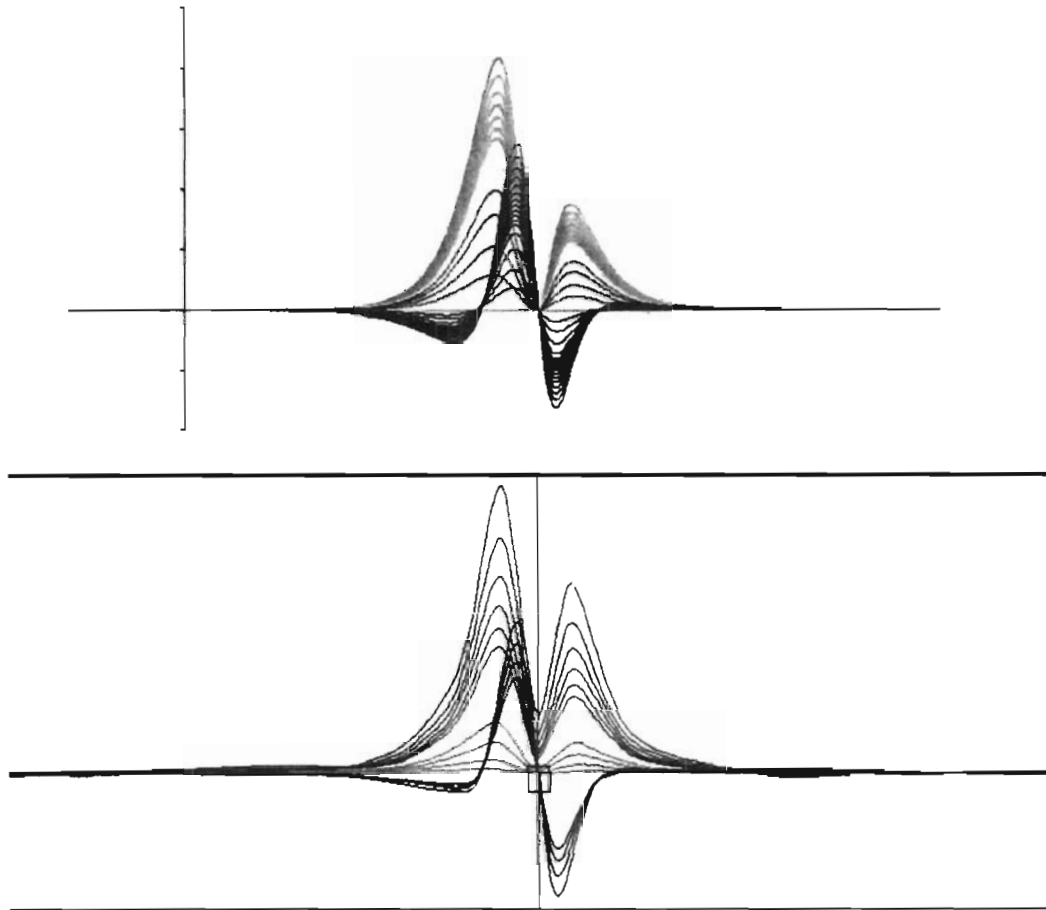
The off-time AeroTEM response for the 16 channel configuration.

The on-time response assuming 100% removal of the measured primary field.

**Figure 4. The off-time and on-time response nomogram of AeroTEM for a base frequency of 150 Hz. The on-time response is much stronger for higher conductance targets and this is why on-time measurements are more important than lower frequencies when considering high conductance targets in a resistive environment.**

**Advantage 3 – Multiple Receiver Coils**

AeroTEM employs two receiver coil orientations. The Z-axis coil is oriented parallel to the transmitter coil and both are horizontal to the ground. This is known as a maximum coupled configuration and is optimal for detection. The X-axis coil is oriented at right angles to the transmitter coil and is oriented along the line-of-flight. This is known as a minimum coupled configuration, and provides information on conductor orientation and thickness. These two coil configurations combined provide important information on the position, orientation, depth, and thickness of a conductor that cannot be matched by the traditional geometries of the HEM or fixed-wing systems. The responses are free from a system geometric effect and can be easily compared to model type curves in most cases. In other words, AeroTEM data is very easy to interpret. Consider, for example, the following modeled profile:



**Figure 5. Measured (lower) and modeled (upper) AeroTEM responses are compared for a thin steeply dipping conductor. The response is characterized by two peaks in the Z-axis coil, and a cross-over in the X-axis coil that is centered between the two Z-axis peaks. The conductor dips toward the higher amplitude Z-axis peak. Using the X-axis cross-over is the only way of differentiating the Z-axis response from being two closely spaced conductors.**

#### **HEM versus AeroTEM**

Traditional helicopter EM systems operate in the frequency domain and benefit from the fact that they use narrowband as opposed to wide-band transmitters. Thus all of the energy from the transmitter is concentrated in a few discrete frequencies. This allows the systems to achieve excellent depth penetration (up to 100 m) from a transmitter of modest power. The Aeroquest Impulse system is one implementation of this technology.

The AeroTEM system uses a wide-band transmitter and delivers more power over a wide frequency range. This frequency range is then captured into 16 time channels, the early channels containing the high frequency information and the late time channels containing the low frequency information down to the system base frequency. Because frequency domain HEM systems employ two coil configurations (coplanar and coaxial) there are only a maximum of three comparable frequencies per configuration, compared to 16 AeroTEM off-time and 12 AeroTEM on-time channels.



Figure 6 shows a comparison between the Dighem HEM system (900 Hz and 7200 Hz coplanar) and AeroTEM (Zaxis) from surveys flown in Raglan, in search of highly conductive Ni-Cu-PGM sulphide. In general, the AeroTEM peaks are sharper and better defined, in part due to the greater S/N ratio of the AeroTEM system over HEM, and also due to the modestly filtered AeroTEM data compared to HEM. The base levels are also better defined in the AeroTEM data. AeroTEM filtering is limited to spike removal and a 5-point smoothing filter. Clients are also given copies of the raw, unfiltered data.

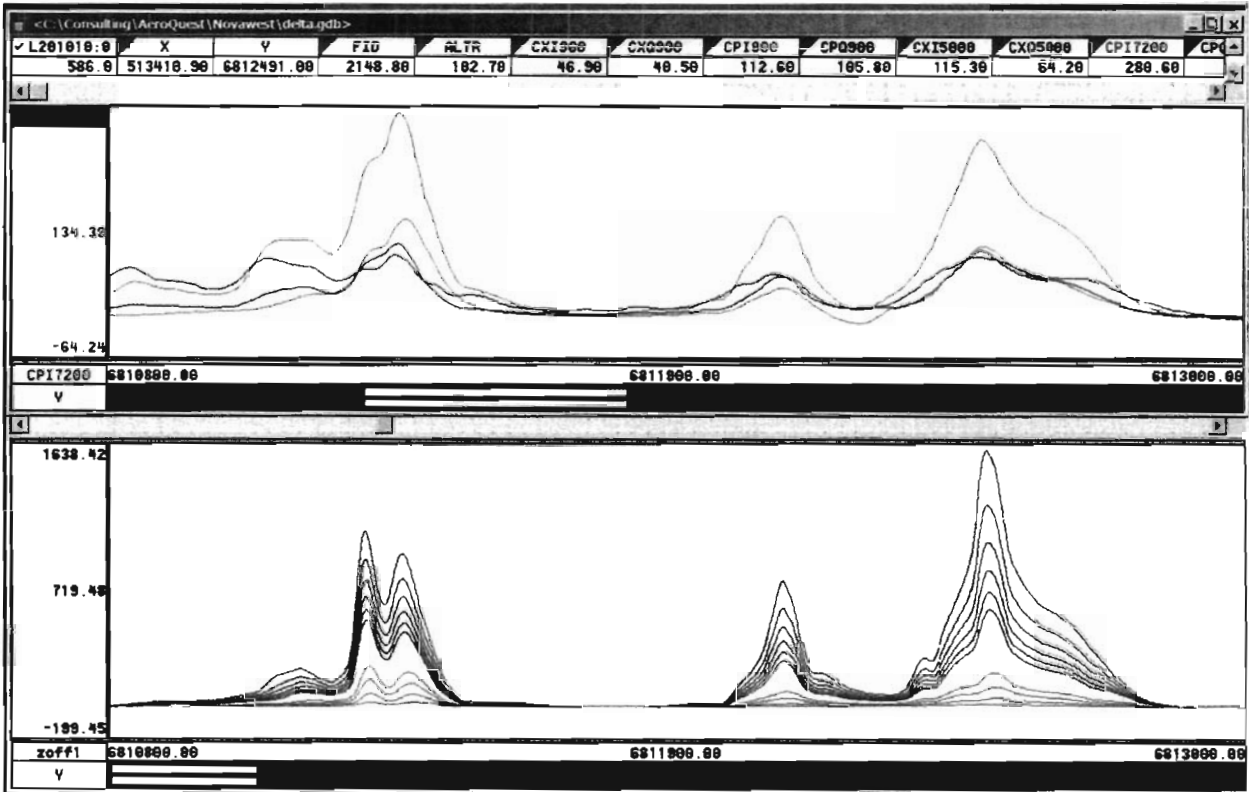


Figure 6. Comparison between Dighem HEM (upper) and AeroTEM (lower) surveys flown in the Raglan area. The AeroTEM responses appear to be more discrete, suggesting that the data is not as heavily filtered as the HEM data. The S/N advantage of AeroTEM over HEM is about 5:1.

Aeroquest Limited is grateful to the following companies for permission to publish some of the data from their respective surveys: Wolfden Resources, FNX Mining Company Inc, Canadian Royalties, Nova West Resources, Aurogin Resources, Spectrem Air. Permission does not imply an endorsement of the AeroTEM system by these companies.

**APPENDIX 5: AeroTEM Instrumentation Specification Sheet****AEROTEM Helicopter Electromagnetic System****System Characteristics**

- Transmitter: Triangular Pulse Shape Base Frequency 150 Hz
- Tx On Time - 1,150 (150Hz)  $\mu$ s
- Tx Off Time - 2,183 (150Hz)  $\mu$ s
- Loop Diameter - 5 m
- Peak Current - 250 A
- Peak Moment - 38,800 NIA
- Typical Z Axis Off-time Noise at Survey Speed = 5 nT peak to peak
- Sling Weight: 270 Kg
- Length of Tow Cable: 40 m
- Bird Survey Height: 30 m nominal

**Receiver**

- Two Axis Receiver Coils (x, z) positioned at centre of transmitter loop
- Selectable Time Delay to start of first channel 21.3 , 42.7, or 64.0 ms

**Display & Acquisition**

- AERODAS Digital recording at 128 samples per decay curve at a maximum of 300 curves per second (26.455  $\mu$ s channel width)
- RMS Channel Widths: 52.9, 132.3, 158.7, 158.7, 317.5, 634.9  $\mu$ s
- Recording & Display Rate = 10 readings per second.
- On-board display - six channels Z-component and 1 X-component

**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 requires dynamic compensation. 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.

**Tel: +1 905 693-9129. Fax: +1 905 693-9128.**  
**Email: sales@aeroquestsurveys.com**