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**REPORT ON A HELICOPTER-BORNE  
TIME DOMAIN ELECTROMAGNETIC AND MAGNETIC  
SURVEY  
AT PICKLE LAKE WEST, ONTARIO**



**Project Name: Pickle Lake West**

**Project Number: 2019-08-30**

**Client: Ardiden Canada Ltd.**

**Contractor:**  **BECI**  
exploration consulting

**Date: September 8, 2019**

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## **1.0 INTRODUCTION**

### **1.1 CONTRACTOR**

Balch Exploration Consulting Inc. (“BECI”, the “Contractor”) having its head office at 11500 Fifth Line, Rockwood, Ontario, Canada, N0B 2K0, has performed a helicopter time domain electromagnetic and magnetic survey using the AirTEM™ system developed by Triumph Instruments.

### **1.2 CLIENT**

Ardiden Canada Ltd., a company incorporated under the provincial laws of Ontario, and having its head office at 684 Squier Street, Thunder Bay, Ontario, P7B 4A8 (hereinafter called the “Client”).

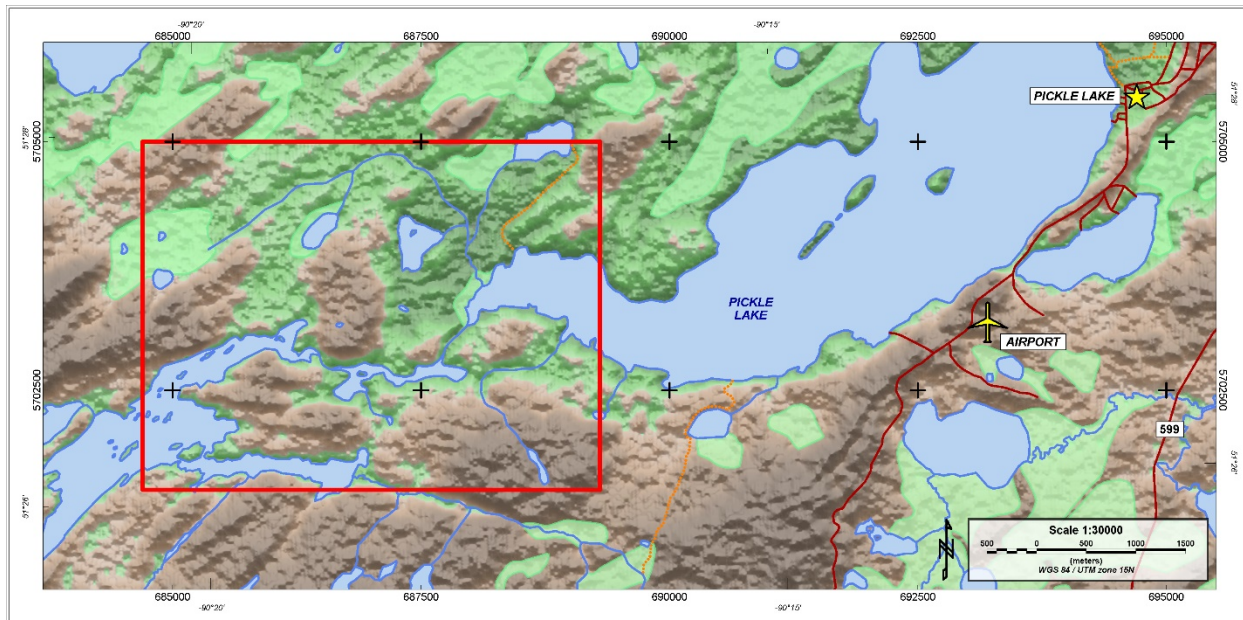
### **1.3 SURVEY OBJECTIVES**

For the West survey block the objective is to identify magnetic and or conductive sources that could be related to VMS (volcanogenic massive sulphide) or Ni-Cu-PGE mineralization.

## **2.0 SURVEY AREA**

### **2.1 LOCATION**

The West survey block is located approximately 5 km west of Pick Lake, Ontario. The West block is within NTS topographic sheet 052-O08. Figure 1 shows the location of the survey block.



**Figure 1 – Survey area showing blocks that were flown.**

## **2.2 ACCESS**

The closest road is Highway 599 located 8.5 km east of the center of the block. Access would be via quad-runner or snowmobile.

## **2.3 INFRASTRUCTURE**

The Pickle Lake airport is located 6.5 km due east of the center of the survey block. There is a major power line corridor running across the central portion of the survey block with a direction of approximately 260 deg azimuth.

## **2.4 CLIMATE**

The average daily temperature varies from a high of +23.4°C during July to a low of -26.5°C during January. During the survey, the weather was cool (10 °C) and overcast with winds under 5 knots.

## **2.5 TOPOGRAPHY**

The topography is relatively flat, with a total variation of less than 30m (increasing from east to west) over the survey area. There are a few lakes within and bordering the survey block area.

## **2.6 MINERAL AND MINING CLAIMS**

The mineral claims are shown in Figure 2. The Client mineral claims are shown in magenta.

## **2.7 FLIGHT AND TIE LINES**

The flight lines are shown in Figure 3 and summarized in Table 1.



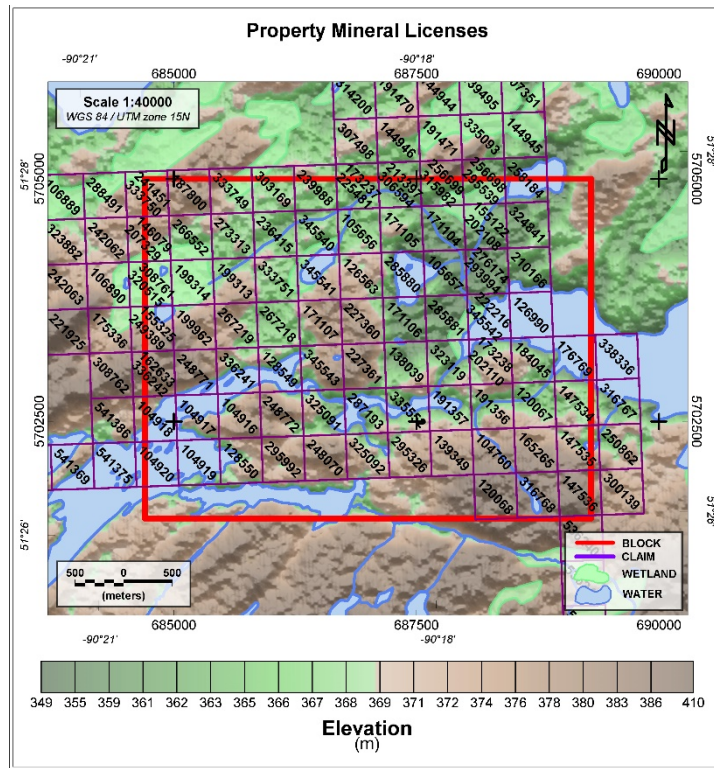


Figure 2 – The mineral claims within the West survey block.

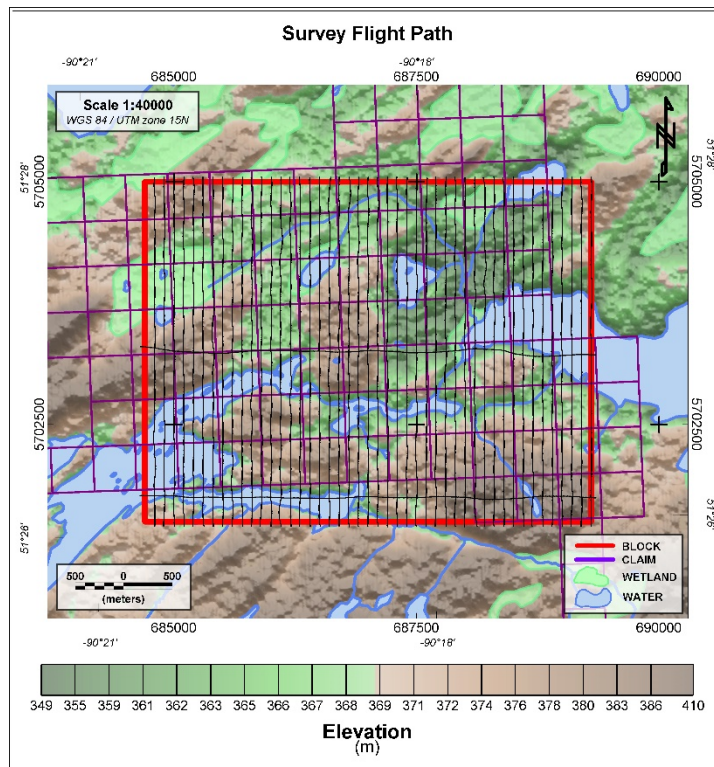


Figure 3 – Flight lines for the West survey block.

Survey Block	Area (km <sup>2</sup> )	Line Type	Planned No. of Lines	Line Spacing (m)	Line Orientation	Nominal Survey Height (m)	Total Planned (km)	Total Actual (km)
West	16.1	Survey	47	100	0°/180°	40	164.5	167.4
		Tie	3	1,500	90°/270°	40	13.8	14.2
		<b>Total</b>					<b>178.3</b>	<b>181.6</b>

Table 1 – Summary of flight and tie line specifications.

## 2.8 DATUM AND PROJECTION

The survey was flown using the WGS-84 Datum. The Datum used to produce this report as well as the map products, grids and database is WGS-84. The projection is UTM, ZONE 15 N. All references to UTM coordinates in this report are based on the WGS-84 Datum.

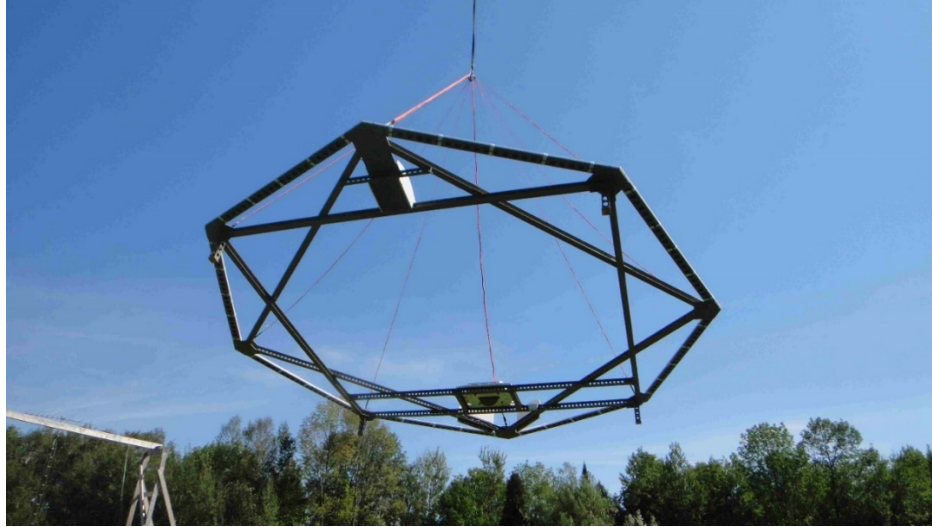
## 3.0 SURVEY SYSTEM

The survey system is comprised of an electromagnetic airframe and magnetic sensor housing connected to the helicopter via a tow cable and related and ancillary electronics and sensors inside the helicopter to control navigation, power and survey height. Combined, this system measures the response from sub-surface conductors containing minerals such as pyrrhotite and pyrite and the magnetic response from features containing minerals such as magnetite. The positions of these responses are measured using a differential GPS antenna and receiver. Flight height is measured by radar altimeter.

### 3.1 ELECTROMAGNETIC SYSTEM

The electromagnetic system (Figure 4) was developed by Triumph Instruments (Triumph) and is known as AirTEM™, a helicopter time domain electromagnetic (HTEM) system that is designed for mineral exploration, oil & gas exploration and geologic mapping. AirTEM™ is based on the concept of a concentric transmitter and receiver geometry originally developed by Wally Boyko.

The AirTEM™ (TS-150) system features an 8.54 m diameter transmitter weighing approximately 500 Kg and producing up to 150,000 Am<sup>2</sup> in transmitted power. The system records the full waveform and “X”, “Y” and “Z” coil measurements for improved interpretation of complex conductor responses. Measurements of the total magnetic field are also provided.



**Figure 4 – The Triumph AirTEM™ TS-150 HTEM System.**

#### **Features**

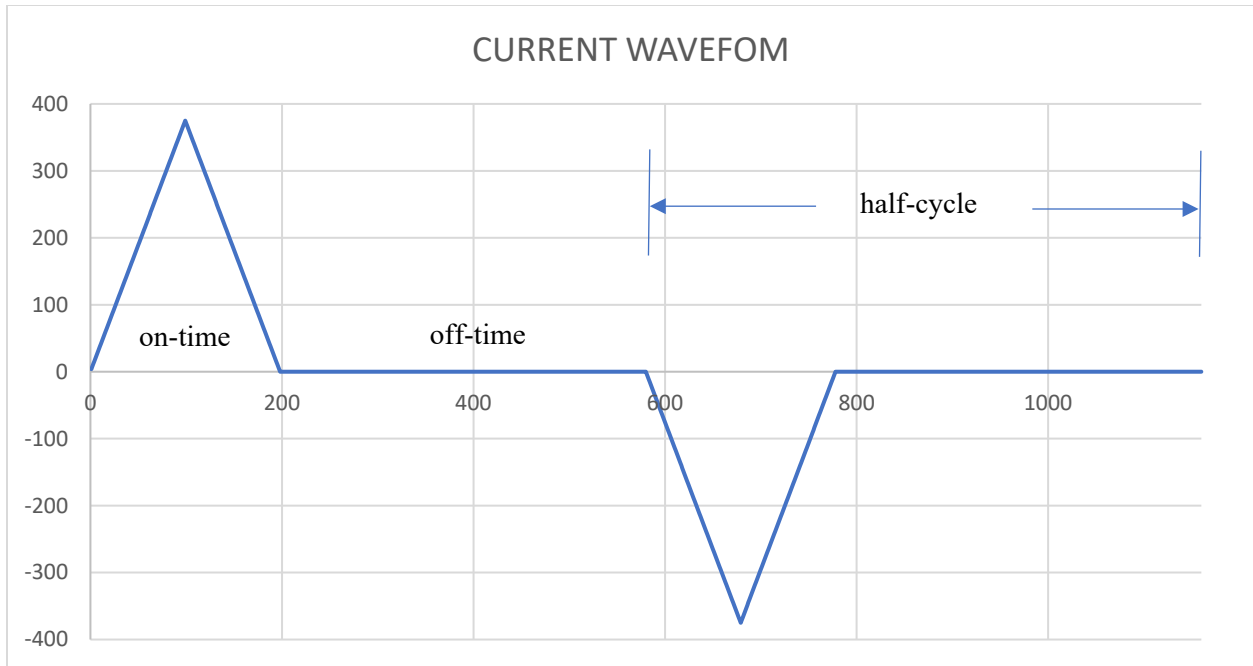
- Rigid concentric geometry
- Full waveform recording
- Software selectable base frequency
- Software selectable on-time period
- dB/dt off-time and on-time profiles
- Total magnetic field

#### **Advantages**

- Excellent early off-time response
- On-time conductance discrimination
- Excellent performance in rugged terrain
- Direct drilling of targets
- Improved nomogram correlation
- Interpretation software readily available

### **3.2 SYSTEM WAVEFORM**

The AirTEM™ system uses a bipolar linear triangular pulse as shown in Figure 5. The on-time pulse is 33% of the half-cycle. The up-going and down-going portions of the pulse are 95% symmetric with the down-going pulse being slightly shorter in time duration.



**Figure 5 – The transmitter full cycle waveform is bi-polar and triangular with 95% on-time linearity.**

### 3.3 BASE FREQUENCY

This survey was flown using a 90 Hz base frequency. At this frequency the bi-polar waveform produces half-cycles 180 times per second. The total half cycle period is the inverse of 180 Hz or 5,556  $\mu$ s. For a one third duty cycle the on-time pulse is 1,850  $\mu$ s in duration and the off-time pulse is 3,704  $\mu$ s.

The data is stacked to a 10 Hz output sample rate. Each stack is the average of 18 half-cycles, 9 positive and 9 negative. The negative half-cycles are rectified before being added to the positive cycles. The rectified and stacked half-cycles are stored at the 10 Hz sample rate.

The half-cycle is sampled at 105 kHz or one sample every 9.48  $\mu$ s producing 580 half-cycle samples, 193 during the transmitter on-time and 387 during the off-time. During the on-time there are 99 up-going samples and 94 down-going samples.

### 3.4 TIME CHANNELS

The time channels are defined on a logarithmic scale starting at channel 10. Channels 1 through 9 are linearly spaced, have a 5  $\mu$ s width and start 10  $\mu$ s after the end of the on-time pulse. For a 90 Hz base frequency there are 41 off-time channels. The time channels used are listed in Table 2.

<u>Channel</u>	<u>Start time (ms)</u>	<u>Channel</u>	<u>Start time (ms)</u>
1	0.0100	26	0.4199
2	0.0150	27	0.4810
3	0.0200	28	0.5512
4	0.0250	29	0.6320
5	0.0300	30	0.7249
6	0.0350	31	0.8317
7	0.0400	32	0.9545
8	0.0450	33	1.0957
9	0.0500	34	1.2581
10	0.0557	35	1.4448
11	0.0622	36	1.6595
12	0.0698	37	1.9063
13	0.0784	38	2.1901
14	0.0884	39	2.5164
15	0.0998	40	2.8916
16	0.1130	41	3.3230
17	0.1281	42	3.8190
18	0.1455	43	4.3893
19	0.1655	44	5.0451
20	0.1885	45	5.7992
21	0.2150	46	6.6662
22	0.2454	47	7.6631
23	0.2803	48	8.8093
24	0.3205	49	10.1273
25	0.3667	50	11.6427

**Table 2 – Time channels for the TS-150.**

### **3.5 MAGNETIC SYSTEM**

The airborne magnetometer system consists of the housing, the sensor and control module and Larmour frequency counter. The counter output rate is 10 Hz in digital RS 232 format. Power is provided to the sensor electronics via a 28 VDC power cable on the tow cable which is terminated to a 5-pin connector at the magnetometer housing. This cable also contains conductors that carry the RS 232 signal.

### **3.6 MAGNETOMETER SENSOR**

The magnetometer sensor is a model CS-3 made by Scintrex Limited. It is an optical split-beam cesium magnetometer and consists of a sensor head with a 3-m cable connected to a sensor driver. The output of the sensor driver is a larmour frequency which is linearly proportional to the earth's magnetic field. The CS-3 is shown in Figure 6 and the sensor specifications are given in Table 3.



**Figure 6 – Scintrex CS-3 magnetometer sensor, cable and electronics.**

### **3.7 LARMOUR COUNTER**

The Larmour frequency is input into a frequency counter made by Triumph Instruments. The counter can convert the magnetic field to a theoretical accuracy of 0.2 pT. The output of the frequency counter is a digital value of the magnetic field with +/- 0.001 nT resolution. This value is transmitted to the EM console at a 10 Hz output rate.

The Larmour counter is not synchronized to the EM transmitter but is synchronized instead to the EM data system. This allows the frequency counter to average down the magnetic field caused by the on-time pulse from the EM transmitter. The noise resulting from lack of synchronization to the EM transmitter is removed using a high-cut frequency filter during processing which also removes the effects of drop-outs when the magnetometer sensor loses lock with the magnetic field (common during turn-arounds).

### **3.8 SENSOR HOUSING**

The magnetometer sensor housing is made from a thin-wall fiberglass tube (see Figure 7). The manufacturer is AeroComp of London, Ontario. Within the housing a two-axis gimbal holds the sensor and can be rotated in both the horizontal and vertical plane. The sensor was set to the point 45° degrees forward with a 25° azimuth for this survey. The housing contains the sensor driver electronics and the Larmour frequency counter.

<b>Operating Principal</b>	Self-oscillation split-beam Cesium Vapor (non-radioactive Cs-133)
<b>Operating Range</b>	15,000 to 105,000 nT
<b>Gradient Tolerance</b>	40,000 nT/meter
<b>Operating Zones</b>	10° to 85° and 95° to 170°
<b>Hemisphere Switching</b>	a) Automatic b) Control voltage c) Manual
<b>Sensitivity</b>	0.0006 nT $\sqrt{\text{Hz}}$ rms
<b>Noise Envelope</b>	Typically, 0.002 nT P-P, 0.1 to 1 Hz bandwidth
<b>Heading Error</b>	+/- 0.25 nT (inside the optical axis to the field direction angle range 15° to 75° and 105° to 165°)
<b>Absolute Accuracy</b>	<2.5 nT throughout range
<b>Output</b>	a) Continuous Larmor frequency proportional to the magnetic field (3.49857 Hz/nT) sine wave signal amplitude modulated on the power supply voltage b) Square wave signal at the I/O connector, TTL/CMOS compatible
<b>Information Bandwidth</b>	Only limited by the magnetometer processor used
<b>Sensor Head</b>	Diameter: 63 mm (2.5") Length: 160 mm (6.3") Weight: 1.15 kg (2.6 lb)
<b>Sensor Electronics</b>	Diameter: 63 mm (2.5") Length: 350 mm (13.8") Weight: 1.5 kg (3.3 lb)
<b>Cable, Sensor to Sensor Electronics</b>	3 m (9' 8"), lengths up to 5 m (16' 4") available
<b>Operating Temperature</b>	-40°C to +50°C
<b>Humidity</b>	Up to 100%, splash proof
<b>Supply Power</b>	24 to 35 Volts DC
<b>Supply Current</b>	Approx. 1.5 A at start up, decreasing to 0.5 A at 20°C
<b>Power Up Time</b>	Less than 15 minutes at -30°C

Table 3 – Scintrex CS-3 specifications.





Figure 7 – Airborne magnetometer housing with tow cable.

### 3.9 BASE STATION MAGNETOMETER

A GSM-19 base station magnetometer (manufactured by Gem Systems) was used to record variations in the earth's magnetic field and referenced into the master database using a GPS UTC time stamp. This system is based on the Overhauser principle and records the total magnetic field to within +/- 0.02 nT at a one (1) second time interval.

The base station unit was erected in a geomagnetically quiet location near the North Star Air Ltd., Northern Storage Area (Figure 8).





**Figure 8 – Base station magnetometer used for diurnal corrections.**

### **3.3 NAVIGATION**

Navigation was provided by the AgNav Incorporated (AgNav-2 version) GPS navigation system (Figure 9 - left) for real-time locating while surveying. The AgNav unit was connected to a Tee-Jet GPS receiver (Figure 9 – right).

Also used was a Garmin 19x antenna and receiver located on the HTEM airframe. The Garmin 19x, which is capable of sub five-meter accuracy, was sampled at 10 Hz.



**Figure 9 – AgNav main console (left) and Tee-Jet GPS receiver (right).**

### **3.4 RADAR ALTIMETER**

The radar altimeter transmitter and receiver antenna were fixed to the rear skids of the helicopter (one antenna on each skid) approximately 36” apart. The coaxial cables were fed through the floor of the helicopter and routed along the floor. Both coaxial cables connected to the controller which was located near the TDEM-2400 control unit. On the output side of the controller (Figure 10 - left) a proprietary 16-bit A/D convertor was connected providing digital input to the TDEM-2400 via RS 232 format. The altimeter signal was also fed into a digital read-out unit (Figure 10 - right) mounted on the dash board of the helicopter in clear vision of the pilot to provide height above ground navigation.



**Figure 10 – Freeflight radar altimeter controller and digital readout.**

### **3.5 HELICOPTER**

The helicopter used (Figure 11) was an AS 350 SD2 with registration C-GCYE, owned and operated by Expedition Helicopters and based in Thunder Bay, Ontario.



**Figure 11 – The survey used an AS 350 SD2 as shown above.**

### 3.6 PERSONNEL

The following personnel were involved in the survey.

<b>Individual</b>	<b>Position</b>	<b>Description</b>
Don Plattel	Pilot	Helicopter pilot
Mark Manikel	AME	Aircraft mechanical engineer
Dan LeBlanc	Operator	Operated and maintained the equipment
Steve Balch	Field Processing	On-site data processing
Steve Balch	Final Processing	Line-leveling, drift correction, diurnal corrections, tie-line leveling
Mike Cunningham	Reporting	Report write-up and interpretation
Steve Balch	Interpretation	Final review of data, interpretation write-up and recommendations
Steve Balch	Supervision	Liaison with Client. Responsible for the crew
Chris Balch	Mapping	Plotting maps, printing report, folding and binding
Daniel Grabiec (Exploration Geologist)	Client	Client representative

**Table 4 – Summary of Personnel.**

## 4.0 DATA ACQUISITION

### 4.1 HARDWARE

Data was collected through the main console (the TDS-2400, see Figure 12) which contained both the acquisition system and dc-dc power control module (booster circuit) for the transmitter coil. The TDS-2400 has a hardware controller that sets the timing for the four (4) 24-bit A/D converters that sample at  $9.48 \mu\text{s}$ . The controller also generates and transmits the timing control signals to the transmitter driver located on the airframe.

The main controller also performs synchronization between the transmitter and receiver and all ancillary information (GPS, MAG, EM, RAD ALT). The ancillary information is digitized and stored at a rate of 10 Hz. The resulting data string is transmitted to a laptop computer and stored on an internal hard drive.



**Figure 12 – Triumph TDS-2400 EM console and acquisition system.**

## 4.2 SOFTWARE

A rugged laptop computer running the Windows 10 operating system controls the incoming data stream from the TDS-2400. The software on the laptop (AirDAS) is capable of real-time acquisition with no data loss from 25 Hz to 300 Hz for a duty cycle that can vary from 10% to 50% (nominally set at 30-35%).

During the survey the Operator can monitor the incoming differential GPS data, radar altimeter, magnetometer and all EM profiles.

After each flight data is copied from the laptop internal hard drive onto a memory stick. While there is no limit on the maximum file size during acquisition, the processing software can only process up to five (5) continuous hours of recorded data. For longer flights the data can be broken into two files.

## 4.3 CALENDAR

Data was acquired over 1-day (Table 5). Mobilization occurred on September 1<sup>st</sup> from Rockwood, Ontario and arrived at Pickle Lake, Ontario on September 3<sup>rd</sup>. Assembly of the system took place on September 4<sup>th</sup>. Production commenced and was completed on September 8<sup>th</sup>. The system was de-installed and demobilized on September 9<sup>th</sup> and September 10<sup>th</sup>.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Sep. 1	Sep. 2	Sep. 3	Sep. 4	Sep. 5	Sep. 6	Sep. 7
Mob (from Rockwood)	Mob	Mob	Install	Other survey work	Other survey work	Other survey work
Sep. 8	Sep. 9	Sep. 10	Sep. 11	Sep. 12	Sep. 13	Sep. 14
FL-01, FL-02	De-install	De-mob				

**Table 5 – Time schedule of the survey.**

## **5.0 DATA PROCESSING**

Preliminary data processing is performed using BECI proprietary methods. This includes compensation, filtering and line leveling of the HTEM data. This also includes calculation of the vertical magnetic gradient, analytic signal, digital terrain model, bird height, and merging of the base station magnetic data (sampled at 1.0 sec) with the survey data (sampled at 0.1 sec).

### **5.1 NAVIGATION**

The helicopter pilot uses “ideal” flight lines as guidance during surveying as displayed on the real-time AgNav system with the aid of a helicopter mounted GPS. A separate GPS mounted to the bird is used to record actual position. The sample rate of the GPS is 10 Hz, the same as the EM, MAG and ancillary data collected in flight.

The GPS unit outputs both latitude, longitude and easting, northing values, all in the WGS-84 Datum, using a UTM Projection. The positional data is not filtered but occasional bad data points are interpolated using a linear algorithm.

### **5.2 TERRAIN CLEARANCE**

The radar altimeter is located under the base of the helicopter. The helicopter mounted radar altimeter is used to maintain terrain clearance by the pilot. A digital indicator is mounted on the dashboard of the helicopter. This installation is approved by a licensed helicopter engineer provided by the helicopter operator.

### **5.3 EM DATA PROCESSING**

The EM data is processed using BECI proprietary software designed to compensate, filter and level both the off-time and on-time data.

The first step in processing is to determine the transmitter shut-off time and align the time gates to this position. The length of time that the transmitter is on is known as the on-time. The time gates are logarithmically spaced in the off-time and linearly spaced in the on-time.

The second processing step is the calculation of the system background transient. This is done at a suitable flight height, nominally 1,000 feet or higher. During this time EM data is collected for a period of 50 seconds and averaged into a single background transient. This is subtracted from the transients recorded on line.

The third step is to assign the flight line numbers to each data point so that the flight can be separated into flight lines within Geosoft.

Line-leveling and drift-correction are achieved on a flight by flight basis using the background transients, recorded at the start and end of each flight.

Filtering the data involves a two-step process. Spikes are removed using an algorithm based on the Naudy non-linear filtering algorithm. This is followed by a 61-point Hanning filter that has the effect of smoothing the profiles over an equivalent distance of approximating twice the nominal flight height.

Micro-leveling of the late time channels is also performed before the data file is written to disk. Conductor picks and Tau time constants are determined at this point as well.

B-field processing of the time channels uses a fully integrated on-time in addition to the integrated off-time (i.e. full waveform). The early off-time channels are evaluated for possible primary field leakage (this involves a compensation filter based on linearly derived correlation between the late on-time and early off-time samples). The exact methodology is considered proprietary.

## **5.4 MAGNETIC DATA PROCESSING**

The magnetic data (i.e. MAG from the airborne sensor and BMAG from the ground sensor) is collected without a lag time (i.e. synchronous with the HTEM data and UTC time), therefore a lag time correction is not applied. In areas where the MAG sensor has become unlocked (e.g. most often during turn-arounds), the total magnetic field values are replaced with a dummy value (“\*”) and the data is later interpolated in Geosoft.

The raw ASCII survey data files and BMAG ASCII data files are imported into BECI software and merged using UTC time, common to both files. A quality control check of the BMAG data is made on a day to day basis.

Diurnal magnetic corrections are applied to the MAG data using the BMAG data. The base station data (i.e. BMAG) is linearly interpolated from a 1.0 sec sample rate to 0.1 sec to correspond to the flight data after the BMAG has been filtered with a 60 second filter.

Once the diurnal field is subtracted from the MAG data, a heading correction is applied and the resulting total magnetic intensity (TMI) is micro-leveled.

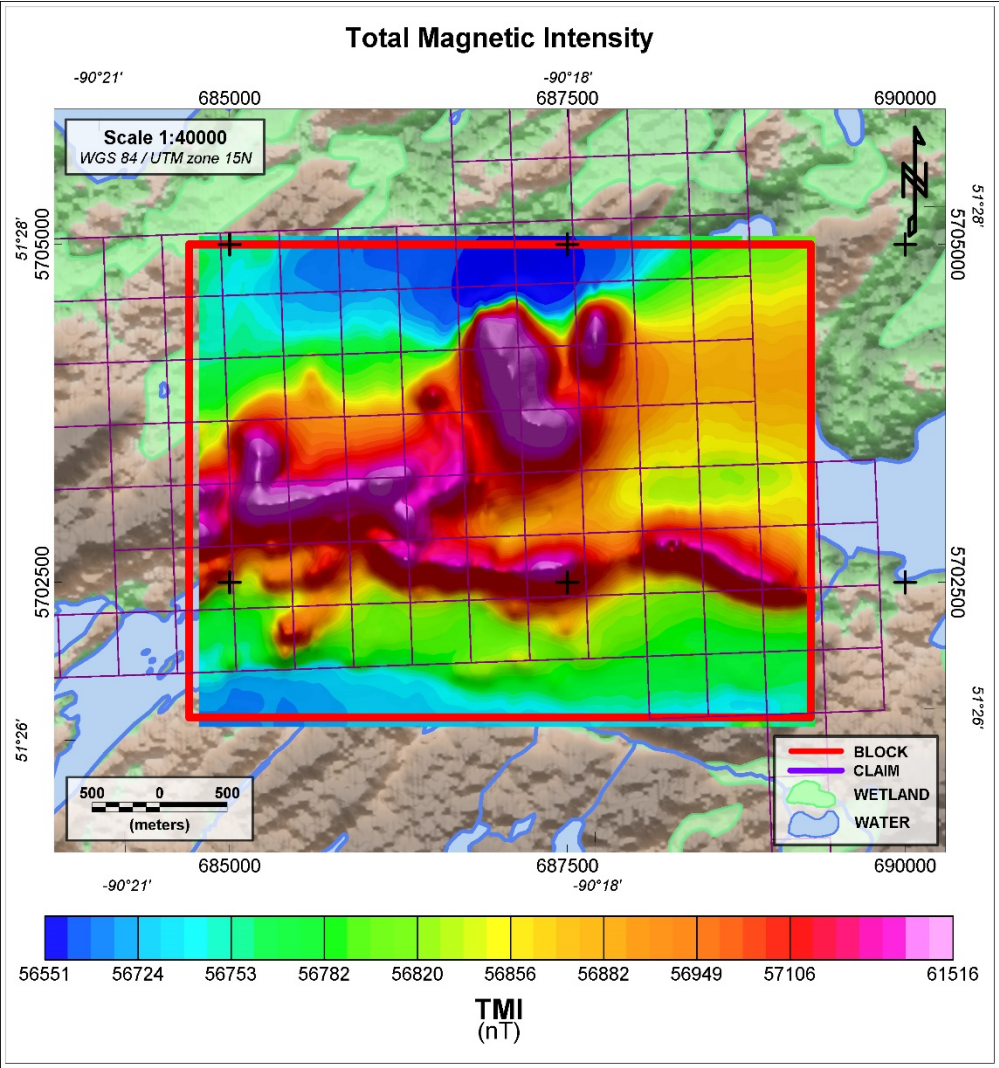
## 6.0 RESULTS

The total magnetic intensity (TMI) is shown in Figure 13 and the vertical derivative is shown in Figure 14.

The anomalous EM response is shown in Figure 15 (early off-time), Figure 16 (mid off-time), and Figure 17 (late off-time).

Figure 18 shows the digital terrain model for the survey area.





**Figure 13 – Shaded image of the Total Magnetic Intensity (TMI) over the West block.**

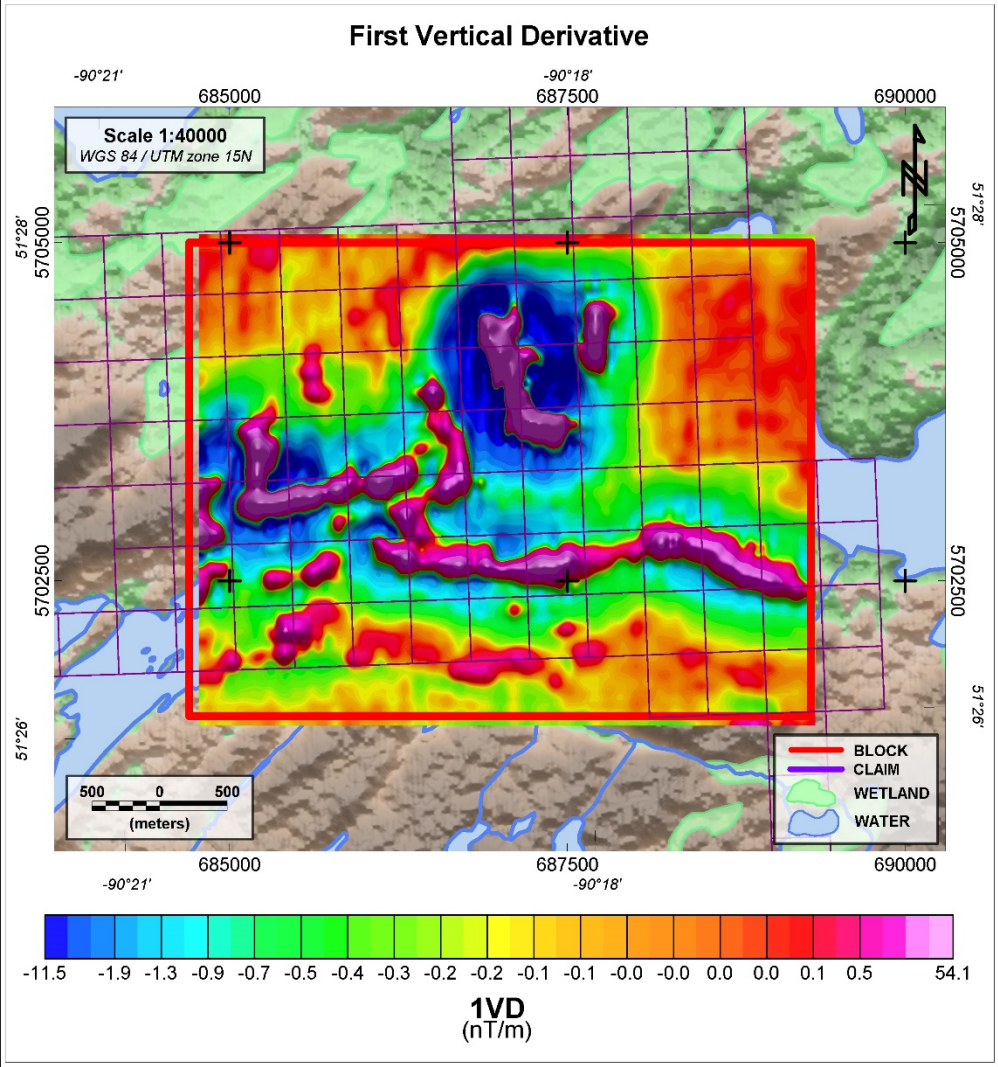


Figure 14 – Shaded image of First Vertical Derivative (1VD) over the West block

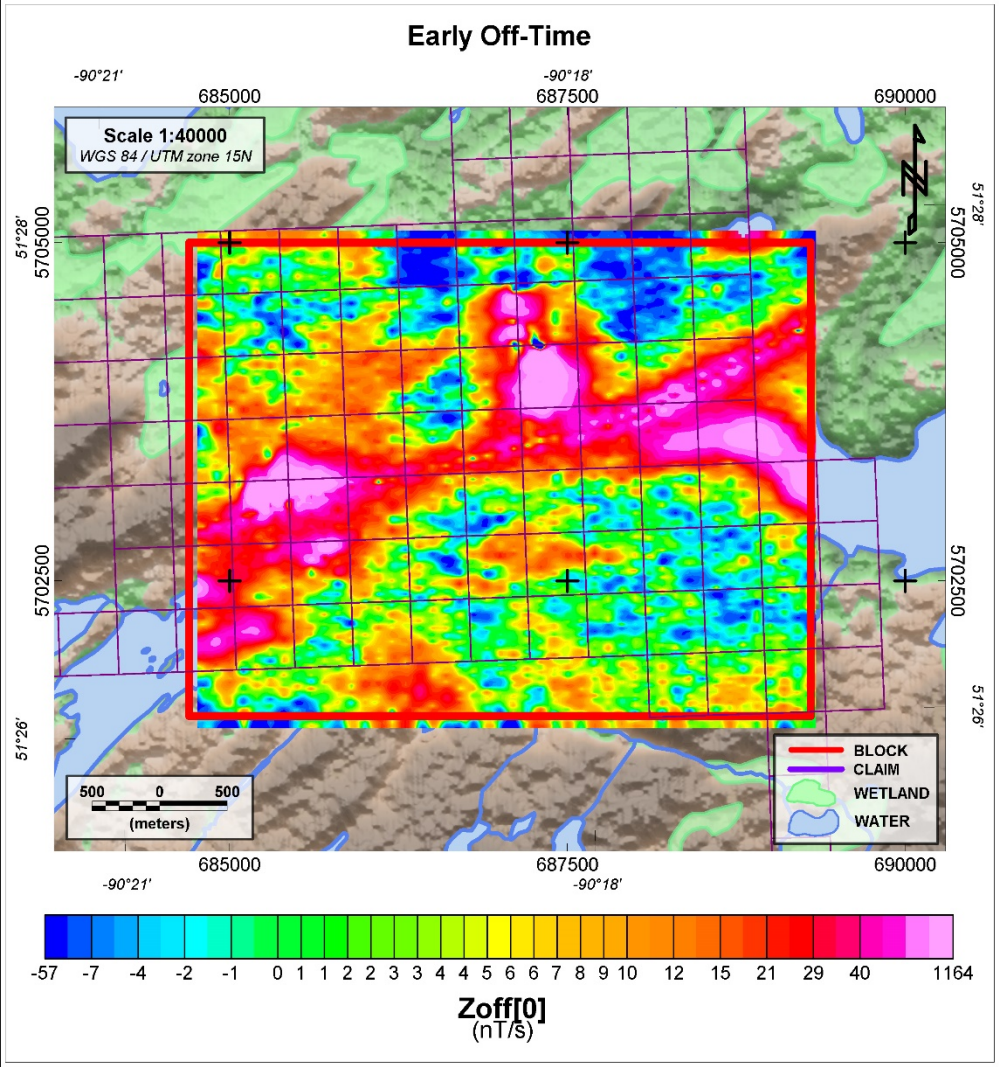


Figure 15 – Shaded image of the Early Off-Time (Zoff[0]) over the West block.



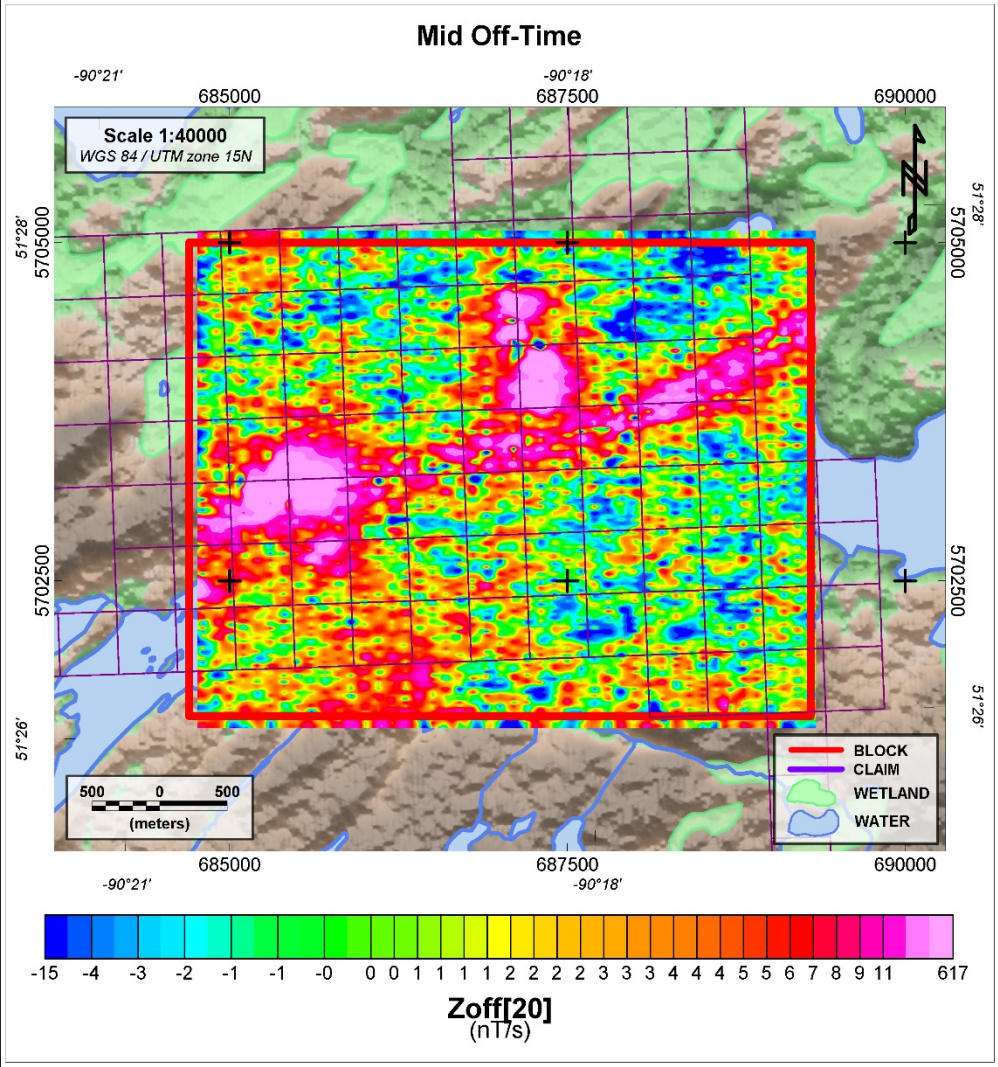


Figure 16 – Shaded image of the Mid Off-Time (Zoff[20]) over the West block.

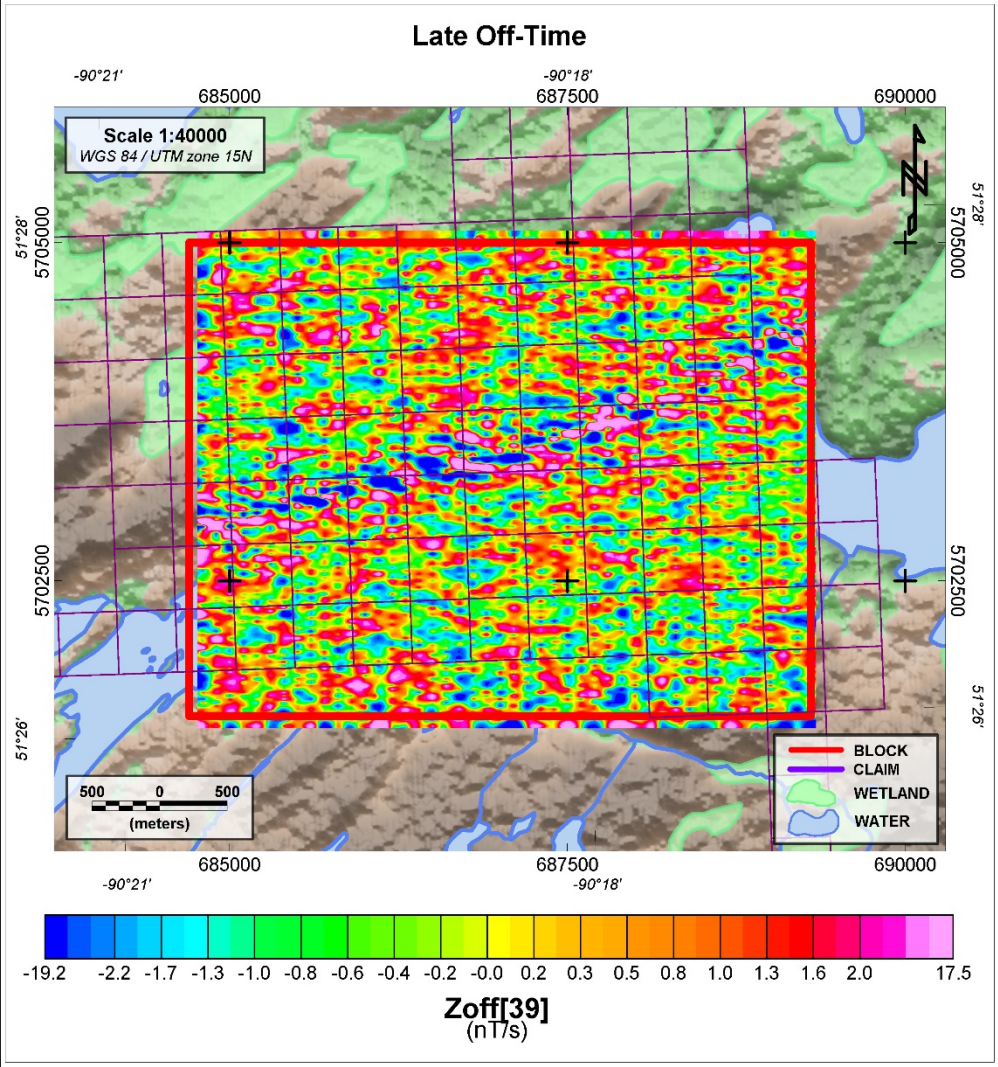
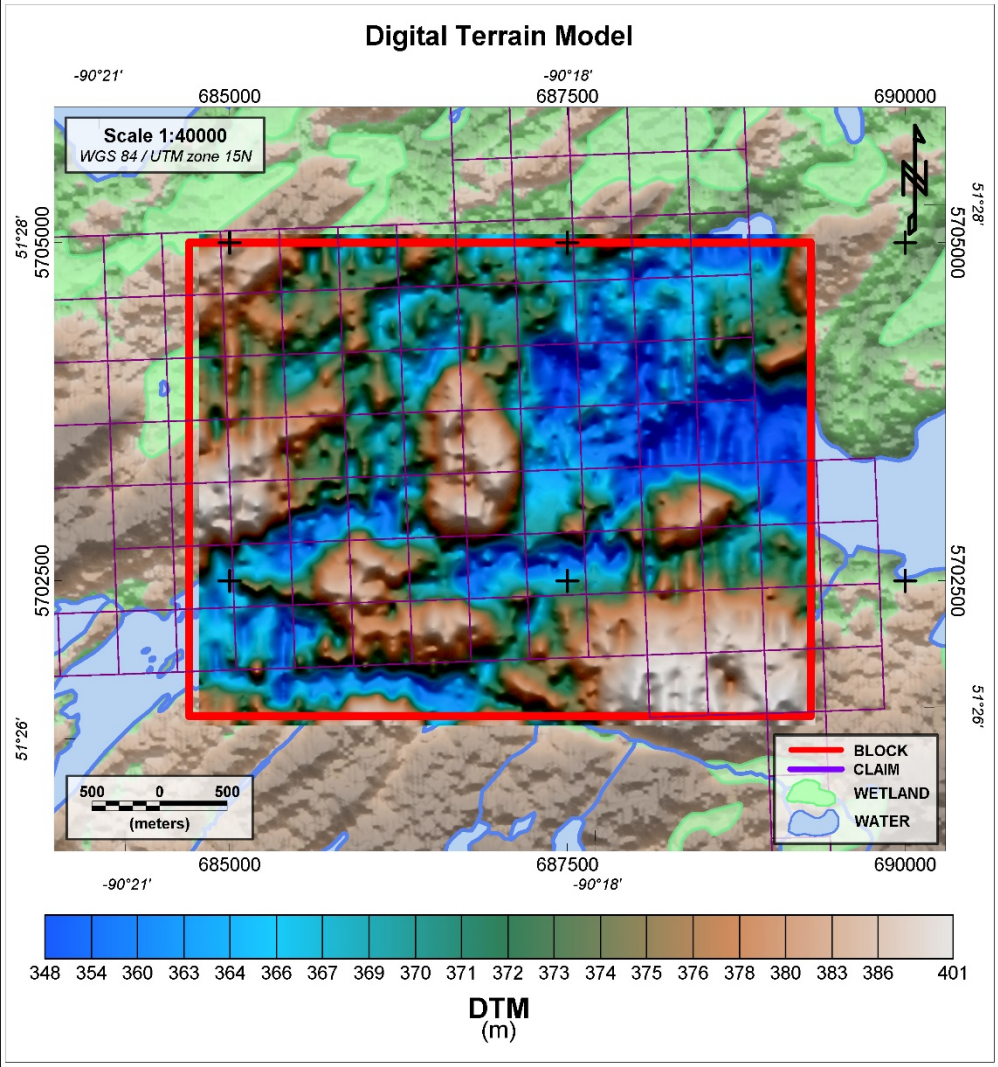


Figure 17 – Shaded image of the Late Off-Time (Zoff[39]) over the West block.



**Figure 18 – Shaded image of the Digital Terrain Model (DTM) over the West block.**

## 7.0 INTERPRETATION

There are five conductive trends within the survey area as shown in Figure 18. Three of the trends appear to be caused by conductive overburden. Trend 1 and Trend 2 could be related to sulphide and/or graphite mineralization and are discussed in more detail below.

### 7.1 TREND 1

Trend 1 is located along the eastern margin of a magnetic trend having a strike length of approximately 1 km and direction to the north-northwest. This trend may have been tested by drillhole K-179 but outside of the conductive trend (assuming the hole is accurately located). The EM response is complex in shape due to the likelihood that the conductor is sub-parallel to the flight lines. It is possible there are 3 discrete conductors within the magnetic response that defines this trend.

The center of Trend 1 is located at 687,200 mE and 5,793,892 mN. The best response occurs on line 260:1 at 687,298 mE and 5,704,142 mN. Here the on-time profiles show higher amplitude than the off-time suggesting a conductive sulphide source such as pyrrhotite (hopefully with accompanying base metals and/or gold). The sharpness of the “z” profiles at the northern edge indicates a dip to the south. This zone could be tested with a single drillhole oriented to the north. The source is thought to be shallow (possibly sub-cropping).

The Trend 1 EM anomalies are clustered along the eastern side of the north-northwest striking magnetic trend. The only drillhole to test this trend (K-179) intersected only the most southerly extent of the magnetic trend and outside of the conductive anomalies (see Figure 19). It would take at least 3 drillholes to properly test this trend.

### 7.2 TREND 2

Trend 2 is located close to a major power line, striking east-west for 550 m. While the trend appears to have been tested by drillholes WL-88-05, WL-88-04 and K-180 (see Figure 20), none of the drillholes tested the conductive trend directly. Hole WL-88-05 tested a north-striking magnetic trend that could be related to Trend 2. The hole intersected a narrow interval of gold mineralization grading 2.35 g/t Au over 0.68 m starting at 63.7 m downhole. Hole WL-88-04 was located too far west and K-180 too far east to test the conductive trend located within the magnetic high.

The best developed EM anomaly is located on line 60:2 and has high amplitude in both off-time and on-time “z”-axis profiles (up to 1,750 nT/s). This suggests the source is closest to surface at this point and would make a good drill target. A south-oriented drillhole would intersect the conductor and test the magnetic feature as well.



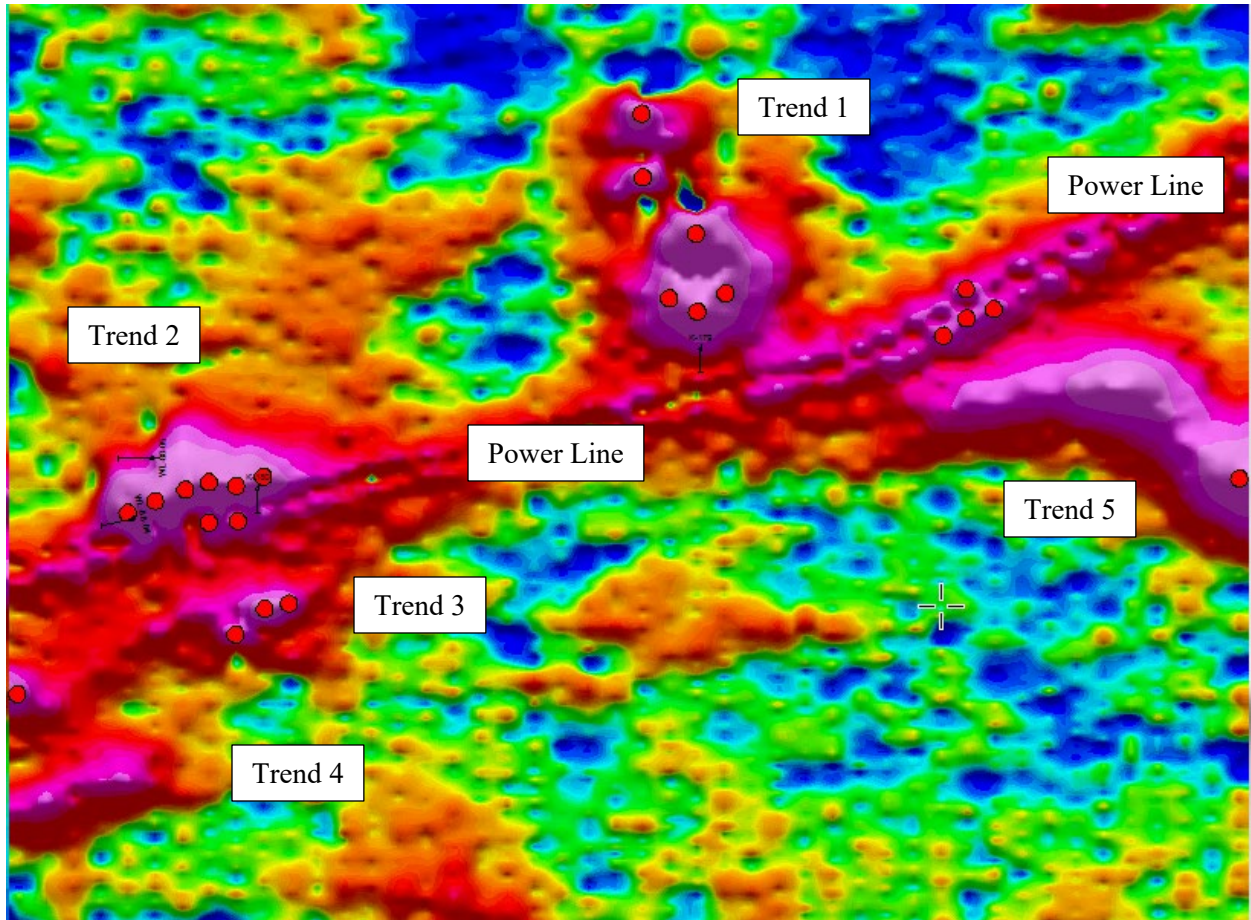


Figure 18 - EM response from "z"-coil showing major EM trends.



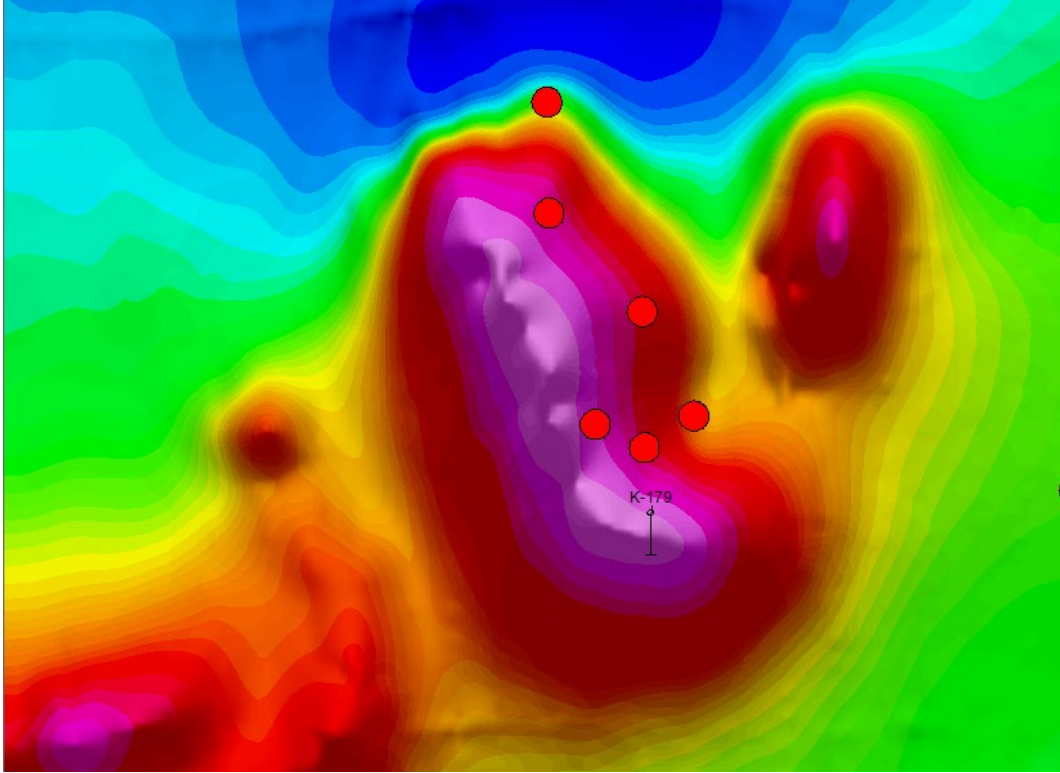


Figure 19 - Trend 1 magnetic response with conductor picks and drilling.

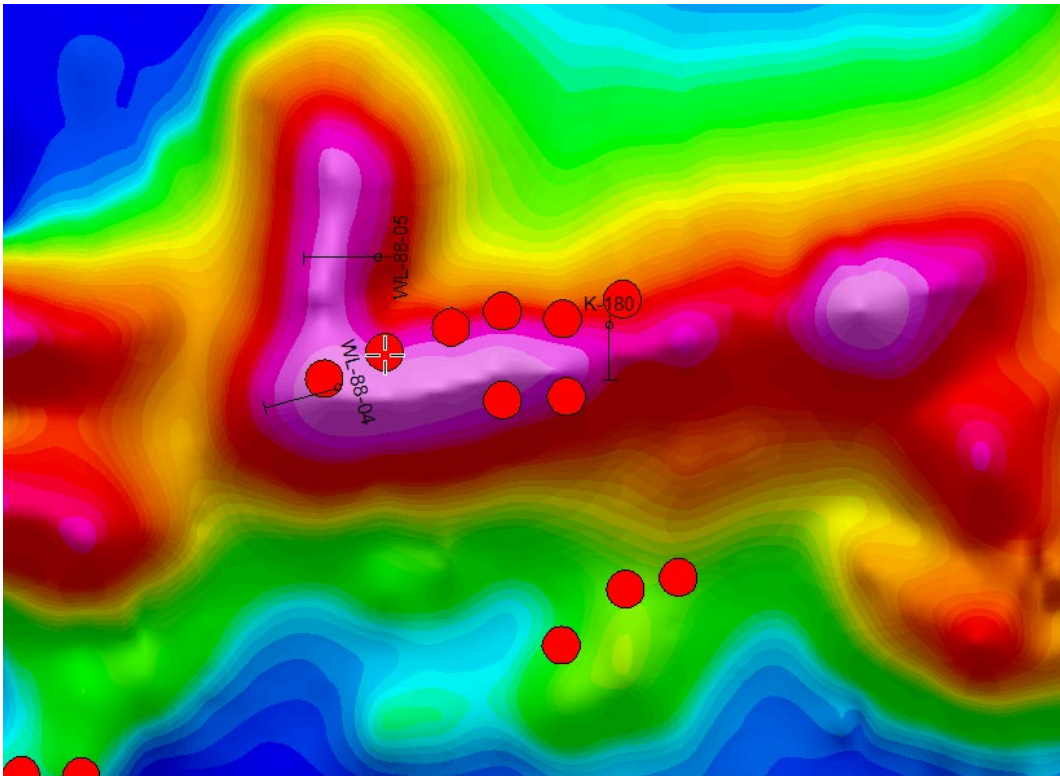


Figure 20 - Trend 2 magnetic response with conductor picks and drilling.

### 7.3 RECOMMENDED DRILLHOLES

Two drillholes are recommended to test the conductive targets within the West Block survey area. These are summarized in Table 6. The hole to test Trend 1 is located sub-parallel to the magnetic trend but will intersect the conductive trend. Additional holes should be based on the results of the first hole including favourable geology and economic base and/or precious metals. The hole to test Trend 2 is located perpendicular to the EM and magnetic trends, which are parallel. Trend 2 is a simpler target to drill when compared to Trend 1 and could be drilled first. It has a strike length of 550 m.

HOLEID	Easting (mE)	Northing (mN)	Dip (°)	Azimuth (°)	Length (m)
WB-01	687,295	5,704,055	-60	0	150
WB-02	685,277	5,703,210	-60	165	150

**Table 6 - Drillhole recommendations for West Block trends.**

## 8.0 QUALIFICATIONS

I, Michael Cunningham, do hereby claim the following to be true:

1. I am a professional geoscientist (P.Ge.) in good standing, registered with the Association of Geoscientists of Ontario (#3007);
2. I am a graduate of Carleton University with a degree in Earth Sciences (Geophysics) (M.Sc, 2016);
3. I am a practicing exploration geophysicist with more than 4 years experience and reside at 124 Camden Pvt, Ottawa, Ontario, K2J 6H9;
4. I have no direct interest in the West block in Pickle Lake, Ontario property or in Artiden Canada Ltd.;
5. I prepared this report with having discussed the interpretation with Stephen Balch, P.Ge..

Dated at Ottawa, Ontario on the 30<sup>th</sup> day of October 2019.



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Michael Cunningham, P.Ge.  
Geophysicist  
Balch Exploration Consulting Inc.

## APPENDIX A – OUTLINE OF SURVEY POLYGONS

Table 7 shows the polygon corners in meters easting and northing, WGS-84 and UTM ZONE 15N.

<b>WEST WGS-84</b>	
<b>Easting (m)</b>	<b>Northing (m)</b>
684700	5701500
684700	5705000
689300	5705000
689300	5701500

**Table 7 – Corner coordinates for the survey blocks.**