Report #10054

HIGH RESOLUTION STINGER MOUNTED MAGNETIC AND RADIOMETRIC SURVEY FOR CANADIAN INTERNATIONAL MINERALS INC.

MARATHON AREA, ONTARIO

Fugro Airborne Surveys Corp.
Mississauga, Ontario
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SUMMARY

This report describes the logistics, data acquisition and presentation of results from a high resolution magnetic and radiometric airborne geophysical survey carried out for Canadian International Minerals Inc. over a property in the Marathon area, Ontario. The survey was flown from September 17th to 20th, 2010. Total coverage of the survey block amounted to 352 km.

The purpose of the survey was to provide information that could be used to map the structure and rare earth elements of the survey area. This was accomplished by using a high sensitivity HM1 stinger system and a 256-channel spectrometer. The information from these sensors was processed to produce maps that display the magnetic and radiometric properties of the survey area. A GPS electronic navigation system ensured accurate positioning of the geophysical data with respect to the base maps.

The survey data were processed and compiled in the Fugro Airborne Surveys Toronto office.

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APPENDICES

1. INTRODUCTION

A high resolution magnetic and radiometric survey was flown for Canadian International Minerals Inc., from September 17th to 20th, 2010. Coverage consisted of 320.0 line-km of traverse lines and 32.0 line-km of tie-lines. The survey area can be located on NTS map sheet 42 D/15. Flight lines were flown in an azimuthal direction of 90° with a traverse line separation of 50 metres. Tie lines were flown orthogonal to the traverse lines with a line separation of 500 metres.

The survey employed the HM1 Stinger magnetic system. Ancillary equipment consisted of radar, laser and barometric altimeters, video camera, digital recorders, a 256-channel spectrometer and an electronic navigation system. The instrumentation was installed in an AS350-B2 turbine helicopter, registration C-GJIX, provided by Questral Helicopters Ltd. (Figure 1.1). The helicopter flew at an average airspeed of 150 km/h with a sensor height of approximately 60 m.

Figure 1.1: Fugro Airborne Surveys HM1 with AS350 B2

2. SURVEY OPERATIONS

The base of operations for this survey was established at Marathon Airport, Marathon, Ontario, from September 17th to 20th, 2010. The planned survey area can be located on NTS map sheet 42 D/15.

Table 2-1 lists the corner coordinates of the survey block in WGS84, UTM Zone 16N, central meridian 87° W.

TABLE 2-1

Block	Corners	X-UTM (E)	Y-UTM (N)
Deadhorse Creek	1	522000.0	5412000.0
	2	526000.0	5412000.0
	3	526000.0	5408000.0
	4	522000.0	5408000.0

The survey specifications were as follows:

Parameter	Specifications
Traverse line direction	90°
Traverse line spacing	50 m
Tie line direction	0°
Tie line spacing	500 m
Sample interval	10 Hz, 4.2 m @ 150 km/h for mag; 1Hz, 42 m @ 150 km/h for spectrometry
Aircraft mean terrain clearance	60 m
Mag sensor mean terrain clearance	60 m
Average speed	150 km/h
Navigation (guidance)	±2 m, Real-time GPS
Post-survey flight path	±1 m, Differential GPS

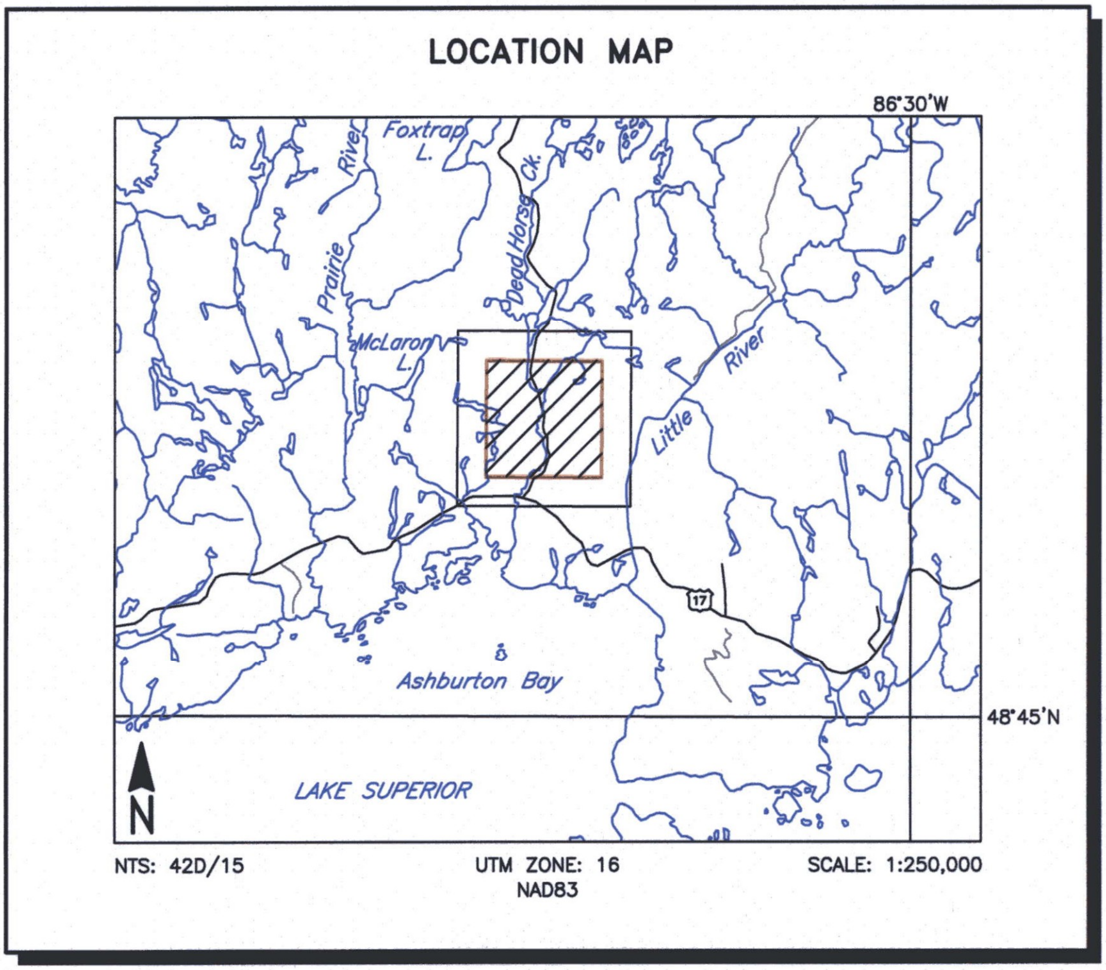

Figure 2: Location map and sheet layout. Marathon Area, Ontario - Job # 10054

3. SURVEY EQUIPMENT

This section provides a brief description of the geophysical instruments used to acquire the survey data and the calibration procedures employed. The geophysical equipment was installed in an AS350-B2 helicopter. This aircraft provides a safe and efficient platform for surveys of this type.

Airborne Magnetometer

Model:	Fugro D1344 processor with Scintrex CS3 sensor
Type:	Optically pumped cesium vapour
Sensitivity:	0.01 nT
Sample rate:	10 per second

The magnetometer sensor is housed in a stinger mounted on the helicopter.

Magnetic Base Station

Two magnetic base stations were installed at Marathon Airport during course of the survey. The second unit was used as a backup in case of failure of the primary unit.

Primary Magnetic Base stations

Model:	Fugro CF1 base station with timing provided by integrated GPS	
Sensor type:	Scintrex CS-2	
Counter specifications:	Accuracy:	±0.1 nT
	Resolution:	0.01 nT
	Sample rate	1 Hz
GPS specifications:	Model:	Novatel Allstar with CMT-1200 antenna
	Type:	Code and carrier tracking of L1 band, 12-channel, C/A code at 1575.42 MHz
	Sensitivity:	-90 dBm, 1.0 second update
	Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is 2 metres

Environmental Monitor specifications:

Temperature:
- Accuracy: ±1.5ºC max
- Resolution: 0.0305ºC
- Sample rate: 1 Hz
- Range: -40ºC to +75ºC

Barometric pressure:
- Model: Motorola MPXA4115A
- Accuracy: ±3.0º kPa max (-20ºC to 105ºC temp. ranges)
- Resolution: 0.013 kPa
- Sample rate: 1 Hz
- Range: 55 kPa to 108 kPa

A digital recorder is operated in conjunction with the base station magnetometer to record the diurnal variations of the earth's magnetic field. The clock of the base station is synchronized with that of the airborne system, using GPS time, to permit subsequent removal of diurnal drift. The location for the primary base station set-up, in WGS84 geographic coordinates is as follows:

Location	**Date (2009)**	**Latitude**	**Longitude**	**Height**
Marathon Airport primary	Sep.18 – Sep 19	48º 45' 22.49"N	86º 20' 50.06"W	317.70

Navigation (Global Positioning System)

<u>Airborne Receiver for Flight Path Recovery and Navigational Guidance</u>

Model:	Novatel OEMV
Type:	Code and carrier tracking of L1-C/A code at 1575.42 MHz, 24 channel (WAAS enabled).
Sample rate:	10 Hz update
Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is better than 1 metre.
Antenna:	Mounted on tail of aircraft.

<u>Primary GPS Base Station</u>

Model:	Novatel OEMV
Type:	Code and carrier tracking of L1-C/A code at 1575.42 MHz Dual frequency, 24-channel.
Sample rate:	1 Hz update and recording
Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is better than 1 metre.

<u>Secondary GPS Base Station</u>

Model:	Marconi Allstar OEM, CMT-1200
Type:	Code and carrier tracking of L1 band, 12-channel, C/A code at 1575.42 MHz
Sensitivity:	-90 dBm, 1.0 second update
Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is 2 metres.

The Novatel OEM V is a line of sight, satellite navigation system that utilizes time-coded signals from at least four of forty-eight available satellites. NAVSTAR satellite constellations along with Wide Area Augmentation Service (WAAS) signal are used to calculate the position and to provide real time guidance to the helicopter. A similar system was used as the primary base station receiver. The mobile and base station raw XYZ data were recorded, thereby permitting post-survey differential corrections for theoretical accuracies of better than 1 metre. A Novatel Allstar GPS unit, part of the CF-1, was used as a secondary (back-up) base station.

Each base station receiver is able to calculate its own latitude and longitude by recording data over a 24 hour period and calculating the average position. For this survey, primary and secondary GPS base stations were established. The GPS location for each base, in WGS84 geographic coordinates, was as follows:

Location	Date (2008)	Latitude	Longitude	Height
Marathon Airport Primary	Sep.18 –Sep 19	48º 45' 23.11"N	86º 20' 49.97"W	321.30
Marathon Airport Secondary	Sep.18 –Sep 19	48º 45' 22.49"N	86º 20' 50.06"W	317.70

Radar Altimeter

Manufacturer: Honeywell/Sperry

Model: AT300/RT220

Type: Short pulse modulation, 4.3 GHz

Sensitivity: 0.3 m

Sample rate: 10 per second

The radar altimeter measures the vertical distance between the helicopter and the ground, except in areas of dense trees.

Laser Altimeter

Manufacturer: Optech

Model: ADM GPA 100

Type: Fixed pulse repetition rate of 1600 kHz

Sensitivity: ±5 cm from 10ºC to 30ºC
±10 cm from -20ºC to +50ºC

Sample rate: 10 per second

The laser altimeter is mounted on a cross bar underneath the helicopter, and measures the distance from the helicopter to the ground.

Barometric Pressure and Temperature Sensors

Model:	DIGHEM D1300	
Type:	Motorola MPX4115AP analog pressure sensor AD592AN high-impedance remote temperature sensors	
Sensitivity:	Pressure:	150 mV/kPa
	Temperature:	100 mV/°C or 10 mV/°C (selectable)
Sample rate:	10 per second	

The D1300 circuit is used in conjunction with one barometric sensor and up to three temperature sensors. Three sensors are installed in the data acquisition system in the aircraft, to monitor pressure and internal and external operating temperatures.

Digital Data Acquisition System

Manufacturer:	Fugro
Model:	HeliDAS
Recorder:	Compact Flash Card

The stored data are downloaded to the workstation PC, for verification, backup and preparation of preliminary products.

Compensation System

Manufacturer: Fugro

Model: HeliDAS, with fluxgate magnetometer

The presence of the helicopter in close proximity to the sensors causes considerable deviations on the readings. The orientation of the aircraft with respect to the sensors and the motion of the aircraft through the earth's magnetic field are contributing factors. A special calibration flight is flown to record the information necessary to remove these effects.

The manoeuvre consists of flying a series of calibration lines at high altitude to gain information in each of the required line directions. During this procedure, the pitch, roll and yaw of the aircraft are varied. Each variation is conducted in succession (first vary pitch, then roll, then yaw). This provides a complete picture of the effects of the aircraft at designated headings in all orientations.

The HeliDAS compensation system derives a set of coefficients for each line direction and for each magnetometer sensor. The coefficients can be applied real-time or in a post-processing environment.

Video Flight Path Recording System

Type: Axis 2420 Digital Network Camera

Recorder: Axis 241S Video Server and tablet computer

Format: Blocked binary digital format with index to allow for extraction of individual JPEG images (.BDX, .BIN files)

Fiducial numbers are recorded continuously and are displayed on the margin of each digital image. This procedure ensures accurate correlation of data with respect to visible features on the ground.

Spectrometer

Manufacturer: Radiation Solutions Inc.

Model: RSX-5

Type: 256 Multichannel, Thorium stabilized

Accuracy: 1 count/sec.

Update: 1 integrated sample/sec.

The RSX-5 Airborne Spectrometer consisted of four downward looking crystals (1024 cu.in.- 16.8 L) and one upward looking crystal (256 cu.in.- 4.2 L). The downward crystals record the radiometric spectrum from 410 KeV to 3 MeV over 256 discrete energy windows, as well as a cosmic ray channel which detects photons with energy levels above 3.0 MeV. From these 256 channels, the standard Total Count, Potassium, Uranium and Thorium channels are extracted. The upward crystal is used to measure and correct for Radon.

Each crystal pack in the RSX-5 is automatically gain stabilized using a sophisticated multi-peak approach. The RSX-5 also performs spectral stabilization on the ground and in the air without the need for test sources.

The RSX-5 does not measure dead time in a traditional sense. A live clock is adjusted for loss of system measured pile-up rejections to give an apparent dead time to ensure the absolute count rate is correct.

4. QUALITY CONTROL AND PRILIMINARY PROCESSING

Digital data for each flight were transferred to the workstation, in order to verify data quality and completeness. A database was created and updated using Geosoft Oasis Montaj and proprietary Fugro Atlas software. This allowed the data processor to calculate, display and verify both the positional (flight path) and geophysical data on a computer screen. Records were examined as a preliminary assessment of the data acquired for each flight.

Preliminary processing of Fugro survey data consists of differential corrections to the airborne GPS data, spike rejection and filtering of all geophysical and ancillary data, verification of flight videos, diurnal correction, preliminary levelling of magnetic data, and verification of spectrometer spectra.

All data, including base station records, were checked on a daily basis, to ensure compliance with the survey contract specifications. Reflights were required if any of the following specifications were not met.

Navigation - Digital positioning must be available; PDOP of less than 10 and 4 or more satellites to be available for GPS solution.

Flight Path	-	No lines to exceed ±25 m departure from planned flight path over a continuous distance of more than 1000 m, except for reasons of safety.
Clearance	-	Mean terrain sensor clearance of 60 m with altitude deviation from planned clearance not to exceed +/- 12 m over a continuous distance of 2000 m, except where precluded by safety considerations, e.g., restricted or populated areas, severe topography, obstructions, tree canopy, aerodynamic limitations, etc., as decided by the pilot.
Airborne Mag	-	The typical Figure of Merit for the magnetometer will be no greater than 2.0 nT The non-normalized 4^{th} difference not to exceed 1.6 nT over a continuous distance of 1000 m excluding areas where this specification is exceeded due to natural anomalies. Noise envelope for the magnetometer data not to exceed +/- 0.1 nT over a continuous distance of 2000 m
Base Mag	-	Diurnal variations not to exceed 10 nT peak to peak over a straight line time chord of 1 minute.

5. DATA PROCESSING

Flight Path Recovery

The raw range data from at least four satellites are simultaneously recorded by both the base and mobile GPS units. The geographic positions are calculated from this information. Differential corrections, which are obtained from the base station, are applied to the mobile unit data to provide a post-flight track of the aircraft, accurate to within 1 m. Speed checks of the flight path are also carried out to determine if there are any spikes or gaps in the data.

The corrected WGS84 latitude/longitude coordinates are transformed to the local coordinate system used on the final maps. Images or plots are then created to provide a visual check of the flight path.

Residual Magnetic Intensity (RMI)

The magnetic data were corrected to produce a final leveled residual field product by the application of the following sequence of procedures:

- Data quality check on the raw and compensated magnetic data
- Lag correction.
- Loading, checking and application of the measured diurnal data.
- Removal of the IGRF

- Levelling of residual magnetic field data.

The data quality check was accomplished by viewing the raw and compensated data together in profile and grid format after loading into Oasis Montage. Spikes were removed manually with the aid of a fourth difference calculation and small gaps (less then 50 metres) were interpolated using an Akima spline. This also allowed monitoring of the noise levels that were superimposed on the data during survey activities. Magnetometer noise levels were maintained within stated specifications.

A lag correction of 1.4 seconds was applied to the magnetic data to remove the effects of temporal delay inherent in the data acquisition system.

The diurnal variations recorded by the base station were edited for any cultural interference and filtered to remove high-frequency noise. This diurnal magnetic data was then subtracted from the de-spiked, lagged TMI to provide a first order diurnal correction. The diurnal removed magnetic field data was then gridded and compared to a grid of the de-spiked, lagged magnetic data to ensure that the data quality was improved by diurnal removal.

The International Geomagnetic Reference Field (IGRF) was calculated for the survey area using the flight date, height above the WGS spheroid and the latitude and longitude of each survey point. Information on the model used for the calculation can be found at http://www.ngdc.noaa.gov/seg/geomag. The IGRF was removed from the lagged and diurnally corrected data.

The lagged, diurnally corrected and IGRF removed magnetic data was gridded and examined in shadow. Tie line levelling was required in order to remove large line by line levelling errors. A procedure known as micolevelling was then applied to remove any persistent, low-amplitude component of flight line noise. A series of directional filters were applied to the magnetic grid to produce a decorrugation "noise" grid. This grid was then re-sampled back into the database where the resultant "noise" channel was filtered to remove any remaining short wavelength non geological responses. The amplitude of the "noise" channel was limited to +/- 3 nT to restrict the effect the microleveling might have on strong geologic response. Finally, the "noise" channel is subtracted from the leveled channel created earlier in the processing sequence, resulting in the final leveled IGRF removed magnetic field channel.

Calculated Vertical Magnetic Gradient

The leveled magnetic field data were subjected to a processing algorithm that enhances the response of magnetic bodies in the upper 500 m and attenuates the response of deeper bodies. The resulting vertical gradient map provides better definition and resolution of near-surface magnetic units. It also identifies weak magnetic features that may not be evident on the total field map. However, regional magnetic variations and changes in lithology may be better defined on the total magnetic field map.

Radiometrics

All radiometric data reductions performed by Fugro rigorously follow the procedures described in the IAEA Technical Report[1].

All processing of radiometric data was undertaken at the natural sampling rate of the spectrometer, i.e., one second. The data were not interpolated to match the fundamental 0.1-second interval of the magnetic data.

The following sections describe each step in the process.

NASVD

Fugro Airborne Surveys utilizes a multi-channel technique developed by Hovgaard and Gratsy to reduce statistical noise in AGS data. This method (described as *noise adjusted single valve decomposition* or "nasvd"), analyses the 256-channel survey data to identify all statistically significant spectral shapes. These "spectral components" are used to reconstruct new potassium, uranium, thorium, and total count window values, which then have significantly less noise than the original raw windows. This is particularly effective for the uranium window because of the low count rates. The spectral component method results in a more accurate measure of the ground concentration, which improves considerably the discrimination between background and anomalous ground concentrations.

Spectrum Stability

In order to monitor spectral drift, the average spectrum for each flight line was examined and peak position analysis was performed on the K, U and Th peaks. The centroid position for each peak is reported to one tenth of a channel and is reviewed according to the radiometric QC requirement of less than one channel change in peak position for the Th peak. The spectral analysis for the survey is shown in Appendix D.

Pre-filtering

Four parameters were filtered, but not returned to the database:

- Radar altimeter, pressure and temperature data was processed with a 3-point median filter to remove spikes and then smoothed with a 3-point Hanning filter
- The Cosmic window was smoothed with a 9-point Hanning filter (Cos_f).

Reduction to Standard Temperature and Pressure

The radar altimeter data were converted to effective height (h_e) in metres using the acquired temperature and pressure data, according to the following formula:

$$h_e = h * \frac{273.15}{T + 273.15} * \frac{P}{1013.25}$$

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[1] Exploranium, I.A.E.A. Report, Airborne Gamma-Ray Spectrometer Surveying, Technical Report No. 323, 1991. Revised and improved in 2003 : Technical Report no 1363, IAEA, Vienna

where: *h* is the observed crystal to ground distance in metres

T is the measured air temperature in degrees Celsius

P is the barometric pressure in kilopascals

Live Time Correction

The spectrometer, an RSX-5, uses the notion of "live time" to express the relative period of time the instrument was able to register new pulses per sample interval. This is the opposite of the traditional "dead time", which is an expression of the relative period of time the system was unable to register new pulses per sample interval.

The RSX-5 measures the live time electronically, and outputs the value in milliseconds. The live time correction is applied to the total count, potassium, uranium, thorium, upward uranium and cosmic channels. The formula used to apply the correction is as follows:

$$C_{lt} = C_{raw} * \frac{1000.0}{L}$$

where: C_{lt} is the live time corrected channel in counts per second

C_{raw} is the raw channel data in counts per second

L is the live time in milliseconds

Aircraft and Cosmic Background

Aircraft background and cosmic stripping corrections were applied to the total count, potassium, uranium, thorium and upward uranium channels using the following formula:

$$C_{ac} = C_{lt} - (a_c + b_c * \text{Cos}_f)$$

where: C_{ac} is the background and cosmic corrected channel

C_{lt} is the live time corrected channel

a_c is the aircraft background for this channel

b_c is the cosmic stripping coefficient for this channel

Cos_f is the filtered Cosmic channel

Compton Stripping

Following the radon correction, the potassium, uranium and thorium are corrected for spectral overlap. First, α,β and γ the stripping ratios, are modified according to altitude. Then an adjustment factor based on a, the reversed stripping ratio, uranium into thorium, is calculated. (Note: the stripping ratio altitude correction constants are expressed in change per metre. A constant of 0.3048 is required to conform to the internal usage of height in feet):

$$\alpha_h = \alpha + h_{ef} * 0.00049$$

$$\alpha_r = \frac{1.0}{1.0 - a * \alpha_h}$$

$$\beta_h = \beta + h_{ef} * 0.00065$$

$$\gamma_h = \gamma + h_{ef} * 0.00069$$

where: α, β, γ are the Compton stripping coefficients

α_h, β_h, γ_h are the height corrected Compton stripping coefficients

h_{ef} is the height above ground in metres

α_r is the scaling factor correcting for back scatter

a is the reverse stripping ratio

The stripping corrections are then carried out using the following formulas:

$$Th_c = (Th_{rc} - a * U_{rc}) * \alpha_r$$

$$U_c = (U_{rc} - \alpha_h * Th_{rc}) * \alpha_r$$

$$K_c = K_{rc} - \gamma_h * U_c - \beta_h * Th_c$$

where: U_c, Th_c and K_c are corrected uranium, thorium and potassium

α_h,β_h,γ_h are the height corrected Compton stripping coefficients

U_{rc}, Th_{rc} and K_{rc} are radon-corrected uranium, thorium and potassium

α_r is the backscatter correction

Attenuation Corrections

The total count, potassium, uranium and thorium data are then corrected to a nominal survey altitude, in this case 60 m. This is done according to the equation:

$$C_a = C * e^{\mu(h_0 - h_{ef})}$$

where: C_a is the output altitude corrected channel

C is the input channel

e^{μ} is the attenuation correction for that channel

h_{ef} is the effective altitude

h_0 is the nominal survey altitude to correct to

Contour, Colour and Shadow Map Displays

The magnetic geophysical data are interpolated onto a regular grid using a TRending Using STructure (TRUST grid) technique. The resulting grid is suitable for image processing and generation of contour maps. The grid cell size is 20% of the line interval.

The radiometric geophysical data are interpolated onto a regular grid using a minimum curvature technique. The grid cell size is 25% of the line interval.

Colour maps are produced by interpolating the grid down to the pixel size. The parameter is then incremented with respect to specific amplitude ranges to provide colour "contour" maps.

6. PRODUCTS

This section lists the final maps and products that have been provided under the terms of the survey agreement. Other products can be prepared from the existing dataset, if requested.

Base Maps

Base maps of the survey area were produced by scanning published topographic maps to a bitmap (.bmp) format. This process provides a relatively accurate, distortion-free base that facilitates correlation of the navigation data to the map coordinate system. The topographic files are combined with geophysical data for plotting the final maps. Maps are created using the following parameters:

Projection Description:

Datum:	WGS84
Ellipsoid:	GRS80
Projection:	UTM (Zone: 16N)
Central Meridian:	87°
False Northing:	0
False Easting:	500000
Scale Factor:	0.9996
WGS84 to Local Conversion:	Molodensky
Datum Shifts:	DX: 0 DY: 0 DZ: 0

All maps include flight lines, contours and topography, unless otherwise indicated. Final map products have been prepared at a scale of 1:10 000.

Final Products

	No. of Map Sets
Residual Magnetic Field	2
Calculated Vertical Gradient	2
Total Count	2
K (cps)	2
U (cps)	2
Th (cps)	2

Additional Products

Geosoft GDB and XYZ archive on DVD
Geosoft grids (mag, cvg, TC , K, Th, U)
PDF maps (1)
Logistics Report (2 paper copies and 1 digital copy in PDF format)
Flightpath Digital Video

7. CONCLUSIONS AND RECOMMENDATIONS

This report describes the equipment, data processing procedures and logistics of the survey.

The various maps included with this report display the magnetic and radiometric properties of the survey area. It is recommended that a complete assessment and detailed evaluation of the survey results be carried out, in conjunction with all available geophysical, geological and geochemical information.

It is also recommended that additional processing of existing geophysical data be considered, in order to extract the maximum amount of information from the survey results. Current software and imaging techniques often provide valuable information on structure and lithology, which may not be clearly evident on the contour and colour maps. These techniques can yield images that define subtle, but significant, structural details.

Respectfully submitted,

FUGRO AIRBORNE SURVEYS CORP.

APPENDIX A

LIST OF PERSONNEL

The following personnel were involved in the acquisition, processing, interpretation and presentation of data, relating to a high resolution magnetometer and radiometric airborne geophysical survey carried out for Canadian International Minerals Inc.

David Miles	Manager, Geophysical Projects
Graham Konieczny	Manager, Data Processing and Interpretation
Adriana Pagliero	Project Manager
Lyn Vanderstarren	Drafting Supervisor
Adam Rampersad	Geophysical Operator
David Lu	Data Processor
Amanda Heydorn	Supervisor, field processing
Terry Thompson	Pilot, Great Slave Helicopters
Pothiah Susan	Word Processor/Expeditor

The survey consisted 352 km of coverage, flown from September 17 to September 20th of 2010. All personnel are employees of Fugro Airborne Surveys, except for the pilot.

APPENDIX B

BACKGROUND INFORMATION

- Appendix B.1 -

BACKGROUND INFORMATION

Magnetic Responses

The measured total magnetic field provides information on the magnetic properties of the earth materials in the survey area. The information can be used to locate magnetic bodies of direct interest for exploration, and for structural and lithological mapping.

The total magnetic field response reflects the abundance of magnetic material in the source. Magnetite is the most common magnetic mineral. Other minerals such as ilmenite, pyrrhotite, franklinite, chromite, hematite, arsenopyrite, limonite and pyrite are also magnetic, but to a lesser extent than magnetite on average.

In some geological environments, an EM anomaly with magnetic correlation has a greater likelihood of being produced by sulphides than one which is non-magnetic. However, sulphide ore bodies may be non-magnetic (e.g., the Kidd Creek deposit near Timmins, Canada) as well as magnetic (e.g., the Mattabi deposit near Sturgeon Lake, Canada).

Iron ore deposits will be anomalously magnetic in comparison to surrounding rock due to the concentration of iron minerals such as magnetite, ilmenite and hematite.

Changes in magnetic susceptibility often allow rock units to be differentiated based on the total field magnetic response. Geophysical classifications may differ from geological classifications if various magnetite levels exist within one general geological classification. Geometric considerations of the source such as shape, dip and depth, inclination of the earth's field and remanent magnetization will complicate such an analysis.

In general, mafic lithologies contain more magnetite and are therefore more magnetic than many sediments which tend to be weakly magnetic. Metamorphism and alteration can also increase or decrease the magnetization of a rock unit.

Textural differences on a total field magnetic contour, colour or shadow map due to the frequency of activity of the magnetic parameter resulting from inhomogeneities in the distribution of magnetite within the rock, may define certain lithologies. For example, near surface volcanics may display highly complex contour patterns with little line-to-line correlation.

Rock units may be differentiated based on the plan shapes of their total field magnetic responses. Mafic intrusive plugs can appear as isolated "bulls-eye" anomalies. Granitic intrusives appear as sub-circular zones, and may have contrasting rings due to contact metamorphism. Generally, granitic terrain will lack a pronounced strike direction, although granite gneiss may display strike.

Linear north-south units are theoretically not well-defined on total field magnetic maps in equatorial regions due to the low inclination of the earth's magnetic field. However, most stratigraphic units will have variations in composition along strike that will cause the units to appear as a series of alternating magnetic highs and lows.

Faults and shear zones may be characterized by alteration that causes destruction of magnetite (e.g., weathering) that produces a contrast with surrounding rock. Structural breaks may be filled by magnetite-rich, fracture filling material as is the case with diabase dikes, or by non-magnetic felsic material.

Faulting can also be identified by patterns in the magnetic total field contours or colours. Faults and dikes tend to appear as lineaments and often have strike lengths of several kilometres. Offsets in narrow, magnetic, stratigraphic trends also delineate structure. Sharp contrasts in magnetic lithologies may arise due to large displacements along strike-slip or dip-slip faults.

Gamma Ray Spectrometry

Radioelement concentrations are measures of the abundance of radioactive elements in the rock. The original abundance of the radioelements in any rock can be altered by the subsequent processes of metamorphism and weathering.

Gamma radiation in the range that is measured in the thorium, potassium, uranium and total count windows is strongly attenuated by rock, overburden and water. Almost all of the total radiation measured from rock and overburden originates in the upper 0.5 metres. Moisture in soil and bodies of water will mask the radioactivity from underlying rock. Weathered rock materials that have been displaced by glacial, water or wind action will not reflect the general composition of the underlying bedrock. Where residual soils exist, they may reflect the composition of underlying rock except where equilibrium does not exist between the original radioelement and the products in its decay series.

Radioelement counts (expressed as counts per second) are the rates of detection of the gamma radiation from specific decaying particles corresponding to products in each radioelements decay series. The radiation source for uranium is bismuth (Bi-214), for thorium it is thallium (Tl-208) and for potassium it is potassium (K-40).

The uranium and thorium radioelement concentrations are dependent on a state of equilibrium between the parent and daughter products in the decay series. Some daughter products in the uranium decay are long lived and could be removed by processes such as leaching. One product in the series, radon (Rn-222), is a gas which can easily escape. Both of these factors can affect the degree to which the calculated uranium concentrations reflect the actual composition of the source rock. Because the daughter products of thorium are relatively short lived, there is more likelihood that the thorium decay series is in equilibrium.

Lithological discrimination can be based on the measured relative concentrations and total, combined, radioactivity of the radioelements. Feldspar and mica contain potassium. Zircon, sphene and apatite are accessory minerals in igneous rocks that are sources of uranium and thorium. Monazite, thorianite, thorite, uraninite and uranothorite are also sources of uranium and thorium which are found in granites and pegmatites.

In general, the abundance of uranium, thorium and potassium in igneous rock increases with acidity. Pegmatites commonly have elevated concentrations of uranium relative to thorium. Sedimentary rocks derived from igneous rocks may have characteristic signatures that are influenced by their parent rocks, but these will have been altered by subsequent weathering and alteration.

Metamorphism and alteration will cause variations in the abundance of certain radioelements relative to each other. For example, alterative processes may cause uranium enrichment to the extent that a rock will be of economic interest. Uranium anomalies are more likely to be economically significant if they consist of an increase in the uranium relative to thorium and potassium, rather than a sympathetic increase in all three radioelements.

Faults can exhibit radioactive highs due to increased permeability which allows radon migration, or as lows due to structural control of drainage and fluvial sediments which attenuate gamma radiation from the underlying rocks. Faults can also be recognized by sharp contrasts in radiometric lithologies due to large strike-slip or dip-slip displacements. Changes in relative radioelement concentrations due to alteration will also define faults.

Similar to magnetics, certain rock types can be identified by their plan shapes if they also produce a radiometric contrast with surrounding rock. For example, granite intrusions will appear as sub-circular bodies, and may display concentric zonations. They will tend to lack a prominent strike direction. Offsets of narrow, continuous, stratigraphic units with contrasting radiometric signatures can identify faulting, and folding of stratigraphic trends will also be apparent.

APPENDIX C

DATA ARCHIVE DESCRIPTION

APPENDIX C

ARCHIVE DESCRIPTION

Project # :10054
Type of Survey :Fugro Radiometrics and Magnetics
Client :Canadian International Minerals Inc.
Area :Marathon Area, Ontario

Output field format : Geosoft database channels
Number of fields : 38

Field	Channel	Rate	Sample Units	Description
1	X	0.10	m	Easting NAD83 (UTM Zone 16 N)
2	Y	0.10	m	Northing NAD83 (UTM Zone 16 N)
3	FID	0.10		Fiducial
4	LATITUDE	0.10	Degrees	LONGITUDE WGS84
5	LONGITUDE	0.10	Degrees	LATITUDE WGS84
6	FLIGHT	0.10		Flight No
7	DATE	0.10		Flight Date (YYYY/MM/DD)
8	ALTRAD_HELI	0.10	m	Helicopter height from radar altimeter
9	ALTLAS_HELI	0.10	m	Helicopter height from laser altimeter
10	GPSZ	0.10	m	Helicopter GPS orthometric Height
11	DTM	0.10	m	Digital Terrain
12	DIURNAL_FILT	0.10	nT	Filtered Diurnal Magnetics
13	DIURNAL_COR	0.10	nT	Diurnal Correction
14	MAG_RAW	0.10	nT	Raw Total Field Magnetics (Compensated)
15	MAG_LAG	0.10	nT	Lagged, total field magnetics
16	MAG_DIU	0.10	nT	total magnetic field - diurnal variation removed
17	IGRF	0.10	nT	IGRF
18	MAG_RMI	0.10	nT	Levelled total field mag, IGRF removed
19	TC_RAW	1.00	counts	Raw total counts
20	K_RAW	1.00	counts	Raw potassium counts
21	U_RAW	1.00	counts	RAW uranium counts
22	TH_RAW	1.00	counts	Raw thorium counts
23	U_UP	1.00	counts	Raw upward looking uranium
24	TC_NASVD	1.00	counts	Total counts after NASVD correction
25	K_NASVD	1.00	counts	Potassium counts after NASVD correction
26	U_NASVD	1.00	counts	Uranium counts after NASVD correction
27	TH_NASVD	1.00	counts	Thorium counts after NASVD correction
28	COSMIC	1.00	counts	Cosmic counts
29	LIVETIME	1.00	mS	Spectrometer livetime
30	KPA	0.10	kpa	Air pressure
31	TEMP_EXT	0.10	degrees C	External air temperature
32	Effectiveheight	0.10	m	Height at standard temperature and pressure
33	TC	1.00	cps	Corrected total counts
34	Th	1.00	cps	Corrected thorium counts

35	K	1.00	cps	Corrected potassium counts
36	U	1.00	cps	Corrected uranium counts
37	GR820_DOWN	1.00		256 channel spectrum, array
38	GR820_DOWN_NASVD	1.00		NASVD 256 channel spectrum, array

APPENDIX D

TESTS AND CALIBRATIONS

Appendix D.1

Aircraft Registration C-FDQA

LAG TEST

A magnetic lag test is flown to calculate the positional lag that develops between the time a reading is made and the time it is recorded in the data. A large metallic body such as railway tracks, a bridge, buildings or a distinct magnetic anomaly is flown over along a single line, at survey altitude, in opposite directions. This allows the time constant value that will line-up the magnetic anomaly peaks or troughs that are produced to be determined. This time shift constant is then applied to the data collected during the survey.
Lag test for C-GJIX was flown on September 18, 2010 while on Job10054. The lag was determined to be 1.4 seconds.

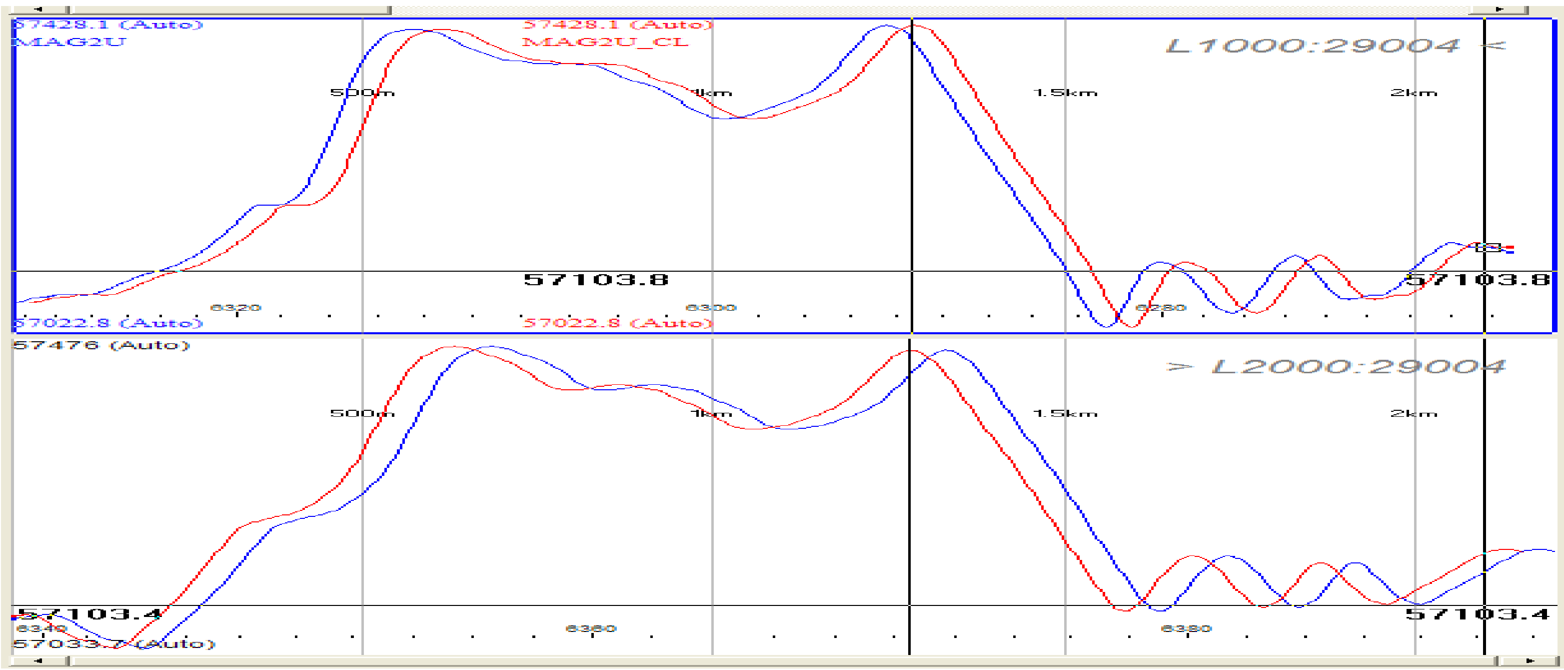

FIGURE OF MERIT

Compensation of magnetic readings is required when the magnetometers are mounted on, or in close proximity to, the aircraft. The aircraft with its metallic parts and surfaces creates secondary magnetic fields while the aircraft moves through the earth's magnetic field. Therefore the compensation calibration test is flown to calculate the effects of the aircraft and its control surfaces on the magnetic field. The test is flown at high altitude, outside the effect of geology on the magnetic readings. The aircraft flies in each of the survey directions performing a series of manoeuvres that moves the aircraft along each of its three axis of rotation. The effect of aircrafts on the magnetic data is calculated and then subtracted from the magnetic data collected during the survey.

MAGNETIC COMPENSATION CALIBRATION

Job Number:	10054	**Survey Type:**	MAGNETICS / RADIOMETRICS		
Date Flown:	**19-Sep-10**	**Helicopter Registration:**	C-GJIX		
Flight Number:	**29005**	**Database Name:**	100919_FOM_Test2.gdb		

BOX 1	**Sensor Position:**	Stinger	**Pitch**	**Roll**	**Yaw**	**Total**	**Figure of Merit**
	Raw Mag Channel:	MAG2U	**Residual Peak to Peak**	**Residual Peak to Peak**	**Residual Peak to Peak**		
	Line Number	**Heading**					
Direction 1:	10000	000	0.19	0.10	0.11	0.39	**1.70**
Direction 2:	10090	090	0.26	0.19	0.11	0.56	
Direction 3:	10180	180	0.10	0.11	0.07	0.29	
Direction 4:	10270	270	0.19	0.16	0.11	0.46	

BOX 2	**Sensor Position:**	Stinger	**Pitch**	**Roll**	**Yaw**	**Total**	**Figure of Merit**
	Raw Mag Channel:	MAG2U	**Residual Peak to Peak**	**Residual Peak to Peak**	**Residual Peak to Peak**		
	Line Number	**Heading**					
Direction 1:	10000	000	0.19	0.14	0.07	0.40	**1.47**
Direction 2:	10090	090	0.17	0.13	0.08	0.38	
Direction 3:	10180	180	0.12	0.12	0.06	0.30	
Direction 4:	10270	270	0.16	0.13	0.10	0.39	

Appendix D.3

COSMIC / AIRCRAFT BACKGROUND TEST

A cosmic test is conducted to determine both the effects of cosmic radiation and aircraft background radiation on the spectrometer readings. This test is conducted at high altitude, outside the geological effect on the spectrometer data and well above the maximum altitude that will be achieved during survey. The aircraft is flown at a series of altitudes for a set amount of time to minimize statistical error. The effects of altitude on the level of cosmic radiation are calculated and this data is extrapolated to and corrected for in the data collected during the survey.

COSMIC CORRECTION COEFFICENTS

Job Number:	10054	**Crystal Pack Volume:**	One Crystal Pack 16.8 L Down, 4.2 L Up	**Spec Pack(s) Serial Number:**	5522
Date Flown:	18-Sep-10	**Helicopter Registration:**	C-GJIX	**Spec Console Type:**	RS500
Flight Number:	29004	**Database Name:**	100918_Attenuation&Cosmic_Test.gdb	**Spec Console Serial Number:**	

LINE	AVERAGE TC_DOWN	Use Data Point	AVERAGE K_DOWN	Use Data Point	AVERAGE U_DOWN	Use Data Point	AVERAGE TH_DOWN	Use Data Point	AVERAGE U_UP	Use Data Point	AVERAGE COSMIC
8000	269.19436	☑	21.24451	☑	11.57994	☑	12.97806	☑	3.11599	☑	190.91278
8500	286.02034	☑	22.40678	☑	12.50508	☑	13.67458	☑	3.21695	☑	206.76006
9000	302.81848	☑	23.37954	☑	13.06271	☑	14.33993	☑	3.42244	☑	222.60258
9500	325.19728	☑	25.24830	☑	14.19728	☑	16.43537	☐	3.72789	☑	240.70602
10000	346.29538	☑	26.28302	☑	15.46140	☑	17.25602	☑	4.17176	☑	257.94310
		☑		☑		☑		☑		☑	
		☐		☐		☐		☐		☐	

Summary of Cosmic Correction Coefficents

	Cosmic Stripping (Slope)	Aircraft Background (Intercept)
TC	**1.15226**	**48.04684**
K	**0.07701**	**6.47910**
U	**0.05642**	**0.73644**
Th	**0.06464**	**0.37055**
U Up	**0.01569**	**0.01879**

ALTITUDE ATTENUATION TEST

An altitude attenuation test is conducted to determine the drop off rate of the spectrometer signal with altitude. A test line is flown at several different altitudes and the attenuation, with increased ground clearance, of the various spectral elements is determined. These attenuation factors are applied to the data collected throughout the survey. During processing these factors were refined to those documented in the radiometric processing control file.

ALTITUDE ATTENUATION COEFFICENTS

Job Number:	10054	**Crystal Pack Volume:**	One Crystal Pack 16.8 L Down, 4.2 L Up	**Spec Pack(s) Serial Number:**	5522
Date Flown:	18-Sep-10	**Helicopter Registration:**	C-GJIX	**Spec Console Type:**	RS500
Flight Number:	29004	**Database Name:**	100918_Attenuation&Cosmic_Test.gdb	**Spec Console Serial Number:**	

LINE	AVERAGE TC_DOWN_ ATTENCOR	Use Data Point	AVERAGE K_DOWN_ ATTENCOR	Use Data Point	AVERAGE U_DOWN_ ATTENCOR	Use Data Point	AVERAGE TH_DOWN_ ATTENCOR	Use Data Point	AVERAGE EFFECTIVE HEIGHT
100	729.08787	☑	66.22121	☑	9.23541	☑	17.14686	☑	28.35814
200	669.56812	☑	56.34865	☑	9.34433	☑	16.57617	☑	54.89828
300	542.03976	☑	44.76249	☑	7.56075	☑	13.21086	☑	81.71375
400	449.85174	☑	33.57381	☑	7.09588	☑	10.78571	☑	108.80226
500	303.59800	☑	23.79484	☑	4.51503	☑	6.96848	☑	138.69685
		☑		☑		☑		☑	
		☐		☑		☐		☐	
		☐		☐		☐		☐	
		☐		☐		☐		☐	

Summary of Altitude Attenuation Coefficents (Must Be Negative)	
TC	-0.00787
K	-0.00936
U	-0.00627
Th	-0.00817

Appendix D.5

RESULTS OF PEAK ANALYSIS

InputSpectrum = GR820_NASVD
PEAK CENTROID POSITION AND RESOLUTION
NASVD CORRECTED

Line/Flt	CentroidK	ResK	CentroidU	ResU	CentroidTh	ResTh
L10010:29006	121.538	6.017	147.099	5.020	218.038	4.638
L10020:29006	121.551	6.033	147.053	5.054	218.065	4.654
L10030:29006	121.558	6.034	147.082	5.053	218.080	4.652
L10040:29006	121.546	6.018	147.128	5.021	218.054	4.638
L10050:29006	121.549	6.021	147.111	5.026	218.048	4.641
L10060:29006	121.571	6.040	147.103	5.061	218.099	4.658
L10070:29006	121.558	6.025	147.121	5.034	218.060	4.646
L10080:29006	121.578	6.044	147.100	5.067	218.102	4.662
L10090:29006	121.556	6.025	147.129	5.033	218.066	4.646
L10100:29006	121.566	6.038	147.112	5.058	218.104	4.656
L10110:29006	121.580	6.045	147.094	5.071	218.101	4.664
L10120:29006	121.569	6.038	147.103	5.058	218.096	4.656
L10130:29006	121.565	6.024	147.152	5.027	218.068	4.642
L10140:29006	121.590	6.037	147.183	5.048	218.104	4.656
L10150:29006	121.585	6.038	147.177	5.051	218.109	4.659
L10160:29006	121.613	6.047	147.198	5.061	218.123	4.664
L10170:29006	121.596	6.052	147.155	5.075	218.143	4.667
L10180:29006	121.590	6.043	147.179	5.059	218.137	4.656
L10190:29006	121.583	6.028	147.196	5.032	218.094	4.646
L10200:29006	121.599	6.053	147.179	5.074	218.155	4.666
L10210:29006	121.589	6.042	147.171	5.057	218.130	4.655
L10220:29006	121.604	6.059	147.144	5.088	218.150	4.675
L10230:29006	121.596	6.046	147.173	5.063	218.136	4.659
L10240:29006	121.611	6.066	147.140	5.099	218.162	4.684
L10250:29006	121.598	6.045	147.155	5.063	218.122	4.657
L10260:29006	121.595	6.040	147.220	5.050	218.130	4.658
L10270:29006	121.611	6.051	147.191	5.069	218.149	4.662
L10280:29006	121.618	6.051	147.224	5.065	218.143	4.667
L10290:29006	121.642	6.070	147.193	5.096	218.178	4.679
L10300:29006	121.633	6.057	147.223	5.074	218.167	4.664
L10310:29006	121.625	6.054	147.226	5.070	218.167	4.662
L10320:29006	121.629	6.041	147.284	5.043	218.146	4.654
L10330:29006	121.637	6.050	147.308	5.055	218.176	4.662
L10340:29006	121.677	6.073	147.279	5.088	218.207	4.673
L10350:29006	121.653	6.052	147.281	5.059	218.156	4.663
L10360:29006	121.657	6.066	147.264	5.080	218.193	4.668
L10370:29006	121.641	6.060	147.254	5.074	218.185	4.665

Appendix D.6

L10380:29006	121.674	6.068	147.265	5.083	218.189	4.669
L10390:29006	121.653	6.056	147.264	5.067	218.157	4.668
L10400:29006	121.666	6.074	147.231	5.097	218.191	4.678
L10410:29006	121.640	6.057	147.231	5.073	218.149	4.671
L10420:29006	121.620	6.054	147.219	5.070	218.166	4.663
L10430:29006	121.610	6.040	147.240	5.046	218.131	4.655
L10440:29006	121.626	6.050	147.232	5.062	218.140	4.665
L10450:29006	121.600	6.024	147.270	5.018	218.115	4.639
L10460:29006	121.638	6.052	147.250	5.062	218.147	4.664
L10470:29006	121.648	6.049	147.273	5.055	218.147	4.660
L10480:29006	121.683	6.068	147.275	5.082	218.174	4.676
L10490:29006	121.640	6.041	147.274	5.042	218.133	4.652
L10500:29006	121.638	6.035	147.326	5.028	218.149	4.647
L10510:29006	121.652	6.053	147.263	5.063	218.151	4.665
L10520:29006	121.670	6.062	147.274	5.074	218.167	4.671
L10530:29006	121.662	6.043	147.335	5.039	218.159	4.652
L10540:29006	121.692	6.055	147.341	5.055	218.174	4.661
L10550:29006	121.672	6.040	147.366	5.032	218.166	4.650
L10560:29006	121.668	6.040	147.338	5.033	218.150	4.649
L10570:29006	121.657	6.048	147.296	5.050	218.151	4.658
L10580:29006	121.666	6.060	147.296	5.069	218.176	4.669
L10590:29006	121.679	6.060	147.297	5.069	218.170	4.668
L10600:29006	121.655	6.043	147.280	5.044	218.133	4.653
L10610:29006	121.672	6.074	147.226	5.096	218.185	4.677
L10620:29006	121.686	6.077	147.247	5.098	218.195	4.677
L10630:29006	121.652	6.059	147.257	5.073	218.161	4.671
L10640:29006	121.671	6.074	147.226	5.097	218.186	4.678
L10650:29006	121.611	6.031	147.268	5.028	218.122	4.645
L10660:29006	121.665	6.071	147.227	5.092	218.182	4.674
L10670:29006	121.638	6.045	147.249	5.051	218.129	4.657
L10680:29006	121.681	6.069	147.254	5.085	218.182	4.669
L10690:29006	121.687	6.060	147.287	5.068	218.158	4.667
L10700:29006	121.645	6.049	147.277	5.055	218.152	4.661
L10710:29006	121.659	6.055	147.253	5.067	218.145	4.666
L10720:29006	121.662	6.052	147.278	5.059	218.150	4.662
L10730:29006	121.657	6.060	147.254	5.073	218.157	4.671
L10740:29006	121.637	6.046	147.255	5.053	218.138	4.659
L10750:29006	121.642	6.052	147.246	5.063	218.143	4.664
L10760:29006	121.625	6.038	147.265	5.040	218.131	4.651
L10770:29006	121.633	6.049	147.249	5.059	218.144	4.662
L10780:29006	121.649	6.063	147.226	5.081	218.172	4.668
L10790:29006	121.653	6.068	147.207	5.092	218.173	4.675
L10800:29006	121.659	6.060	147.254	5.074	218.157	4.671
T19010:29007	121.663	6.166	146.993	5.237	218.425	4.789
T19020:29007	121.642	6.144	147.015	5.211	218.345	4.778
T19030:29007	121.665	6.116	147.103	5.169	218.257	4.729

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T19040:29007	121.635	6.064	147.226	5.083	218.183	4.671
T19050:29007	121.659	6.036	147.374	5.025	218.166	4.646
T19060:29007	121.625	6.032	147.289	5.028	218.130	4.645
T19070:29007	121.622	6.005	147.357	4.974	218.091	4.624
T19080:29007	121.619	6.006	147.328	4.975	218.076	4.623
Global	121.628	6.050	147.231	5.063	218.140	4.665

APPENDIX E

RADIOMETRIC PROCESSING CONTROL FILE

Appendix E.1

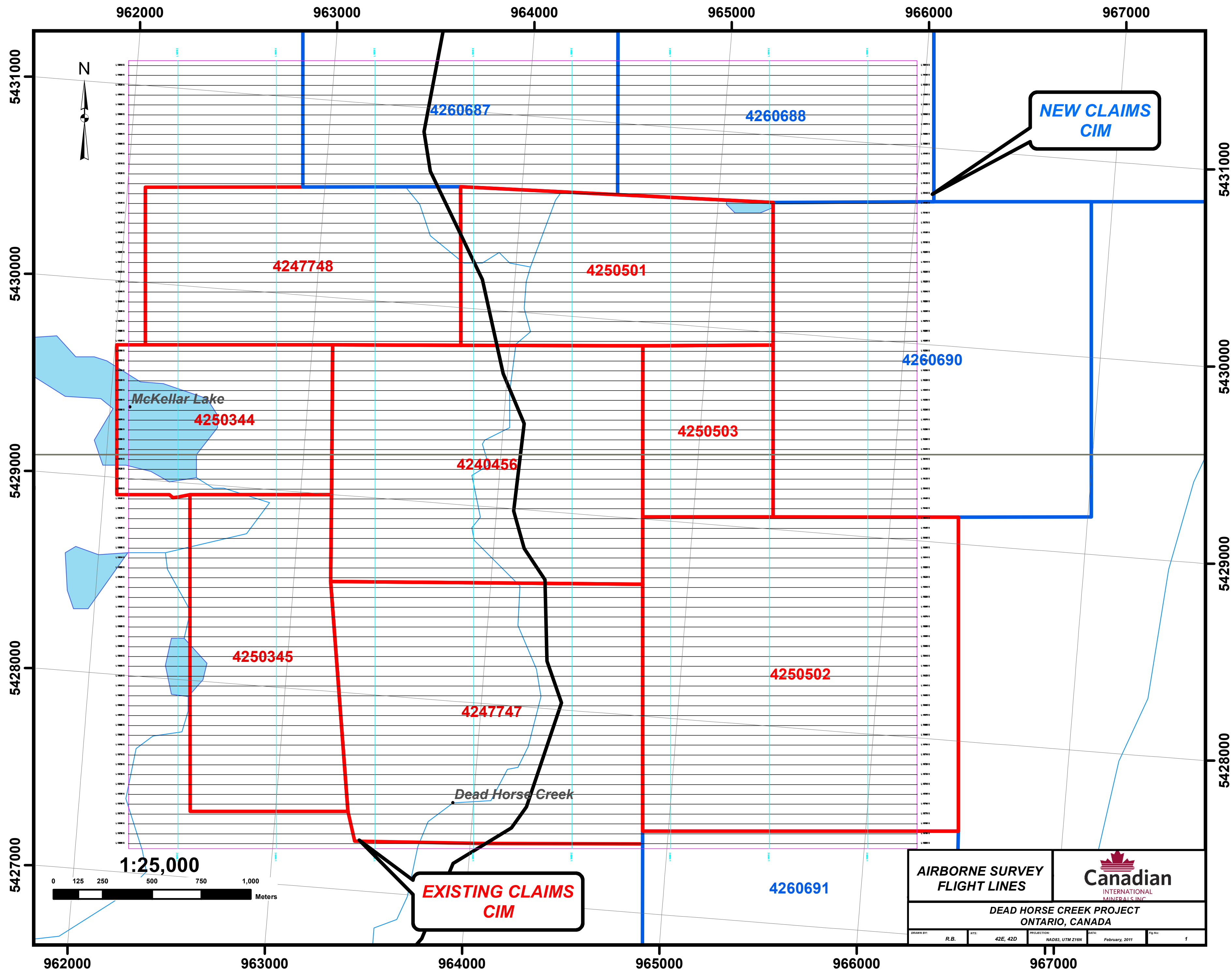
RADIOMETRIC PROCESSING CONTROL FILE

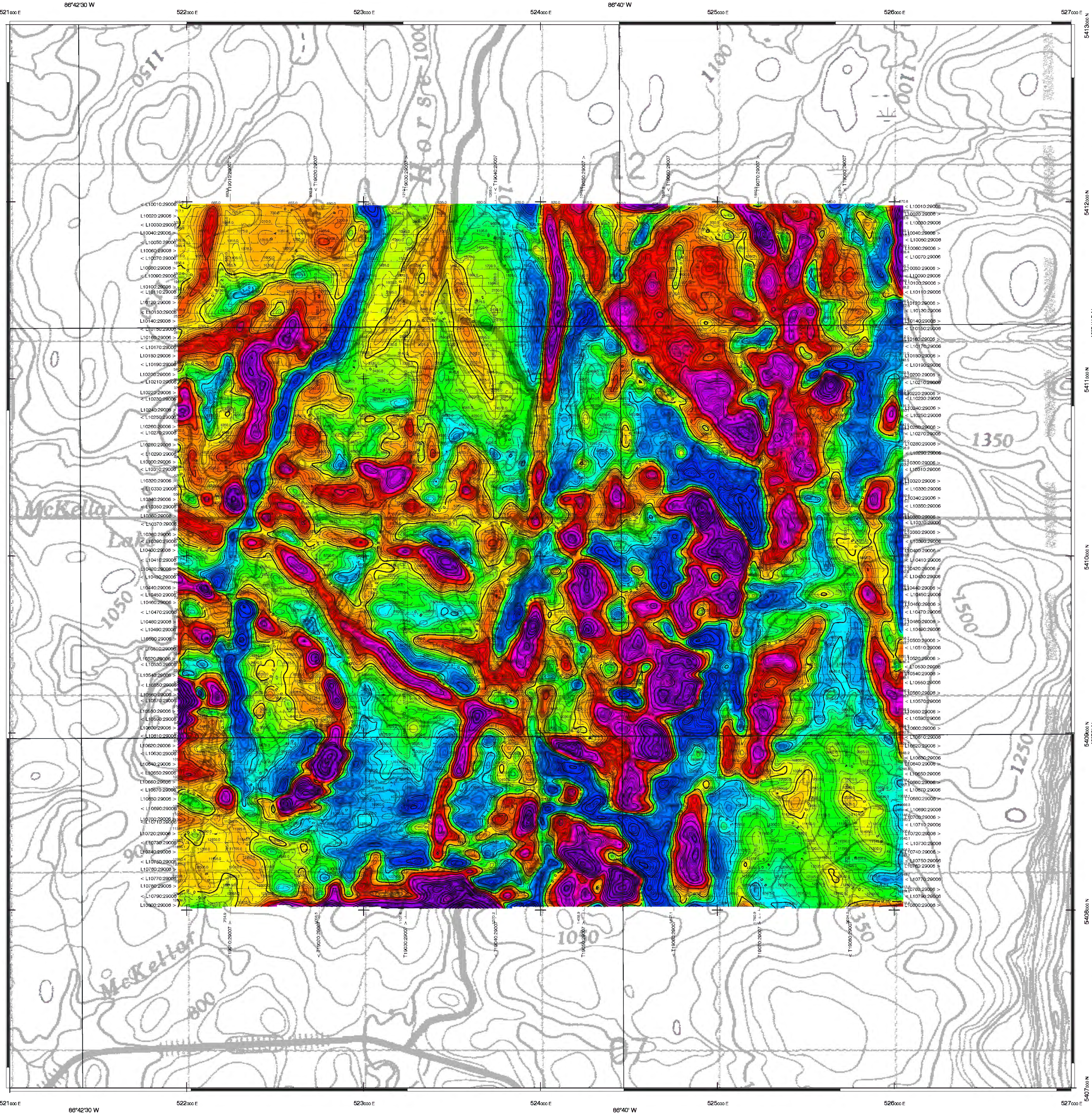
<u>FOR SURVEY PLATFORM : C-GJIX</u>

```
//////////////////////////////////////////////////
// Atlas Control/Workspace File//
// # or // for comment              //
//////////////////////////////////////////////////

CONTROL_BEGIN

 PROGRAM  = AGSCorrection
 VERSION  = 1.4.0

  ### Process or Calibration? ###
     WhatToDo = Process Survey Line

  ### Corrections to apply ###
     CorrectionType = Yes  Filtering
     CorrectionType = Yes  LiveTimeCorrection
     CorrectionType = Yes  CosmicAircraftBGRemove
     CorrectionType = Yes  CalcEffectiveHeight
     CorrectionType = No   RadonBGRemove
     CorrectionType = Yes  ComptonStripping
     CorrectionType = Yes  HeightCorrection
     CorrectionType = No   ConvertToConcentration


  ### Main I/O settings ###
     MainChannelIO|TC       = TC_NASVD_R --> TC_NASVD_Cor
     MainChannelIO|K        = K_NASVD_R  --> K_NASVD_Cor
     MainChannelIO|U        = U_NASVD_R  --> U_NASVD_Cor
     MainChannelIO|Th       = TH_NASVD_R --> TH_NASVD_Cor
     MainChannelIO|UpU      = U_UP       --> U_UP_Cor
     MainChannelIO|Cosmic   = COSMIC     --> COSMIC_Cor
     MainChannelIO|Spectrum =            -->

  ### Control Channel I/O settings ###
     ControlChannel|RadarAltimeter     = ALTRAD_M    [metres]
     ControlChannel|Pressure/Barometer = KPA         [kPa]
     ControlChannel|Temperature        = TEMP_EXT
```

```
### Input for correction ###
    InputForCorrection    = ROIs


### Negative count handling ###
    NegativeCountHandlingROI         = -1    //-1: Allow negative  0:Replace with zero
1:Replace with dummy
    NegativeCountHandlingFullSpectrum = 0    //-1: Allow negative  0:Replace with
zero


### Pre-filtering settings ###
    Filtering|TC      = 0
    Filtering|K       = 0
    Filtering|U       = 0
    Filtering|Th      = 0
    Filtering|UpU     = 0
    Filtering|Cosmic  = 13
    Filtering|RadarAltimeter     = 3
    Filtering|Pressure/Barometer = 3
    Filtering|Temperature       = 0

### Live-time correction settings ###
    LiveTimeChannel            = LIVE_TIME
    LiveTimeUnits              = milli-seconds
    ApplyLiveTimeCorrToUpU      = Yes

### Cosmic correction settings ###
    CosmicCorrParam|TC      = 1.152260,  48.046833
    CosmicCorrParam|K       = 0.077008,  6.479111
    CosmicCorrParam|U       = 0.056415,  0.736426
    CosmicCorrParam|Th      = 0.066717,  0.038037
    CosmicCorrParam|UpU     = 0.015695,  0.018773
    CosmicCorrParam|SpectrumBackgroundFile    =

### Effective-Height settings ###
    EffectiveHeightOutputChannel = EffectiveHeight
    EffectiveHeightOutputUnits   = metres

### Special Stripping (Compton Stripping) ###
    ComptonCorrParam_Stripping_Alpha     = 0.276000
    ComptonCorrParam_Stripping_Beta      = 0.417000
    ComptonCorrParam_Stripping_Gamma     = 0.754000
    ComptonCorrParam_AlphaPerMetre       = 0.000010
    ComptonCorrParam_BetaPerMetre        = 0.000010
```

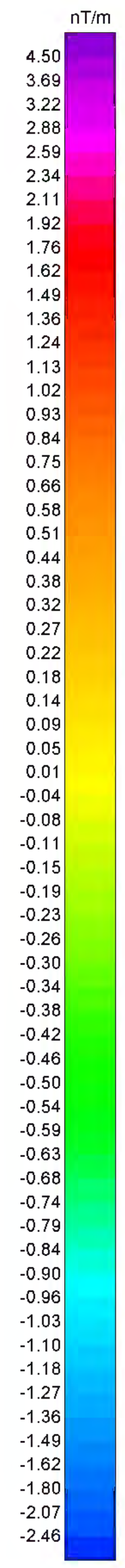
```
    ComptonCorrParam_GammaPerMetre       = 0.000010
    ComptonCorrParam_GrastyBackscatter_a = 0.043000
    ComptonCorrParam_GrastyBackscatter_b = 0.000010
    ComptonCorrParam_GrastyBackscatter_g = 0.000010

  ### Height Correction settings ###
    SurveyHeightDatum     = 60.000000
    AttenuationCorrControl = 1
    AttenuationForNegROIs  = Yes
    HeightCorrParam|TC      = -0.007869, 300.000000
    HeightCorrParam|K       = -0.009363, 300.000000
    HeightCorrParam|U       = -0.006273, 300.000000
    HeightCorrParam|Th      = -0.008174, 300.000000

  ### Concentration settings ###
    ConcentrationParam|K       = Concentration_K,  0.000000
    ConcentrationParam|U       = Concentration_U,  0.000000
    ConcentrationParam|Th      = Concentration_Th,  0.000000
    AirAbsorbedDoseRateParam   = DoseRate,  0.000000
    NaturalAirAbsorbedDoseRateParam = NaturalDoseRate,  13.078000, 5.675000,
2.494000


CONTROL_END
```


N
1:25,000
0 125 250 500 750 1,000
Meters
NEW CLAIMS CIM
EXISTING CLAIMS CIM
4260687
4260688
4260690
4260691
4247748
4250501
4250344
4240456
4250503
4250345
4247747
4250502
McKellar Lake
Dead Horse Creek
962000
963000
964000
965000
966000
967000
5431000
5430000
5429000
5428000
5427000
AIRBORNE SURVEY FLIGHT LINES
Canadian INTERNATIONAL MINERALS INC
DEAD HORSE CREEK PROJECT
ONTARIO, CANADA
DRAWN BY: R.B.
NTS: 42E, 42D
PROJECTION: NAD83, UTM Z16N
DATA: February, 2011
Fig No: 1

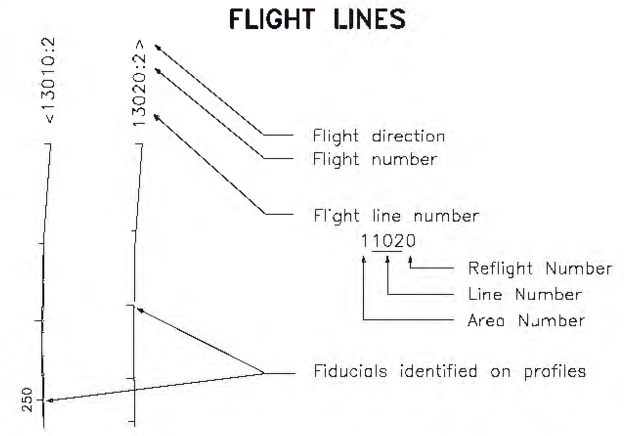


TECHNICAL SUMMARY

Navigation	Different'ally-corrected GPS
Data reduction grid interval	10 metres
Terrain clearance	Helicopter, Spectrometer 60 m Magnetometer 60 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Cesium / 0.01 nT
Spectrometer	RS-500
Spectrometer data sampling	1.0 second



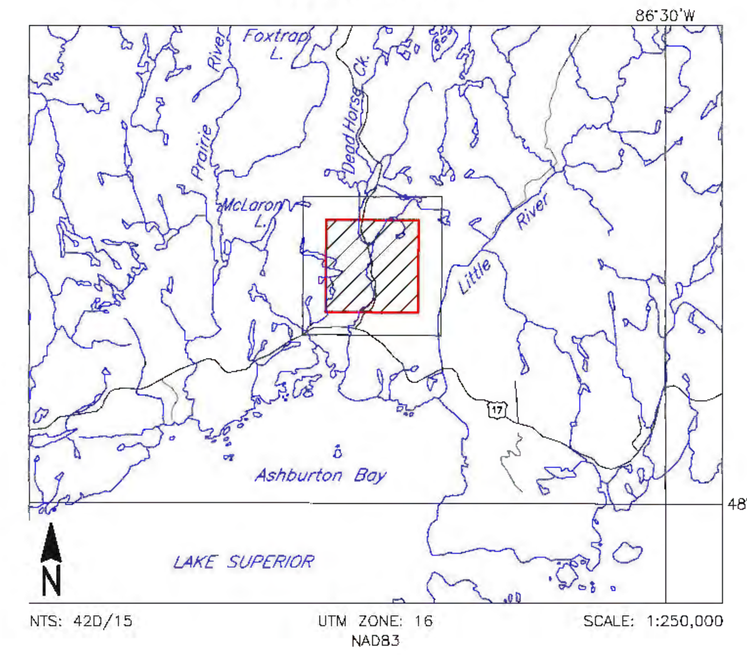
FLIGHT LINES



CALCULATED VERTICAL GRADIENT CONTOURS

(line)	5.00 nT/metre
(line)	1.00 nT/metre
(line)	0.20 nT/metre
(dashed line)	0.10 nT/metre

LOCATION MAP



NTS: 42D/15 UTM ZONE: 16 NAD83 SCALE: 1:250,000

CANADIAN INTERNATIONAL MINERALS INC.

MARATHON AREA, ONTARIO

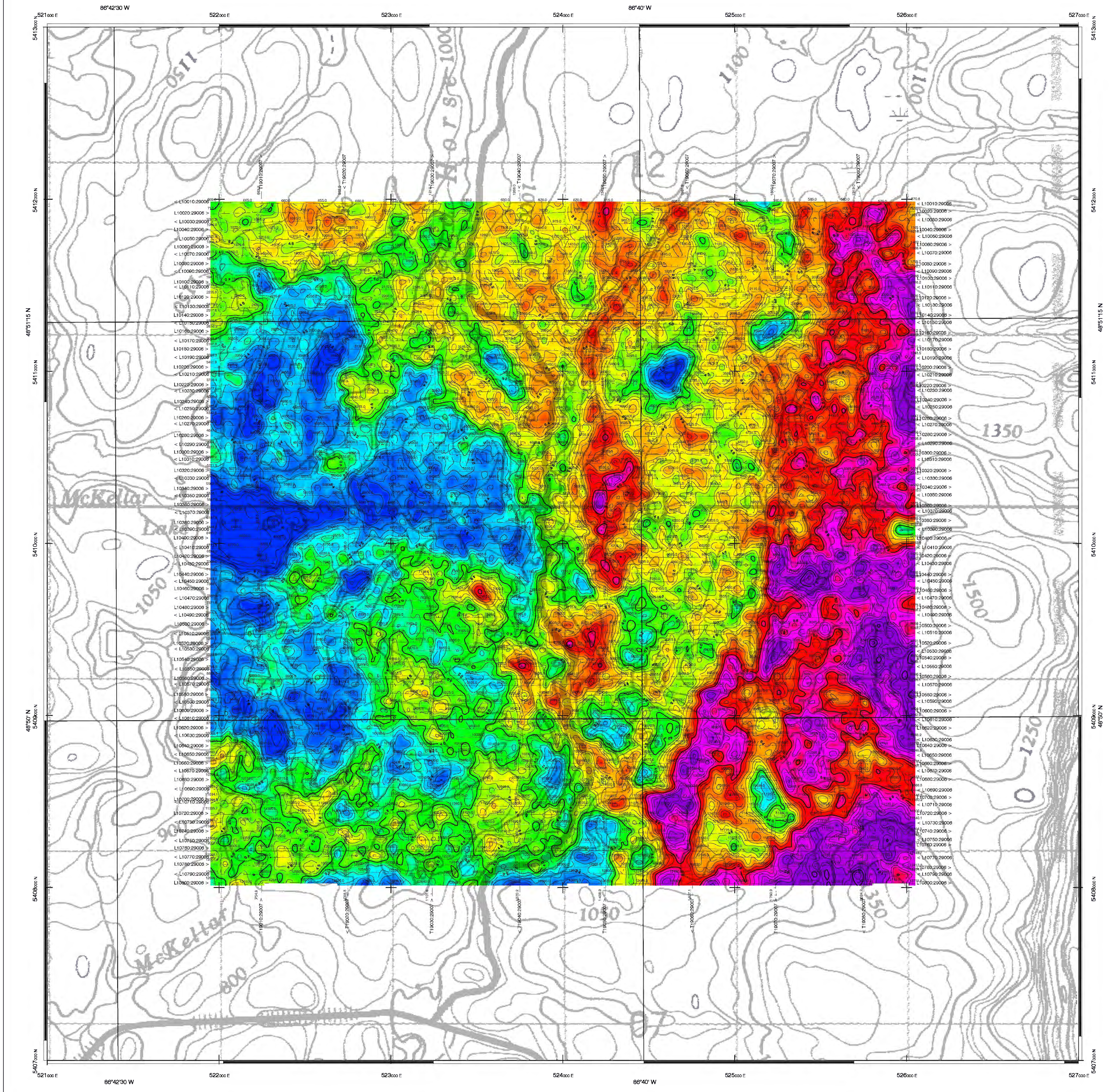
CALCULATED VERTICAL MAGNETIC GRADIENT

FUGRO MAG/RAD SURVEY	NTS: 42D/15	GEOPHYSICIST:
DATE: OCTOBER, 2010	JOB: 10054	SHEET: 1

Fugro Airborne Surveys

0 0.5 1.0 Km
0 0.5 Mi
Scale 1:10 000

FUGRO AIRBORNE SURVEYS



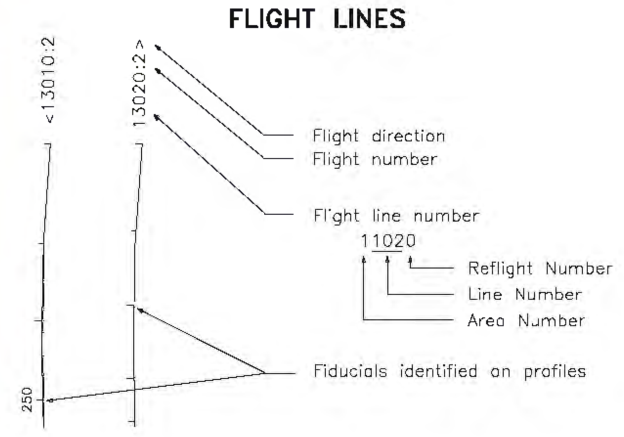
TECHNICAL SUMMARY

Navigation . . . . Different'ally-corrected GPS
Data reduction grid interval . . . . 12 metres
Terrain clearance . . . . Helicopter, Spectrometer 60 m
Magnetometer 60 m
Data sampling interval . . . . 0.1 second
Magnetometer / sensitivity . . . . . Cesium / 0.01 nT
Spectrometer RS-500
Spectrometer data sampling . . . . 1.0 second

cps

103, 98, 94, 91, 88, 85, 82, 80, 77, 75, 73, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57, 56, 55, 54, 53, 52, 51, 50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 19, 18, 15

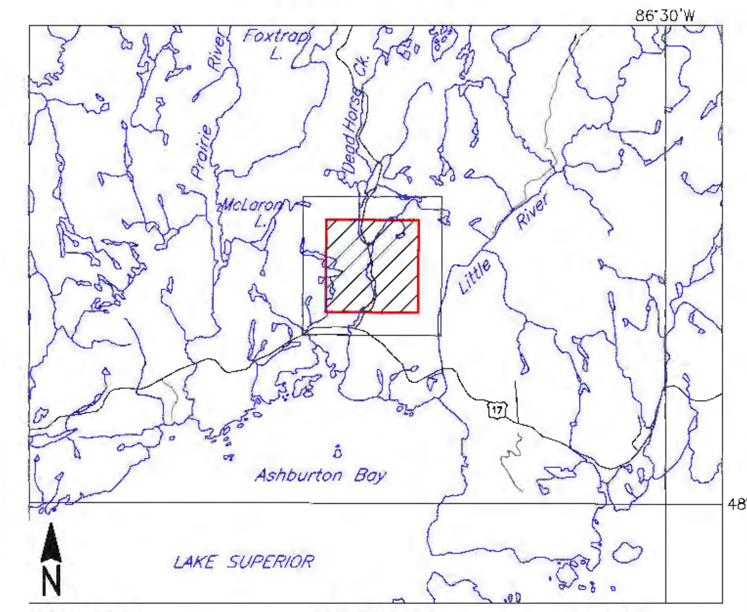
FLIGHT LINES



CONTOUR INTERVALS

. . . . 200 cps
. . . . 40 cps
. . . . 8 cps
. . . . 4 cps
. . . . low

LOCATION MAP



NTS: 42D/15 UTM ZONE: 16 NAD83 SCALE: 1:250,000

CANADIAN INTERNATIONAL MINERALS INC.

MARATHON AREA, ONTARIO

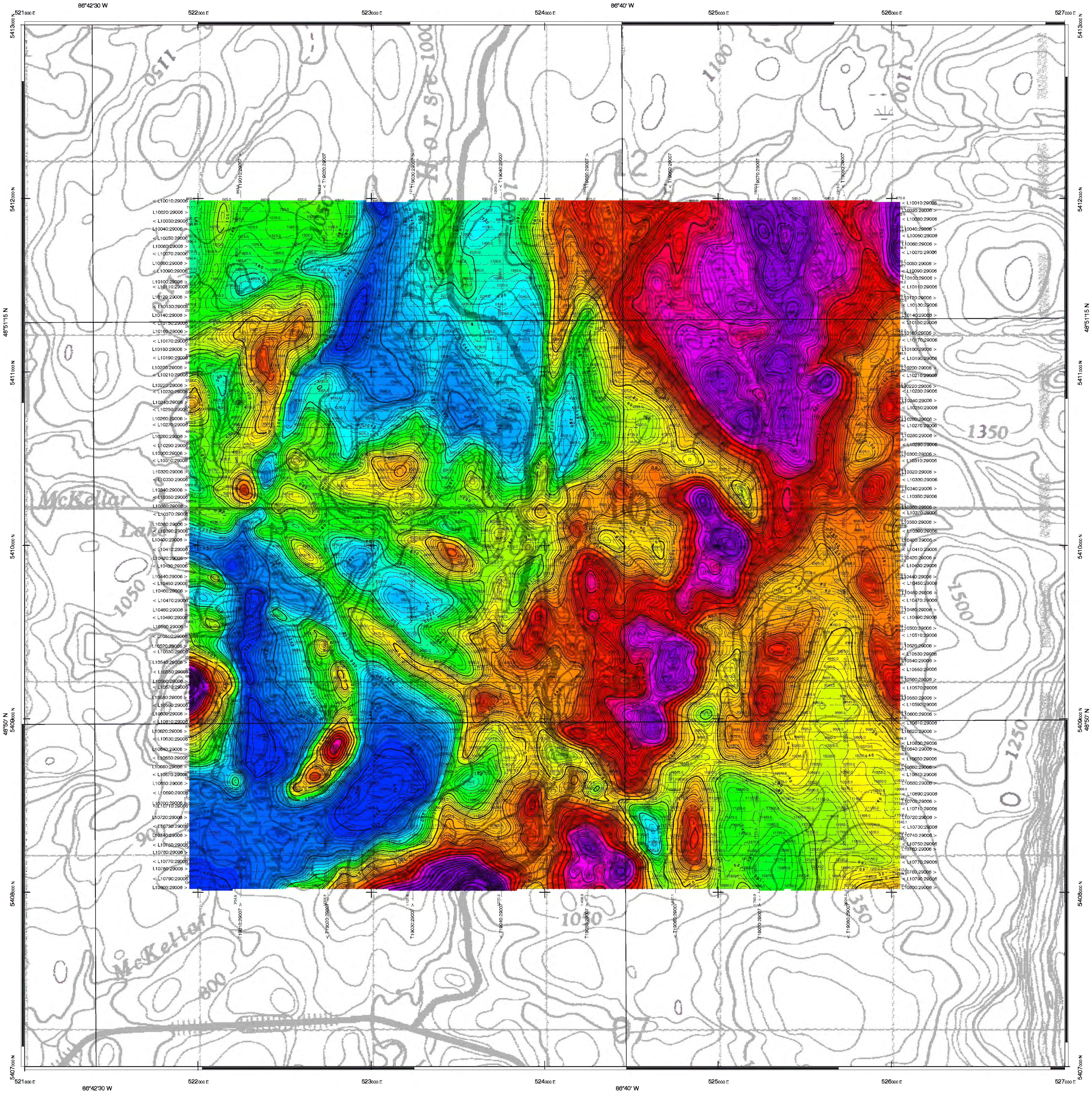
RADIOMETRIC POTASSIUM COUNTS

FUGRO MAG/RAD SURVEY	NTS: 42D/15	GEOPHYSICIST:
DATE: OCTOBER, 2010	JOB: 10054	SHEET: 1

Fugro Airborne Surveys

0 0.5 1.0 Km
0 0.5 Mi
Scale 1:10 000

FUGRO AIRBORNE SURVEYS



TECHNICAL SUMMARY

Navigation	Differentially-corrected GPS
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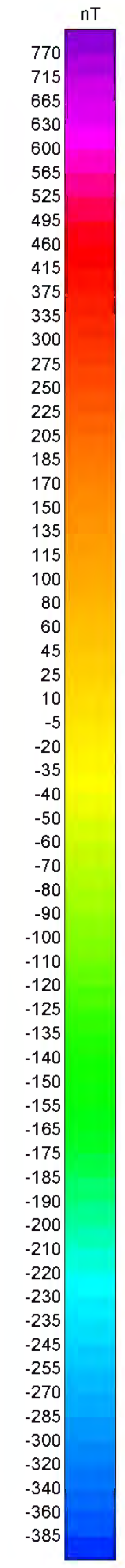
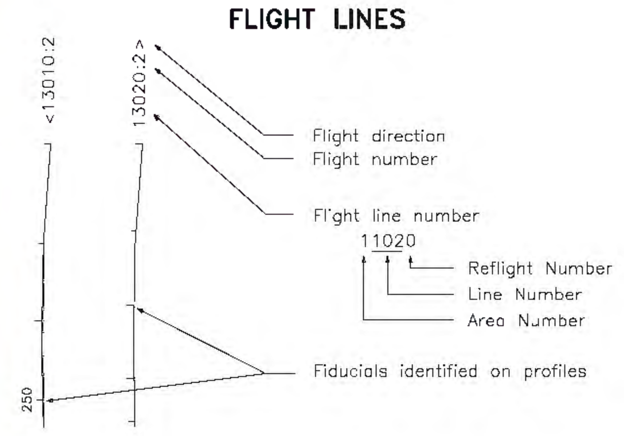


FLIGHT LINES

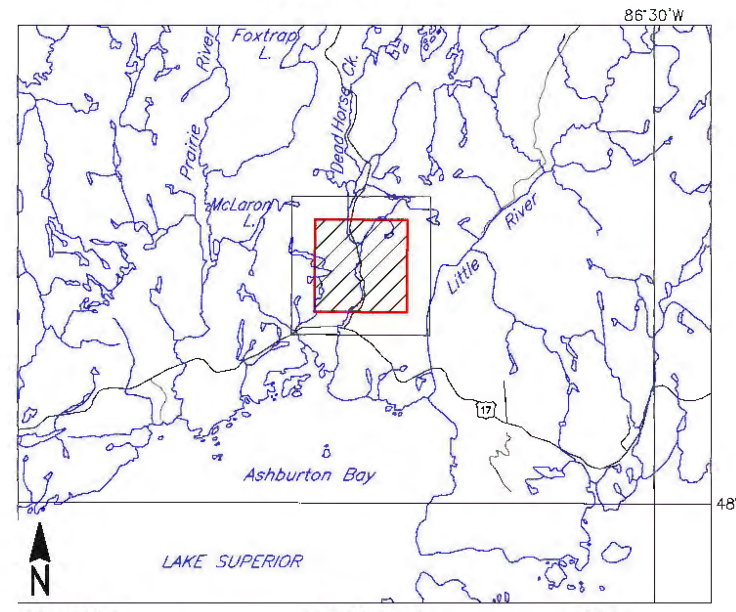


RESIDUAL MAGNETIC FIELD CONTOURS

(line)	500 nT
(line)	100 nT
(line)	20 nT
(dashed line)	10 nT
(symbol)	magnetic low

Magnetic inclination within the survey area: 75 degrees N
Magnetic declination within the survey area: 6 degrees W

LOCATION MAP



NTS: 42D/15 UTM ZONE: 16 NAD83 SCALE: 1:250,000

CANADIAN INTERNATIONAL MINERALS INC.
MARATHON AREA, ONTARIO

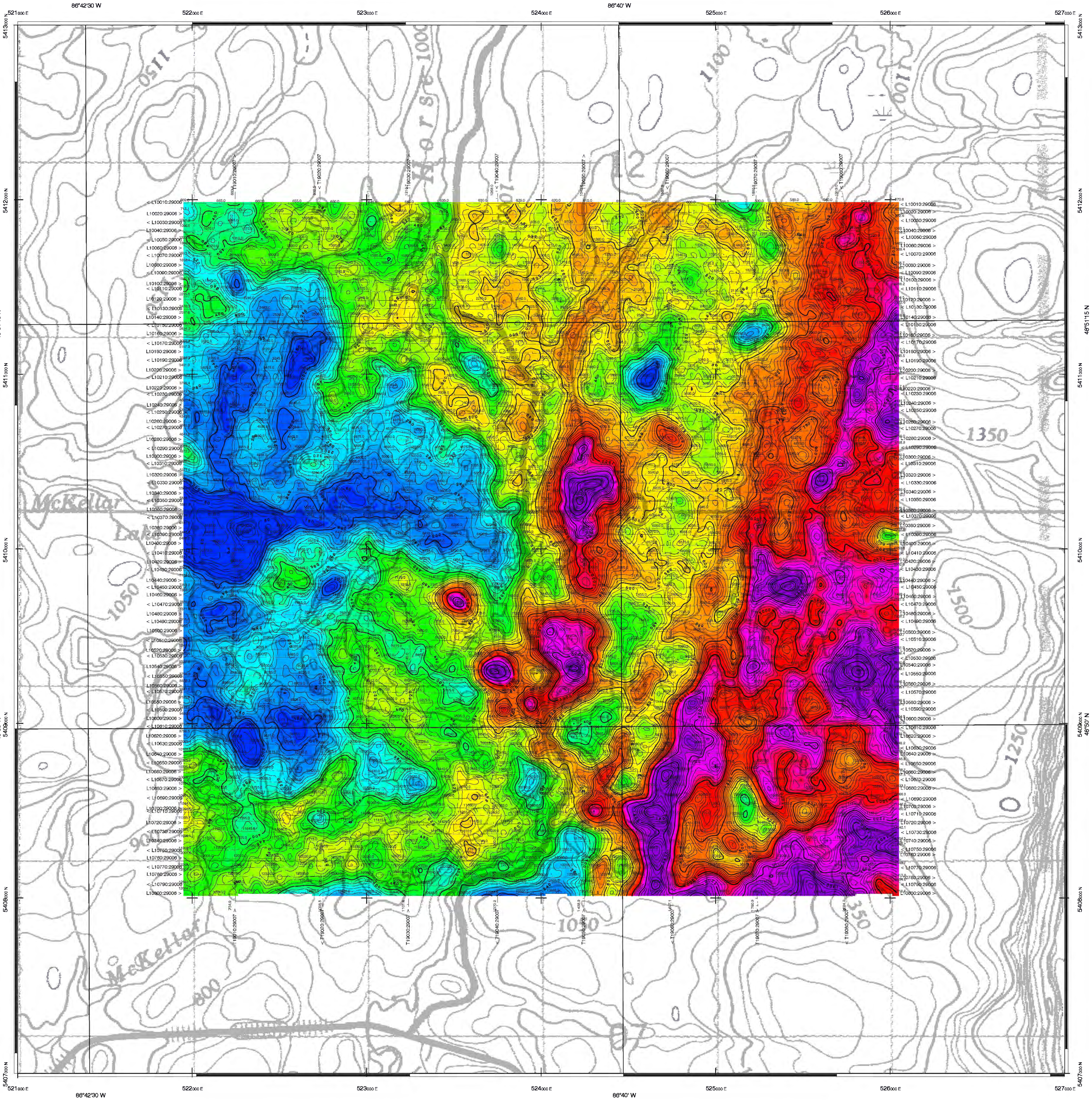
RESIDUAL MAGNETIC FIELD
IGRF Removed

FUGRO MAG/RAD SURVEY	NTS: 42D/15	GEOPHYSICIST:
DATE: OCTOBER, 2010	JOB: 10054	SHEET: 1

Fugro Airborne Surveys

0 0.5 1.0 Km
0 0.5 Mi
Scale 1:10 000

FUGRO AIRBORNE SURVEYS



TECHNICAL SUMMARY

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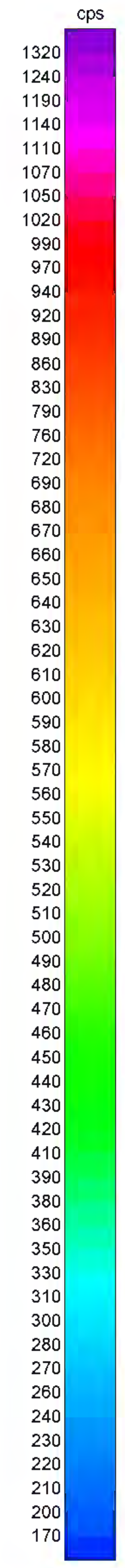
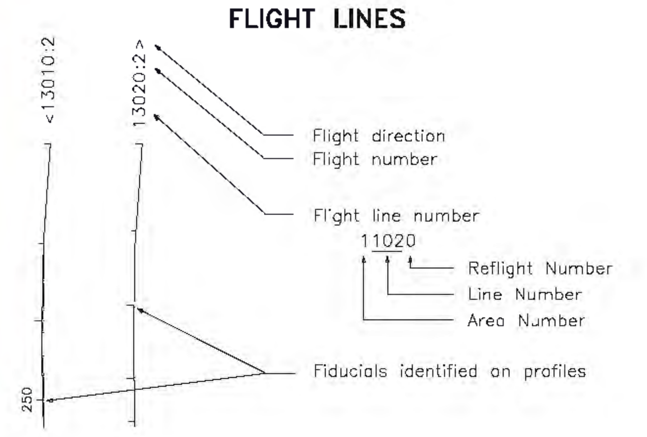
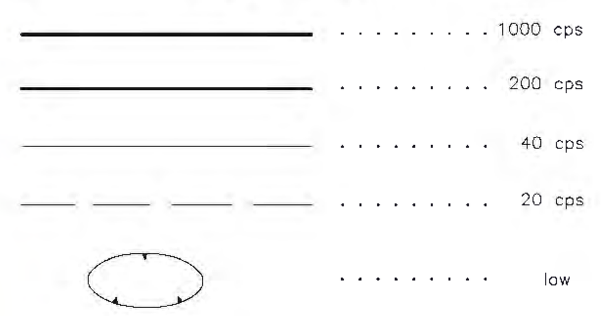


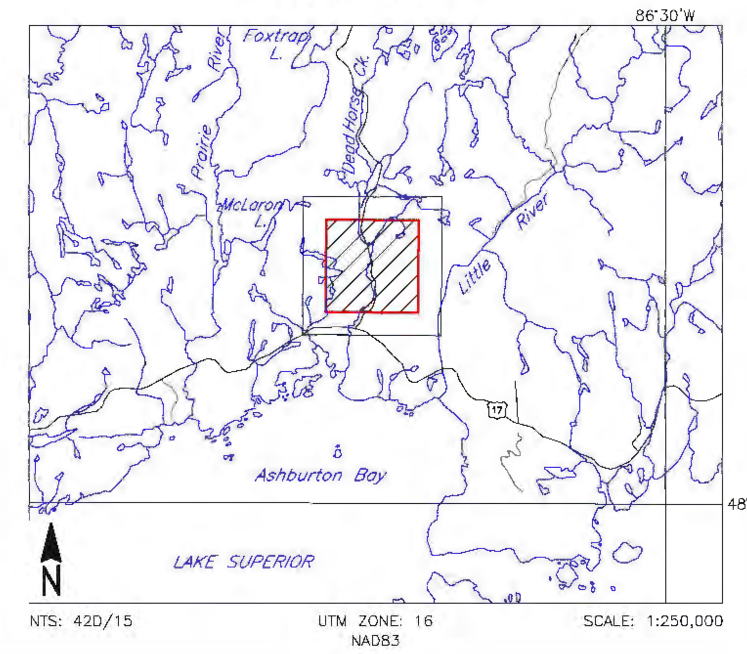
FLIGHT LINES



CONTOUR INTERVALS



LOCATION MAP



NTS: 42D/15 UTM ZONE: 16 NAD83 SCALE: 1:250,000

CANADIAN INTERNATIONAL MINERALS INC.

MARATHON AREA, ONTARIO

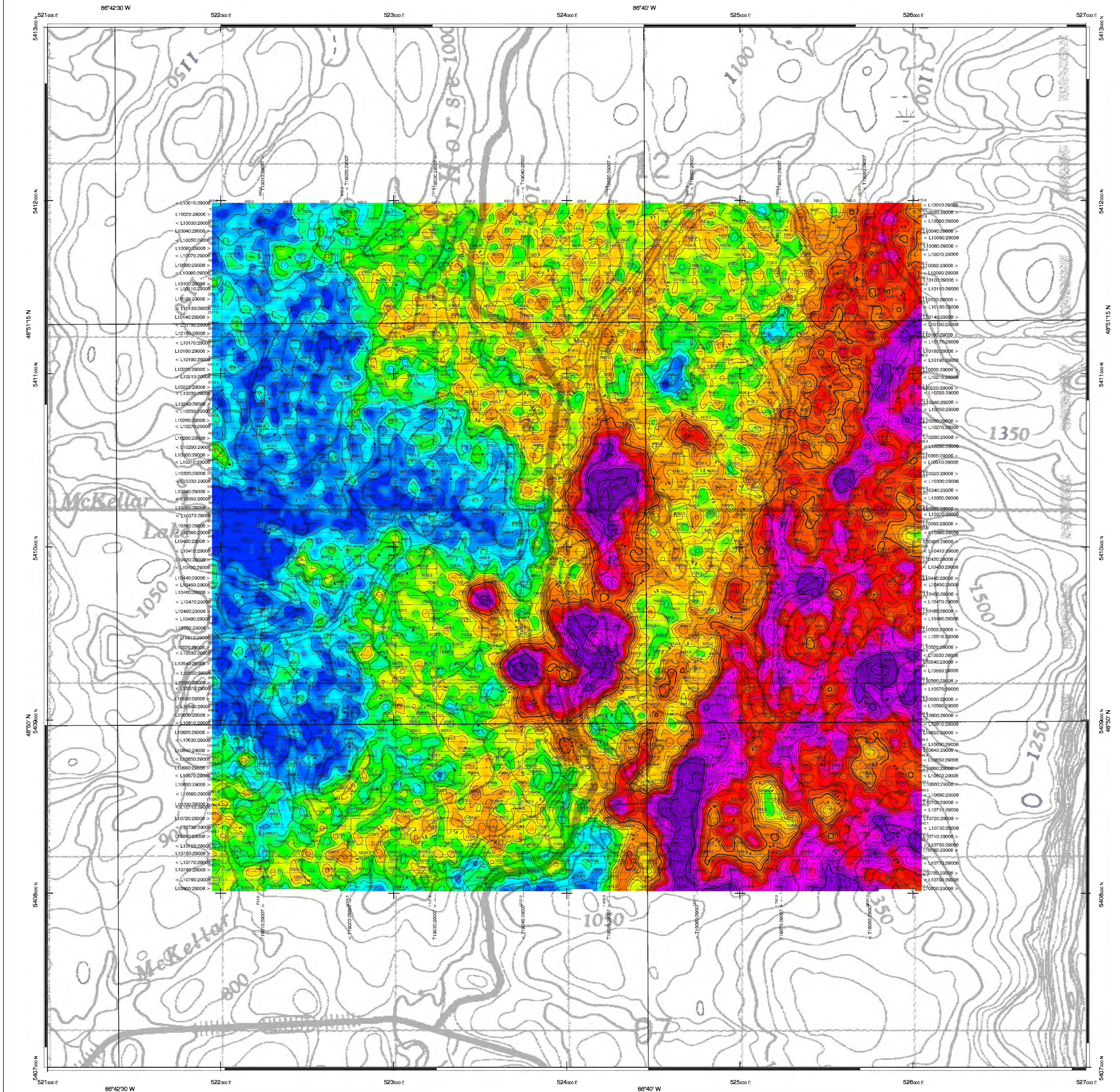
RADIOMETRIC TOTAL COUNT

FUGRO MAG/RAD SURVEY	NTS: 42D/15	GEOPHYSICIST:
DATE: OCTOBER, 2010	JOB: 10054	SHEET: 1

Fugro Airborne Surveys

0 0.5 1.0 Km
0 0.5 Mi
Scale 1:10 000

FUGRO AIRBORNE SURVEYS



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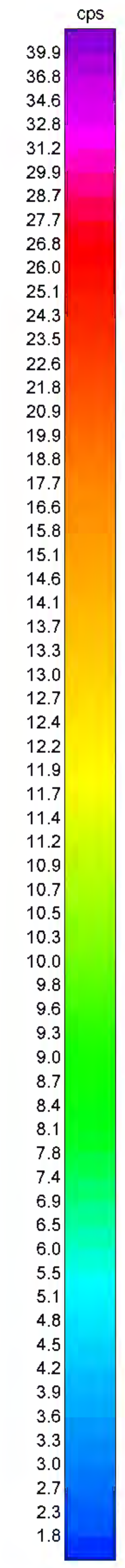
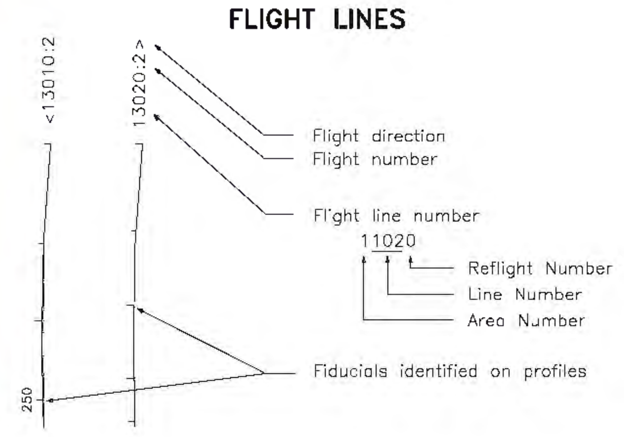
Data sampling interval	0.1 second
Magnetometer / sensitivity	Cesium / 0.01 nT
Spectrometer	RS-500
Spectrometer data sampling	1.0 second



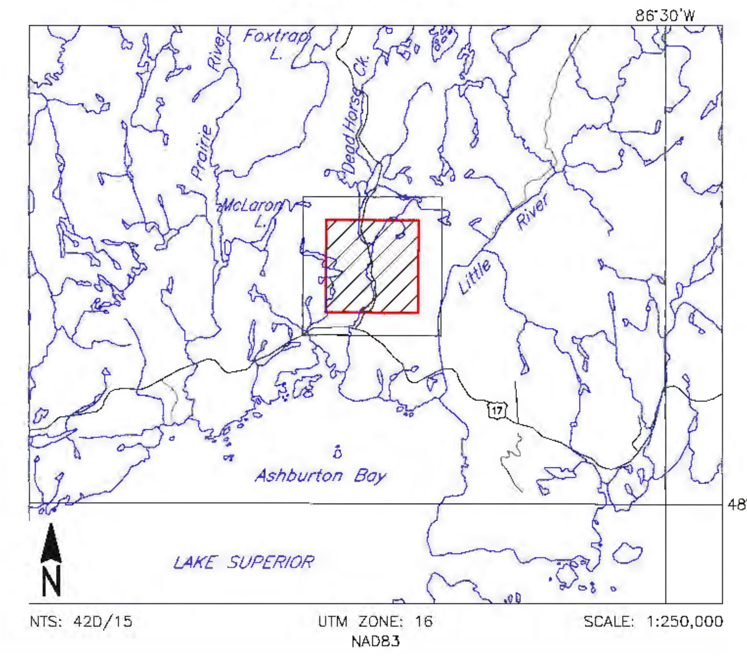
FLIGHT LINES



CONTOUR INTERVALS

————	100 cps
————	20 cps
————	4 cps
— — —	2 cps
(closed)	low

LOCATION MAP



NTS: 42D/15 | UTM ZONE: 16 NAD83 | SCALE: 1:250,000

CANADIAN INTERNATIONAL MINERALS INC.

MARATHON AREA, ONTARIO

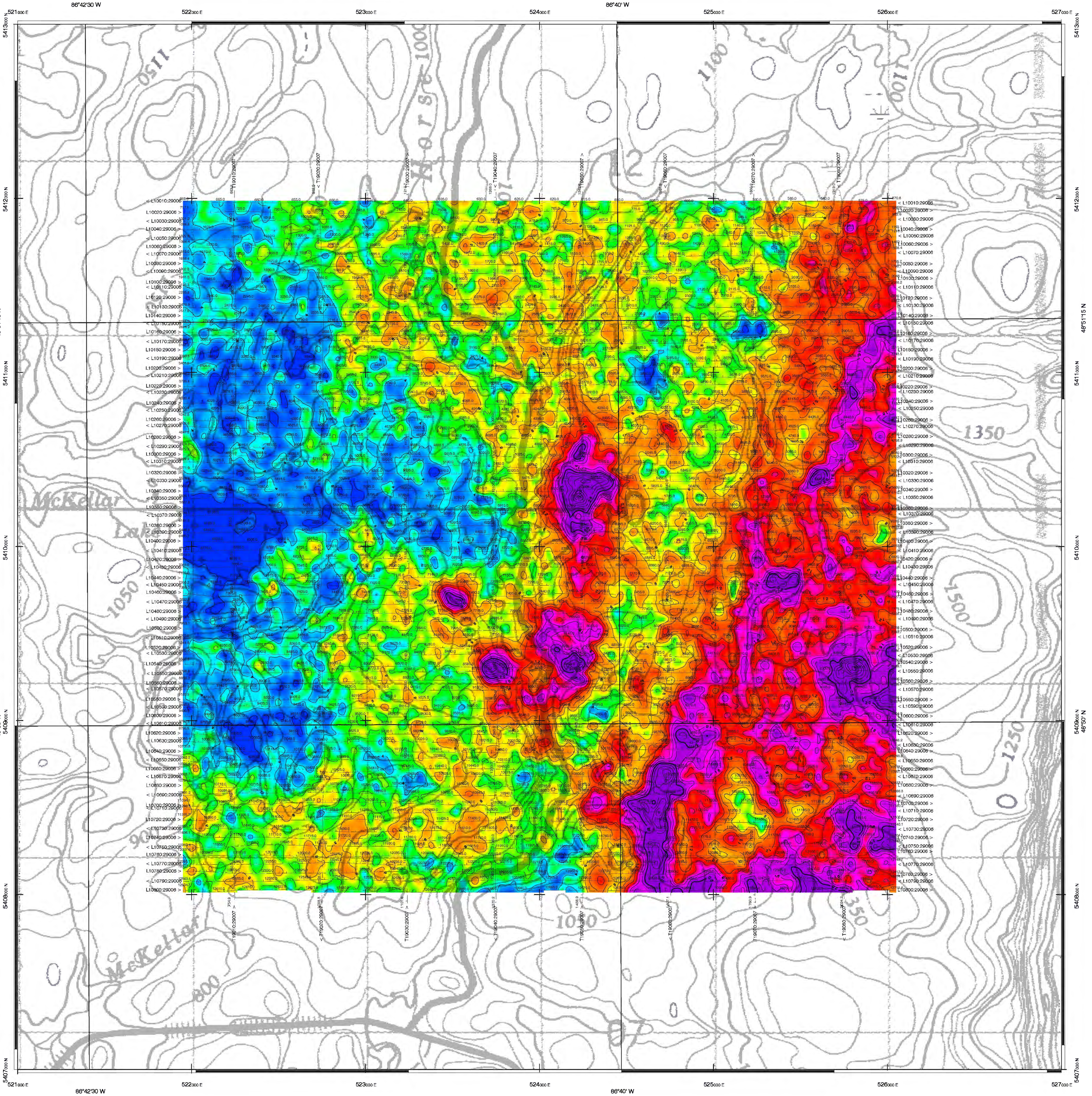
RADIOMETRIC THORIUM COUNTS

FUGRO MAG/RAD SURVEY	NTS: 42D/15	GEOPHYSICIST:
DATE: OCTOBER, 2010	JOB: 10054	SHEET: 1

Fugro Airborne Surveys

0 — 0.5 — 1.0 Km
0 — 0.5 Mi
Scale 1:10 000

FUGRO AIRBORNE SURVEYS



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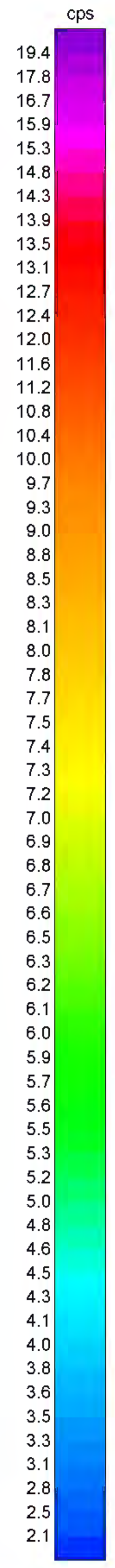
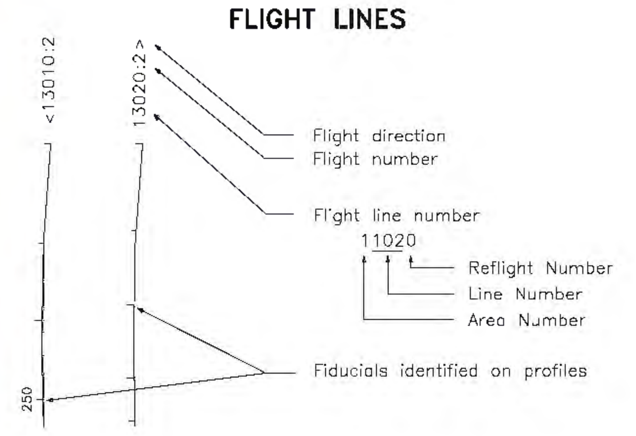
Spectrometer RS-500
Spectrometer data sampling . . . . . 1.0 second



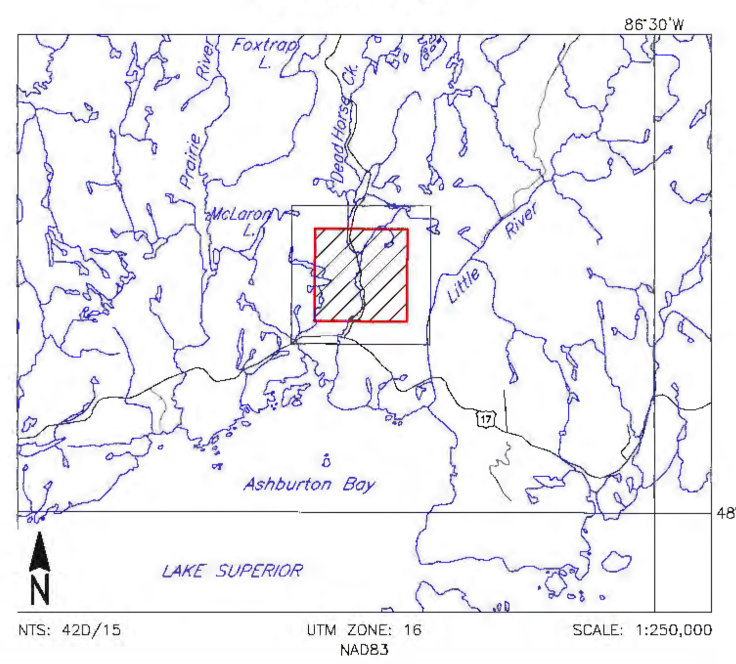
FLIGHT LINES



CONTOUR INTERVALS

. . . . 100 cps
. . . . 20 cps
. . . . 4 cps
. . . . 2 cps
. . . . low

LOCATION MAP



NTS: 42D/15 UTM ZONE: 16 NAD83 SCALE: 1:250,000

CANADIAN INTERNATIONAL MINERALS INC.

MARATHON AREA, ONTARIO

RADIOMETRIC URANIUM COUNTS

FUGRO MAG/RAD SURVEY	NTS: 42D/15	GEOPHYSICIST:
DATE: OCTOBER, 2010	JOB: 10054	SHEET: 1

Fugro Airborne Surveys

0 0.5 1.0 Km
0 0.5 Mi
Scale 1:10 000

FUGRO AIRBORNE SURVEYS