

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
1016 -510 West Hastings Street  
Vancouver, B.C. V6B 1L8

Telephone: 604-688-2568

Fax: 604-688-2578

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**ASSESSMENT REPORT**

describing

**GEOPHYSICAL SURVEYS**

at the

**ROSY PROPERTY**

Rosy 1-20    YC18054-YC18073  
21-30    YC18159-YC18168

NTS 105C/13

Latitude 60°56'N; Longitude 133°45'W

in the

Whitehorse Mining District  
Yukon Territory

prepared by

Archer, Cathro & Associates (1981) Limited

for

**ATAC RESOURCES LTD.**

by

W. A. Wengzynowski, P. Eng.  
May 2008

W28150

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
1016 - 510 West Hastings Street  
Vancouver, B.C. V6B 1L8

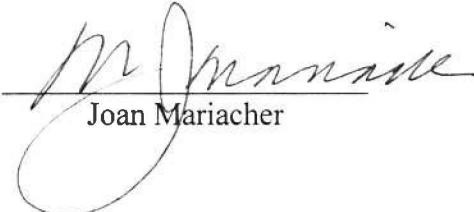
Telephone: 604-688-2568



AFFIDAVIT


I, Joan Mariacher, of Vancouver, B.C. make oath and say:

That to the best of my knowledge the attached Statement of  
Expenditures for exploration work on Rosy 1-30  
mineral claims on Claim Sheet 105C/13 is accurate.

  
Joan Mariacher

Sworn before me at Vancouver, B.C.

this 3rd day of December, 2007.

  
Notary Public, Yukon Territory

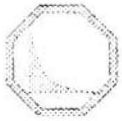
Statement of Expenditures  
Rosy 1-30 Mineral Claims  
November 27, 2007

Contract VTEM Survey

Geotech Ltd.

\$19,296.81

QW28150



# Geotech Ltd.

30 Industrial Parkway South, Aurora ON L4G 3W2

<b>BILL TO:</b>
Archer, Cathro & Associates (1981) Limite 1016-510 West Hastings Street Vancouver, BC Canada V6B 1L8

<b>DATE:</b>	<b>INVOICE:</b>
10/12/2007	991107

ROSY - \$18 204.54 + \$1092.27  
= \$19 296.81

<b>TERMS:</b>	<b>Project</b>
Due on receipt	7067

Description	Amount
Helicopter-borne time domain electromagnetic geophysical survey with VTEM system Interim Billing - 90% of the estimated total charge plus any additional charges, including but not limited to additional line km, standby days, plus GST is payable completion of flying.	665,651.00
Contract (Yukon and northern BC.)	
Estimated 5690 line km @ \$70.00	\$398,300.00
29 blocks @ \$2,000.00 per block	\$58,000.00
65 days @ \$6,000.00 per day	\$390,000.00
Helicopter time charges for 227.3 hours @ \$1,800.00 per hour	\$409,140.00
Helicopter mob/demob	\$10,000.00
Crew and equipment mob/demob	\$7,000.00
Minimum survey charge	\$1,272,440.00
90% of \$1,278,440.00	\$1,145,196.00
Less Previous Billing	
Invoice 991034	(\$289,040.00)
Invoice 991078	(\$190,505.00)
<b>Total Billable Amount</b>	<b>\$665,651.00</b>
Business Number: 110859469	
<i>Handwritten notes:</i> ✓ Randevia (QB) \$1707.74 ✓ Rosy - 18204.54 ✓ Tot - (26498.33) ✓ Tot - 64498.40 ✓ Tot - 35089.32 ✓ Dist - 8273.46 ✓ Lind - 9441.72 ✓ Mt Hinton - 204340.42 ✓ Niimo (Rich) - 58082.27 ✓ Niimo (Nish) - 55523.83 ✓ Obvian - 20240.71 ✓ Plata - 61361.67 ✓ Rau - 12552.70 ✓ unadvent - 1800.00 ✓ 856156	✓ Ade - 15740.54 ✓ Burnish - 12 218.54 ✓ Cabin - 33955.98 ✓ Jensen - 21969.52 ✓ GK - (10408.48) ✓ Fairweather - 26560.49 ✓ Gram - 54432.85 (Mt Hinton) ✓ Hart - 32515.30 ✓ Hidden - 8081.37 ✓ Highwin - 64498.40 ✓ Hopeful - 42331.13 ✓ Hopper - 18930.28 ✓ Hej - 33868.92 ✓ Jak - 2308.40 ✓ Man - 28500.60 ✓ Mor - 42190.87
	Subtotal: Can\$665,651.00
	GST: Can\$39,939.06
	<b>TOTAL: Can\$705,590.06</b>

Please Remit By Bank Transfer To:  
TD CANADA TRUST  
16655 YONGE ST., UNIT 1  
NEWMARKET, ONTARIO L3X 1V6  
TRANSIT # 3102  
ACCOUNT #5217874

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## **INTRODUCTION**

The Rosy property covers a gold-silver prospect located 5 km south of the Red Mountain porphyry molybdenum deposit in southern Yukon. The property consists of 30 claims owned 100% by ATAC Resources Ltd.

This report describes previous work done in the area plus results of property wide, helicopter-borne magnetic and versatile time domain electromagnetic (VTEM) surveys by Geotech Ltd. on behalf of ATAC. The geophysical surveys were performed in September, 2007. The author supervised the work and his Statement of Qualifications appears in Appendix I.

## **PROPERTY LOCATION, CLAIM DATA AND ACCESS**

The Rosy property comprises 30 contiguous mineral claims located 77 km east-northeast of Whitehorse in southern Yukon at latitude 60°56'N and longitude 133°45'W on NTS 105C/13, as shown on Figure 1. The claims are registered with the Whitehorse Mining Recorder in the name of Archer, Cathro & Associates (1981) Limited which holds them in trust for ATAC. Claim data are listed below while the locations of individual claims are illustrated on Figure 2.

<u>Claim Name</u>	<u>Grant Number</u>	<u>Expiry Date*</u>
Rosy 1-20	YC18054-YC18073	March 21, 2014
21-30	YC18159-YC18168	March 21, 2014

\*Expiry date includes 2007 work that has been filed for assessment credit but not yet accepted.

The geophysical surveys were conducted by helicopter from the Whitehorse airport. The closest road access to the property is the Sydney Creek trail, which accesses placer workings about 25 km southeast of the property. An abandoned winter road, extending northwest from the Sydney Creek trail to the Red Mountain Deposit, passes 1 km east of the Rosy property. That trail would be the logical access route if heavy equipment is required on the property.

## **HISTORY**

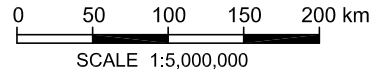
The first recorded activity in the vicinity of the Rosy property occurred in 1935 when silver-lead-zinc veins on the edge of Red Mountain porphyry molybdenum deposit were staked. These occurrences consist of galena and sphalerite in quartz-carbonate veins cutting metasedimentary rocks. They have been staked and explored by a number of operators over the years and are currently part of the Red Mountain claim block.

The Red Mountain Deposit is marked by a prominent red gossan and hosted by a quartz stockwork associated with a Late Cretaceous quartz monzonite stock. It was first drilled in 1967 but the main exploration program was conducted in the late 1970s by Amoco Canada which earned a 50% interest from the owner, Tintina Mines. Drill indicated reserves are 170 million tonnes grading 0.167% MoS<sub>2</sub>, including 19.3 million tonnes averaging 0.293% MoS<sub>2</sub> (Deklerk and Traynor, 2005). Gold content is low in the porphyry deposit and is reported to be inversely proportional to molybdenum content.

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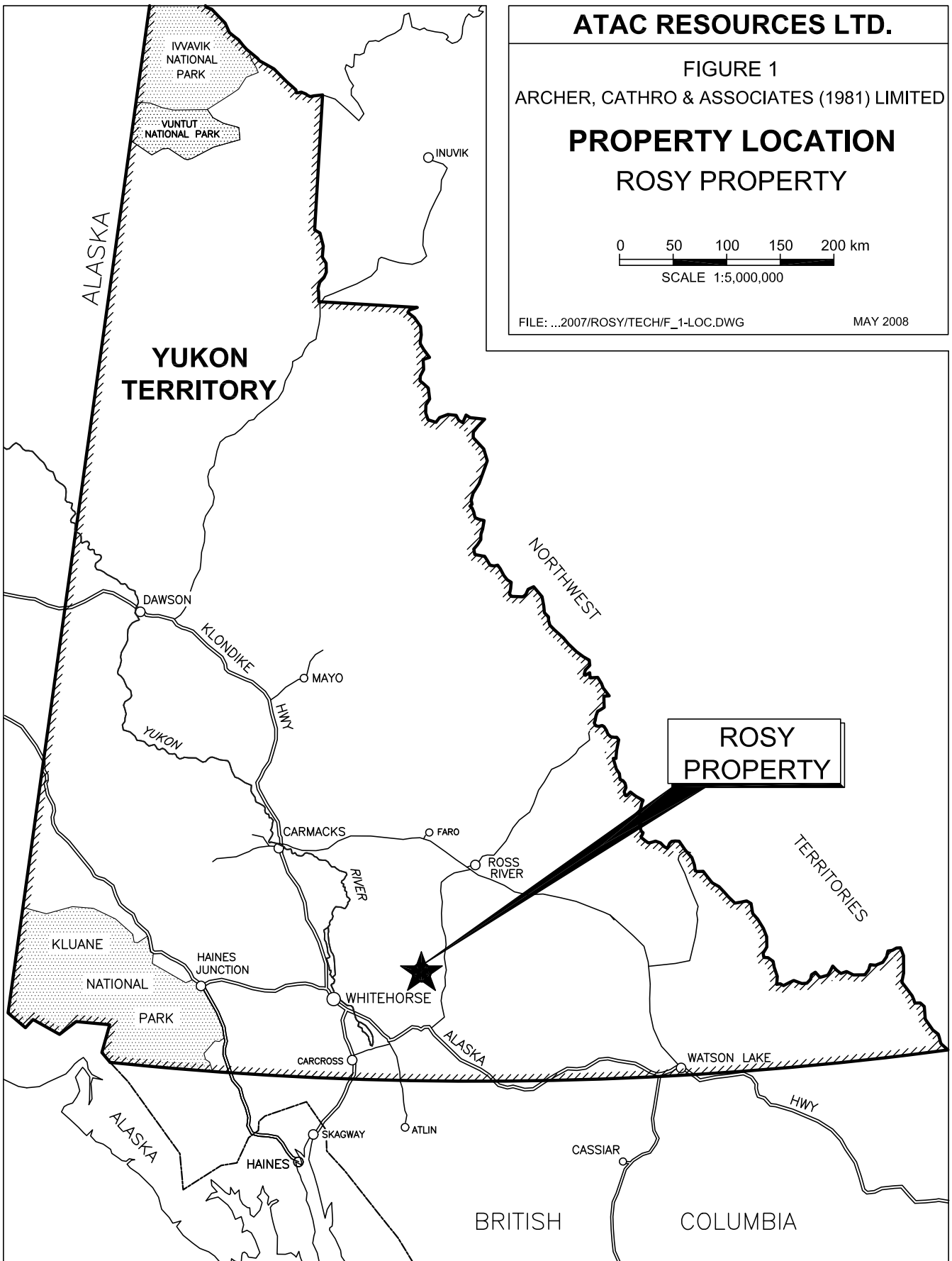
FIGURE 1  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

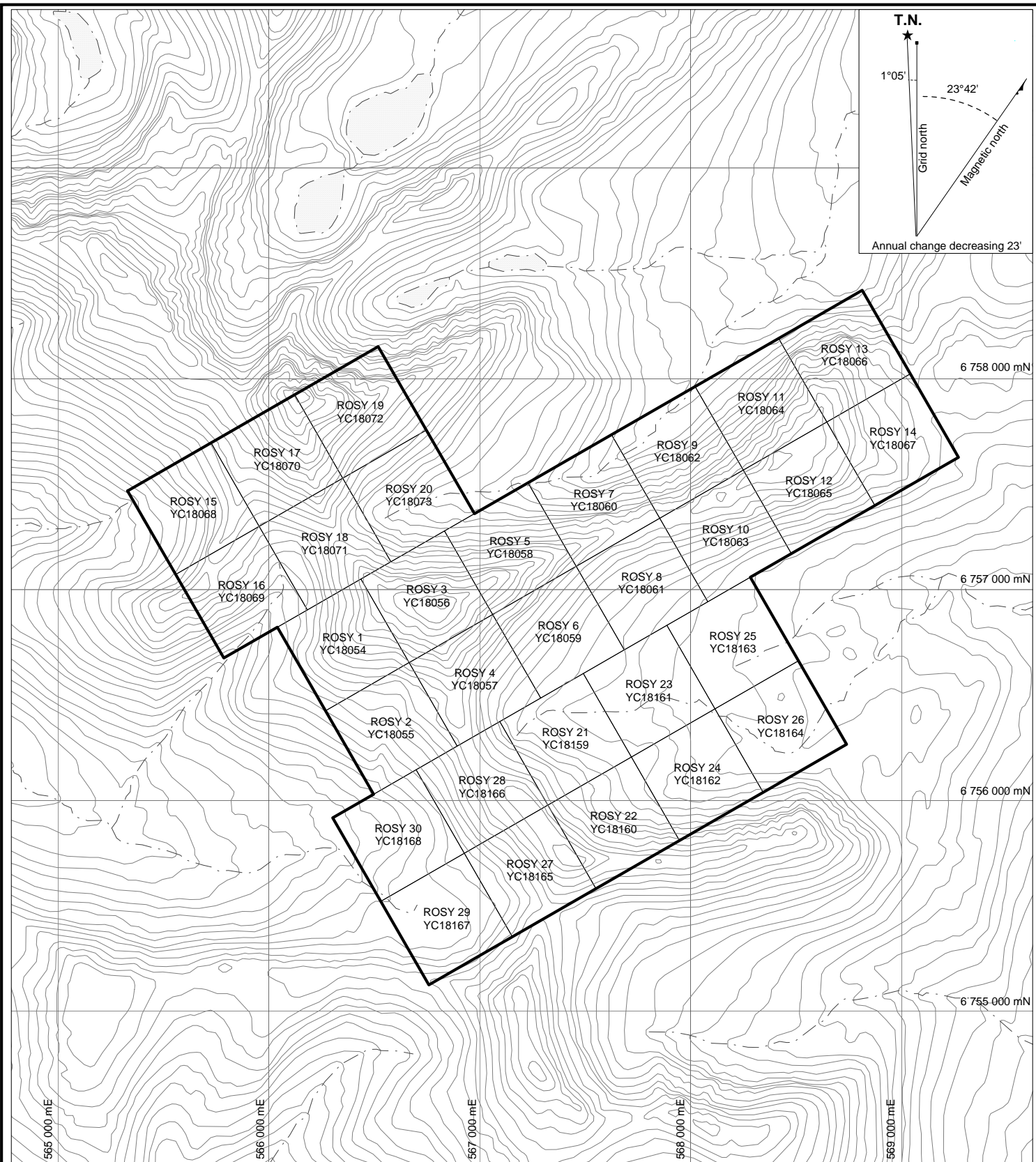
**PROPERTY LOCATION  
ROSY PROPERTY**



FILE: ...2007/ROSY/TECH/F\_1-LOC.DWG

MAY 2008





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FIGURE 2  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**CLAIM LOCATION**  
 ROSY PROPERTY



UTM ZONE 8V, NAD 83, 105C/13

FILE: ...2007/ROSY/F\_2-CLAIMS.WOR

DATE: MAY 2008

Recent prospecting on the Rosy property discovered numerous very old claim posts which likely date from the 1930s or 1940s. There is no record of this staking or any exploration related to it.

The first reported staking on what is now the Rosy property occurred in July 1986 immediately following the release of geochemical results from a reconnaissance stream sediment sampling program conducted by the Geological Survey of Canada (Open File 517). All-North Resources staked the Was 1-6 claims in the headwaters of a creek, samples from which returned 95<sup>th</sup> percentile values for gold (36 ppb), arsenic (121 ppm) and antimony (2.8 ppm). Concurrently, Noranda Exploration staked the Saw 1-6 claims on a north facing slope further downstream to cover another part of the anomalous drainage.

Both All-North and Noranda conducted reconnaissance mapping and soil sampling in 1987. All-North reported quartz vein float that assayed up to 1.3 g/t gold and 102 g/t silver associated with a soil anomaly containing values up to 145 ppb gold and 9 ppm silver (Garagan, 1987). Noranda found quartz-carbonate alteration zones, samples of which returned low values. No further work was done on either property and the claims were allowed to lapse.

ATAC restaked the property in summer 1999 and explored later that year with prospecting and soil geochemistry (Eaton, 1999). That work outlined several veins marked by recessive linears and strongly anomalous gold, silver and arsenic soil geochemical results. ATAC conducted further prospecting and soil geochemistry in 2004, which discovered additional veins and expanded the area of anomalous geochemistry (Eaton, 2004).

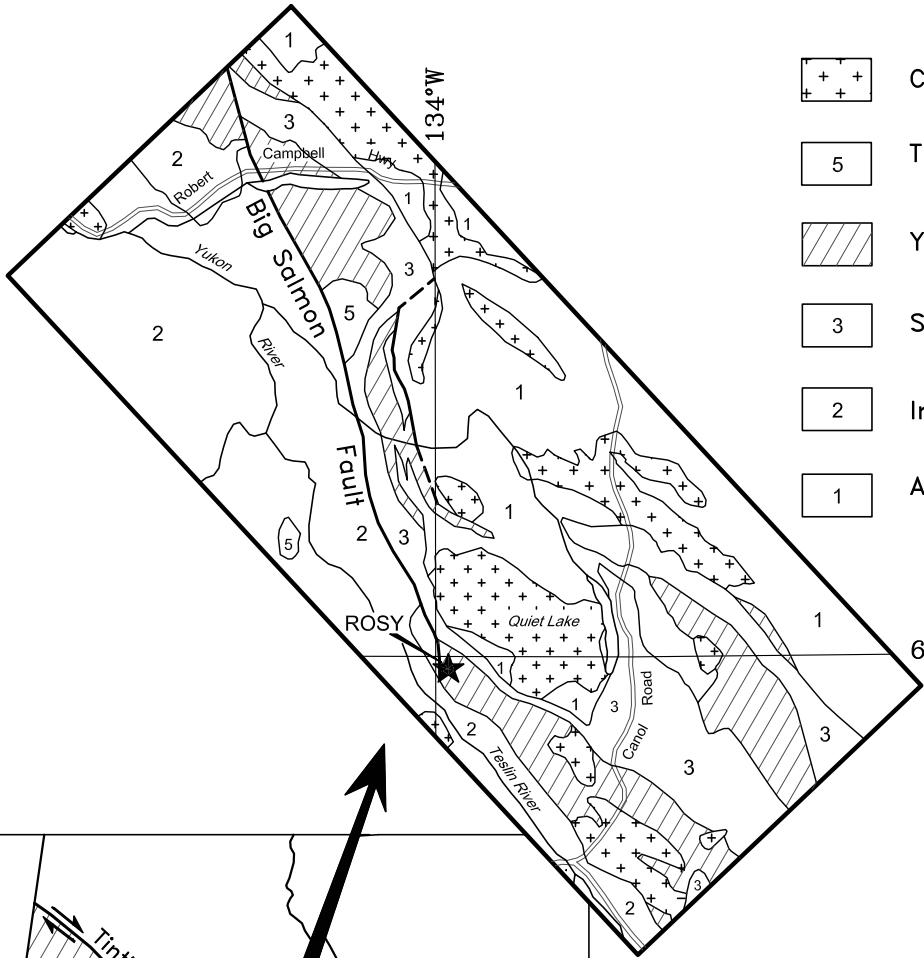
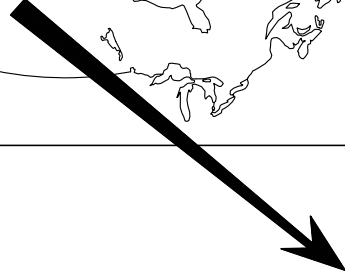
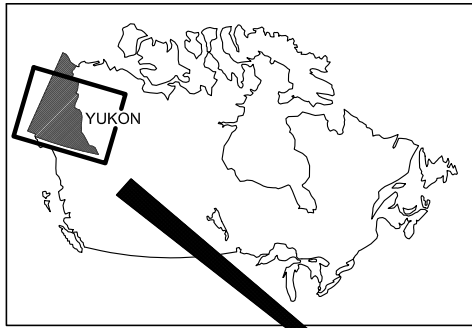
### **GEOMORPHOLOGY**


The claims cover a series of ridges and glacial valleys, all of which are above tree line. The highest point is a prominent, 2094 m peak located in the northern part of the property. Elevations elsewhere range between 1500 and 1900 m. North facing slopes are characterized by cliffs and unstable talus. Southerly slopes are steep but relatively accessible, featuring outcrops separated by grass- or buckbrush-stabilized talus.

Valley floors are narrow in the headwaters of creeks where talus encroaches from surrounding slopes but become broad and relatively flat downstream. Glacial and fluvial material blankets the valley floors. Creeks draining the property all ultimately drain into the Teslin River, which is part of the Yukon River watershed.





### **REGIONAL GEOLOGY**

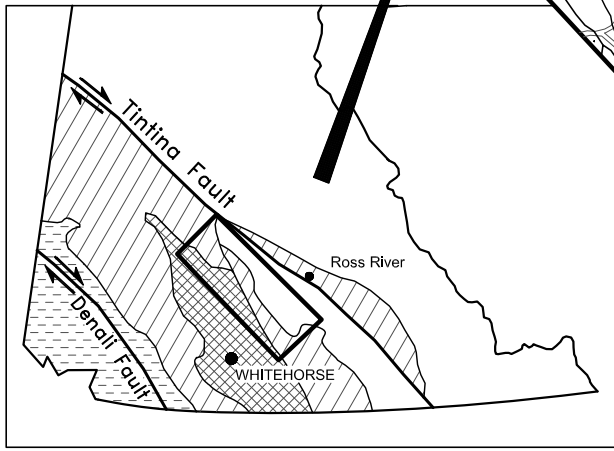
The Rosy property lies within an enigmatic package of metamorphosed volcanic, sedimentary and intrusive rocks named the Big Salmon Complex (Mulligan, 1963). Previous mappers have interpreted these rocks as a steeply dipping suture zone marking accretion of an island arc to North America during Jurassic times (Tempelman-Kluit, 1979). Recent detailed structural mapping in the area led to reinterpretation, which indicates that the steep dips are the result of a large scale fold and assigns the rocks on the Rosy property to the Yukon-Tanana Terrane (de Keijzer, et al., 1999), as shown on Figure 3.



-  Cretaceous Plutons
-  Triassic and Jurassic Plutons
-  Yukon-Tanana Terrane
-  Slide Mountain Terrane
-  Intermontane Belt
-  Ancestral North America including Cassiar Terrane

SCALE 1:2,000,000  
0 50  
km

-  Coastal and Insular Belts
-  Intermontane Belt
-  Yukon-Tanana Terrane and Slide Mountain Terrane
-  Ancestral North America including Cassiar Terrane



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FIGURE 3  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**TECTONIC SETTING  
ROSY PROPERTY**

FILE: ...2007/ROSY/TECH/F\_3-TEC.DWG      DATE: MAY 2008

Regional geology in the immediate vicinity of the Rosy property is shown in Figure 4.

The metamorphic rocks are schist, gneiss, quartzite and marble that are believed to be Devonian or earlier in age (Gordey and Stevens, 1994). They are intruded by Early Jurassic and Cretaceous plutons. The youngest rocks are a Late Cretaceous quartz monzonite stock and related miarolitic quartz-feldspar porphyry dykes. The stock hosts the Red Mountain Deposit. The main lithologies are briefly described in the following table.

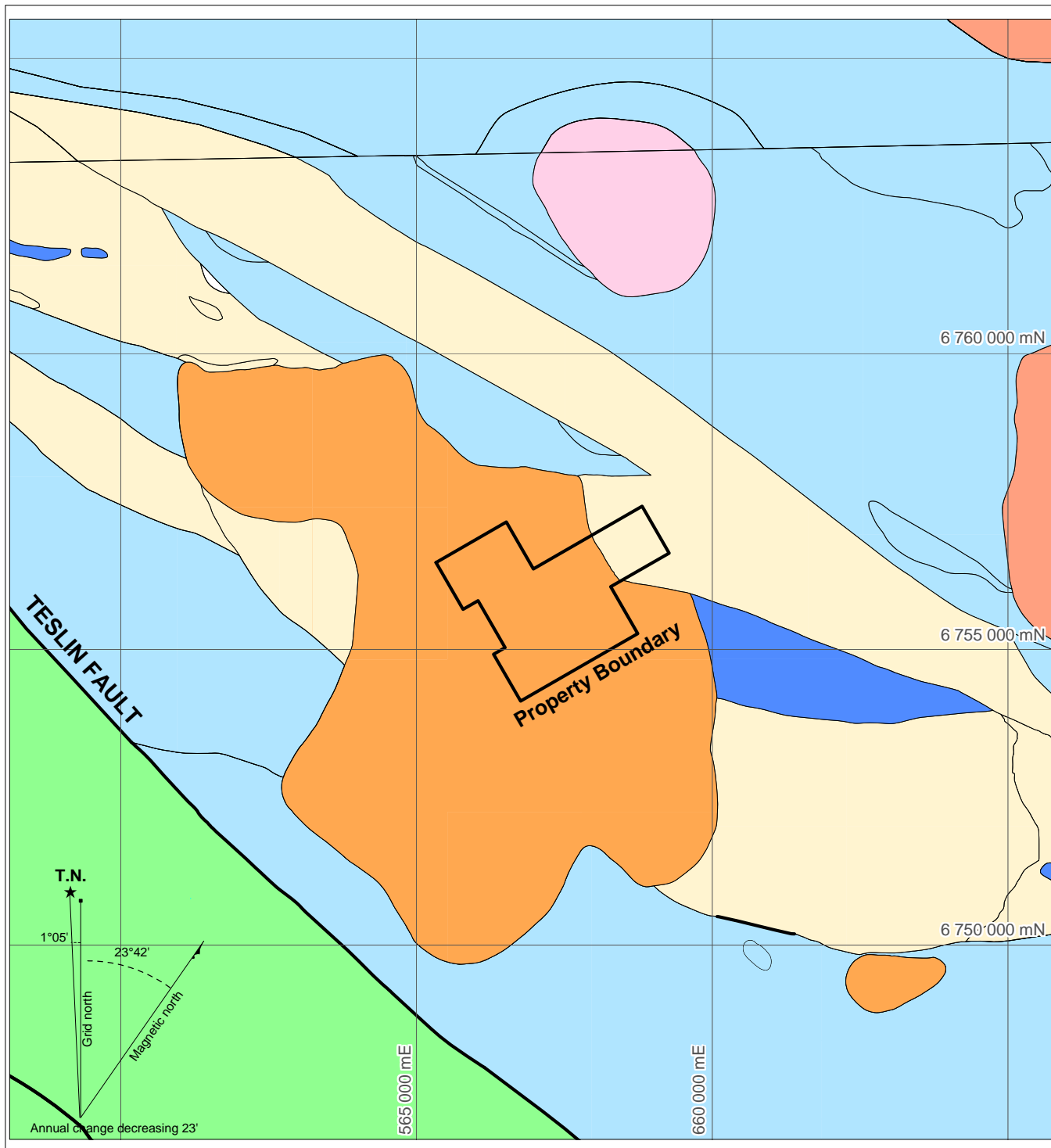
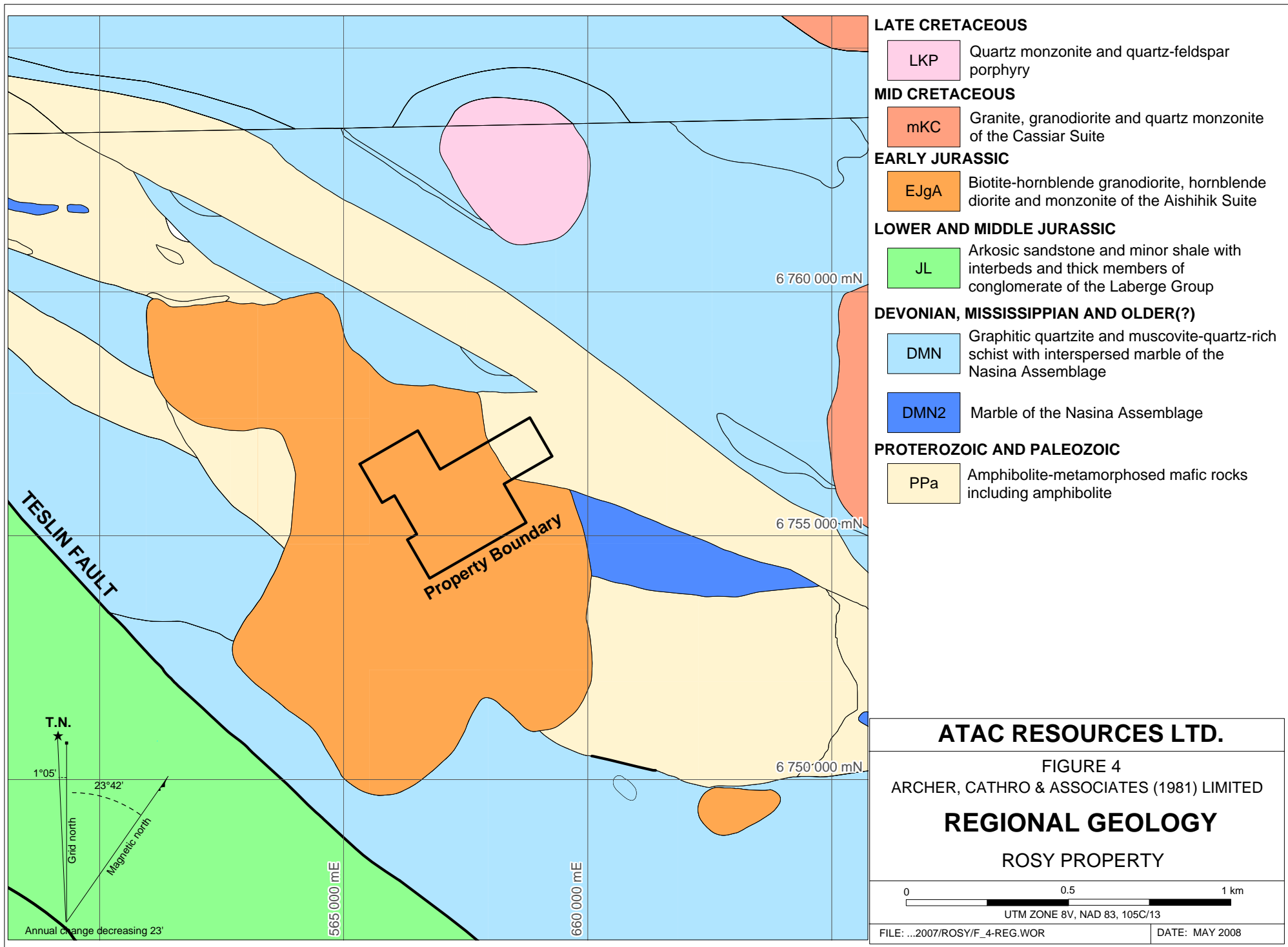
**Table I - Regional Lithological Units (after Gordey and Stevens, 1994)**

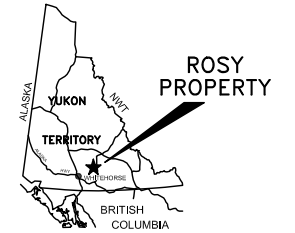
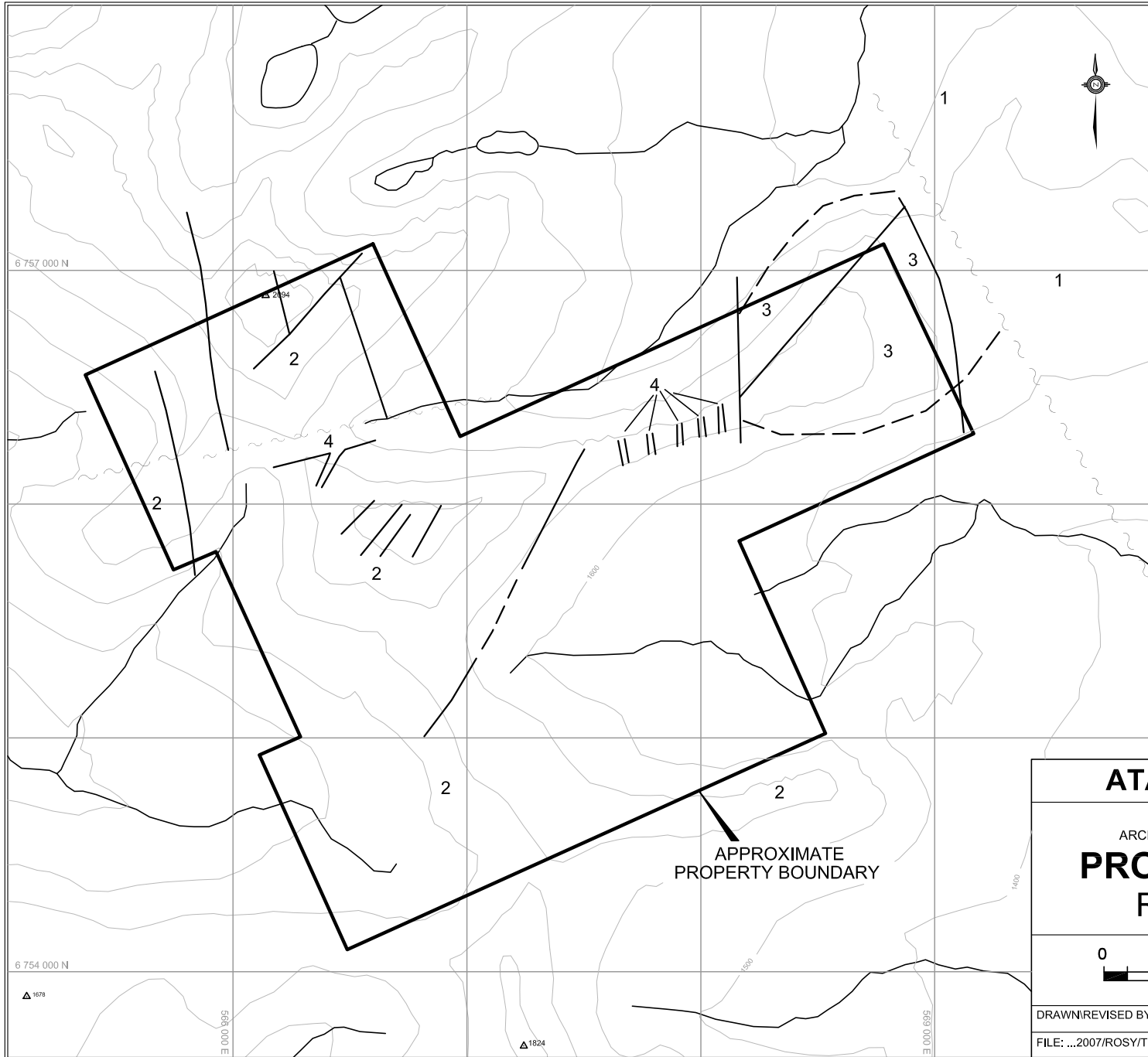
<u>Age</u>	<u>Unit Name</u>	<u>Description</u>
Pleistocene to recent	Overburden	Glacial till and moraines; glaciofluvial outwash and more recent talus and fluvial material
Late Cretaceous	LKP	Quartz monzonite and quartz-feldspar porphyry
Mid-Cretaceous	mKC	Medium- to coarse-grained, equigranular to porphyritic granite, granodiorite and quartz monzonite of the Cassiar Suite
Early Jurassic	EJgA	Medium-to coarse-grained, foliated biotite-hornblende granodiorite, foliated hornblende diorite and monzodiorite of the Aishihik Suite
Lower and Middle Jurassic	JL	Poorly sorted, medium bedded to massive arkosic sandstone and minor shale with interbeds and thicker members of heteroclastic pebble- and boulder-conglomerate of the Laberge Group
Devonian, Mississippian and older(?)	DMN	Graphitic quartzite and muscovite -and quartz-rich schist with interspersed marble of the Nasina Assemblage
	DMN2	Massive marble of the Nasina Assemblage
Paleozoic or Proterozoic	PPa	Amphibolite: metamorphosed mafic rocks including hornblendite and serpentinite

The main structural trend in the area is northerly to northwesterly. The Teslin Fault, a regional scale, post-accretionary, high angle structure is located about 5 km southwest of the property (Figure 3). Rocks on the southwest side of the Teslin Fault are quite different from those on the northeast side, which belong to the Whitehorse Trough, part of the Stikinia Terrane.

### **PROPERTY GEOLOGY AND MINERALIZATION**

The property is predominantly underlain by weakly foliated metadiorite (EJgA) with lesser quartz-hornblende and quartz-feldspar-hornblende gneiss (DMN), (Figure 5). An 800 m

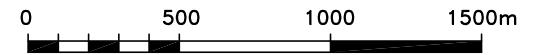




- 4 quartz-feldspar porphyry
- 3 hornblende
- 2 metadiorite and gneiss
- 1 limestone and serpentine
  
- major fault
- vein fault
- vein fault, known, inferred
- geological contact

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FIGURE 5  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**PROPERTY GEOLOGY**  
**ROSY PROPERTY**



UTM ZONE 8, NAD83, 105C/13

DRAWN/REVISED BY: AG/MRD

FILE: ...2007/ROSY/TECH/F\_5-GEO.DWG

DATE: MAY 2008

diameter, coarse grained hornblendite body (PPa) outcrops on the ridge in the northeastern part of the property. This unit is unfoliated. Cream to pink weathering, quartz-feldspar porphyry dykes (LKP) cut all other units and occur throughout the property. Although the largest of these dykes are about 50 m thick, most are 10 m or less. They exhibit a variety of strikes but all dip steeply. Many of the dykes are flanked by quartz-carbonate veins and/or carbonate alteration zones in the adjacent wallrocks.

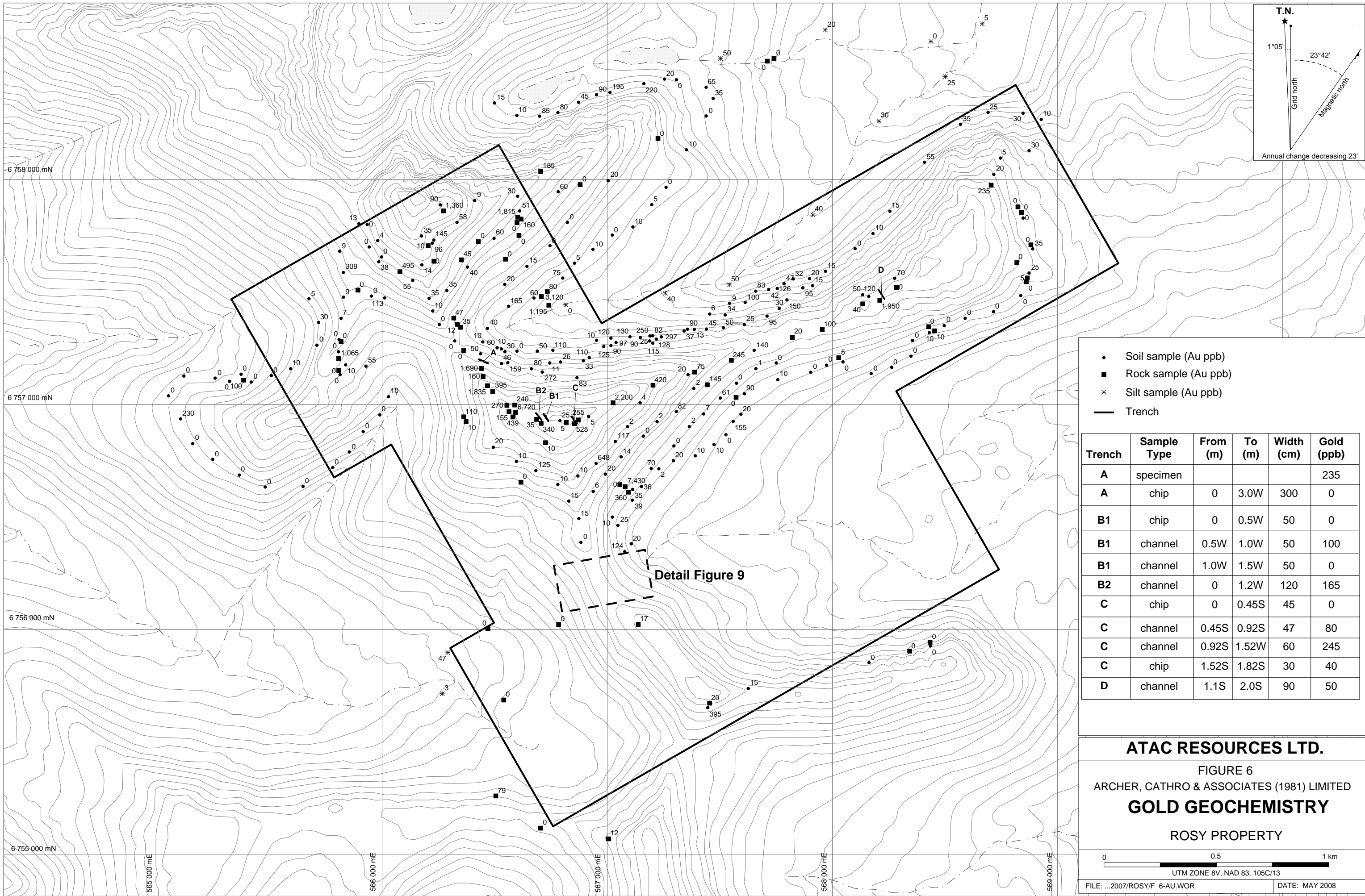
More than 20 quartz-carbonate veins have been found in various parts of the property. These veins cut all units except the quartz-feldspar porphyry dykes. They are marked by 1 to 10 m wide recessive linears, most of which strike northeasterly and dip moderately to steeply to the southeast. Steeply dipping, north trending linears are also present. The veins themselves are typically less than 80 cm wide. Gouge zones, quartz-feldspar porphyry dykes and carbonate altered wallrocks often occur with the quartz veins in the linears. There are usually sharp breaks separating unaltered resistant weathering wallrocks from the altered recessive weathering rocks in the linears. The linears are best exposed on ridge crests and cliffs because blocky unaltered wallrock talus tends to obscure them on normal hillsides.

Quartz in the veins is milky white to light grey and often chalcedonic. Carbonate weathers orange to red-brown and is likely a mixture of ankerite and dolomite. The veins often exhibit differential weathering that highlights delicate interbanding of quartz and carbonate. Open space textures and the fine grain size suggest that the veins are epithermal. Sulphide minerals rarely comprise more than 5% of the veins and consist of finely disseminated pyrite with minor arsenopyrite.

Figures 6 to 8 illustrate gold, silver and arsenic results from rocks collected in different parts of the property while Figures 9 to 11 show gold, silver and arsenic results in a detail area. The samples include veins and altered rocks taken adjacent to veins.

During the various programs a total of 41 quartz-carbonate vein specimens were collected. Of these, most appeared to be barren or contained only a few percent pyrite or limonitic pits after pyrite. Arsenopyrite content in the veins ranged from trace to 10% of the rock. Gold results are highly correlated with arsenic and weakly correlated with silver and antimony. A best fit line on a scatter plot indicates that on average the veins contain about 450 ppb gold for each 1000 ppm arsenic. Five of the 41 samples returned more than 4700 ppm arsenic and all of those assayed more than 3310 ppb gold. The best assay came from a sample that was visually estimated to contain about 10% arsenopyrite and returned 35.92 g/t gold. This sample also contained 32.4 ppm silver and 392 ppm antimony. Some silver rich vein samples are anomalous for antimony but many returned near low values. The highest silver assay obtained to date is 650 ppm from a specimen that also returned 2200 ppb gold, 2610 ppm arsenic and 204 ppm antimony.

Samples from altered rocks adjacent to the veins have been collected from numerous structures cutting a variety of rock types. Some gouge samples taken along side quartz-carbonate veins are slightly enriched in gold (up to 235 ppb), silver (up to 5.2 ppm), arsenic (up to 1015 ppm) and antimony (up to 8 ppm). Carbonate altered wallrocks returned weakly anomalous values, but



- Soil sample (Au ppb)
- Rock sample (Au ppb)
- \* Silt sample (Au ppb)
- Trench

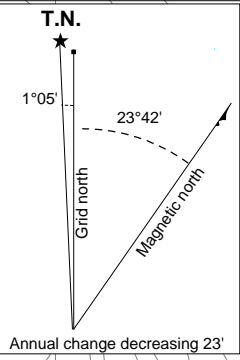
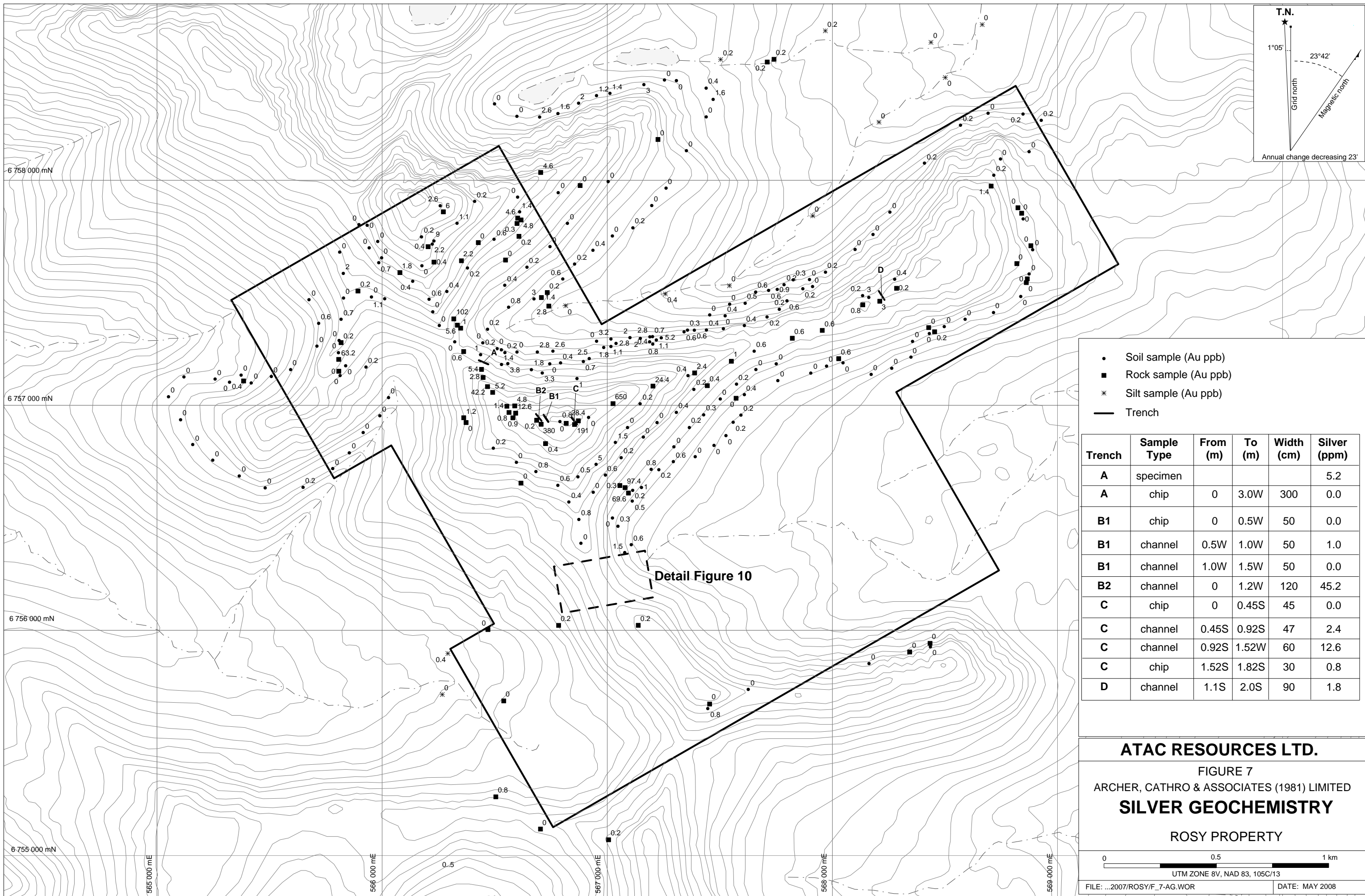
Trench	Sample Type	From (m)	To (m)	Width (cm)	Gold (ppb)
A	specimen				235
A	chip	0	3.0W	300	0
B1	chip	0	0.5W	50	0
B1	channel	0.5W	1.0W	50	100
B1	channel	1.0W	1.5W	50	0
B2	channel	0	1.2W	120	165
C	chip	0	0.45S	45	0
C	channel	0.45S	0.92S	47	80
C	channel	0.92S	1.52W	60	245
C	chip	1.52S	1.82S	30	40
D	channel	1.1S	2.0S	90	50

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FIGURE 6  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**GOLD GEOCHEMISTRY**  
ROSY PROPERTY

0                      0.5                      1 km  
UTM ZONE 8V, NAD 83, 105C/13

FILE: ...2007/ROSY/F\_6-AU.WOR                      DATE: MAY 2008



- Soil sample (Au ppb)
- Rock sample (Au ppb)
- \* Silt sample (Au ppb)
- Trench

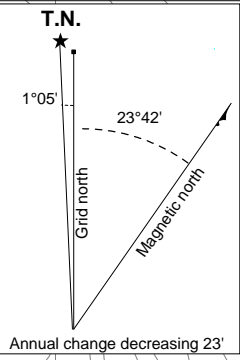
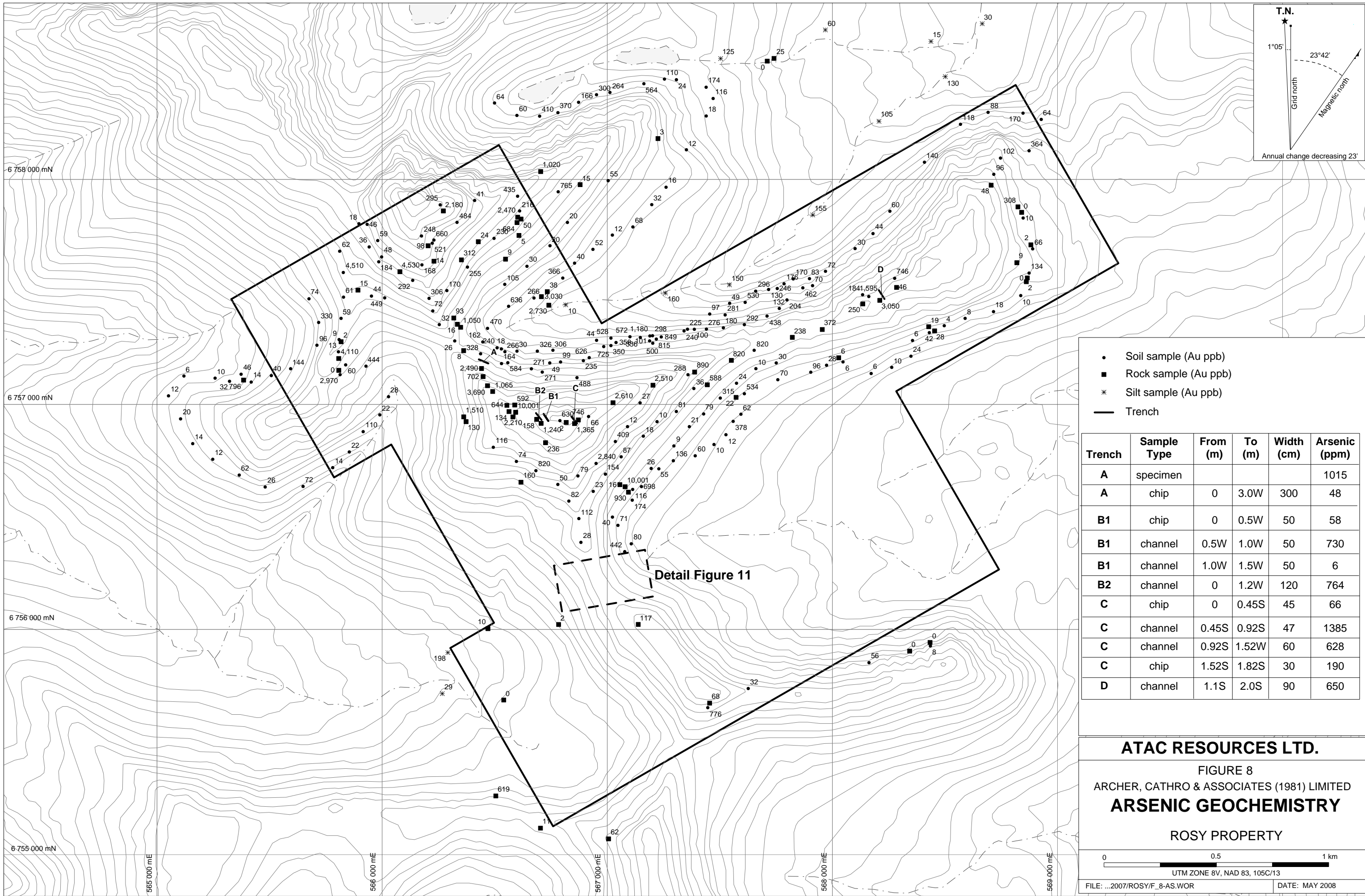
Trench	Sample Type	From (m)	To (m)	Width (cm)	Silver (ppm)
A	specimen				5.2
A	chip	0	3.0W	300	0.0
B1	chip	0	0.5W	50	0.0
B1	channel	0.5W	1.0W	50	1.0
B1	channel	1.0W	1.5W	50	0.0
B2	channel	0	1.2W	120	45.2
C	chip	0	0.45S	45	0.0
C	channel	0.45S	0.92S	47	2.4
C	channel	0.92S	1.52W	60	12.6
C	chip	1.52S	1.82S	30	0.8
D	channel	1.1S	2.0S	90	1.8

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FIGURE 7  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**SILVER GEOCHEMISTRY**  
ROSY PROPERTY

UTM ZONE 8V, NAD 83, 105C/13

FILE: ...2007/ROSY/F\_7-AG.WOR      DATE: MAY 2008



- Soil sample (Au ppb)
- Rock sample (Au ppb)
- \* Silt sample (Au ppb)
- Trench

Trench	Sample Type	From (m)	To (m)	Width (cm)	Arsenic (ppm)
A	specimen				1015
A	chip	0	3.0W	300	48
B1	chip	0	0.5W	50	58
B1	channel	0.5W	1.0W	50	730
B1	channel	1.0W	1.5W	50	6
B2	channel	0	1.2W	120	764
C	chip	0	0.45S	45	66
C	channel	0.45S	0.92S	47	1385
C	channel	0.92S	1.52W	60	628
C	chip	1.52S	1.82S	30	190
D	channel	1.1S	2.0S	90	650

**ATAC RESOURCES LTD.**

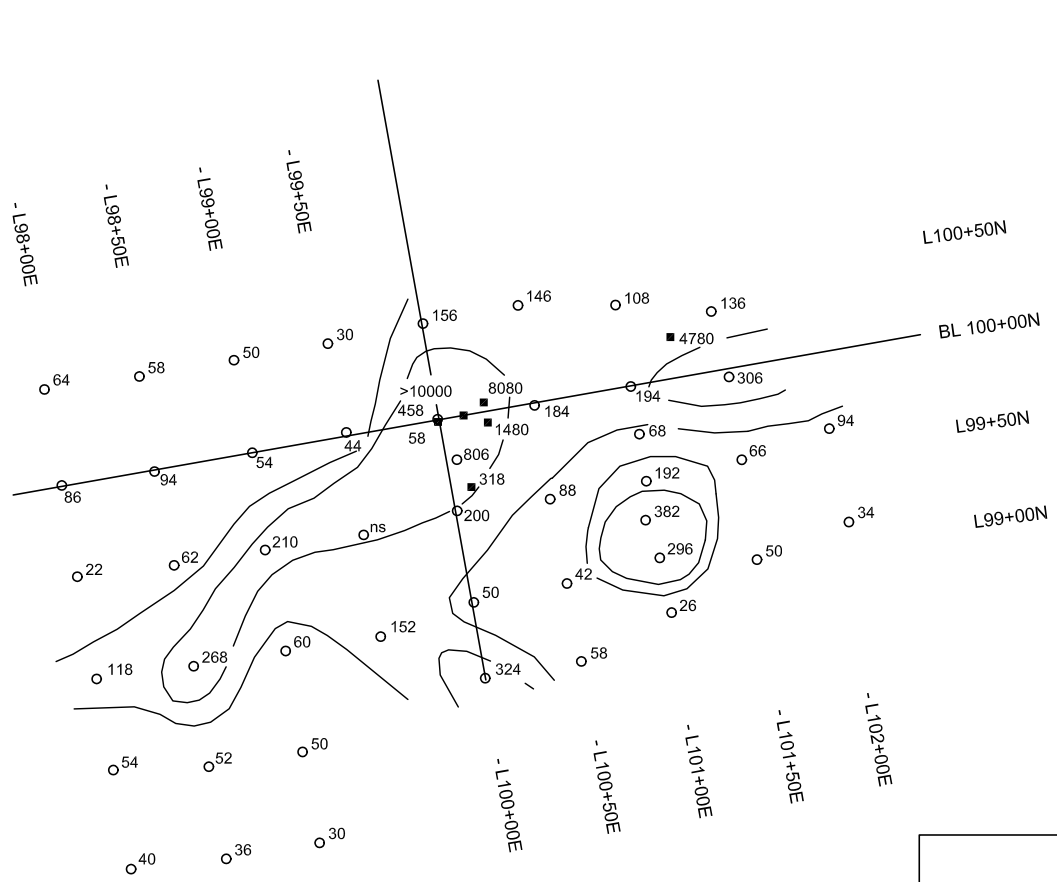
FIGURE 8  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**ARSENIC GEOCHEMISTRY**  
ROSY PROPERTY

UTM ZONE 8V, NAD 83, 105C/13

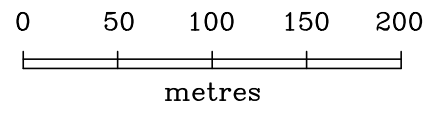
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- <sup>458</sup> Soil sample location with As value in ppm
- <sup>4780</sup> Rock sample location with As value in ppm



<b>ATAC RESOURCES LTD.</b>	
FIGURE 11	
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED	
<b>DETAIL ARSENIC GEOCHEMISTRY</b>	
<b>ROSY PROPERTY</b>	
DRAWN/REVISED BY: AG/MRD	
FILE: ...2007/ROSY/F_11-DETAIL_AS.DWG	DATE: MAY 2008

unaltered porphyry dykes, skarns and other rock types produced near background results for all metals.

### **SOIL GEOCHEMISTRY**

Soil sampling and prospecting traverses have been conducted along most hillsides and ridge tops on the property but only in one detail area is there a high density of geochemical coverage. Gold, silver and arsenic results from across the property are illustrated on Figures 6 to 8, respectively, while those from a detail grid are plotted on Figures 9 to 11, respectively.

Results from soils resemble those from rock with gold showing a strong positive correlation with arsenic and a weak to moderate correlation with silver. Moderately to strongly anomalous gold values are spread over a 7 sq km area. The highest gold (835 ppb) and silver (9.6 ppm silver) soil values came from a sample on the detail grid, which was collected 125 m west of the rock that produced the highest gold assay. This sample is part of a 200 m long northeast trending anomaly that is open to the northeast. Arsenic values within this trend ranged up to 806 ppm.

Other noteworthy clusters of coincidentally anomalous high values are located about 200 to 400 m to the north (possible along the same vein structure) and along talus slopes on either side of the main creek draining the northern part of the property, which produced the high stream sediment analyses that first attracted attention to the Rosy area.

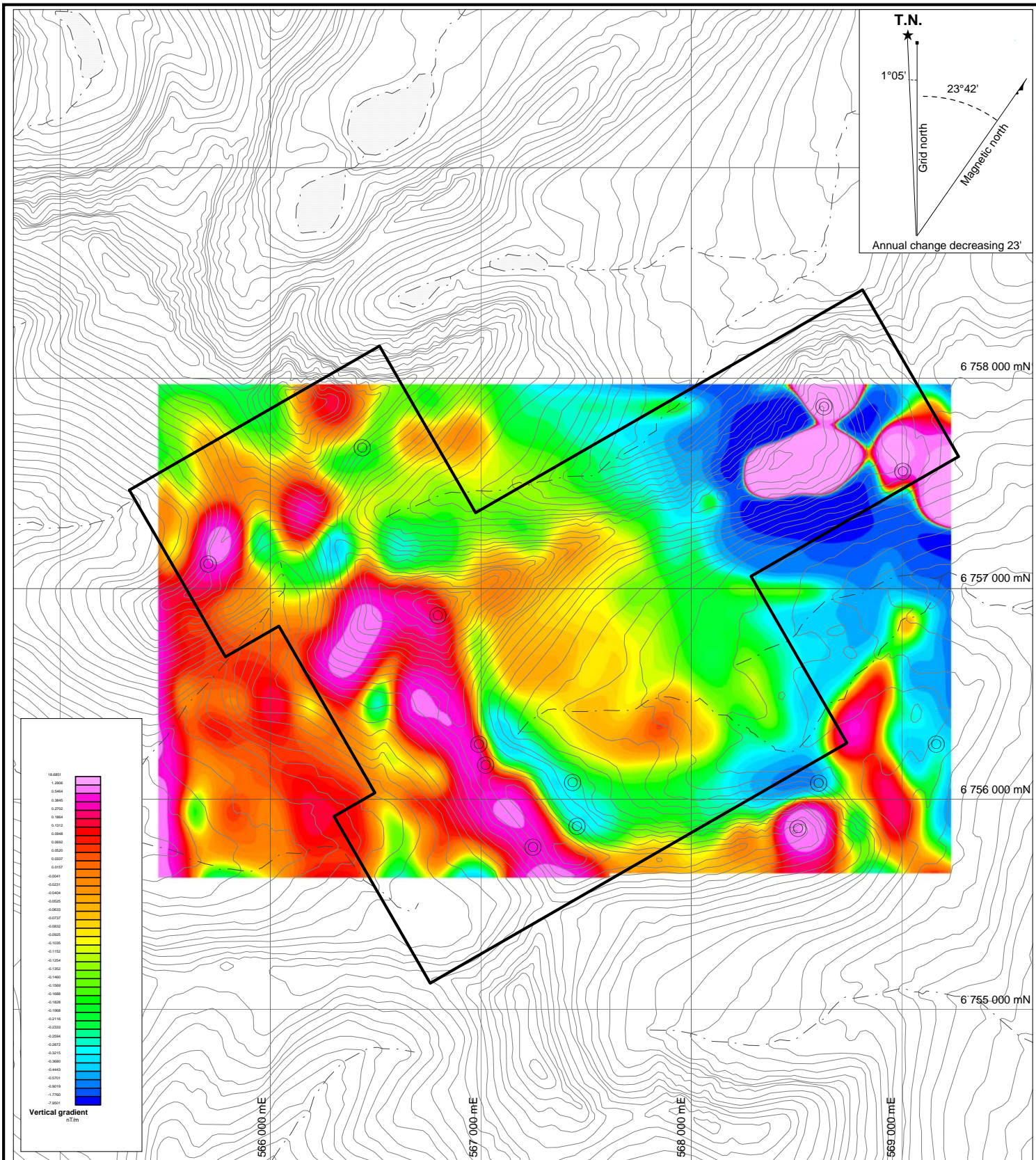
### **2007 GEOPHYSICAL SURVEYS**

The 2007 geophysical surveys were contracted to Geotech Ltd. of Aurora, Ontario and were performed with an AStar B3 helicopter operated by TRK Helicopters (B.C.) Ltd. of Langley, British Columbia. The surveys covered a 4500 m by 2000 m area centred on the property and consisted of versatile time-domain electromagnetics (VTEM) and magnetics. Appendix II contains reports by Geotech, which describe equipment and procedures that were used during the surveys and interpreted results. CDs containing digital survey data are also attached to this report.

The surveys were flown at a constant speed of 80 km/hr and an average ground clearance of 150 m. Traverse lines were spaced 100 m apart and were flown due east or due west. Tie lines were spaced 1000 m apart and were flown due north or due south.

Total field magnetic field values range from 57300 nT to 59600 nT. The high variability is primarily attributed to a strong anomaly in the northeast corner of the survey area, which is related to the amphibolite (Figure 12). Weaker magnetic highs in the southwestern part of the survey area are likely related to metadiorite. Elsewhere, response is relatively subdued. Some linear magnetic lows correspond to known fault and vein zones and other similar lows could mark unmapped structures.

VTEM response is relatively flat, except in the northeastern corner of the survey area, where a major fault is mapped (Figure 13).



⊙ VTEM anomaly

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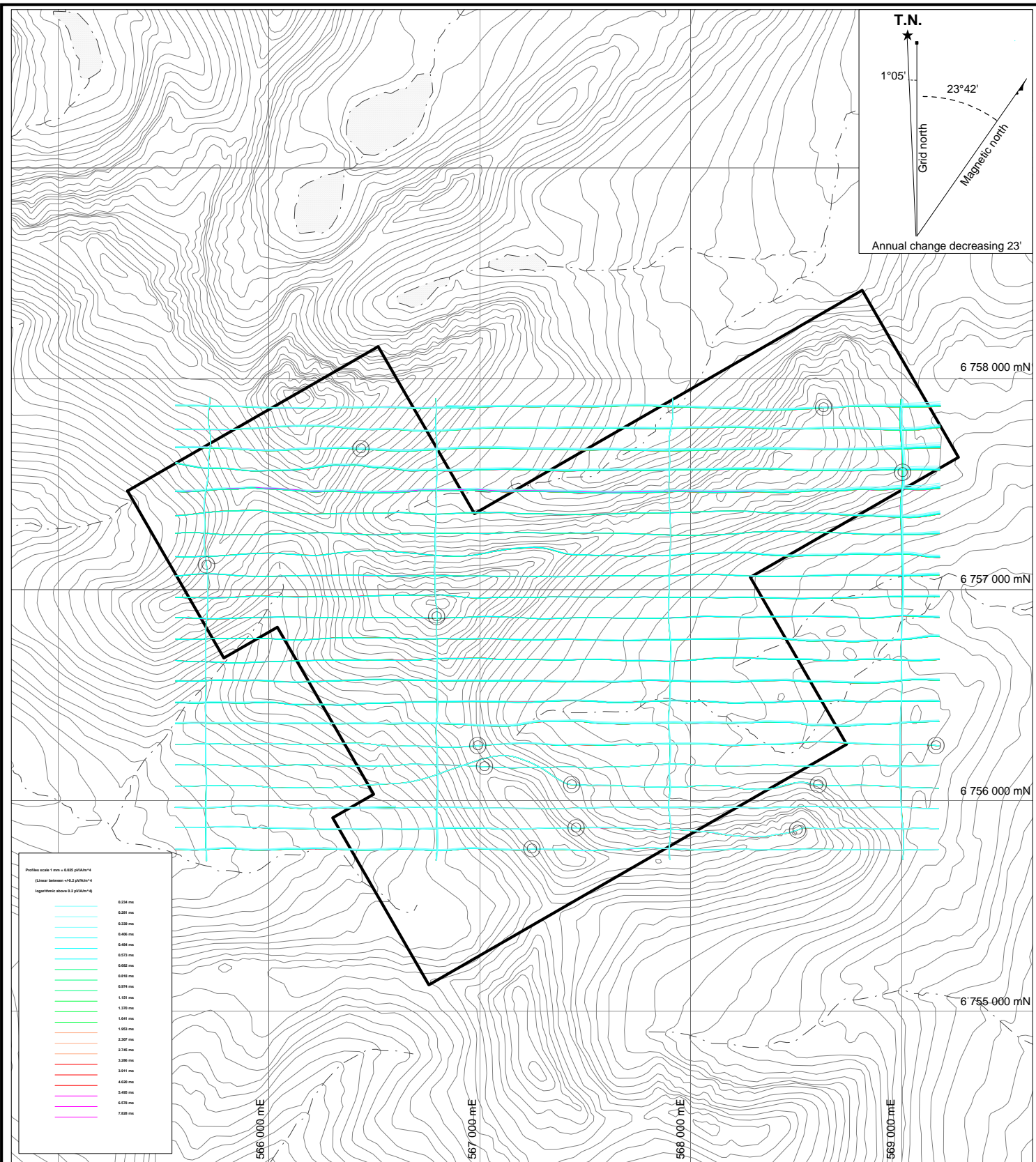
FIGURE 12  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**VERTICAL GRADIENT  
MAGNETICS**  
ROSY PROPERTY



UTM ZONE 8V, NAD 83, 105C/13

FILE: ...2007/ROSY/F\_12-MAG.WOR

DATE: MAY 2008



⊙ VTEM anomaly

**ATAC RESOURCES LTD.**

FIGURE 13  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**EM dB/dt STACKED PROFILES**  
 ROSY PROPERTY

0      0.5      1.0      1.5 km  
 UTM ZONE 8V, NAD 83, 105C/13

FILE: ...2007/ROSY/F\_13-EM.WOR      DATE: MAY 2008

## **DISCUSSION AND CONCLUSIONS**

The Rosy property hosts widespread gold-and-silver bearing veins that appear to be spatially and temporarily associated with Late Cretaceous intrusive activity. The gold-silver-arsenic lithogeochemical signature, coupled with textural features observed in the veins, suggests that they are developed in a distal part of a large hydrothermal system, possibly in an epithermal setting. The nearby Red Mountain porphyry deposit is likely part of the same system and certainly exhibits the pronounced lithophile signature, which is characteristic of Cretaceous age intrusions related to precious metal deposits elsewhere in Yukon.

The next stage of exploration should consist of additional detailed prospecting and mapping of vein structures coupled with hand trenching and closer spaced, property-wide soil geochemical sampling.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

William A. Wengzynowski, P.Eng.

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**APPENDIX I**  
**STATEMENT OF QUALIFICATIONS**

## **STATEMENT OF QUALIFICATIONS**

I, William A. Wengzynowski, geological engineer, with business addresses in Vancouver, British Columbia and Whitehorse, Yukon Territory and residential address at 301 Fairway Drive, North Vancouver, British Columbia, V7G 1L4 do hereby certify that:

1. I am President of Archer, Cathro & Associates (1981) Limited.
2. I graduated from the University of British Columbia in 1993 with a B.A.Sc in Geological Engineering, Option 1, mineral and fuel exploration.
3. I registered as a Professional Engineer in the Province of British Columbia on December 12, 1998 (Licence Number 24119).
4. From 1983 to present, I have been actively engaged in mineral exploration in the Yukon Territory, Northwest Territories, northern British Columbia and Mexico.
5. I have personally participated in and supervised the fieldwork reported herein.

William A. Wengzynowski, P. Eng.

**APPENDIX II**

**GEOPHYSICAL REPORTS BY GEOTECH LTD.,  
INCLUDING CDS WITH THE DIGITAL SURVEY DATA**



**REPORT ON A HELICOPTER-BORNE  
TIME DOMAIN ELECTROMAGNETIC  
GEOPHYSICAL INTERPRETATION**

**ROSY PROPERTY  
Yukon Territory, Canada**

**For  
Atac resources Ltd.**

**By**

**Geotech Limited  
245 Industrial Parkway North  
L4G 4C4 Aurora, Ontario, Canada  
Tel: 1.905.841.5004  
Fax: 1.905.841.0611**

**[www.geotech.ca](http://www.geotech.ca)**

**Email: [info@geotech.ca](mailto:info@geotech.ca)**

**Survey flown in September 2007**

**Project 7067  
March, 2008**

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# REPORT ON A HELICOPTER-BORNE TIME DOMAIN ELECTROMAGNETIC INTERPRETATION

**ROSY Property**, Yukon Territory, Canada

## **1. INTRODUCTION**

In September 2007, a helicopter-borne electromagnetic survey was carried out by Geotech Ltd. for Atac resources Ltd. over the ROSY Property located in Yukon Territory, Canada.

This report includes the results of the geophysical interpretation, over this Property. The Property is located at approximately 70 km north-east from Whitehorse, in the Yukon Territory. The geographic coordinates of the block extents are: longitudes, 133° 47'23" W and 133° 43'28" W, and latitudes, 60° 55' 18" N and 60° 56'28" N. The surveyed area is 7 km<sup>2</sup>, and the total line kilometers flown are 100 km (Fig. 1).

The survey was conducted using Geotech Ltd VTEM system. Principal geophysical sensors included a versatile time domain electromagnetic system and a high resolution cesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter.

Data processing and map compilation, including generation of final digital data products were achieved at the office of Geotech Ltd in Aurora, Ontario.

The present report describes the results of the geophysical interpretation of this Property.



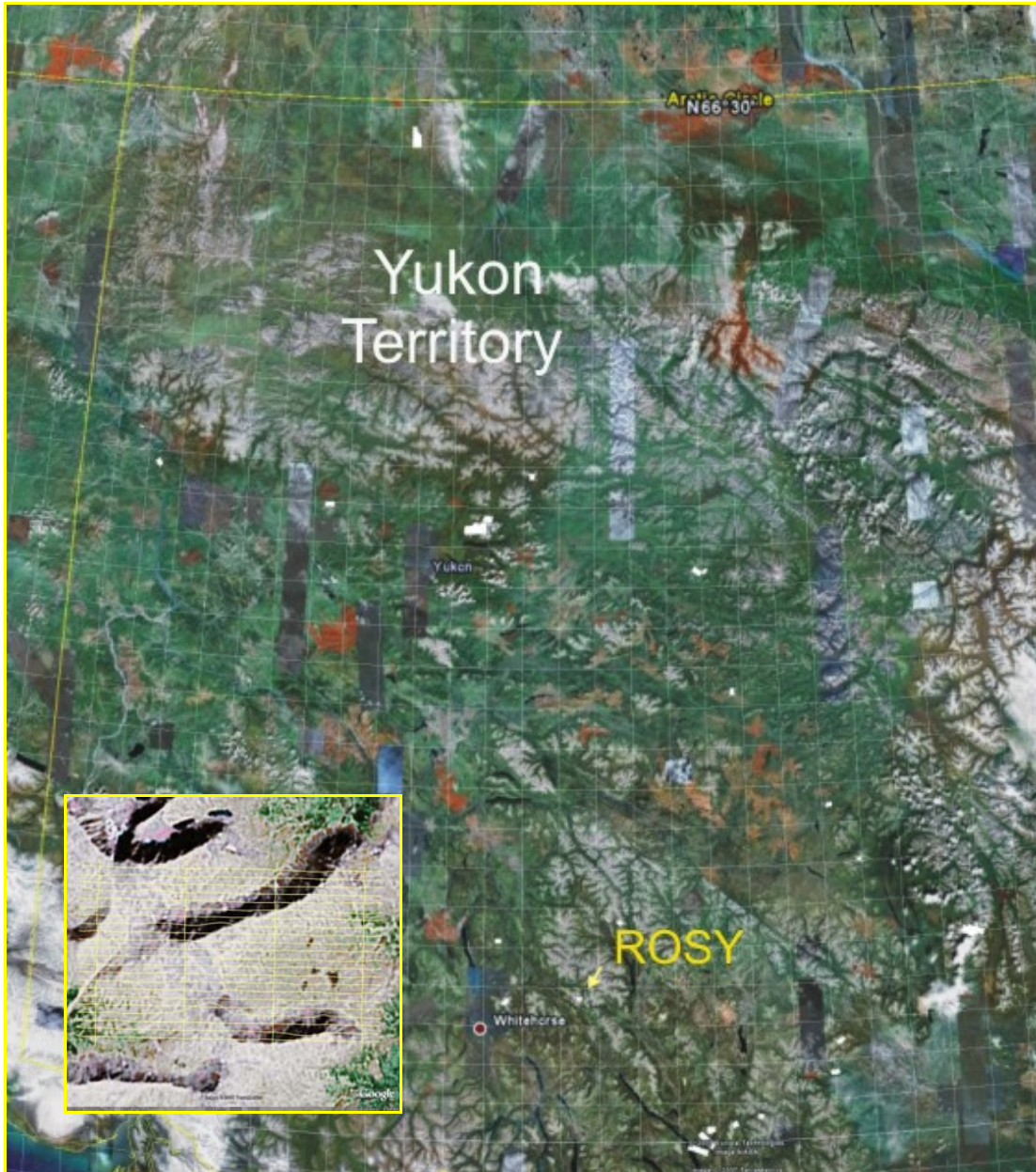


Fig. 1 Location map of the ROSY Property on the satellite image.

## **2. SURVEY DESCRIPTION**

In September 2007, Geotech Ltd. carried out a helicopter-borne geophysical survey over the ROSY property located in Yukon. Geotech Ltd. utilized a Versatile Time Domain Electromagnetic System to measure the electromagnetic induction field (B-field) and the vertical component of its time derivative (dB/dt). The electromagnetic measurements were made at the off-time mode. The concentric in-loop system was towed at a distance of 42 m from the helicopter. The VTEM Transmitter uses a trapezoid waveform shape with 7.2 ms duration operating at a base frequency of 30Hz. The dipole moment was approximately 425 000 NIA. The half-waveform was 16.7 ms.

A towed cesium and high resolution magnetometer was used to measure the Earth's magnetic field intensity. Data positioning and navigation were assured by a Novatel WAA GPS with accuracy less than 3 m.

A Terra TRA radar altimeter was used to measure the terrain clearance. The helicopter was flying at a constant speed of 80 km/h and at an average ground clearance of 150 m. The traverse lines direction was EW and the tie lines direction was NS. The distance between the traverse lines and the tie lines was 100 m and 1000 m, respectively. A more detailed description of the survey parameters is provided in the logistics/processing report.

### 3. GEOLOGICAL CONSIDERATIONS

#### 3.1 Topography

The terrain is mountainous and very rugged with alternating valleys and streams. The absolute altitudes range from 1300 m to 2000 m approximately. Due to the terrain roughness it was difficult to keep a constant ground clearance while surveying this area.

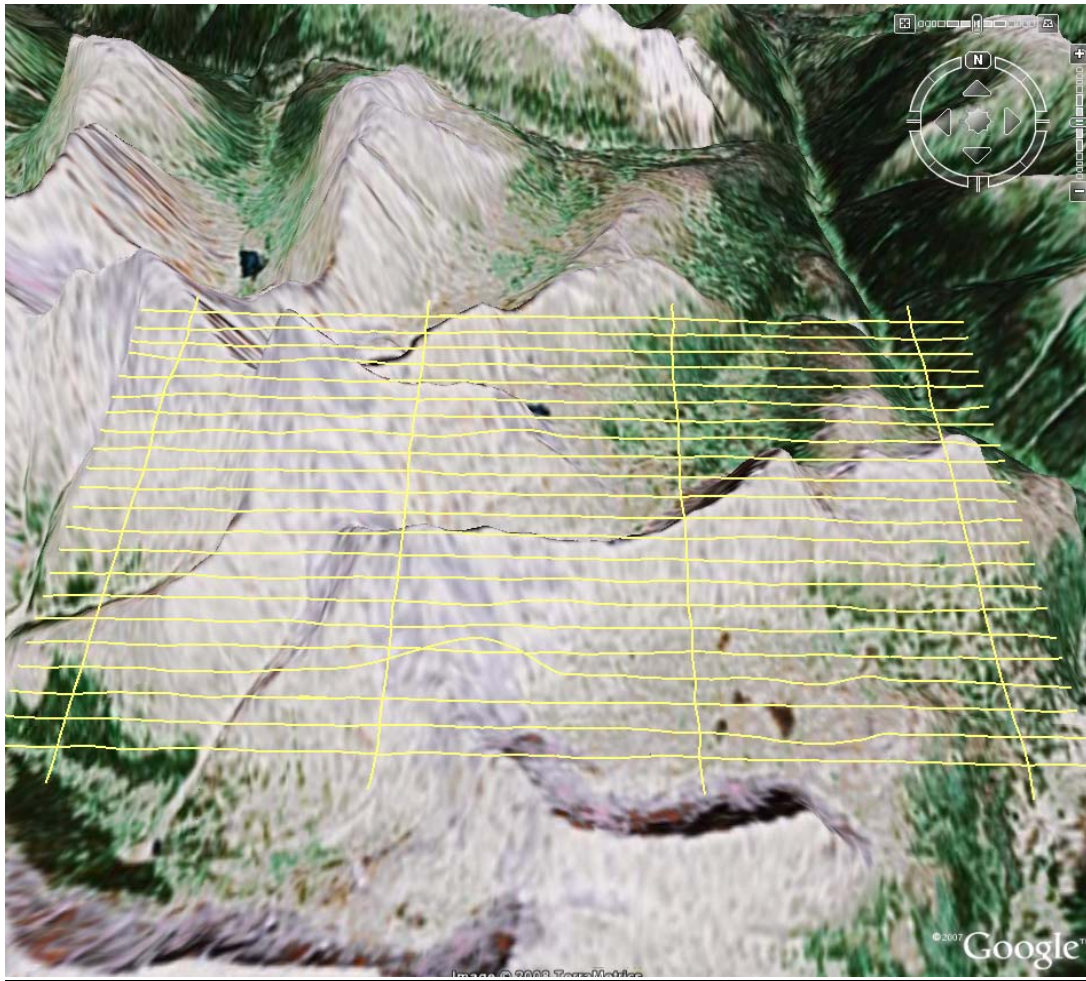


Fig.2 Topographic relief map of the ROSY Property with flight path.

### 3.2 Regional geological context

The Yukon Territory is situated in the northern part of the large geologic (and physiographic) belt known as the Cordillera. It is composed of relatively young mountain belts that range from Alaska to Mexico. The Yukon Territory is composed of a diverse type of rocks recording more than a billion years of geological history. Most of them have been affected by folding, faulting, metamorphism and uplift during various tectono-metamorphic events over at least the last 190 million years. This deformation has resulted in a complex arrangement of rock units and the mountainous terrain that has shaped today's geology. Geologically, Yukon is divided into two main components which are largely separated by the Tintina Trench. Formations northeast of the Tintina Fault consist of a thick, older sequence of sedimentary rocks which was deposited upon a stable geological basement. Rocks southwest of the Tintina Trench are composed of a younger, complex mosaic of igneous and metamorphic, representing numerous accreted terranes (Fig. 3).

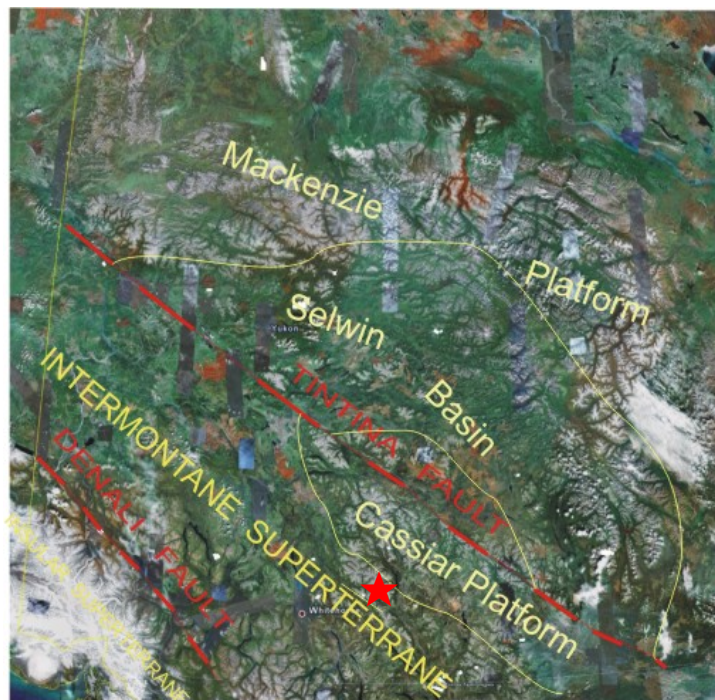


Fig.3 The major tectonic elements of Yukon superimposed on the satellite image. The figure indicates that the territory is composed of two dominant rock packages separated by the Tintina Fault: thick packages of sediments (northeast) and accreted Terranes (Southwest). The star indicates the location of the ROSY property.

### **3.3 Geological context of the ROSY Property**

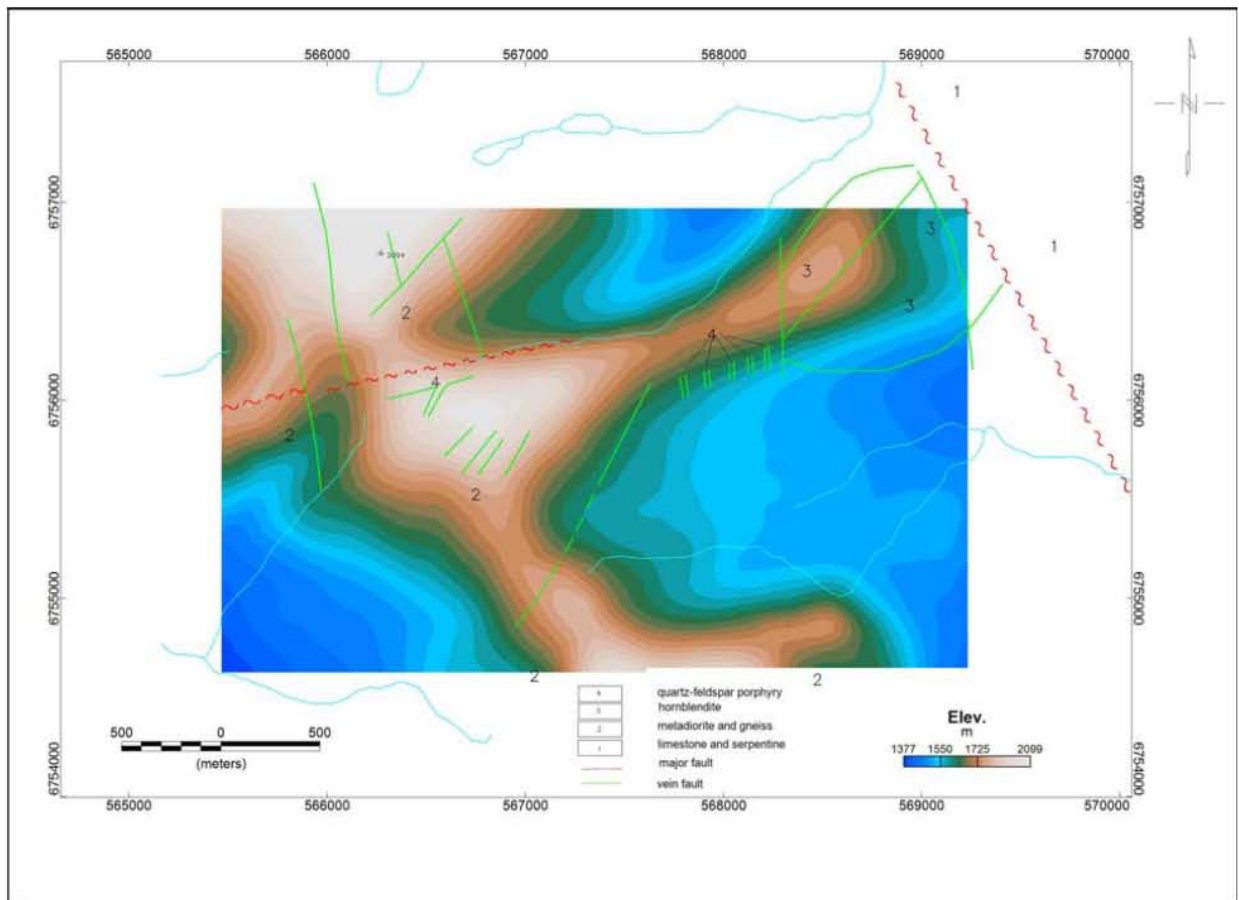
The property is predominantly underlain by weakly foliated metadiorite with lesser quartz-hornblende and quartz-feldspar-hornblende gneiss (Fig. 4). An 800 m diameter, coarse grained hornblendite body outcrops on the ridge in the north-eastern part of the property. This unit is unfoliated. Cream to pink weathering, quartz-feldspar porphyry dykes cut all other units and occur throughout the property. Although the largest of these dykes are about 50 m thick, most are 10 m or less. They exhibit a variety of strikes but all dip steeply. Many of the dykes are flanked by quartz-carbonate veins and/or carbonate alteration zones in the adjacent wallrocks.

More than 20 quartz-carbonate veins have been found in various parts of the property. These veins cut all units except the quartz-feldspar porphyry dykes. They are marked by 1 to 10 m wide recessive lineaments, most of which strike north-easterly and dip moderately to steeply, to the southeast. Steeply dipping, north trending lineaments are also present. The veins themselves are typically less than 80 cm wide. Gouge zones, quartz-feldspar porphyry dykes and carbonate altered wallrocks often occur with the quartz veins in the lineaments. There are usually sharp breaks separating unaltered resistant weathering wallrocks from the altered recessive weathering rocks in the lineaments.

### **3.4 Mineralization**

During the various programs several quartz-carbonate vein specimens were collected. Of these, most appeared to be barren or contained only a few percent finely disseminated pyrite. Arsenopyrite content in the veins ranged from trace to 10% of the rock. Gold results are highly correlated with arsenic and weakly correlated with silver and antimony. On average the veins contain about 450 ppb gold / 1000 ppm arsenic. The best assay came from a sample that was visually estimated to contain about 10% arsenopyrite and returned 35.92 g/t gold. This sample also contained 32.4 ppm silver and 392 ppm antimony. The highest silver assay obtained to date is 650 ppm from a specimen that also returned 2200 ppb gold, 2610 ppm arsenic and 204 ppm antimony.

Samples from altered rocks adjacent to the veins have been collected from numerous structures cutting a variety of rock types. Some gouge samples taken along side quartz-carbonate veins are slightly enriched in gold (up to 235 ppb), silver (up to 5.2 ppm), arsenic (up to 1015 ppm) and antimony (up to 8 ppm). Carbonate altered wallrocks returned weakly anomalous values, but unaltered porphyry dykes, skarn and other rock types produced near background results for all metals.



**Fig. 4 Simplified Geological map of the ROSY Property superimposed on the DEM image.**

## **4. INTERPRETATION OF THE MAGNETIC DATA**

### **4.1 Introduction**

Aeromagnetic surveys are routinely used as a powerful tool at different stages in mining exploration and in geological mapping. Because geological formations have different concentrations of magnetic minerals, they exhibit different magnetic signatures in the magnetic field, depending on the susceptibility contrast of rocks and the characteristics of the magnetic field. Thus, observed magnetic field over an area, can provide useful information that can assist the lithological and the structural mapping. It can be used to detect iron-rich mineral deposits, and/or mineral deposits associated with highly magnetic rocks (mafic and ultramafic formations).

### **4.2 Analysis of the Magnetic data**

The observed magnetic field over the ROSY Property is shown in Figs. 5a-5c. The total magnetic field values are ranging from 57300 nT to 59600 nT approximately, yielding an amplitude difference of 2300 nT, attributed to strong anomaly located in the north-eastern corner of the block (Fig. 5b). The observed anomaly is associated with the outcrop of ultramafic body (hornblendite). A NW trending lineament is observed in the south-western area. It corresponds to a metadioritic dyke. Magnetic highs are also observed in the south-eastern and north-western portions of the block, corresponding to metadiorites. Elsewhere, the magnetic field expresses a quiet behavior especially in the central area where gneissic rocks are mapped. The magnetic highs observed in this property are well correlated with the topographic highs as shown in Fig. 5c.

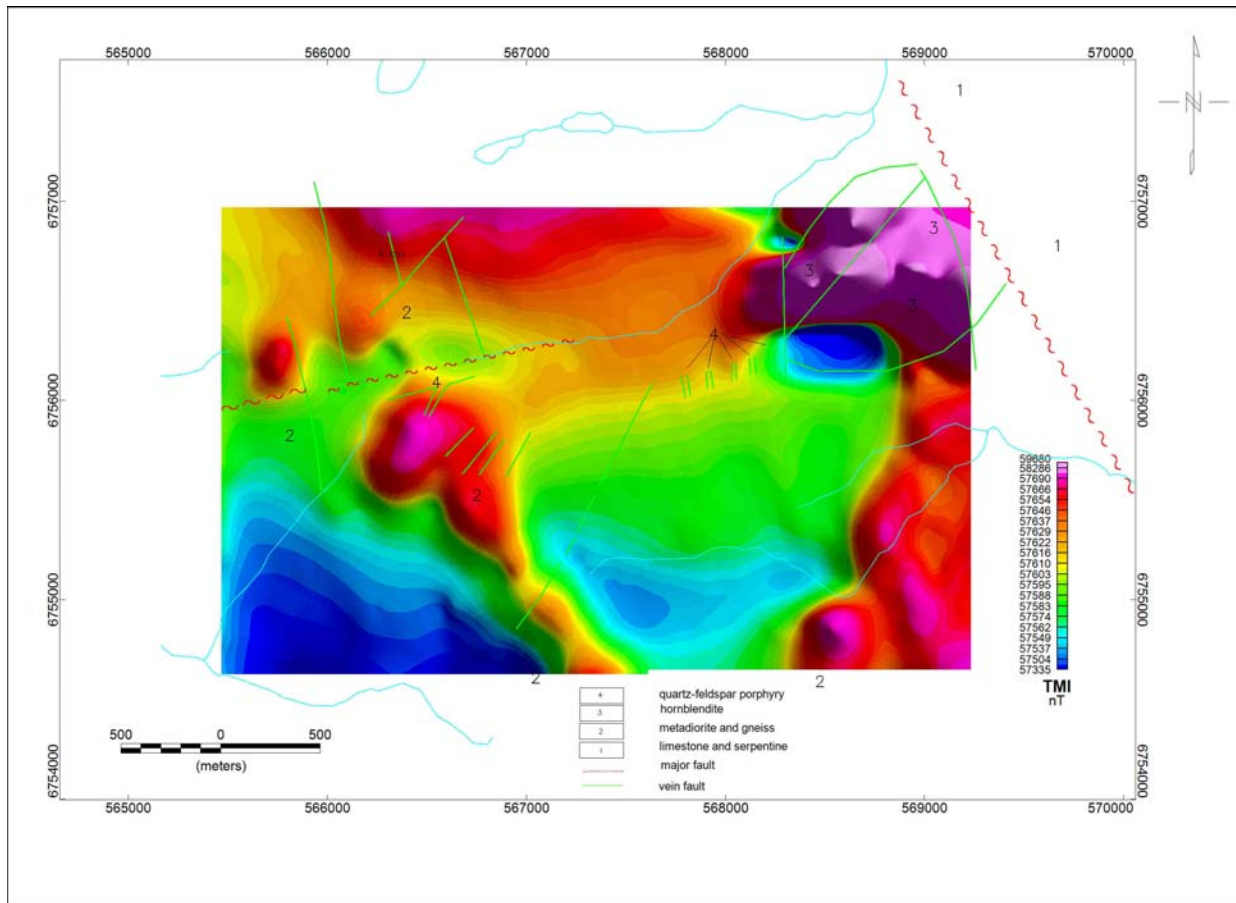
Since the contents of the observed magnetic maps include the response of shallow and deep magnetic sources, it is difficult to analyze the maps containing various wavelength anomalies. Distinguishing shallow features from deeper ones can be performed via several methods of field separation and filtering.

Figure 6 shows the reduced to the pole magnetic field map, upward continued to 100m. The map shows smoother anomalies with reduced intensities. The RTP clearly shows strong anomaly in the NE corner of the block related to ultramafic rocks. The NW lineament persists in the upward continued map. The latter is associated with a mafic dyke indicating probably a deep fault. Elsewhere, the RTP field exhibits a quieter behavior over the gneissic formations in the central and west-southern areas.

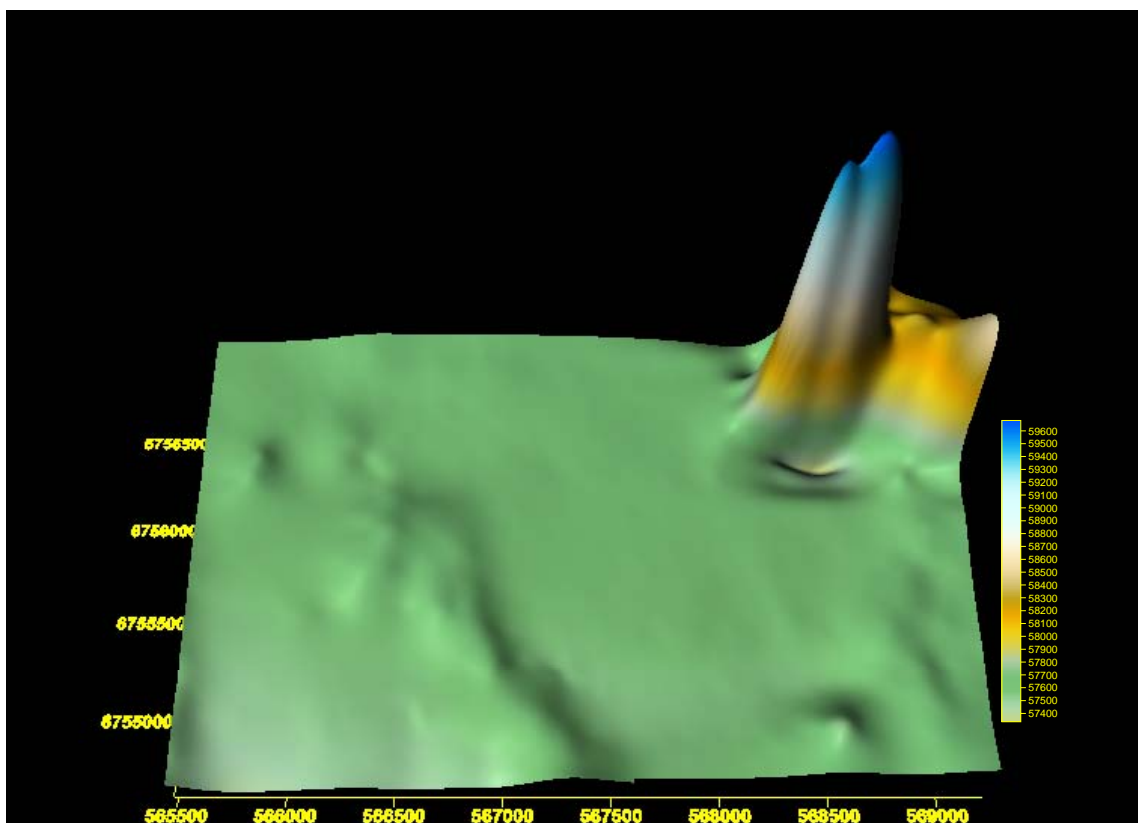
Figure 7 illustrates the vertical gradient of the TMI. The vertical gradient is used to enhance

magnetic signals caused by shallow sources and related to faults, dykes and contacts. The map highlights in the north-eastern corner strong signals associated with ultramafic formations. The map also shows NW trending lineament in the south and related to metadioritic dyke. The tilt derivative map illustrated in Fig. 8 yields another example of amplifying signals associated with shallow sources. The tilt derivative known as being the local phase is computed from the vertical and horizontal gradients. As illustrated in the Tilt derivative a better outline of the magnetic structures and NW trending dyke-like structures. The vertical gradient and tilt derivative maps are very useful for helping to understand the structural patterns of the area.

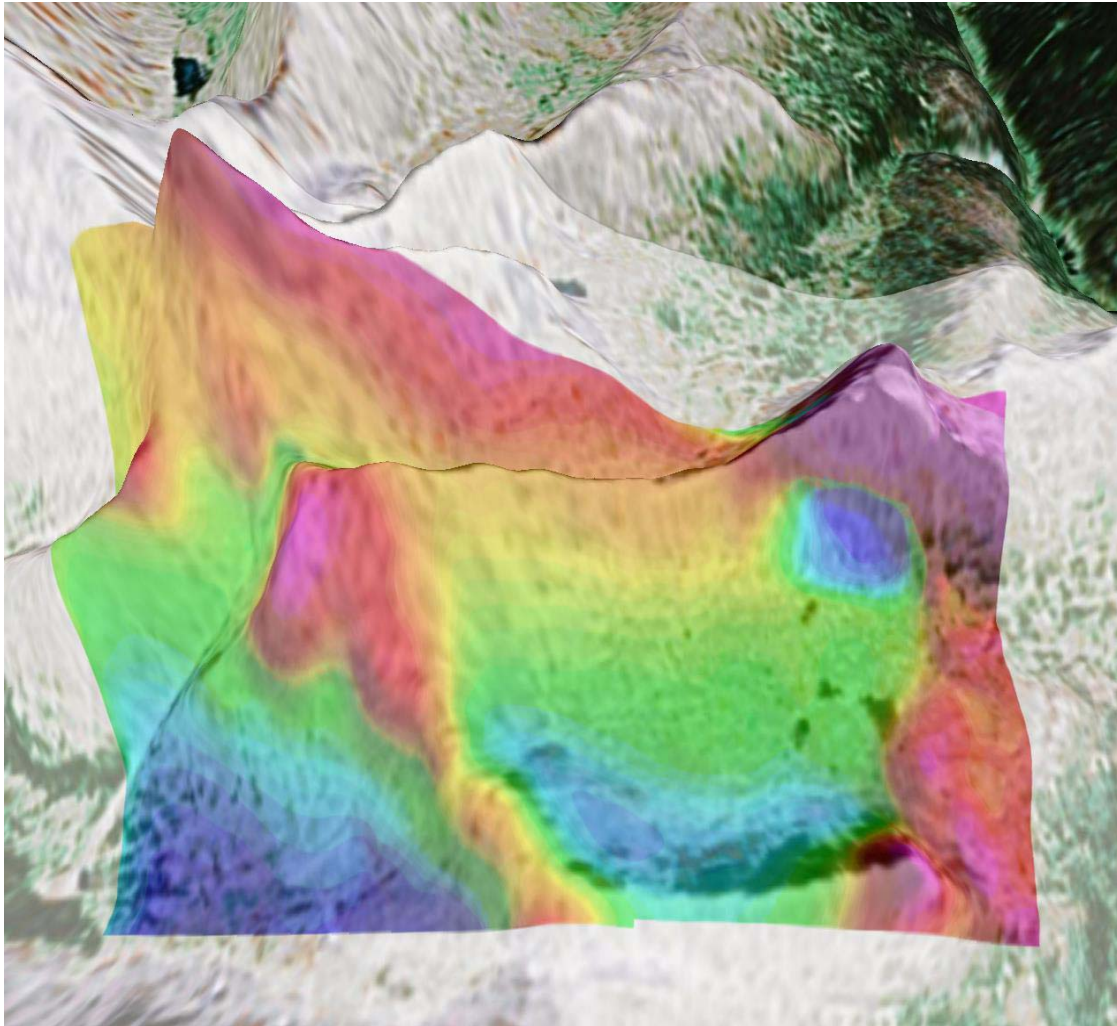




**Fig. 5a TMI image of the ROSY Property indicating a strong anomaly in the northeastern corner of the property.**



**Fig. 5b** Perspective view of the magnetic relief of the ROSY Property. The map clearly highlights a strong anomaly (NW of the block) related to ultramafic formations.



**Fig. 5c** Perspective view of the TMI image superimposed on the topographic relief. The map clearly that magnetic highs are correlated with topographic highs.

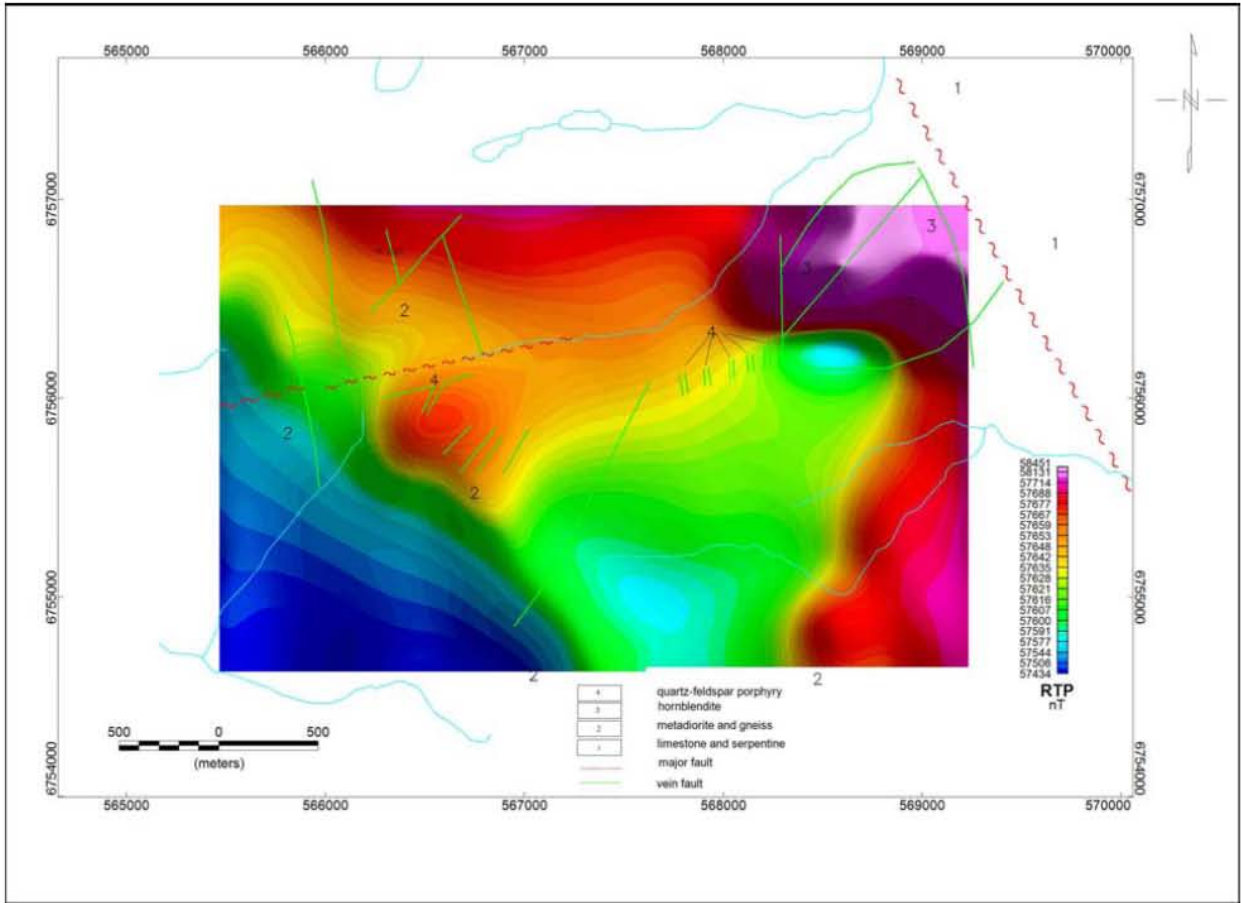
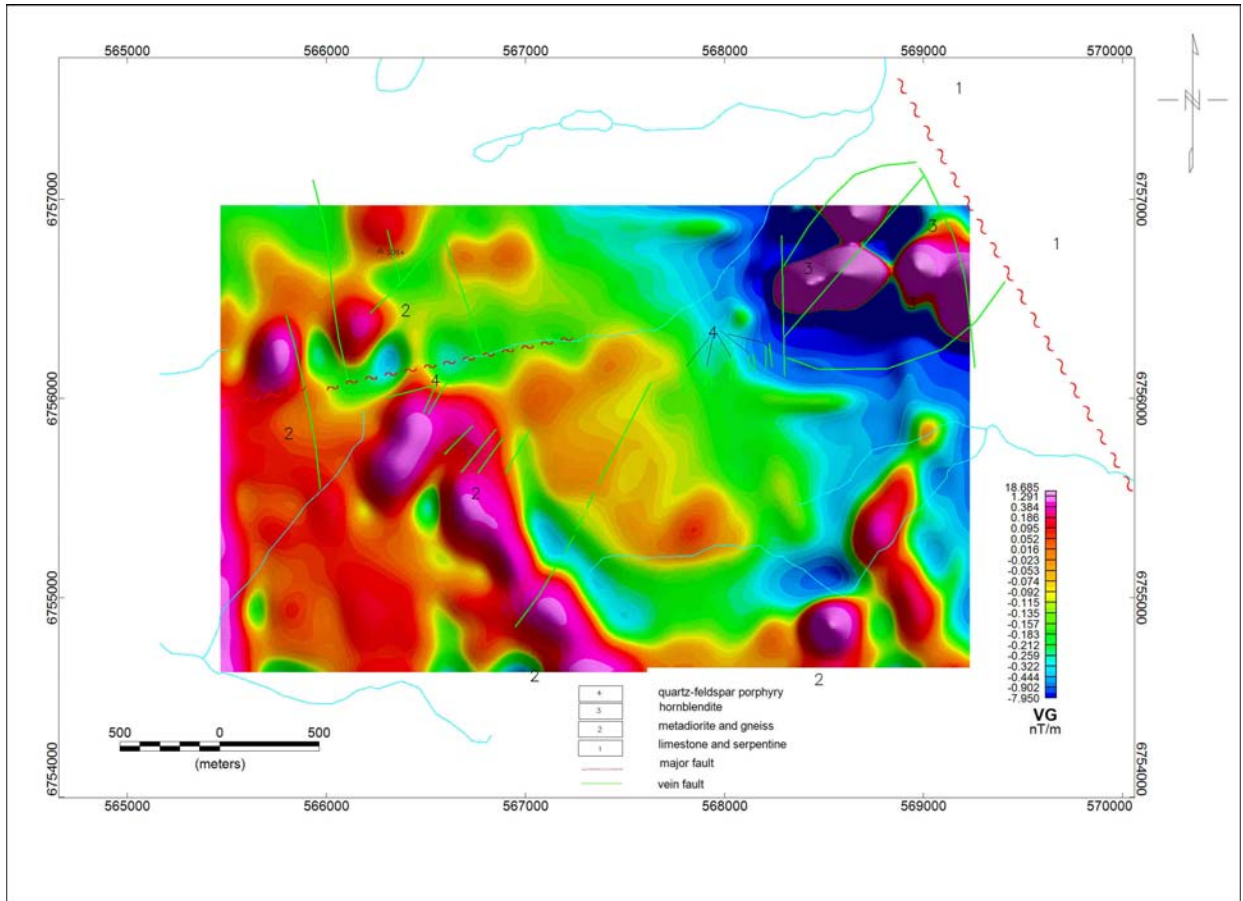
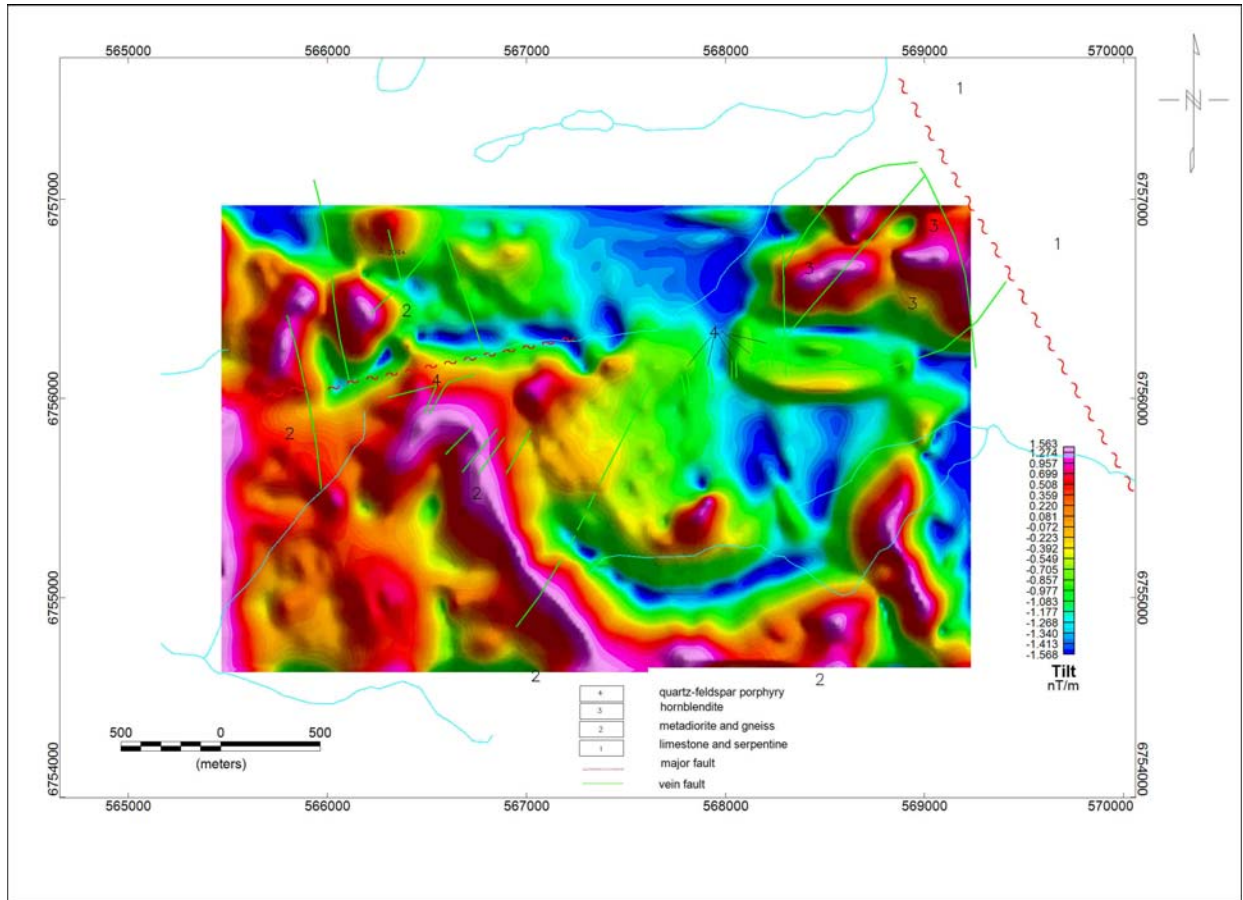


Fig.6 Color shaded relief of reduced to the pole TMI (upward continued to 100m).



**Fig.7 Color shaded relief of the vertical gradient of the magnetic field.**



**Fig. 8 Color shaded relief of the tilt derivative.  
The NW trending lineament coincides with a metadioritic dyke.**

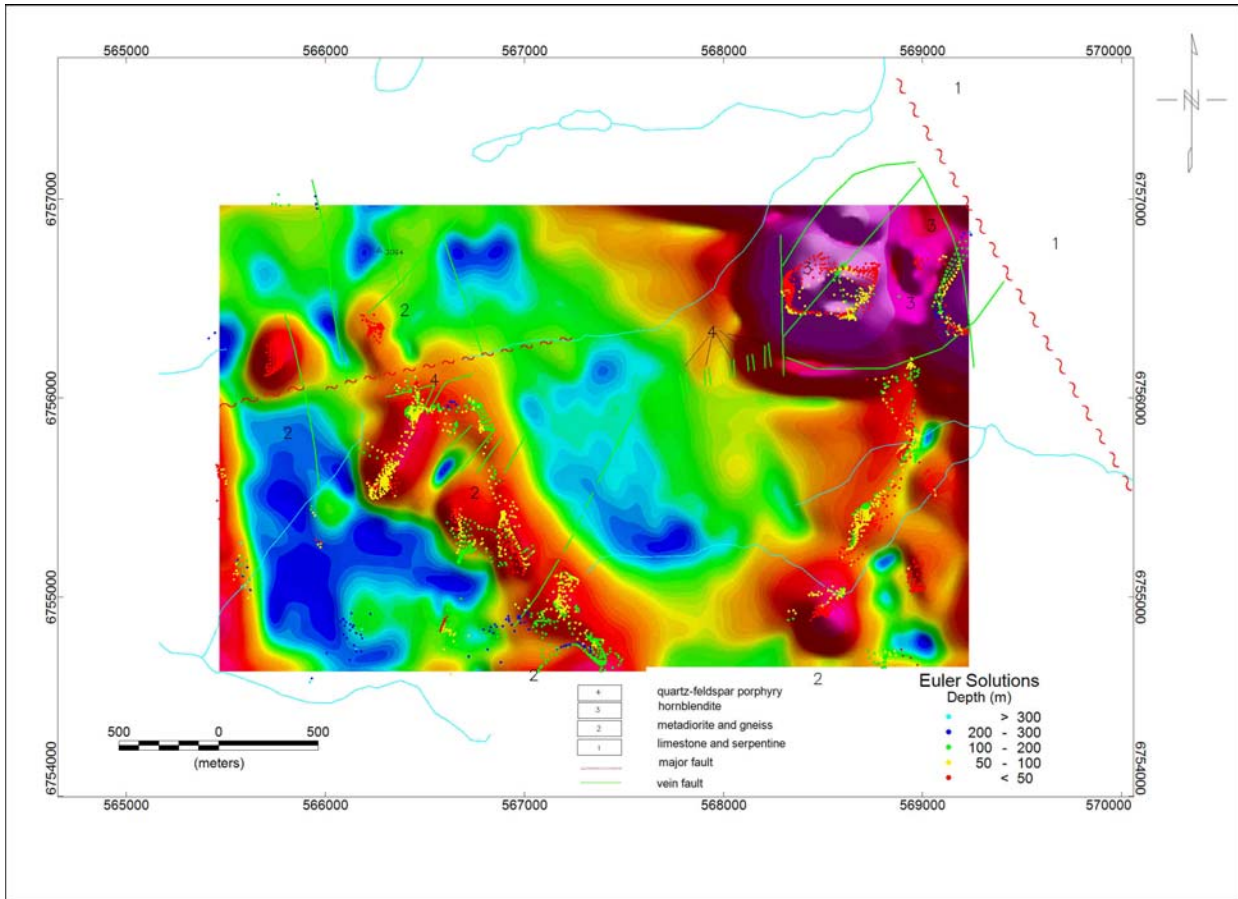
### **4.3 Inversion of the magnetic data**

Several computer-based techniques can be used to automatically detect magnetic sources and yield estimations of their geometrical and physical parameters. These techniques can be either used to gridded data (3D methods) or to profiles (2D methods). Euler deconvolution is a well established technique, allowing a rapid interpretation of a large amount of magnetic data. This method is mainly aimed to delineate magnetic sources boundaries and to estimate their depths.

Fig. 9 shows the results obtained with the Euler deconvolution inversion using a structural index of 1, a depth tolerance of 10% and a square deconvolution window with a size of  $400 \times 400$  metres. Euler solutions have been plotted on the total gradient (analytic signal) map for a better illustration. The peaks of the total gradient are also used to locate and delineate magnetic sources boundaries. The advantage of the total gradient (analytic signal) is that the location and delineation of magnetic bodies is independent of the magnetization and the inducing magnetic field direction.

The map shows that Euler solutions are mostly located at shallow depths (<200m). The shallowest solutions (<50m) are located in the north-eastern corner of the block and provide the outlines of the ultramafic intrusion. Most of them are located in the central area and associated with the mapped ultramafic sills and dykes. Deeper solutions (50-200m) are associated with NW and NE lineaments corresponding to mafic dykes. Results obtained with the Euler deconvolution confirm the qualitative analysis conducted with the reduced maps and can be very useful for the structural understanding of the area.





**Fig. 9 Euler deconvolution solutions plotted on the total gradient image.**

## **5. INTERPRETATION of the VTEM DATA**

### **5.1 Introduction**

Transient electromagnetic surveys have proven to be a very efficient tool in mineral exploration by detecting hidden deposits characterized by higher conductivities than the medium in which they are embedded. Because Time domain systems have a much greater depth penetration compared to the Frequency domain systems, these systems are considered as a tool of choice in the mining exploration. The Geotech Helicopter VTEM system, operating in the Time domain, uses concentric-loop geometry with the receiver mounted in the centre of a larger transmitter loop. Both loops are oriented in the vertical plane. This configuration has a number of advantages, as a maximum coupling, sharper anomalies by comparison to airborne fixed wing systems, and the shape of the anomalies is independent of the flight path orientation. Furthermore, the high moment transmitter combined with the lower terrain clearance yields stronger secondary field signals in most conductors when compared to other systems. The actual VTEM systems measure both the electromagnetic induction field  $B$  and its time derivative  $dB/dt$ . This system specificity has a lot of advantages, as the  $dB/dt$  better resolves the shallow conductive sources while the  $B$ -field exhibits a better resolution for deep conductors.

### **5.2 VTEM anomalies shape**

For concentric-loop geometry systems when both loops are oriented in the Z-axis (VTEM system) thick dipping or horizontal conductors exhibit a characteristic single peak, while steeply dipping and thin conductors manifest a double peak. The minimum indicates the location of the top of the thin conductor, and the major peak indicates the side towards which the conductor is dipping. Synthetic models anomalies were generated for the plate type conductors are provided in the Appendix A to better understand the shape of the VTEM anomalies

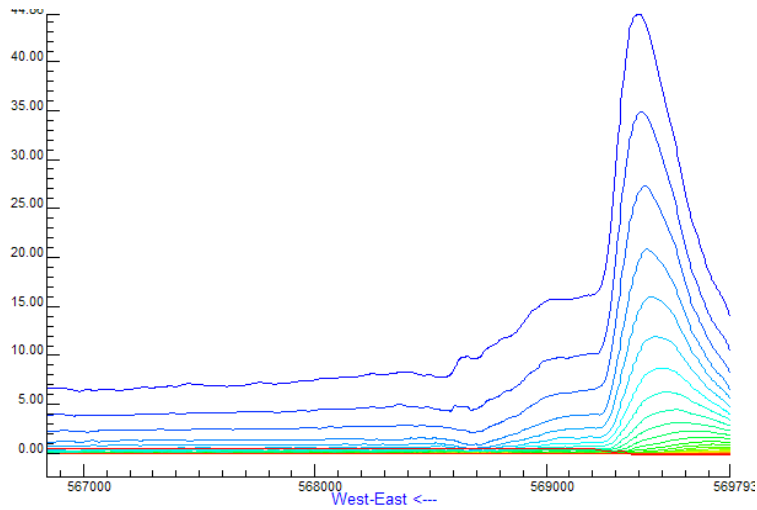
### **5.3 Analysis of the EM results**

Figures 12 and 13 show the stacked profiles in pseudo-logarithmic scale of the dB/dt and B-field decays, respectively. The maps do not show any noticeable anomalies except for the east most portion of the line 5010 where, a very weak anomaly zone is fairly observed (Fig. 10). The anomaly is related to poorly conductive bedrock moderately dipping in the eastern direction (Fig. 10). No evident anomalies can, however be observed in the rest of the survey lines (Fig. 11).

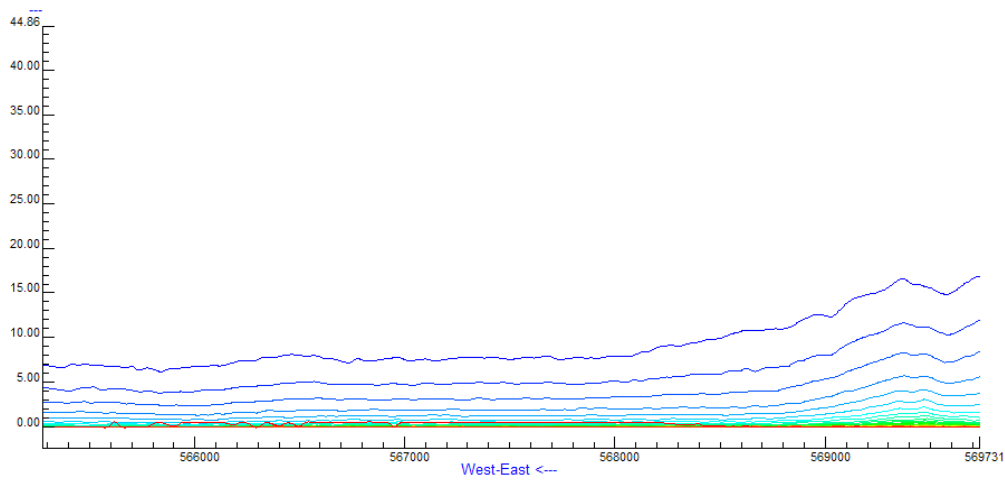
The interpretation of the EM profiles was performed using in-house built software for automatically picking the anomalies along the profiles and yielding estimates of the conductance and the decay constant ( $\tau$ ) of isolated anomalies. The picked EM anomalies were posted on the late time EM channel. Figures 14 and 15 illustrate the results of the picked anomalies superimposed on the dB/dt, and B-field late time channel (3.911 ms after the current shut off), respectively.

The estimated conductance values of the picked anomalies are very low ( $<0.5$  S) and the calculated decay constants are negligible (less than 0.3ms), excluding the existence of good conductive bedrocks in this area. Several weak anomalies are depicted over the whole block, however neither one is associated with local good conductor.

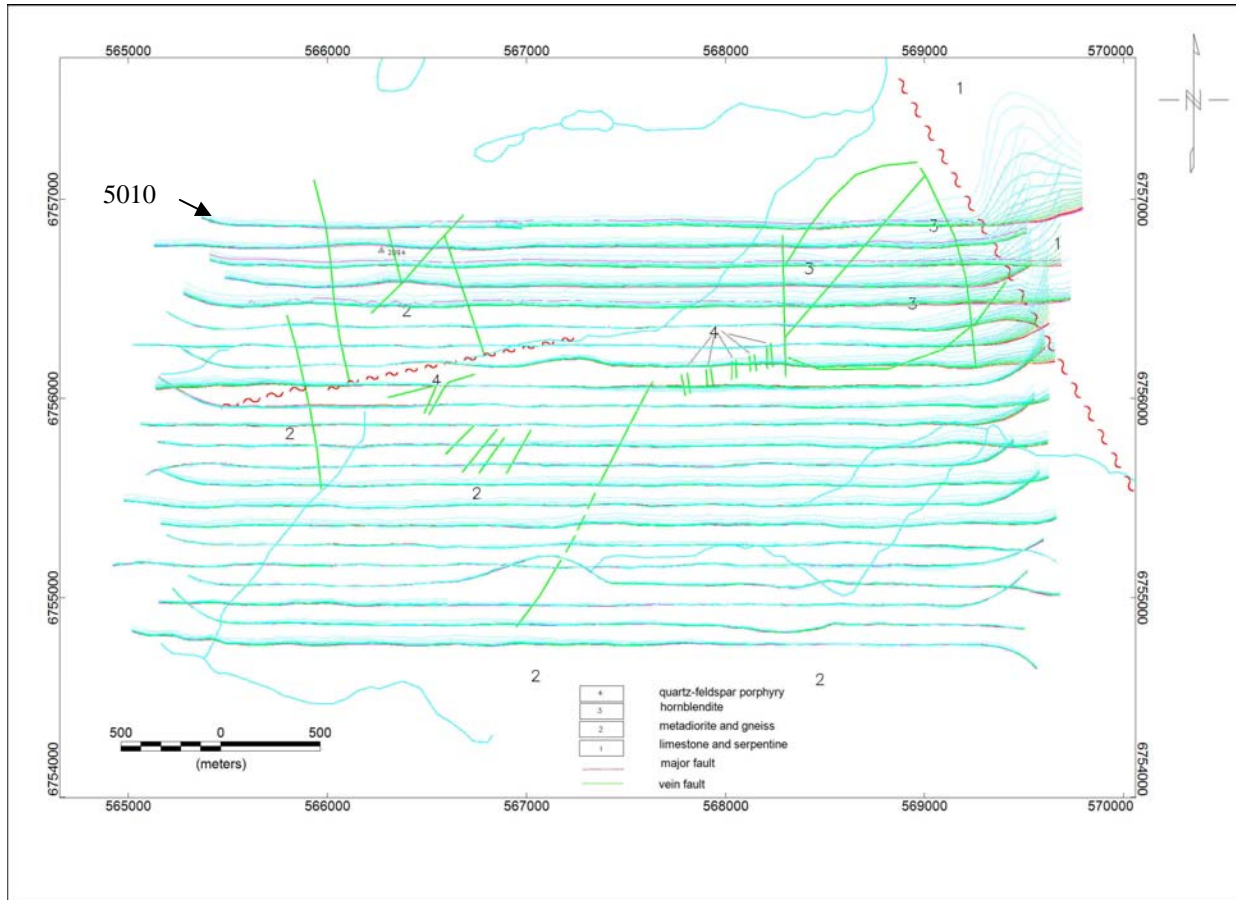
The interpretation map (Fig. 18) shows the results of the magnetic and electromagnetic analysis superimposed on the total gradient image. The magnetic interpretation allowed us to delineate accurately the ultramafic body located in the northeastern corner of the block. Also, it helped to locate linear magnetic bodies (NW and NE trending) associated with metadioritic dykes. On the other hand, the interpretation suggests the existence of NNW trending faults. The analysis of the EM data does not reveal any significant anomaly that could be related to conductive bedrocks. All detected anomalies are weak and close to the background level; however they are closely correlated to the existing magnetic structures.



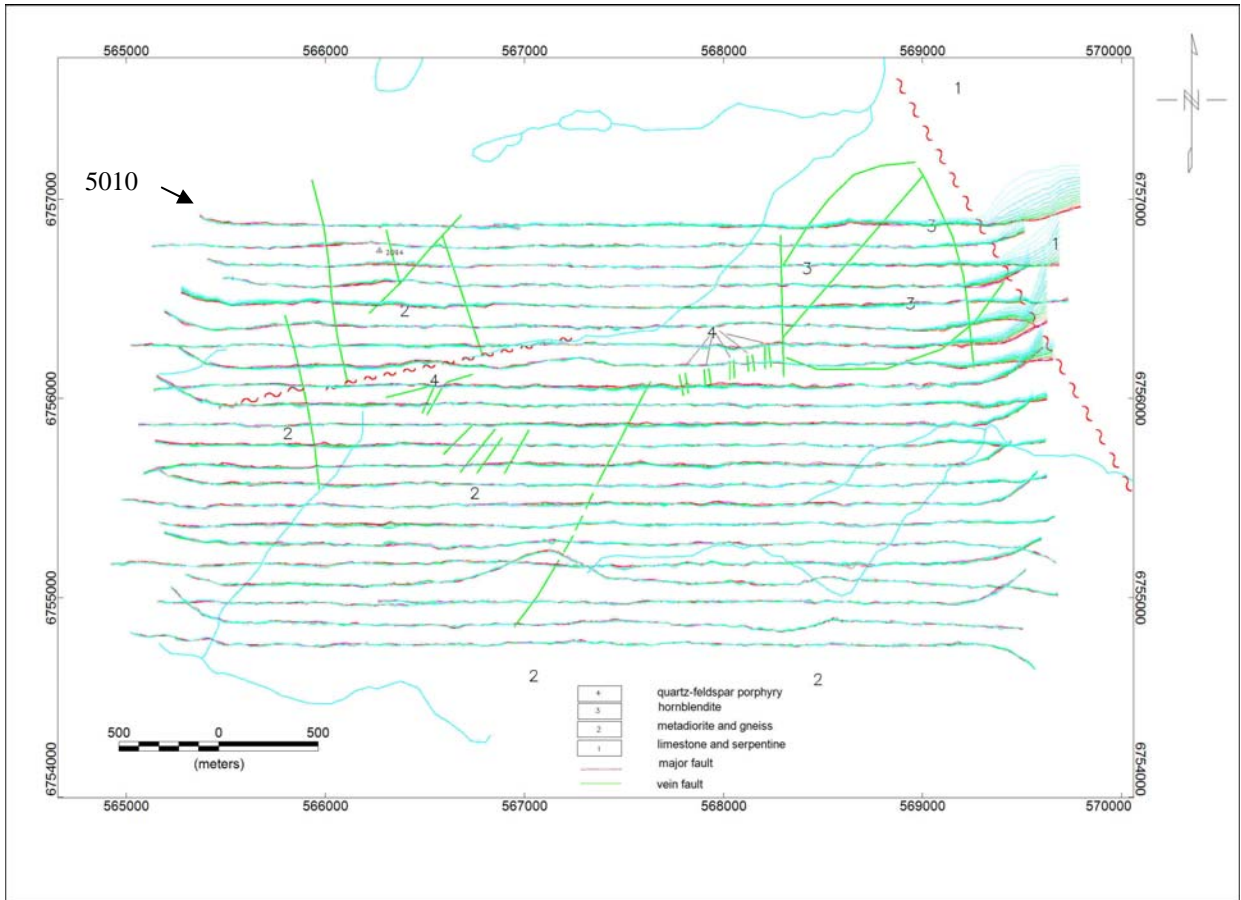
**Fig. 10 EM decays over for the line 5010 indicating a weak response (early and mid time decays) in the eastern portion of the line.**



**Fig. 11 Common shape of the EM decays over the Rosy property (Line 5050).**



**Fig. 12 EM dB/dt stacked profiles at log-linear scale. Early time decays are in green and late time in red. The map indicates a weak anomalous zone in the NW corner associated with overburden.**



**Fig. 13 EM B-Field stacked profiles at log-linear scale. Early time decays are in green and late time in red. The map indicates a weak anomalous zone in the NW corner associated with overburden.**

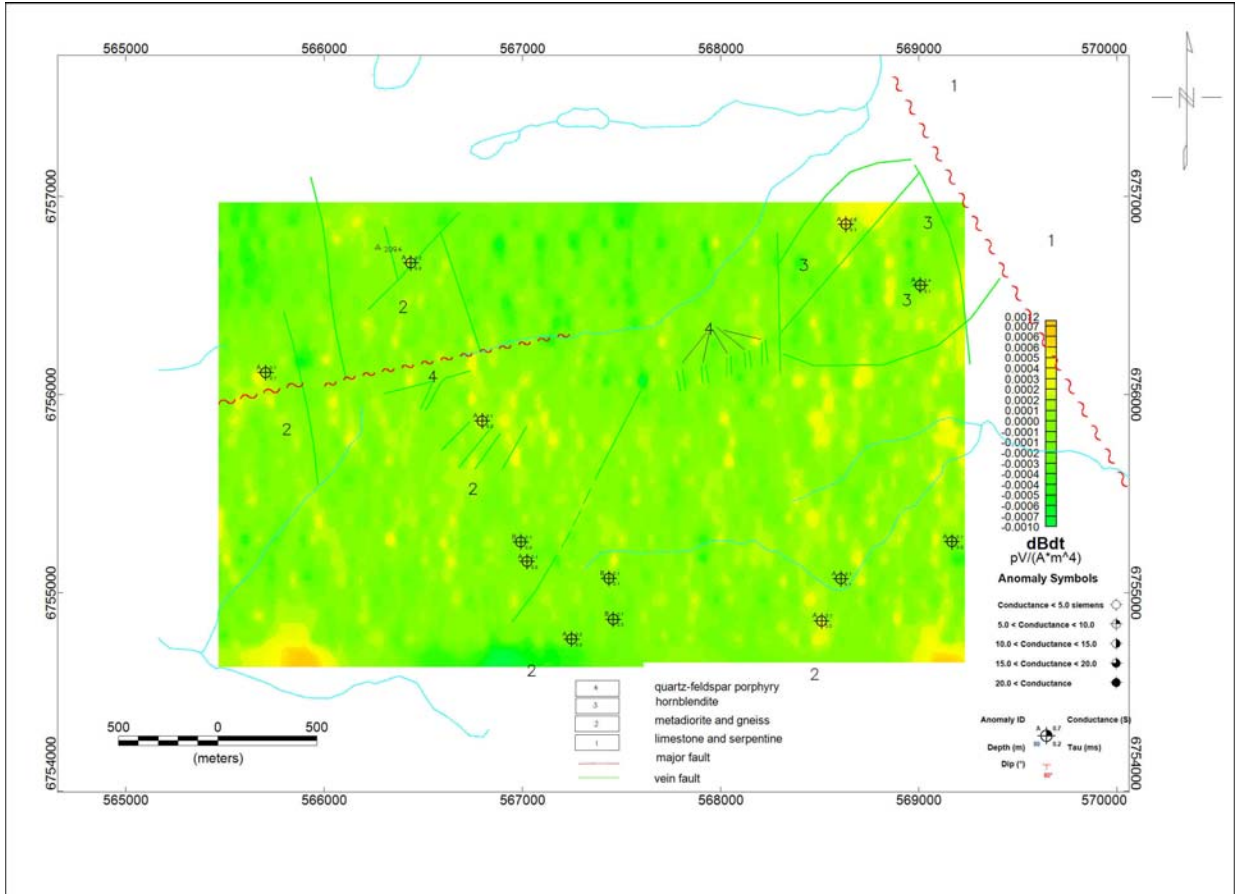


Fig. 14 EM picked anomalies plotted on the late time dB/dt channel image (3.911 ms after current shut off).

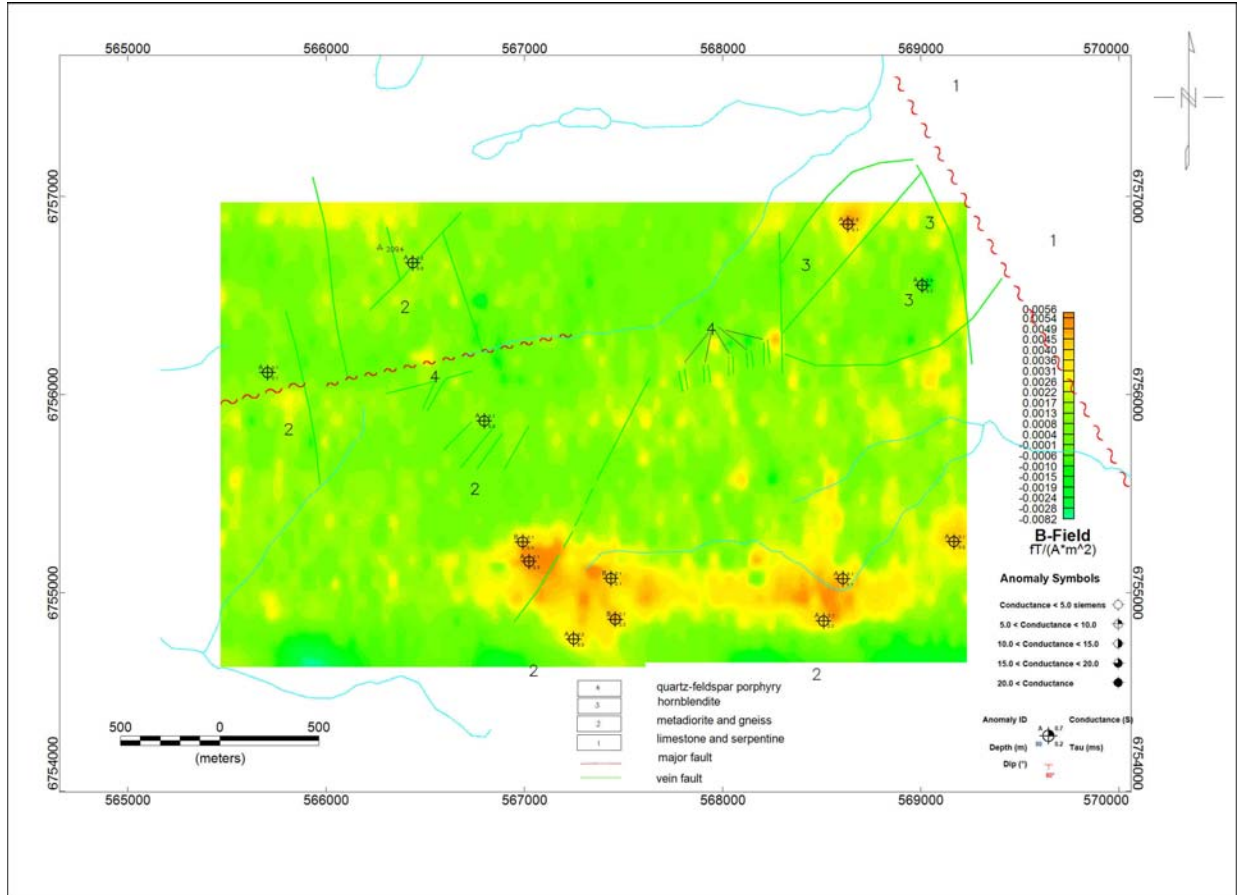
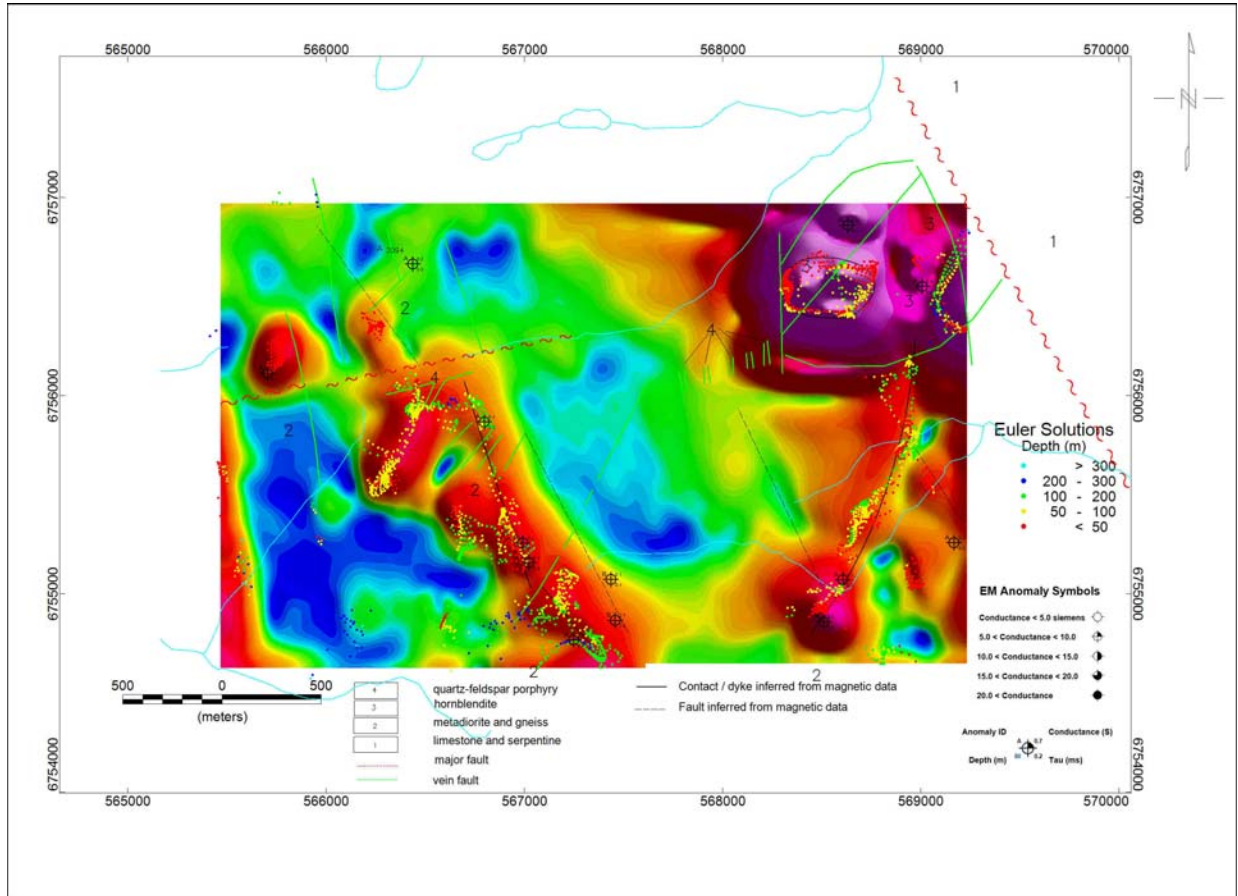


Fig. 15 EM picked anomalies plotted on the late time B-Field channel image (3.911 ms after current shut off).



## 5.4 EM Anomalies description

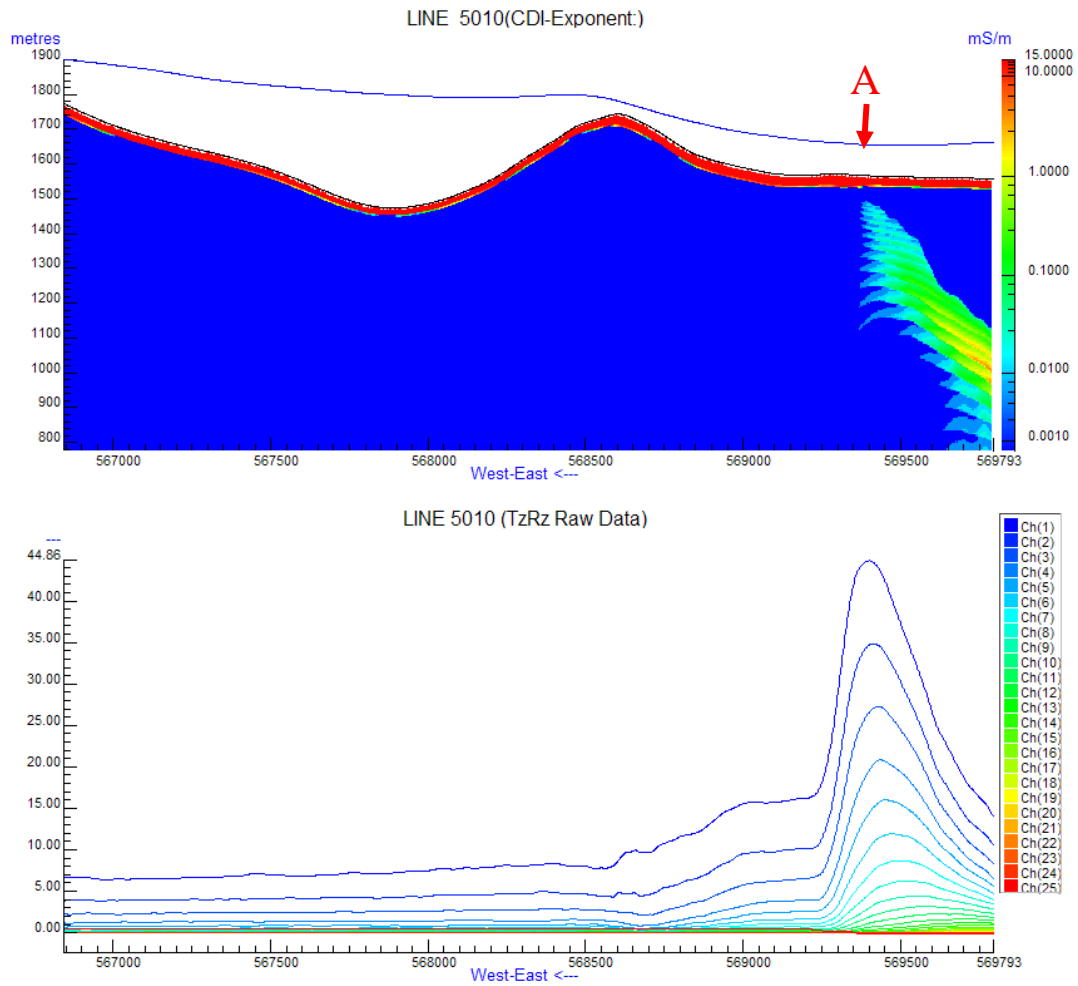
As shown in table 1 the estimated conductance and decay constant values are very low. The obtained results do not reveal the existence of good conductive bedrocks in the ROSY property.

Lines	ID	Type	x(m)	y(m)	dem (m)	Rx-Alt(m)	Cond.(S)	Tau(ms)		
5010	A	""	568631	6756861	1772	35	0.5	0.1	*	*
5030	A	""	566437	6756666	1893	116	0.2	0.0	*	*
5170	A	""	569165	6755260	1530	43	0.1	0.0	*	*
5170	B	""	566991	6755259	1772	62	0.1	0.0	*	*
5180	A	""	567023	6755160	1787	49	0.1	0.0	*	*
5190	A	""	568605	6755073	1596	44	0.1	0.1	*	*
5190	B	""	567436	6755075	1700	60	0.1	0.1	*	*
5210	A	""	568508	6754860	1772	32	0.1	0.0	*	*
5210	B	""	567458	6754868	1766	83	0.1	0.0	*	*
5220	A	""	567248	6754769	1796	66	0.2	0.0	*	*
5910	A	""	565705	6756113	1805	67	0.1	0.1	*	*
5920	A	""	566797	6755869	1986	37	0.1	0.3	*	*
5940	A	""	569006	6756553	1639	43	0.4	0.1	*	*

Table 1. Summarized results of picked anomalies in the Rosy property.

## 5.5 Conductivity Depth Section

Conductivity depth imaging (CDI) is considered as one of the important steps in the analysis and interpretation of electromagnetic data. CDI allows providing useful information of the conductivity distribution of the considered cross section. CDI was performed for the line 5010 using the EMflow software. The obtained results are shown in Fig.17.



**Fig. 17** CDI section for the line 5010 indicating moderately dipping (easterly) poor conductive bedrock. Letter A, indicates the location of the anomaly in the map.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

The analysis of the magnetic map of the ROSY property allowed to map and to accurately delineate a highly magnetic structure associated with ultramafic formations located in the north-eastern corner of the block. It also helped to locate NW and NE trending magnetic dykes associated with mafic dykes (diorites). The interpretation also suggests the existence of NNW trending faults.

The analysis of the EM data revealed the existence of several very weak anomalies over the whole block, however neither one is associated with local good conductor.

CDI section performer for the line 5010 showed that the observed anomaly is associated with easterly dipping poor conductive bedrock.

Based on the obtained results, the Vtem survey was unable to detect good conductive bedrocks directly or indirectly associated with metallic mineralization. However, if it is established that the mineralization is presented in disseminated form and /or associated with disseminated sulphides, then it is recommended to carry out ground IP surveys to map metallic disseminated zones.

Respectfully submitted,

Nasreddine Bournas, PhD, PGeo.  
Geotech Ltd.  
February, 2008



## 7. REFERENCES

1. J. CHEN, A. RAICHE, AND J. MACNAE, 2000, Inversion of airborne EM data using thin-plate models, SEG 2000 expanded abstracts.
2. STOLZ, E.M.G. AND MACNAE, J.C., 1991 Evaluating EM waveforms by singular-value decomposition of exponential functions. *Geophysics*, 63, 64-74
3. A.B. REID, J.M. ALLSOP, H. GRANSE, A.J. MILLETT AND I.W. SOMERTON, 1990, Magnetic interpretation in three dimensions using Euler deconvolution, , *Geophysics*, 55, 80-91.
4. Yukon Geological Survey, [www.geology.gov.yk.ca](http://www.geology.gov.yk.ca)



## APPENDIX A

### VTEM ANOMALY MODELING

#### I. THIN PLATE

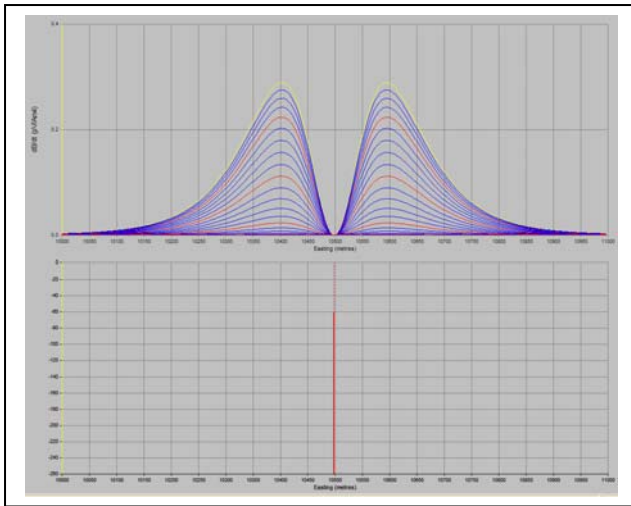


Figure A-1: dB/dt response of a shallow vertical thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

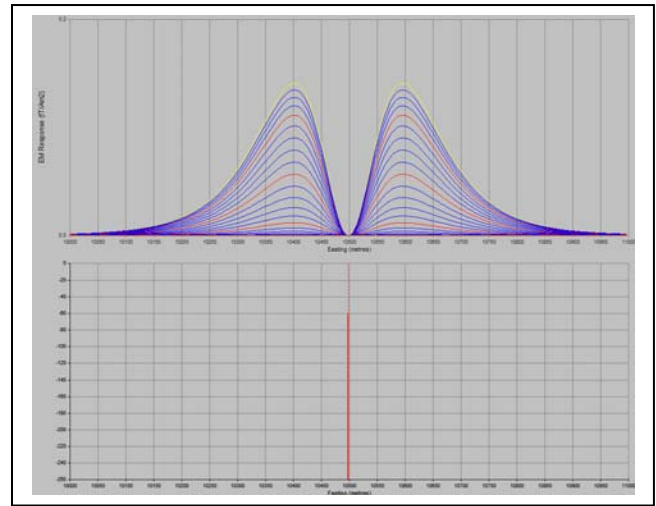


Figure A-2: B-field response of a shallow vertical thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

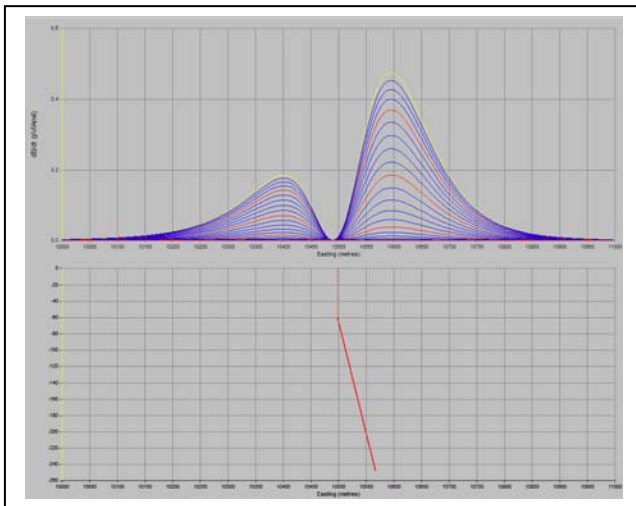


Figure A-3: dB/dt response of a shallow skewed thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

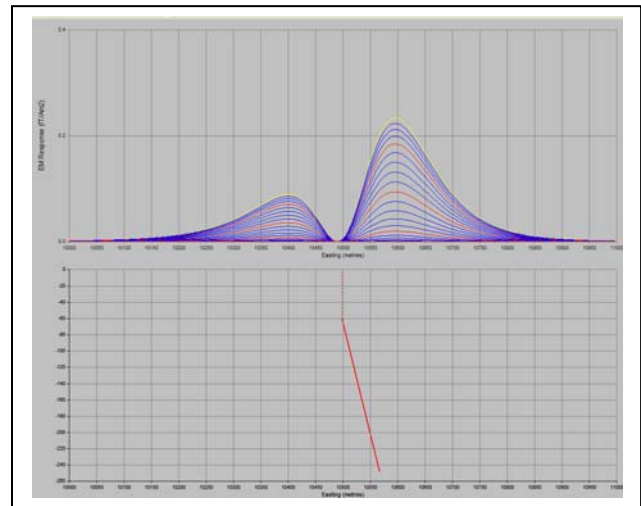


Figure A-4: B-field response of a shallow skewed thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

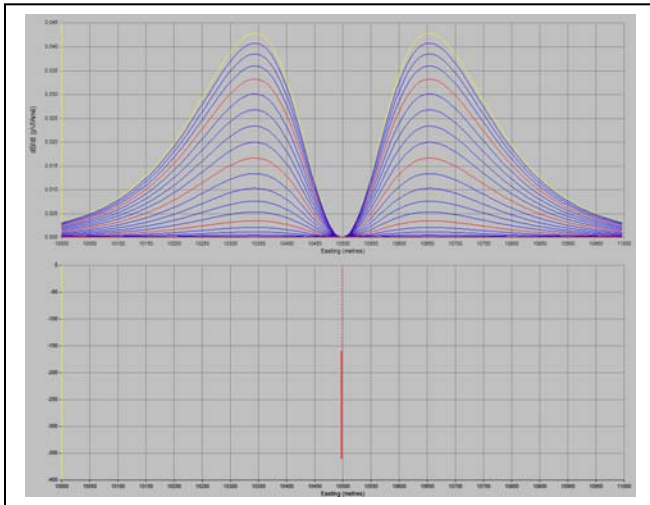


Figure A-5: dB/dt response of a deep vertical thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

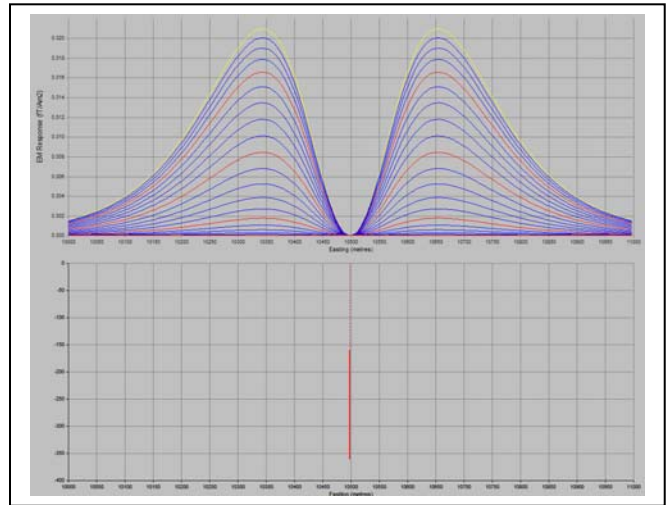


Figure A-6: B-Field response of a deep vertical thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.

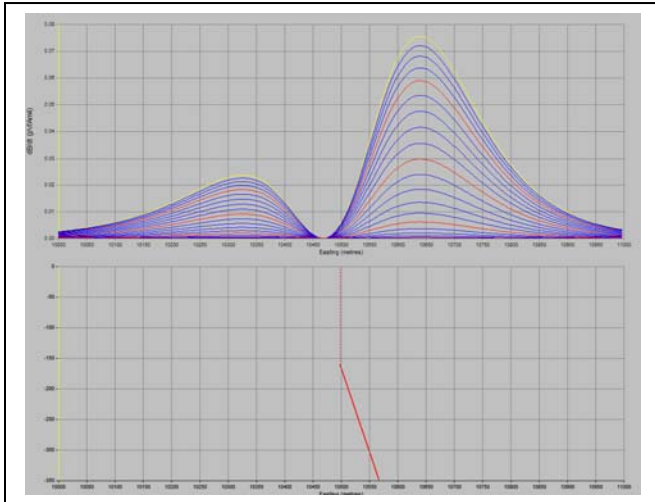


Figure A-7: dB/dt response of a deep skewed thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

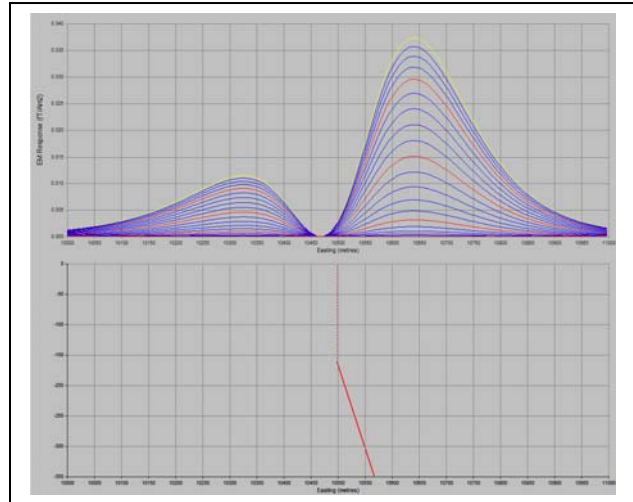


Figure A-8: B-field response of a deep skewed thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.

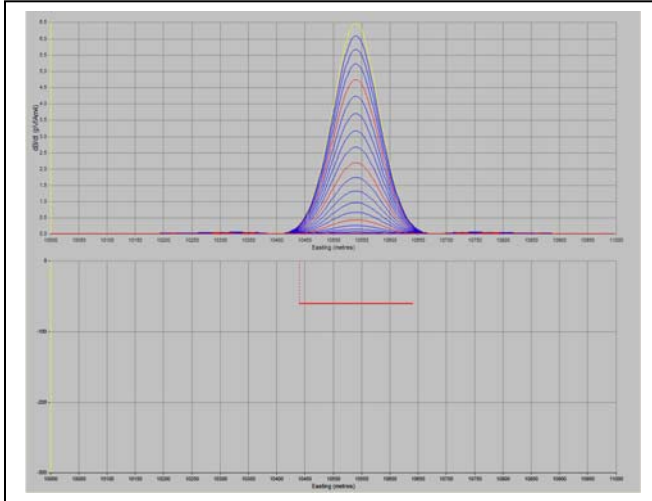


Figure A-9: dB/dt response of a shallow horizontal thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

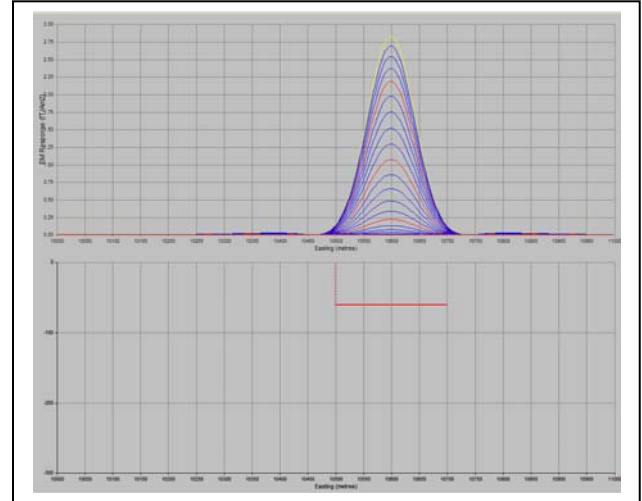


Figure A-10: B-Field response of a shallow horizontal thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

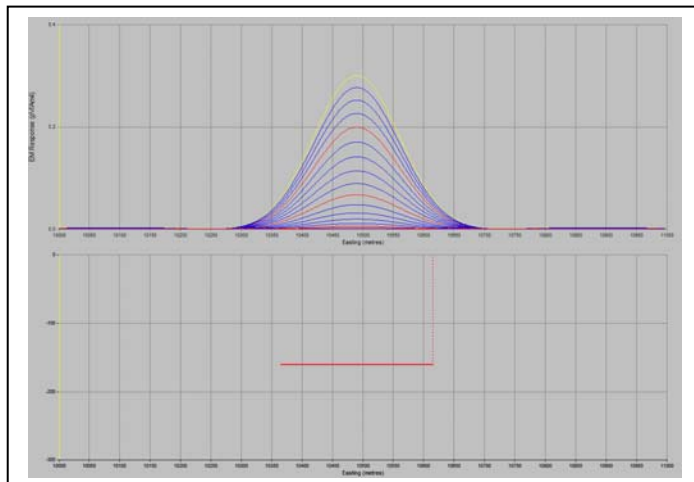


Figure A-11: dB/dt response of a deep horizontal thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

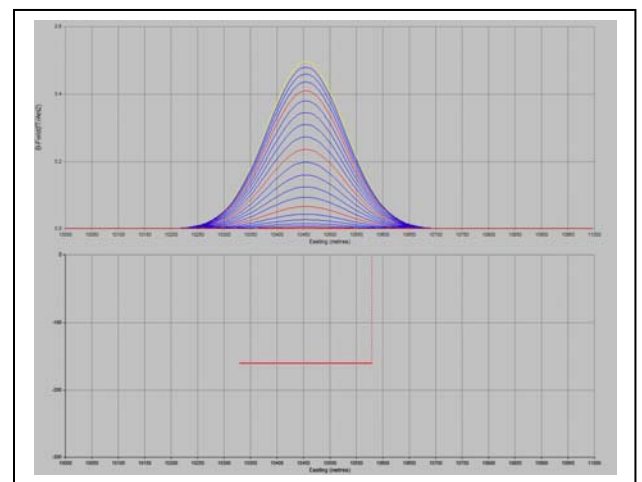


Figure A-12: B-Field response of a deep horizontal thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.

## II. THICK PLATE

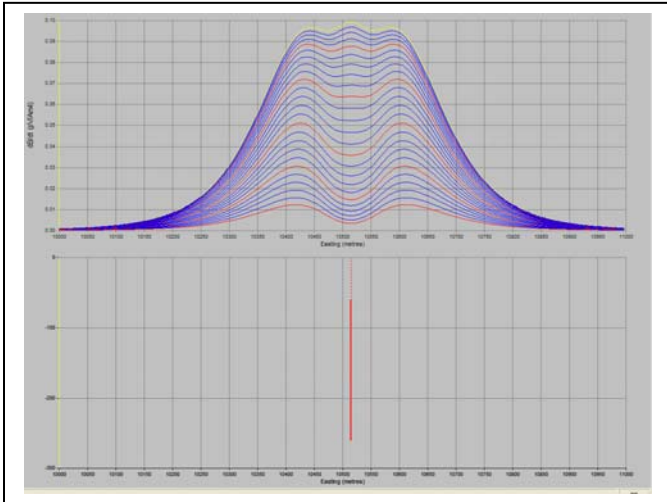


Figure A-13: dB/dt response of a shallow vertical thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment and the Rx area.

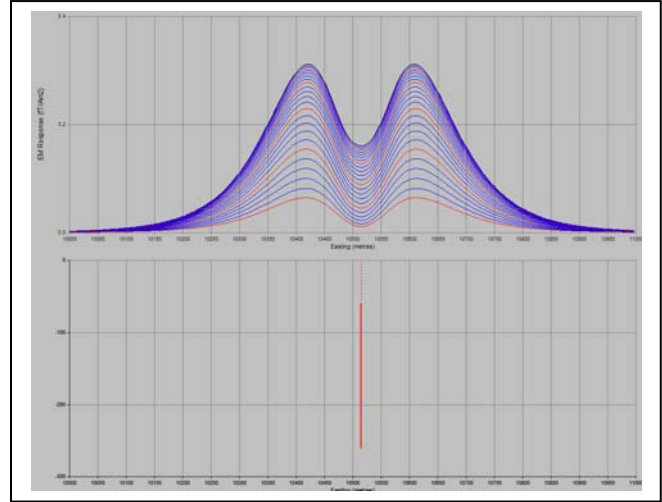


Figure A-14: B-Field response of a shallow vertical thick plate. Depth=100 m, C=12 S/m, thickness= 20 m. The EM response is normalized by the dipole moment.

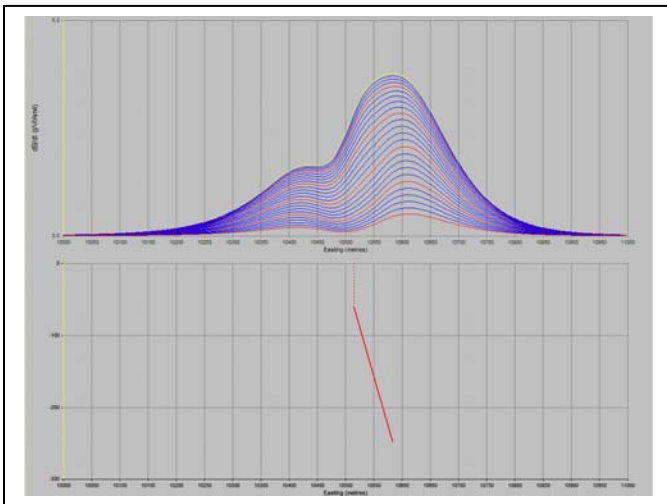


Figure A-15: dB/dt response of a shallow skewed thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment and the Rx area.

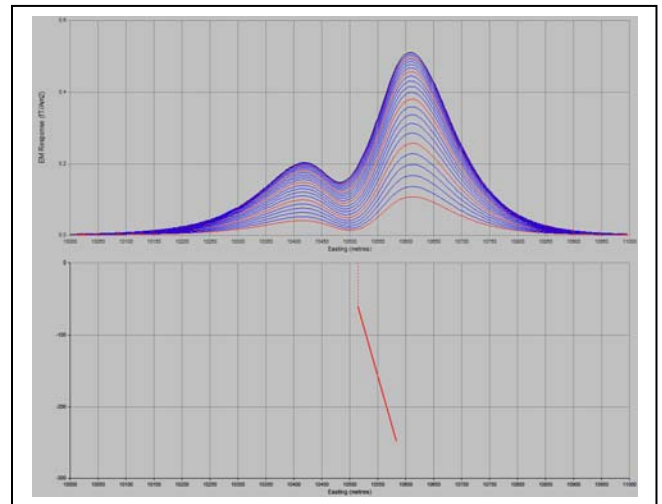


Figure A-16: B-Field response of a shallow skewed thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment.

### III. MULTIPLE THIN PLATES

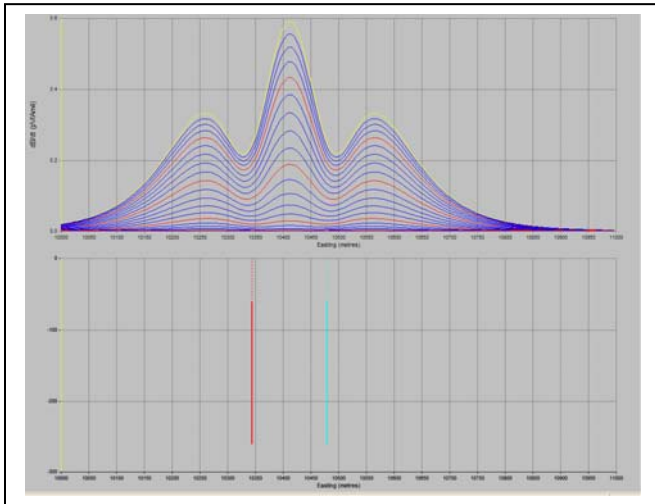


Figure A-17: dB/dt response of two vertical thin plates. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

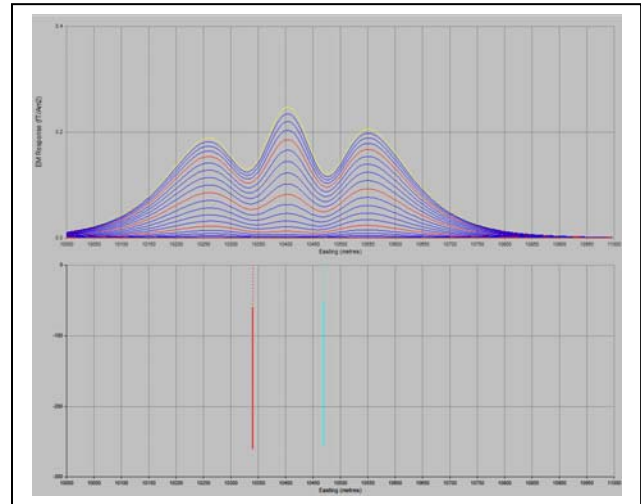


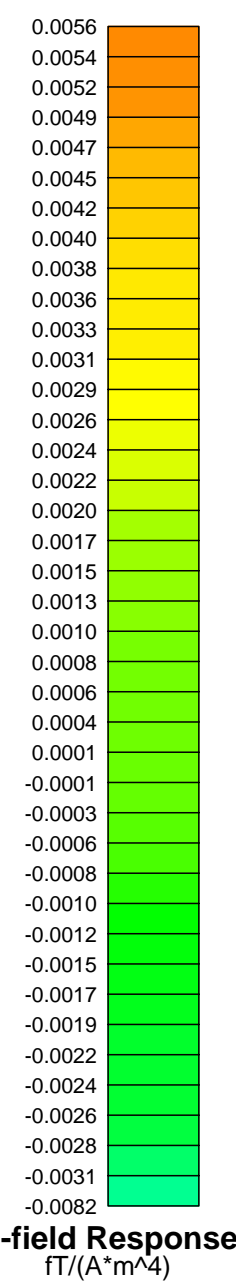
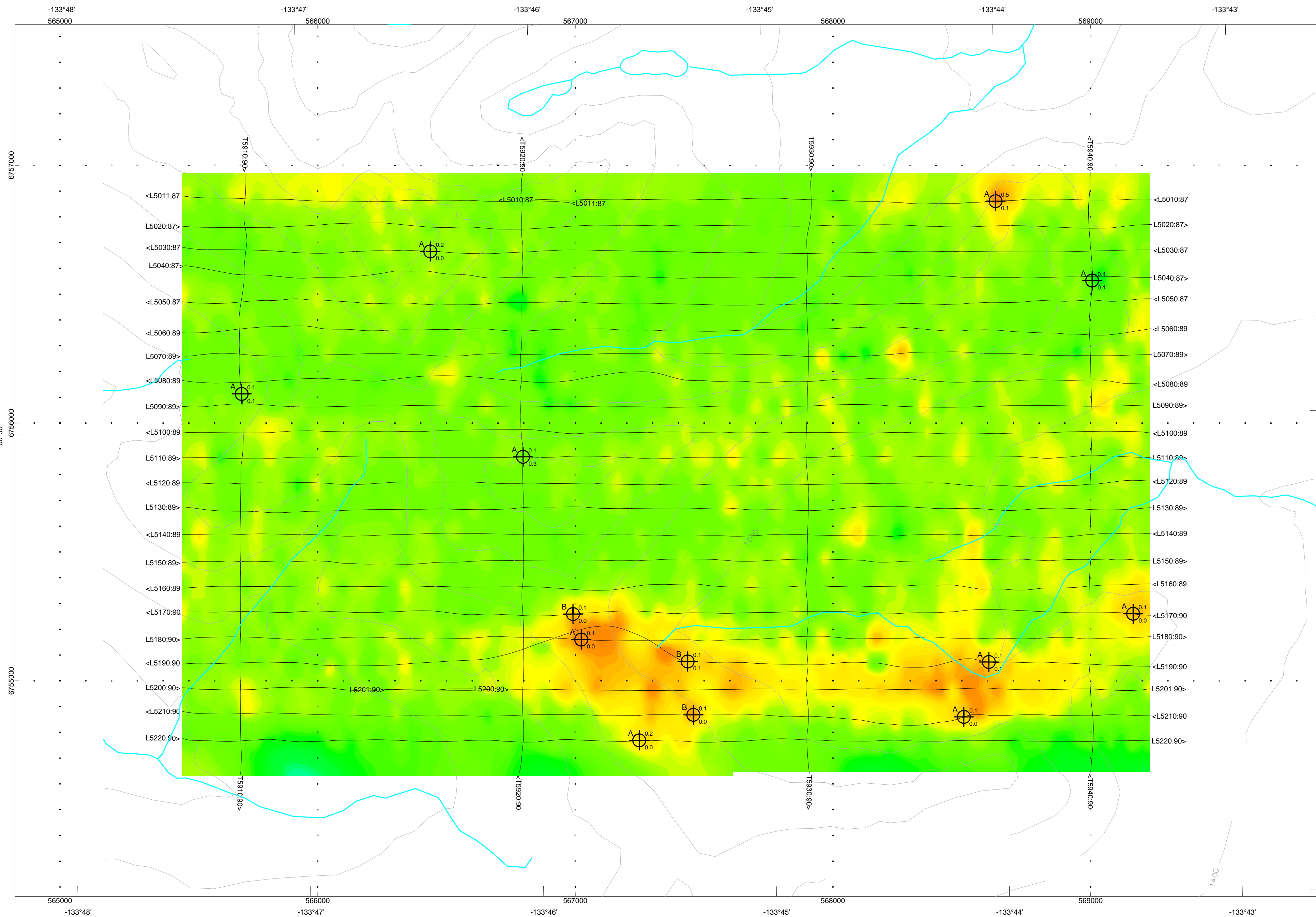
Figure A-18: B-Field response of two vertical thin plates. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

**Survey Specifications:**

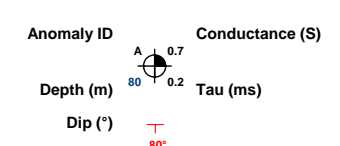
Date Flown: August, 2007  
 Aircraft: Astar B3 helicopter, Registration C-GTFX  
 Nominal Flight Line Spacing: 100 metres  
 Nominal Flight Line Direction: EW  
 Nominal Tie Line Spacing: 1000 metres  
 Nominal Tie Line Direction: NS  
 Nominal helicopter terrain clearance 150 metres  
 EM Loop is 35 metres under helicopter  
 Magnetic sensor is 15 metres under helicopter

**Instruments:**

Geotech Time Domain Electromagnetic System (VTEM)  
 with concentric Rx/Tx geometry  
 Transmitter Loop Diameter 26 m, Base Frequency 30 Hz  
 Dipole Moment 400,000 N/A  
 Transmitter Wave Form: Trapezoid, Pulse Width 7.22 ms  
 Geometrics Optically-pumped,  
 High Sensitivity Cesium Magnetometer  
 Magnetometer Resolution 0.02 nT at 10 samples/sec


**Anomaly Symbols**

- Conductance < 5.0 siemens
- 5.0 < Conductance < 10.0
- 10.0 < Conductance < 15.0
- 15.0 < Conductance < 20.0
- 20.0 < Conductance



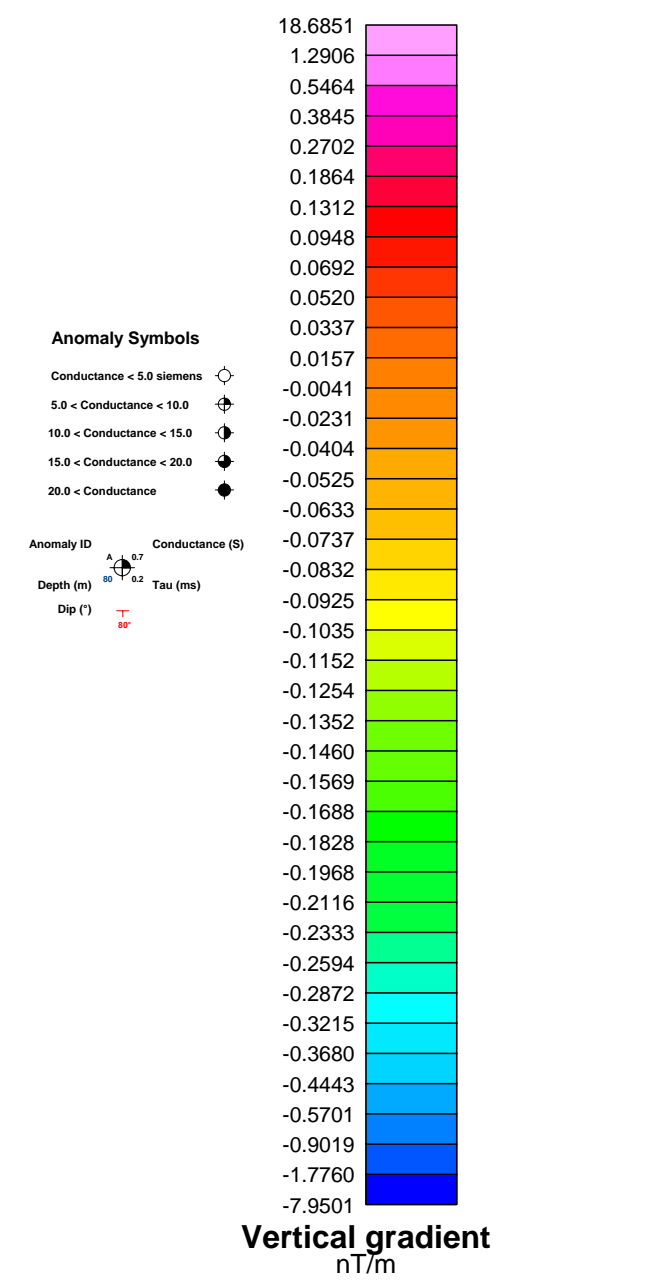
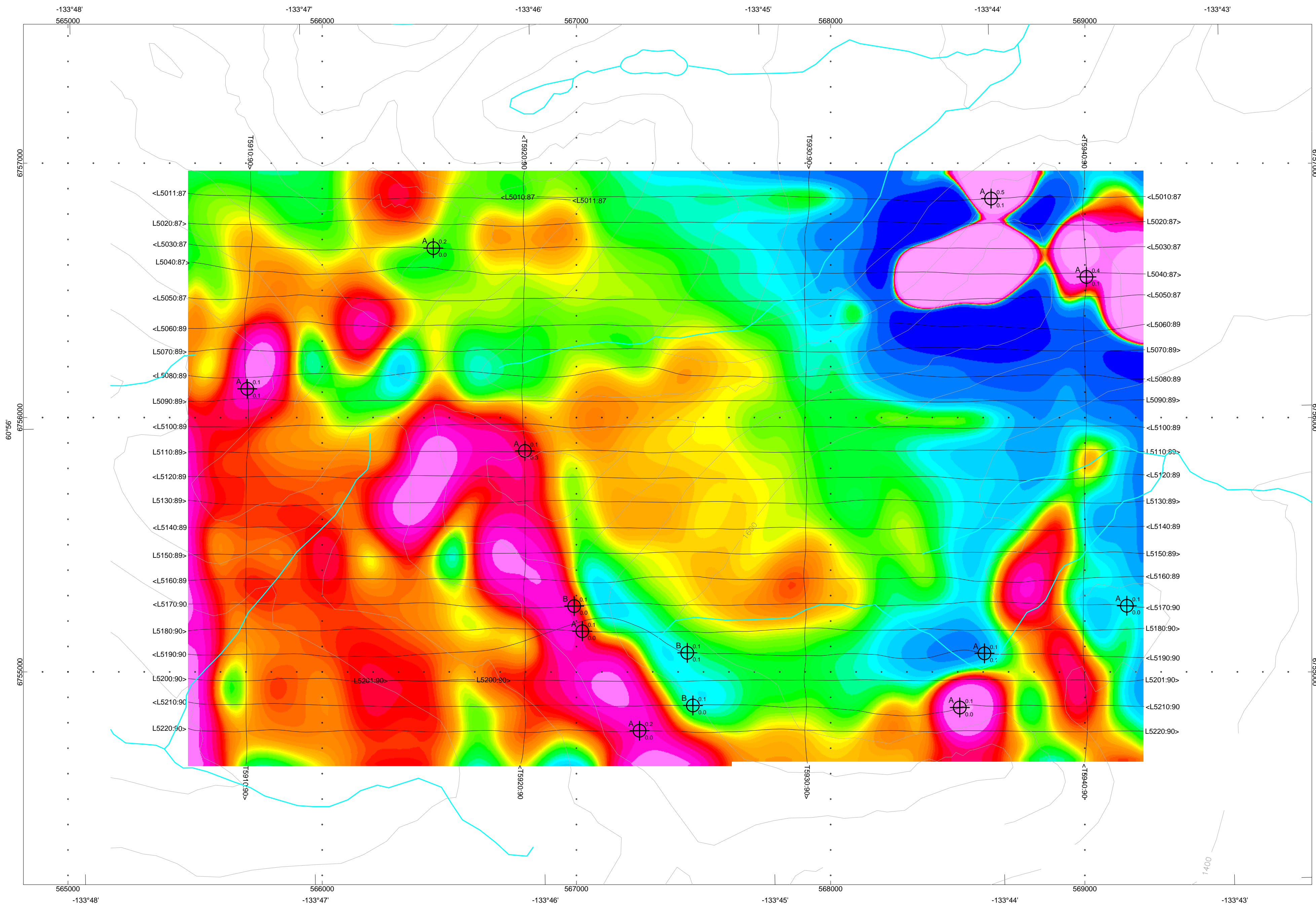
Anomaly ID	Conductance (S)	Depth (m)	Dip (°)	Tau (ms)
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A 0.5	0.0004	0.1		0.0001
A 0.4	-0.0001	0.1		-0.0003
A 0.1	-0.0006	0.1		-0.0010
A 0.1	-0.0012	0.1		-0.0015
A 0.1	-0.0017	0.1		-0.0022
A 0.1	-0.0022	0.1		-0.0024
A 0.1	-0.0028	0.1		-0.0031
A 0.1	-0.0031	0.1		-0.0082
A 0.1	0.0001	0.1		0.0004
A 0.1	0.0006	0.1		0.0026
A 0.1	0.0026	0.1		0.0049
A 0.1	0.0049	0.1		0.0082
A 0.1	0.0082	0.1		0.0150
A 0.1	0.0150	0.1		0.0260
A 0.1	0.0260	0.1		0.0490
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A 0.1	49000.0000	0.1		82000.0000
A 0.1	82000.0000	0.1		150000.0000
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A 0.1	82000000000000000000000000000000.0000	0.1		150000000000000000000000000000000.0000
A 0.1	150000000000000000000000000000000.0000	0.1		260000000000000000000000000000000.0000
A 0				

**Survey Specifications:**

Date Flown: August, 2007  
 Aircraft: Astar B3 helicopter, Registration C-GTFX  
 Nominal Flight Line Spacing: 100 metres  
 Nominal Flight Line Direction: EW  
 Nominal Tie Line Spacing: 1000 metres  
 Nominal Tie Line Direction: NS  
 Nominal helicopter terrain clearance 150 metres  
 EM Loop is 35 metres under helicopter  
 Magnetic sensor is 15 metres under helicopter

**Instruments:**

Geotech Time Domain Electromagnetic System (VTEM)  
 with concentric Rx/Tx geometry  
 Transmitter Loop Diameter 26 m, Base Frequency 30 Hz  
 Dipole Moment 400,000 N/A  
 Transmitter Wave Form: Trapezoid, Pulse Width 7.22 ms  
 Geometrics Optically-pumped,  
 High Sensitivity Cesium Magnetometer  
 Magnetometer Resolution 0.02 nT at 10 samples/sec



**Anomaly Symbols**

- Conductance < 5.0 siemens
- 5.0 < Conductance < 10.0
- 10.0 < Conductance < 15.0
- 15.0 < Conductance < 20.0
- 20.0 < Conductance

**Anomaly ID**

- A
- B

**Depth (m)**

- 0.0
- 0.1
- 0.2
- 0.5

**Dip (°)**

- 0.0
- 0.1
- 0.2
- 0.5

**Conductance (S)**

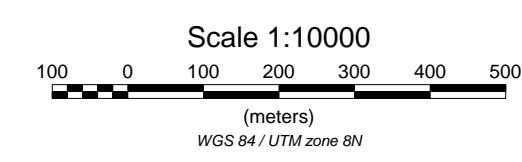
- 0.0
- 0.1
- 0.2
- 0.5
- 1.0
- 2.0
- 5.0
- 10.0
- 20.0

**Depth (m)**

- 0.0
- 0.1
- 0.2
- 0.5

**Dip (°)**

- 0.0
- 0.1
- 0.2
- 0.5



**ATAC Resources Ltd.**  
**ROSY Property**  
**Yukon, Canada**

**Geotech VTEM System**  
**Vertical gradient of TMI**

Flown and processed by Geotech Ltd.  
 245 Industrial Parkway N.,  
 Aurora, Ontario, Canada L4G 4C4  
 www.geotech.ca

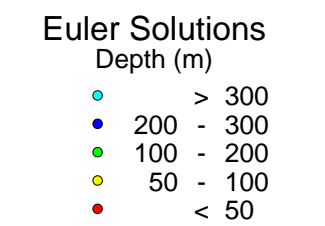
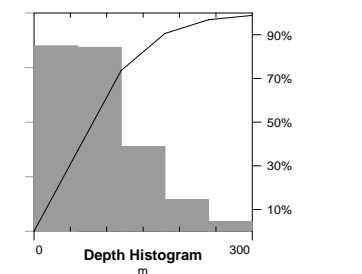
**March 2008**

**Survey Specifications:**

Date Flown: August, 2007  
 Aircraft: Astar B3 helicopter, Registration C-GTFX  
 Nominal Flight Line Spacing: 100 metres  
 Nominal Flight Line Direction: EW  
 Nominal Tie Line Spacing: 1000 metres  
 Nominal Tie Line Direction: NS  
 Nominal helicopter terrain clearance 150 metres  
 EM Loop is 35 metres under helicopter  
 Magnetic sensor is 15 metres under helicopter

**Instruments:**

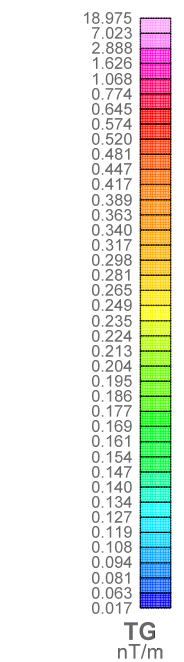
Geotech Time Domain Electromagnetic System (VTEM)  
 with concentric Rx/Tx geometry  
 Transmitter Loop Diameter 26 m, Base Frequency 30 Hz  
 Dipole Moment 400,000 N/A  
 Transmitter Wave Form: Trapezoid, Pulse Width 7.22 ms  
 Geometrics Optically-pumped,  
 High Sensitivity Cesium Magnetometer  
 Magnetometer Resolution 0.02 nT at 10 samples/sec


**Anomaly Symbols**

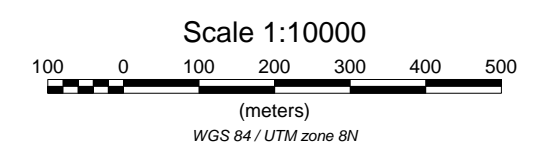
- Conductance < 5.0 siemens
- 5.0 < Conductance < 10.0
- 10.0 < Conductance < 15.0
- 15.0 < Conductance < 20.0
- 20.0 < Conductance

Anomaly ID  
 Depth (m)  
 Dip (°)

Conductance (S)  
 Tau (ms)



- 4 quartz-feldspar porphyry
- 3 hornblende
- 2 metadiorite and gneiss
- 1 limestone and serpentine
- major fault
- vein fault
- Contact / dyke inferred from magnetic data
- Fault inferred from magnetic data

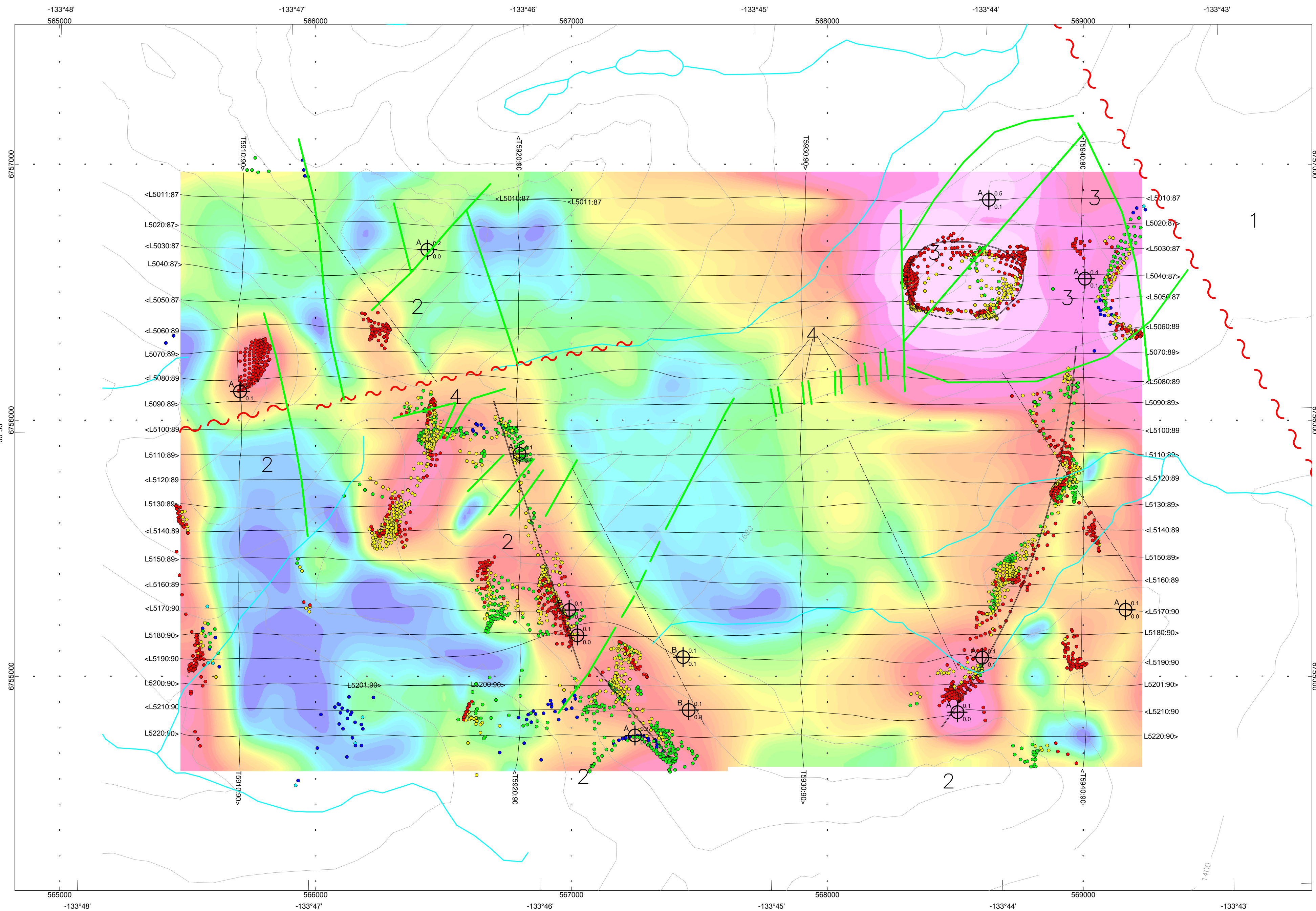


**ATAC Resources Ltd.**  
**ROSY Property**  
**Yukon, Canada**

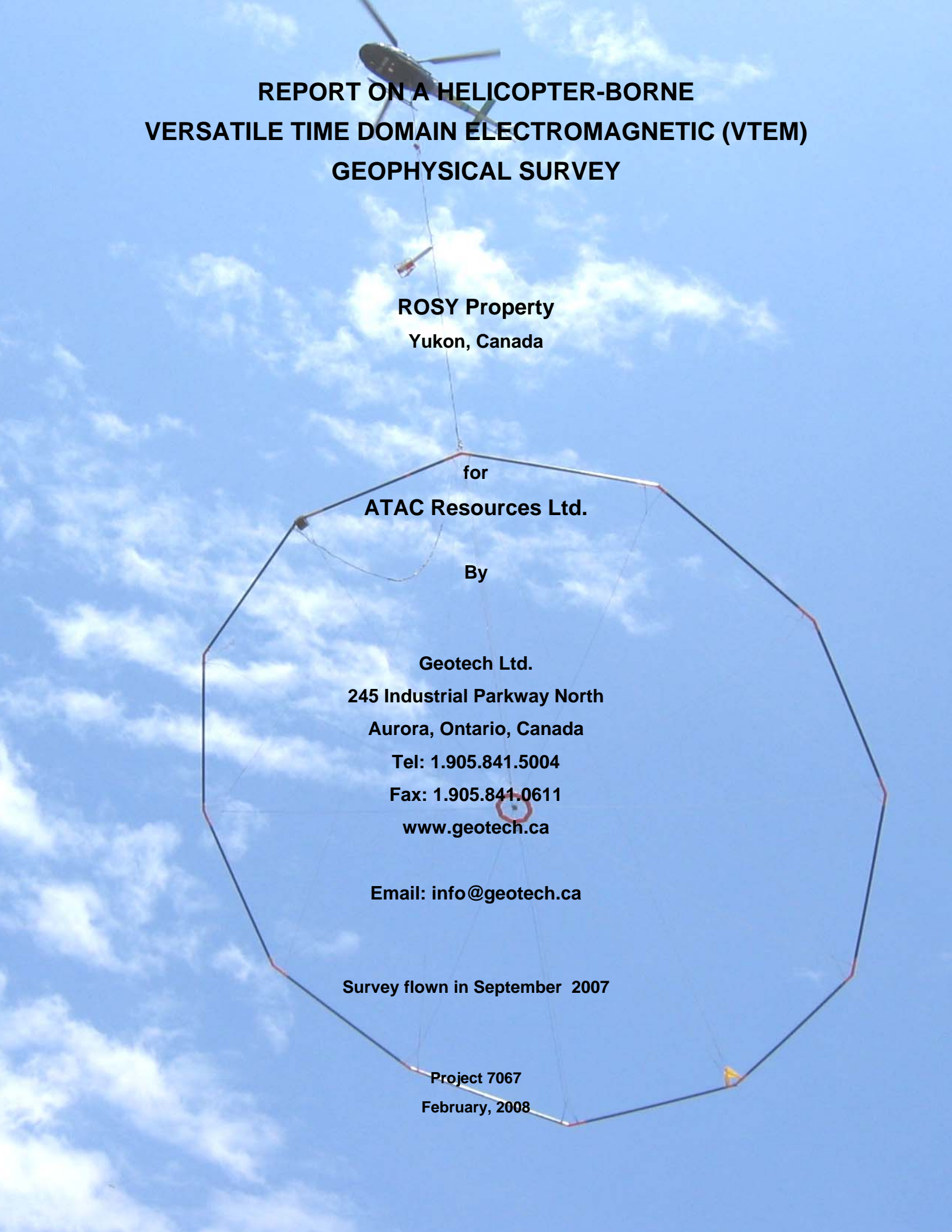
**Geotech VTEM System**  
**INTERPRETATION MAP**

Flown and processed by Geotech Ltd.  
 245 Industrial Parkway N.,  
 Aurora, Ontario, Canada L4G 4C4  
 www.geotech.ca

March 2008







**REPORT ON A HELICOPTER-BORNE  
VERSATILE TIME DOMAIN ELECTROMAGNETIC (VTEM)  
GEOPHYSICAL SURVEY**

**ROSY Property  
Yukon, Canada**

**for  
ATAC Resources Ltd.**

**By**

**Geotech Ltd.  
245 Industrial Parkway North  
Aurora, Ontario, Canada  
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[www.geotech.ca](http://www.geotech.ca)**

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**Survey flown in September 2007**

**Project 7067  
February, 2008**

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# REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN ELECTROMAGNETIC SURVEY

ROSY Property, Yukon, Canada

## **Executive Summary**

This report describes the Helicopter-borne geophysical survey carried out on behalf of ATAC Resources Ltd. by Geotech Ltd. over one block in Yukon, Canada.

Principal geophysical sensors included a versatile time domain electromagnetic (VTEM) system and a cesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 89.1 line-km were flown.

In-field data processing involved quality control and compilation of data collected during the acquisition stage, using the in-field processing centre established in Whitehorse, Yukon. Preliminary and final data processing, including generation of final digital data products were done at the office of Geotech Ltd. in Aurora, Ontario.

The processed survey results are presented as electromagnetic stacked profiles and total magnetic intensity grid.

Digital data includes all electromagnetic and magnetic products plus positional, altitude and raw data.

# 1. INTRODUCTION

## 1.1 *General Considerations*

These services are the result of the Agreement made between Geotech Ltd. and Archer Cathro & Associates to perform a helicopter-borne geophysical survey over one block located in Yukon, Canada.

89.1 line-km of geophysical data were acquired during the survey.

Bill Wengzynowski, acted on behalf of ATAC Resources Ltd. during data acquisition and data processing phases of this project.

The survey block is as shown in Appendix A.

The crew was based in Whitehorse, Yukon for the acquisition phase of the survey, as shown in Section 2 of this report.

The helicopter was based at the Whitehorse airport for the duration of the survey. Survey flying was completed on September 12<sup>th</sup>, 2007. Preliminary data processing was carried out daily during the acquisition phase of the project. Final data presentation and data archiving was completed in the Aurora office of Geotech Ltd. in February, 2008.

## 1.2. *Survey and System Specifications*

The survey block was flown at nominal traverse line spacing of 100 metres, at N90°E / N270°E direction. Tie lines were flown perpendicular to traverse lines.

Where possible, the helicopter maintained a mean terrain clearance of 145 metres, which translated into an average height of 110 metres above ground for the bird-mounted VTEM system and 130 metres for the magnetic sensor.

The survey was flown using an Astar B3 helicopter, registration C-GTFX. The helicopter was operated by TRK helicopters. Details of the survey specifications may be found in Section 2 of this report.



### 1.3. **Data Processing and Final Products**

Data compilation and processing were carried out by the application of Geosoft OASIS Montaj and programs proprietary to Geotech Ltd.

A database, grids and maps of final products were presented to Atac Resources Ltd.

The survey report describes the procedures for data acquisition, processing, final image presentation and the specifications for the digital data set.

### 1.4. **Topographic Relief and cultural features**

The survey block is located in Yukon, approximately 75 kilometers ENE of the town of Whitehorse.

Topographically, the survey area exhibits a challenging mountainous terrain, with elevation range from 1350 metres to 2080 metres above sea level. Due to rugged topography, the altitude of the aircraft above ground varied significantly and the geophysical data was influenced accordingly.

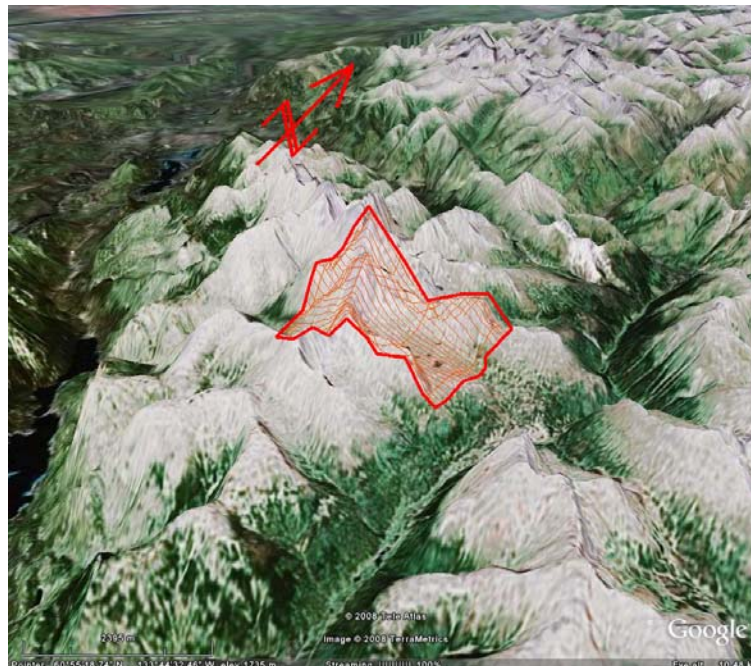


Figure 1 – Projection of flight path on topography.

## 2. DATA ACQUISITION

### 2.1. Survey Area

The survey block (see location map, Appendix A) and general flight specifications are as follows:

Survey block	Line spacing (m)	Area (Km2)	Line-km	Flight direction	Line number
ROSY	100	7.44	80.31	N90E / N270E	L5010 – L5220
	1000		8.77	N0E / N180E	T5910 – T5940

Table 1 - Survey block

Survey block boundaries co-ordinates are provided in Appendix B.

### 2.2. Survey Operations

Survey operations were based in Whitehorse, Yukon for the acquisition phase of the survey.

The following table shows the timing of the flying.

Date	Flight #	Flown KM	Block	Crew Location	Comments
11-Sep-07	85 - 87	18.3	ROSY	Whitehorse, Yukon	Other blocks flown on same day
12-Sep-07	88 - 90	70.8	ROSY	Whitehorse, Yukon	Other blocks flown on same day / Rosy finished

Table 2 - Survey schedule

### **2.3. Flight Specifications**

The nominal EM sensor terrain clearance was 110 m (EM bird height above ground, i.e. helicopter is maintained 145 m above ground) due to rough terrain and helicopter crew safety.

\* Due to rugged topography, over 700 metres in altitude variation, the aircraft radar varied significantly and the geophysical data was influenced accordingly.

Nominal survey speed was 80 km/hour. The data recording rates of the data acquisition was 0.1 second for electromagnetics and magnetometer, 0.2 second for altimeter and GPS. This translates to a geophysical reading about every 2 metres along flight track. Navigation was assisted by a GPS receiver and data acquisition system, which reports GPS co-ordinates as latitude/longitude and directs the pilot over a pre-programmed survey grid.

The operator was responsible for monitoring of the system integrity. He also maintained a detailed flight log during the survey, tracking the times of the flight as well as any unusual geophysical or topographic feature.

On return of the aircrew to the base the survey data was transferred from a compact flash card (PCMCIA) to the data processing computer.

## 2.4. Aircraft and Equipment

### 2.4.1. Survey Aircraft

An Astar B3 helicopter, registration C-GTFX - owned and operated by TRK Helicopters Ltd. - was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Geotech Ltd.

### 2.4.2. Electromagnetic System

The electromagnetic system was a Geotech Time Domain EM (VTEM) system. The configuration is as indicated in Figure 2 below.

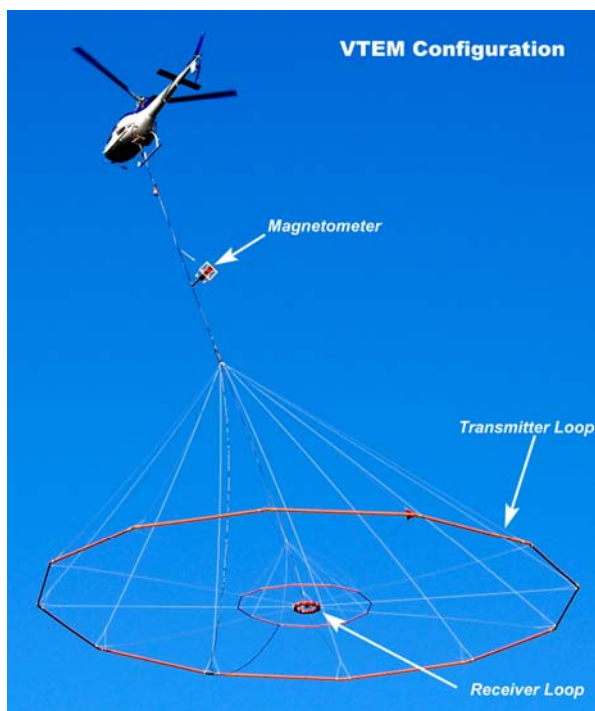


Figure 2 – VTEM configuration

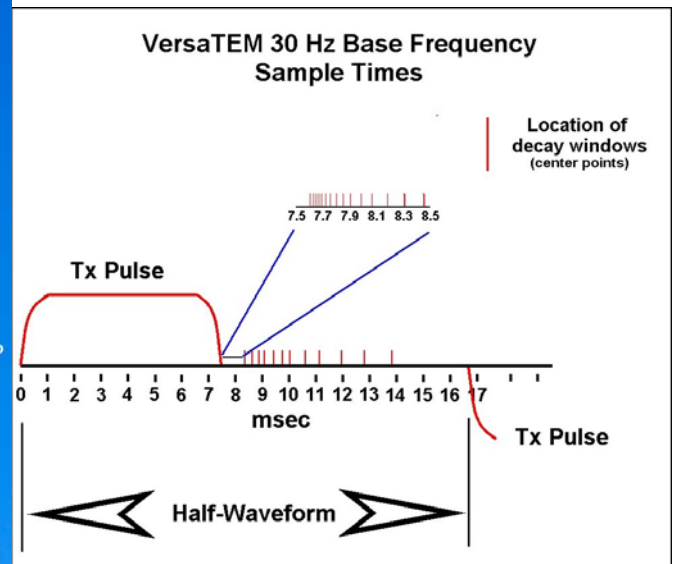


Figure 3 – Sample times

Receiver and transmitter coils are concentric and Z-direction oriented.  
 The receiver decay recording scheme is shown diagrammatically in Figure 2.

Twenty-four measurement gates were used in the range from 120  $\mu$ s to 6578  $\mu$ s, as shown in Table 3.

<b>VTEM Decay Sampling scheme</b>				
<b>Array Index</b>	<b>( Microseconds )</b>			
	<b>Time Gate</b>	<b>Start</b>	<b>End</b>	<b>Width</b>
10	120	110	131	21
11	141	131	154	24
12	167	154	183	29
13	198	183	216	34
14	234	216	258	42
15	281	258	310	53
16	339	310	373	63
17	406	373	445	73
18	484	445	529	84
19	573	529	628	99
20	682	628	750	123
21	818	750	896	146
22	974	896	1063	167
23	1151	1063	1261	198
24	1370	1261	1506	245
25	1641	1506	1797	292
26	1953	1797	2130	333
27	2307	2130	2526	396
28	2745	2526	3016	490
29	3286	3016	3599	583
30	3911	3599	4266	667
31	4620	4266	5058	792
32	5495	5058	6037	979
33	6578	6037	7203	1167

Table 3 - VTEM decay sampling scheme

Transmitter coil diameter was 26 metres, the number of turns was 4.  
Transmitter pulse repetition rate was 30 Hz.  
Peak current was 200.08 Amp.  
Pulse width was 7.2 ms  
Duty cycle was 43%.  
Peak dipole moment was 425000 NIA.

Receiver coil diameter was 1.2 metre, the number of turns was 100.  
Receiver effective area was 113.1 m<sup>2</sup>  
Wave form – trapezoid.  
Recording sampling rate was 10 samples per second.

The EM bird was towed 42 m below the helicopter.

### **2.4.3. Airborne magnetometer**

The magnetic sensor utilized for the survey was a Geometrics optically pumped cesium vapour magnetic field sensor, mounted in a separated bird, towed 15 metres below the helicopter, as shown on figure 1. The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds. The magnetometer sends the measured magnetic field strength as nanoTeslas to the data acquisition system via the RS-232 port.

### **2.4.4. Ancillary Systems**

#### **2.4.4.1. Radar Altimeter**

A Terra TRA 3000/TRI 40 radar altimeter was used to record terrain clearance. The antenna was mounted beneath the bubble of the helicopter cockpit.

#### **2.4.4.2. GPS Navigation System**

The navigation system used was a Geotech PC based navigation system utilizing a NovAtel's WAAS enable OEM4-G2-3151W GPS receiver, Geotech navigate software, a full screen display with controls in front of the pilot to direct the flight and an NovAtel GPS antenna mounted on the helicopter tail.

The co-ordinates of the block were set-up prior to the survey and the information was fed into the airborne navigation system.

#### 2.4.4.3. Digital Acquisition System

A Geotech data acquisition system recorded the digital survey data on an internal compact flash card. Data is displayed on an LCD screen as traces to allow the operator to monitor the integrity of the system. The data type and sampling interval as provided in table 4.

DATA TYPE	SAMPLING
TDEM	0.1 sec
Magnetometer	0.1 sec
GPS Position	0.2 sec
RadarAltimeter	0.2 sec

Table 4 - Sampling Rates

#### 2.4.5. Base Station

A combine magnetometer/GPS base station was utilized on this project. A Geometrics Cesium vapour magnetometer was used as a magnetic sensor with a sensitivity of 0.001 nT. The base station was recording the magnetic field together with the GPS time at 1 Hz on a base station computer.

The base station magnetometer sensor was installed close to the airport in Whitehorse, away from electric transmission lines and moving ferrous objects such as motor vehicles.

The magnetometer base station's data was backed-up to the data processing computer at the end of each survey day.

### 3. PERSONNEL

The following Geotech Ltd. personnel were involved in the project:

#### Field

Project Manager:	Harish Kumar
Crew Chief:	Keith Lavelley
Operator:	Paul Taylor

The survey pilot and the mechanic engineer were employed directly by the helicopter operator – TRK Helicopters Ltd.

Pilot:	Randy Marks
Engineer:	Chris Ward

#### Office

Data Processing / Reporting:	George Lev
Data Technician:	Maria Jagodkin

Data acquisition and processing phases were carried out under the supervision of Andrei Bagrianski, Surveys Manager. Overall management of the project was undertaken by Edward Morrison, President, Geotech Ltd.

## 4. DATA PROCESSING AND PRESENTATION

### 4.1. *Flight Path*

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the UTM coordinate system in Oasis Montaj.

The flight path was drawn using linear interpolation between x, y positions from the navigation system. Positions are updated every second and expressed as UTM eastings (x) and UTM northings (y).

### 4.2. *Electromagnetic Data*

A three stage digital filtering process was used to reject major spheric events and to reduce system noise. Local spheric activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major spheric events. The filter used was a 16 point non-linear filter.

The signal to noise ratio was further improved by the application of a low pass linear digital filter. This filter has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 1 second or 20 metres. This filter is a symmetrical 1 sec linear filter.

The results are presented as stacked profiles of EM voltages for the time gates, in linear - logarithmic scale for both B-field and dB/dt response.

Generalized modeling results of the VTEM system, written by Geophysicist Roger Barlow, are shown in Appendix C.

Graphical representation of the VTEM output voltage of the receiver coil and the transmitter current is shown in Appendix D.

### **4.3. Magnetic Data**

The processing of the magnetic data involved the correction for diurnal variations by using the digitally recorded ground base station magnetic values. The base station magnetometer data was edited and merged into the Geosoft GDB database on a daily basis. The aeromagnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations.

A micro-levelling procedure was applied to remove persistent low-amplitude components of flight-line noise remaining in the data. Where Tie lines were available, Tie line levelling was carried out by adjusting intersection points along the traverse lines.

The corrected magnetic data was interpolated between survey lines using a random point gridding method to yield x-y grid values for a standard grid cell size of approximately 0.1 cm at the mapping scale. The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

The survey area shows an average magnetic activity. Maximum values of 57709 nT are observed in the NW corner of the block.. Average of 57652 nT is detected in the survey area.

## 5. DELIVERABLES

### 5.1. *Survey Report*

The survey report describes the data acquisition, processing, and final presentation of the survey results.

The survey report is provided in two paper copies and digitally in PDF format.

### 5.2. *Maps*

Final maps were produced at a scale of 1:10,000. The coordinate/projection system used was the WGS84, UTM zone 8N. All maps show the flight path trace and topographic data. Latitude and longitude are also noted on maps.

The following maps are presented on paper,

- dB/dt profiles, Time Gates 0.234 – 6.578 ms in linear - logarithmic scale
- B-field profiles, Time Gates 0.234 – 6.578 ms in linear - logarithmic scale
- Total Magnetic intensity contours and colour image

### 5.3. *Digital Data*

Two copies of DVDs were prepared.

There are two (2) main directories,

**Data** contains a database, grids and maps, as described below.

**Report** contains a copy of the report and appendices in PDF format.

a kmz file containing flightpath of the ROSY property.

A free version of Google Earth software can be downloaded from,  
<http://earth.google.com/download-earth.html>

- Database in Geosoft GDB format, containing the following channels:

X:	X positional data (metres – WGS84, utm zone 8 north)
Y:	Y positional data (metres – WGS84, utm zone 8 north)
Z:	GPS antenna elevation (metres - ASL)
Radar:	Helicopter terrain clearance from radar altimeter (metres - AGL)
DEM:	Digital elevation model (metres)
Gtime1:	GPS time (seconds of the day)
Mag1:	Raw Total Magnetic field data (nT)
Basemag:	Magnetic diurnal variation data (nT)
Mag2:	Total Magnetic field diurnal variation corrected data (nT)
Mag3:	Leveled Total Magnetic field data (nT)
SF[10]:	dB/dt 120 microsecond time channel ( $pV/A/m^4$ )
SF[11]:	dB/dt 141 microsecond time channel ( $pV/A/m^4$ )
SF[12]:	dB/dt 167 microsecond time channel ( $pV/A/m^4$ )
SF[13]:	dB/dt 198 microsecond time channel ( $pV/A/m^4$ )
SF[14]:	dB/dt 234 microsecond time channel ( $pV/A/m^4$ )
SF[15]:	dB/dt 281 microsecond time channel ( $pV/A/m^4$ )
SF[16]:	dB/dt 339 microsecond time channel ( $pV/A/m^4$ )
SF[17]:	dB/dt 406 microsecond time channel ( $pV/A/m^4$ )
SF[18]:	dB/dt 484 microsecond time channel ( $pV/A/m^4$ )
SF[19]:	dB/dt 573 microsecond time channel ( $pV/A/m^4$ )
SF[20]:	dB/dt 682 microsecond time channel ( $pV/A/m^4$ )
SF[21]:	dB/dt 818 microsecond time channel ( $pV/A/m^4$ )
SF[22]:	dB/dt 974 microsecond time channel ( $pV/A/m^4$ )
SF[23]:	dB/dt 1151 microsecond time channel ( $pV/A/m^4$ )
SF[24]:	dB/dt 1370 microsecond time channel ( $pV/A/m^4$ )
SF[25]:	dB/dt 1641 microsecond time channel ( $pV/A/m^4$ )
SF[26]:	dB/dt 1953 microsecond time channel ( $pV/A/m^4$ )
SF[27]:	dB/dt 2307 microsecond time channel ( $pV/A/m^4$ )
SF[28]:	dB/dt 2745 microsecond time channel ( $pV/A/m^4$ )
SF[29]:	dB/dt 3286 microsecond time channel ( $pV/A/m^4$ )
SF[30]:	dB/dt 3911 microsecond time channel ( $pV/A/m^4$ )
SF[31]:	dB/dt 4620 microsecond time channel ( $pV/A/m^4$ )
SF[32]:	dB/dt 5495 microsecond time channel ( $pV/A/m^4$ )
SF[33]:	dB/dt 6578 microsecond time channel ( $pV/A/m^4$ )
BF[10]:	B-field 120 microsecond time channel ( $pV*ms)/(A*m^4$ )
BF[11]:	B-field 141 microsecond time channel ( $pV*ms)/(A*m^4$ )
BF[12]:	B-field 167 microsecond time channel ( $pV*ms)/(A*m^4$ )
BF[13]:	B-field 198 microsecond time channel ( $pV*ms)/(A*m^4$ )
BF[14]:	B-field 234 microsecond time channel ( $pV*ms)/(A*m^4$ )
BF[15]:	B-field 281 microsecond time channel ( $pV*ms)/(A*m^4$ )

BF[16]:	B-field 339 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[17]:	B-field 406 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[18]:	B-field 484 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[19]:	B-field 573 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[20]:	B-field 682 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[21]:	B-field 818 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[22]:	B-field 974 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[23]:	B-field 1151 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[24]:	B-field 1370 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
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BF[26]:	B-field 1953 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[27]:	B-field 2307 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[28]:	B-field 2745 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[29]:	B-field 3286 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[30]:	B-field 3911 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[31]:	B-field 4620 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[32]:	B-field 5495 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
BF[33]:	B-field 6578 microsecond time channel (pV*ms)/(A*m <sup>4</sup> )
PLM:	Power line monitor

Electromagnetic B-field and dB/dt data is found in array channel format between indexes 10 – 33, as described above.

- Database 7067Rosy\_wform.gdb in Geosoft GDB format, containing the following channels:

Time:            Sampling rate interval, 10.416 microseconds  
 Volt:            output voltage of the receiver coil (volt)

- Grids in Geosoft GRD format, as follow,

ROSY\_magfin:    Total magnetic intensity (nT)  
 ROSY\_DEM:      Digital elevation model (m)

A Geosoft .GRD file has a .GI metadata file associated with it, containing grid projection information.

Grid cell size of 10 metres was used.

- Maps at 1:10,000 scale in Geosoft MAP format, as follow,

ROSY\_Magfin:    Total magnetic intensity contours and colour image  
 ROSY\_dBdt:      VTEM dB/dt profiles, Time Gates 0.234 – 6.578 ms  
                           in linear - logarithmic scale  
 ROSY\_EMLP:      VTEM B-field profiles, Time Gates 0.234 – 6.578 ms  
                           in linear - logarithmic scale

- A *readme.txt* file describing the content of digital data, as described above.

## 6. CONCLUSIONS

A helicopter-borne versatile time domain electromagnetic (VTEM) geophysical survey has been completed over the ROSY property, located in Yukon, Canada.

The total area coverage is 7.44 km<sup>2</sup>. Total survey line coverage is 85.41 line kilometres. The principal sensors included a Time Domain EM system and a magnetometer. Results have been presented as stacked profiles and contour colour images at a scale of 1:20,000.

Final data processing at the office of Geotech Ltd. in Aurora, Ontario was carried out under the supervision of Andrei Bagrianski, Surveys Manager.

A number of EM anomaly groupings were identified. Ground follow-up of those anomalies should be carried out if favourably supported by other geoscientific data.

Respectfully submitted,

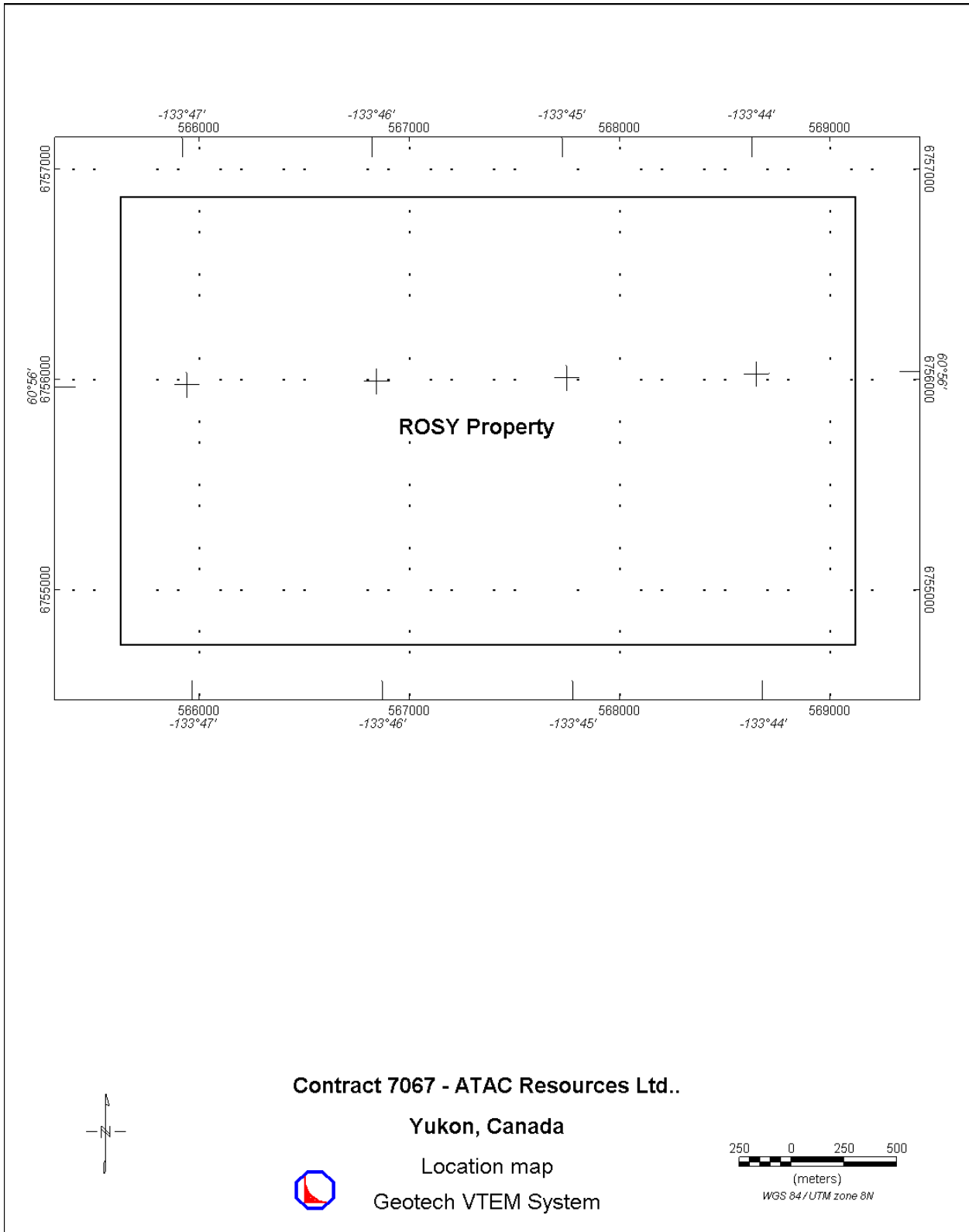
George Lev  
**Geotech Ltd.**  
February, 2008



**APPENDIX A**

**SURVEY BLOCK LOCATION MAP**





## APPENDIX B

### SURVEY BLOCK COORDINATES (WGS 84, UTM zone 8 north)

#### ROSY property

ROSY	
Easting	Northing
569120	6756867
569120	6754738
565625	6754738
565625	6756867

## APPENDIX C

### MODELING VTEM DATA

# MODELING VTEM DATA

## Introduction

The VTEM system is based on a concentric or central loop design, whereby, the receiver is positioned at the centre of a 26.1 meters diameter transmitter loop that produces a dipole moment up to 625,000 NIA at peak current. The wave form is a bi-polar, modified square wave with a turn-on and turn-off at each end. With a base frequency of 30 Hz, the duration of each pulse is approximately 7.5 milliseconds followed by an off time where no primary field is present.

During turn-on and turn-off, a time varying field is produced (dB/dt) and an electro-motive force (emf) is created as a finite impulse response. A current ring around the transmitter loop moves outward and downward as time progresses. When conductive rocks and mineralization are encountered, a secondary field is created by mutual induction and measured by the receiver at the centre of the transmitter loop.

Measurements are made during the off-time, when only the secondary field (representing the conductive targets encountered in the ground) is present.

Late in 2006, Geotech Ltd. incorporated a B-Field measurement in the VTEM system. The B-Field measurements have the advantage of containing more spectral energy at low spectral frequencies than the dB/dt measurements; hence, greater amplitudes and accuracies when encountering targets with higher conductances (> 500 Siemens). The converse is true at higher spectral frequencies where dB/dt measurements are best applied. The B-field is most widely used in nickel exploration where a small percentage of targets are extremely conductive (> 2500 Siemens) and less resolvable or invisible (below the noise threshold) using dB/dt measurements.

Efficient modeling of the results can be carried out on regularly shaped geometries, thus yielding close approximations to the parameters of the measured targets. The following is a description of a series of common models made for the purpose of promoting a general understanding of the measured results.

## Variation of Plate Depth

Geometries represented by plates of different strike length, depth extent, dip, plunge and depth below surface can be varied with characteristic parameters like conductance of the target, conductance of the host and conductivity/thickness and thickness of the overburden layer.

Diagrammatic models for a vertical plate are shown in figures A and G at two different depths, all other parameters remaining constant. With this transmitter-receiver geometry, the classic **M** shaped response is generated. Figure A shows a plate where the top is near surface. Here, amplitudes of the dual peaks are higher and symmetrical with the zero centre positioned directly above the plate. Most important is the separation distance of the peaks. This distance is small when the plate is near surface and widens with a linear relationship as the plate (depth to top) increases. Figure G shows a much deeper plate where the separation distance of the peaks is much wider and the amplitudes of the channels have decreased.

## Variation of Plate Dip

As the plate dips and departs from the vertical position, the peaks become asymmetrical. Figure B shows a near surface plate dipping  $80^\circ$ . Note that the direction of dip is toward the high shoulder of the response and the top of the plate remains under the centre minimum.

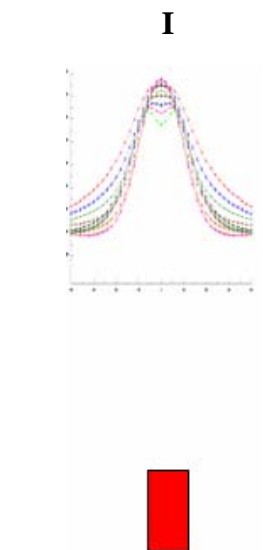
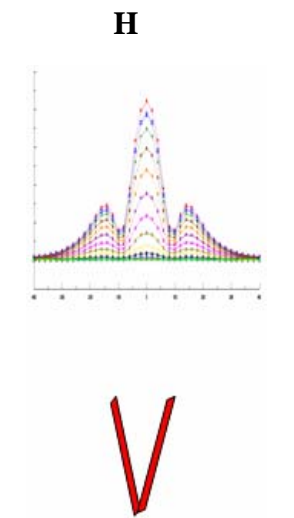
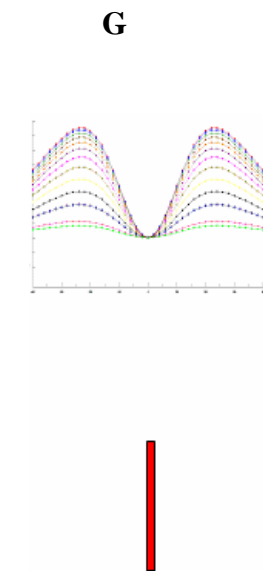
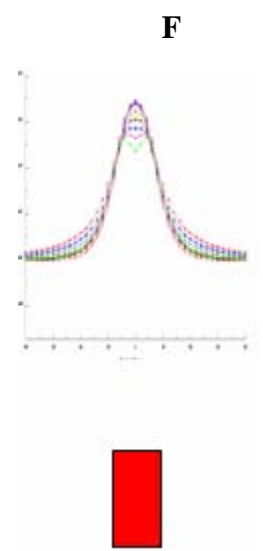
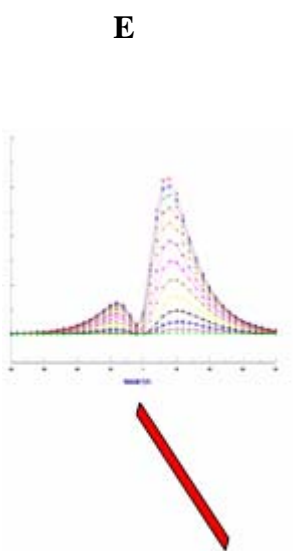
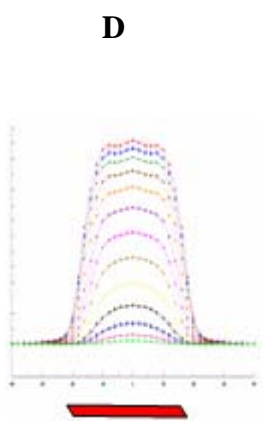
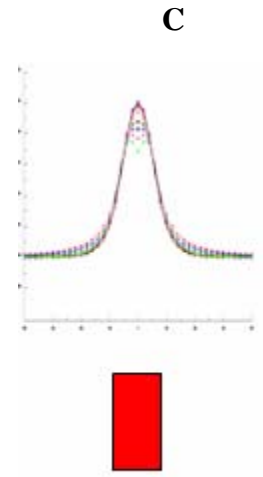
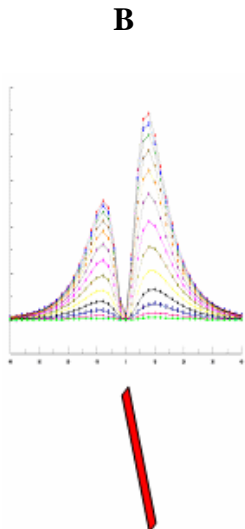
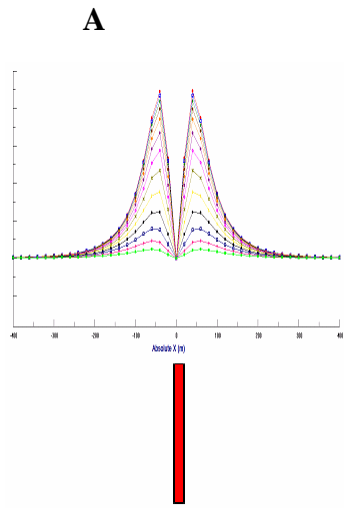
As the dip increases, the aspect ratio (Min/Max) decreases and this aspect ratio can be used as an empirical guide to dip angles from near  $90^\circ$  to about  $30^\circ$ . The method is not sensitive enough where dips are less than about  $30^\circ$ . Figure E shows a plate dipping  $45^\circ$  and, at this angle, the minimum shoulder starts to vanish. In Figure D, a flat lying plate is shown, relatively near surface. Note that the twin peak anomaly has been replaced by a symmetrical shape with large, bell shaped, channel amplitudes which decay relative to the conductance of the plate.

Figure H shows a special case where two plates are positioned to represent a synclinal structure. Note that the main characteristic to remember is the centre amplitudes are higher (approximately double) compared to the high shoulder of a single plate. This model is very representative of tightly folded formations where the conductors were once flat lying.

## Variation of Prism Depth

Finally, with prism models, another algorithm is required to represent current on the plate. A plate model is considered to be infinitely thin with respect to thickness and incapable of representing the current in the thickness dimension. A prism model is constructed to deal with this problem, thereby, representing the thickness of the body more accurately.

Figures C, F and I show the same prism at increasing depths. Aside from an expected decrease in amplitude, the side lobes of the anomaly show a widening with deeper prism depths of the bell shaped early time channels.



## General Modeling Concepts

A set of models has been produced for the Geotech VTEM® system with explanation notes (see models A to I above). The reader is encouraged to review these models, so as to get a general understanding of the responses as they apply to survey results. While these models do not begin to cover all possibilities, they give a general perspective on the simple and most commonly encountered anomalies.

When producing these models, a few key points were observed and are worth noting as follows:

- For near vertical and vertical plate models, the top of the conductor is always located directly under the centre low point between the two shoulders in the classic **M** shaped response.
- As the plate is positioned at an increasing depth to the top, the shoulders of the **M** shaped response, have a greater separation distance.
- When faced with choosing between a flat lying plate and a prism model to represent the target (broad response) some ambiguity is present and caution should be exercised.
- With the concentric loop system and Z-component receiver coil, virtually all types of conductors and most geometries are most always well coupled and a response is generated (see model H). Only concentric loop systems can map this type of target.

The modelling program used to generate the responses was prepared by PetRos Eikon Inc. and is one of a very few that can model a wide range of targets in a conductive half space.

## General Interpretation Principals

### Magnetics

The total magnetic intensity responses reflect major changes in the magnetite and/or other magnetic minerals content in the underlying rocks and unconsolidated overburden. Precambrian rocks have often been subjected to intense heat and pressure during structural and metamorphic events in their history. Original signatures imprinted on these rocks at the time of formation have, in most cases, been modified, resulting in low magnetic susceptibility values.

The amplitude of magnetic anomalies, relative to the regional background, helps to assist in identifying specific magnetic and non-magnetic rock units (and conductors) related to, for example, mafic flows, mafic to ultramafic intrusives, felsic intrusives, felsic volcanics and/or sediments etc. Obviously, several geological sources can produce the same magnetic response. These ambiguities can be reduced considerably if basic geological information on the area is available to the geophysical interpreter.

In addition to simple amplitude variations, the shape of the response expressed in the wave length and the symmetry or asymmetry, is used to estimate the depth, geometric parameters and magnetization of the anomaly. For example, long narrow magnetic linears usually reflect mafic flows or intrusive dyke features. Large areas with complex magnetic patterns may be produced by intrusive bodies with significant magnetization, flat lying magnetic sills or sedimentary iron formation. Local isolated circular magnetic patterns often represent plug-like igneous intrusives such as kimberlites, pegmatites or volcanic vent areas.

Because the total magnetic intensity (TMI) responses may represent two or more closely spaced bodies within a response, the second derivative of the TMI response may be helpful for distinguishing these complexities. The second derivative is most useful in mapping near surface linears and other subtle magnetic structures that are partially masked by nearby higher amplitude magnetic features. The broad zones of higher magnetic amplitude, however, are severely attenuated in the vertical derivative results. These higher amplitude zones reflect rock units having strong magnetic susceptibility signatures. For this reason, both the TMI and the second derivative maps should be evaluated together.

Theoretically, the second derivative, zero contour or colour delineates the contacts or limits of large sources with near vertical dip and shallow depth to the top. The vertical gradient map also aids in determining contact zones between rocks with a susceptibility contrast, however, different, more complicated rules of thumb apply.

### **Concentric Loop EM Systems**

Concentric systems with horizontal transmitter and receiver antennae produce much larger responses for flat lying conductors as contrasted with vertical plate-like conductors. The amount of current developing on the flat upper surface of targets having a substantial area in this dimension, are the direct result of the effective coupling angle, between the primary magnetic field and the flat surface area. One therefore, must not compare the amplitude/conductance of responses generated from flat lying bodies with those derived from near vertical plates; their ratios will be quite different for similar conductances.

Determining dip angle is very accurate for plates with dip angles greater than 30°. For angles less than 30° to 0°, the sensitivity is low and dips can not be distinguished accurately in the presence of normal survey noise levels.

A plate like body that has near vertical position will display a two shoulder, classic **M** shaped response with a distinctive separation distance between peaks for a given depth to top.

It is sometimes difficult to distinguish between responses associated with the edge effects of flat lying conductors and poorly conductive bedrock conductors. Poorly conductive bedrock conductors having low dip angles will also exhibit responses that may be interpreted as surficial overburden conductors. In some situations, the conductive response has line to line continuity and some magnetic correlation providing possible evidence that the response is related to an actual bedrock source.

The EM interpretation process used, places considerable emphasis on determining an understanding of the general conductive patterns in the area of interest. Each area has different characteristics and these can effectively guide the detailed process used.

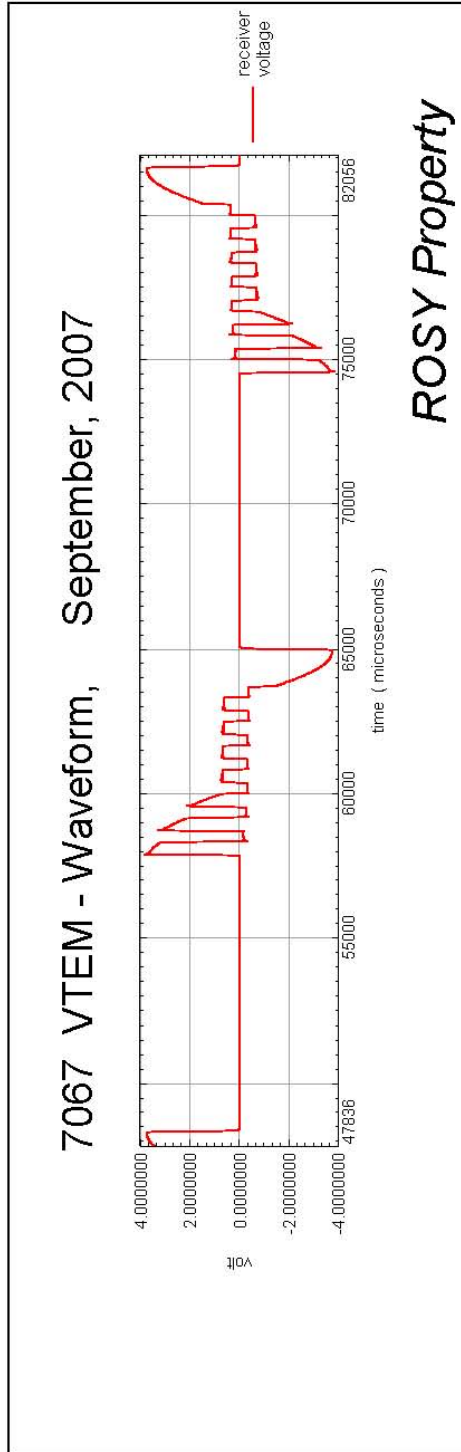
The first stage is to determine which time gates are most descriptive of the overall conductance patterns. Maps of the time gates that represent the range of responses can be very informative.

Next, stacking the relevant channels as profiles on the flight path together with the second vertical derivative of the TMI is very helpful in revealing correlations between the EM and Magnetics.

Next, key lines can be profiled as single lines to emphasize specific characteristics of a conductor or the relationship of one conductor to another on the same line. Resistivity Depth sections can be constructed to show the relationship of conductive overburden or conductive bedrock with the conductive anomaly.

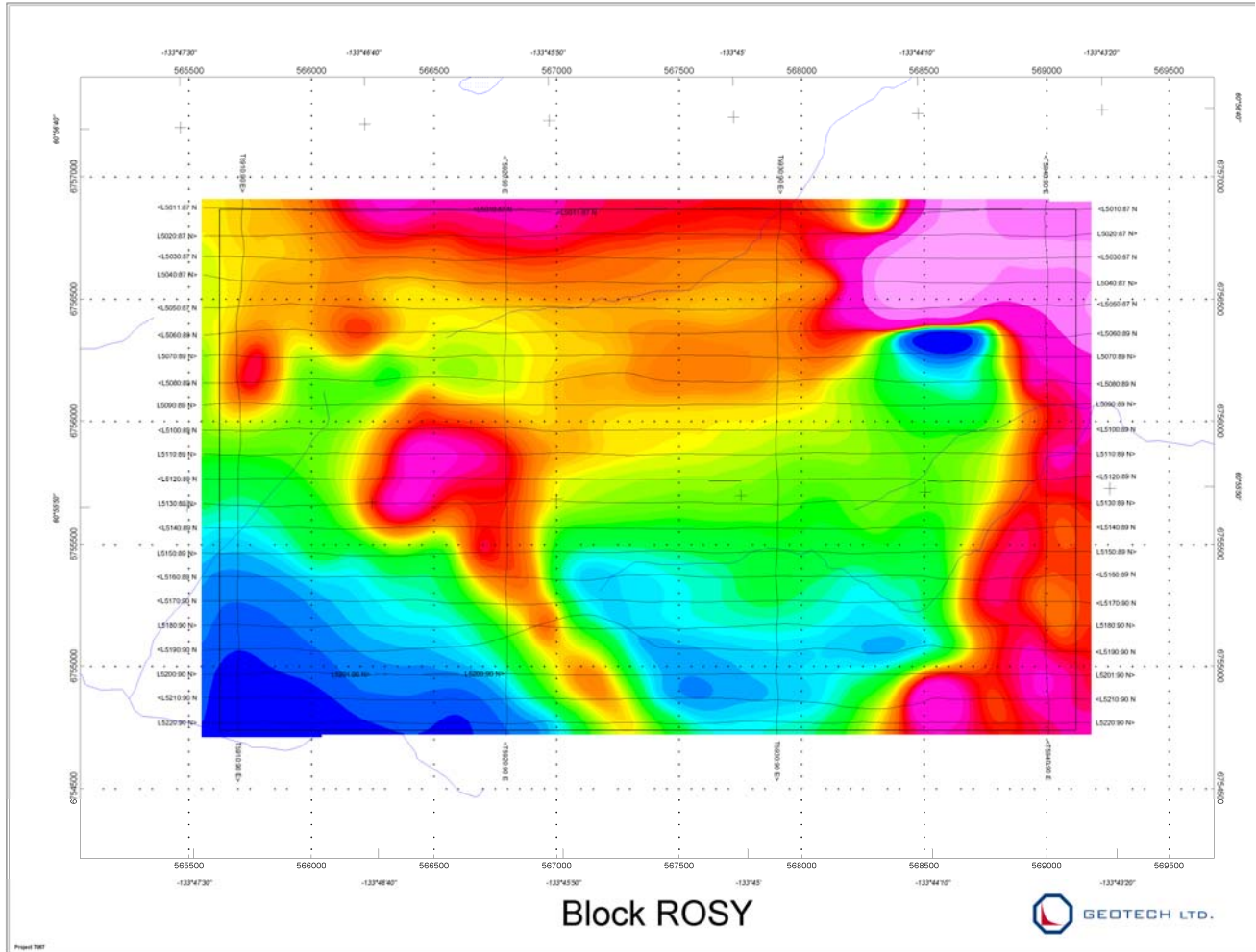
# APPENDIX D

## VTEM WAVEFORM



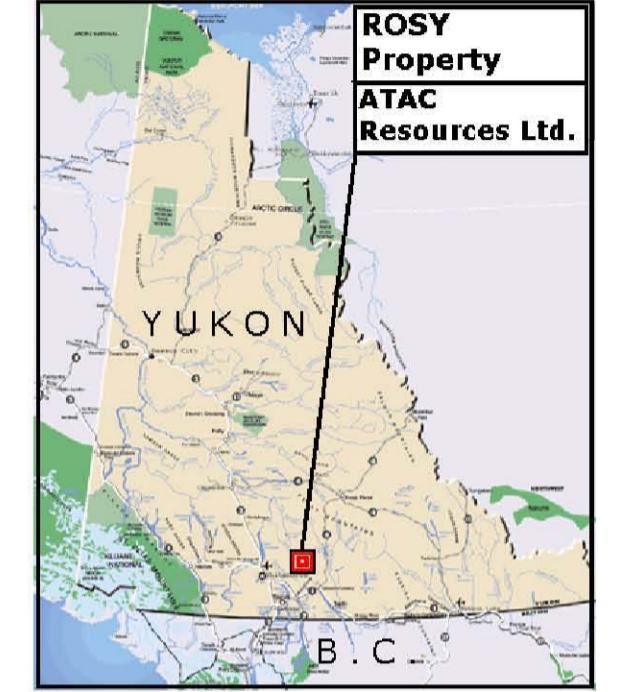
# APPENDIX E

## GEOPHYSICAL MAP



Survey Specifications:  
 Dates Flown: September 11-12, 2007  
 Survey Base: Whitehorse, YT  
 Aircraft: Aslar B3 helicopter, Registration C-GTFX  
 Nominal Flight Line Spacing: 100 metres  
 Nominal Flight Line Direction: N90°E/N270°E  
 Nominal Tie Line Spacing: 1000 metres  
 Nominal Tie Line Direction: N0°E/N180°E  
 Nominal helicopter terrain clearance 145 metres  
 EM Loop is towed 42 metres under helicopter  
 Magnetic sensor is 15 metres under helicopter

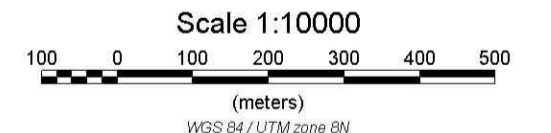
Instruments:  
 Geotech Time Domain Electromagnetic System (VTEM)  
 with concentric Rx/Tx geometry  
 Transmitter Loop Diameter 26 m, Base Frequency 30 Hz  
 Dipole Moment 425,000 N/A  
 Transmitter Wave Form: Trapezoid, Pulse Width 7.22 ms  
 Geometrics Optically-pumped,  
 High Sensitivity Cesium Magnetometer  
 Magnetometer Resolution 0.02 nT at 10 samples/sec



Profiles scale 1 mm = 0.025 (pV\*ms)/A/m<sup>4</sup>  
 (Linear between +/-0.2 (pV\*ms)/A/m<sup>4</sup>  
 logarithmic above 0.2 (pV\*ms)/A/m<sup>4</sup>)

- 0.234 ms (B-field)
- 0.281 ms (B-field)
- 0.339 ms (B-field)
- 0.406 ms (B-field)
- 0.484 ms (B-field)
- 0.573 ms (B-field)
- 0.682 ms (B-field)
- 0.818 ms (B-field)
- 0.974 ms (B-field)
- 1.151 ms (B-field)
- 1.370 ms (B-field)
- 1.641 ms (B-field)
- 1.953 ms (B-field)
- 2.307 ms (B-field)
- 2.745 ms (B-field)
- 3.286 ms (B-field)
- 3.911 ms (B-field)
- 4.620 ms (B-field)
- 5.495 ms (B-field)
- 6.578 ms (B-field)
- 7.828 ms (B-field)

Legend:  
 Roads  
 Lakes, Rivers  
 Swamps  
 Topographic contours

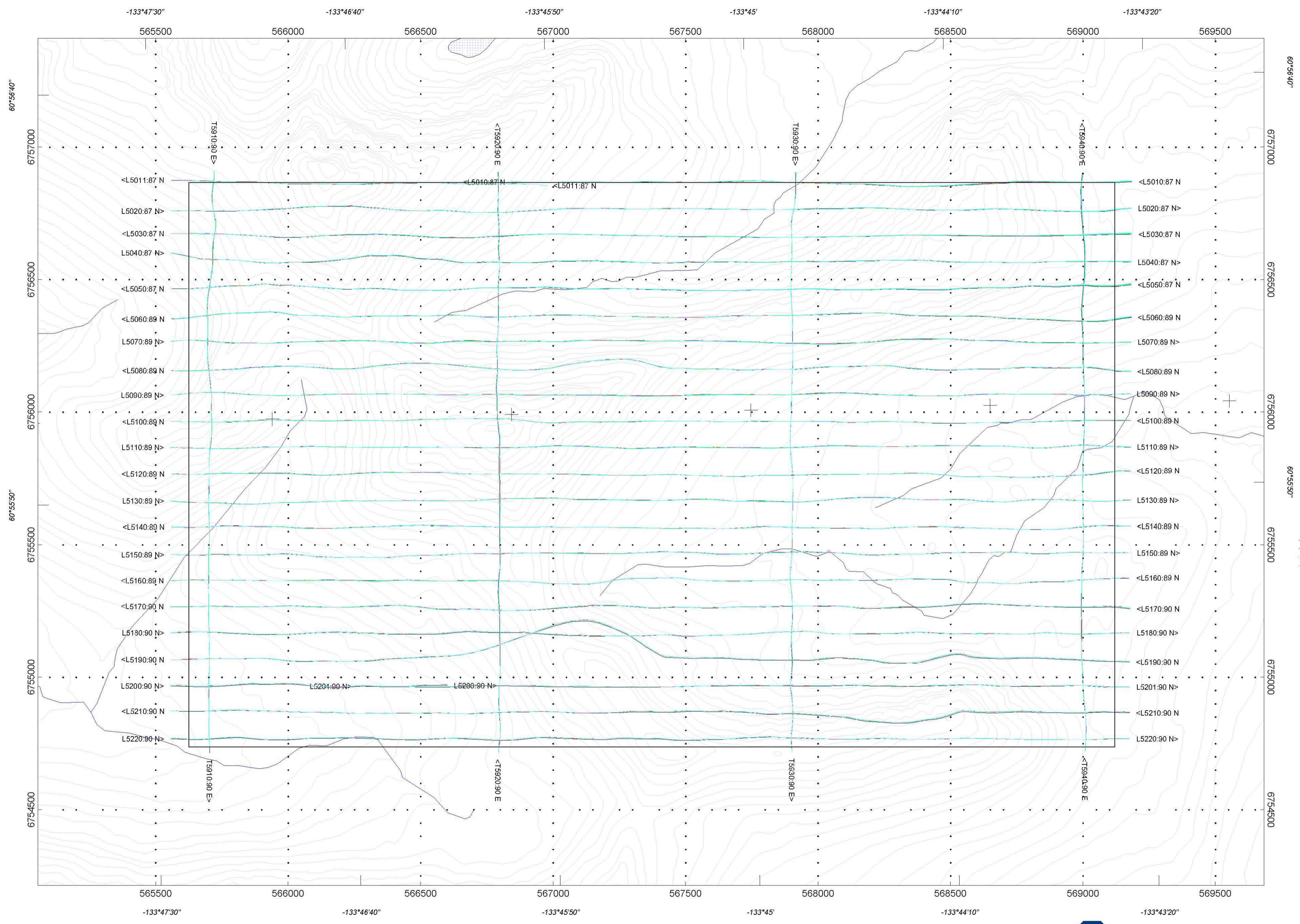


**ATAC Resources Ltd.**  
 Block ROSY  
 Yukon, Canada

Geotech VTEM System  
 B-Field Profiles  
 Time Gates 0.234 - 6.578 ms

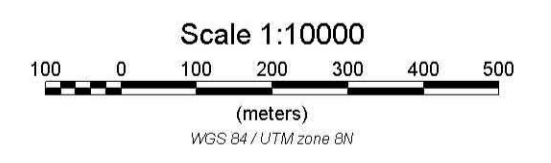
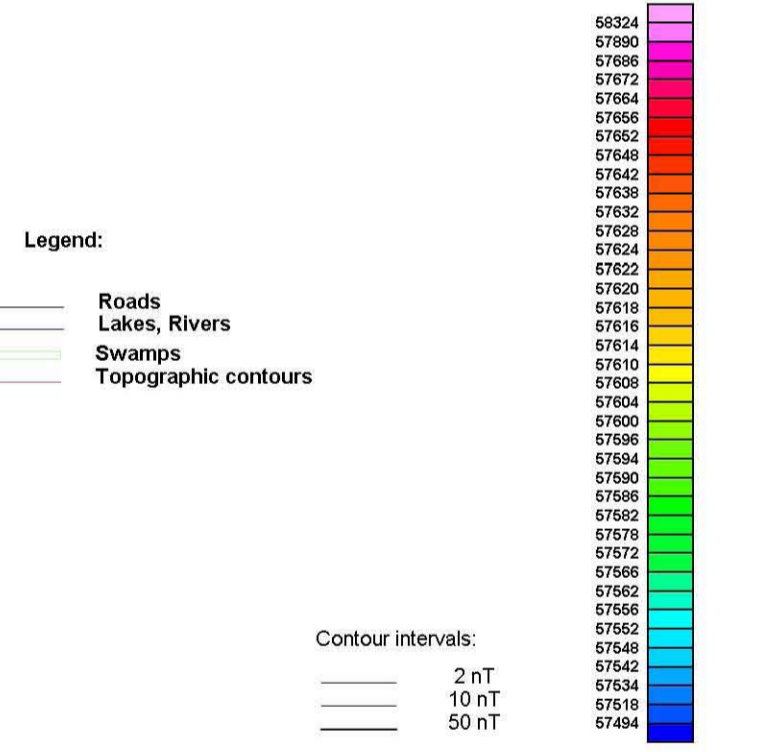
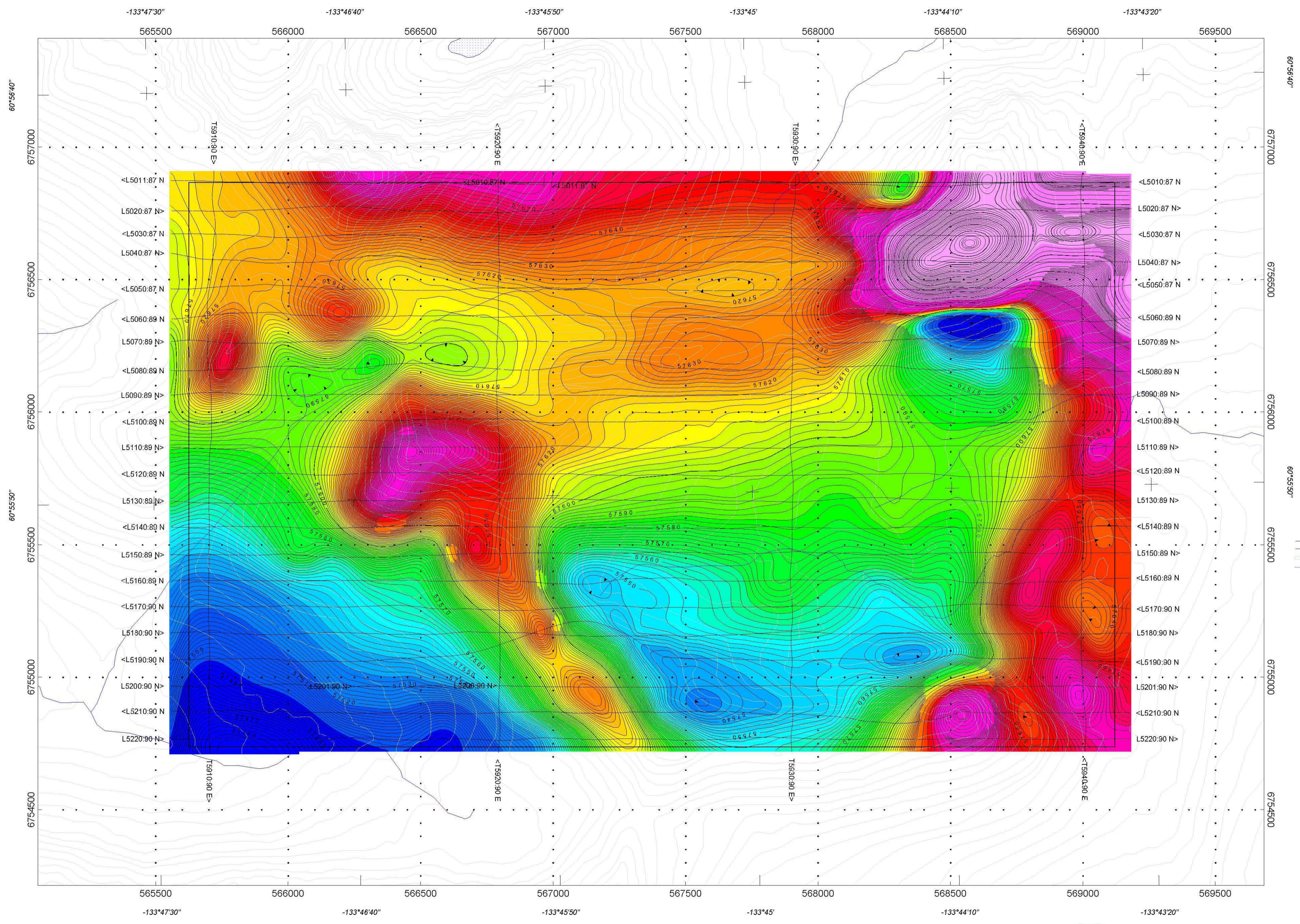
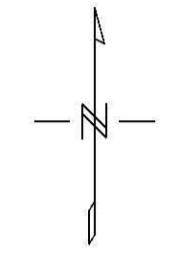
Flown and processed by Geotech Ltd.  
 245 Industrial Parkway North.,  
 Aurora, Ontario, Canada L4G 4C4  
 www.geotech.ca

February, 2008



Survey Specifications:  
 Dates Flown: September 11-12, 2007  
 Survey Base: Whitehorse, YT  
 Aircraft: Astar B3 helicopter, Registration C-GTFX  
 Nominal Flight Line Spacing: 100 metres  
 Nominal Flight Line Directions: N90°E/N270°E  
 Nominal Tie Line Spacing: 1000 metres  
 Nominal Tie Line Directions: N0°E/N180°E  
 Nominal helicopter terrain clearance 145 metres  
 EM Loop is towed 42 metres under helicopter  
 Magnetic sensor is 15 metres under helicopter

Instruments:  
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 Transmitter Loop Diameter 26 m, Base Frequency 30 Hz  
 Dipole Moment 425,000 N/A  
 Transmitter Wave Form: Trapezoid, Pulse Width 7.22 ms  
 Geometrics Optically-pumped,  
 High Sensitivity Cesium Magnetometer  
 Magnetometer Resolution 0.02 nT at 10 samples/sec



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 Block ROSY  
 Yukon, Canada

**Geotech VTEM System**  
**Total Magnetic Field Map**

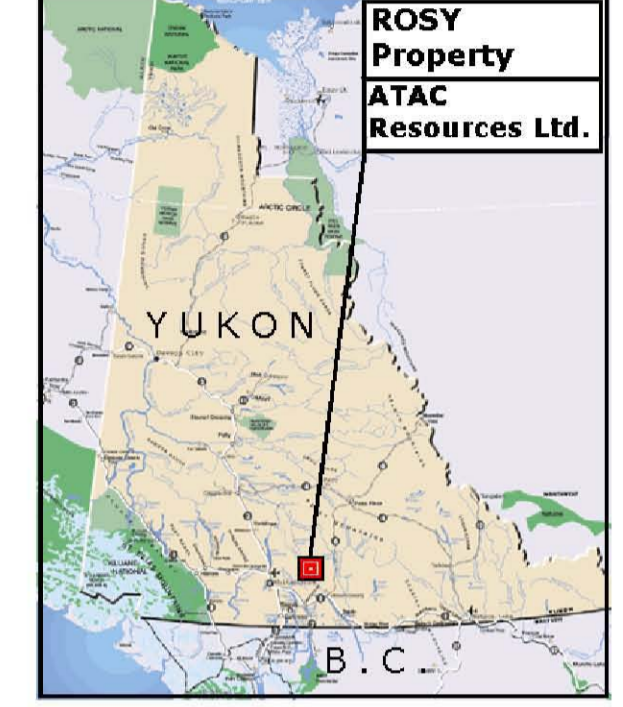
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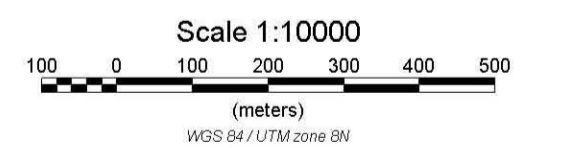
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Profiles scale 1 mm = 0.025 pV/A/m<sup>4</sup>  
 (Linear between +/-0.2 pV/A/m<sup>4</sup>  
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0.281 ms
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5.495 ms
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7.828 ms

Legend:  
 Roads  
 Lakes, Rivers  
 Swamps  
 Topographic contours



**ATAC Resources Ltd.**  
 Block ROSY  
 Yukon, Canada

Geotech VTEM System  
 dB/dt Profiles  
 Time Gates 0.234 - 6.578 ms

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February, 2008

