

YEIP  
04-055  
2004



**SUMMARY REPORT ON SMOKER FLATS AREA**  
**AIRBORNE GEOPHYSICAL SURVEY**

**YUKON GEOLOGICAL SURVEY - FOCUSED REGIONAL PROGRAM**  
**YMIP 04-055**

AUGUST 1 – AUGUST 7, 2004

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Figure 1

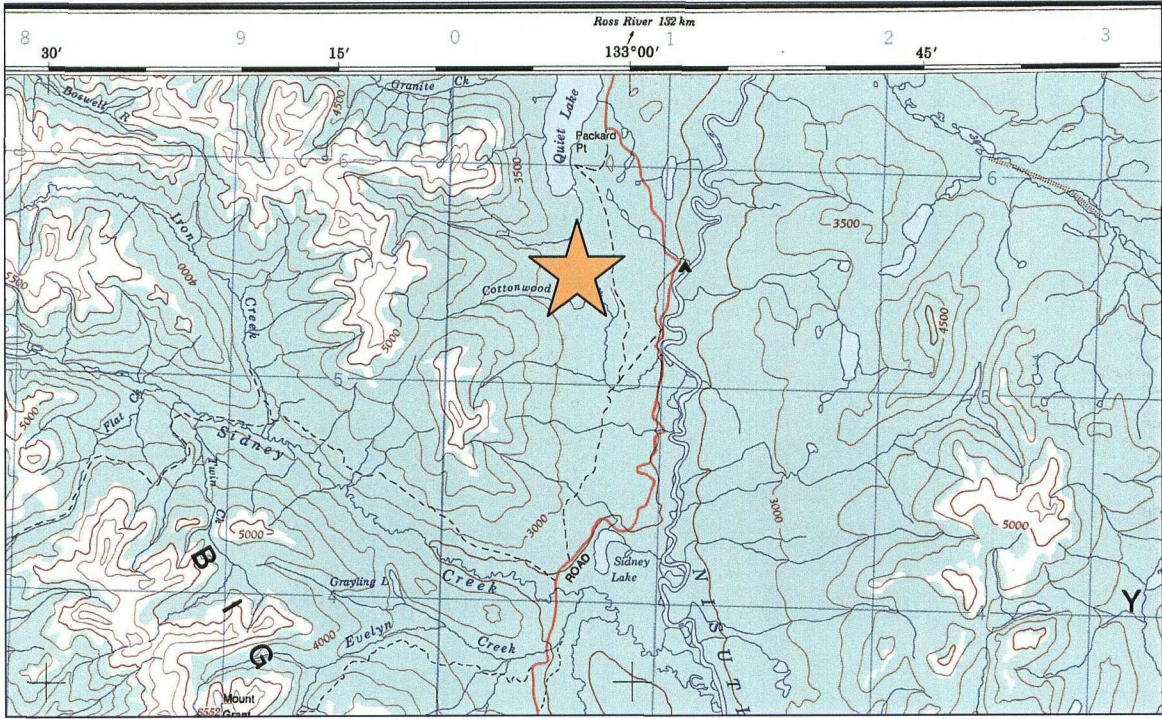


Figure 2

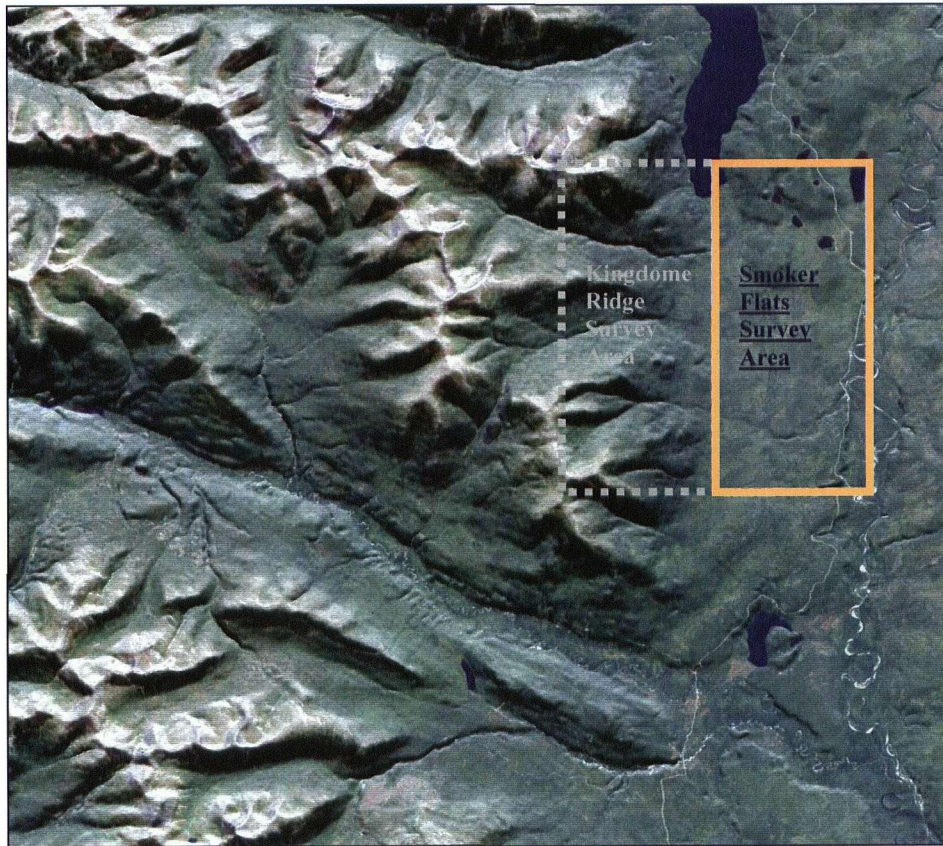


Figure 3

## SUMMARY

In the summer of 2004 a (10km x 12km) helicopter-borne geophysics survey was conducted over the Miklin Claims near the south end of Quiet Lake in Yukon. The Miklin Claims cover the area known in this report as Smoker Flats, which exists on the east side of the survey grid.

The rocks that underlie the airborne survey area are diverse and have been described as mainly calcareous metasedimentary and metavolcanic rocks with associated granitic intrusions. Limited amounts of extrusive felsic volcanic rocks have also been observed in the project area as well as a relatively large ultramafic stock. Outcrop is very scarce within the survey area.

The airborne survey outlined several interesting conductors within the Miklin Claim block. The survey also highlighted an apparent network of major linear structures that exists on the nose of the section of Quiet Lake Batholith that intrudes into the area. The linear structures and many EM conductors occur in coincidence. At one such occurrence two deep seated EM conductors exist near the intersection of four major linear (fault) structures. Several other very interesting EM anomalies occur further to the south west.

The survey also discovered a large circular resistivity anomaly. The anomaly is actually coincidental with an EM conductor that is found in the exact center of the area of high resistivity.

The large circular resistivity anomaly is also coincident with the location of the highly magnetic ultramafic intrusive stock in the area. The stock is bounded on all sides by what appear to be long linear fault structures. Another north trending fault cuts through the middle of the ultramafic. Several EM anomalies (including the two mentioned earlier) occur around the perimeter of the ultramafic.

The higher frequency EM channels did not detect any anomalies near the surface on the Miklin Claims and the stronger anomalies were detected by the lowest EM frequencies (980 Hz/880 Hz). The EM anomalies also appear to be more flat lying than vertical as they have respond the strongest to the 880 coplanar (lowest) frequency.

The strength of the EM conductors is also quite interesting. The conductance values for the survey area anomalies varies from  $< 10S$  (Siemens) to over  $>10,000S$ , with several high values in between.

Ground EM, IP and Mag geophysics survey should be conducted over parts of the Miklin Claims so as to ground-truth all EM/Mag anomalies of interest. This would identify any possible conductors associated with massive sulfides linked to the emplacement of the Cretaceous granite into the area of the ultramafic stock. The magnetic survey will identify any magnetic or structural features that may be associated with mineralization and an IP survey will highlight disseminated sulfides targets in the area.

## **INTRODUCTION**

The areas of interest regarding this report are known as Smoker Flats (fig.3).

The 2004 airborne geophysics survey was conducted by McPhar Geosurveys on behalf of Cordilleran Minerals Ltd. The survey collected electromagnetic (EM), magnetic (Mag) and radiometric (RAD) geophysical data. The job was started on August 1<sup>st</sup> and finished on August 7<sup>th</sup>, 2004. The survey covered the areas known as Smoker Flats, Kingdome Ridge and Oldtimers Hill. Ground support for the airborne survey and helicopter crews was provided by Cordilleran Minerals Ltd.

Geophysical exploration over the Smoker Flats area was conducted to identify the conductive, magnetic or radiometric source of gossanous materials found in certain places throughout the area and of gold mineralization found in drill core from the central part of the target area.

This report will discuss the general geology of the area and the analytical results from helicopter-borne geophysics survey across the target.

## **LOCATION AND ACCESS**

Smoker Flats is located on N.T.S. mapsheet 105C 14, and is within the Whitehorse Mining District. The target area is located immediately at the south end of Quiet Lake. The area is accessible from Whitehorse, to the west, by helicopter; a flight of approximately 110 Km. A staging area near Smoker Flats can be accessed in the summer months by driving 135 Km east along the Alaska Highway from Whitehorse to Johnson's Crossing, and then north on the Canol Road for another 80 Km.

The approximate geographic center of the target areas is UTM 606962 E / 6755060 N.

## **PHYSIOGRAPHY, VEGETATION AND CLIMATE**

Smoker Flats is located near the northwestern extent of the heavily forested Nisutlin River Valley at the southern end of Quiet Lake. The valley at the south end of Quiet Lake is relatively flat with some small hills. The western edge of the valley is bound by the Big Salmon Mountains and on the eastern extent is the Thirty Mile Range. Bedrock exposures are almost non-existent except along creek drainages and in a small number of other localities.

The elevation of the area is from 820m to 940m. Drainage in the area is good in some location and poor in others. Local creeks have a continuous supply of water during the spring and summer months. Most of the creek water is provided from melting permafrost. Vegetation in the area is very dense. Black Spruce, Lodge-pole Pine and Alder Willow are found throughout the entire area. Moss and long grasses are found everywhere. The

terrain for the most part is split between swamps and marshy areas and some dry woodland; the latter being located mostly on the eastern side and northern extents of the target area.

The climate of the area is typical of the interior continental region at this latitude. Winters are long with short hours of daylight and average daily temperatures of -20 Celsius. Summers are pleasant and warm with long days (20 hours of daylight on June 21), although it can be quite rainy at times. There is a yearly average of 120 days of precipitation. The average summer temperature is 22 Celsius with highs ranging into the low 30's.

## **HISTORY AND PREVIOUS WORK**

The general area of the south end of Quiet Lake has been explored intermittently since prospectors first ascended the Big Salmon River to Quiet Lake in 1897/98 in their search for placer gold deposits. The few who prospected this part of the territory recognized the mineral potential and settled in the area. A few creeks in the region produced placer gold and men built small settlements around their discoveries. Cottonwood Creek, which flows through the middle of the Smoker Flats Area, was the site of one such settlement.

Gold was discovered on Cottonwood Creek near the turn of the 20<sup>th</sup> century. At its height the settlement at Cottonwood Creek had approximately seven cabins. Placer workings on the creek are quite extensive for such a small remote drainage. It appears that a fire burnt down all of the cabins sometime in the early 1900's. A lone prospector was living and mining on the creek as late as 1925. Equipment found at the prospector's cabin suggests that he was engaged in placer gold and hard-rock mining.

In the mid 1960's interest in the target area began when a large rust gossan was discovered by people who were salvaging pipe from the 1940's Canol Road pipeline. It was later revealed that the US Army had also recorded finding large rust gossans in the southern parts of the area, while building the Canol Road. Continuous exploration was conducted in the area from 1966 to 1973.

Mineral exploration programs conducted around the south end of Quiet Lake during the 1960's and 1970's, for the most part, were of a reconnaissance nature. Work carried out in the area included airborne geophysics [electromagnetics and magnetics], a variety of ground electromagnetics and magnetics geophysical surveys, geochemical soil sampling, and very limited diamond drilling. Many of the surveys were not extensive enough to define the sources of anomalies that exist in the area, and the greater numbers of anomalies were not investigated. Mineral exploration surveys from the area have created a good template to guide future work programs. There have been limited amounts of exploration in the area since the mid 1970's.

## **PROPERTY and CLAIM STATUS**

Cordilleran Minerals Limited owns 212 quartz mineral claims (fig.4) over the Smoker Flats area. The area is equivalent to approximately 44 square kilometers. The status of the claims is listed below.

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<b><u>Claim Name</u></b>	<b><u>Grant Number</u></b>	<b><u>Expiry Date</u></b>
MIKLIN 1 – 212	YC26755 - YC29866 105C 14	2005/05/29

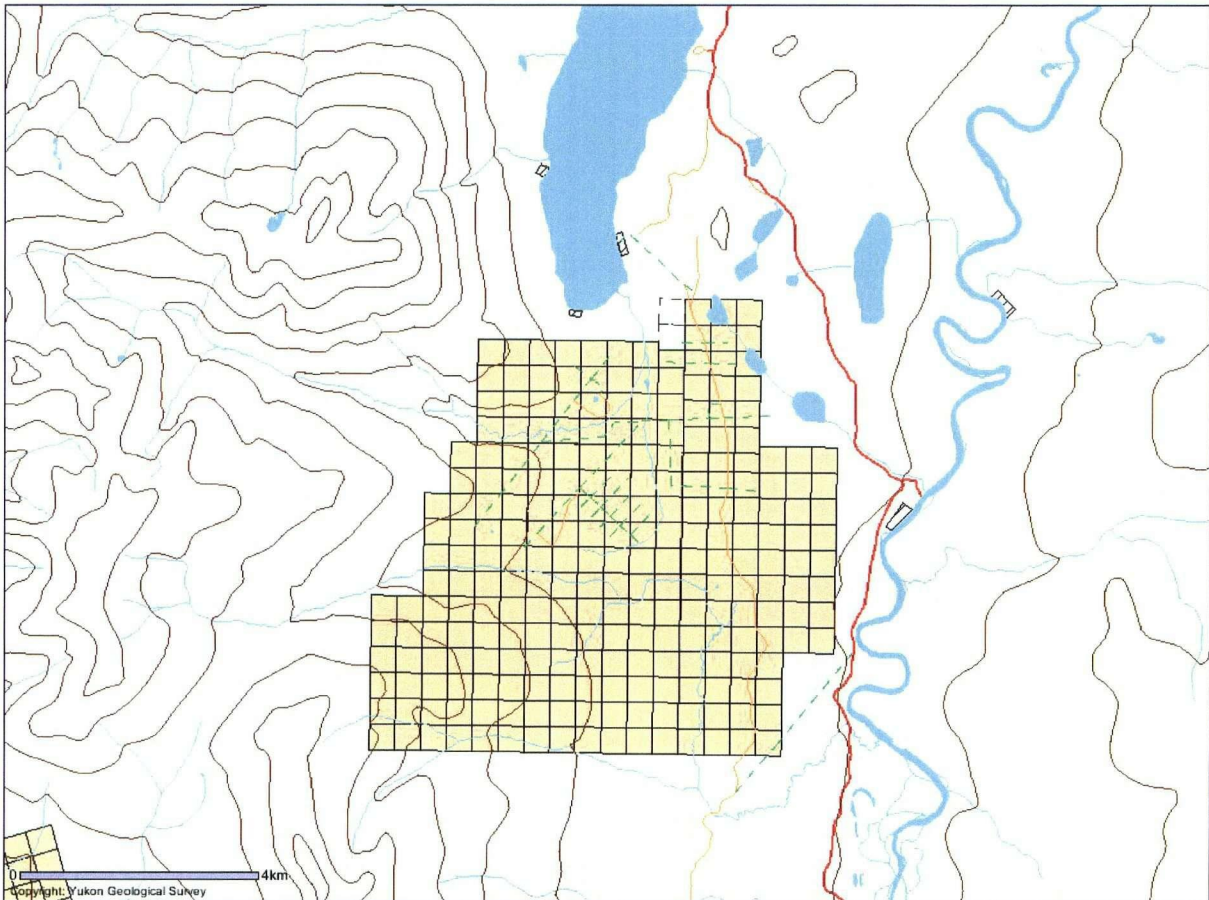


Figure 4

## **2004 WORK COMPLETED**

McPhar Geosurveys Ltd conducted a helicopter-borne electromagnetic, magnetic and radiometrics geophysical survey over the Smoker Flats area in 2004. The survey was carried out between August 1<sup>st</sup> and August 7<sup>th</sup> 2004. Cordilleran Minerals provided a base-camp and employees Mark Lindsay, Dale Brown, Adam Mickey and Chad Pen provided support and help for the survey and helicopter crews while they worked in the Smoker Flats area.



## REGIONAL GEOLOGY

The Canol Project Area is located within the morphogeological Omineca Belt. The Omineca Belt is dominated by crystalline rocks of the Yukon Tanana Terrane. The Yukon Tanana Terrane, which is the largest terrane in the Yukon, is well recognized for its mineral deposit potential through the discovery of the several massive sulphide deposits within its bounds in southeast Yukon. The world class Fort Knox and Pogo intrusion related gold deposits, in Alaska, also occur within Yukon Tanana Terrane.

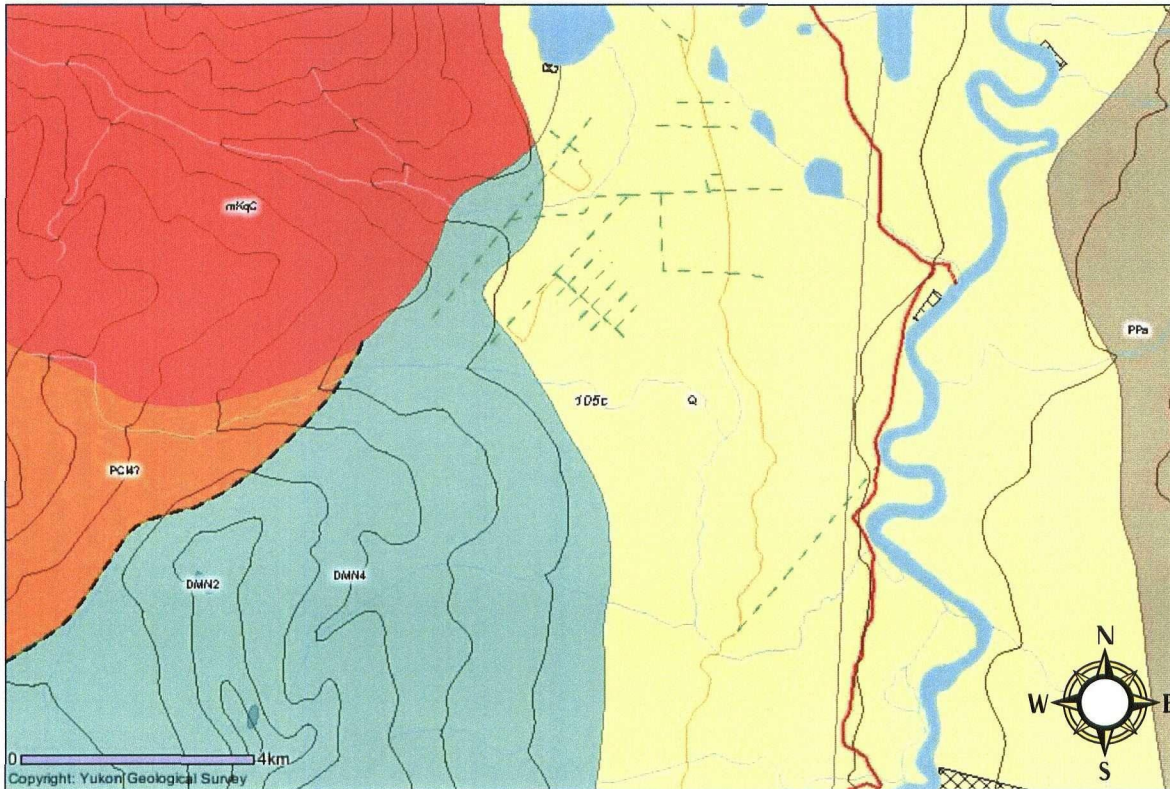


Figure 5

The geology in the immediate area of Canol Project (fig. 5) is composed of rocks of the Nasina Assemblage (**DMN** - graphitic quartzite and muscovite quartz-rich schist, with interspersed marble [4] and marble [2]). Ingenika Group rocks (**PCI4** - thin bedded slate, siltstone, quartzite and minor limestone with local medium to coarse grained, feldspathic sandstone to orthoquartzite; muscovite biotite +/- garnet schist, micaceous quartzite, minor amphibolite and marble; rare granodiorite gneiss) may be in the local area, as they are known to occur immediate to the west of the target area. Amphibolite Assemblage rocks (**PPa** - metamorphosed mafic rocks including (1) amphibolite (2) ultramafic rocks of unknown association and (3) mafic-ultramafic intrusions within Nasina assemblage) occur to the east of the Canol Project Area and may have some association with the ultramafic rocks that occur (under cover) in the central part of the target area. The Cassiar Suite intrusive (**mKqC** - medium to coarse grained, equigranular to porphyritic [K-feldspar] granite and biotite quartz monzonite; biotite-hornblende quartz monzonite and granodiorite), known as the Quiet Lake Batholith, is thought to intrude all other rock units in the area of the Canol Project.

# 2004 AIRBORNE SURVEY SPECIFICATIONS

## FLIGHT SPECIFICATIONS

### 1. Flight Lines

Line directions and line spacings are specified in Schedule B, but may be subject to change and will therefore be confirmed between McPhar's and Client's representative immediately prior to the commencement of the survey operations.

### 2. Terrain Clearances

Optimum terrain clearances for the helicopter and instrumentation during normal survey flying are:

- Helicopter - 60 metres
- Gamma ray Spectrometer - 60 metres
- Magnetometer - 30 metres
- Hummingbird EM sensor - 30 metres

### 3. Airspeed

Normal helicopter airspeed will be approximately 110 km/hr, but this may vary in areas of rugged terrain. With a sampling rate of 0.1 second, EM, magnetometer and altimeter measurements are acquired approximately every 3 metres along the survey line.

Gamma ray Spectrometer data are collected approximately every 30 metres along the survey line.

**Table 1**

SURVEY SPEED (km/hour)	SURVEY SPEED (metres/sec)	SAMPLING INTERVAL (0.1 second)
110	30 metres	3 metres

#### 4. Magnetic Diurnal

Flight lines, or portions thereof, will be re-flown if the magnetic diurnal exceeds 25nT in a straight-line chord over 5 minutes. Survey data acquisition will be stopped altogether in the case of severe magnetic diurnal activity.

#### 5. Sampling Rates

Table 2

SYSTEM/No. of CHANNELS	SAMPLING RATES/SEC.
Total Field Magnetometer (1 channel)	0.1 sec
E.M. - 880 Hz (2 channels) Coplanar	0.1 sec
E.M. - 980 Hz (2 channels) Coaxial	0.1 sec
E.M. - 6.6 kHz (2 channels) Coplanar	0.1 sec
E.M. - 7 kHz (2 channels) Coaxial	0.1 sec
E.M. - 34 kHz (2 channels) Coplanar	0.1 sec
Gamma ray Spectrometer (512 channels plus U, Th, K, TC and cosmic)	1.0 sec
Radar Altimeter (1 channel)	1.0 sec
DGPS Navigation	1.0 sec

### SURVEY INSTRUMENTS

#### 1. The Helicopter-borne HUMMINGBIRD5 Digital Electromagnetic System

The HUMMINGBIRD5 is an all-digital, high-performance, multi-sensor airborne geophysical surveying system designed to fully utilize the latest technologies and digital data acquisition techniques in a low-weight, lowest-cost configuration.

The HUMMINGBIRD5 sensor, which is the heart of this system, can be simply described as a multi-frequency, multi-coil electromagnetic system, which measures the in-phase and quadrature responses from a number of coil-pairs installed in a tubular bird, towed beneath a helicopter.

HUMMINGBIRD5 features horizontal coplanar and vertical coaxial coil sets at frequencies of 880 Hz, 980 Hz, 6.6 kHz, 7 kHz and 34 kHz.

The system noise of the EM sensor is less than 2 ppm of the transmitted field, under ideal conditions. A total of ten EM channels of information are sampled at 0.1 second intervals or approximately every 3 metres along the survey line (at a survey airspeed of approximately 110 kph), with a time constant of 0.1 second.

The EM system is calibrated with an external coil at the start and end of each survey and with an internal coil approximately three times per hour during survey flights. The phasing of the EM system is checked with an external ferrite rod before each survey flight.

For ease of shipping, the HUMMINGBIRD5 sensor/bird is constructed in 3 sections, each of approximately 2.2 m in length. The three sections are shipped in their own separate containers and joined together in the field in a matter of a few hours by the operating crew.

**Table 3**

COIL FREQUENCY	COIL ORIENTATION	COIL SEPARATION	CHANNELS
880 Hz	Coplanar	6.0 metres (19 ft)	I, Q
980 Hz	Coaxial	6.0 metres (19 ft)	I, Q
6.6 kHz	Coplanar	6.3 metres (20.5 ft)	I, Q
7 kHz	Coaxial	6.3 metres (20.5 ft)	I, Q
35 kHz	Coplanar	4.9 metres (16 ft)	I, Q

I = In-Phase

Q = Quadrature

Sferic activity can be reduced by post-survey processing to less than 2.0 ppm.

The electromagnetic system and ancillary equipment will be operating for a sufficient period prior to survey flying to allow for sufficient warm-up of the equipment. Nulling, ferrite and external Q-coil calibration for the EM system will only be performed after the system has stabilized following the warm-up period. All of these ground calibrations will be completed before commencement of each flight. Internal calibrations will be performed frequently throughout the survey flights.

## 2. Airborne High Sensitivity Magnetometer

Either a Scintrex CS-2 Cesium or a Geometrics G-822A split-beam total-field magnetometer sensor, installed in the HUMMINGBIRD airfoil, with a sampling rate of ten times per second and an in-flight sensitivity of 0.01 nT, will be utilized. The magnetometer will perform continuously in areas of high magnetic gradient with the ambient range of the sensor approximately 20k-100k nT. Aerodynamic magnetometer noise should not exceed 0.25 nT.

### 3. Gamma-ray Spectrometer System

A Pico-Envirotec GRS-410 multi-channel gamma-ray spectrometer with 16.8 litres "downward looking" NaI sensor and 4.2 litres "upward looking" NaI sensor will be utilised during this survey, and will sample data once per second. The thermally isolated sensor will be installed in the cabin of the helicopter.

The GRS-410 is a self-stabilizing spectrometer, and tracks and corrects for the spectral drift by following a spectral peak, typically thorium. The standard regions of interest, as listed below, will be recorded and processed. The 256 channel digital data will be recorded and provided to Client. An example of the standard regions of interest that will be recorded, with window limits in MeV, is given in the table below:

**Table 4 Sample Regions of Interest (ROI)**

Sample of Standard Windows		
Element	Approximate Lower Boundary (MeV)	Approximate Upper Boundary (MeV)
Total Count	0.41	2.81
Potassium	1.37	1.57
Uranium	1.66	1.86
Thorium	2.41	2.81
Cosmic	3.00	$\infty$
Upward-looking Uranium	1.66	1.86

The spectrometer will be calibrated daily using standard calibration thorium (Th), cesium (Cs) and uranium (U) sources.

### **2004 AIRBORNE SURVEY RESULTS**

The results of the 2004 helicopter-borne geophysics survey are summarized in the next few sections. The boundary for the Smoker Flats Area (red in Fig. 7) exists along the middle north-south UTM grid line at 605000E and extends to the east.

The summary of results is based on observations made by Cordilleran Minerals staff and is not the opinion of a professional geophysicist. A full analysis of the airborne geophysical specifications, methods and results, analyzed by a professional geophysicist, will be attached to this report at a later date.

The electromagnetic survey carried out over the Miklin Claims in 2004 collected data from the 6600Hz, 980Hz and 880Hz electromagnetic frequencies. The EM data was

converted to maps showing horizontal offset profiles and as apparent conductivity contours and points.

The magnetic data was collected in the following formats: Total magnetic field contours; reduction-to-the-pole (RTP) magnetic contours; calculated first vertical derivative contours; calculated second derivative contours and analytic signal of the magnetic contours

Radiometric data was collected in the following formats: Total count contours, uranium contours, thorium contours and potassium contours and the selected radiometric ratio color contour for Th/K.



**Figure 6**

## ELECTROMAGNETIC (EM) SURVEY

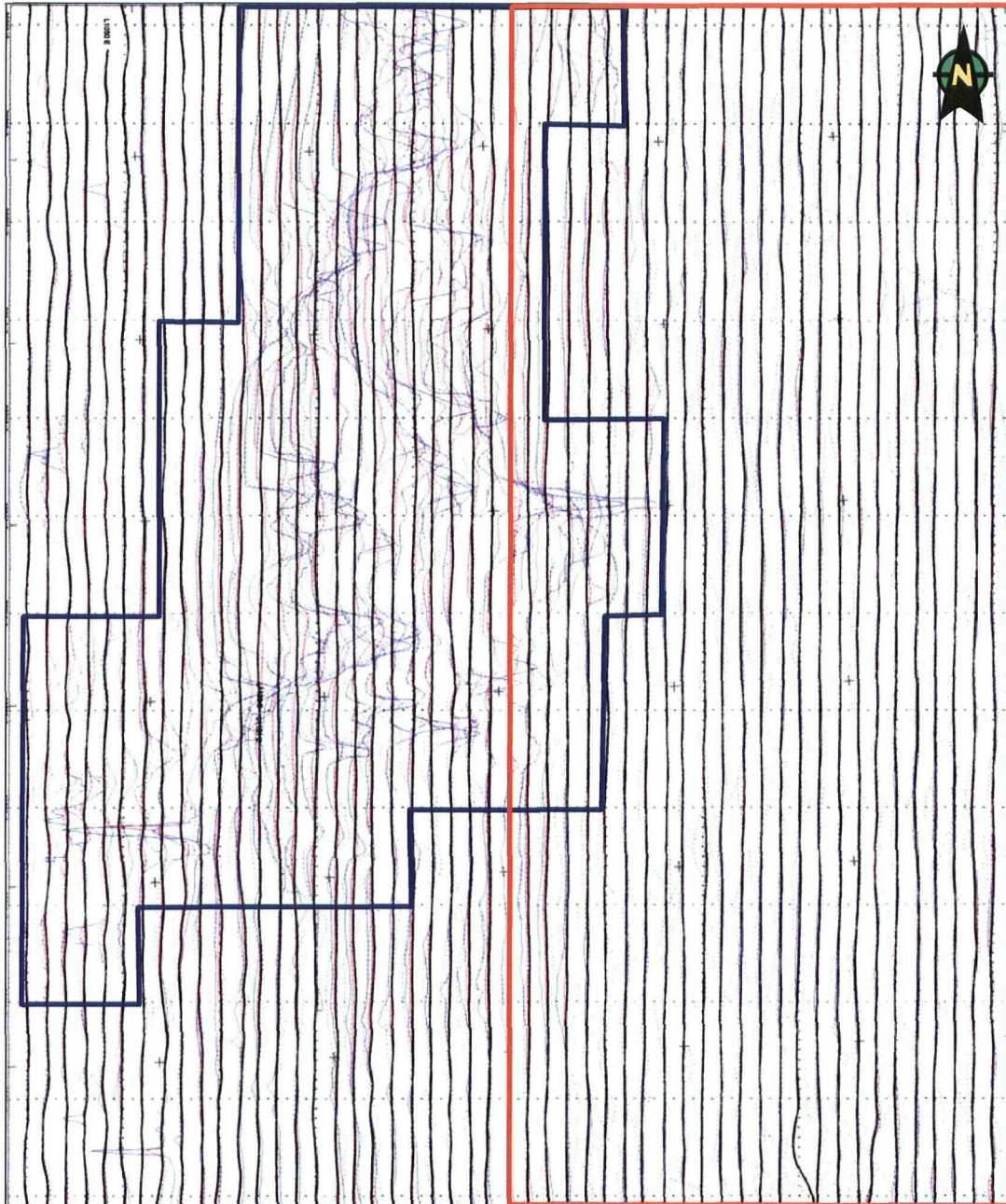


Figure 7

The 2004 air geophysics survey discovered a broad area of heightened conductivity (blue in Fig. 7) on the nose of the section of the Quiet Lake Batholith that intrudes into the general target area. The area of enhanced EM conductivity in Figure 7 is approximately 45 sq. km.

The EM response in the higher frequencies (near surface) was poor. Analysis of the highest EM frequencies (35000 & 7000 Hz) was not included in the final airborne geophysics report. The EM response in the horizontal offset 6600Hz coplanar frequency

(highest frequency for this report) detected some small anomalies nearer to the surface, but overall the data was subdued. The horizontal offset response for the coaxial 7000 Hz frequency (not included in report) was reported as basically flat across the entire airborne grid as was the 35000 Hz frequency.

The lowest frequency coil (coplanar 880Hz) expressed the largest horizontal offset. The horizontal offset EM response over the target area, as shown in Figure 8, was (at least) twice as strong in the 880Hz coplanar EM coil as compared to the 980Hz coaxial EM coil. The strength in responsiveness of the 880Hz EM coil appears to show that the focal point of conductive zones in the target area exists relatively deep (as deep as the system could detect) in the local stratigraphy. The height difference between the (880 and 980 Hz) horizontal offset profiles shows that the EM anomalies are potentially wide (flatter lying) structures as compared to usual narrow (vertical) dykes or veins. The 880 Hz coil can detect anomalies that exist about 100 meters below surface.

Figure 8 shows an example of a method of presenting EM data (horizontal offset profiles). The blue lines are 880 Hz coplanar and the red lines are 980 Hz coaxial.

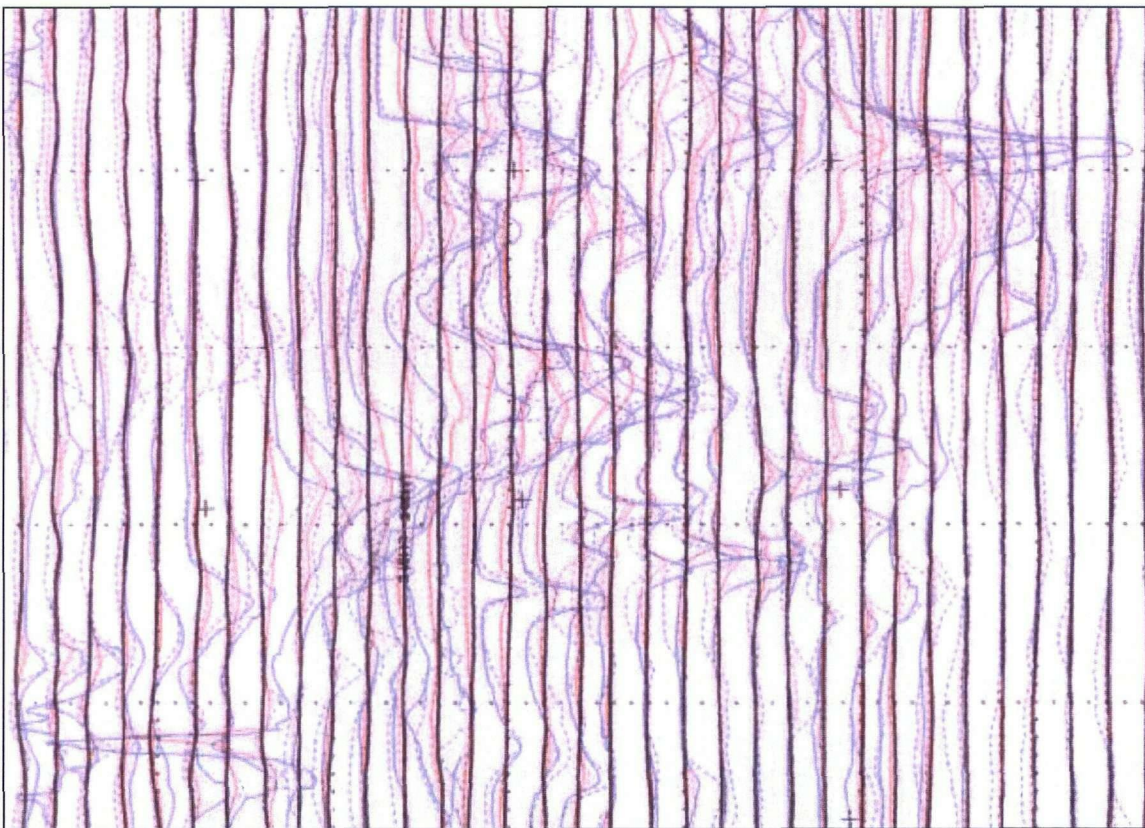


Figure 8

The conductances map in figure 9 shows the areas where the calculated EM conductances were strongest in the target area. The conductance's (6600Hz frequency) were calculated with the help of a computer program. The point conductance values (Fig. 11) for the 980 coaxial coils were most numerous in the 10-50S (Siemens) range with several anomalies in the 50-100S range and one at 100-500S, two at 500-1000S and one over 10,000s.



A very interesting anomalous feature on the conductance map is a circular area of high resistivity (yellow circle Fig. 9 & 10) near the north end of the survey grid. The resistivity anomaly is large (~3km x 3km). The anomaly is very odd by the fact that it has a conductor in its center? The conductive zone is approximately 1 kilometer wide (Fig. 10). The area has the strongest conductor (> 10,000S) on the airborne grid and it appears to exist on the edge of the ultramafic.

The circular resistivity anomaly is also ringed by smaller conductive areas. One large conductive zone exists immediately to the south. Any of these conductors could be reflecting the occurrence of massive sulfide bodies associated with the ultramafic intrusion.

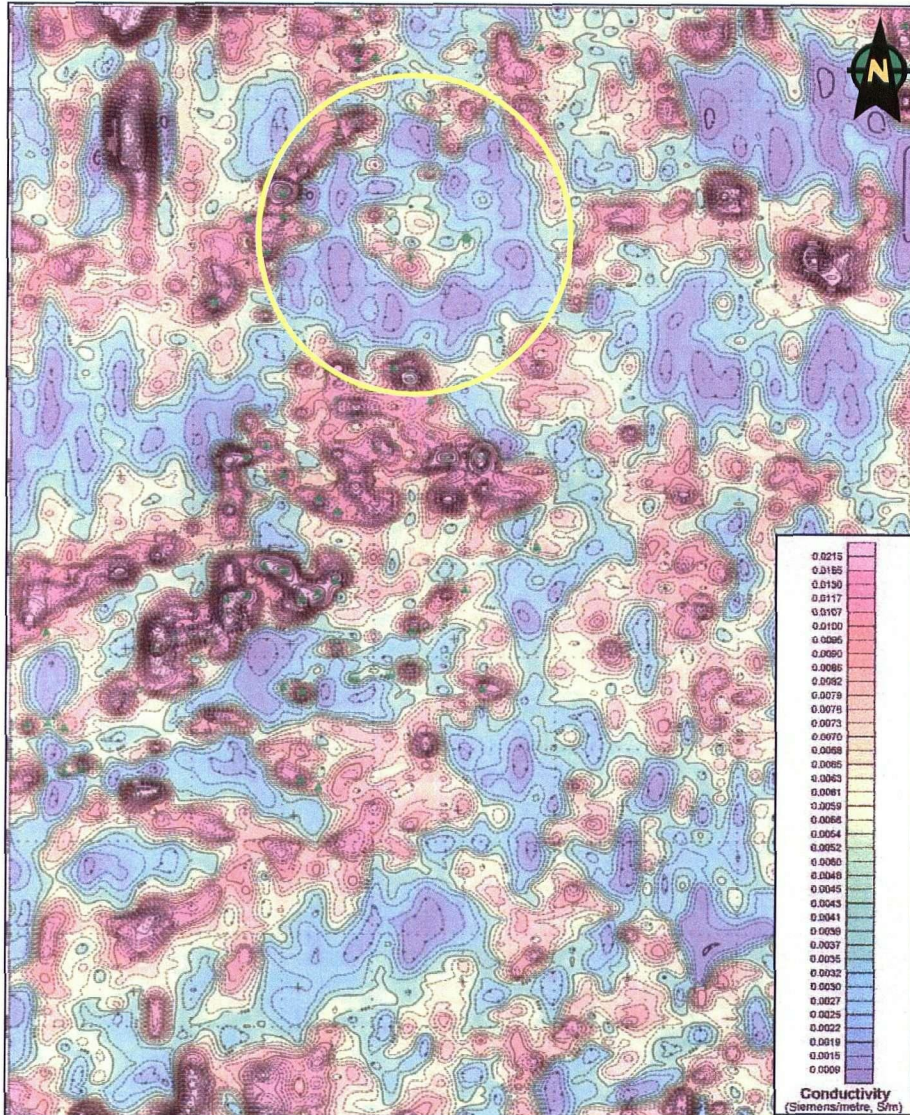


Figure 9

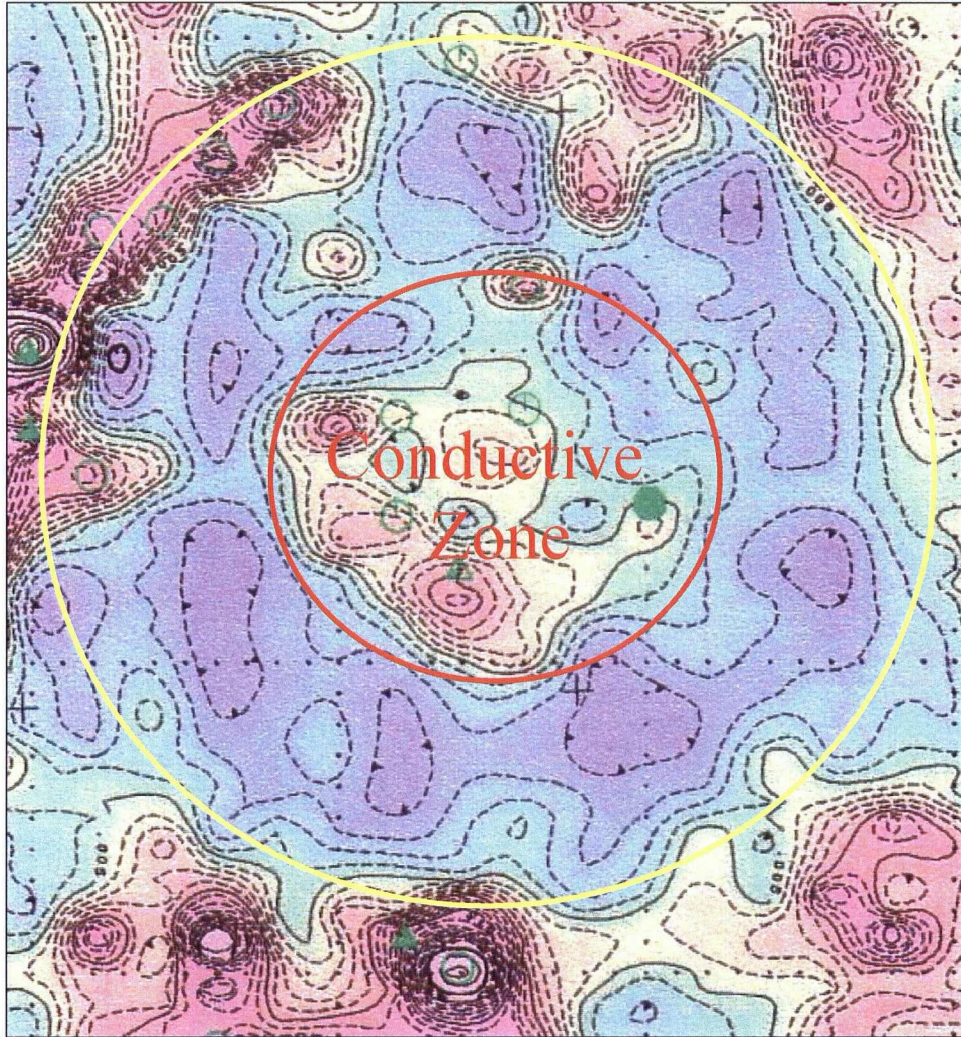


Figure 10

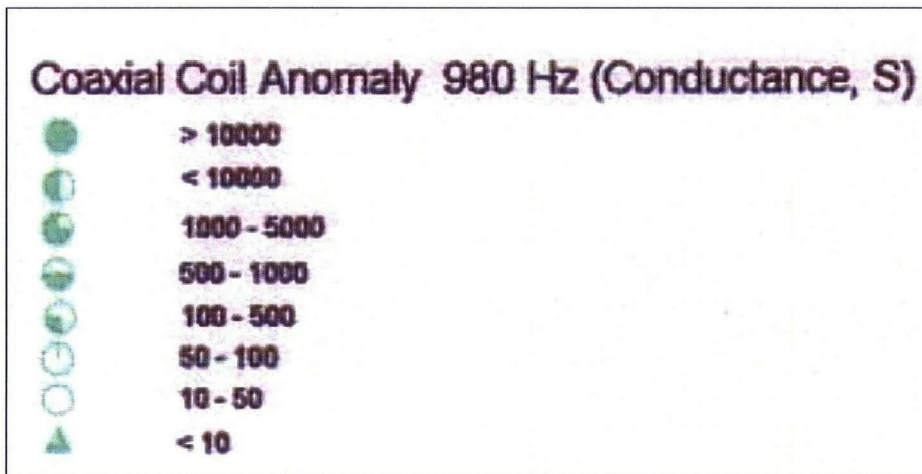


Figure 11

## MAGNETIC SURVEY

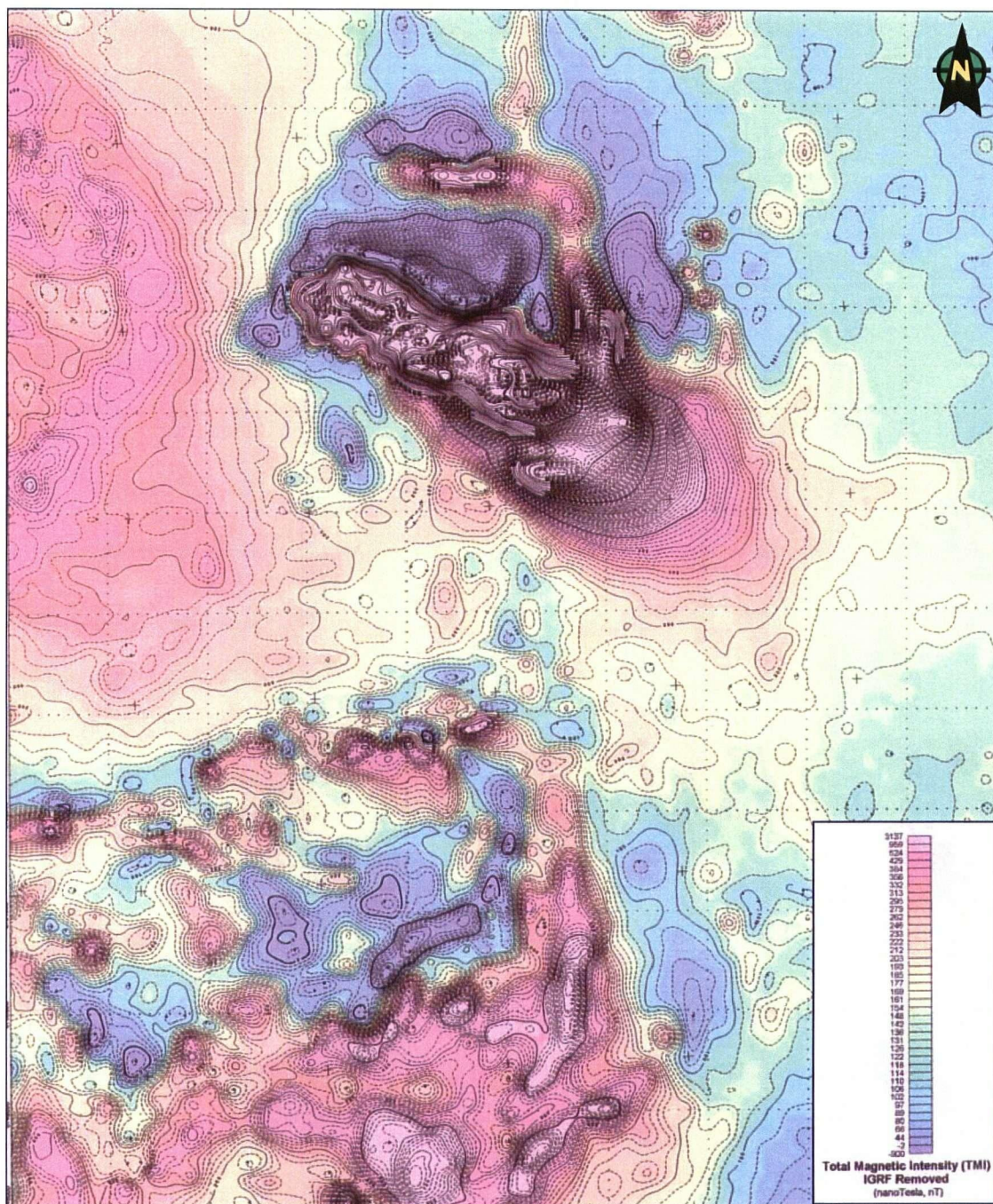


Figure 12

The results of the magnetic survey (Fig. 12) over the Miklin Claims have provided an interesting glimpse at the major structural features that exist at this geographic location.

The magnetic data has highlighted several linear features on the nose of the Quiet Lake Batholith. The most evident fault structures are outlined in figure 13. The two northwest trending linear anomalies in figure 13 (on the immediate northeast side of the dominant

magnetic anomaly) have been ground-truthed and thus are real fault structures. The size and emplacement of the ultramafic intrusive stock (the dominant magnetic anomaly) appears to be closely constrained by the apparent fault/fracture zones.

The most dominant feature on the magnetic map is the highly magnetic ultramafic stock. The stock is substantially more magnetic than other rocks in the area. The high degree of magnetism in the ultramafic may be due to a metamorphic alteration process that has occurred in the rock. The absolute magnetic intensity of the ultramafic (above background – earth's magnetic field) is  $\sim 3200$  nT.

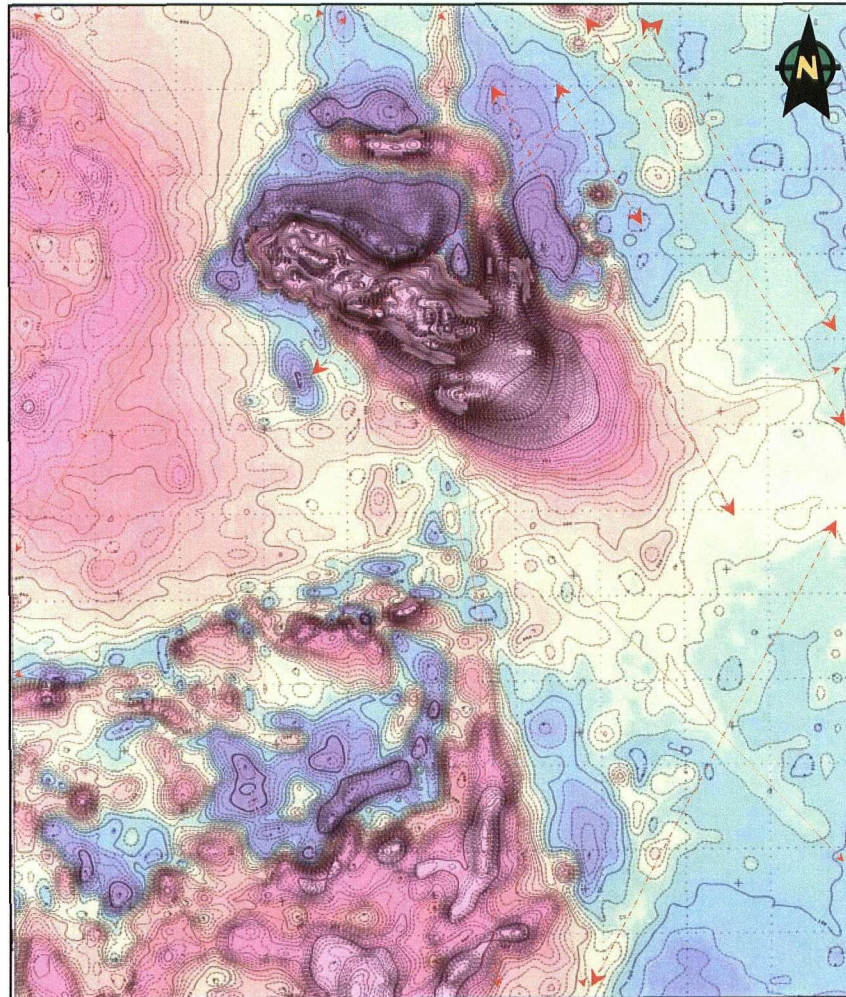


Figure 13

There is another fault bound block to the southwest, which exhibits some relatively strong magnetic signatures. The geological nature of this area is poorly understood. The author has seen ultramafic rocks, mafic sediments and schists in the area. The magnetic anomalies may be from granites that have intruded these units.

Another important feature regarding the magnetic data is the large area of magnetic low that is an intricate part of the overall magnetic signature associated with the pronounced

location of the ultramafic intrusive stock. The low magnetic areas may be related to alteration brought on by the intruding granite rocks from the west.

The magnetic low areas (violet color in Fig. 14) are interwoven within the ultramafic magnetic high areas (light and dark pink colors) and form a northward curving shape that mirrors the location of the previously mentioned circular resistivity anomaly. The magnetic lows are also intimately associated with some of the EM conductors. The magnetic low areas are possible locations of alteration where magnetite has been destroyed and replaced with clay, carbonate or quartz.

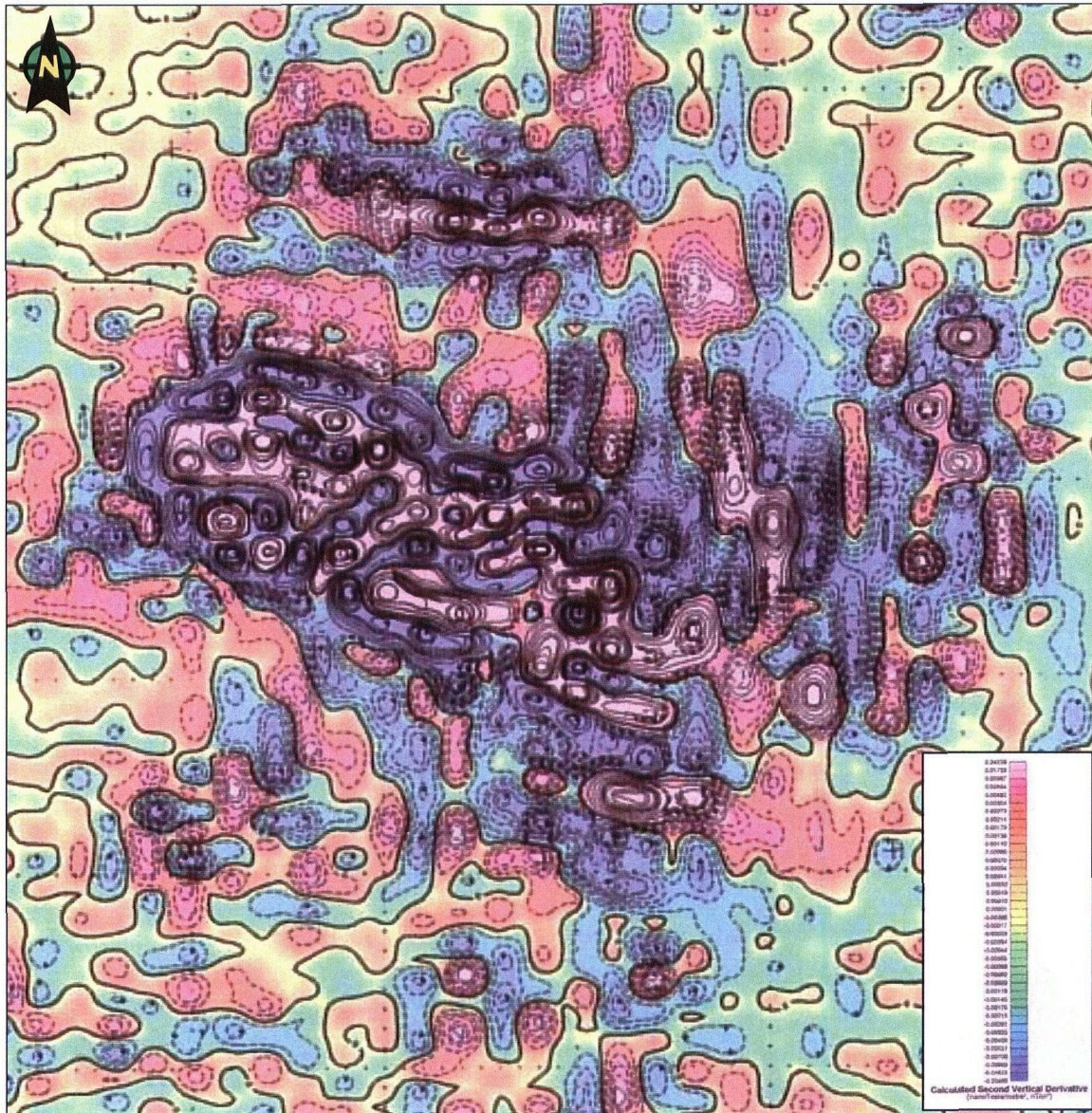


Figure 14

## RADIOMETRIC SURVEY

The radiometric data from the 2004 airborne survey was useful in helping to decipher areas that had been affected by the intrusion of the Quiet Lake Batholith. A large part of the survey area is covered with significant depths of overburden and this factor may have affected the collection of accurate gamma-rays emissions for the survey.

The most diagnostic radiometric data from the survey is the potassium contours map. The map (Fig. 15) highlights the main outcrop locations along the west side of the grid area. The Quiet Lake Batholith intrudes from the west and is conspicuous from the large amount of pink coloration all along the western side of the airborne grid. In the central and east portion of the grid the colors blue are most dominant indicating the locations of bodies of water, swamps (lowest %K) that known to occur in the area and accentuating the (probable) locations of deep sections of overburden.

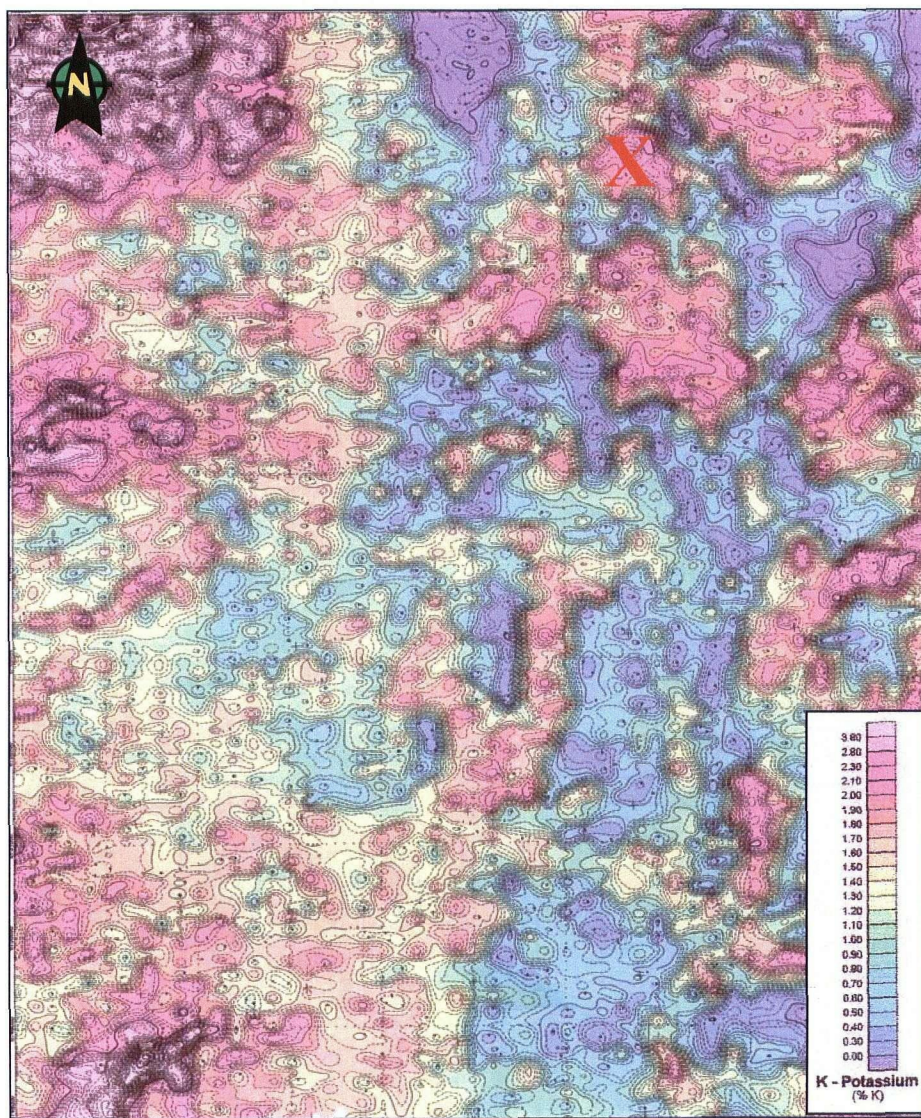


Figure 15

An example of how the map helps in defining an area is given in figure 15, where the red X marks a spot where a 22m wide quartz vein with significant pyrite and sericite mineralization was encountered while ground-truthing an anomaly in 2003. The sericite probably produced the potassic anomaly at this location.

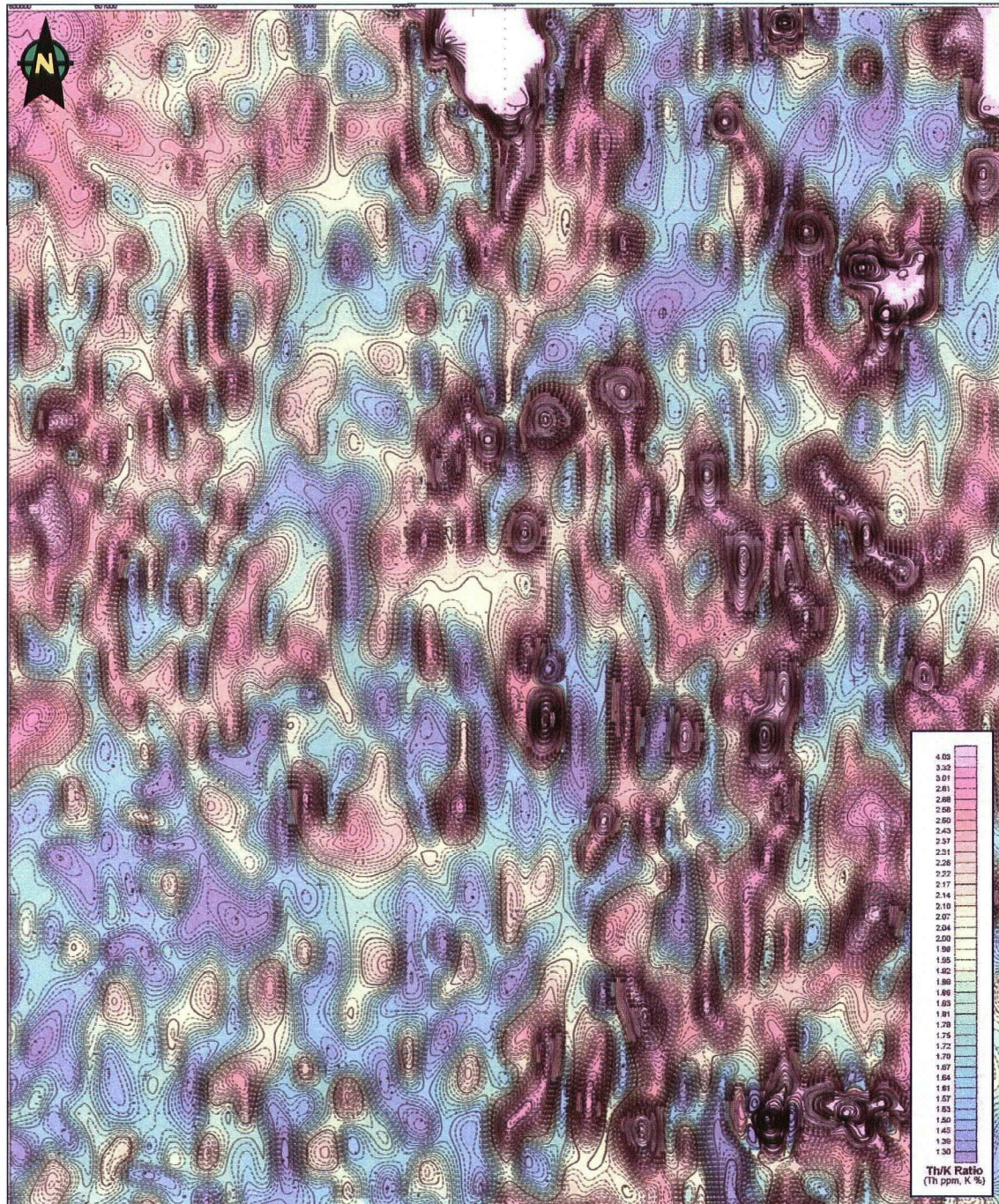


Figure 16

Another interesting piece of radiometric data is the thorium/potassium (Th/K) ratio map in figure 16. Very low Th/K ratios (violet color) sometimes indicate areas of alteration in regard to felsic related intrusive processes.

The map shows several areas that are the anomalously lowest of Th/K ratios. The Th/K anomalies seem to trend in a southwest-northeast pattern and may be reflecting and may be reflecting alteration processes associated with the location of the Quiet Lake Batholith. Some of these areas correspond to known alteration zones and others may also be related to alteration zones, but are in need of investigation.

The areas of high Th/K ratios on the east side of the grid may be reflecting the deep overburden conditions that possibly exist in that area. The high ratios in the upper-middle part of the grid may be associated with the known occurrence of ultramafic rocks.

## **CONCLUSIONS AND RECOMMENDATIONS**

The Smoker Flats Area, although only represented by half of the 2004 Helicopter-borne Geophysics Survey, is a block of land that has good potential to host economic mineral deposits. The target covers approximately 1/3 of the ground which hosts a large circular resistivity anomaly and a primitive ultramafic stock which are potentially significant areas.

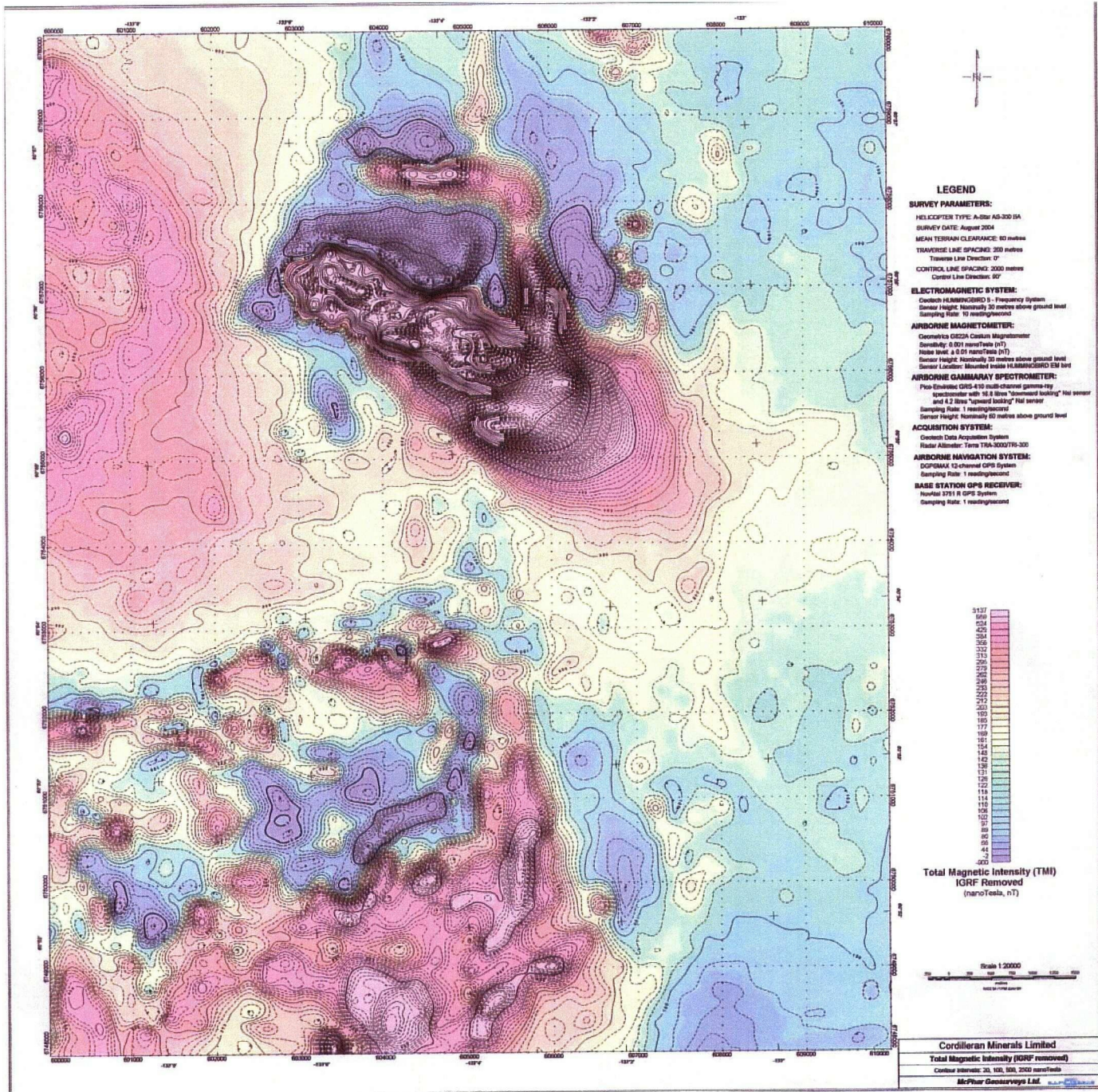
Now that interesting airborne anomalies have been discovered within the Smoker Flats Area the zone now needs to have ground geophysical surveys conducted over the highest potential anomalies to accurately identify ground coordinates of the anomalies for further investigation. This process will also weed out any weaker anomalies that exist.

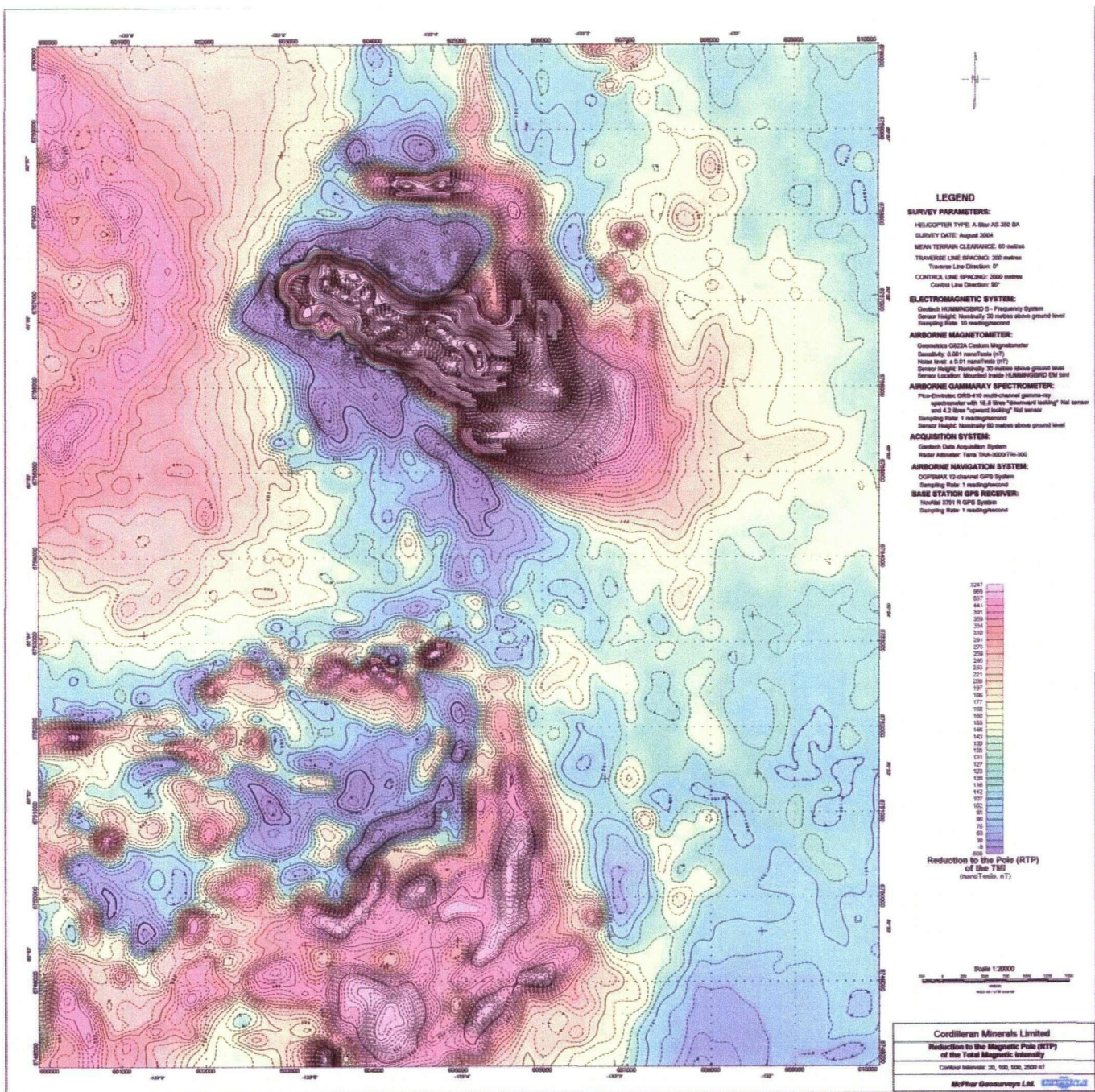
A line grid should be slashed out over all high potential conductors and resistivity anomalies. The grid should be cut perpendicular to the trend of the EM horizontal offset profiles. Maxmin Horizontal Loop Electromagnetics (HLEM), Induced Polarization (IP) and ground Magnetism (Mag) surveys should be conducted over all of the grid area.

Once ground geophysics is completed the data should be analyzed and drill targets should be identified and prioritized. Drilling using a core drill should then take place at the discrepancy of the project operator.



# APPENDIX I





**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AS-300 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 60 metres  
 TRANSMIT LINE SPACING: 300 metres  
 Traverse Line Direction: 0°  
 CONTROL LINE SPACING: 3000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geosoft HEMASPECT-5 Frequency System  
 Sensor Height: nominally 30 metres above ground level  
 Sampling Rate: 10 readings/second

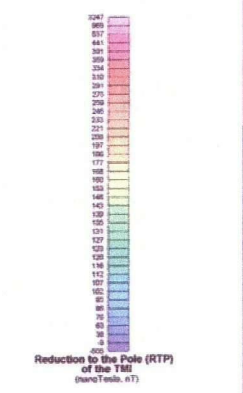
**AIRBORNE MAGNETOMETER:**  
 Geosoftics G020A Custom Magnetometer  
 Sensitivity: 0.001 nanoTesla (nT)  
 Noise level: ± 0.21 nanoTesla (nT)  
 Sensor Height: nominally 30 metres above ground level  
 Sensor Location: Mounted inside HELICOPTER EM bay

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 Pro-Counter: G050-410 multi-channel gamma-ray spectrometer with 16.8 litre "staircase" NaI sensor and 4.2 litre "upward looking" NaI sensor  
 Sensor Height: nominally 30 metres above ground level

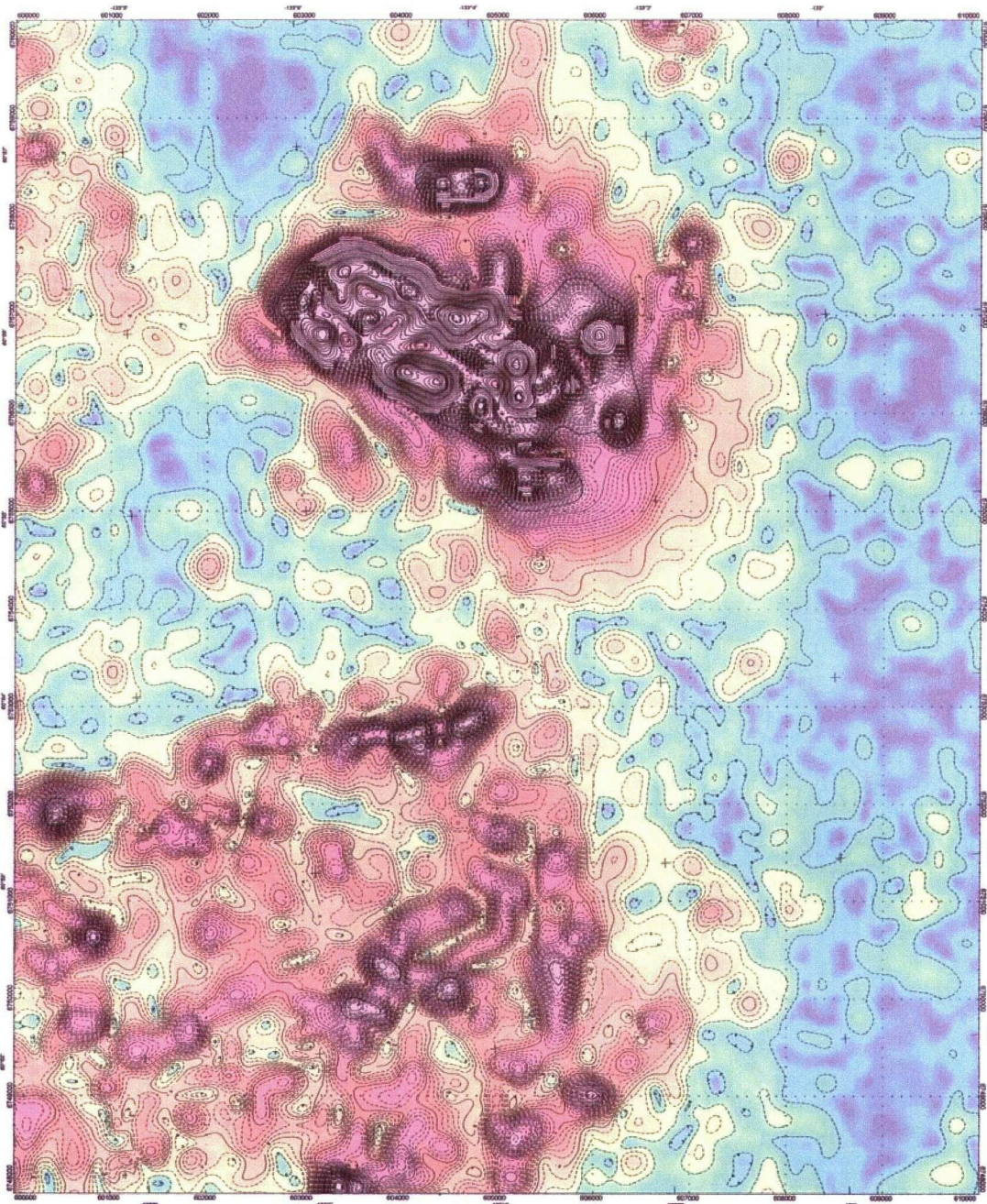
**ACQUISITION SYSTEM:**  
 Geosoft Data Acquisition System  
 Raster Altitude: Terra TRA-3000/70-300

**AIRBORNE NAVIGATION SYSTEM:**  
 GEOSOFX 10-channel GPS System  
 Sampling Rate: 1 readings/second

**BASE STATION GPS RECEIVER:**  
 Trimble 5721 RT GPS System  
 Sampling Rate: 1 readings/second



Cordilleran Minerals Limited  
 Reduction to the Magnetic Pole (RTP)  
 of the Total Magnetic Intensity  
 Contour Interval: 20, 60, 80, 200, 400 nT  
 McPhar Geosurveys Ltd.



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AD-300 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 80 metres  
 TRAVERSE LINE SPACING: 300 metres  
 Traverse Line Direction: 0°  
 CONTROL LINE SPACING: 3000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 DeLtech HUMMINGBIRD S - Frequency System  
 Sensor Height: Normally 20 metres above ground level  
 Sampling Rate: 10 readings/second

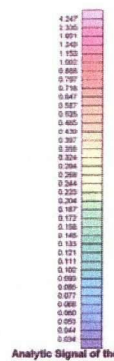
**AIRBORNE MAGNETOMETER:**  
 Geometrics G824 Cesium Magnetometer  
 Sensitivity: 0.01 nanoTesla (nT)  
 Noise level:  $\pm 0.01$  nanoTesla (nT)  
 Sensor Height: Normally 20 metres above ground level  
 Sensor Location: Normalised to HORIZONTAL ESM line

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 Picometrics GRS-410 multi-channel gamma-ray spectrometer with 18.8 litre "streamer looking" NaI sensor and 4.2 litre "upward looking" NaI sensor  
 Sampling Rate: 1 reading/second  
 Sensor Height: Normally 80 metres above ground level

**ACQUISITION SYSTEM:**  
 Geoscan Data Acquisition System  
 Radio Altimeter: Telex TRM-3000/10-300

**AIRBORNE NAVIGATION SYSTEM:**  
 DCP/IRAX 12 channel GPS System  
 Sampling Rate: 1 reading/second

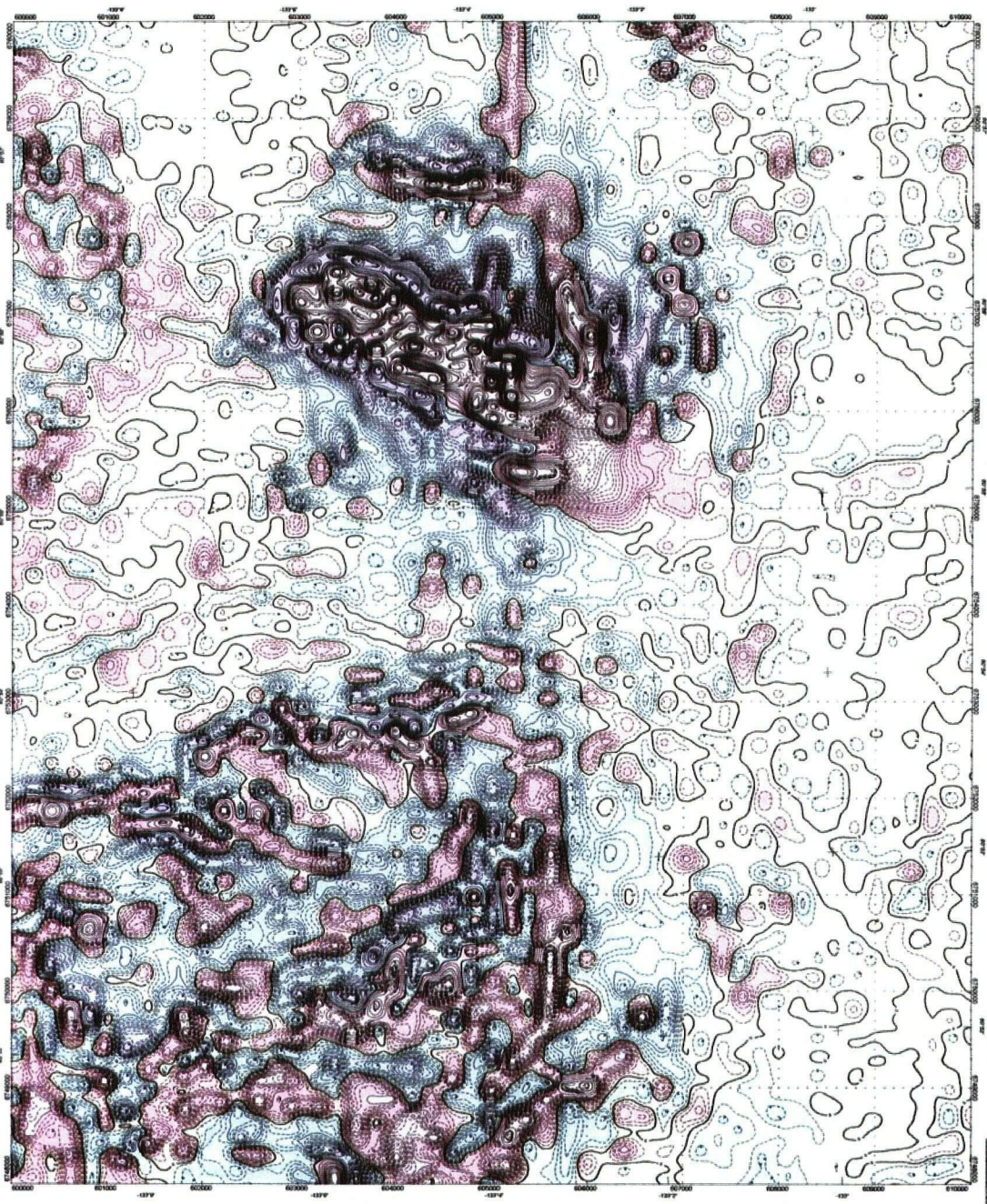
**BASE STATION GPS RECEIVER:**  
 Novatel SP5 R GPS System  
 Sampling Rate: 1 reading/second



Analytic Signal of the TM1  
(nanoTesla/metre, nT/m)



Cordilleran Minerals Limited  
 Analytic Signal of the Total Magnetic Intensity  
 Contour Interval: 0.1, 0.5, 2.5, 10.0 nanoTesla/metre  
 McPhar Geosurveying Ltd.



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AS-350 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 60 metres  
 TRAVERSE LINE SPACING: 200 metres  
 Traverse Line Direction: 0°  
 CONTROL LINE SPACING: 3000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geotech HUMMER3000 S - Frequency System  
 Sensor Height: Nominaly 30 metres above ground level  
 Sampling Rate: 10 readings/second

**AIRBORNE MAGNETOMETER:**  
 Geometrics G824 Ocean Magnetometer  
 Sensitivity: 0.01 nanoTesla (nT)  
 Noise level: ±0.01 nanoTesla (nT)  
 Sensor Height: Nominaly 30 metres above ground level  
 Sensor Location: Mounted inside HUMMER3000 S (40 kg)

**AIRBORNE GAMMAREY SPECTROMETER:**  
 Nico-Enviromer GPS-410 multi-channel gamma-ray spectrometer with 18 x 8 fibre "downward looking" NaI sensor and 4 x 2 fibre "upward looking" NaI sensor  
 Sampling Rate: 1 reading/second  
 Sensor height: Nominaly 60 metres above ground level

**ACQUISITION SYSTEM:**  
 Geotech Data Acquisition System  
 Host: Atmelstar Tera 750/3000/75/300

**AIRBORNE NAVIGATION SYSTEM:**  
 DCP/IMAX 12-channel GPS System  
 Sampling Rate: 1 reading/second

**BASE STATION GPS RECEIVER:**  
 Novatel 375 R GPS System  
 Sampling Rate: 1 reading/second

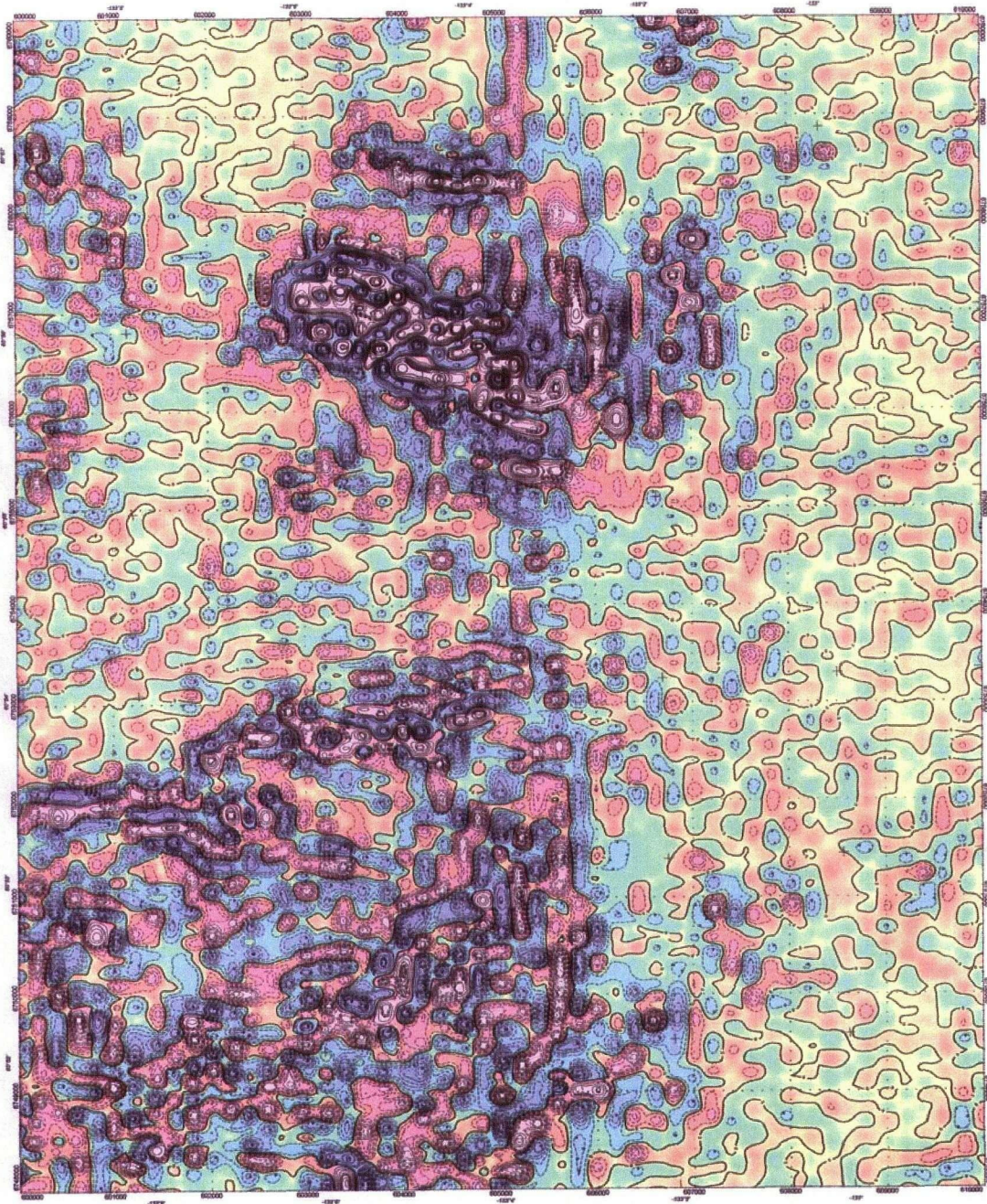
15.000  
1.000  
0.000  
-0.000  
-1.000  
-2.000  
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-4.000  
-5.000  
-6.000  
-7.000  
-8.000  
-9.000  
-10.000  
-11.000  
-12.000  
-13.000  
-14.000  
-15.000  
-16.000  
-17.000

Calculated First Vertical Derivative  
(nano-Tesla/metre, nT/m)

Scale 1:20000  
 0 100 200 300 400 500 600 700 800 900 1000  
 metres

**Cordilleran Minerals Limited**  
 Calculated First Vertical Derivative (FVD) of the  
 Total Magnetic Intensity  
 Contour Interval: 0.1, 0.5, 2.5, 10.0 nT/m

**MuPac Geosurvey Ltd**



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AB-300 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 80 metres  
 TRAVERSE LINE SPACING: 200 metres  
 Traverse Line Direction: 10°  
 CONTROL LINE SPACING: 2000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geoscan HEMPROBHD 5 - Frequency System  
 Sensor Height: Normally 80 metres above ground level  
 Sampling Rate: 10 readings/second

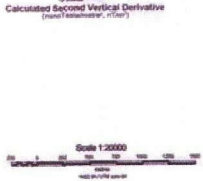
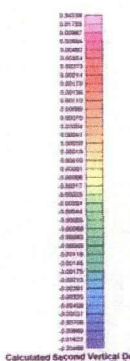
**AIRBORNE MAGNETOMETER:**  
 Geoscan G254 Cesium Magnetometer  
 Sensitivity: 0.01 nanotesla (nT)  
 Noise level: ± 0.01 nanotesla (nT)  
 Sensor Height: Normally 80 metres above ground level  
 Sensor Location: Mounted inside HEMPROBHD EM Unit

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 Pico-Observer GPS-470 multi-channel gamma-ray spectrometer with 18.8 litre "downward looking" NaI sensor and 4.3 litre "upward looking" NaI sensor  
 Sampling Rate: 1 reading/second  
 Sensor Height: Normally 80 metres above ground level

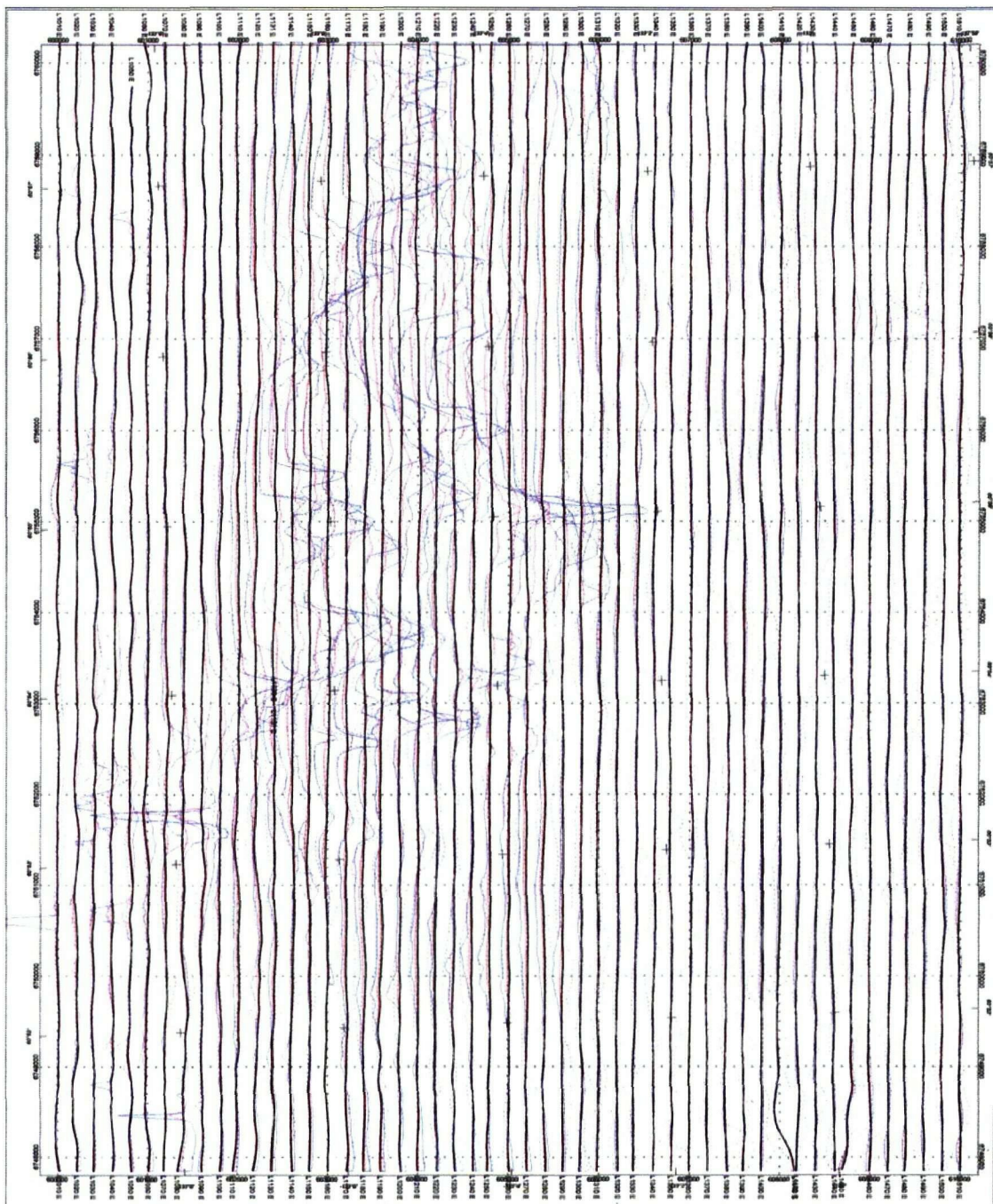
**ACQUISITION SYSTEM:**  
 Geoscan Data Acquisition System  
 Radio Altitude: Tera TRA-3000/750-300

**AIRBORNE NAVIGATION SYSTEM:**  
 ODFIMAX 12-channel GPS System  
 Sampling Rate: 1 reading/second

**BASE STATION GPS RECEIVER:**  
 Novatel 3791 H GPS System  
 Sampling Rate: 1 reading/second



**Cordilleran Minerals Limited**  
 Calculated Second Vertical Derivative (ZVD)  
 of the Total Magnetic Intensity  
 Contour Interval: 0.002, 0.01, 0.05, 0.25 nT/m  
 McPac Geosurvey Ltd.



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AD-300 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 80 metres  
 TRAVERSE LINE SPACING: 200 metres  
 Traverse Line Orientation: 0°  
 CONTROL LINE SPACING: 2000 metres  
 Control Line Orientation: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geotech EM3082(S)RD 5 - Frequency System  
 Sensor Height: Normally 20 metres above ground level  
 Sampling Rate: 10 measurements

**AIRBORNE MAGNETOMETRY:**  
 Geometrics G822R Cesium Magnetometer  
 Sensitivity: 0.001 nanoTesla (nT)  
 Noise level: ± 0.01 nanoTesla (nT)  
 Sensor Height: Normally 20 metres above ground level  
 Sensor Location: Mounted inside EM3082(S)RD 5M box

**AIRBORNE GAMMA-RAY SPECTROMETRY:**  
 Picometrics GM-410 multi-channel gamma-ray  
 spectrometer with 16.8 litre "stomach bucket" NaI sensor  
 and 4.2 litre "spigot bucket" NaI sensor  
 Sampling Rate: 1 measurement  
 Sensor Height: Normally 80 metres above ground level

**ACQUISITION SYSTEM:**  
 Geotech Data Acquisition System  
 Model: Atlantic Tern TPA-3000/10-300

**AIRBORNE NAVIGATION SYSTEM:**  
 OXPROM 10 channel GPS System  
 Sampling Rate: 1 measurement

**BASE STATION GPS RECEIVER:**  
 Trimble 5701 RT GPS System  
 Sampling Rate: 1 measurement

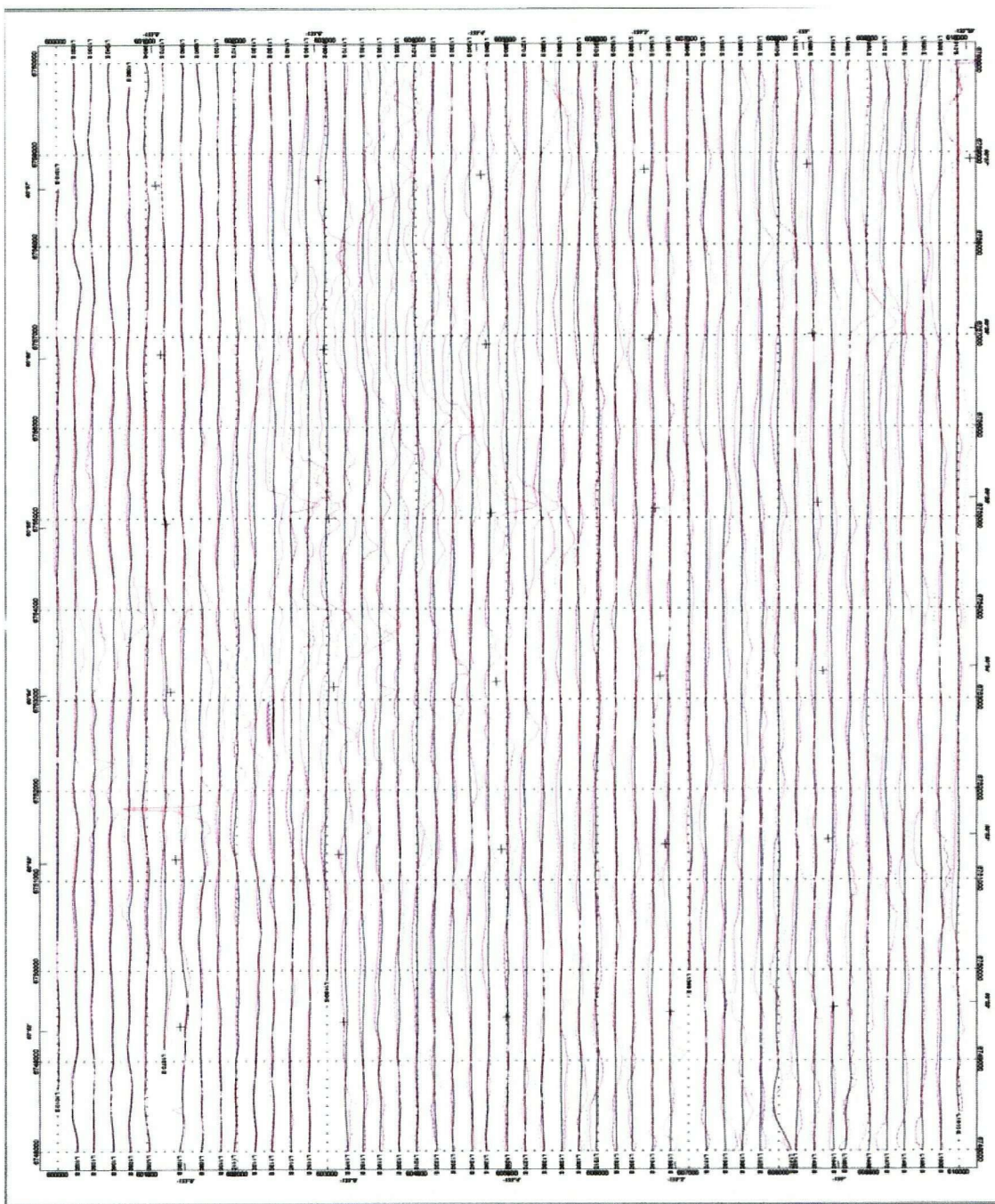


**Cordilleran Minerals Limited**

**Offset Profiles of Horizontal Coplanar 880 Hz Coil and Vertical Coastal 900 Hz Coil**

Vert. Scale: 2.0ppm/m, In-Phase component Coastal 900 Hz  
 Vert. Scale: 2.0ppm/m, Quadrature component Coastal 900 Hz  
 Vert. Scale: 2.0ppm/m, In-Phase component Coplanar 880 Hz  
 Vert. Scale: 2.0ppm/m, Quadrature component Coplanar 880 Hz

**McPhar Geosurvey Ltd.**



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AS-300 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 60 metres  
 TRAVERSE LINE SPACING: 200 metres  
 Traverse Line Direction: 0°  
 CONTROL LINE SPACING: 2000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geosouth M4000KERSO 5 - Frequency System  
 Sensor Height: Normally 30 metres above ground level  
 Sampling Rate: 10 readings/second

**AIRBORNE MAGNETOMETER:**  
 Geosouth G200A Custom Magnetometer  
 Sensitivity: 0.01 nanoTesla (nT)  
 Noise level: ± 0.01 nanoTesla (nT)  
 Sensor Height: Normally 30 metres above ground level  
 Sensor Location: Mounted inside M4000KERSO 5M box

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 Pass-Filter: GRS-410 multi-channel gamma-ray spectrometer with 10.0 litre "diamond looking" NaI sensor and 4.2 litre "upward looking" NaI sensor  
 Sampling Rate: 1 readings/second  
 Sensor Height: Normally 60 metres above ground level

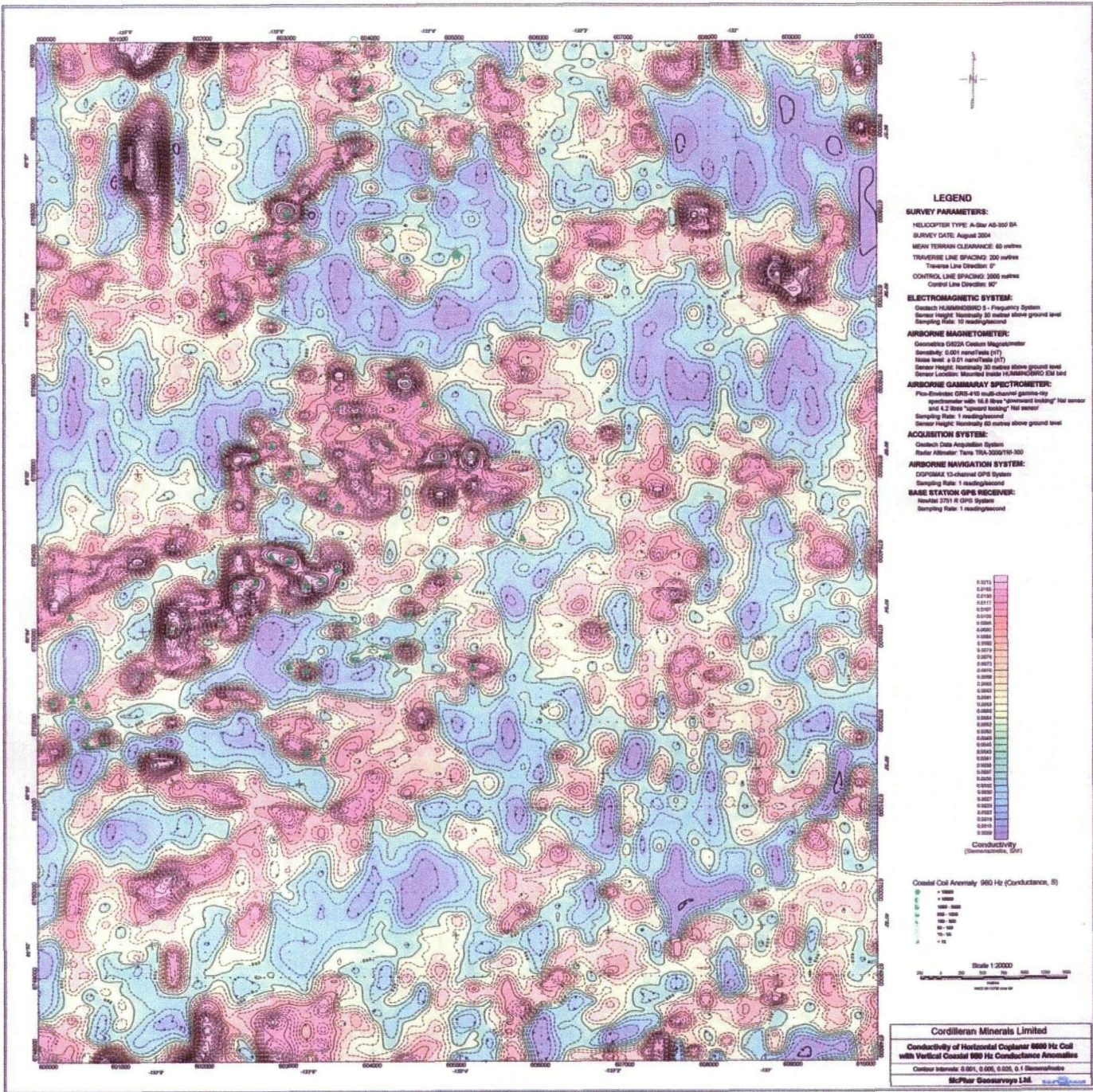
**ACQUISITION SYSTEM:**  
 Geosouth Data Acquisition System  
 Radio Modem: Terra TRM-3000TR-900

**AIRBORNE NAVIGATION SYSTEM:**  
 GPS/INS 12 channel GPS System  
 Sampling Rate: 1 readings/second

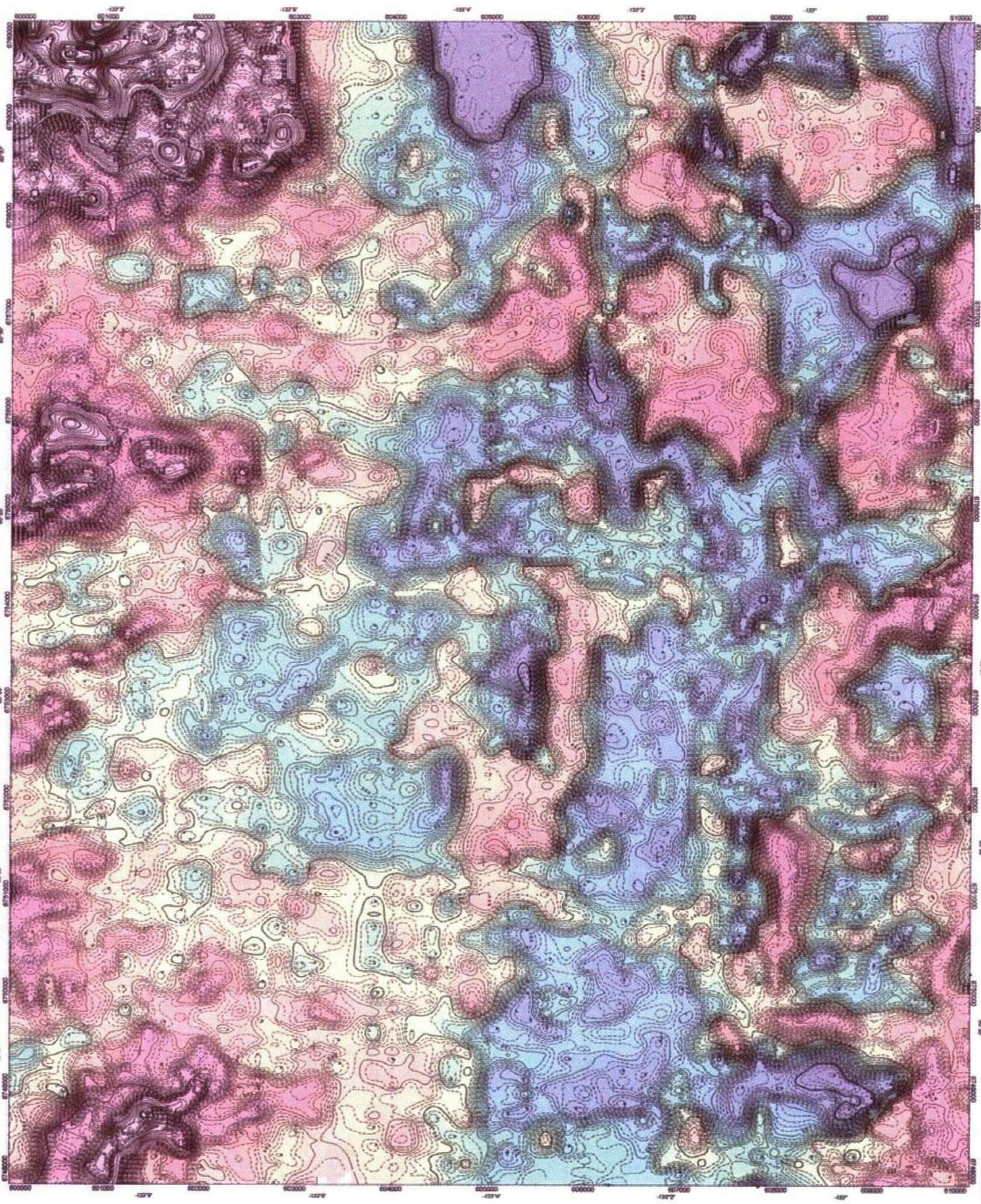
**BASE STATION GPS RECEIVER:**  
 Novatel 5751 R GPS System  
 Sampling Rate: 1 readings/second



Cordilleran Minerals Limited  
 Client: Profiles of Historical Copper 6000 No. 011  
 Vert. Scale: 10m/10m In-Plane component  
 Vert. Scale: 10m/10m Out-of-Plane component  
 SURVEY Geosurvey Ltd







**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AS-300 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 60 metres  
 TRAVERSE LINE SPACING: 200 metres  
 Traverse Line Direction: 0°  
 CONTROL LINE SPACING: 2000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geotech HUMMINGBIRD S - Frequency System  
 Sensor Height: Normally 30 metres above ground level  
 Sampling Rate: 10 readings/second

**AIRBORNE MAGNETOMETER:**  
 Geoscientia GSDA Caesium Magnetometer  
 Sensitivity: 0.001 nanotesla (nT)  
 Noise level: ±0.01 nanotesla (nT)  
 Sensor Height: Normally 30 metres above ground level  
 Sensor Location: Mounted inside HUMMINGBIRD S24 box

**AIRBORNE GAMMA RAY SPECTROMETER:**  
 Picos-Electro GRS-410 multi-channel gamma-ray spectrometer with 18.8 litre "stepped bucket" Pb shield and 4.2 litre "upward looking" NaI scintillator  
 Sampling Rate: 1 reading/second  
 Sensor Height: Normally 60 metres above ground level

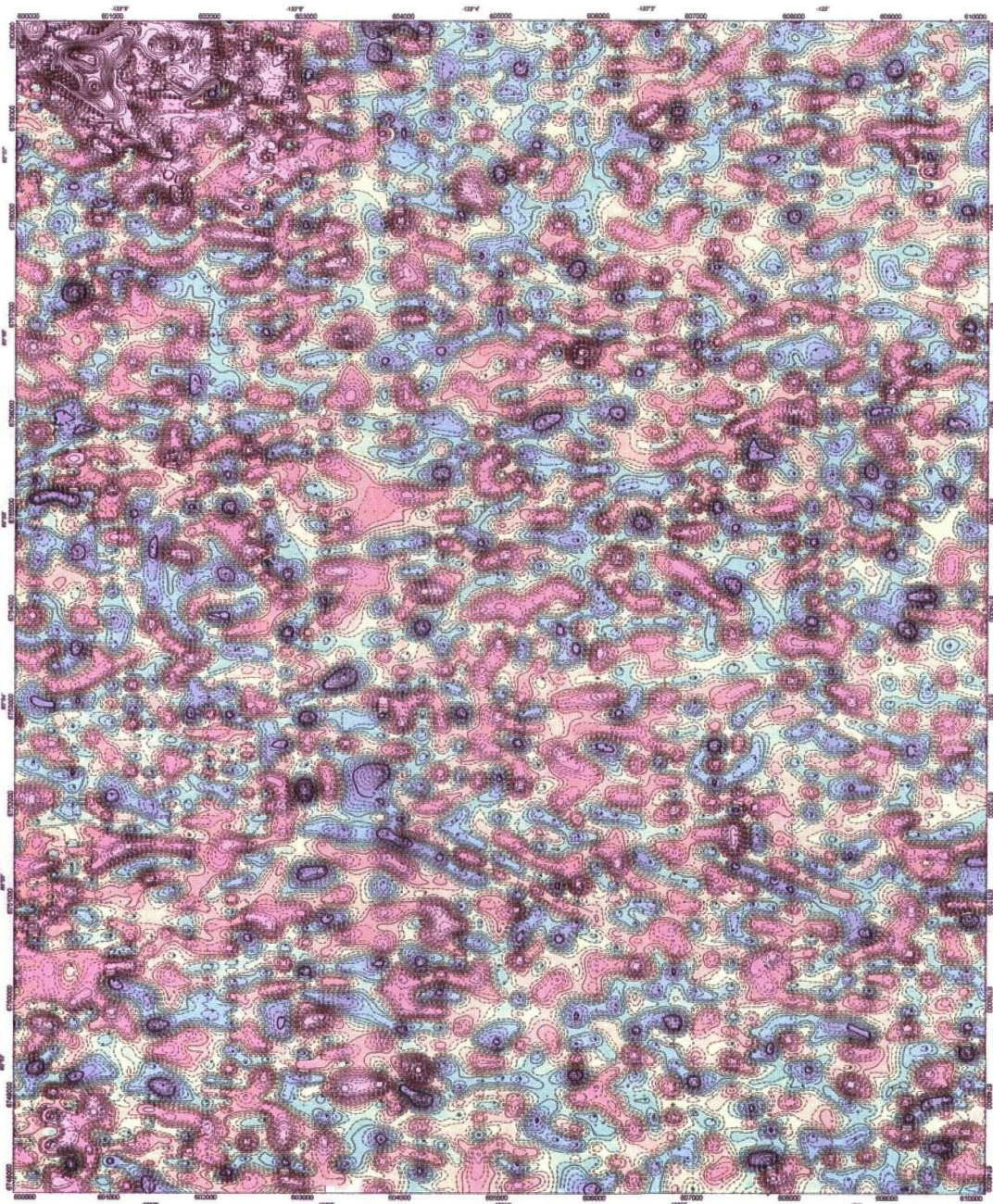
**ACQUISITION SYSTEM:**  
 Geotech Data Acquisition System  
 Hosts: Atomtek Terns 700-3000/70-300

**AIRBORNE NAVIGATION SYSTEM:**  
 DCP/Max 12-channel GPS System  
 Sampling Rate: 1 reading/second

**BASE STATION GPS RECEIVER:**  
 Novatel OTE 1 GPS System  
 Sampling Rate: 1 reading/second



Cordilleran Minerals Limited  
 Total Count Map  
 Contour Interval: 10, 50, 250, 1000 cps  
 McPhar Geosurvey Ltd



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AS-350 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 90 metres  
 TOWERSIDE LINE SPACING: 200 metres  
 TRANSVERSE LINE DICTION: 0°  
 CONTROL LINE SPACING: 2000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geosouth HEM-3000 1 - Frequency System  
 Sensor Height: Nominally 30 metres above ground level  
 Sampling Rate: 12 readings/second

**AIRBORNE MAGNETOMETER:**  
 Geosouth GCSA Custom Magnetometer  
 Sensitivity: 0.001 nanoTesla (nT)  
 Noise level: ± 0.01 nanoTesla (nT)  
 Sensor Height: Nominally 30 metres above ground level  
 Sensor Location: Mounted inside H-1000/AS350 BA

**AIRBORNE GAMMA-RAY SPECTROMETRY:**  
 Pro-Electronics CRG-410 multi-channel gamma-ray spectrometer with 16.8 litre "downward looking" NaI sensor and 4.2 litre "upward looking" NaI sensor  
 Sampling Rate: 1 reading/second  
 Sensor Height: Nominally 60 metres above ground level

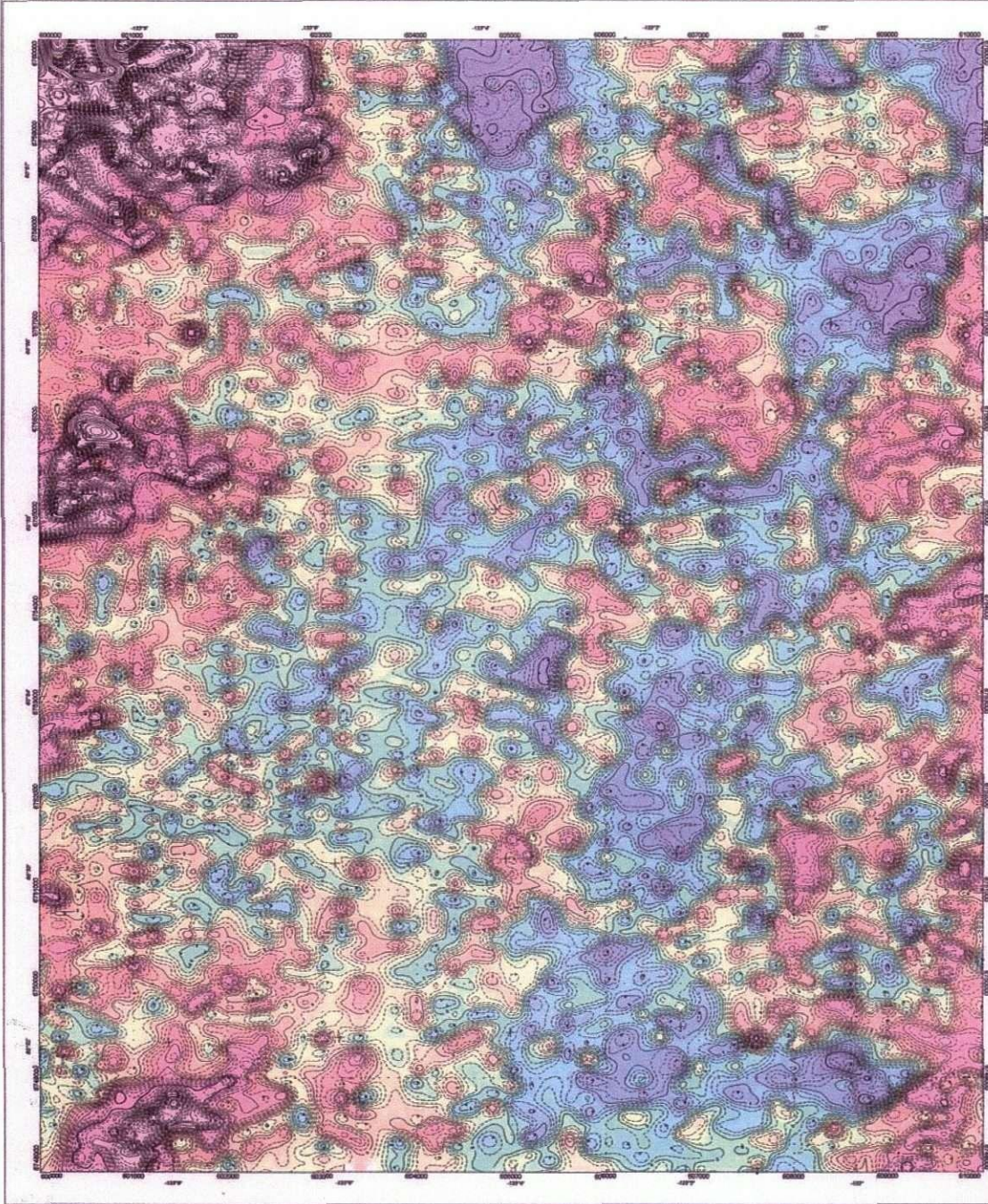
**ACQUISITION SYSTEM:**  
 Geosouth Data Acquisition System  
 Radar Attenuator: Tera TTA-3000TR-300

**AIRBORNE NAVIGATION SYSTEM:**  
 COPISSIX 12-channel GPS System  
 Sampling Rate: 1 reading/second

**BASE STATION GPS RECEIVER:**  
 Novatel 2371 R GPS System  
 Sampling Rate: 1 reading/second



Cordilleran Minerals Limited  
 Uranium Map  
 Contour Interval: 0.1, 0.5, 2.5, 10.0 ppm (nT)  
 McPhar Geosurveying Ltd.



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AS-300 BA  
 SURVEY DATE: August 2004  
 MIN TERRAIN CLEARANCE: 60 metres  
 TRAVERSE LINE SPACING: 200 metres  
 Traverse Line Direction: 0°  
 CONTROL LINE SPACING: 2000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Cesium HUMPHREYS 5 - Frequency System  
 Sensor Height: Nominal 30 metres above ground level  
 Sampling Rate: 10 readings/second

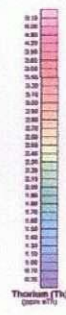
**AIRBORNE MAGNETOMETER:**  
 Geometrics G823A Cesium Magnetometer  
 Sensitivity: 0.001 nanotesla (nT)  
 Noise level: ± 0.01 nanotesla (nT)  
 Sensor Height: Nominal 30 metres above ground level  
 Sensor Location: Mounted inside the AIRBORNE EM Unit

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 Fluor-Optics GEM-410 multi-channel gamma-ray spectrometer with 16.8 litre "upward looking" NaI sensor and 4.2 litre "ground looking" NaI sensor  
 Sampling Rate: 1 reading/second  
 Sensor Height: Nominal 60 metres above ground level

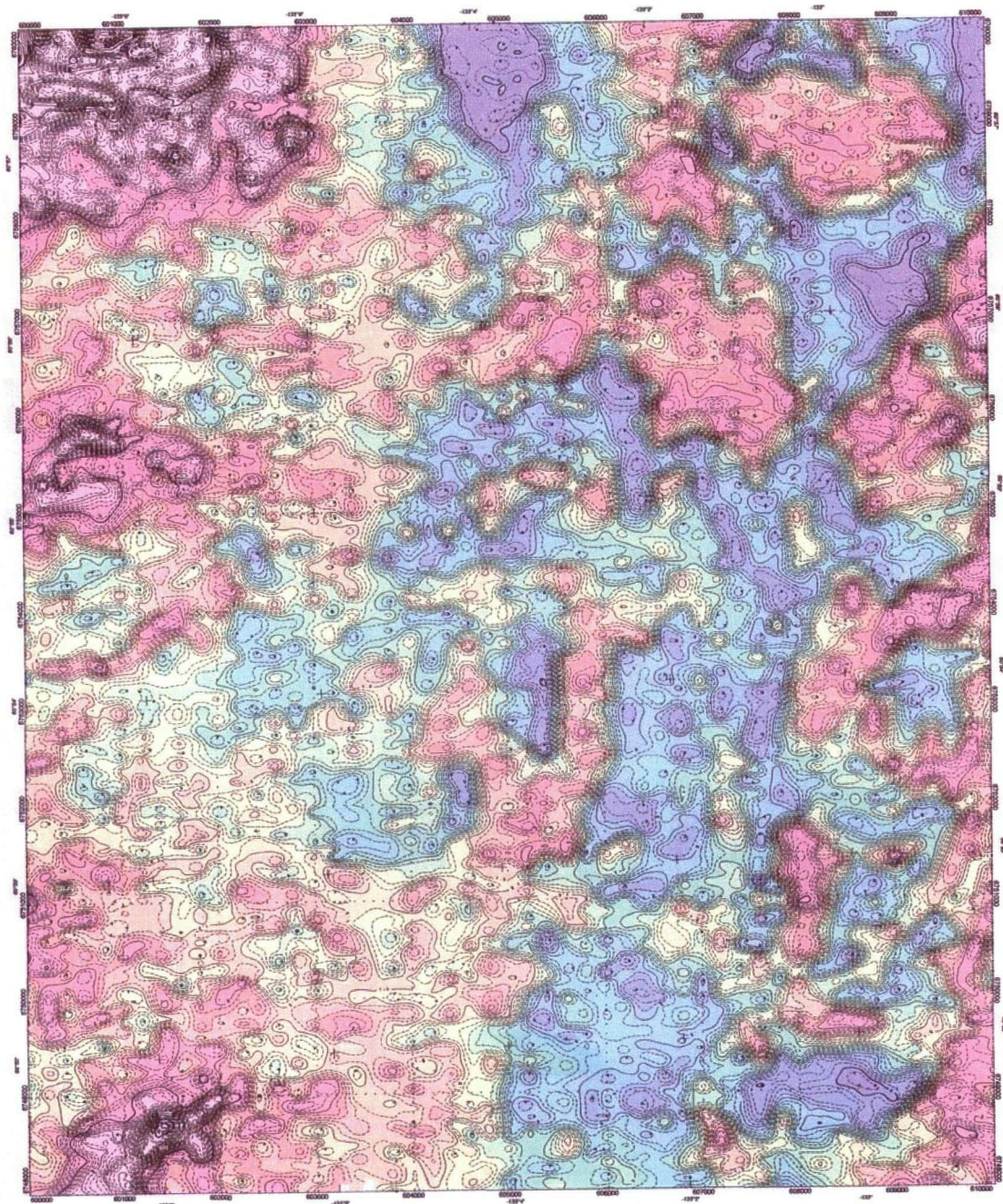
**ACQUISITION SYSTEM:**  
 Geomatics Data Acquisition System  
 Tablet Address: Tera T5A-2000/10-200

**AIRBORNE NAVIGATION SYSTEM:**  
 DOPNAX 12 channel GPS System  
 Sampling Rate: 1 reading/second

**BASE STATION GPS RECEIVER:**  
 Novatel 2701 R GPS System  
 Sampling Rate: 1 reading/second



<b>Cordilleran Minerals Limited</b>	
<b>Thorium Map</b>	
Colour Interval: 0.2, 1.0, 5.0 ppm 4Tn	
<b>McPhar Geosurvey Ltd.</b>	



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: A-Star AS-300 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 90 metres  
 TRANSVERSE LINE SPACING: 200 metres  
 Transverse Line Direction: 9°  
 CONTROL LINE SPACING: 2000 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geosouth H.A.M.M.S.I.C.E.R.O 3 - Frequency System  
 Sensor Height: Normally 90 metres above ground level  
 Sampling Rate: 10 readings/second

**AIRBORNE MAGNETOMETER:**  
 Geosouth G222A Custom Magnetometer  
 Sensitivity: 0.001 nanoTesla (nT)  
 Noise level: ± 0.01 nanoTesla (nT)  
 Sensor Height: Normally 90 metres above ground level  
 Sensor Location: Situated inside H.A.M.M.S.I.C.E.R.O EM Unit

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 Picometrics GRS-410 multi-channel gamma-ray spectrometer with 18.8 litres "downward looking" NaI sensor and 4.2 litres "upward looking" NaI sensor  
 Sampling Rate: 1 reading/second  
 Sensor Height: Normally 90 metres above ground level

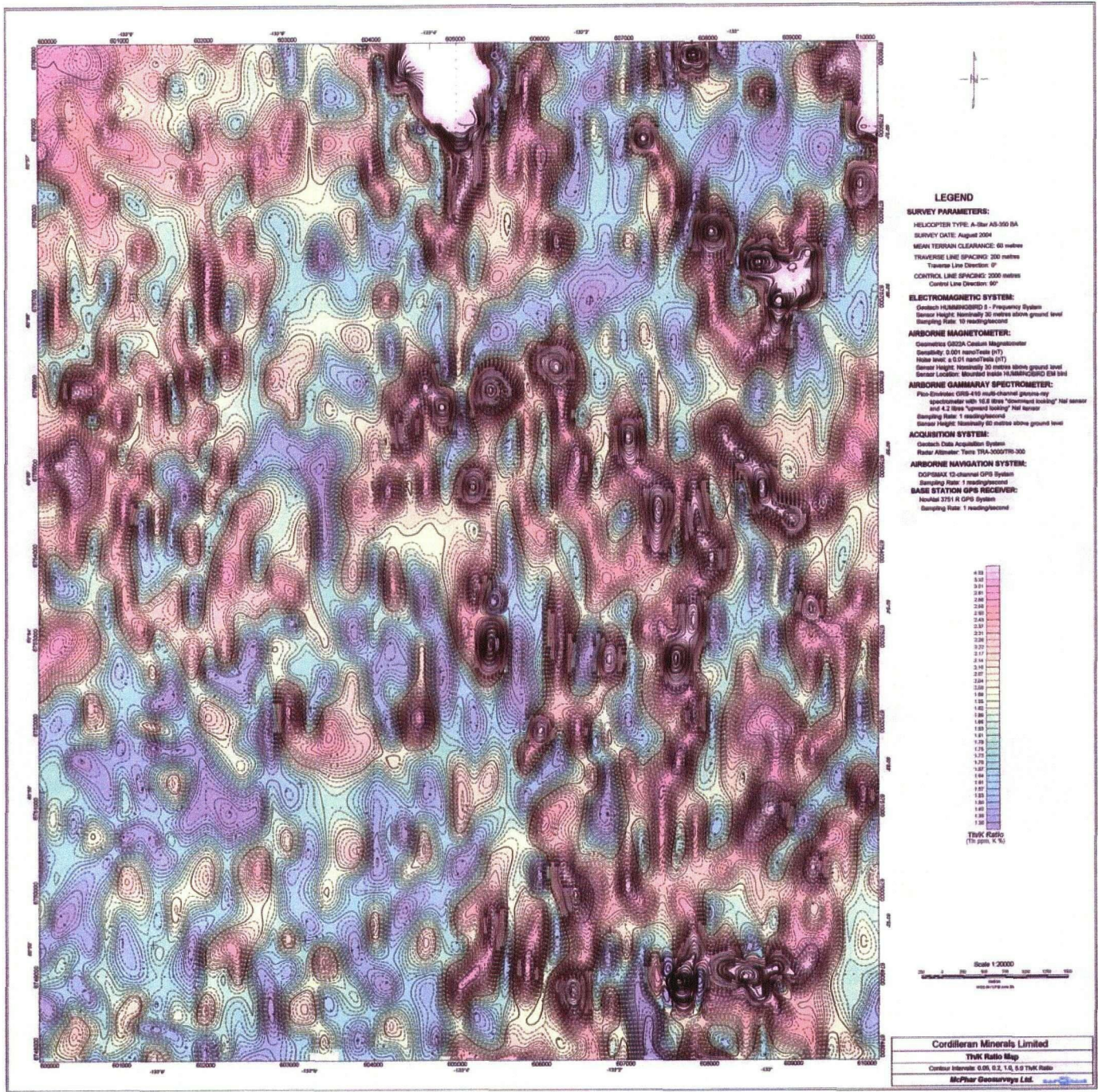
**ACQUISITION SYSTEM:**  
 Geosouth Data Acquisition System  
 Radar Altitude: Terra TRX-3000/710-300

**AIRBORNE NAVIGATION SYSTEM:**  
 DGP/BAUK 12-channel GPS System  
 Sampling Rate: 1 reading/second

**BASE STATION GPS RECEIVER:**  
 NovAtel 3751 R GPS System  
 Sampling Rate: 1 reading/second



<b>Cordilleran Minerals Limited</b>
<b>Potassium Map</b>
Cordilleran Minerals 0.1.05.23.04
McPhar Geosurveys Ltd.



**LEGEND**

**SURVEY PARAMETERS:**  
 HELICOPTER TYPE: AS-350 BA  
 SURVEY DATE: August 2004  
 MEAN TERRAIN CLEARANCE: 60 metres  
 TRAVERSE LINE SPACING: 200 metres  
 Traverse Line Direction: 30°  
 CONTROL LINE SPACING: 200 metres  
 Control Line Direction: 90°

**ELECTROMAGNETIC SYSTEM:**  
 Geoswath HUMMINGBIRD 3 - Frequency System  
 Sensor Height: Nominally 30 metres above ground level  
 Sampling Rate: 10 readings/second

**AIRBORNE MAGNETOMETER:**  
 Geoswath GSD3 Cesium Magnetometer  
 Sensitivity: 0.01 nanoTesla (nT)  
 Noise level: 0.01 nanoTesla (nT)  
 Sensor Height: Nominally 30 metres above ground level  
 Sensor Location: Mounted inside HUMMINGBIRD 3 air

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 Flux-Gate GR5-415 multi-channel gamma-ray spectrometer with 16.8 litre "downward looking" NaI sensor and 4.2 litre "upward looking" NaI sensor  
 Sampling Rate: 1 reading/second  
 Sensor Height: Nominally 60 metres above ground level

**ACQUISITION SYSTEM:**  
 Geoswath Data Acquisition System  
 Host: Airborne Telex TDA-3000/70-300

**AIRBORNE NAVIGATION SYSTEM:**  
 DOPMAX 12-channel GPS System  
 Sampling Rate: 1 reading/second

**BASE STATION GPS RECEIVER:**  
 NovAtel 3751 R GPS System  
 Sampling Rate: 1 reading/second



Cordilleran Minerals Limited  
 ThK Ratio Map  
 Contour Interval: 0.05, 0.2, 1.0, 5.0 ThK Ratio  
 McPac Geosurvey Ltd.



1000762944

**DATE DUE**