

## ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: *Report on an Aerotem Helicopter-borne Electromagnetic and Magnetic Survey*

TOTAL COST: \$80,000

AUTHOR(S): *Jonathan Rudd*  
SIGNATURE(S):

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):

STATEMENT OF WORK EVENT NUMBER(S)/DATE(S): ~~520551~~ 5200551

YEAR OF WORK: 2012

PROPERTY NAME: *Chita / Taseko*

CLAIM NAME(S) (on which work was done):

*CHITA 7, NEW GEOLOGICAL MODEL 2-3, EAST CHITA 4, 6-7, & 9, CHITA G*COMMODITIES SOUGHT: *Cu (Au, Mo)*MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: *0920076 & 0920049*MINING DIVISION: *Clinton*NTS / BCGS: *092003*LATITUDE: 51 ° 16 ' 18 "LONGITUDE: -123 ° 23 ' 31 " (at centre of work)UTM Zone: *10N*EASTING: *472,650*NORTHING: *5,680,100*

OWNER(S):

*Kress, Dwayne**Billingsley, Richard*

MAILING ADDRESS:

*P.O. Box 2612, Garibaldi Highlands  
British Columbia V0N 1T0**11114 - 147A Street  
Surrey, BC V3R 3W2*

OPERATOR(S) [who paid for the work]:

*Revolver Capital Corp.*

MAILING ADDRESS:

*200 - 551 Howe Street  
Vancouver, BC V6C 2C2*REPORT KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude. **Do not use abbreviations or codes**)

*Intense carbonate and argillite alteration accompanied by 2 - 10% content of disseminated sulphides is hosted in a Late Cretaceous quartz feldspar porphyry, granodiorite and quartz monzonite. These batholiths and stocks intrude the Lower Cretaceous undifferentiated sedimentary sequence of the Taylor Creek Group and Upper Cretaceous volcanoclastic rocks of the Powell Creek Formation. Sulphides are dominantly pyrite and pyrrhotite, with lesser chalcopyrite, molybdenite, and bornite. Higher grades of copper appear to be found in localized breccias zones, the largest being 40m long, with an undetermined width, and composed of angular fragments of sediments and volcanic rocks in a matrix of crushed and fine-grained silicified granodiorite.*

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

*551, 1606, 8893, 10674, 22160, 22251*

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (in metric units)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne	<i>303.7 line km</i>	<i>947091, 947092, 949289, 947093, 705664, 705663, 947098, 936349, 947087, 947088, 947094</i>	<i>\$ 80,000</i>
GEOCHEMICAL (number of samples analysed for ...)			
Soil			
Silt			
Rock			
Other			
DRILLING (total metres, number of holes, size, storage location)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling / Assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale/area)			
PREPATORY / PHYSICAL			
Line/grid (km)			
Topo/Photogrammetric (scale, area)			
Legal Surveys (scale, area)			
Road, local access (km)/trail			
Trench (number/metres)			
Underground development (metres)			
Other			
		<b>TOTAL COST</b>	<i>\$ 80,000</i>

# Report on an AeroTEM Helicopter-Borne Electromagnetic & Magnetic Survey



**Aeroquest Job # 12-011**

**Taseko Lake Project  
British Columbia**

NTS 0902003, 006

For

**Revolver Resources Inc.**

3750 West 49<sup>th</sup> Ave.  
Vancouver, B.C., V6N 3T8

by



7687 Bath Road  
Mississauga, ON, L4T 3T1

Tel: (905) 672-9129

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[www.aeroquestairborne.com](http://www.aeroquestairborne.com)

**BC Geological Survey  
Assessment Report  
32972**

Report date: April 2, 2012

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- TMI – Total Magnetic Intensity colour grid with contours and EM anomaly symbols.
- EM Profiles– Profiles of 2-12 Z-axis EM channels with Flight Path and EM anomaly symbols.
- ZOFF1 –Early Time EM Channel grid with contours and EM anomaly symbols

## 1. INTRODUCTION

This report describes a helicopter-borne geophysical survey carried out on behalf of Revolver Resources Inc, for the Taseko Lake project near Big Creek Lodge, BC.

The principal geophysical sensor is Aeroquest's exclusive AeroTEM IV (Lima) time domain helicopter electromagnetic system which is employed in conjunction with a high-sensitivity caesium 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 36,000 samples per second. The streaming data comprise the transmitted waveform, and the X component and Z component of the resultant field at the receivers.

The total survey coverage is 303.7 line-km, of which 292.1 line-km fell within the defined project area (Appendix 1). The survey was made up of one block, flown at 100 metre line spacing and at 90°/270° flight direction (Table 1). The survey flying described in this report took place on February 20<sup>th</sup>- February 23<sup>rd</sup>, 2012. This report describes the survey logistics, the data processing, presentation, and provides the specifications of the survey.

## 2. PROPERTY DESCRIPTION

The Chita property is located approximately 135 km southwest of Williams Lake, BC. Access to the property is limited to a few limited-use roads along the western portion of the survey area. The property is in rough terrain with elevations ranging from 1,420 m to 3,050 m. The survey area is centered at latitude 51° 14' 30" & longitude 123° 29' 25".

The survey polygon covered a number of mineral claims which are contiguous (Figure 2). The property claims (See Appendix 5) are held by the following owners:

Dwayne Kress	Richard Billingsley
P.O. Box 2662	11114 – 147A Street
Garibaldi Highlands	Surrey, BC
BC V0N 1T0	V3R 3W2

The base of operations was at the Big Creek Lodge, Williams Lake, BC which was located about 50 km northeast of the Chita survey area. The aircraft was fueled out of a temporary fuel cache set up closer to the survey area.

The Chita Lake property consists of 54 contiguous mineral claims located in the Clinton Mining Division in compliance with the regulations of the MEMPR of the Province of British Columbia, comprising approximately 23,000 hectares (see Figure 1 and Appendix 6 for details).

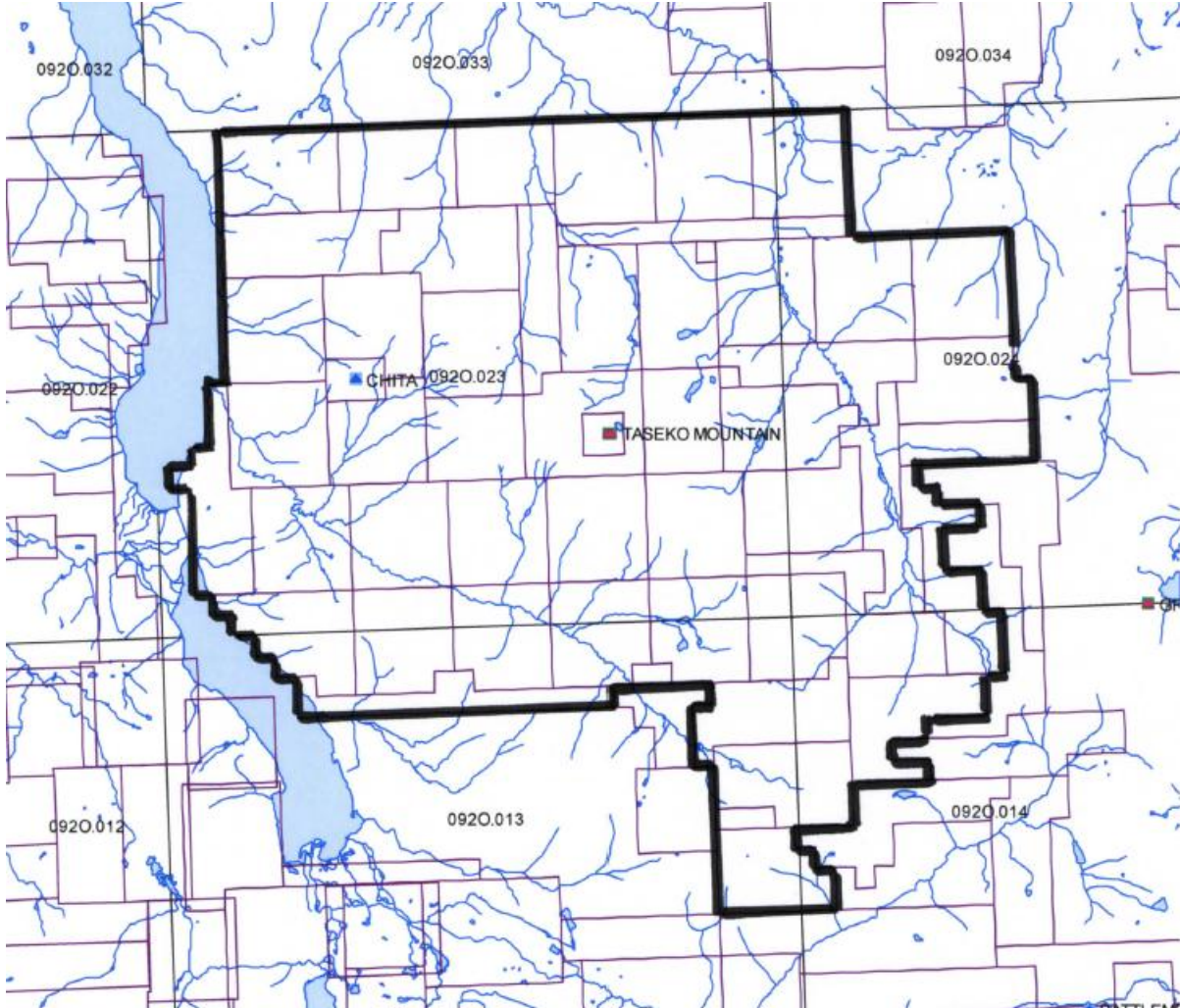


Figure 1: Claim Map – Chita Property

The terrain on the Chita Property is moderate to mountainous, with rolling topography, cut by a few steep sided gullies formed as melt-water channels in glacial overburden. Forest cover was originally nearly complete, made up predominantly of lodgepole pine with local spruce and willows along watercourses, and a few aspen groves. A significant portion of the project area has been clear-cut logged within the last decade. There are several small streams and creeks, and no significant lakes.

Climatic conditions are typical of the southern Chilcotin plateau region. Summers are warm and generally dry; winters are cold but snowfall is light to moderate. Most of the property is snow-free from May to October. Normal exploration and drilling programs should be completed during this period.

Infrastructure, including power, water, and labour are all located 80 to 100 km to the east of the property in the small Cariboo cities. The property is well-facilitated for all aspects of a

mining operation including adequate areas for plant, waste and tailing disposal, and other recovery designs. There are no apparent environmental concerns.

No permits were required to complete the airborne survey.

### 3. GEOLOGY

#### **Regional Geology (Blann, 1992)**

The Chilko-Taseko Lakes area lies on the boundary between the Coast Plutonic Complex to the southwest and the Intermontane Belt. The Intermontane Belt consists of three northwest-southeast trending fault-bounded blocks of Triassic to Cretaceous aged sedimentary and volcanic rocks. Andesitic flows and associated tuffs, and breccias constitute the bulk of the volcanic rocks and these are intercalated with waterlain tuffs, siltstones, shales, minor sandstone and carbonate rocks. These are unconformably overlain by scattered outliers of Ivliocene and Pliocene plateau lavas.

Plutonic rocks emplaced during Cretaceous and Tertiary periods are granodiorite, quartz diorite and diorite. They form the main mass of the Coast Mountains to the southwest, however, related dykes, stocks and sills intrude the volcanic and sedimentary rocks throughout the Taseko and Chilco Lakes area.

The Taseko/Chita property is located on the southwestern flank of what was once the Tyaughton trough, an Early Cretaceous volcanic island arc environment transitional to a marine sedimentary basin environment. Intrusive rocks of the Coast Plutonic Complex truncate the volcanic and sedimentary sequences, and have uplifted the volcanic arc, exposing it to erosion. McLaren (1990) suggests the volcanic rocks in the Taseko area are related to those at the Britannia Mine and Harrison Lake; they may have once been part of the continuous volcanic arc that has since been dismembered, uplifted and eroded. Large fault zones cutting through the Taseko Lakes region may be related to the major faults which affect precious metal mineralization in the Bridge River Camp, 80 kilometers to the southeast. The Bridge River area contains several past-producing gold mines (Bralorne, Pioneer), and has produced more gold than any other district in British Columbia.

#### **Property Geology (Blann, 1992)**

The Taseko/Chita property is underlain by upper Cretaceous aged andesite to basaltic flows, lithic and crystal tuffs and breccias, and andesitic tuffaceous sediments and minor rhyolite trending northwards with moderate easterly dips. These rocks are extensively intruded by various phases of hornblende feldspar porphyritic diorite to granodiorite. Fine grained felsic to intermediate dykes and irregular plugs crosscut both the volcanic and intrusive rocks. Dykes vary from 0.5 m to 25 m in width and occur in a northwesterly trending swarm, capped by volcanic rocks, in the area of Easy Peak on the east side of Taseko mountain.

The dominant structures are shears trending 330° and 040°, with related splays. The northwest trending, sub-vertical dipping shear zone is approximately 1 kilometer in width and extends from the southeast corner of the property to the northwest corner. Parallel faults occur in the valley and ridge to the east of Easy Peak. The northeast trending shear is also



strong and cuts the main shear zone from the south-central to the east central portion of the property. At the intersection of these two shear zones, moderate to extensively altered volcanic and intrusive rocks occur.

#### 4. SURVEY AREA

The Project area (Figure 2) is located in southern B.C. The survey consisted of one block, Taseko Lake (30.69 sq. km.) and is located approximately 60 km southwest of Big Creek Lodge, B.C. The base of survey operations was at Big Creek Lodge, B.C.



Figure 2. AeroTEM IV survey area

#### 5. SURVEY SPECIFICATIONS AND PROCEDURES

The survey specifications are summarised in the following table:

Project Name	Line/Tie Spacing (metres)	Line Direction	Survey Coverage (line-km)	Date flown
Taseko Lake Block	100/1000	90°/270°	303.7	February 20 <sup>th</sup> - 23 <sup>rd</sup> , 2012

Table 1. Survey specifications summary



The survey coverage was calculated by summing the along-line horizontal distance of the survey lines as presented in the final Geosoft database. The survey was flown with a line spacing of 100 metres.

The nominal EM bird terrain clearance is 30 metres, 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 32 metres above the EM bird and 18 metres below the helicopter (Figure 3). 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 36,000 samples per second and is processed to generate final data at 10 samples per second. The 10 samples per second translate 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 ADAS 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 less than 3 metres. A recent static ground test of the Mid-Tech WAAS GPS yielded a standard deviation in x and y of less than 0.6 metres and for z less than 1.5 metres over a two-hour period.

### **5.2. SYSTEM DRIFT**

Unlike frequency domain electromagnetic systems, the AeroTEM IV 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 ADAS 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 ADAS 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 reflown.

## 6. AIRCRAFT AND EQUIPMENT

### 6.1. AIRCRAFT

An Aerospatiale AS350 B2 helicopter - registration C-GPWZ was used as survey platform. The helicopter was owned and operated by Pacific Western Helicopters Ltd. Installation of the geophysical and ancillary equipment was carried out by Aeroquest Limited personnel in conjunction with a licensed aircraft engineer. The survey aircraft was flown at a nominal terrain clearance of 262 ft (80 metres).



Figure 3. Helicopter C- GPWZ used during the survey

### 6.2. MAGNETOMETER

The AeroTEM IV airborne survey system employs the Geometrics G-823A caesium vapour magnetometer sensor installed in a two metre towed bird airfoil attached to the main tow line, 18 metres below the helicopter (Figure 3). 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 62 metres (203 ft.). The magnetic data is recorded at 10 Hz by the ADAS.

### 6.3. ELECTROMAGNETIC SYSTEM

The electromagnetic system is an Aeroquest AeroTEM IV time domain towed-bird system (18 metres below the helicopter (Figure 3). 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 62 metres (203 ft.). The magnetic data is recorded at 10 Hz by the ADAS. The AeroTEM IV transmitter dipole moment at the 90 Hz is 183 kNIA. The AeroTEM bird is

towed 50 metres (164 ft) below the helicopter. More technical details of the system may be found in Appendix 5.

The wave-form is triangular with a symmetric transmitter on-time pulse of 1.949 ms and a base frequency of 90 Hz (Figure 5). The current alternates polarity every on-time pulse. During every Tx on-off cycle (180 per second), 200 contiguous channels of raw X and Z component (and a transmitter current monitor, itx) of the received waveform are measured. Each channel width is 27.78 microseconds starting at the beginning of the transmitter pulse. This 200 channel data is referred to as the raw streaming data. The AeroTEM system has one separate EM data recording stream, the newly designed AeroDAS system which records the full waveform (Figure 6).

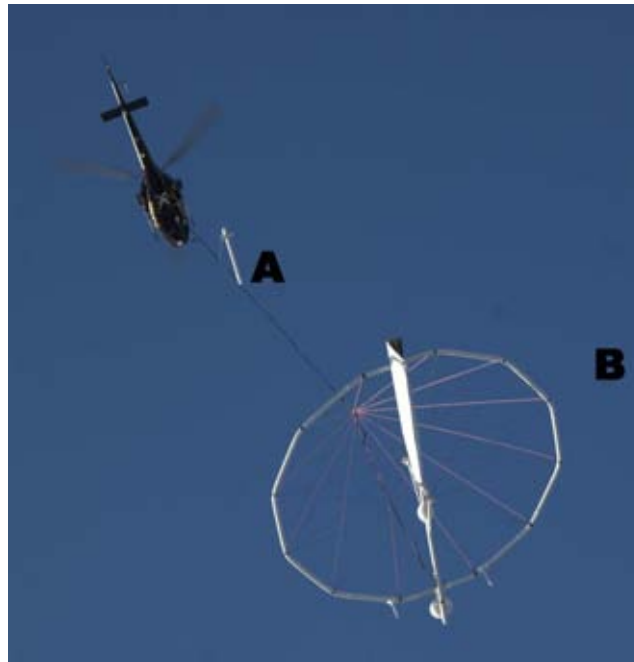


Figure 4. The magnetometer bird (A) and AeroTEM IV EM bird (B)

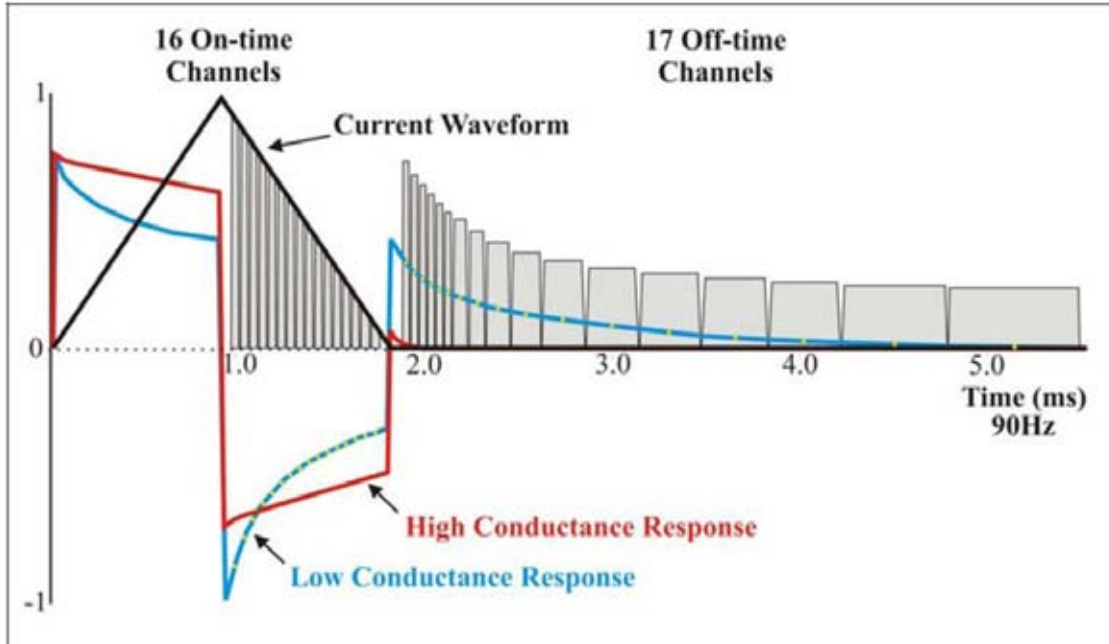


Figure 5. Schematic of Transmitter and Receiver waveforms

#### 6.4. AERODAS ACQUISITION SYSTEM

The 200 channels of raw streaming data are recorded by the AeroDAS acquisition system (Figure 6) onto a removable hard drive. In addition the magnetic, altimeter and position data are also recorded in it, six channels of real time processed off-time EM decay in the Z direction and one in the X direction can be viewed on a color monitor on board, these channels are derived by a binning, stacking and filtering procedure on the raw streaming data.

The primary use of the displayed EM data (Z1 to Z6, X1), magnetic and altimeter is to provide for real-time QA/QC on board.

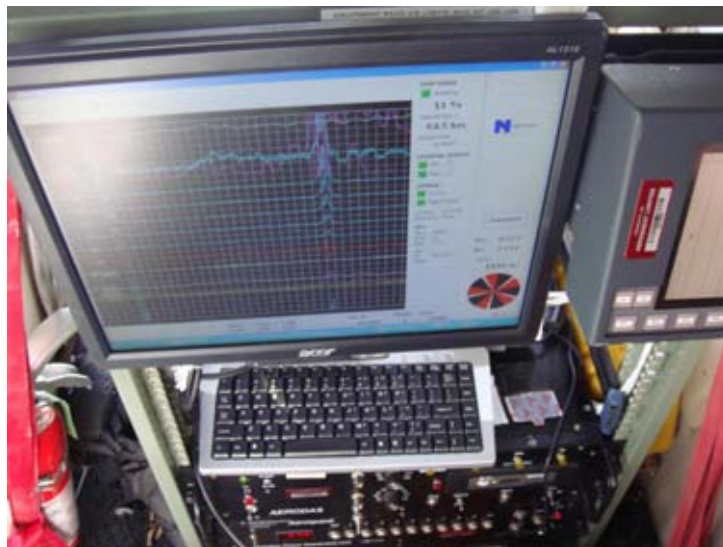


Figure 6. AeroTEM IV Instrument Rack



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:

Average TxOn -8.6710 us  
 Average TxSwitch 1003.3817 us  
 Average TxOff 1940.6967 us  
 Average TxPeak 200.8034 A

OTC Gate 66  
 Gate Shift 36

[Channel Data]

Channel	Sample	Range	Time Width (us)	Time Center (us)	Time After TxOn (us)
On1		4 - 4	27.8	97.2	105.9
On2		5 - 5	27.8	125.0	133.7
On3		6 - 6	27.8	152.8	161.4
On4		7 - 7	27.8	180.6	189.2
On5		8 - 8	27.8	208.3	217.0
On6		9 - 9	27.8	236.1	244.8
On7		10 - 10	27.8	263.9	272.6
On8		11 - 11	27.8	291.7	300.3
On9		12 - 12	27.8	319.4	328.1
On10		13 - 13	27.8	347.2	355.9
On11		14 - 14	27.8	375.0	383.7
On12		15 - 15	27.8	402.8	411.4
On13		16 - 16	27.8	430.6	439.2
On14		17 - 17	27.8	458.3	467.0
On15		18 - 18	27.8	486.1	494.8
On16		19 - 19	27.8	513.9	522.6

Channel	Sample	Range	Time Width (us)	Time Center (us)	Time After TxOff (us)
Off0		74 - 74	27.8	2041.7	101.0
Off1		75 - 75	27.8	2069.4	128.7
Off2		76 - 76	27.8	2097.2	156.5
Off3		77 - 77	27.8	2125.0	184.3
Off4		78 - 78	27.8	2152.8	212.1
Off5		79 - 79	27.8	2180.6	239.9
Off6		80 - 82	83.3	2236.1	295.4
Off7		83 - 85	83.3	2319.4	378.7
Off8		86 - 88	83.3	2402.8	462.1
Off9		89 - 91	83.3	2486.1	545.4
Off10		92 - 96	138.9	2597.2	656.5
Off11		97 - 101	138.9	2736.1	795.4
Off12		102 - 107	166.7	2888.9	948.2
Off13		108 - 117	277.8	3111.1	1170.4
Off14		118 - 131	388.9	3444.4	1503.7
Off15		132 - 153	611.1	3944.4	2003.7
Off16		154 - 188	972.2	4736.1	2795.4

## 6.5. MAGNETOMETER BASE STATION

The base magnetometer was a Geometrics G-859 caesium vapour magnetometer system with integrated GPS. Data logging and UTC time synchronisation was carried out within the magnetometer, with the GPS providing the timing signal. The data logging was configured to measure at 1.0 second intervals. Digital recording resolution was 0.001 nT. The sensor was placed on a tripod in an area of low magnetic gradient and 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 variation.

## 6.6. 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. Therefore, the recorded

data reflect the height of the helicopter above the ground. The Terra altimeter has an altitude accuracy of +/- 1.5 metres.

### 6.7. VIDEO TRACKING AND RECORDING SYSTEM

A high resolution digital colour 8 mm video camera 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.

### 6.8. 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 corrected position has a published accuracy of less than 3 metres.

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 10N projection. The real-time differentially corrected GPS positional data was recorded by the AeroDAS system in geodetic coordinates (latitude and longitude using WGS84) at 0.2 s intervals.

### 6.9. DIGITAL ACQUISITION SYSTEM

The AeroTEM received waveform sampled during on and off-time at 200 channels per decay, 180 times per second, was logged by the proprietary AeroDAS data acquisition system. The streaming data was recorded on a removable hard-drive and was later backed-up onto DVD-ROM from the field-processing computer.



## 7. PERSONNEL

The following Aeroquest personnel were involved in the project:

- Operations Project Manager: Troy Will
- Field Data Processor: Josh Poirier
- Field Operator: Steve Sartor
- Data Interpretation and Reporting: Jonathan Rudd and Theo Cociorba

The survey pilot, Steven Tanaka, was employed directly by the helicopter operator – Pacific Western Helicopters Ltd.

## 8. DELIVERABLES

### 8.1. HARDCOPY DELIVERABLES

The report includes a set of one 1:10,000 maps and the following three geophysical data products are delivered:

- TMI – Total Magnetic Intensity colour grid with contours and EM anomaly symbols.
- EM Profiles– Profiles of 2-12 Z-axis EM channels with Flight Path and EM anomaly symbols.
- ZOFF1 –Early Time EM Channel grid with contours and EM anomaly symbols

The coordinate/projection system for the maps is WGS84 – UTM Zone 10N. 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 off-time conductance. The anomaly symbol is accompanied by postings denoting the calculated off-time conductance, a thick or thin classification and an anomaly identifier label. The anomaly symbol legend and survey specifications are displayed on the left margin of the maps. All maps are presented in Appendix 7 **Final Deliverables**.

### 8.2. DIGITAL DELIVERABLES

#### 8.2.1. Final Database of Survey Data (.GDB)

The geophysical profile data is archived digitally in a Geosoft GDB binary format database. A description of the contents of the individual channels in the database can be found in Appendix 2. A copy of this digital data is archived at the Aeroquest head office in Mississauga.

#### 8.2.2. Geosoft Grid files (.GRD)

Levelled Grid products used to generate the geophysical map images. All grids have 20 m cell size.

- TMI– Total Magnetic Intensity grid
- ZOFF1– Early Time EM Channel grid
- DTM – Digital Terrain Model grid

### **8.2.3. Digital Versions of Final Maps (.MAP, .PDF)**

Map files in Geosoft .map and Adobe PDF format.

### **8.2.4. Google Earth Files (.kmz)**

Flight navigation lines, EM Anomalies and geophysical grids in Google earth kmz format.  
Double click to view in Google Earth.

### **8.2.5. Free Viewing Software (.EXE)**

Geosoft Oasis Montaj Viewing Software  
Adobe Acrobat Reader  
Google Earth Viewer

### **8.2.6. Digital Copy of this Document (.PDF)**

Adobe PDF format of this document.

## **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 and 42-inch wide Hewlett Packard ink-jet plotters.

### **9.1. BASE MAP**

The geophysical maps accompanying this report are based on positioning in the WGS84 datum. The survey geodetic GPS positions have been projected using the Universal Transverse Mercator projection in Zone 10 North. A summary of the map datum and projection specifications is given following:

Ellipse: GRS 1980

Ellipse major axis: 6378137m eccentricity: 0.081819191

Datum: WGS84

Datum Shifts (x,y,z) : 0, 0, 0 metres

Map Projection: Universal Transverse Mercator Zone 10 (Central Meridian 123°W)

Central Scale Factor: 0.9996

False Easting, Northing: 500,000m, 0m

The background vector topography was sourced from Natural Resources Canada at 1:50000 scales and the background shading were derived from NASA Shuttle Radar Topography Mission (SRTM) 90 metre resolution DEM data.

For reference, the latitude and longitude in WGS84 are also noted on the maps.

### **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 (5 Hz) 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 and are not tied in to surveyed geodetic heights.

Each flight included at least two high elevation „background“ checks. These high elevation checks are 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 36,000 Hz (200 channels, 180 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, levelled and split up into the individual line segments. Further base level adjustments may be carried out at this stage. The filtering of the stacked data is designed to remove or minimize high frequency noise that cannot be sourced from the geology.

The final field processing step was to merge the processed EM data with the other data sets into a Geosoft GDB file. The TS “time stamp” and EM Fiducial are 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.

Apparent bedrock EM anomalies were interpreted with the aid of an auto-pick from positive peaks and troughs in the off-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 bi-directional grid technique with a grid cell size of 20 metres. The final levelled grid provided the basis for threading the presented contours which have a minimum contour interval of 10 nT.

## 10. INTERPRETIVE 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 10 metres), the response is a single peak in the z-component response and a negative to positive crossover in the x-component response (Figure 98). 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.

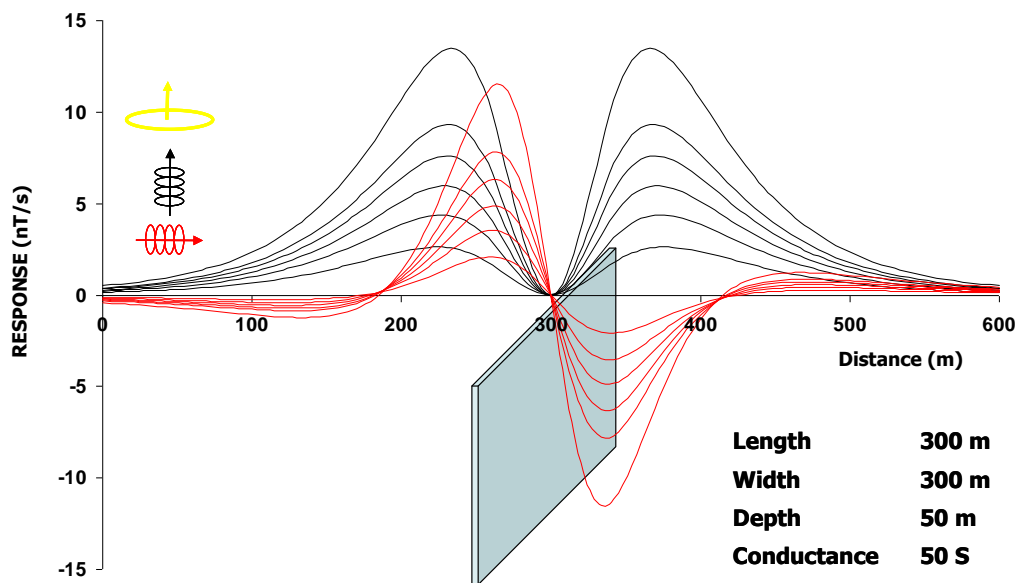


Figure 8. AeroTEM response to a „thin“ vertical conductor.

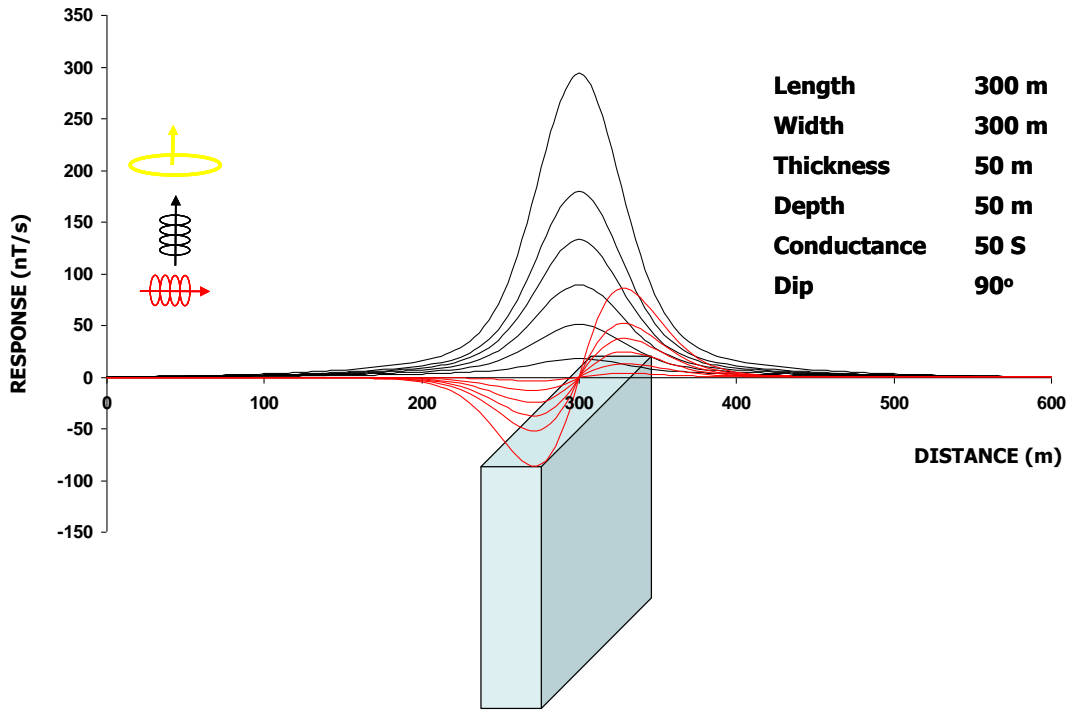


Figure 9. AeroTEM response for a „thick“ vertical conductor.

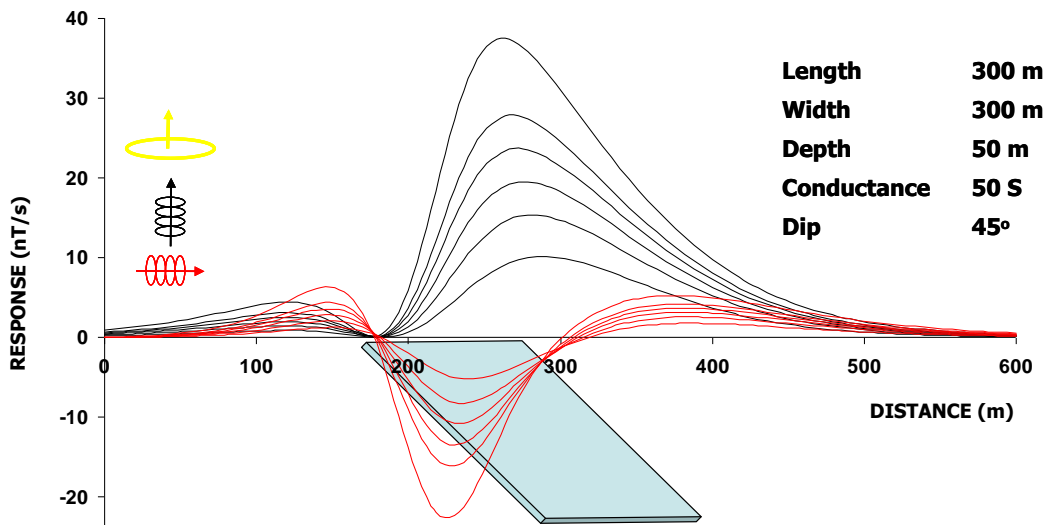


Figure 10. AeroTEM response over a „thin“ dipping conductor.

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,

Jonathan Rudd, P.Eng.  
Aeroquest Airborne



## APPENDIX 1: SURVEY BOUNDARIES

The following table presents the block boundaries. All geophysical data presented in this report have been windowed to 100 m outside of these boundaries. X and Y positions are in metres: WGS84 UTM Zone 10N.

### Taseko Lake Block:

<b>X</b>	<b>Y</b>
470000.0	5677366.0
470000.0	5683198.0
475000.0	5683198.0
475000.0	5677366.0

## APPENDIX 2: 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".

COLUMN	UNITS	DESCRIPTOR
Line		Line number
flight		Flight #
emfid		AERODAS Fiducial
utctime	hh:mm:ss.ss	UTC time
Lat_wgs84	dd.mm.ss	Latitude
Long_wgs84	dd.mm.ss	Longitude
X	m	UTM Easting (WGS84, Zone 10)
Y	m	UTM Northing (WGS84, Zone 10)
Galt	m	GPS elevation of magnetometer bird
Ralt	m	Helicopter radar altimeter (height above terrain)
bheight	m	Terrain clearance of EM bird
basemag	nT	Base station total magnetic intensity
magU	nT	Final levelled total magnetic intensity from upper magnetometer sensor (installed on the tail of the EM bird).
dtmf	m	Digital Terrain Model
Zon	nT/s	EM On-Time Z component Channels 1-16
Zoff	nT/s	EM Off-Time Z component Channels 0-16
Xon	nT/s	EM On-Time X component Channels 1-16
Xoff	nT/s	EM Off-Time X component Channels 0-16
pwrline		powerline monitor data channel
Grade		Classification from 1-7 based on conductance of conductor pick
Anom_Labels		Letter label of conductor pick (Unique per flight line)
Off_Con	S	Off-time conductance at conductor pick
Off_Tau	µs	Off-time decay constant at conductor pick
Anom_ID		EM Anomaly response style (K= thick, N = thin)
Off_AllCon	S	Off-time conductance
Off_AllTau	µs	Off-time decay constant
TranOff	s	Transmitter turn off time
TranOn	s	Transmitter turn on time
TranPeak	A	Transmitter peak current
TranSwitch	s	Transmitter peak current time
Off_Pick		Anomaly pick channel
Depth	m	Depth from top of the conductor

### APPENDIX 3: AEROTEM ANOMALY LISTING

#### Taseko Lake Block:

Line	Anom	ID	Cond (S)	Tau (µs)	Flight #	UTC Time	Bird height (m)	Easting (m)	Northing (m)
10030	A	K	0.4	63.0	1	18:24:36	76.0	470152.6	5679805.5
10040	A	K	0.3	55.0	1	18:27:00	86.5	470242.3	5679713.8
10050	A	K	1.0	98.1	1	18:43:29	35.3	470337.5	5679582.5
10060	A	K	0.3	55.8	1	18:46:22	86.1	470520.4	5679501.3
10070	A	K	0.2	46.5	1	19:02:37	48.3	470469.8	5679401.3
10080	A	K	0.5	70.4	2	20:33:33	44.6	470620.8	5679300.6
10080	B	K	0.5	70.6	2	20:33:46	46.6	470504.3	5679299.5
10090	A	K	0.7	85.7	2	20:36:26	36.5	470537.2	5679199.9
10090	B	K	0.3	54.0	2	20:36:43	49.4	470687.3	5679204.3
10100	A	K	0.2	40.4	2	20:52:44	50.1	470883.5	5679108.8
10100	B	K	0.3	54.7	2	20:52:54	49.3	470734.7	5679106.2
10110	A	K	0.1	31.6	2	20:56:36	58.1	470764.3	5679004.0
10110	B	K	0.1	31.6	2	20:56:48	61.9	470902.2	5678999.3
10120	A	K	0.1	32.9	2	21:11:14	39.7	470961.1	5678889.2
10120	B	K	0.7	80.6	2	21:11:37	58.3	470728.7	5678910.9
20050	A	K	1.6	126.3	6	0:34:36	56.5	472658.2	5683099.8
20050	B	K	9.6	309.5	6	0:35:44	53.1	474390.4	5683093.7
20050	C	K	22.3	471.8	6	0:36:05	54.6	474960.8	5683105.5
20060	A	K	18.3	428.1	6	0:25:56	52.6	474927.4	5683000.9
20060	B	N	23.7	486.6	6	0:26:08	44.8	474628.7	5683004.2
20060	C	K	23.7	486.6	6	0:26:13	39.0	474512.9	5683000.0
20060	D	K	1.6	127.7	6	0:27:21	39.6	473311.2	5683005.5
20060	E	K	1.2	111.5	6	0:27:48	79.1	472786.4	5682979.4
20070	A	K	1.7	129.1	6	0:23:11	58.1	472689.6	5682914.3
20070	B	K	6.5	254.3	6	0:23:48	45.9	473588.8	5682883.2
20070	C	K	18.7	431.8	6	0:24:11	64.0	474150.1	5682919.8
20070	D	K	15.3	391.2	6	0:24:24	56.1	474484.6	5682901.1
20070	E	K	16.4	405.0	6	0:24:34	45.9	474732.7	5682890.8
20080	A	K	12.0	346.2	6	0:12:43	45.2	474925.6	5682805.3
20080	B	K	10.5	324.1	6	0:13:04	41.1	474509.7	5682812.4
20080	C	K	1.9	137.5	6	0:15:00	54.0	472698.2	5682786.9
20080	D	N	1.9	137.5	6	0:15:09	67.7	472514.3	5682784.5
20090	A	N	1.5	123.3	6	0:09:12	32.0	472232.6	5682680.1
20090	B	K	1.5	123.3	6	0:09:28	54.2	472374.8	5682685.3
20090	C	K	1.3	114.4	6	0:09:42	70.2	472597.8	5682688.9
20090	D	K	5.1	225.4	6	0:10:36	40.8	473730.8	5682694.9

Line	Anom	ID	Cond (S)	Tau (µs)	Flight #	UTC Time	Bird height (m)	Easting (m)	Northing (m)
20090	E	K	11.2	334.5	6	0:10:48	45.9	474010.4	5682702.6
20090	F	K	15.9	398.5	6	0:11:06	50.2	474445.0	5682731.6
20090	G	N	14.1	375.7	6	0:11:19	52.8	474831.5	5682672.6
20090	H	K	14.1	375.7	6	0:11:21	53.9	474894.4	5682677.6
20090	I	K	25.5	505.1	6	0:11:26	59.8	475042.5	5682701.6
20110	A	K	6.0	245.4	6	22:30:55	48.7	474968.9	5682603.1
20110	B	N	3.6	188.5	6	22:31:02	43.7	474832.2	5682603.7
20110	C	K	3.6	188.5	6	22:31:09	47.3	474694.5	5682600.2
20110	D	K	2.4	153.4	6	22:31:20	43.7	474439.8	5682592.8
20110	E	K	1.3	113.9	6	22:31:33	75.3	474179.8	5682599.3
20110	F	K	1.5	123.8	6	22:31:39	62.1	474094.5	5682602.4
20110	G	K	2.4	155.5	6	22:32:33	67.5	473121.6	5682602.6
20110	H	K	1.1	103.9	6	22:32:58	46.2	472633.1	5682602.5
20110	I	K	0.5	73.4	6	22:33:17	49.3	472280.6	5682596.7
20110	A	K	1.2	107.7	6	22:43:25	60.9	472583.2	5682509.0
20110	B	K	16.5	405.7	6	22:44:35	47.1	474030.3	5682516.8
20110	C	K	15.3	390.6	6	22:45:00	60.8	474673.5	5682501.0
20120	A	K	7.8	279.3	6	22:48:50	38.6	474725.7	5682401.0
20120	B	K	2.0	142.2	6	22:49:11	52.9	474229.4	5682406.3
20120	C	K	1.2	109.1	6	22:50:46	42.6	472595.4	5682404.5
20130	A	K	0.6	74.4	6	22:59:36	42.9	472549.8	5682303.6
20130	B	K	9.1	300.9	6	23:01:07	63.6	474167.9	5682309.2
20130	C	K	6.3	250.4	6	23:01:19	45.4	474455.2	5682296.4
20130	D	K	12.9	359.2	6	23:01:24	45.1	474586.3	5682295.8
20130	E	K	7.2	268.8	6	23:01:36	39.4	474896.8	5682292.1
20140	A	K	8.1	284.2	6	23:02:47	45.9	475082.7	5682197.6
20140	B	K	9.1	301.1	6	23:02:54	35.9	474931.3	5682205.7
20140	C	K	8.0	283.1	6	23:03:10	45.4	474547.0	5682205.7
20140	D	K	0.7	83.2	6	23:05:11	60.3	472491.5	5682186.4
20150	A	K	0.1	31.0	6	23:13:34	54.4	472445.4	5682093.3
20161	A	K	0.3	57.4	6	23:43:37	61.4	472417.4	5682002.1
20170	A	K	0.5	71.5	6	23:51:54	66.7	472360.6	5681904.6
20170	B	K	7.8	278.8	6	23:54:29	61.6	474494.7	5681902.9
20181	A	K	2.2	147.5	6	23:56:27	80.1	474463.8	5681806.4
20181	B	K	0.1	34.1	6	23:59:51	56.4	472339.7	5681791.9
20190	A	K	0.8	89.8	5	20:28:22	64.7	472333.4	5681691.8
20190	B	K	8.9	297.6	5	20:31:13	75.2	474439.6	5681705.1
20200	A	K	0.9	94.1	5	20:16:55	90.2	474421.7	5681581.5
20200	B	K	1.2	111.5	5	20:20:27	54.7	472330.0	5681593.3

Line	Anom	ID	Cond (S)	Tau ( $\mu$ s)	Flight #	UTC Time	Bird height (m)	Easting (m)	Northing (m)
20210	A	K	1.6	127.8	5	20:13:51	79.0	474384.1	5681491.7
20220	A	K	0.8	87.0	5	19:58:42	78.3	474324.6	5681416.0
20220	B	K	0.5	67.9	5	19:58:54	43.6	474156.5	5681401.6
20230	A	K	1.8	133.1	5	19:55:34	80.6	474287.6	5681310.2
20240	A	K	1.2	111.4	5	19:41:20	46.3	474209.7	5681190.8
20240	B	K	0.9	93.3	5	19:41:43	46.5	473814.5	5681186.4
20250	A	K	3.4	184.8	5	19:38:12	88.5	474131.0	5681101.0
20260	A	K	0.6	78.8	5	19:20:20	87.4	474027.8	5681001.8
20260	B	K	0.8	87.1	5	19:20:28	75.2	473863.3	5681006.0
20260	C	K	0.7	80.4	5	19:20:36	41.3	473687.7	5680998.2
20270	A	K	0.4	66.5	4	17:29:33	87.9	474003.9	5680890.8
20270	B	K	0.3	54.5	4	17:29:48	58.5	473695.6	5680894.7
20270	C	K	0.2	44.7	4	17:29:52	53.1	473608.9	5680893.8
20280	A	K	0.4	59.1	4	17:22:59	56.5	473518.5	5680793.7
20280	B	K	0.8	90.8	4	17:23:08	42.1	473790.6	5680792.4
20280	C	K	0.5	67.8	4	17:23:17	79.5	474066.1	5680810.0
20290	A	K	0.3	55.9	4	17:11:54	53.7	473812.0	5680703.0
20290	B	K	0.3	50.0	4	17:12:05	63.1	473566.0	5680710.3
20300	A	K	0.4	62.0	4	17:08:28	54.3	473600.7	5680619.5
20300	B	K	0.7	84.3	4	17:08:38	45.1	473867.8	5680615.6
20300	C	K	0.5	73.3	4	17:09:22	64.3	475019.8	5680600.8
20310	A	K	0.6	78.7	4	16:56:02	98.5	475034.0	5680500.9
20310	B	K	0.3	53.5	4	16:56:59	56.6	473707.3	5680498.8
20320	A	K	1.0	99.0	4	16:54:06	62.3	473694.5	5680409.1
20340	A	K	0.3	50.6	4	16:38:37	39.5	472640.1	5680199.9
20350	A	K	0.2	43.9	4	16:30:39	112.2	472653.4	5680116.3

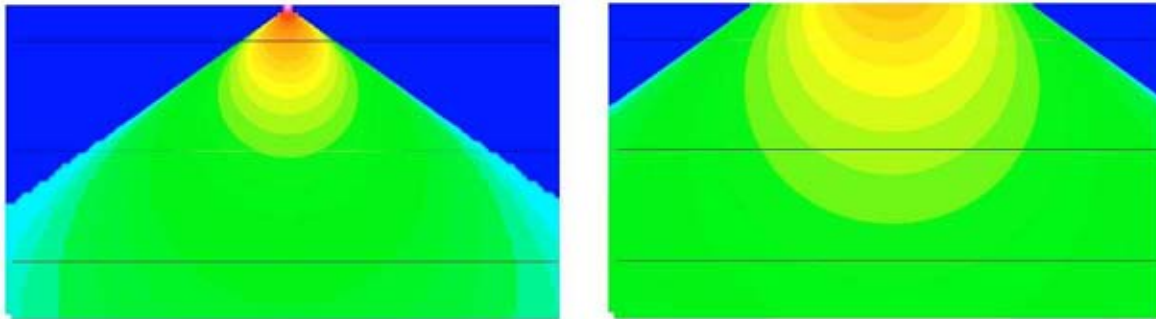
## APPENDIX 4: AeroTEM Design Considerations

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

3a 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.



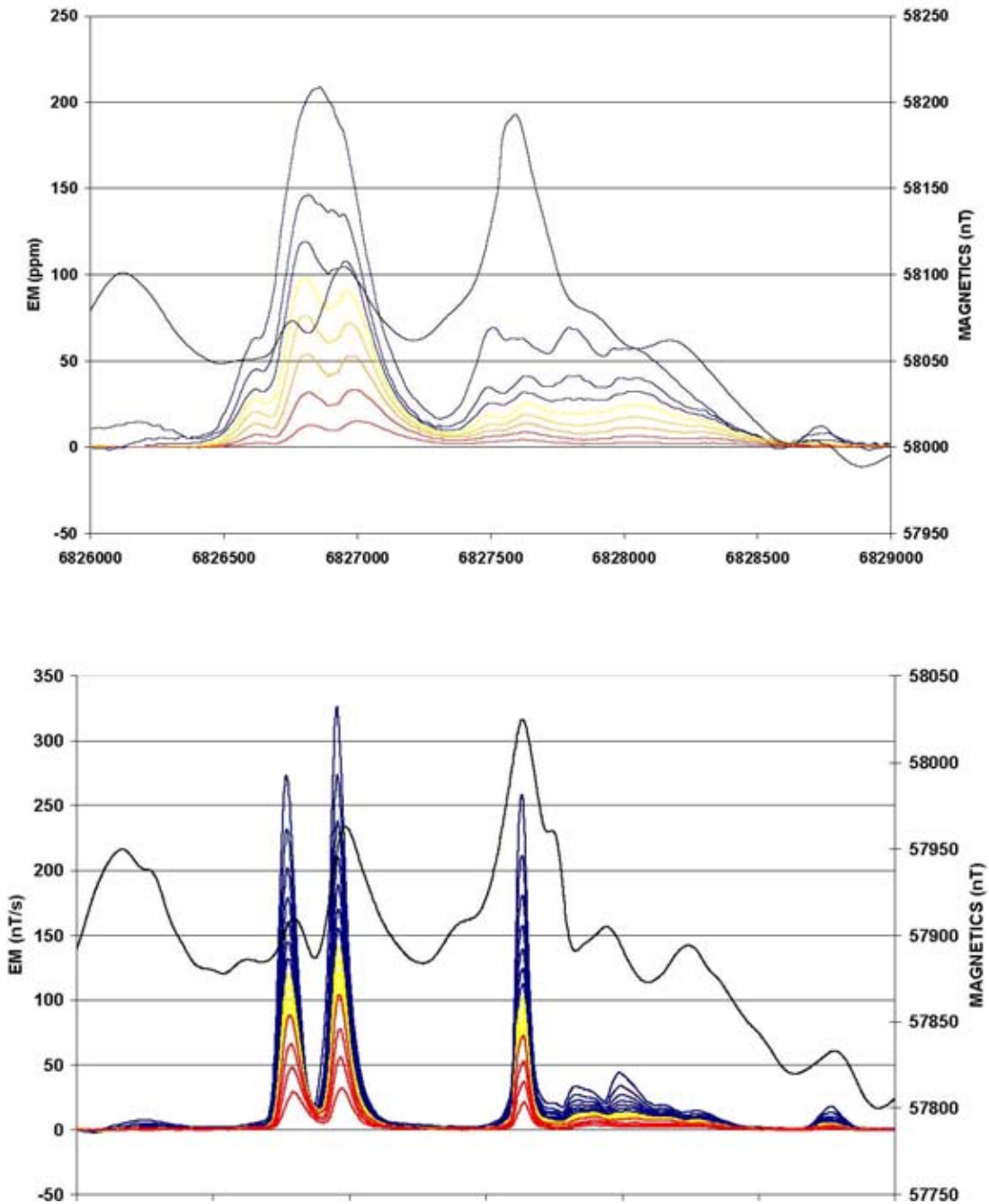
The footprint of AeroTEM at the earth's surface is roughly 50m on either side of transmitter

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 favour 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.





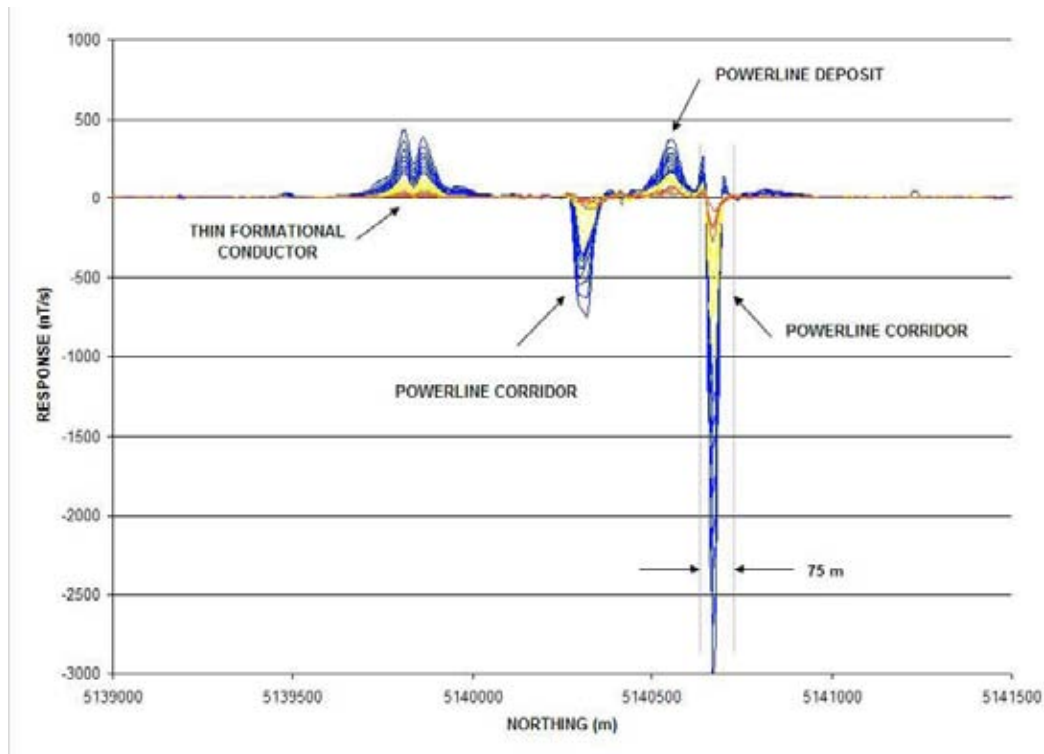
**Figure 2. Fixed-wing (upper) and AeroTEM (lower) comparison over the eastern limit of the Mesamax Deposit, a Ni-Cu-PGE zone located in the Raglan nickel belt and owned by Canadian Royalties. Both systems detected the Deposit further to the west where it is closer to surface.**

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 favourable 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.

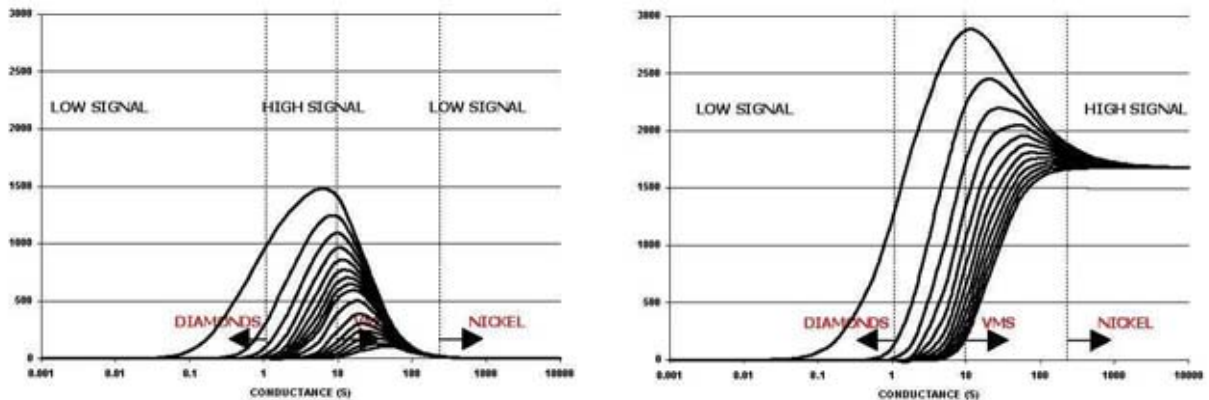
The peak response of a conductive target to an EM system is a function of the target conductance and the EM system base frequency. For time domain EM systems that measure only in the off-time, there is a drop in the peak response of a target as the base frequency is lowered for all conductance values 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 in phase 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.

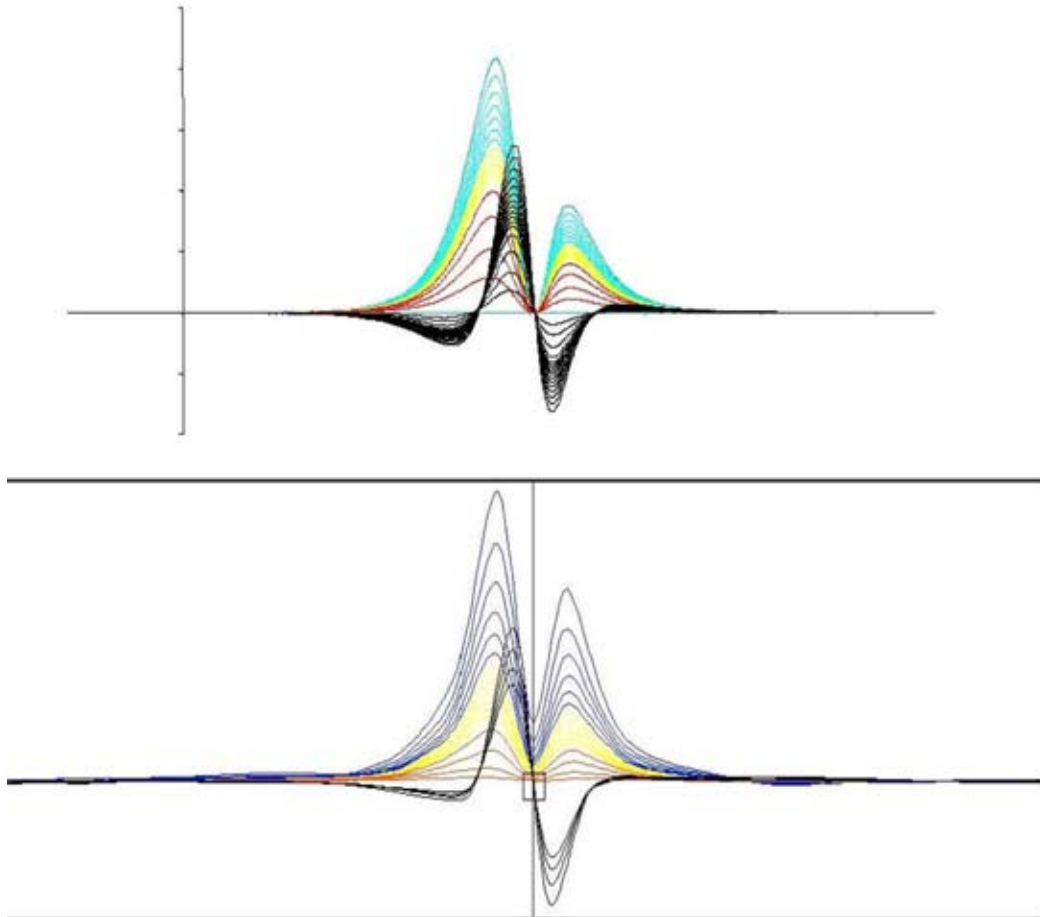
The on-time response assuming 100% removal of the measured primary field.

**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:



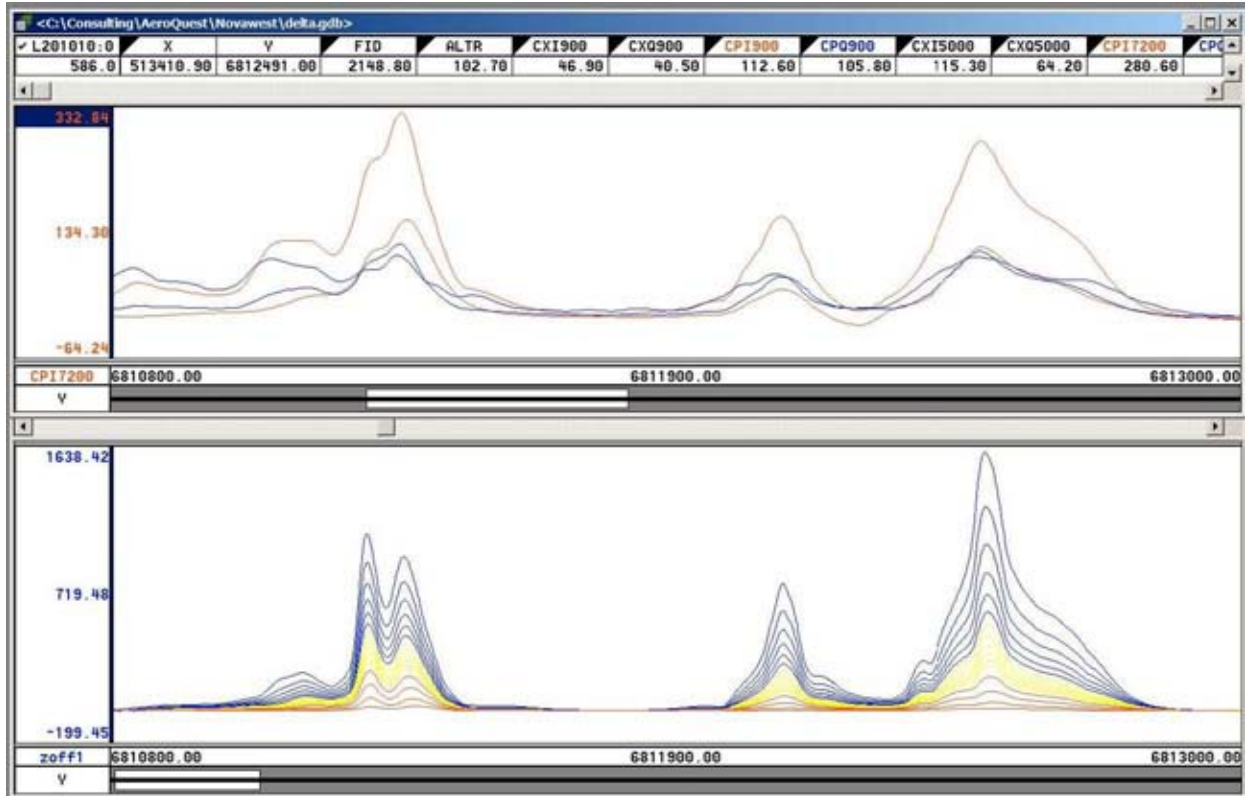
**Figure 5. Measured (lower) and modeled (upper) AeroTEM responses are compared for a thin steeply dipping conductor. The response is characterized by two peaks in the Z-axis coil, and a cross-over in the X-axis coil that is centered between the two Z-axis peaks. The conductor dips toward the higher 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 (Z-axis) 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 90 Hz
- Tx On Time – 1,833 (90 Hz)  $\mu$ s
- Tx Off Time – 3,667 (90 Hz)  $\mu$ s
- Loop Diameter - 12 m
- Peak Current - 455 A
- Peak Moment – 183,131 NIA
- Typical Z Axis Noise at Survey Speed = 5 nT/s peak to peak
- Sling Weight: 1000 lb
- Length of Tow Cable: 56.1 m
- Bird Survey Height: 30 m nominal

### Receiver

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

### Display & Acquisition

- AERODAS Digital recording at 120 samples per decay curve at a maximum of 300 curves per second (27.778  $\mu$ s channel width)
- ADAS 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 183.131 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.

## APPENDIX 6: CLAIM OWNERSHIP AND STATUS



Tenure #	Claim Name	Owner	Map #	Issued	Expires	Area (ha)
946458	CHITA B	146911 (100%)	0920	2012/feb/06	2013/feb/06	486.145
946469	CHITA A	139085 (100%)	0920	2012/feb/06	2013/feb/06	486.126
946470	CHITA C	139085 (100%)	0920	2012/feb/06	2013/feb/06	486.134
946471	CHITA D	139085 (100%)	0920	2012/feb/06	2013/feb/06	486.109
947074	EAST CHITA 8	139085 (100%)	0920	2012/feb/08	2013/feb/08	505.572
947086	CHITA 6	146911 (100%)	0920	2012/feb/08	2013/feb/08	505.314
947087	CHITA 7	146911 (100%)	0920	2012/feb/08	2013/feb/08	505.305
947090	CHITA 8	146911 (100%)	0920	2012/feb/08	2013/feb/08	505.297
947098		146911 (100%)	0920	2012/feb/08	2013/feb/08	303.266
949297	CHITA F	139085 (100%)	0920	2012/feb/14	2013/feb/14	486.103
949300	CHITA E	139085 (100%)	0920	2012/feb/14	2013/feb/14	465.594
950241	SOUTH CHITA 2	146911 (100%)	0920	2012/feb/17	2013/feb/17	40.518
950248	SOUTH CHITA 1	139085 (100%)	0920	2012/feb/17	2013/feb/17	384.955
950251	SOUTH CHITA 5	139085 (100%)	0920	2012/feb/17	2013/feb/17	506.670
950252	SOUTH CHITA 6	139085 (100%)	0920	2012/feb/17	2013/feb/17	425.792
950254	SOUTH CHITA 7	139085 (100%)	0920	2012/feb/17	2013/feb/17	60.814
685963	NEW CHITA 12	139085 (100%)	0920	2009/dec/15	2014/sep/23	485.113
685964	NEW CHITA 11	139085 (100%)	0920	2009/dec/15	2014/sep/23	485.123
685965	NEW CHITA 13	139085 (100%)	0920	2009/dec/15	2014/sep/23	404.236
705662	NEW GEOLOGICAL MODEL 1	139085 (100%)	0920	2010/feb/05	2013/nov/13	485.397
705663	NEW GEOLOGICAL MODEL 2	139085 (100%)	0920	2010/feb/05	2013/nov/13	20.220
705664	NEW GEOLOGICAL MODEL 3	139085 (100%)	0920	2010/feb/05	2013/nov/13	404.720
705665	NEW GEOLOGICAL MODEL 4	139085 (100%)	0920	2010/feb/05	2013/nov/13	506.133
705666	NEW GEOLOGICAL MODEL 5	139085 (100%)	0920	2010/feb/05	2013/nov/13	506.156
705667	NEW GEOLOGICAL MODEL 6	139085 (100%)	0920	2010/feb/05	2013/nov/13	506.172
705668	NEW GEOLOGICAL MODEL 7	139085 (100%)	0920	2010/feb/05	2013/nov/13	506.166
705669	NEW GEOLOGICAL MODEL 8	139085 (100%)	0920	2010/feb/05	2013/nov/13	506.161
947076	CHITA 5	146911 (100%)	0920	2012/feb/08	2013/nov/13	505.877
947081	CHITA 1	146911 (100%)	0920	2012/feb/08	2013/nov/13	283.313
947085	EAST CHITA 2	139085 (100%)	0920	2012/feb/08	2013/nov/13	506.052
947088	EAST CHITA 4	139085 (100%)	0920	2012/feb/08	2013/nov/13	485.554
947091	EAST CHITA 7	139085 (100%)	0920	2012/feb/08	2013/nov/13	505.565
947092	EAST CHITA 6	139085 (100%)	0920	2012/feb/08	2013/nov/13	505.566
947093	EAST CHITA 9	139085 (100%)	0920	2012/feb/08	2013/nov/13	445.050
947094		146911 (100%)	0920	2012/feb/08	2013/nov/13	20.232
947096	EAST CHITA 1	139085 (100%)	0920	2012/feb/08	2013/nov/13	465.572
947099	EAST CHITA 10	139085 (100%)	0920	2012/feb/08	2013/nov/13	506.287
947100	EAST CHITA 11	139085 (100%)	0920	2012/feb/08	2013/nov/13	485.967
949289	CHITA G	146911 (100%)	0920	2012/feb/14	2013/nov/13	465.171
949292	CHITA H	146911 (100%)	0920	2012/feb/14	2013/nov/13	486.054
950249	SOUTH CHITA 3	139085 (100%)	0920	2012/feb/17	2013/nov/13	506.515
950250	SOUTH CHITA 4	139085 (100%)	0920	2012/feb/17	2013/nov/13	486.254
685903	NEW CHITA 1	139085 (100%)	0920	2009/dec/15	2014/nov/13	505.686
685904	NEW CHITA 2	139085 (100%)	0920	2009/dec/15	2014/nov/13	444.985
685923	NEW CHITA 3	139085 (100%)	0920	2009/dec/15	2014/nov/13	505.716
685924	NEW CHITA 4	139085 (100%)	0920	2009/dec/15	2014/nov/13	505.941
685925	NEW CHITA 5	139085 (100%)	0920	2009/dec/15	2014/nov/13	445.243

685926	NEW CHITA 6	139085 (100%)	092O	2009/dec/15	2014/nov/13	404.772
685927	NEW CHITA 7	139085 (100%)	092O	2009/dec/15	2014/nov/13	505.495
685928	NEW CHITA 8	139085 (100%)	092O	2009/dec/15	2014/nov/13	505.495
685943	NEW CHITA 9	139085 (100%)	092O	2009/dec/15	2014/nov/13	343.803
685944	NEW CHITA 10	139085 (100%)	092O	2009/dec/15	2014/nov/13	505.922
589643	CHITA 2	146911 (100%)	092O	2008/aug/07	2015/sep/23	121.396
704744	NEW CHITA 10A	139085 (100%)	092O	2010/jan/25	2015/sep/23	80.951

## APPENDIX 7: FINAL DELIVERABLES

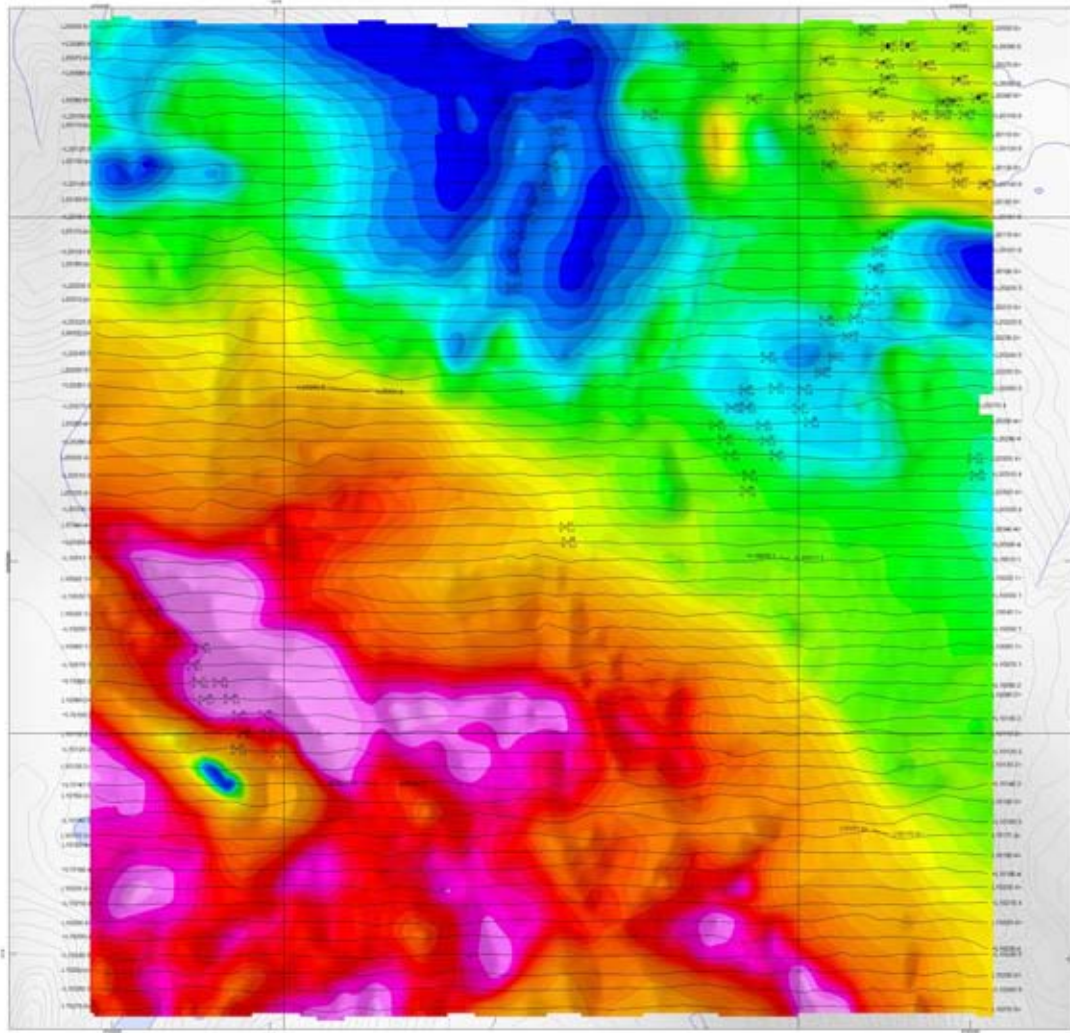


Figure 1 TMI – Total Magnetic Intensity colour grid with contours and EM anomaly symbols

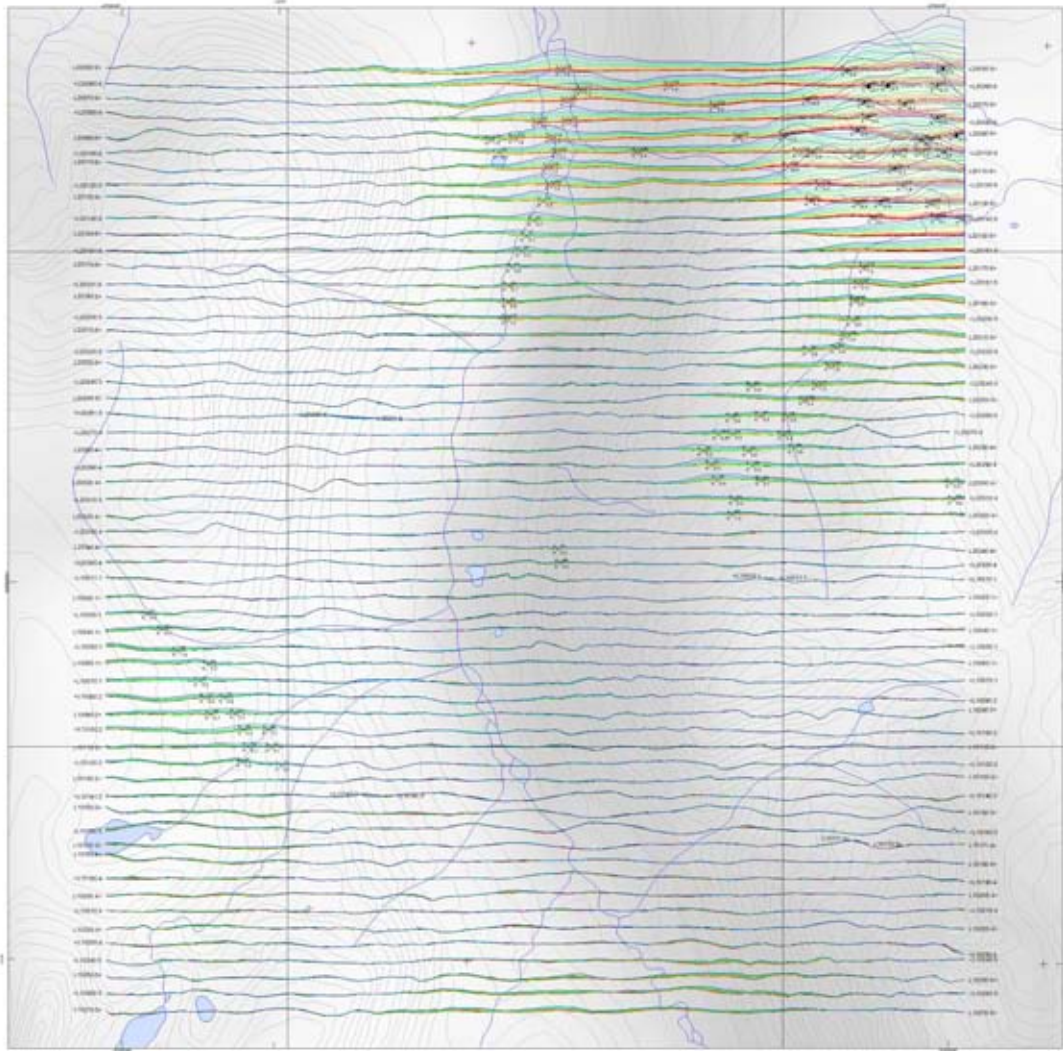


Figure 2. EM Profiles – Profiles of 2-12 Z-axis EM channels with Flight Path and EM anomaly symbols



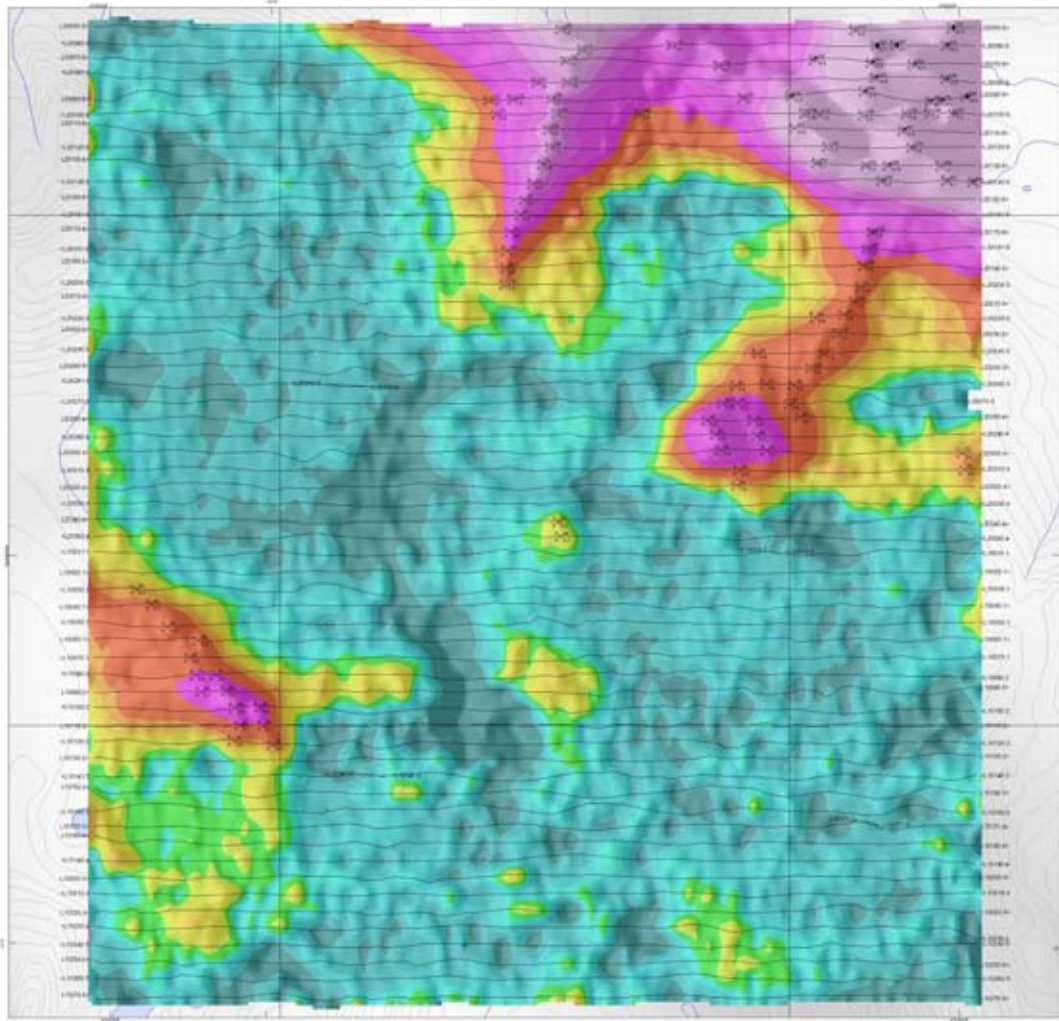
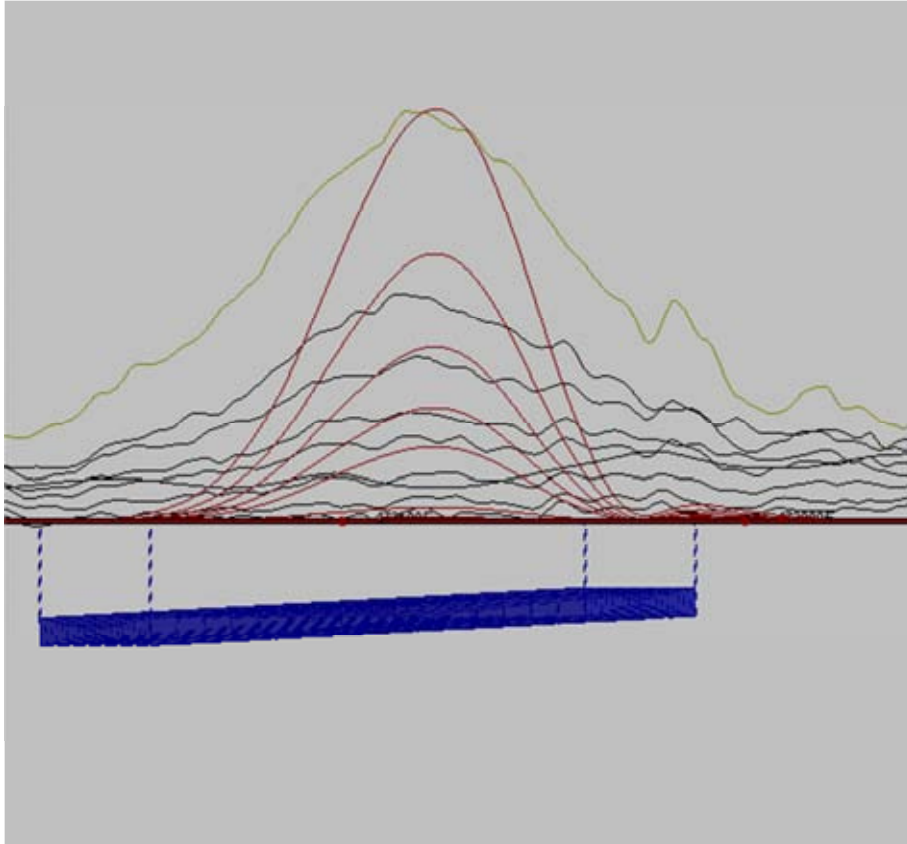


Figure 3. ZOFF1 – Early Time EM Channel grid with contours and EM anomaly symbols

## MAXWELL MODEL

Maxwell is a software application developed for the treatment of electromagnetic geophysical data. The software was created by EMIT (Electromagnetic Imaging Technology). The application is primarily used for geophysical inversion and forward modelling of plate models and overburden responses.

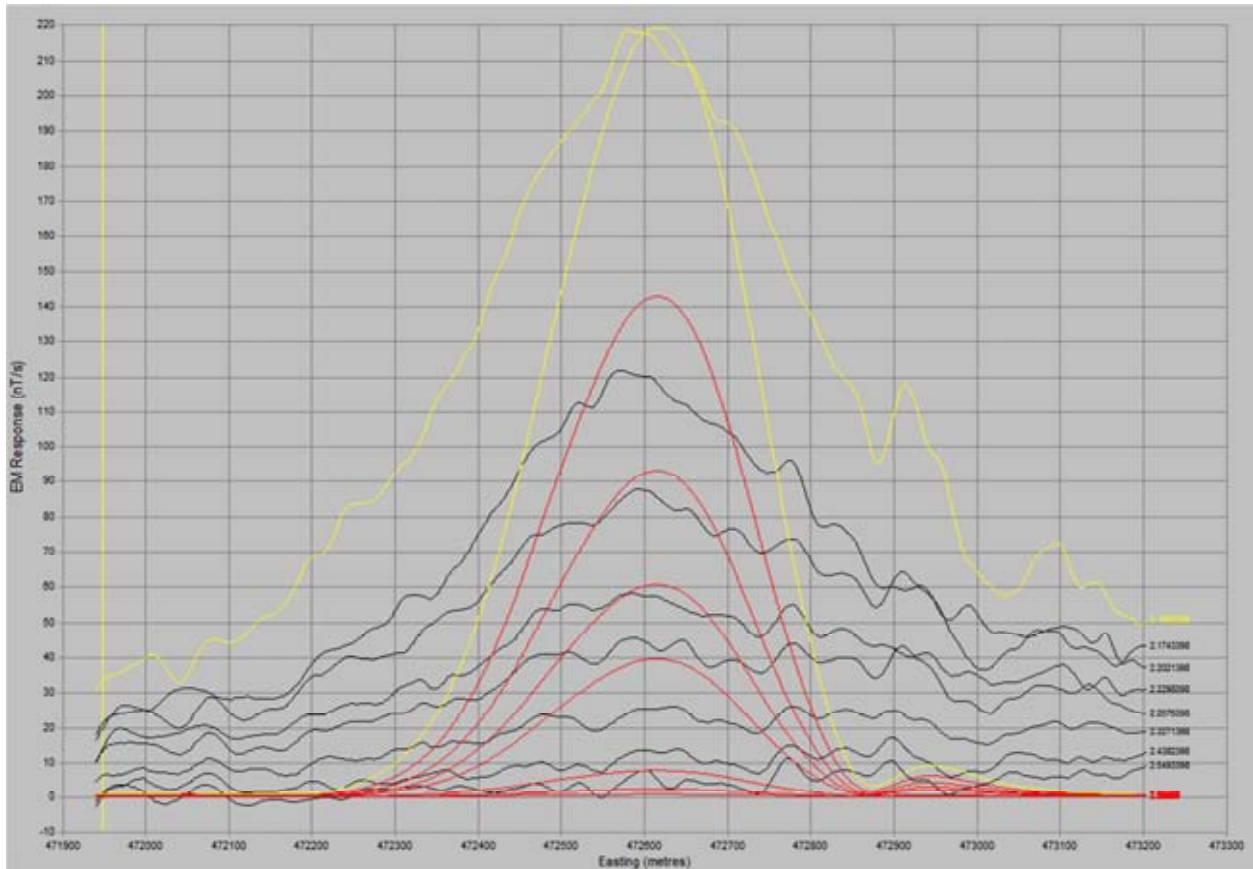
The discrete electromagnetic response seen on Line 20120 (Easting 472870m Northing 5682405m) was imported and plate modelled in Maxwell.



### Plate Parameters:

- Depth: 83 metres
- Dip: 3 degrees
- Dip direction: 290 degrees
- Rotation: 0 degrees
- Dip extent: 700m
- Conductivity: 0.044S
- Thickness: 35m





The above image displays the actual earth response measured by the AeroTEM IV system (Black) and modeled plate response (Red). The yellow trace indicates the beginning of time channels used for modelling (Off time Channel 1). The plate parameters show moderate correlation to the early time channel response, though any conductive overburden was not modeled. The input and output parameters for this model can be found in the Maxwell folder on the final DVD.

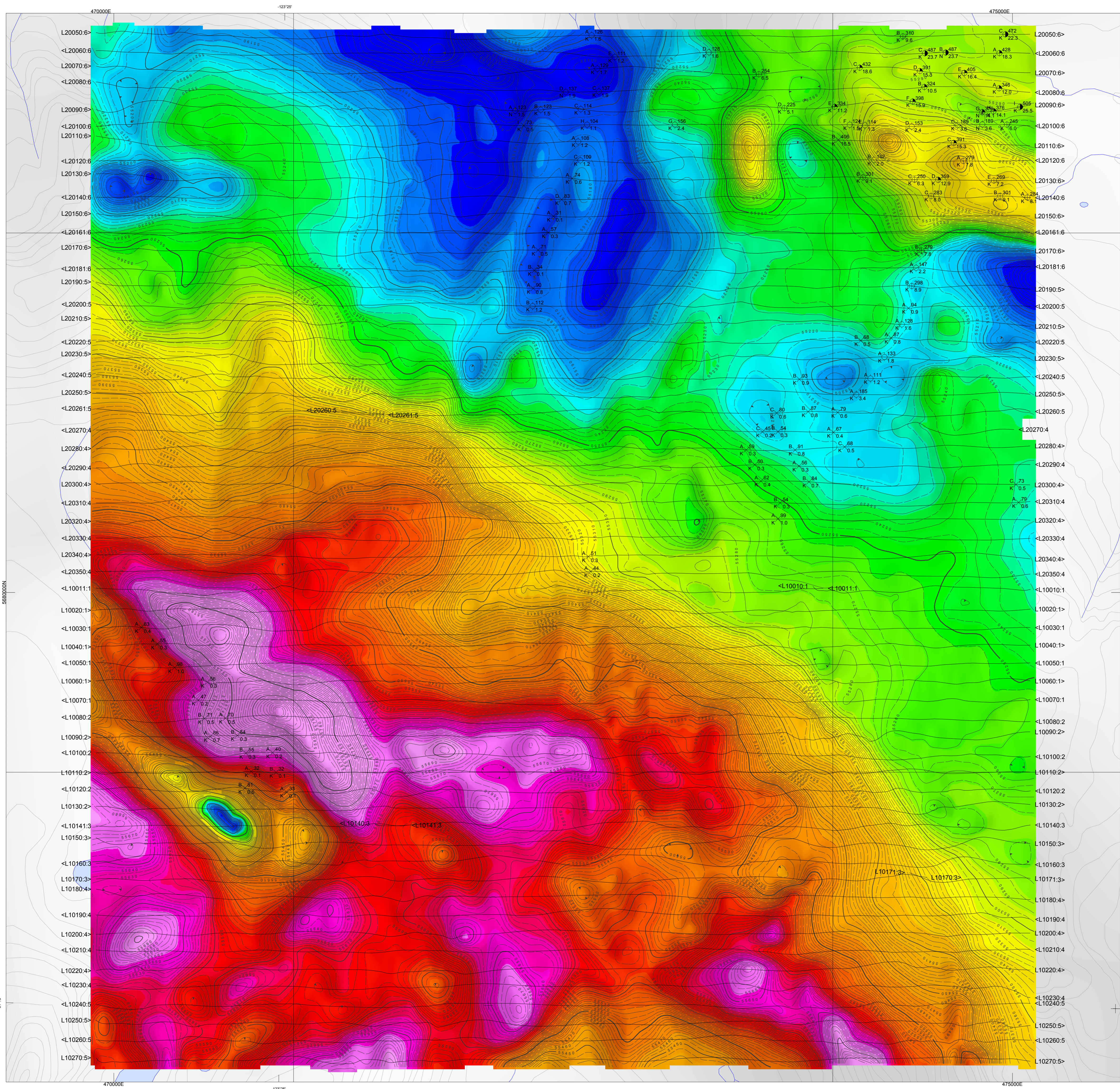
#### Input:

- MaxInvest\_12011\_AeroTEM4\_90Hz.mcg – Maxwell configuration file containing system parameters and time channels.
- 12-011\_MaxInvestments\_20120.gdb – Subset Geosoft Database windowed to anomaly boundaries

#### Output:

- ArcView Shapefile
- Plate Model Corner Points (ASCII)
- Geosoft Polygon
- Geosoft XYZ



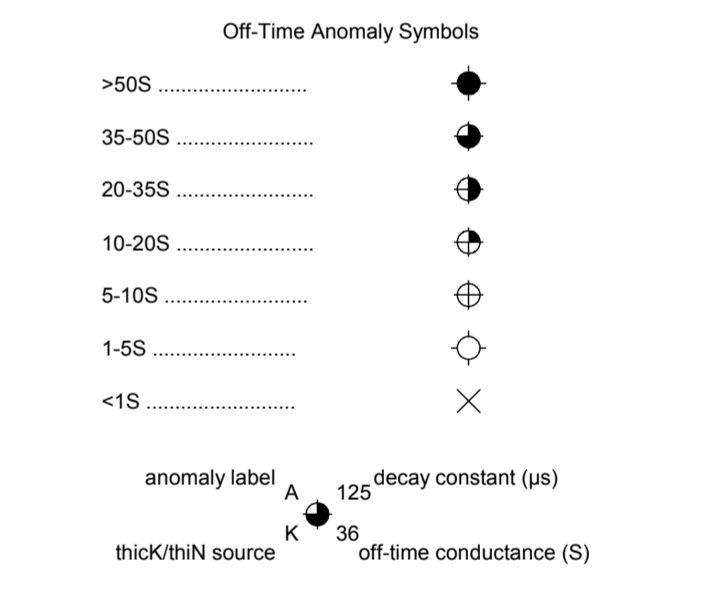
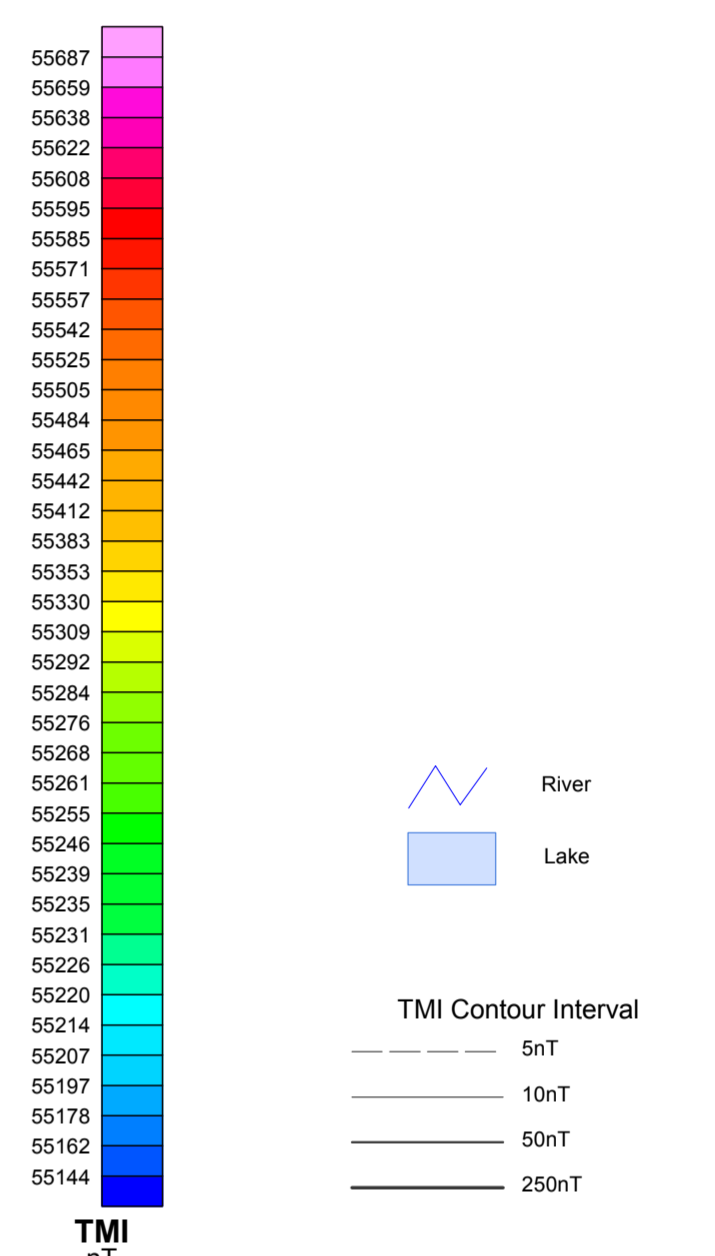


Topo data base and contours derived from NASA 90m SRTM (Shuttle Radar Topography Mission) data  
 Inset data derived from Natural Resources Canada 'Atlas of Canada Base Maps'

This map accompanies the technical report entitled 'Report on a Helicopter-Borne Magnetic and EM survey, Big Lake, BC by Aeroquest Airborne, March 2012'

Grid North  
 WGS 84 - Zone10N

Scale 1:10,000,000



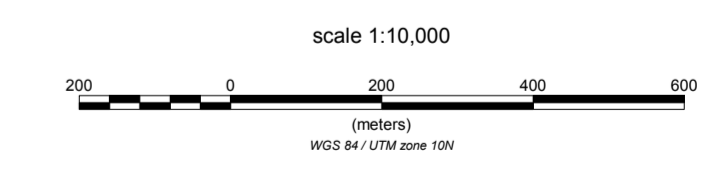
**SURVEY SPECIFICATIONS:**  
 Survey flown: Feb 20th - Feb 23rd, 2012  
 Traverse/Tie line spacings: 100/1000 meters  
 Traverse/tie line direction: (90°/270°)/(0°/180°)  
 Nominal helicopter height: 80 meters  
 Aircraft: Aerospatiale A-Star 350B2 (C-GPWZ)

**INSTRUMENTATION:**  
 Data acquisition: ADAS  
 Magnetometer: Geometrics G-823A caesium vapour  
 Installation: Towed bird 33 m above EM bird  
 Sensitivity: 002 nanoTesla  
 Electromagnetics: AeroTEM IV System (LIMA)  
 Configuration: Towed bird

**NAVIGATION:**  
 Navigation: Differential Global Positioning System (DGPS)  
 Navigation equipment: AGNAV with MID-TECH RX400p receiver  
 Radar Altimeter: Terra TRA3000/TRI-30

**POSITIONING:**  
 Datum: WGS84  
 Major Axis: 6378137.000  
 Inverse Flattening: 298.25722

**MAP PROJECTION:**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 123°W (Zone 10N)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m



Revolver Resources Inc  
 Big Lake, BC

**TOTAL MAGNETIC INTENSITY**

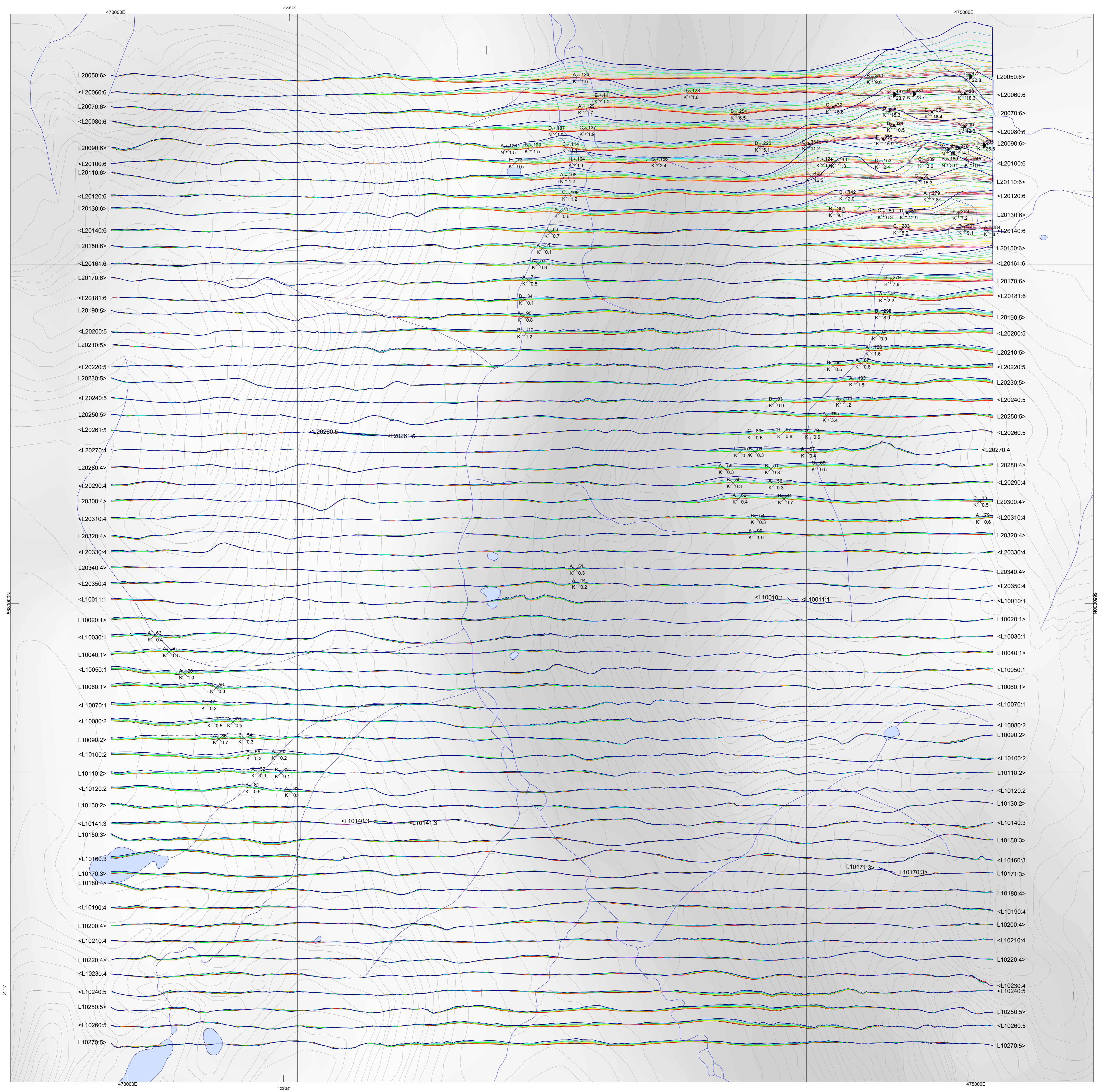
**Taseko Lake**

NTS 092003\_06

7877 Bath Road, Mississauga, ON, CANADA L4T 3T1  
 Tel: (905) 672-6129 Fax: (905) 672-7083  
 www.aeroquestairborne.com

March 2012

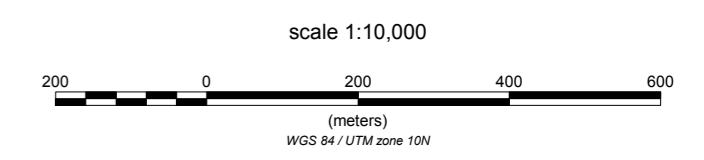




- AeroTEM Z Off-Time Profiles**  
 positive excursion to top and right, 1mm=20nT/s
- Z2 Off-Time Channel 152.5  $\mu$ s
  - Z3 Off-Time Channel 180.2  $\mu$ s
  - Z4 Off-Time Channel 208.2  $\mu$ s
  - Z5 Off-Time Channel 235.8  $\mu$ s
  - Z6 Off-Time Channel 291.3  $\mu$ s
  - Z7 Off-Time Channel 374.7  $\mu$ s
  - Z8 Off-Time Channel 458.0  $\mu$ s
  - Z9 Off-Time Channel 541.3  $\mu$ s
  - Z10 Off-Time Channel 652.5  $\mu$ s
  - Z11 Off-Time Channel 751.3  $\mu$ s
  - Z12 Off-Time Channel 944.1  $\mu$ s

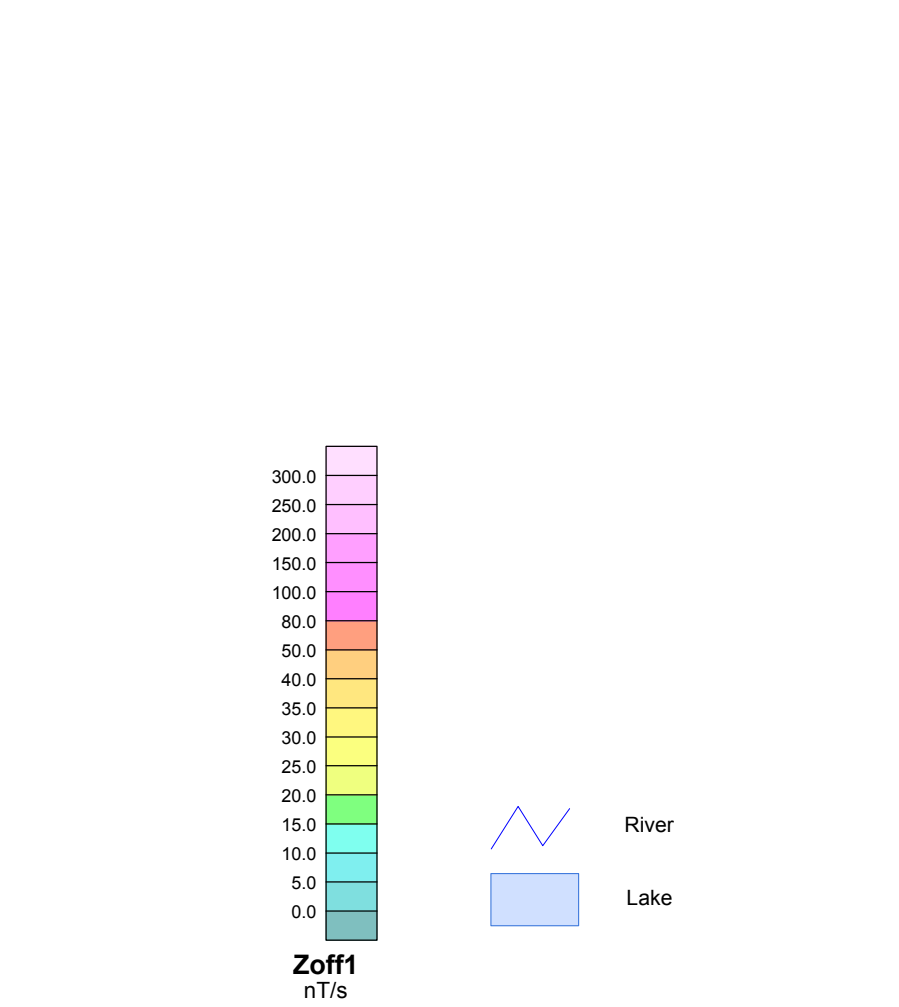
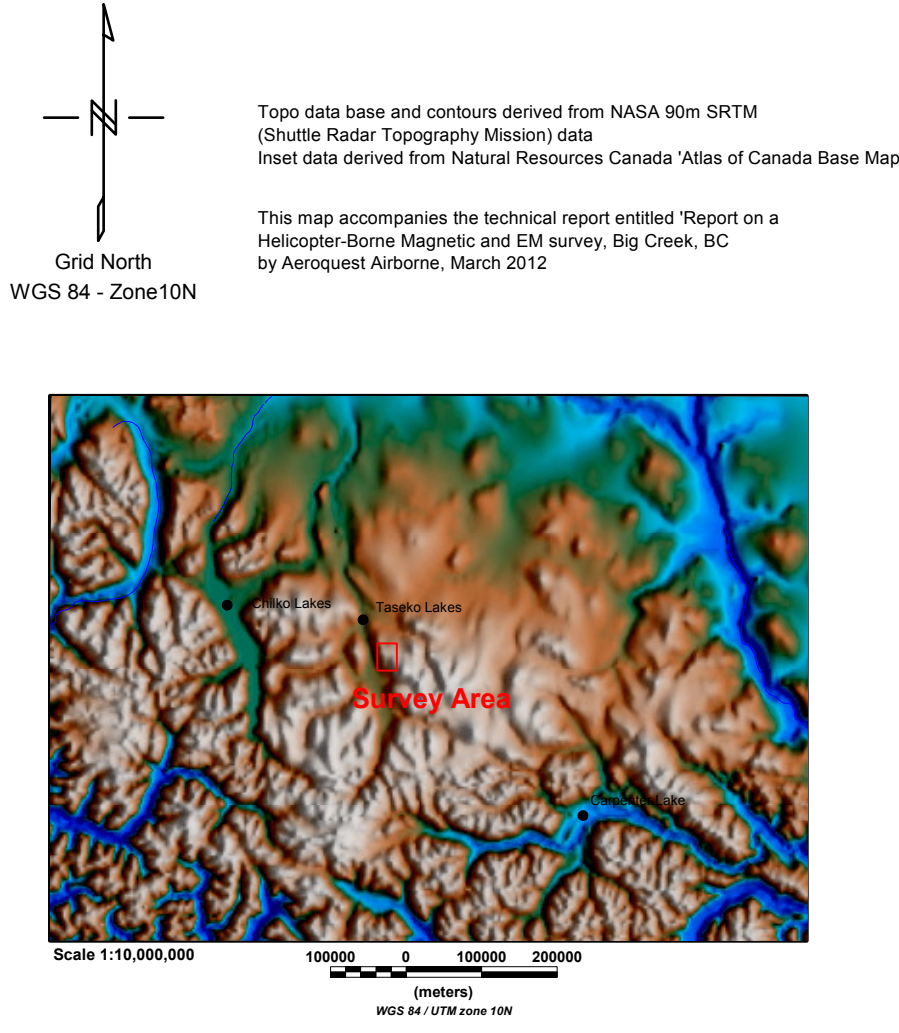
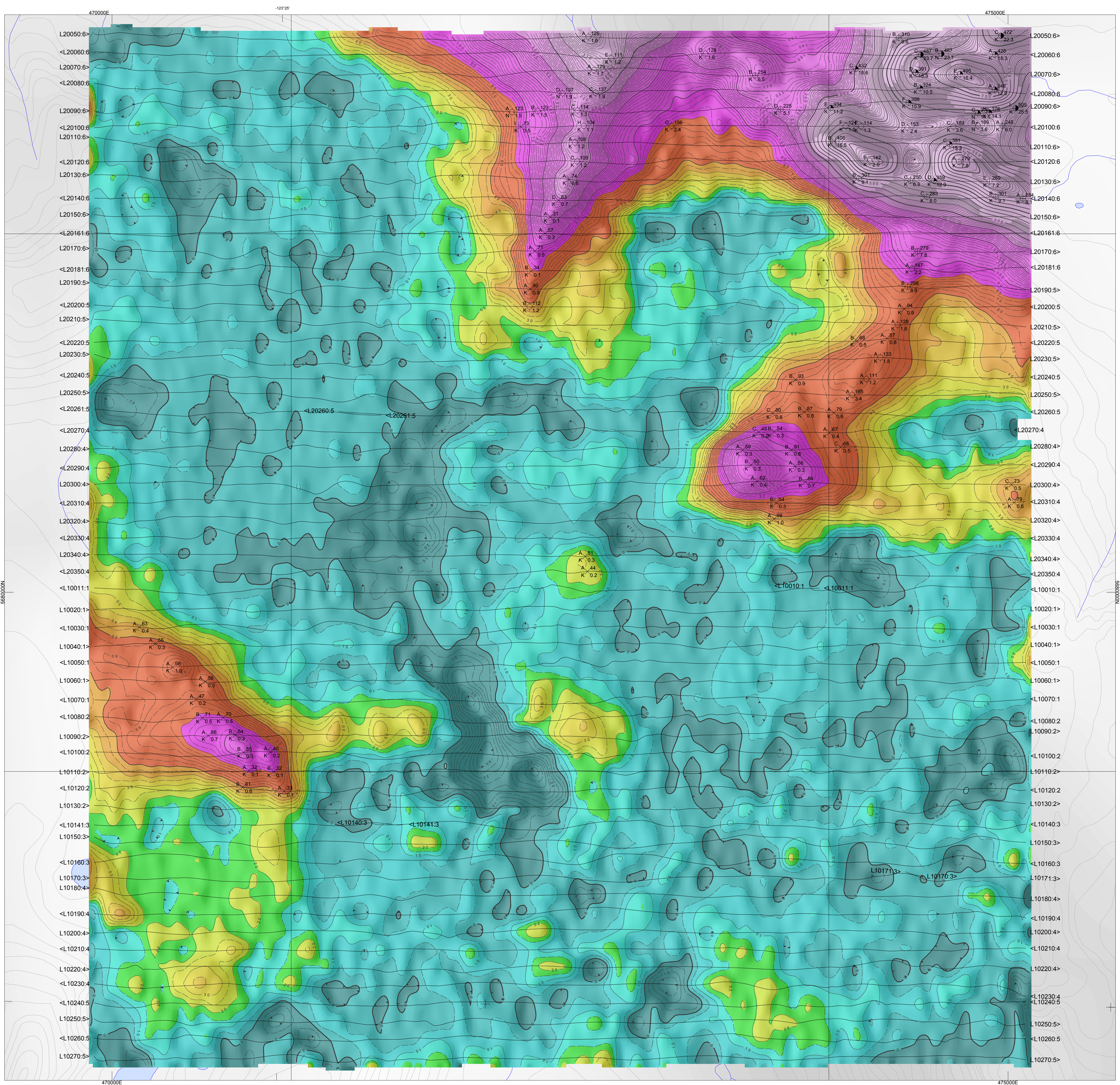
- Off-Time Anomaly Symbols**
- >50S ..... ●
  - 35-50S ..... ●
  - 20-35S ..... ●
  - 10-20S ..... ●
  - 5-10S ..... ●
  - 1-5S ..... ●
  - <1S ..... ×
- anomaly label    A    125    decay constant ( $\mu$ s)  
 K    56    off-time conductance (S)  
 thick/thin source

**SURVEY SPECIFICATIONS:**  
 Survey flow: Feb 20th - Feb 23rd, 2012  
 Traverse/Tie line spacings: 100/1000 meters  
 Traverse/tie line direction: (90°/270°)/(0°/180°)  
 Nominal helicopter height: 80 meters  
 Aircraft: Aerospatiale A-Star 350B2 (C-GPWZ)  
**INSTRUMENTATION:**  
 Data acquisition: ADAS  
 Magnetometer: Geometrics G-823A caesium vapour  
 Installation: Towed bird 33 m above EM bird  
 Sensitivity: .002 nanoTesla  
 Electromagnetics: AeroTEM IV System (LIMA)  
 Configuration: Towed bird  
**NAVIGATION:**  
 Navigation: Differential Global Positioning System (DGPS)  
 Navigation equipment: AGNAV with MID-TECH RX400p receiver  
 Radar Altimeter: Terra TRA3000/TRI-30  
**POSITIONING**  
 Datum: WGS84  
 Major Axis: 6378137.000  
 Inverse Flattening: 298.25722  
**MAP PROJECTION**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 123°W (Zone 10N)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m



Revolver Resources Inc  
 Big Lake, BC  
**AEROTEM OFF-TIME  
 PROFILES 2-12**  
 Taseko Lake  
 NTS 092003, 06





**ZOFF1 Contour Interval**

- 5nT/s
- 10nT/s
- 50nT/s
- 250nT/s

**Off-Time Anomaly Symbols**

- >50S
- 35-50S
- 20-35S
- 10-20S
- 5-10S
- 1-5S
- <1S

anomaly label  $\frac{A}{K}$  125 decay constant ( $\mu$ s)

thick/thin source  $\frac{A}{K}$  36 off-time conductance (S)

**SURVEY SPECIFICATIONS:**  
 Survey flown: Feb 20th - Feb 23rd, 2012  
 Traverse/Tie line spacings: 100/1000 meters  
 Traverse tie line direction: (90°/270°/0°/180°)  
 Nominal helicopter height: 80 meters  
 Aircraft: Aerospatiale A-Star 350B2 (C-GPWZ)

**INSTRUMENTATION:**  
 Data acquisition: ADAS  
 Magnetometer: Geometrics G-823A caesium vapour  
 Installation: Towed bird 33 m above EM bird  
 Sensitivity: .002 nanoTesla  
 Electromagnetics: AeroTEM IV System (LIMA)  
 Configuration: Towed bird

**NAVIGATION:**  
 Navigation: Differential Global Positioning System (DGPS)  
 Navigation equipment: AGNAV with MID-TECH RX400p receiver  
 Radar Altimeter: Terra TRA3000/TRI-30

**POSITIONING**  
 Datum: WGS84  
 Major Axis: 6378137.000  
 Inverse Flattening: 298.25722

**MAP PROJECTION**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 123°W (Zone 10N)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m

scale 1:10,000

Revolver Resources Inc  
 Big Lake, BC

**AEROTEM Z1 OFF-TIME**  
 Time After TX Off 124.7 $\mu$ s

**Taseko Lake**  
 NTS 092003, 06