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XMET INC.

MAG-GPS, RESISTIVITY / INDUCED POLARIZATION
IPOWER3D® CONFIGURATION & HIGH-RESOLUTION
GROUND GRAVITY SURVEYS

BLACKFLAKE PROJECT

PITOPIKO RIVER AND LIMESTONE RAPIDS TOWNSHIPS,
HEARST, ONTARIO, CANADA

LOGISTICS AND INTERPRETATION REPORT

14N021 **MAY 2014**

PGE C Fe Ag Cu Au Zn REE Li Mo U Ni Cr Pb

Abitibi Geophysics Inc. 1746 chemin Sullivan, Val-d'Or, Québec J9P 7H1 T. : 819.874.8800 F. : 819.874.8801 www.ageophysics.com

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ABSTRACT

On behalf of Xmet Inc., a ***Resistivity / Induced Polarization*** *survey using the* ***IPower3D®*** *configuration as well as a* ***MAG-GPS*** *and high resolution ground* ***Gravity*** *surveys were conducted on the* ***Blackflake Property****, located in the Pitopiko River and Limestone Rapids Townships, in Hearst, Ontario.*

During the period of ***March 24 to April 7, 2014,*** *a total of 10 km of Time Domain Resistivity / Induced Polarization survey was completed using the IPower3D® configuration. A total of 70 km was surveyed using MAG-GPS and a total of 488 gravity stations were surveyed. Survey specifications, instrumentation controls, data acquisition, processing and interpretation were successfully completed within the Abitibi Geophysics quality system framework.*

The objectives of this survey were to identify zones amenable to Graphite and or Kimberlite mineralization on the Blackflake property and to identify potential drill targets.

A follow-up program including prospecting, drilling and a survey extension has been proposed. The recommendations are presented in section 8 of this report.

1. THE MANDATE

❑ *PROJECT ID*	**Blackflake Project** (Our reference: **14N021**)
❑ *GENERAL LOCATION*	**60 km** northwest of Hearst, Ontario
❑ *CUSTOMER*	**Xmet Inc.** 120 Adelaide Street West, Suite 2500 Toronto, Ontario M5H 1T1 **Telephone**: (416) 644-6588
❑ *REPRESENTATIVES*	**Mr. Stephen Stewart** President sstewart@xmet.ca
❑ *SURVEY TYPES*	**Time domain Resistivity / Induced Polarization, IPower3D® configuration with MAG-GPS and High Resolution Ground Gravity surveys**
❑ *GEOPHYSICAL OBJECTIVES*	• Identify zones amenable to graphite and or kimberlite mineralization • Identify targets for further exploration.

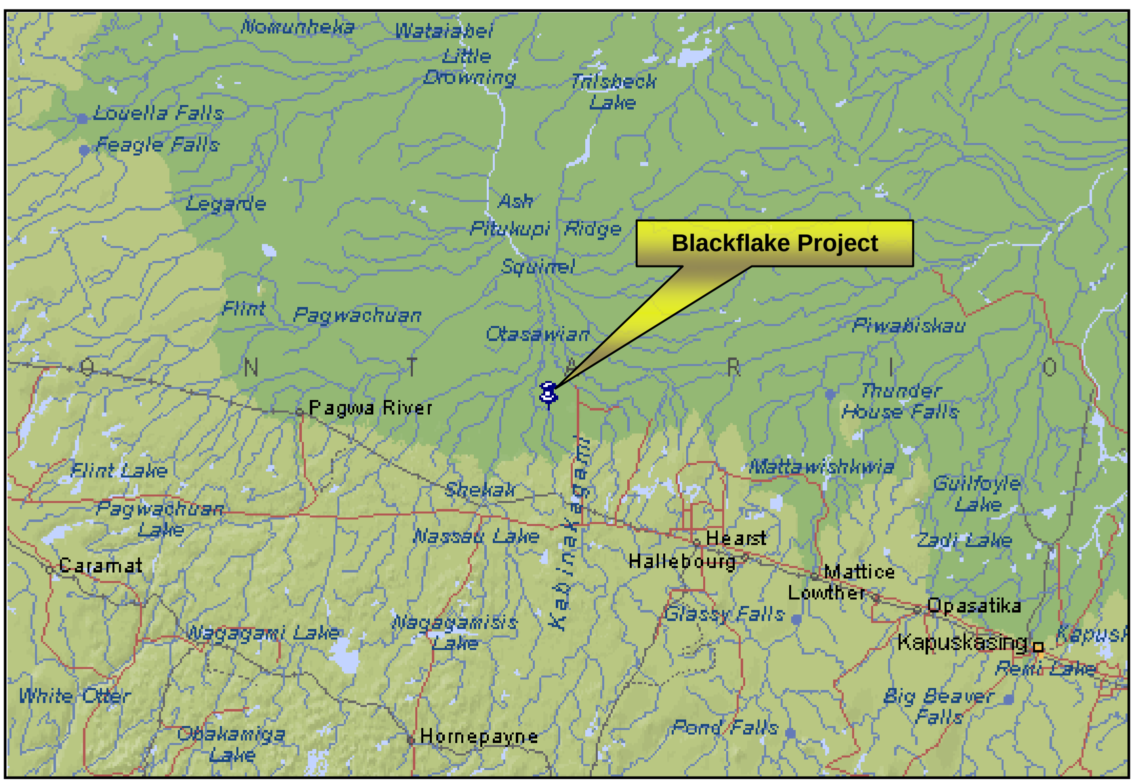


Figure 1. General location of the Blackflake Project

2. THE BLACKFLAKE PROJECT

- *LOCATION*

  Pitopiko River and Limestone Rapids Townships
  Hearst, Ontario, Canada
  Centred on 50.03641°N and 84.26987°W,
  UTM NAD83, zone 16N: 695 500 mE, 5 546 250 mN
  NTS sheets: **42K/01**

- *NEAREST SETTLEMENTS*

  Hearst: 60 km to the southeast.
  Calstock: 30 km south southeast.

- *ACCESS*

  The Blackflake grid was accessed daily from Hearst by taking highway 11 west for ~35 km until route 663. From here, route 663 was taken north, past Calstock, for ~35 km. An access road is then taken west for ~10 km and from there the grid was accessed by ATV.

- *GEOMORPHOLOGY*

  Topography on the grid ranged from 120 m to 160 m above sea level. There are a few small streams present, and vegetation consisted of spruce, fir and birch.

- *CULTURAL FEATURES*

  Cultural features were limited to the access trail; this is not thought to have any effect on the data.

- *MINING LAND TENURE*

  The Blackflake property comprises 16 claims; the claim numbers encompassed by the present survey are illustrated on page 4.

- *SURVEY GRID*

  This grid on the Blackflake property consists of 14, 3000 m E/W lines spaced at 150 m and 17, 1350 m N/S lines spaced at 75 m. The base line is located at 0+00 E cutting the grid in half. There are also 2 tie lines located at 15+00W and 14+50E. In total 10 line km were surveyed with IPower3D®, 70 line km with MAG-GPS, and 506 gravity stations.

- *ENVIRONMENTAL HEALTH AND SAFETY*

  As part of the Abitibi Geophysics EHS program crew members received first aid training and are provided with safety equipment and specialized training for the induced polarization technique. In addition, the crew was provided with a satellite telephone for emergency communication.

- *COORDINATE SYSTEM*

  Projection: Universal Transverse Mercator, zone: 16N
  Datum: NAD83

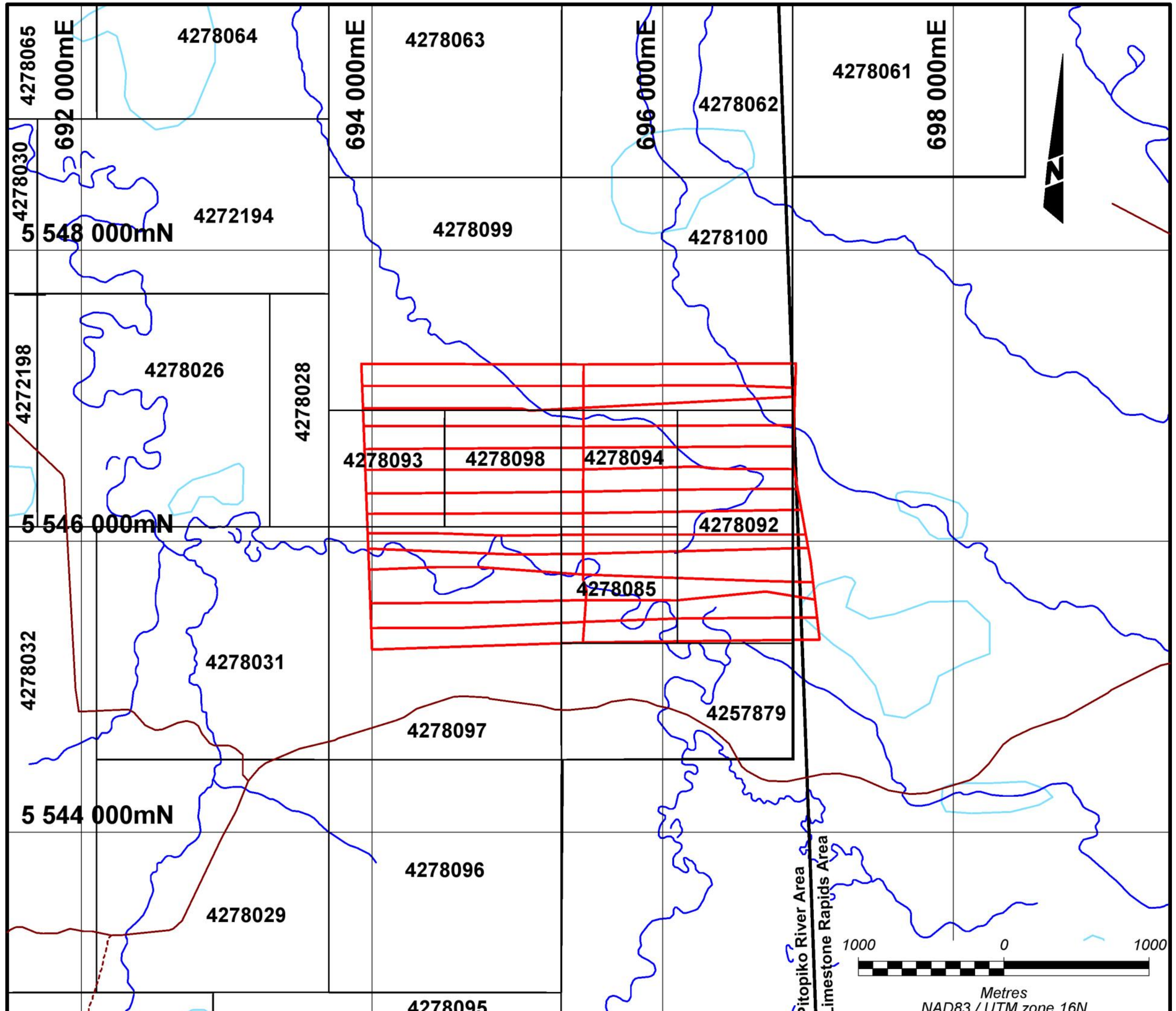


Figure 2. Index of claims covering the Blackflake Project

3. IPOWER3D® RESISTIVITY / INDUCED POLARIZATION SURVEY

❑ *TYPE OF SURVEY*	Time Domain Resistivity / Induced Polarization	
❑ *CONFIGURATION*	**IPower3D®**	
❑ *PERSONNEL*	Bruno Tremblay,	Crew Chief & Operator
	Éric Vallerand,	Assistant
	Darryl Ouellet,	Assistant
	Guillaume Nantel,	Assistant
	Mario Bertrand,	Assistant
	Bruno Tremblay,	Logistics
	Carole Picard, tech	Production of maps
	Pam Coles, G.I.T.,	Quality Control, Processing, Interpretation Report
	Chris Brown, P.Geo.,	Final verification of product conformity
❑ *SURVEY COVERAGE*	**10 km**	
❑ *DATA ACQUISITION*	**March 31 to April 5, 2014**	
❑ *TRANSMITTER*	**GDD Instruments TxIII**, s/n 259	
	Generator:	Honda 5000 VA
	Maximum output:	3.6 kW at 10 A at 2,400 V
	Electrodes:	memory-shape alloy rods
	Resolution:	1 mA on output current display
	Waveform:	Bipolar square wave with 50% duty cycle
	Pulse Duration:	1 second

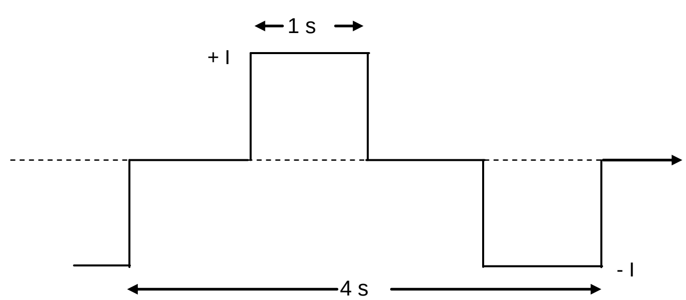


Figure 3. Signal transmitted across electrodes C_1-C_2

- *RECEIVER*

IRIS Elrec-PRO, (10 input channels), s/n 184
IRIS Switch-PRO 240, s/n 65
Electrodes: Memory-shape alloy rods
V_p Primary voltage measurement:

- Input impedance: 100 MΩ
- Resolution: 1 μV
- Typical accuracy: **0.2%**

M_A Apparent chargeability measurement:

- Resolution: 0.01 mV/V
- Typical accuracy: **0.4%**
- Semi-log sampling mode, 20 time windows (M_1 to M_{20}).

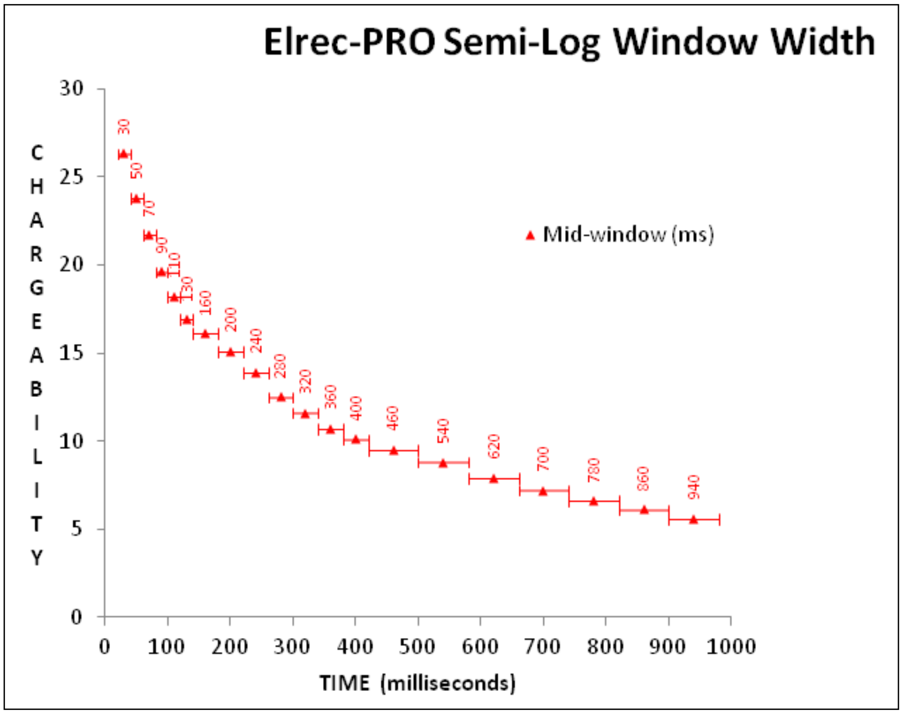


Figure 4. Semi-log windows (1 s pulse)

- All gates are normalized with respect to a standard decay curve for field quality assurance.
- Final chargeability values were normalized to the 2 second pulse Newmont standard.

- *APPARENT RESISTIVITY CALCULATION*

$$\rho_a = 2\pi \cdot \frac{V_p}{I} \cdot \frac{1}{\left(\frac{1}{C_1P_1} - \frac{1}{C_2P_1}\right) - \left(\frac{1}{C_1P_2} - \frac{1}{C_2P_2}\right)}, \quad (\Omega{\cdot}m)$$

Cumulative error: **5% max**, mainly due to chaining accuracy.

- ❑ *QUALITY CONTROLS* *(RECORDS AVAILABLE UPON REQUEST)*

Before the survey:
- ✓ Transmitters & motor generators were checked for maximum output using calibrated loads.
- ✓ Receivers were checked using the Abitibi Geophysics SIMP™ certified and calibrated V_P & M_a signal simulator.

During data acquisition:
- ✓ Rx & Tx cable insulation was verified every morning.
- ✓ Proprietary Software *ProsysControl*™ allowed a daily thorough monitoring of data quality and survey efficiency.
- ✓ Sufficient pulses were stacked: 8 pulses for every reading.

At the Base of Operations:
- ✓ Field quality assurance inspected & validated.
- ✓ Each IP decay curve was analyzed with *ProsysControl*™. The few gates that were rejected were not included in the calculation of the plotted M_a.

- ❑ *QUALITY STATISTICS*

Table 1. Quality statistics – IPower3D®

Blackflake Project IPower3D®	
Average contact resistance across R_X dipole (P_1-P_2)	1.4 kΩ
Average current applied to T_X dipole (C_1-C_2)	4042 mA
Average V_p measured across R_x dipole (P_1-P_2)	134.6 mV
Observed windows found to fit a pure electrode polarization relaxation curve	89.5%
Average deviation of the validated, normalized windows with respect to the mean chargeabilities.	0.24 mV/V

4. GPS INTEGRATED GROUND MAGNETIC SURVEY

❑ *TYPE OF SURVEY*	Measurement of the Total Magnetic Field (TMF) with GPS readings recorded every second. The plotted values were corrected for diurnal variations using readings from a synchronized MAG base station.
❑ *PERSONNEL*	Sylvain Brousseau, Geophysical operator Bruno Tremblay, Logistics Carole Picard, tech Production of maps Pam Coles, G.I.T., Quality Control, Processing, Interpretation Report Chris Brown, P.Geo., Final verification of product conformity
❑ *DATA ACQUISITION*	**March 24 to 31, 2014**
❑ *SURVEY COVERAGE*	**70 km**
❑ *FIELD MAGNETOMETER*	**GEM Systems GSM-19W**, s/n 71191 Proton precession magnetometers with Overhauser effect and built-in GPS. Resolution: 0.01 nT / 1 m Absolute accuracy: 0.2 nT / 2-5 m Gradient tolerance: >10 000 nT/m TMI sensor: at a height of 1.8 m above ground Sensor: 14140
❑ *BASE STATION*	**GEM Systems GSM-19**, s/n 61519 Proton precession magnetometer with Overhauser effect Resolution: 0.01 nT Absolute accuracy: 0.2 nT Cycle time: **10 seconds** Sensor s/n: 42231 Location (UTM NAD83): 16U, 5 547 334 mN, 696 794 mE Reference field: 57 100 nT

- *QUALITY CONTROLS (RECORDS AVAILABLE UPON REQUEST)*

Before the survey:

✓ All magnetometers were successfully field-tested on Abitibi Geophysics' private control line.

Every day during data acquisition:

✓ Every morning, the operator had to successfully test for any magnetic contamination.

✓ In the evening, the geophysical operator reviewed the base station and the mobile unit recordings using our proprietary MAGneto® processing and QC software.

✓ The geophysical operator ensures no active geomagnetic activity would be encountered during the survey by visiting the Space Weather Canada website (www.spaceweather.gc.ca).

At the Base of Operations:

✓ Field QCs were inspected & validated.

✓ All profiles were inspected and only a few noisy readings were removed from the database.

5. GRAVITY DATA ACQUISITION

❑ *TYPE OF SURVEY*	Semi-detailed gravity survey with expected Bouguer anomaly accuracy better than 0.05 mGal (before terrain corrections).	
❑ *PERSONNEL*	Dennis Palos,	Crew chief, gravimeter operator
	Daniel Duquette,	Gravimeter operator
	Sandro Paquette,	GPS operator
	Luc Houle,	GPS operator
	Martin Dubois,	Logistics
	Carole Picard, Tech.,	Plotting
	Madjid Chemam, P.Geo.,	QC, processing and interpretation
	Chris Brown, P. Geo.,	Final validation of product conformity
❑ *SURVEY COVERAGE*	**506** stations, including one base station but excluding all the re-visited stations.	
❑ *DATA ACQUISITION*	**March 28 to April 6, 2014**	
❑ *INSTRUMENTATION*	Type:	**Scintrex CG-5u Autograv** Fused Quartz
	Reading resolution:	0.001 mGal (digital recording)
	Stand. Field Repeatability:	< 0.005 mGal
	Operating Range:	8000 mGal without resetting
	Residual Long Term drift:	< 0.02 mGal/day (static)
	Operating Temperature:	-40°C to +45°C
	Serial numbers:	080740**418** (418) 980890**430** (430)
	Calibration constant:	K_{418} = **0.999642** mGal / unit K_{430} = **0.999645** mGal / unit
	Seismic filter:	Enabled
	Continuous tilt correction:	Enabled
	Auto rejection:	Enabled (*threshold is 6 x standard deviation with seismic filter on)*
	Tide correction:	Enabled
	Read time:	2 to 4 cycles of 30 seconds
❑ *SOFTWARE*	**SCTutil** (Scintrex) for data transfer to a PC. **Xcelleration** (Oasis Montaj module from Geosoft) for all remaining gravity processing.	
❑ *BASE STATION*	The survey is tied to Canadian Gravity Standardization Network (CGSN) gravity base **9229-1976** located at the Canada Post office of Hearst. Two secondary control bases **HJH-9999** & **BF-8888** were established respectively at the Howard Johnson Hotel and on the survey grid, and used daily (refer to the description of the gravity base BF-8888 at page 13).	

- *FIELD PROCEDURES*

Each loop began and ended with a reading at the **HJH-9999** and **BF-8888** base stations. Only gravity readings gathered at the local base **BF-8888** were used during the processing to correct for the residual instrument drift. The closure errors (drift) correction was linearly applied to the data included within the loop.

At each station, the following parameters were recorded in the field notebooks:

- Station identification;
- Local time in UTC;
- Standard deviation of each gravity reading;
- Instrument readings;
- Instrument base height above ground;
- Slopes to the centre of each of the four Hammer zone sectors:B (2-12 m) and C (12-50 m).

The following data were recorded in the instrument's memory:

- Station identification;
- Instrument readings;
- The standard deviation of each reading;
- Tilt - X axis in arc-seconds, at the end of the reading;
- Tilt - Y axis in arc-seconds, at the end of the reading;
- The gravity sensor temperature compensation factor;
- The tide correction for each reading;
- The number of samples that were read;
- The number of rejected samples;
- Local time in UTC.

The first step in data acquisition is to locate the most appropriate site for both GPS and gravity readings. The gravity meter is then placed on the tripod; the meter is levelled with the tripod levelling screws. Before the reading is to be initiated the operator stands still to avoid inducing ground motion that could affect the gravity meter. Once the above requirements have been met, the reading is taken.

The gravity meter was put in its padded and insulated carrying bag immediately after each reading.

At the end of each day, the data were downloaded from the CG-5u Autograv gravimeters through an USB cable to a computer. The Scintrex ***SCTutil*** program was used to facilitate the data transfer.

Xmet Inc.	
Station number:	**9229-1976**
Name:	**Hearst**
Area:	Town of Hearst, Ontario
NTS sheet:	**42G/12**
Geodetic system:	NAD 83, UTM Zone 16N
Longitude:	83°39' 54.41" W
Latitude:	49° 41' 16.00" N
Easting:	740 523.694 ± 0.010 mE
Northing:	5 509 257.800 ± 0.010 mN
Elevation (HTv2):	242.994 ± 0.016 m
g_{ABS} (fixed):	**980 953.970** mGal
Primary station:	IGSN71
Positioning:	Leïca Viva DGPS

The CGSN gravity base station is located at the Canada Post Office of Hearst at the northern entrance on 9th street, 76 cm from the NW corner of the building. The station is marked by an aluminum disc.

Hearst 9229-1976 CGSN Gravity Base

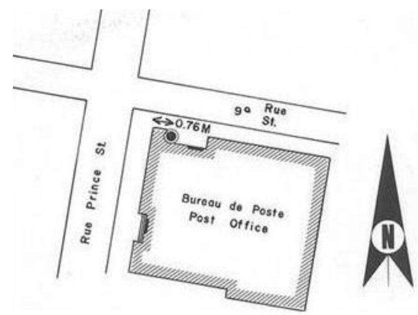
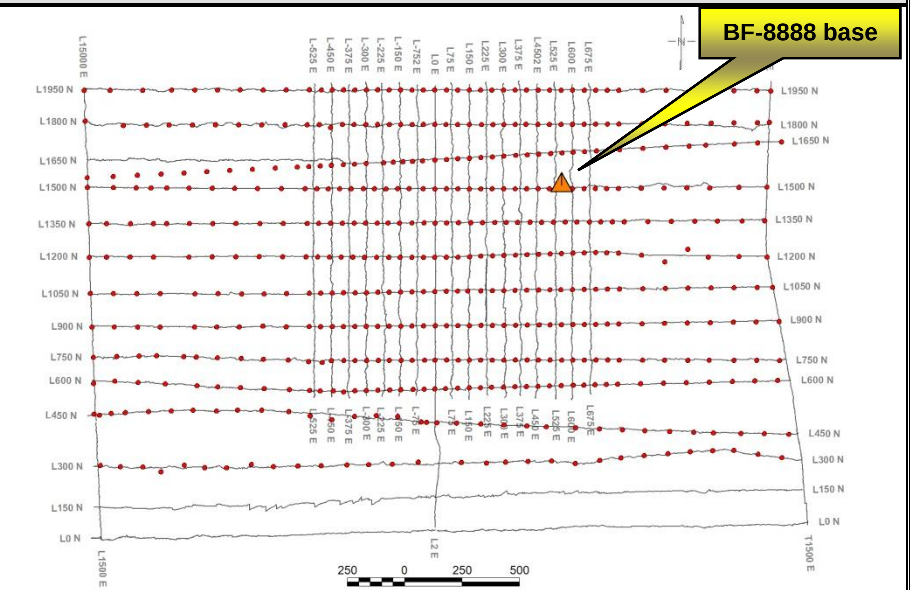


Figure 5. Hearst 9229-1976 CGSN gravity base description

Xmet Inc.	
Station number:	**BF-8888**
Name:	**Black Flake**
Area:	MNR District, Hearst, Ontario
NTS sheet:	**42K/01**
Geodetic system:	NAD 83, UTM Zone 16N
Longitude:	83°15' 45.09" W
Latitude:	50° 02' 28.43" N
Easting:	696 005.933 ± 0.010 mE
Northing:	5 546 805.129 ± 0.010 mN
Elevation (HTv2):	137.045 ± 0.016 m
g_{ABS} (calculated):	**980 990.379** mGal
Primary station:	Tied to **9229-1976** CGSN
Positioning:	Leïca Viva DGPS

The gravity base station is located in the survey grid near the line 1500N, 17.5 M from the station 2161. The station is not monumented.

BF-8888 Secondary Control Base



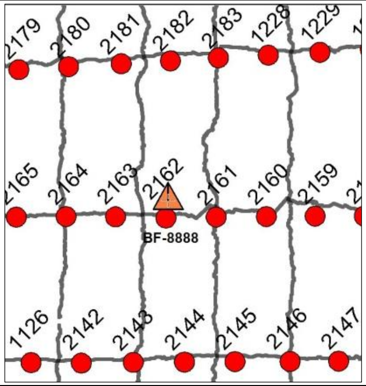


Figure 6. BF-8888 gravity base description

❑ *GRAVITY QC'S*

Before the survey:

- ✓ The gravity meter had been heated and stabilized for more than a week.
- ✓ All the internal constant values had been checked.
- ✓ Temperature compensation had been fine-tuned to $\pm$ 0.1 mGal/mK.
- ✓ The X and Y tilt sensitivities had been checked and did not require any adjustments.

During the survey:

- ✓ The drift was controlled after each loop. The absolute average closure error was found to be:

Table 2. Absolute average closure error

Drift (mGal)	Contract Requirements	Absolute drift	
		Meter 418	Meter 430
Per loop	0.100	**0.024**	**0.023**
Per hour	0.010	**0.004**	**0.004**

Chart of the daily closure errors (drift) of the gravimeters 418 and 430 are presented on page 15.

- ✓ While readings were recorded, the operator observed the tiltmeter to ensure that the instrument stayed levelled well within $\pm$ 20 arc sec range.
- ✓ At least two readings were taken at every station. A third and even a fourth one was recorded if the first two were more than 0.005 mGal apart.

At Operation Headquarters:

- ✓ Dump files (YYMMDD_#Grav.txt) were inspected to detect any spurious readings, for instance:

  - reading time: < 30 seconds
  - standard deviation: > 0.1 mGal
  - rejected samples: > 5

506 unique stations were surveyed, **20** readings (4%) were randomly repeated for quality control. The average repeat error of the absolute gravity g_A was **0.006** mGal and the standard deviation was **0.008** mGal.

The maximum error value was found to be **0.020** mGal at station **1022.**

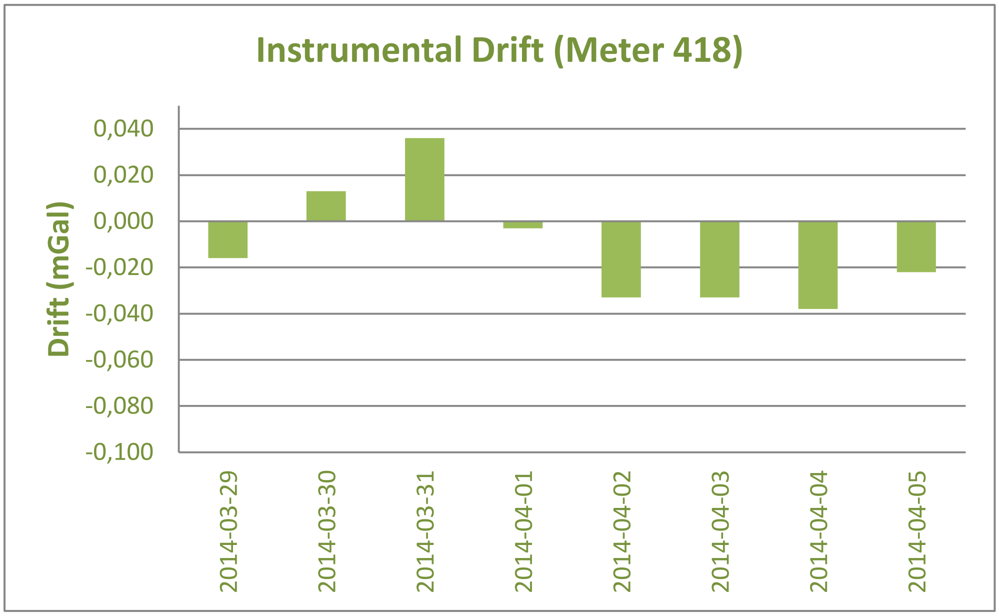


Figure 7. Daily gravity loop closure errors of the gravimeter 418

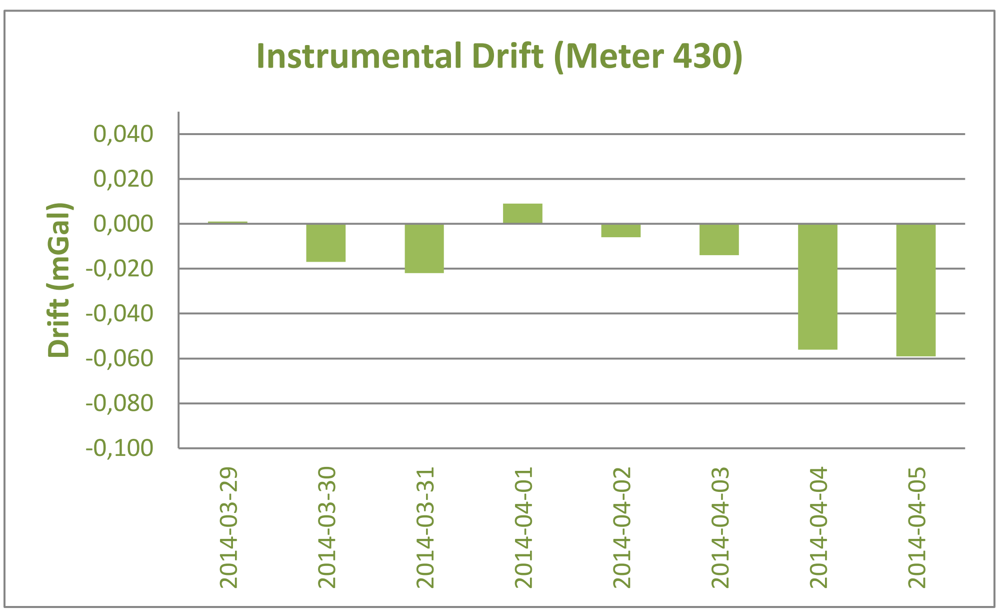


Figure 8. Daily gravity loop closure errors of the gravimeter 430

6. GPS DATA ACQUISITION

❑ *TYPE OF SURVEY*	Real Time Kinematic (RTK) GPS surveying from an unknown geodetic point with an expected accuracy better than 5 cm in elevation and horizontal positioning.

❑ *INSTRUMENTATION*

Base station:	Leica Viva GS15:	s/n: 1508148
Mobiles:	Leica Viva GS15:	s/n: 1501746
	Leica Viva GS15:	s/n: 1506143

❑ *GNSS PERFORMANCE AND ACCURACY*

- Advanced measurement engine.
- Jamming resistant measurements.
- Excellent low elevation tracking.
- Very low Noise GNSS carrier phase measurements with < 0.5 mm precision.
- 120 channels.
- Up to 60 Satellites simultaneously on two frequencies.
- Tracking Satellite signals:
  - GPS: L1, L2, L2C, L5
  - GLONASS: L1, L2
  - Galileo (Test): Glove-A, Glove-B
  - Galileo: E1, E5a, E5b, Alt-BOC
- GNSS measurements:
  - Fully independent code and phase measurements of all frequencies.
  - GPS: Carrier phase full wave length.
  - GLONASS: Carrier phase full wave length, Code (C/A, P narrow Code).
- Reacquisition time: < 1 sec.

Accuracy (rms) with Real-Time (RTK):

- Rapid static (phase): Horizontal: 5 mm + 0.5 ppm
- Static mode after initialization: Vertical: 10 mm + 0.5 ppm
- Kinematic (phase): Horizontal: 10 mm + 0.5 ppm
- Moving mode after initialization: Vertical: 20 mm + 0.5 ppm

Accuracy (rms) with Post-Processing:

- Static (phase) with log observations:
  - Horizontal: 3 mm + 0.1 ppm
  - Vertical: 3.5 mm+0.4 ppm
- Static and rapid static (phase):
  - Horizontal: 5 mm + 0.5 ppm
  - Vertical: 10 mm + 0.5 ppm
- Kinematic (phase):
  - Horizontal: 10 mm + 1 ppm
  - Vertical: 20 mm + 1 ppm

❑ *SOFTWARE* *LEICA Geo-Office 8.2*

- **COORDINATE SYSTEM**

Projection:	UTM Zone 16N
Type:	Transverse Mercator
Datum:	NAD 83
Central meridian:	87°00' W
Central scale factor:	0.9996
False easting:	500 000 m
False northing:	0 m
Ellipsoid:	GRS 1980
Geoïd model:	HTv2.0

- **GPS BASE STATIONS**

The DGPS survey is tied to the geodetic point **HRST RACS GLCORS**, Two non-monumented control bases (Check-10 & Check-11) were established on the grid and used for the survey duration. Positions of these two GPS base stations were tied to the geodetic point **HRST RACS-GLCORS** located at Hearst.

Table 3. GPS base station

Base	Easting (mE)	Northing (mN)	Elevation
HRST RACS GLCORS	751739.16	5507501.89	267.362
Check-10	695995.03	5546789.19	137.365
Check-11	696001.11	5546804.90	136.836

- **GPS PROCESSING**

The coordinates were processed and recorded in real-time (in the field) with the radio information transmitted by the base station. Data were downloaded from the GPS SD cards to a computer and checked after each survey day. Secondary processing was performed at head office in Val-d'Or, QC.

- **GPS QC'S**

Before the survey:

- ✓ The GPS units were verified against three provincial calibration benchmarks in Val-d'Or, QC.
- ✓ Level and graduated staff accuracies were checked.

During the survey:

- ✓ The distance between the antenna and the ground was measured to a precision of 1 millimetre and was then entered on the keypad.
- ✓ The gravity station number was manually incremented on the keypad-display unit and then checked against the number recorded in the gravimeter.
- ✓ The base station unit provided real-time corrections of the satellites time-tagged information to the mobile unit every second.
- ✓ The base station unit also took a recording automatically every 5 seconds for static post processing.

At Operation Headquarters:

- ✓ The average precision of the elevation values as determined by *LEICA Geo-Office* 8.2 is **1.6 cm** with a standard deviation of **0.7 cm**. The maximum value was found to be **4.8 cm** at station **2008**.
- ✓ The average precision on the horizontal positions (X & Y) is **1.0 cm** with a standard deviation of **0.4 cm**.
- ✓ Re-visited stations were processed daily to identify any possible weakness in the survey method. **22** stations out of **506** were re-visited (4.3%). The average absolute error of the elevation was calculated to be **0.4 cm** with a root mean square (RMS) error of **0.5 cm**. The maximum error values were found to be **1.1 cm** at station **2081.**

7. Data Processing and Deliverables

- *Total Magnetic Field Contours*

The total magnetic field was gridded using a bi-directional gridding method (BIGRID GX) with grid cell size of 25 m. This method is ideal for line-oriented data as it inherently tends to strengthen trends perpendicular to the survey line direction. One pass of a 3 x 3 Hanning filter was then applied to improve the overall appearance of the final *Total Field Contours* map (1.2). For the Blackflake grid, the Geosoft colour table was used with linear intervals of 5 nT, from 57 050 to 57 370 nT.

- *Magnetic Gradient (First Vertical Derivative)*

The first vertical derivative was calculated from the total magnetic field grid. The Geosoft colour table was used with linear intervals of 2 nTm, from -4 to 4 nT/m.

- *IPower3D® Quality Control*

The first step in processing IPower3D® data is quality control. The IPower3D® configuration takes a large number of readings using different electrode orientations to thoroughly investigate the subsurface in 3D. Because of the varying geometry used there are a small number of readings that are not at favourable dipole orientations. IPower3D® incorporates a high degree of redundancy, so a moderate percentage of readings can be rejected, without compromising survey coverage.

To ensure consistent and efficient quality control Abitibi Geophysics has developed *ProSysControl*™ This application analyses the normalized decay curve for each reading within the data set. Only readings that successfully pass quality control will be used to calculate the final chargeability. This software also allows the user to view each decay curve for additional manual quality control.

Figure 9 is a screen grab from *ProSysControl*™ showing an alarm for high contact resistance (red box) that has been accepted (green bar) and plot, showing the decay curve (red) and normalized decay curve (blue) for the selected reading, highlighted in blue.

- *IPower3D® Inversion*

Apparent resistivity and chargeability values were inverted using RES3DINV x 64 version 3.04.98 from GEOTOMO (www.geoelectrical.com). This software calculates three dimensional patterns of resistivity and chargeability of the subsurface that best explain the values recorded at surface. The software generates a model consisting of rectangular prisms and applies a nonlinear algorithm to minimise the difference between the calculated model and field measurements.

- *ABSOLUTE GRAVITY (g_A)*

The observed gravity values were first imported into Geosoft Xcelleration along with the elevation data. In view of the high accuracy of the gravity readings, the absolute RMS error of the observed gravity repeat values was **0.006** mGal.

Field observations corrected for earth tides, long term instrument drift and corrections made for instrument height and residual instrument drift. These values were estimated as following:

- ✓ Tidal correction is re-calculated in Xcelleration using the station location and measuring time. The accuracy of this correction is better than 0.001 mGal.
- ✓ New drift correction factors of 0.296 and 0.143 were calculated for the gravimeters 418 and 430, respectively to automatically correct the long term instrument drift during the survey.
- ✓ In presence of the snow, the value of the instrument height is typically accurate within ± 3.0 cm which is equivalent to an error of ± 0.009 mGal.
- ✓ The residual drift of the gravimeter is assumed linear between two readings at the base station. The closure error was linearly distributed on the data in the corresponding loop, taking into account the instrument height and the tidal correction. Non-linear drifting could introduce an error of up to 0.005 mGal in the middle of a loop.

The maximum error on $\mathbf{g_A}$ is therefore estimated to be ± **0.021** mGal.

No re-visited station has exceeded that value.

- *BOUGUER ANOMALY (g_B)*

Density "ρ": a mean crustal rock density of **2.75** g/cm^3 was taken for the Bouguer correction.

Latitude Correction: both the rotation of the Earth (generating centripetal acceleration) and its slight equatorial bulge produce an increase of gravity with latitude. This effect is corrected when computing the theoretical value of gravity at the surface of the reference ellipsoid using the Geodetic Reference System GRS67:

$$g_L(\phi) = 978\,031.846\,\{1.0+0.005278895\sin^2(\phi) + 0.000023462\sin^4(\phi)\}\ \text{mGal}$$

For local surveys, only the gradient due to latitude is important:

$$g_L = 0.0000812132\sin(2\phi)\,Y_i \quad \text{mGal/m}$$

With dual frequency DGPS, the horizontal (latitude) position is accurate to better than ± 5.0 cm, so the error is less than **0.001** mGal.

- *BOUGUER ANOMALY (g_B) (CONT'D)*

Free Air Anomaly: since gravity varies with the inverse of distance squared, it is necessary to correct for changes in elevation between stations so that all field readings are reduced to a datum surface. The Free Air anomaly at elevation "h" is:

$$g_F = g_A - g_L + 0.308596 * h$$

Simple Bouguer Anomaly: it accounts for attraction of bedrock of density "ρ" between the station and the datum plane, which was ignored in the Free Air calculation. The Bouguer anomaly is:

$$g_B = g_F - 0.0419088 * \rho * h$$

Using a density of 2.67 g/cm^3 and a typical accuracy of ± **1.6 cm** in elevation, the error on the combined Free Air and Bouguer correction is **± 0.003** mGal.

- *ACCURACY OF g_B*

Table 4. Accuracy of g_B

Step	Source / Evaluation Method	Error (mGal)	
		Maximal	Typical
g_A	Re-occupied stations	0.021	0.009
g_L	Latitude correction	0.001	0.000
g_B	Free Air and Bouguer	0.009	0.003
Estimated error ε_{g_B} on g_B *		**0.023**	**0.009**
Contract requirement *		0.050	0.050

* excluding terrain correction,

$$\varepsilon_{g_B} = \pm\sqrt{\varepsilon_{g_A}^2 + \varepsilon_{g_L}^2 + \varepsilon_{g_B}^2} \text{ , mGal}$$

- *TERRAIN CORRECTION*

Terrain correction allows for surface irregularities in the vicinity of the station, not terrain accounted for in the Simple Bouguer anomaly calculation. An excess mass in the form of a positive topographic feature adjacent to a gravity station exerts an upward pull on the gravity meter, thus lowering the observed reading. A mass deficiency in the form of a valley adjacent to a gravity station causes the gravity field to be lower than it would be where the terrain is flat. Terrain corrections compensate for these effects and are therefore always positive.

❑ *TERRAIN CORRECTION (CONT'D)*

Inner Terrain Correction (ITC):
The ITC, which corrects for local topographic features (terrain effect up to 50 m from the station), is performed using the Hammer method (Geophysics, 1939). This method involves creating a set of concentric rings, or zones as they are referred to here, each of which is divided into a specified number of equal-sized segments. The average elevation for each of these segments is entered relative to the elevation specified for a given station. In this way, the topography immediately surrounding each station can be defined and the inner terrain correction calculated:

$$g_T = \gamma * 0 * \theta * \left(r_2 - r_1 + \sqrt{r_1^{\,2} + z^2} - \sqrt{r_2^{\,2} + z^2} \right)$$

Where	γ =	$6.67\text{x}10^{-8}$ dyne cm^2/g^2
	θ =	sector angle (in radians)
	ρ =	density (in g/cm^3)
	r_1, r_2 =	inner and outer sector radius (in cm)
	z =	average height difference between the station and the sector (in cm)

	Zone B	**Zone C**
r_1:	2 m	12 m
r_2:	12 m	50 m
Number of sectors:	4 (θ = 1.57)	4 (θ = 1.57)

The slopes of hammer Zones B and C were collected at each gravity station during the fieldwork operations and the inner terrain correction was calculated using our Excel code and added in the final processing.

Outer Terrain Correction (OTC):
The OTC, which corrects for more distant topographic features, was not performed in this project because the DEM grid of 50 m resolution (cell size) provided by the client is not wide enough to perform this correction properly.

In this project only near (inner) terrain correction was used to calculate the Complete Bouguer anomaly. The obtained near terrain effect values range from 0 to 0.257 mGal for an average of 0.004 mGal on the Black Flake property.

- *COMPLETE BOUGUER ANOMALY*

The Bouguer anomaly was calculated employing standard reductions using a mean crystal rock density value of 2.67 g/cm^3.

The reduced data are interpolated to a square grid of 35 m cell size using a minimum curvature method (RANGRID) and followed by a second gridding (regrid) process with a cell size of 5 m to improve the overall appearance of the final data (map 2.2). The Oasis Montaj color table Clra64.tbl was used with linear intervals of 0.05 mGal from -55.25 to -56.95 mGal.

- *RESIDUAL ANOMALY CONTOURS*

The residual anomaly was generated by subtracting the regional field from the *Bouguer gravity anomaly* (map 2.5).

The Oasis Montaj color table (Clra64.tbl) was used with linear intervals of 0.2 mGal from -0.3 to 0.5 mGal.

- *VERTICAL GRADIENT CONTOURS*

Using a convolution filter method, the first *vertical derivative* (vertical gradient) of the Bouguer anomaly was calculated (map 2.7). Two passes of a Hanning 3 x 3 filter were applied to the grid to improve the overall appearance of the final contours map.

The Oasis Montaj color table (Clra64.tbl) was used with linear interval of 0.0001 mGal/m from -0.003 to 0.003 mGal/m.

- *MAPS PRODUCED*

The following colour maps (next page) are bound or inserted in pouches at the end of this report.

Our Quality System requires every final map to be inspected by at least two qualified persons before being approved and included within a final report.

Table 5. Maps produced

Map Number	Description	Scale
L6+00N to L12+00N (5 plates)	IPower3D® Induced Polarization Survey – Vertical sections	1:10 000
1.1	GPS-positioned Magnetic Field Survey – Total Magnetic Intensity Anomaly Profiles (nT)	1:5 000
1.2	GPS-positioned Magnetic Field Survey – Total Magnetic Intensity Anomaly Contours (nT)	1:5 000
1.4	GPS-positioned Magnetic Field Survey – Calculated Vertical Gradient Contours (nT/m)	1:5 000
2.2	High-Resolution Ground Gravity Survey – Bouguer Anomaly Contours (mGal) (Slab density: 2.67 g/cm^3)	1:5000
2.3	High-Resolution Ground Gravity Survey – Elevation Contours (m)	1:5000
2.5	High-Resolution Ground Gravity Survey – Residual Anomaly Contours (mGal) (1st order polynomial trend)	1:5000
2.7	High-Resolution Ground Gravity Survey – First Vertical Derivative Contours (mGal/m)	1:5000
8.2_150	IPower3D® IP Survey – Inverted Resistivity at a depth of 150 m (Ohm-m)	1:5 000
8.2_250	IPower3D® IP Survey – Inverted Resistivity at a depth of 250 m (Ohm-m)	1:5 000
8.3_150	IPower3D® IP Survey – Inverted Chargeability at a depth of 150 m (mV/V)	1:5 000
8.3_250	IPower3D® IP Survey – Inverted Chargeability at a depth of 250 m (mV/V)	1:5 000
8.6_150	IPower3D® IP Survey – Calculated Gold Index at a depth of 150 m	1:5 000
8.6_250	IPower3D® IP Survey – Calculated Gold Index at a depth of 250 m	1:5 000
10.0	Geophysical Interpretation	1:5 000

- *DIGITAL DATA*

The above-described maps are delivered in the Oasis Montaj map file format on DVD-Rom.

A copy of all survey acquisition data (ASCII text format) and processed data (Geosoft Montaj databases) are also delivered on DVD-Rom.

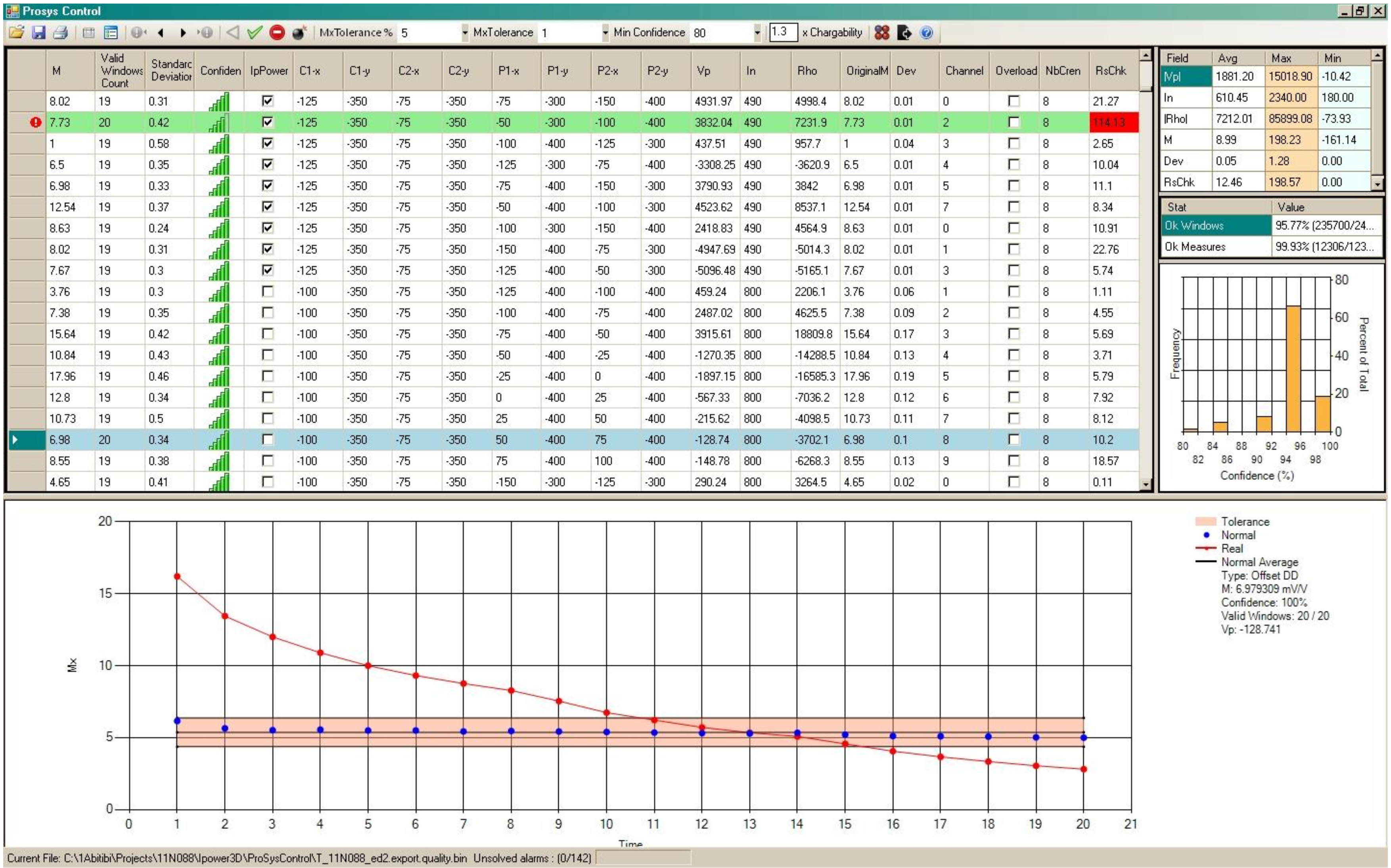


Figure 9. Screen grab from ProSysControl, Abitibi Geophysics' proprietary QC software

8. RESULTS AND RECOMMENDATIONS

❑ *MAGNETIC*

The analysis of the *Total Magnetic Field profiles* (1.1), *contours* (1.2) and the *Calculated Vertical Gradient Contours* (1.4) from the Blackflake survey has shown several magnetic trends throughout the grid. There are **4** magnetic highs, labelled **MH-01** to **MH-04** as well as **3** magnetic low bodies, coloured in green on the *Geophysical Interpretation* map (10.0). The magnetic high trends correlate in strike and location with known magnetie rich diabase dikes that cut through the grid at ~130º. There are several circular magnetic low regions throughout the grid as well. Two of these, located near the center of the grid, between lines 6+00N and 12+50N also correlate with anomalous gravity lows.

Figure 10 below shows the 3D inversion results of the magnetic data. Negative susceptibility values are represented by the blue isosurfaces and range from -0.003 to -0.005 and positive susceptibility values are represented in hot colors and range from 0.002 to 0.007. The two positive features striking NW/SE correlate to the diabase dikes in the area. Negative values represent values below the average magnetic susceptibility.

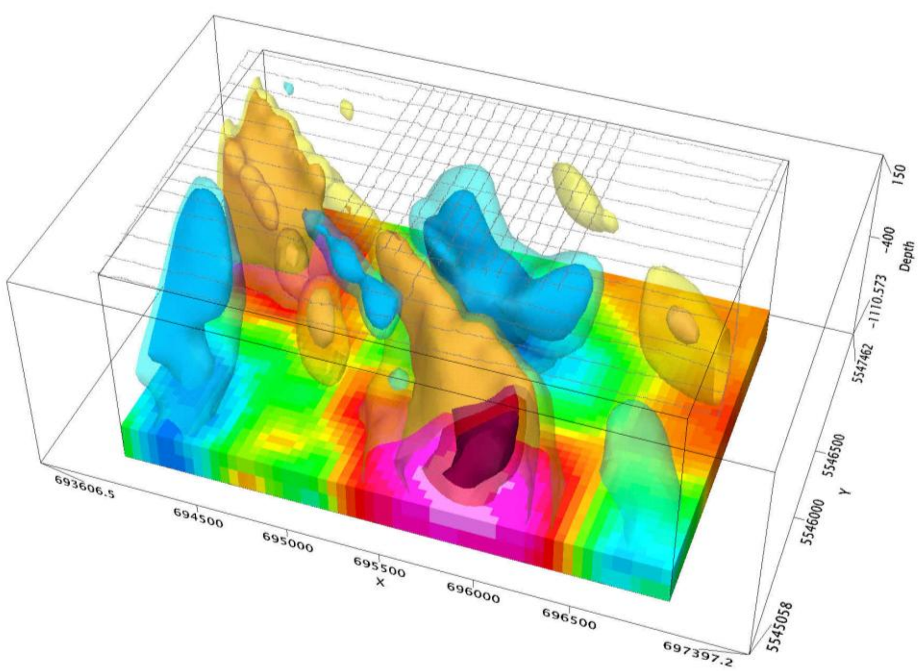


Figure 10. Magnetic 3D model with susceptibility isosurfaces at 1100 m depth, cool colors are negative susceptibility and hot colors are positive susceptibility (looking northeast)

❑ *THE IPOWER3D® SYSTEM*

The IPower3D® configuration has been designed to maximize the sensitivity of the induced polarization survey and is especially effective under conditions of high conductance overburden (conductance is the product of conductivity and thickness). The values of apparent chargeability measured in the field by the IPower3D® configuration can be several times greater than the values measured by a conventional electrode configuration, however the background response is not amplified as it occupies the entire range of sensitivity (both positive and negative). The advantage of the IPower3D® configuration is that it is able to detect anomalies that would otherwise be within the noise envelope of conventional IP arrays.

The IP response of this grid is very low; with apparent chargeability anomalies having small amplitudes up to 5.68 mV/V. The inversion results of the IPower3D® data show that the intrinsic chargeabilities are within the range that would be expected with the inversion of data collected using a conventional electrode configuration such as dipole-dipole. The disadvantage of conventional configurations is that sensitivity is often not sufficient to allow the inversion to resolve the source of a polarizable anomaly beneath thick conductive overburden.

Resistivity and chargeability anomalies have been interpreted by studying the 3D inversion models, the true-depth sections and the inverted resistivity and chargeability maps. A total of **3 anomalous trends** have been interpreted, the inferred surface projection of the resistivity / chargeability sources are shown along the survey lines on the *Geophysical Interpretation* map (10.0) and on the true-depth section plates. The anomalies have been correlated from line-to-line and are fully described in appendix B, found at the end of this report.

❑ *RESISTIVITY*

The resistivity inversion indicates a thick layer of conductive overburden. This can be seen clearly on the vertical sections included at the end of the report. It's variable thickness varies, ranging from ~50 m in the west and generally thickening to the east, up to ~200 m in some areas. Underneath this thick layer the ground is more resistive, with values increasing to the east.

A resistive zone has been interpreted from the data and is defined by the 1000 Ω•m contour and can be seen on the *Geophysical Interpretation* map (10.0) in blue. The chargeable anomaly **BF-01** is associated, at least partially with this wide zone of high resistivity.

A resistive low zone has been interpreted as well. This zone has a resistivity of up to 200 Ω•m and is very small. This zone is associated slightly with chargeable anomaly **BF-03.**

❑ *CHARGEABILITY*

The IPower3D® survey has revealed 3 regions of anomalous chargeability. The chargeable anomaly **BF-01** is nearer to surface (~30 m below surface) in the south at L6+00N and starts to dip towards the north (~300 m below surface). Chargeable anomaly **BF-02** has the same signature as **BF-01**; however because of its close proximity to **BF-01** it is only distinguishable as a separate anomaly from L9+00N to L12+50N. The anomaly **BF-03** has the strongest chargeable response of the three (3) anomalies present on the Blackflake grid, however caution should be exercised in the interpretation of anomalies occurring at the ends of lines as the inversion is not as well constrained at the edge of the grid and spatial relationships may not be accurate.

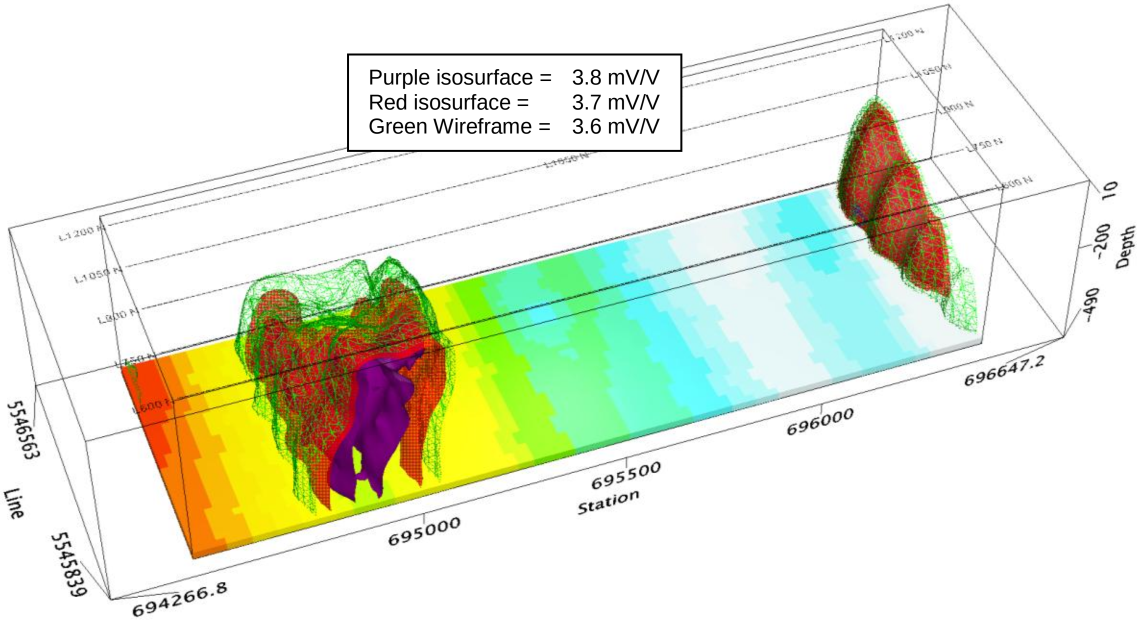


Figure 11. IPower3D® model with chargeability isosurfaces sitting on a resistivity surface at 490 m depth, cool colors are resistive and hot colors are conductive (looking northeast)

❑ *GOLD INDEX*

In addition to resistivity and chargeability, the sections also display the calculated Gold Index, this value is the product of the squared chargeability multiplied by the resistivity ($M^2 * R$). This highlights regions that are both resistive and chargeable, helping to localize the areas with a high potential for hosting gold mineralization. The Gold Index can be a useful tool in exploration for disseminated mineralization associated resistive material such as quartz veins, or silicified zones. In the case of the Blackflake property, most of the survey area is associated with high resistivity, once past the conductive overburden. The Gold Index highlights anomaly **BF-01** nicely throughout its entire trend.

❑ *DRILLING RECOMMENDATIONS*

IPower3D® Drilling Recommendations

Diamond drilling is recommended in order to test the **BF-01** anomaly. Figure 11 below illustrates the drilling target; this information is shown in table 6 and in appendix A.

Table 6. IPower3D® Diamond drilling targets

Anomaly	DDH Target (not collar, center of target)			Priority
	Easting	Northing	Estimated vertical depth below surface (m)	
BF-01	694 850	5 546 150	250	**1**

❑ *PRIORITY 1 TARGET*

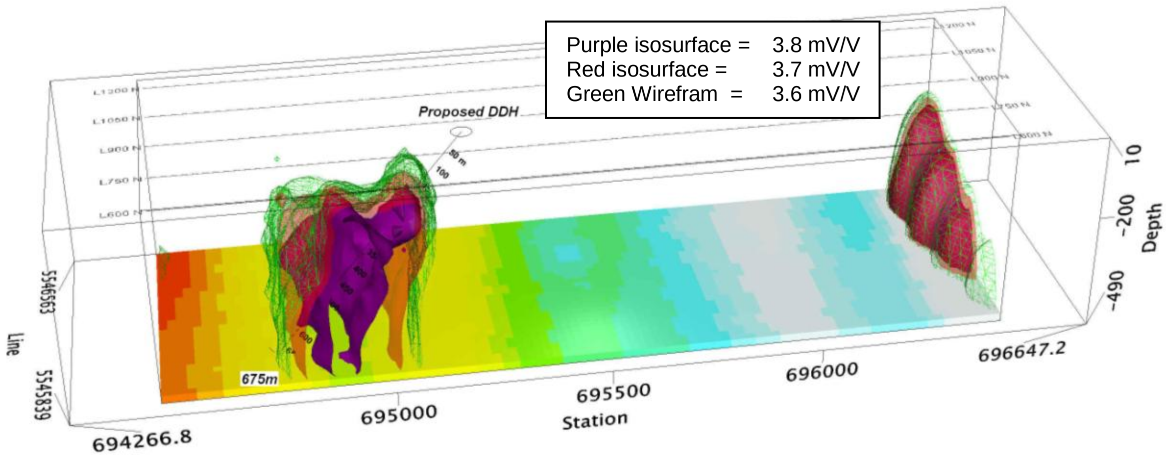


Figure 12. Proposed DDH testing anomalies **BF-01** (looking north)

❑ *GRAVITY*

The Bouguer gravity anomaly is predominantly negative, ranging from -55.25 to -56.95 mGal, (average -56.10 mGal). The most dominant feature on the *Bouguer* map (2.2) is the gravity high trending NW/SE on the western side of the grid. This feature correlates well with the diabase dikes in this area and also with the magnetic high trends. Note that there is no correlation between the pattern of the Bouguer anomaly and its associated topography as seen on the *Elevation Contours* map (2.3).

Upward residual gravity anomaly with the calculation of the first vertical derivative is performed in order to extract the local gravity anomalies from the regional field.

Feature A is a gravity high trend of 0.3 mGal in amplitude striking NW-SE, for the length of the grid and up to 440 m width. Referring to the geological information of the Blackflake property, anomaly **A** corresponds to known diabase dikes at this location. The *magnetic* map of the property (1.2) shows that the feature **A** is also magnetic and the chargeable anomaly **BF-01** is also associated with this anomaly.

Feature B is gravity high of 0.26 mGal in amplitude, open ended to the northeast, and ~300 m wide.

Feature C is a weak, circular gravity low of -0.1 mGal in amplitude, open ended to the west, and ~200 m wide.

Feature D is a weak gravity low of -0.08 to -0.12 mGal in amplitude, open ended to the west and south.

Feature E is a group of small, circular and weak gravity anomalies varying from -0.08 to 0.12 mGal in amplitude. There is a circular magnetic low association with the southern circular gravity low in this group and can be seen on the *Geophysical Interpretation* map (10.0).

Feature F is a small, circular and weak gravity anomaly of 0.12 mGal in amplitude, and ~250 m wide. There is a circular magnetic low associated with this gravity low and can be seen on the *Geophysical Interpretation* map (10.0).

❑ *DISCUSSION*

The objectives of this survey were to identify zones amenable to graphite and/or kimberlite mineralization. The type of graphite mineralization being explored for is hydrothermal vein style located within breccia pipes. A circular gravity low paired with a circular magnetic anomaly would be the response expected. Based on the response seen from gravity features **E** and **F** an IPower3D® survey was conducted over this region, L6+00N to L12+50N. This survey would yield a strongly conductive and chargeable feature in this same locale if the mineralization was graphite. However the chargeability response over this region was very low, indicating a lack of graphite mineralization.

A similar sort of response would be expected from to a kimberlite pipe, a circular gravity low anomaly paired with a circular magnetic anomaly. Typically the magnetic response would be a high due to the presence of magnetite; however, some kimberlites do not contain magnetite. Again, we would expect a circular conductive feature due to the clay depression in the upper section of the pipe. This grid does display a thick layer of conductive overburden that is potentially masking this response. Gravity anomalies **E** and **F** may be attributed to an overburden trough over a kimberlite pipe and are recommended for follow up. However it should be noted that this gravity low region may be due to sediment accumulation.

The chargeable anomaly **BF-01** is located within a resistive region. This chargeable and resistive feature may indicate disseminated sulphide mineralization within a quartz vein or silicified region. This is a geological environment that may be amenable to gold mineralization.

❑ *SURVEY EXTENSIONS*

It is recommended to extend the IPower3D® survey to the north, south and east to further delineate the chargeable anomalies discussed above.

The interpretation of the geophysical data embodied in this report is essentially a geophysical appraisal of the Blackflack Project. As such, it incorporates only as much geoscientific information as the author had on hand at the time. Geologists thoroughly familiar with the area may be in a better position to evaluate the geological significance of the various geophysical signatures. Moreover, as time passes and data provided by follow-up programs are compiled, the priority and significance of exploration targets reported in this study may be downgraded or upgraded.

Respectfully submitted,
Abitibi Geophysics Inc.

Pam Coles, G.I.T.
Project Geophysicist

Pierre Bérubé, P.Eng.,
PEO # 100173563
Senior Geophysicist

PC/mw

APPENDIX A

DESCRIPTION OF THE IP / RESISTIVITY ANOMALIES INTERPRETED ON THE BLACKFLAKE PROJECT

Anomaly	Location			Contrast		Strike Length & Orientation	Comments	Recommendations	Priority
	Line	From	To	Charg.	Res.			P: Prospecting DDH: Drilling X: Survey extension	
BF-01	6+00N	5+25W	6+00W	1	(R)	600 m N-S (Open to the north and south)	Weakly chargeable anomaly associated partially with the resistive zone in the south. This source has potential for disseminated gold mineralization.	**X: survey extension to the north and south** **DDH: Proposed DDH** Northing: 5 546 150 Easting: 695 200 Azimuth: 225 Dip: -45° Depth: 675 m	**1**
	7+50N	5+25W	6+00W	1	(R)				
	9+00N	5+50W	6+00W	1	(R)				
	10+50N	5+75W	6+25W	1	-				
	12+00N	5+75W	6+50W	1	-				
BF-02	9+00N	3+50W	4+00W	1	-	300 m N-S (Open to the north)	Weakly chargeable anomaly.	**X: survey extension to the north**	**2**
	10+50N	3+50W	4+00W	1	-				
	12+00N	3+50W	4+25W	1	-				
BF-03	6+00N	9+25E	East end	1	-	600 m N-S (Open to the north, south and east)	Moderately to weakly chargeable anomaly with a slight conductive association. This source is located at the eastern extent of the survey area. Location information for sources at the edge of the survey are not reliable and an extension is recommended to delineate this target.	**X: survey extension to the north, south and east**	3
	7+50N	9+50E	East end	1	-				
	9+00N	9+25E	East end	1	(C)				
	10+50N	9+25E	East end	2	-				
	12+00N	9+25E	East end	2	-				

**pending favourable prospecting results*

Legend		
Chargeability	Increase:	? = Marginal 1 = Weak 2 = Moderate 3 = High 4 = Very High
Resistivity	Increase:	↑ = Resistive ↑↑ = Very Resistive (R) = Wide Resistive Zone
	Decrease:	↓ = Conductive ↓↓ = Very Conductive (C) = Wide Conductive zone

APPENDIX B

IPOWER3D® INDUCED POLARIZATION SURVEY – VERTICAL SECTION

Xmet Inc.
Blackflake Project
Ontario, Canada

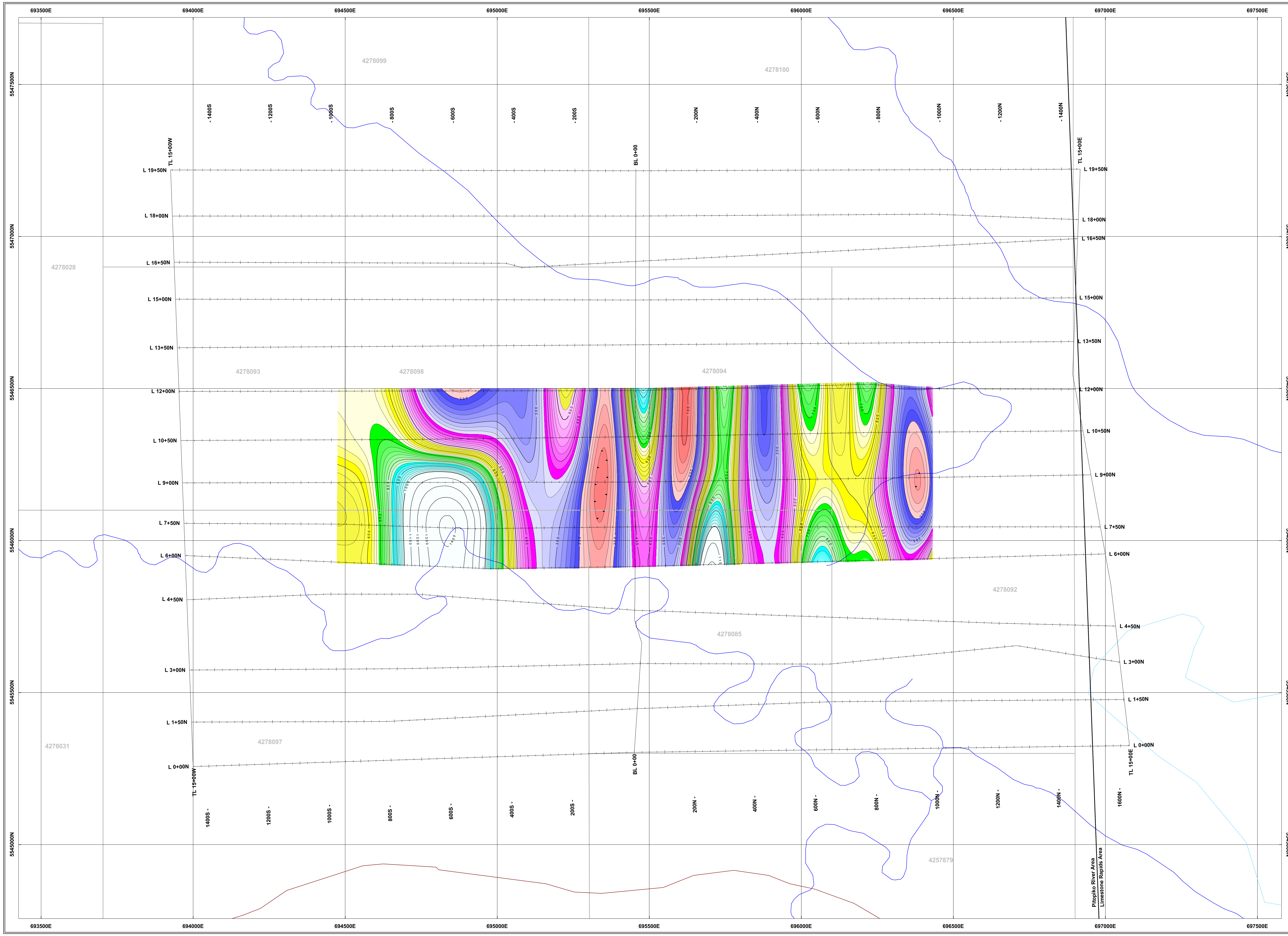
IPower3D® IP Survey
Inverted Chargeability at a Depth of 150 m (mV/V)

Interpreted by:	P. Coles, G.I.T.	2014/05
Surveyed by:	Abitibi Geophysics Inc.	2014/04
Approved by:	C. Brown, P.Geo.	2014/05

Reference map: 42K/01 — Scale 1:5000

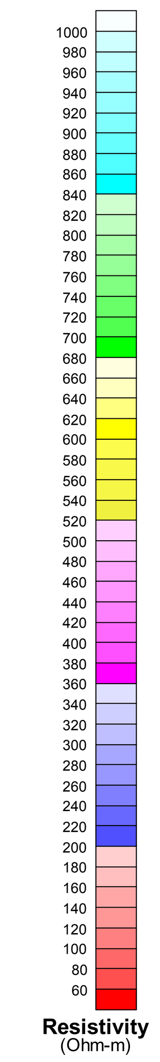
Project no: 14N021 — Map no: 8.3_150

ABITIBI GEOPHYSICS



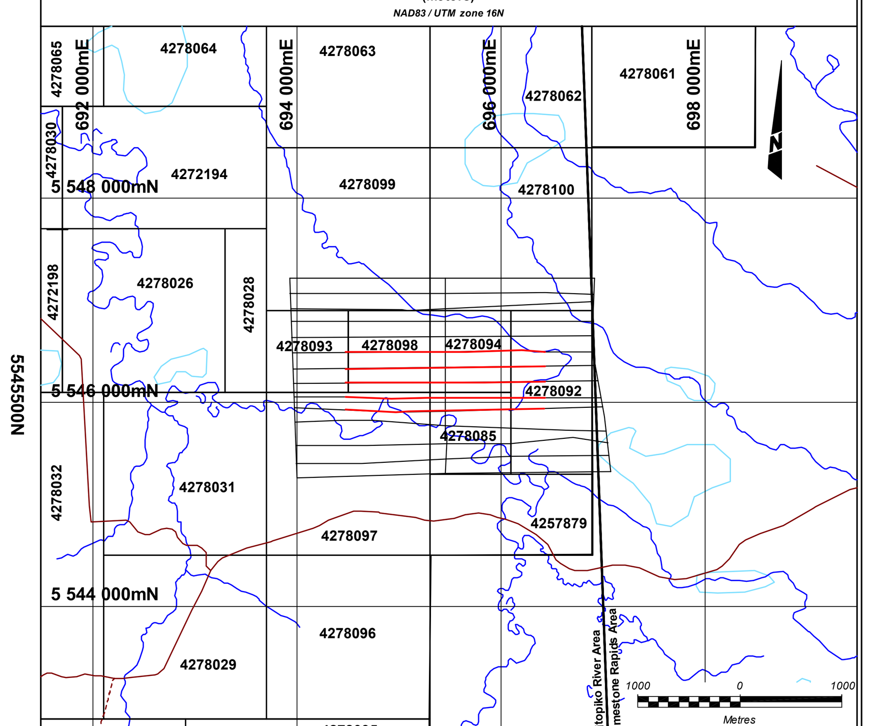
Resistivity Contours

Unit: Ohm-m
Configuration: IPower3D®
Inversion: Res3Dinv (Geotomo)



Scale 1:5000

100 0 100 200 300
(meters)
NAD83 / UTM zone 16N

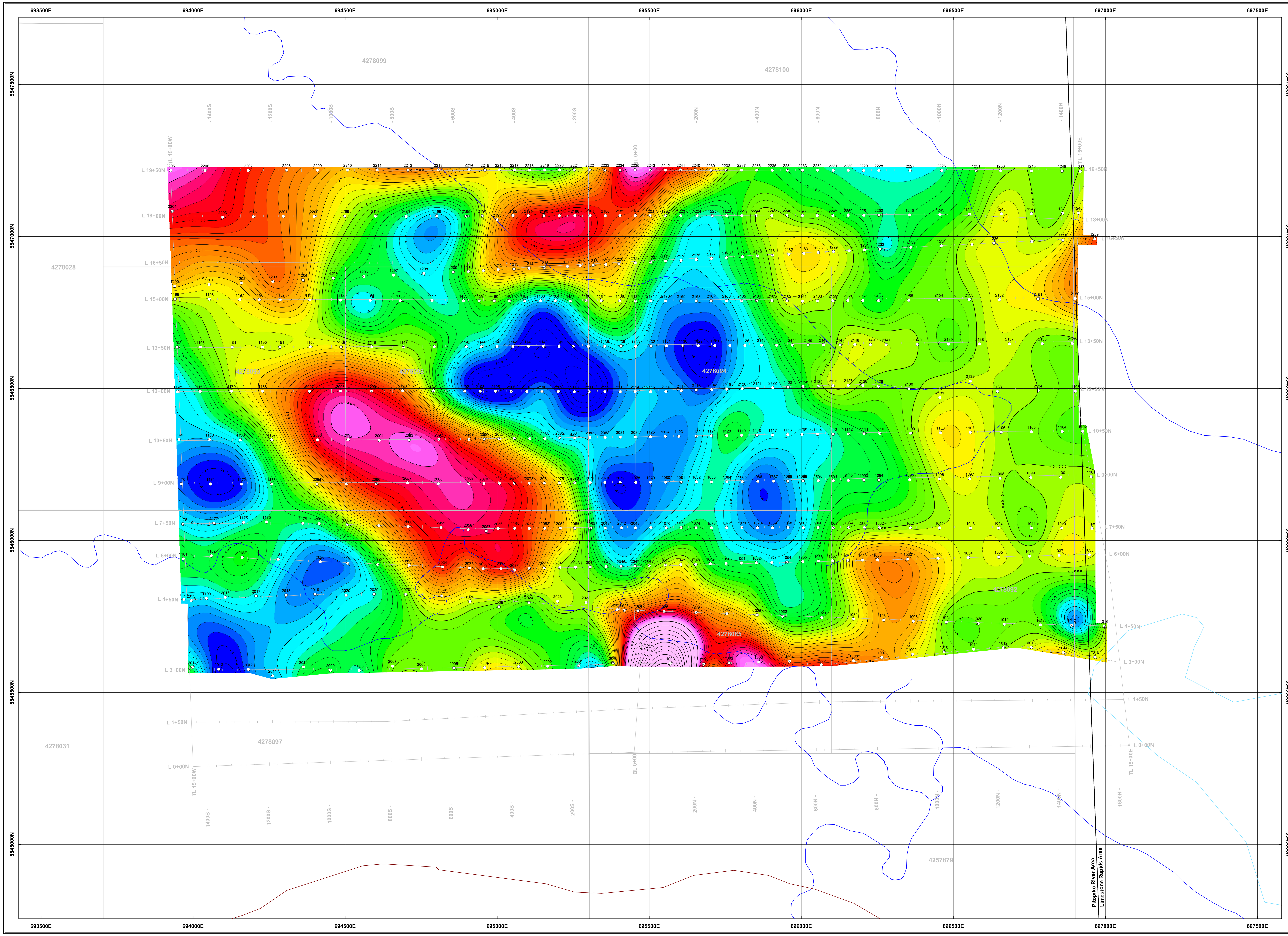


Xmet Inc.
Blackflake Project
Ontario, Canada

IPower3D® IP Survey
Inverted Resistivity at a Depth of 150 m
(Ohm-m)

Interpreted by:	P. Coles, G.I.T.	2014/05
Surveyed by:	Abitibi Geophysics Inc.	2014/04
Approved by:	C. Brown, P.Geo.	2014/05
Reference map: 42K/01		Scale 1:5000
Project no: 14N021		Map no: 8.2_150

ABITIBI GEOPHYSICS



Residual Anomaly Contours

Unit: mGal

Instruments: Gravity Meter: Scintrex CG-5u AutoGrav
GPS: Leica Viva GS15

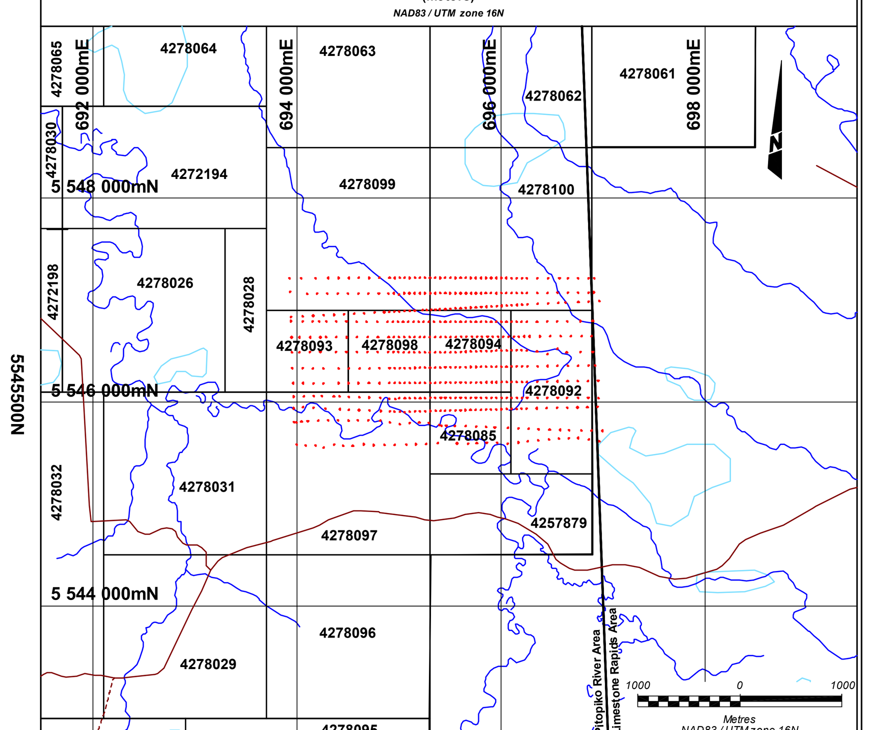
Station # — Gravity Station

Residual Anomaly (mGal): 0.48, 0.46, 0.44, 0.42, 0.40, 0.38, 0.36, 0.34, 0.32, 0.30, 0.28, 0.26, 0.24, 0.22, 0.20, 0.18, 0.16, 0.14, 0.12, 0.10, 0.08, 0.06, 0.04, 0.02, 0.00, -0.02, -0.04, -0.06, -0.08, -0.10, -0.12, -0.14, -0.16, -0.18, -0.20, -0.22, -0.24, -0.26, -0.28

Scale 1:5000

100 0 100 200 300 (meters)

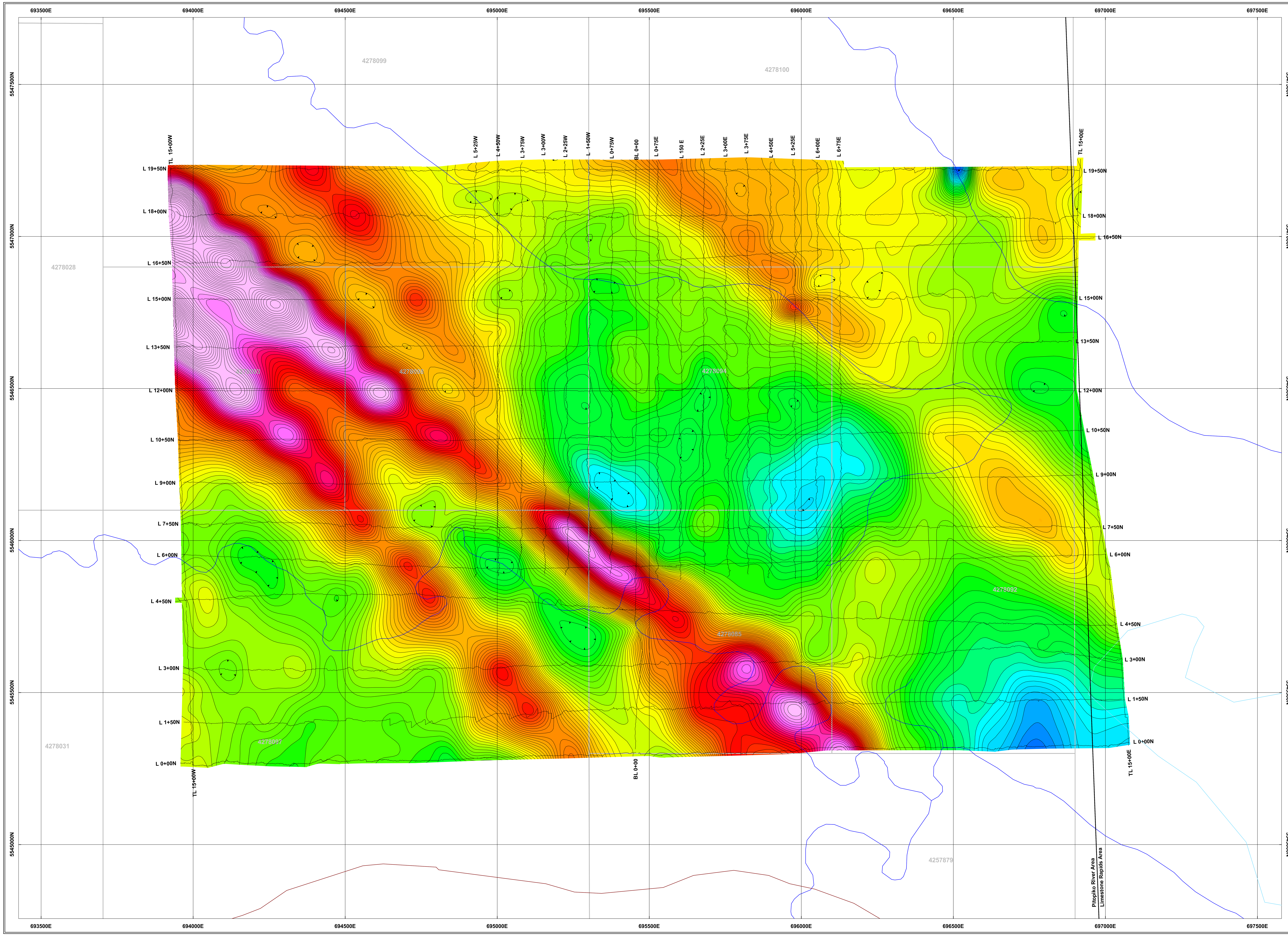
NAD83 / UTM zone 16N

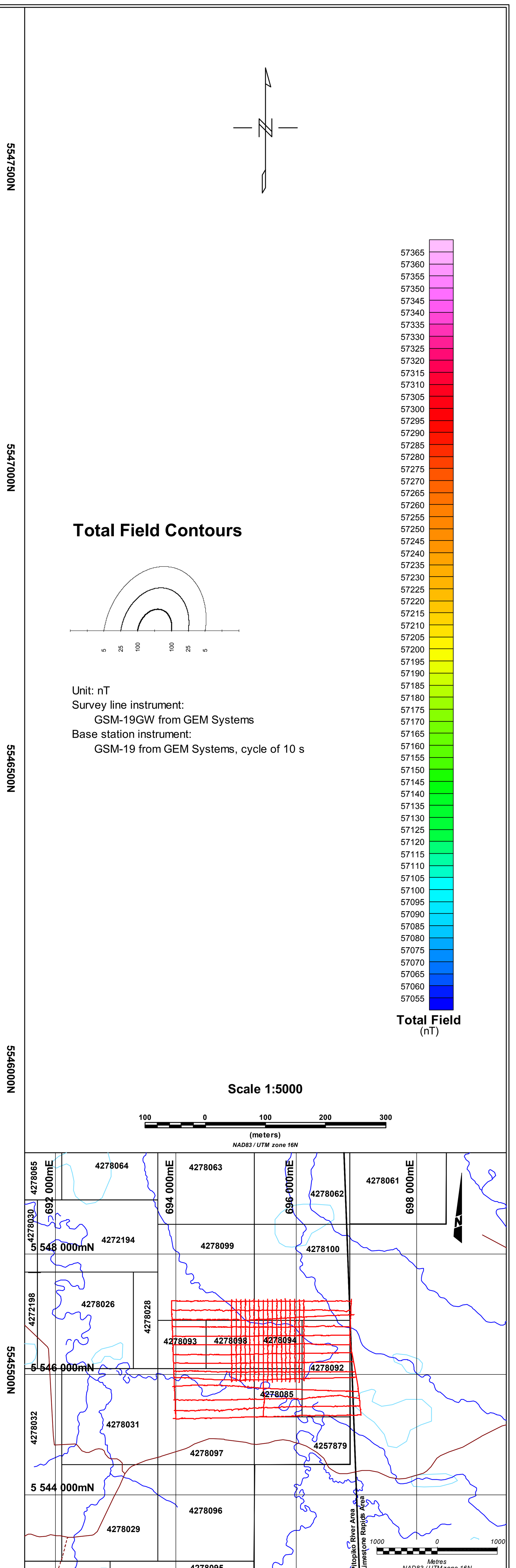


Xmet Inc.
Blackflake Project
Ontario, Canada

High-Resolution Ground Gravity Survey
Residual Anomaly Contours (mGal)
(1st order polynomial trend)

Interpreted by:	P. Coles, G.I.T.	2014/05
Surveyed by:	Abitibi Geophysics Inc.	2014/03
Approved by:	C. Brown, P.Geo.	2014/05
Reference map: 42K/01		Scale 1:5000
Project no: 14N021		Map no: 2.5





Xmet Inc.
Blackflake Project
Ontario, Canada

GPS-positioned Magnetic Field Survey
Total Magnetic Intensity Anomaly Contours (nT)

Interpreted by:	P. Coles, G.I.T.	2014/05
Surveyed by:	Abitibi Geophysics Inc.	2014/03
Approved by:	C, Brown, P.Geo.	2014/05
Reference map: 42K/01		Scale 1:5000
Project no: 14N021		Map no: 1.2