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**ASSESSMENT REPORT**

describing

**GEOPHYSICAL SURVEYS**

at the

**BAR PROPERTY**

Bar 1-32      YC29741-YC29772  
33-44      YC31935-YC31946

NTS 105C/8 & 9  
Latitude 60°30'N; Longitude 132°14'W

in the

Watson Lake Mining District,  
Yukon Territory

prepared by

Archer, Cathro & Associates (1981) Limited

for

**STRATEGIC METALS LTD.**

by

W.A.Wengzynowski, P.Eng.  
March 2007

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## INTRODUCTION

The Bar property covers a volcanogenic massive sulphide (VMS) prospect located in southern Yukon. The property is owned 100% by Strategic Metals Ltd.

This report primarily describes results of helicopter-borne VTEM and magnetic surveys conducted in May 2006 by Geotech Ltd. on behalf of Strategic. The author supervised the geophysical work and conducted a one day property trip in October, the results of which are also incorporated into this report. The Author's Statement of Qualifications appears in Appendix I.

## PROPERTY LOCATION, CLAIM DATA AND ACCESS

The Bar property consists of 44 contiguous mineral claims located in southern Yukon on NTS map sheets 105C 8 and 9 at latitude 60°30'N and longitude 132°14'W (Figure 1). The claims are registered with the Watson Lake Mining Recorder in the name of Archer, Cathro & Associates (1981) Limited. The locations of individual claims are shown on Figure 2 while claim registration data are listed below.

<u>Claim Name</u>	<u>Grant Number</u>	<u>Expiry Date *</u>
Bar 1-32	YC29741-YC29772	February 17, 2012
Bar 33-44	YC31935-YC31946	September 5, 2007

\* The expiry date includes assessment credit for 2006 work that has been filed but not yet accepted.

The Bar property is located 40 km east of Teslin, a village that lies alongside the Alaska Highway, approximately 183 km by road southeast of Whitehorse. An abandoned winter road extends 50 km north from the Alaska Highway to the property. Access is normally by helicopter. In 2006, the geophysical surveys were done by a helicopter from a temporary base at the Teslin airport.

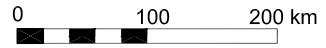
## HISTORY

The area now covered by the Bar property has been owned by a number of individuals and companies since the mid 1950s (Traynor, 2005). Work from historical programs is compiled on Figure 3. The first reported exploration was done in 1971 by Wolf Lake Joint Venture (Rayrock Mines Ltd., Ashland Oil Canada Ltd. and Canadian Industrial Gas and Oil Ltd.), which performed geological mapping and geochemical sampling (Archer, 1971).

In 1976 the area was staked by J.C Stephen who optioned the claim to D.C. Syndicate (Dome Mines Ltd. and Cominco Ltd.), which performed geological mapping, soil

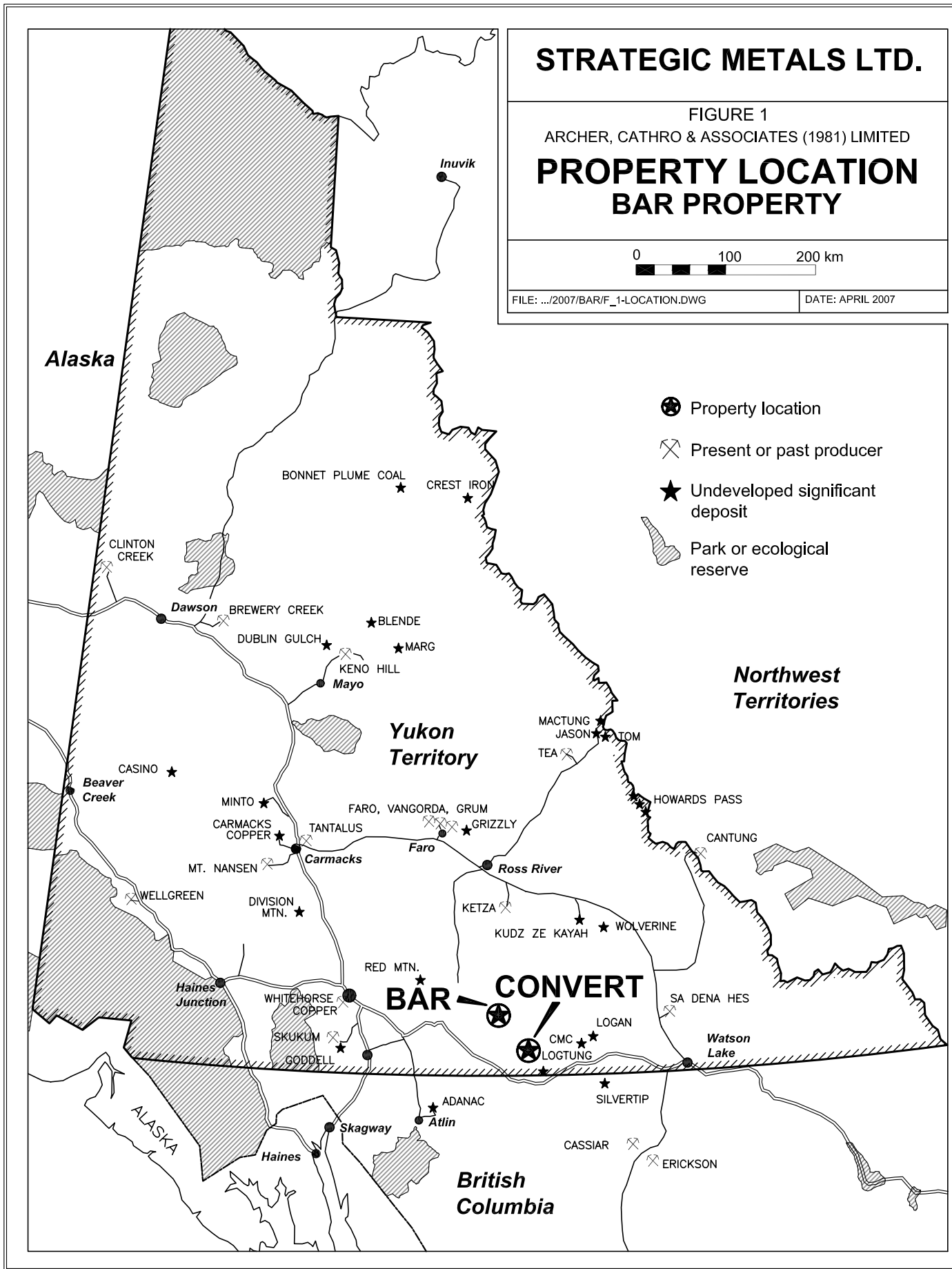
# STRATEGIC METALS LTD.

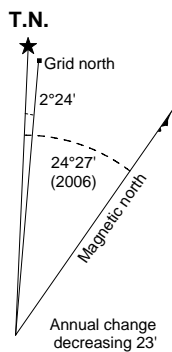
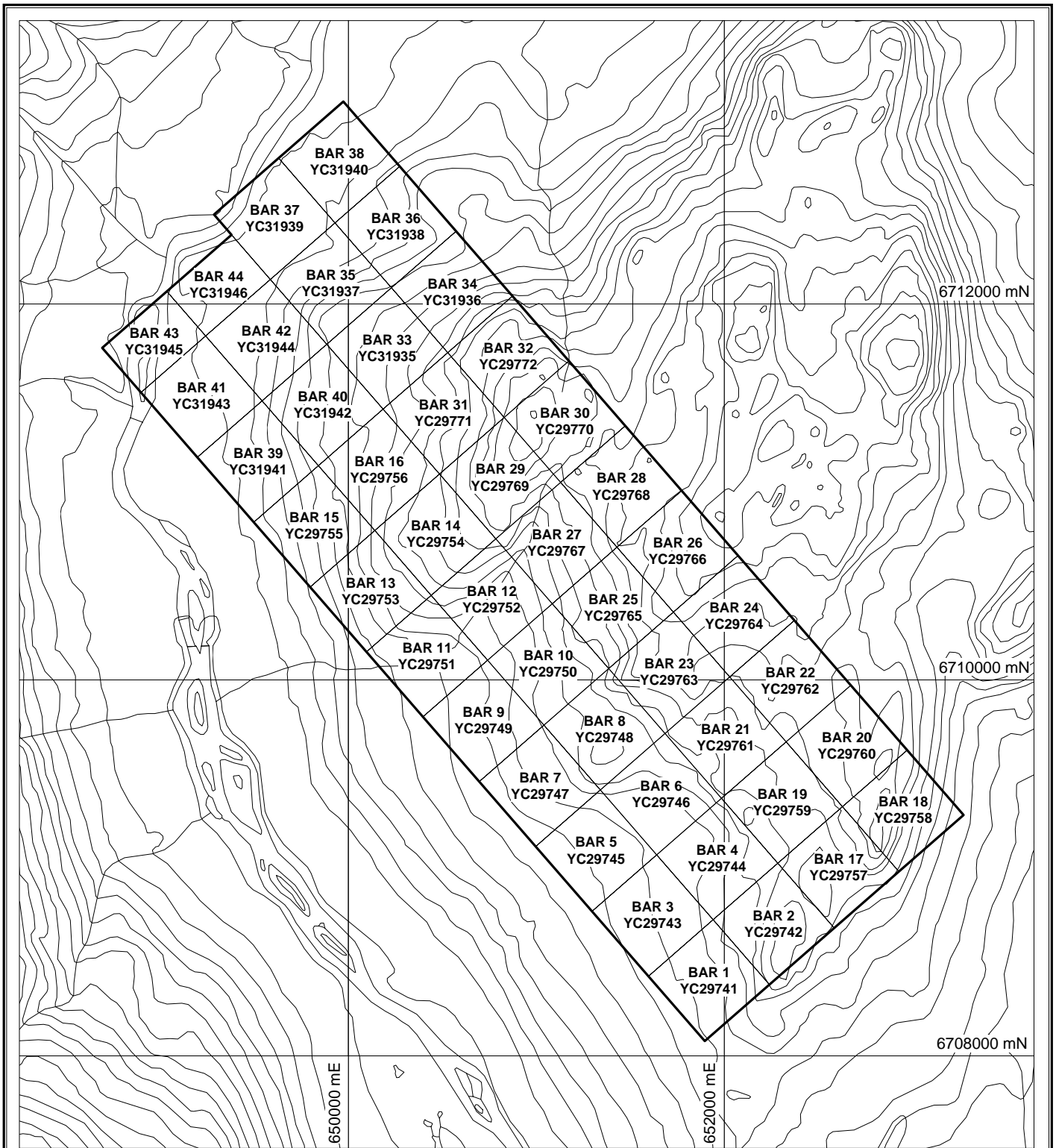
FIGURE 1  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**PROPERTY LOCATION  
BAR PROPERTY**



FILE: .../2007/BAR/F\_1-LOCATION.DWG

DATE: APRIL 2007





# STRATEGIC METALS LTD.

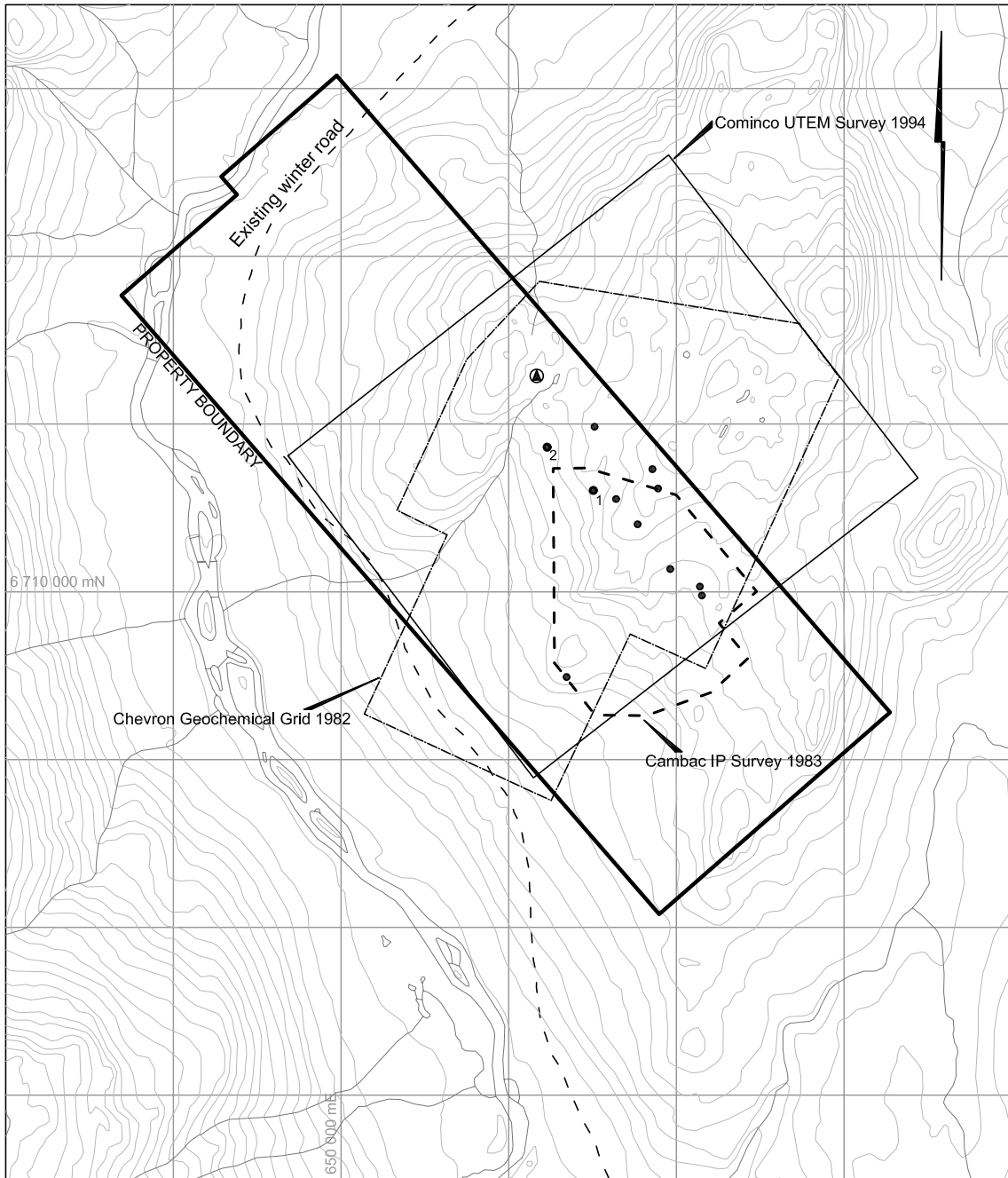
## FIGURE 2 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED CLAIM LOCATION BAR PROPERTY



UTM Zone 8, NAD83, NTS 105C/8 - 105C/9

FILE:./2007/BAR/F2\_CLAIM\_LOC

DATE: APRIL 2007



- Old camp
- Historical diamond drill hole

Drill Core

- 1● Massive pyrite to 2 m thick: best assay 2.5% Zn over 1 m
- 2● Massive pyrite to 5 m thick: best assay 2.6% Zn over 1 m

<b>STRATEGIC METALS LTD.</b>	
FIGURE 3 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED	
<b>HISTORICAL COMPILATION</b>	
<b>BAR PROPERTY</b>	
NAD 83 / UTM ZONE 8	
FILE: ...2006/BAR/F_3-BAR-HIST.DWG	DATE: APRIL 2007

geochemical sampling and an induced polarization survey in 1976 (Stephen and DePaoli, 1976); a magnetometer survey and trenching in 1978; and, 340 m of diamond drilling in 4 holes in 1980 (Stephen, 1980). This work was conducted in what is now the central and southern parts of the Bar property.

In 1981, the D.C. Syndicate dropped its option and Stephen re-optioned the claims to Chevron Canada Ltd., which carried out line cutting, geological mapping and geochemical sampling in 1981 and 1982 (Shaw and Dyson, 1982). Again the work was done in the central and southern parts of the current Bar property.

After Chevron dropped its option, the claims were transferred to Comox Resources Ltd., which performed geological mapping, geochemical sampling, VLF-EM and IP surveys and trenching in 1983 (Sawyer, 1983), and 608 m of diamond drilling in 5 holes in 1985 (Heagy, 1985).

Cominco Ltd. staked the area in 1993. It conducted UTEM electromagnetic, magnetic and gravity survey in 1994 (Lajoie and Holroyd, 1994), and 536.4 m of diamond drilling in two holes in 1997 (Senft, 1998).

Strategic staked the property in spring 2006.

## **GEOMORPHOLOGY**

The property lies on the northwestern flank of the Cassiar Mountains on the east side of the Wolf River. Topography in most parts of the property is subdued with elevations ranging between 950 and 1220 m above sea level. The property was covered by Pleistocene ice sheets and glacial features are common. Outcrop is rare.

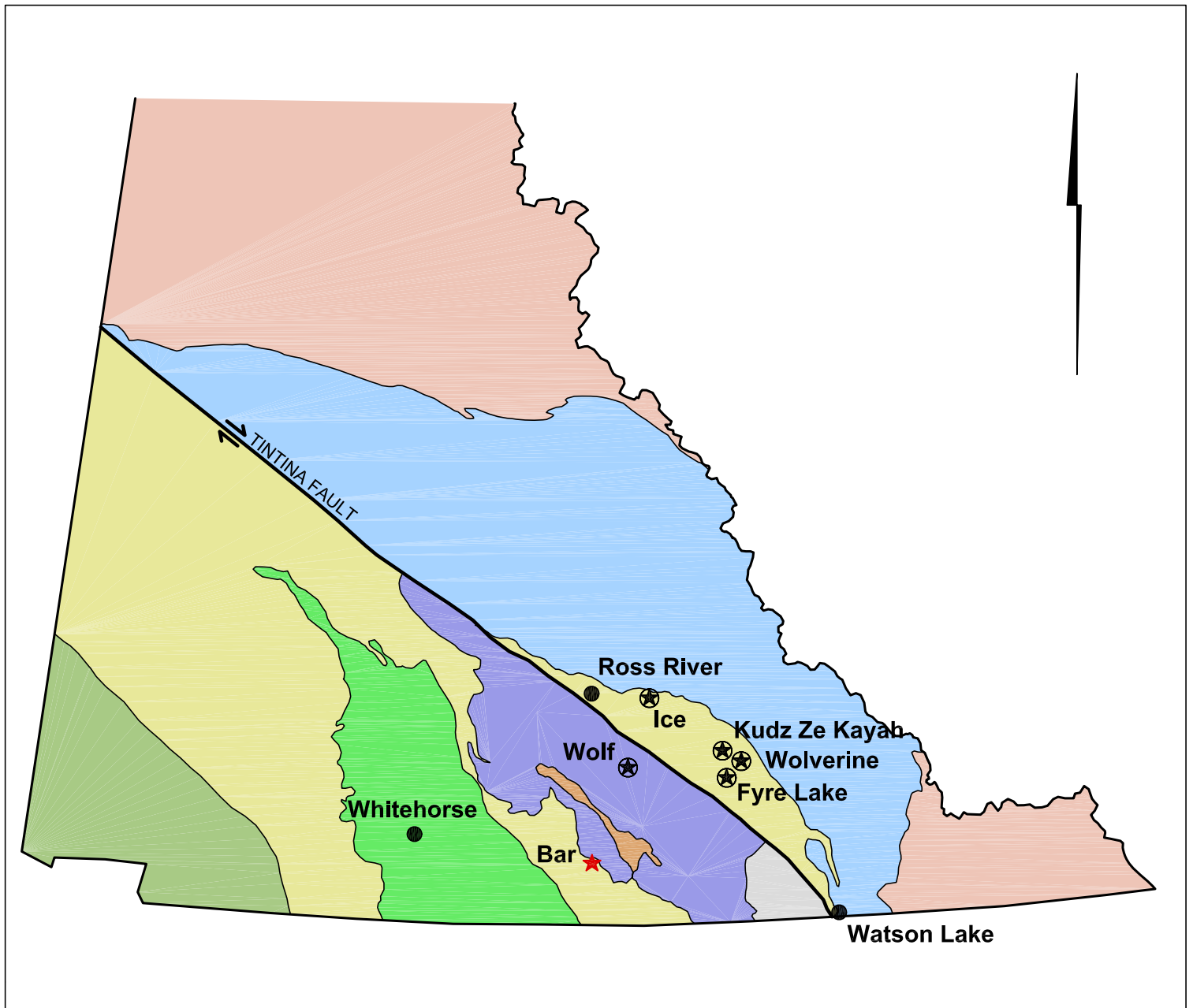
Treeline in the vicinity of the Bar property is at about 1450 m and it is well vegetated with black spruce, pine or alder on hillsides and thick willow along creeks and in marshes.

## **GEOLOGY**

### **Regional Geology**

The Teslin map sheet, where the property is located, was mapped by the Geological Survey of Canada in the 1950's and 1960's (Mulligan, 1963).

The area lies within a belt of Yukon-Tanana Terrane rocks on the southwest side of the Tintina Fault Zone (Figure 4). This belt of rocks is part of an accreted island arc assemblage consisting of bimodal volcanics, coeval plutons and a variety of predominantly clastic sedimentary rocks. Yukon-Tanana Terrane rocks underlie much of west-central Yukon, including an elongated thrust slice (Finlayson Block) located on the northeast side of the Tintina Fault Zone. The Finlayson Block hosts a number of VMS deposits as illustrated on Figure 4.



**TERRANE**

-  Quaternary
-  Mackenzie Platform
-  Selwyn Basin
-  Slide Mountain
-  Cassiar Platform
-  Yukon-Tanana
-  Intermontane
-  Insular

 VMS deposit

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FIGURE 4

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**TECTONIC SETTING  
BAR PROPERTY**



The area of Yukon-Tanana Terrane containing the Bar property is bounded to the east by the D'Abbadie Thrust Fault (Figure 5), (Keijzer, et al., 1999). Rocks on the lower (eastern) plate of the thrust fault belong to the Cassiar Platform tectonic element, which consists of calcareous and non-calcareous sediments and metasediments.

Both the Yukon-Tanana and Cassiar Platform rocks were deformed and metamorphosed by arc-continent collision in the early Mesozoic and were subsequently intruded by various plutonic suites. The regional metamorphic fabric strikes southeasterly and dips moderately toward the northeast. Intrusions in the area range from Early Jurassic to Early Tertiary in age (Mihalynuk and Heaman, 2002) but most belong to the Early Cretaceous, Cassiar Plutonic Suite. The Pre-Mesozoic rocks are complexly imbricated by a series of west dipping thrust faults but the Jurassic and younger intrusions post-date the thrusts. The main lithologies in the vicinity of the Bar property area are summarized on the following table.

**Table I - Main Lithological Units**

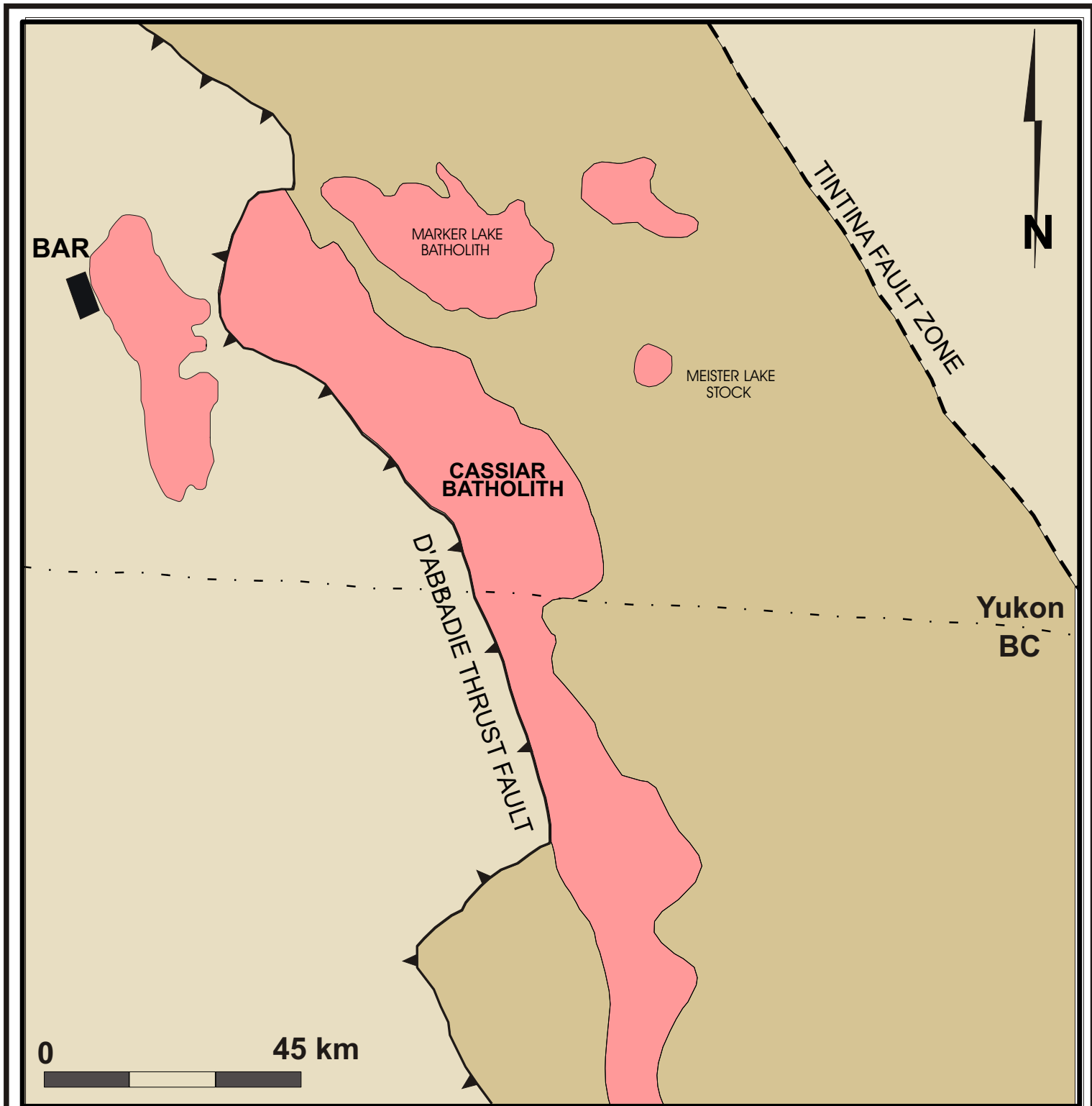
<u>Recent Overburden</u>	Glacial till, lateral and terminal moraines and glaciofluvial outwash
<u>Late Cretaceous or Early Tertiary</u>	Quartz monzonite and quartz-feldspar porphyry
<u>Early Cretaceous</u>	Biotite granite, granodiorite, leuco-quartz monzonite and alaskite
<u>Early Jurassic</u>	Porphyritic granodiorite, monzonite, minor diorite and gabbro
<u>Upper Carboniferous to Permian Klinkit Group</u>	Marble, meta-tuft and volcanic breccia of intermediate composition and limestone
<u>Lower Carboniferous to Upper Silurian Swift River Group</u>	Quartz-plagioclase grit, meta-sandstone, argillite, limestone, chloritic meta-tuft and andesitic intrusions, breccias and tuff.
<u>Carboniferous or older Dorsey Complex</u>	Biotite±garnet schist, quartz meta-grit, hornblende schist and gneiss

Roots et al., 2004

The Swift River Group and Dorsey Complex, belong to the Yukon-Tanana Terrane while the Klinkit Group is an over-lap sequence that straddles both the Yukon-Tanana Terrane and Cassiar Platform.

### Property Geology

Recent relatively detailed geological maps (Roots, 2004) do not extend far enough west to cover the Bar property, and existing property reports do not include detailed geological descriptions. Thus direct correlations cannot be made between units described on the property and specific regional units. Lithological descriptions most closely resemble units of the Klinkit or Swift River Groups.



- Mid Cretaceous  
Cassiar Plutonic Suite
- Cassiar Platform
- Yukon-Tanana Terrane

<b>STRATEGIC METALS LTD.</b>
FIGURE 5 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
<b>REGIONAL GEOLOGY</b>  <b>BAR PROPERTY</b>
FILE: .../2007/BAR/F_5-REG_GEO.CDR      DATE: APRIL 2007

Figure 6 illustrates the generalized geology of the Bar property, which dominantly consists of sedimentary and volcanic units. The basal assemblage comprises limestone, limestone conglomerate and calcareous mudstone. These limy rocks are overlain by a volcanic containing tuffaceous siltstone, chert, chert breccia, rhyolite and calcareous to graphitic mudstone. The volcanoclastic sequence is capped by a laterally extensive barite-silica horizon and chert pebble conglomerate. These rocks are in turn overlain by more volcanoclastic rocks and another section of limestone.

The strata strike northwesterly and dip shallowly to the southwest. No large faults have been mapped on the property.

### **MINERALIZATION AND GEOCHEMISTRY**

The most prominent features at the Bar property are a laterally extensive barite-silica exhalite horizon and a series of large metal-rich transported gossans, locally referred to as ferricrete "kill zones" because vegetation cannot grow upon them.

The exhalite horizon is at least 2000 m long and up to 50 m thick. This horizon consists primarily of barite but grades locally to a baritic quartzite. It typically contains finely disseminated pyrite with traces of sphalerite and galena. Drill holes have intersected 3 to 5 m thick bands of massive pyrite that are vein and stratiform in nature, but this type of mineralization has not been reported on the surface. The best assays from drill core were reported from the 1997 program. They graded 2.5% Zn, 0.06% Pb and 22% Ba across a 1 m interval (Senft, 1998).

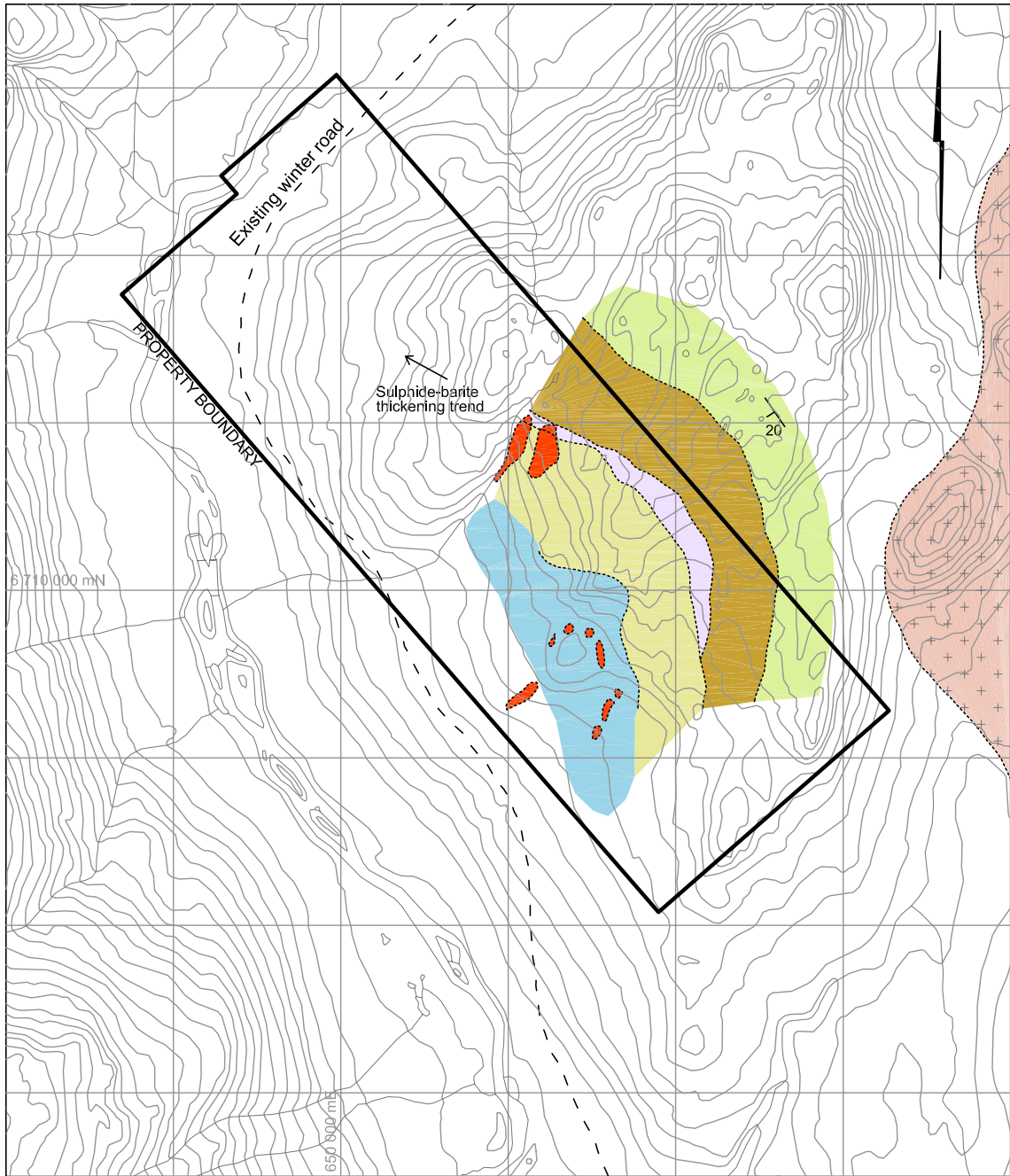
The transported gossans are up to 300 m long and 60 m wide and are located topographically below the exhalite horizon. They are predominantly composed of iron but are also commonly enriched in zinc and other metals. These gossans may be important exploration indicators because similar gossans occur near some deposits elsewhere in the Yukon. They are believed to have been precipitated from ground water that contains metals leached from oxidizing portions of sulphide-rich deposits.

Various soil geochemical surveys that have been done on the Bar property show lead response is strongest near the surface trace of the barite-silica horizon in the central part of the property, reaching a maximum of 212.6 ppm. The highest zinc values, up to 1438.6 ppm, are clustered within the ferricrete gossans. The best silver and barium values mostly coincide with areas of high lead response. Copper values are generally low.

### **PRE-2006 GEOPHYSICAL SURVEYS**

Geophysical surveys have been conducted at the Bar property at various times since 1976 but much of the early work was poorly documented.

In 1976, an induced polarization survey was conducted by Morrison and DePaoli Geophysical Surveying and Consulting on behalf of D.C. Syndicate. A total of 17 line kilometres were done on cut grid lines using a multiple frequency McPhar Model P660



**Klinkit or Swift River Groups**

- Limestone
- Chert, rhyolite, tuffaceous mudstone
- Barite
- Chert pebble conglomerate, shale and tuffaceous sandstone
- Volcaniclastic rocks and limestone
- Transported gossan

Stratigraphic orientation

Geologic contact, inferred

**Cassiar Plutonic Suite**

- Granite

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FIGURE 6  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**PROPERTY GEOLOGY**  
**BAR PROPERTY**

0 1000 1500 m

NAD 83 / UTM ZONE 8

system to measure polarization and resistivity parameters. The survey used a symmetrical in line dipole-dipole array with measurements taken to four separations. Several induced polarization anomalies and corresponding resistivity lows were identified in the vicinity of known mineral occurrences and soil geochemical anomalies associated with the barite-silica exhalite horizon.

In 1978 magnetometer surveys were reportedly done but there is no documentation of the equipment used or results obtained. Similarly in 1983, Glen E. White Geophysical Consultants conducted induced polarization and VLF-EM surveys on behalf of Comox Resources. These surveys expanded the area of anomalous induced polarization response (Sawyer, 1983), but there was no mention of results from the VLF-EM work. No specifics were given regarding procedures or equipment used for either survey.

In 1994 Cominco conducted 22 line kilometres of electromagnetic and magnetic surveys and 1.4 line kilometres of gravity surveys. The surveys utilized a UTEM III transmitter; and three EDA Omni Plus magnetometers, one of which was used as a base station. The UTEM surveys produced four crossover anomalies and areas of lower resistivity that are interpreted as carbonaceous units. The magnetic surveys yielded anomalous readings west of the UTEM conductors. Gravity surveys that followed up the UTEM cross-over anomalies produced negative results consistent with a carbonaceous shale.

### **DIAMOND DRILLING**

A total of 11 diamond drill holes have been completed at the Bar Property (Figure 3). Four of the holes were drilled in 1980 by Drilcor Industries Ltd. of Richmond B.C. on behalf of the D.C. Syndicate. A total of 340 m were completed during that program using BQ equipment. Another 608 m of drilling was done by Drilcor in 1985 on behalf of Comox Resources Ltd. This program comprised 5 holes that were all done with BQ equipment. Finally, in 1997 Cominco Ltd. performed 536.4 m of drilling in two holes. This work was done by D.J. Drilling of Watson Lake using a Longyear LF70 drill with NQ equipment.

The 11 diamond drill holes are located along a 1300 m trend near the centre of the current claim block. The 1980 holes primarily tested the eastern (updip) edge of the barite-silica horizon. The best reported intercept graded 1.88% zinc, 0.12% lead and 17 g/t silver over 3 m.

The 1985 drilling explored using a geological model that interpreted the barite-silica and transported gossans as belonging to an epithermal system. Two of the holes cut several short intervals of pyrite-sphalerite-galena mineralization within the barite-silica horizon. The best of these intervals returned 2.77% zinc, 0.43% lead and 32.2g/t silver over 0.9 m.

Cominco's 1997 drilling was done at the northwestern end of the drill tested trend. Both holes encountered massive sulphide bands beneath the barite-silicate horizon. Hole 97-01 cut several, one to two metre thick intervals of massive pyrite that exhibit vein and stratiform characteristics. The best of these intervals returned 2.5% zinc across 1 m.

Hole 97-02 intersected 3 m and 5 m thick sections of massive pyrite, the highest assay from which was 2.6% zinc across 1 m.

### **2006 GEOPHYSICAL SURVEYS**

A total of 171 line kilometres of magnetic and VTEM surveys were flown across the Bar property by Geotech Ltd. between May 25 and 28, 2006. The block was flown at 100 m line spacings with two perpendicular tie lines roughly 960 m apart. Where possible, the apparatus maintained a terrain clearance of 45 m. Geotech's report appears in Appendix II.

The magnetic field response over the Bar property is generally weak (Figure 7). The strongest anomaly forms a northwest trending band along the southwestern edge of the claim block parallel to the Wolf River. Several moderately anomalous isolated points are scattered across the central part of the survey area.

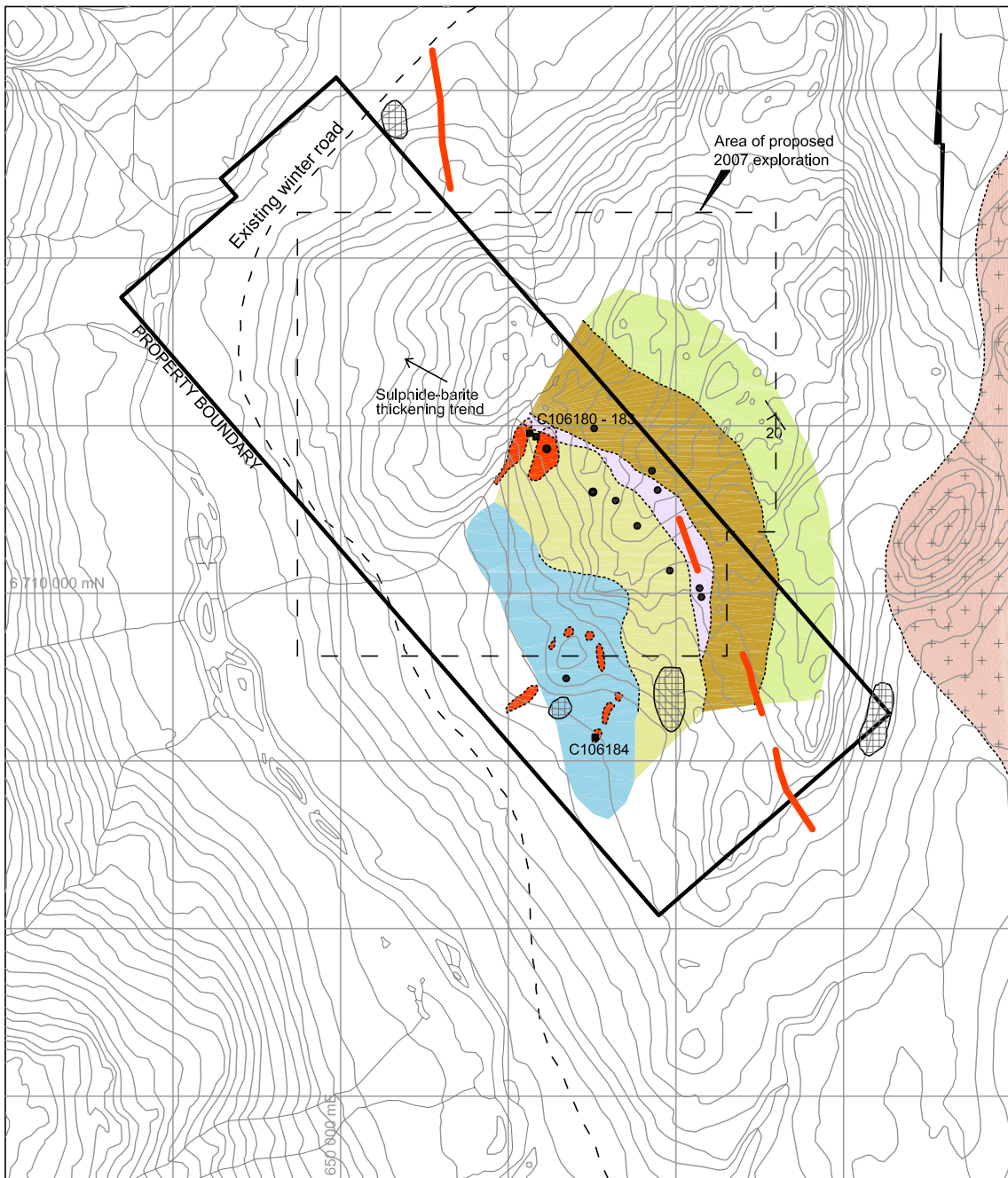
Euler deconvolution inversion of the data show a number of linear and circular magnetic features at depths estimated between 0 and 300 m. The majority of the linear features trend due north.

The VTEM survey identified several broad anomalies in the central and eastern parts of the survey block, which are likely associated with thick conductive zones with large lateral extents. Late time channels show a fairly good conductor in the northern part of the survey area. This conductor trends northerly and lies east of the property boundary (Figure 7). Three conductors in the southern and central parts of the claims are considered weakly conductive. None of the VTEM conductors correlate with magnetic anomalies.

### **2006 PROSPECTING**

The author attempted follow up prospecting of the geophysical anomalies on October 16. However, the property was largely snow covered limiting exposure in the areas of interest. Rock samples collected during the visit were sent to ALS Chemex in North Vancouver where they were fine crushed with more than 70% passing 2 mm before a 250 g split was pulverised to better than 85% passing 75 microns. A split of the pulverized fraction was then analyzed for 34 elements using inductively coupled plasma-atomic emission spectroscopy (ME-ICP41). The sample locations are shown on Figure 7 while Certificates of Analysis appear in Appendix III. Rock sample descriptions appear in Appendix IV.

The first site visited lies within the central part of the property and at the collar of Hole 97-02, which yielded two intervals of massive pyrite up to 5 m thick. The drill collar lies within a roughly 100 m by 50 m area that is covered by a thick accumulation of dark red to orange and yellow banded ferricrete. Locally derived talus within the ferricrete zone consists mostly of crudely banded quartz-eye rhyolite, grey-black mudstone, quartz-muscovite schist and andesite. Specimens of ferricrete and felsic schist containing pyrite



**Klinkit or Swift River Groups**

- Limestone
- Chert, rhyolite, tuffaceous mudstone
- Barite
- Chert pebble conglomerate, shale and tuffaceous sandstone
- Volcaniclastic rocks and limestone
- Transported gossan

**Cassiar Plutonic Suite**

- Granite
- EM conductor
- Magnetic anomaly
- Stratigraphic orientation
- Geologic contact, inferred

C106180

- 2006 rock sample
- Historical diamond drill hole

Sample	Ag (g/t)	Pb (ppm)	Zn (ppm)
C106180	0.4	168	36
C106181	2.3	103	10
C106182	20.2	2160	1115
C106183	2.0	964	15
C106184	-	14	2190

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FIGURE 7  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**VTEM COMPILATION  
BAR PROPERTY**

0 1000 1500 m

NAD 83 / UTM ZONE 8

FILE: ...2007/BAR/F\_7-BAR-VTEM.DWG

DATE: APRIL 2007

and traces of galena returned up to 20.2 g/t Ag, 0.22 % Pb and 0.11 % Zn. The ferricrete samples were particularly elevated in thallium to a peak value of 1150 ppm. Other elements of interest that were moderate to strongly anomalous from the suite of rocks sampled include arsenic (to 2280 ppm), mercury (to 448 ppm) and antimony (to 476 ppm). Gold analyses were below detection limits for all samples. The second site visited coincides with one of eight transported gossans forming a ring around a gentle height of land in the south-central part of the property. One sample (C106184) was collected from a thick accumulation of dark red ferricrete originating from a spring. This sample yielded elevated values for zinc (2190 ppm), manganese (14199 ppm) and thallium (210 ppm).

### **CONCLUSIONS AND RECOMMENDATIONS**

The Bar property is located within the Yukon-Tanana Terrane, a geological package containing known VMS deposits. Previous work on the property has identified thick, laterally extensive exhalite horizons within a stratigraphic section that includes metamorphosed volcanic rocks. Prospective VMS target areas are marked by the barite rich exhalite, previous sulphide rich drill intersections and geophysical anomalies. The presence of large transported gossans, which are enriched in several metals besides iron, suggests that sulphide rich mineralization is being leached by oxygenated groundwater. These types of metal rich gossans are developed near known deposits but are not common elsewhere in Yukon-Tanana Terrane.

Although previous diamond drilling has not intersected 'ore' grade mineralization, some of the holes have cut horizons that could represent the distal facies of a VMS deposit. Additional drilling is definitely warranted. Future work at the Bar property should be done along strike to the northwest from previous drill holes that intersected massive sulphide mineralization. This area has never been drill tested and lies outside the area covered by soil geochemical surveys. The Cominco geologist, who supervised the last diamond drill program concluded that "the amount of pyrite intersected suggests a large sulphide system is present that has not yet been sufficiently tested. Results from the 1997 drilling suggest that the mineralization-hosted (silica) barite stratigraphy thickens as it trends off the existing grid to the northwest" (Senft, 1998). A three to four hole, 600 m drill program is recommended.

Respectfully Submitted

Archer, Cathro & Associates (1981) Limited

W.A. Wengzynowski, P.Eng.

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Traynor, S.  
2005 Yukon Minifile, Yukon Geological Survey, Yukon Energy, Mines and  
Resource

**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, B.A.Sc., P. Eng.

**APPENDIX II**  
**GEOPHYSICAL REPORT BY GEOTECH LTD.**



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

**BAR PROPERTY**  
Yukon Territory, Canada

for  
**Strategic Metals Ltd.**

By

**Geotech Limited**  
30 Industrial Parkway South  
Aurora, Ontario, Canada  
Tel: 1.905.841.5004  
Fax: 1.905.841.0611

[www.geotechairborne.com](http://www.geotechairborne.com)

Email: [info@geotechairborne.com](mailto:info@geotechairborne.com)

Survey flown in May - July 2006

Project 663  
October 2006

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## REPORT ON A HELICOPTER-BORNE

# TIME DOMAIN ELECTROMAGNETIC SURVEY

**Bar Property**, Yukon Territory, Canada

## Executive Summary

During the period of May 20<sup>th</sup> to July 8<sup>th</sup>, 2006, Geotech Limited carried out a helicopter-borne geophysical survey for Strategic Metals Ltd. over ten blocks located in the Yukon Territory, Canada, including **Bar Property**.

Principal geophysical sensors included a versatile time domain electromagnetic system (VTEM) and a cesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 2750.77 line-km. were flown, including 171 line-km. for **Bar Property**.

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

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

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 Limited and Strategic Metals Ltd., to perform a helicopter-borne geophysical survey over the multiple blocks, located in Yukon Territory, Canada, including **Bar Property**.

2750.77 line-km of geophysical data were acquired during the survey.

The survey coordinates for **Bar Property** are as shown in Appendix A.

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

The helicopter was obtained from TransNorth Helicopters for the duration of the survey. Multiple fuel caches were arranged.

Survey flying was completed on July 8<sup>th</sup>, 2006. 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 Limited in November 2006.

## 1.2. *Survey and System Specifications*

The **Bar Property** survey block was flown at a nominal traverse line spacing of 100 metres.

Tie lines were flown perpendicular to traverse lines at approximately 960 metres, as shown in Section 2 of this report.

Where suitable, survey lines were extended beyond original block boundary to reach the minimum length of 3 km.

Where possible, the helicopter maintained a mean terrain clearance of 80 metres, which translated into an average height of 45 metres above ground for the bird-mounted VTEM system and 45 metres for the magnetic sensor.

The survey was flown using an Astar B2 helicopter, registration C-GTNU, operated by TransNorth Helicopters Limited. 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 Limited.

Database, grid and maps of final products were presented to Strategic Metals 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**

The **Bar Property** survey block location is shown on the location map (Appendix A).

Topographically, the block exhibits a rugged mountainous relief, with an elevation range of 850 metres to 1240 metres above sea level.

## 2. DATA ACQUISITION

### 2.1. Survey Area

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

Survey areas	Line /Tie spacing (m)	Line /Tie - km	Line / Tie direction	Line number	Line KM
Bar	100	151.8	N48E	1010 - 1500	170.9
	960	19.1	N42W	1910 - 1940	

Table 1 - Survey block

The survey block boundary is shown in Appendix B.

### 2.2. Survey Operations

Survey operations were based in several locations in the Yukon Territory for the acquisition phase of the survey, including Teslin for the **Bar Property**. The following table shows the timing of the various flights.

**Bar Property** was flown along with other blocks in the same vicinity.

Date	Flights	Production	Block	Crew location	REMARK
20-May		0		Whitehorse	Mobilization to Whitehorse
21-May		0		Whitehorse	Assembly of system
22-May		0		Whitehorse	Helicopter installation, test flight
23-May		0		Teslin	Mobilization to Teslin - no production
24-May		0		Teslin	No production due to weather
25-May	1,2,3	109.5	BAR	Teslin	
26-May	4, 1, 2	161.09	BAR, CONVERT	Teslin	
27-May	7,8	95.62	CONVERT	Teslin	flying aborted – due to weather
28-May	9	18.83	BAR	Teslin	flying aborted – due to weather
29-May		0		Watson Lake	move to Watson lake, prepare fuel cache
30-May	10, 11, 12	118.74	SIM	Watson Lake	
31-May	13, 14, 15	109.46	SIM, 4C	Watson Lake	
01-Jun	16, 17, 18	87.97	4C	Watson Lake	flying aborted – due to rough terrain
02-Jun	19	5.38	SIM	Ross River	Re-flight
03-Jun	20	91.37	TIDD	Ross River	flying aborted – due to weather
04-Jun		0		Ross River	No production due to weather
05-Jun	21, 22, 23	270.54	TIDD	Ross River	
06-Jun	24, 25, 26	194.78	TIDD	Ross River	flying aborted – due to weather
07-Jun	27, 28, 29	269.91	TIDD	Ross River	
08-Jun	30,31	92.81	TIDD	Ross River	rough terrain
09-Jun		0		Ross River	
21-Jun		0		Mayo	Ferry flights, move fuel to MARG
22-Jun		0		Mayo	No production due to weather
23-Jun	1, 2	84.68	MARG	Mayo	flying aborted – due to weather
24-Jun	3,4,5	158.36	MARG	Mayo	
25-Jun	6,7	123.1	MARG	Mayo	
26-Jun		0		Dawson City	No production due to weather
27-Jun		0		Dawson City	No production due to weather
28-Jun	1,2,3	111	MIC	Dawson City	flying aborted – due to weather
29-Jun	3,4	139.51	MIC, MAG	Dawson City	
30-Jun	5,6,7	115.74	MAG	Dawson City	flying aborted – due to weather
01-Jul	7,8	101.59	CN	Dawson City	
02-Jul	9	76.63	CN	Dawson City	flying aborted – due to weather
03-Jul	10, 11	121.16	CN	Dawson City	
04-Jul	1,2	66	PAN	Dawson City	
05-Jul	3	3	PAN	Dawson City	Test flights
06-Jul	4	24	PAN	Dawson City	
07-Jul		0			helicopter inspection
08-Jul		0		Burwash	Burwash Block cancelled due to rough topo

Table 2 - Survey schedule

### **2.3. Flight Specifications**

The nominal EM sensor terrain clearance was 45 m (EM bird height above ground, i.e. helicopter is maintained 80 m above ground). 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 the 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 camp 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 B2 helicopter, registration C-GTNU - owned and operated by TransNorth 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 Versatile Time Domain EM (VTEM) system. The layout of the configuration used for this survey is as indicated in Figure 1 below.

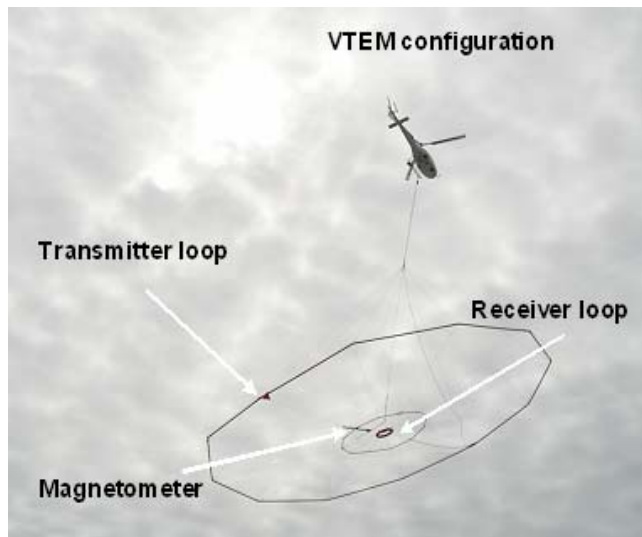


Figure 1 - VTEM Configuration

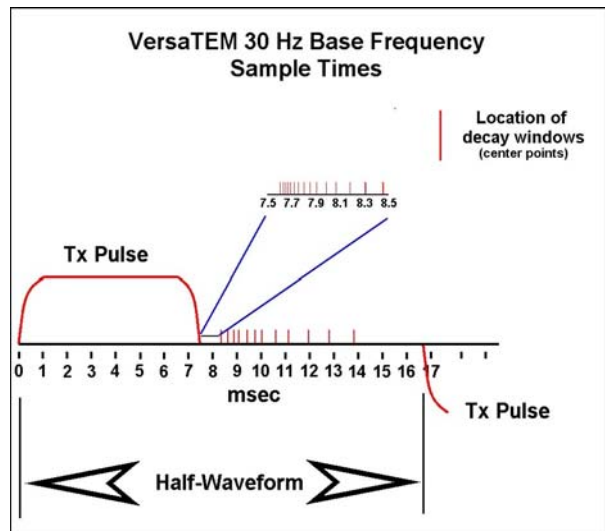


Figure 2 - VTEM sample times

Receiver and transmitter coils are concentric and Z-direction oriented.

The receiver decay recording scheme is shown diagrammatically in Figure 2.

Twenty-six measurement gates were used in the range from 130  $\mu$ s to 7540  $\mu$ s, as shown in the following table.

<b>VTEM Decay Sampling scheme (Microseconds)</b>			
<b>Time gate</b>	<b>Start</b>	<b>End</b>	<b>Width</b>
130	120	140	20
150	140	160	20
170	160	180	20
190	180	205	25
220	205	240	35
260	240	280	40
300	280	325	45
350	325	380	55
410	380	445	65
480	445	525	80
570	525	625	100
680	625	745	120
810	745	885	140
960	885	1045	160
1130	1045	1235	190
1340	1235	1470	235
1600	1470	1750	280
1900	1750	2070	320
2240	2070	2450	380
2660	2450	2920	470
3180	2920	3480	560
3780	3480	4120	640
4460	4120	4880	760
5300	4880	5820	940
6340	5820	6860	1040
7540	6860	8220	1360

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 167 A.  
Duty cycle was 37%.  
Peak dipole moment was 355,000 NIA.

Receiver coil diameter was 1.2 metre, the number of turns was 100.  
Receiver effective area was 113 m<sup>2</sup>  
Wave form – trapezoid.  
Recording sampling rate was 10 samples per second.

The EM bird was towed 35 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 separate bird towed at the same altitude as the EM sensor. 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. Contents and update rates were as follows:

DATA TYPE	SAMPLING
TDEM	0.1 sec
Magnetometer	0.1 sec
GPS Position	0.2 sec
Radar Altimeter	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 bench sensitivity of 0.002 nT. The base station records the magnetic field together with the GPS time at 1 Hz on a base station computer. The base station magnetometer sensor was installed 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

Crew chiefs / Operators: Graeme Lille, Calin Cosma, Brad Marsh

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

Pilots: Stephen Soubliere  
Mechanical Engineer: Margo Hager

#### Office

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

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

Overall management of the survey was carried out from the Aurora office of Geotech Ltd. by Edward Morrison, President.

## 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 gate times, in logarithmic scale.

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

The VTEM output voltage of the receiver coil 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.

Tie line levelling was carried out by adjusting intersection points along the traverse lines. A micro-levelling procedure was then applied. This technique is designed to remove persistent low-amplitude components of flight-line noise remaining after tie line levelling.

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 0.2 cm. at the mapping scale. The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

## 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 WORD format.

### 5.2. *Maps*

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

The following maps are presented to Strategic Metals Ltd. on paper as results of the helicopter-borne geophysical survey carried out over the **Bar Property**.

- Total Magnetic Field contours and colour images
- Logarithmic scale VTEM profiles, Time Gates 0.22 - 6.34 ms

### 5.3. *Gridded Data*

Total Magnetic Field grid is provided to Strategic Metals Ltd. in Geosoft GRD format. Grid cell size was adjusted to suit the parameters of the individual block. For traverse line spacing of 100 metres, 10 m grid cell size was used.

## 5.4. Digital Data

There are three (3) main directories,

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

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

**VTEM\_fp\_GoogleEarth** contains kmz file containing flightpath of the BAR Property.

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) (on the tail of the helicopter)
Gtime1:	GPS time (seconds of the day)
Radar:	Helicopter terrain clearance from radar altimeter (metres - AGL)
DEM:	Digital elevation model (metres)
Mag1:	Raw Total Magnetic field data (nT)
Basemag:	Base station magnetic data (nT)
Mag2:	Total Magnetic field base station corrected data (nT)
Mag3:	Levelled Total Magnetic field data (nT)
C130f:	Raw 130 microsecond time channel (pV/A/m <sup>4</sup> )
C150f:	Raw 150 microsecond time channel (pV/A/m <sup>4</sup> )
C170f:	Raw 170 microsecond time channel (pV/A/m <sup>4</sup> )
C190f:	Raw 190 microsecond time channel (pV/A/m <sup>4</sup> )
C220f:	Raw 220 microsecond time channel (pV/A/m <sup>4</sup> )
C260f:	Raw 260 microsecond time channel (pV/A/m <sup>4</sup> )
C300f:	Raw 300 microsecond time channel (pV/A/m <sup>4</sup> )
C350f:	Raw 350 microsecond time channel (pV/A/m <sup>4</sup> )
C410f:	Raw 410 microsecond time channel (pV/A/m <sup>4</sup> )
C480f:	Raw 480 microsecond time channel (pV/A/m <sup>4</sup> )
C570f:	Raw 570 microsecond time channel (pV/A/m <sup>4</sup> )
C680f:	Raw 680 microsecond time channel (pV/A/m <sup>4</sup> )

C810f: Raw 810 microsecond time channel (pV/A/m<sup>4</sup>)  
 C960f: Raw 960 microsecond time channel (pV/A/m<sup>4</sup>)  
 C1130f: Raw 1130 microsecond time channel (pV/A/m<sup>4</sup>)  
 C1340f: Raw 1340 microsecond time channel (pV/A/m<sup>4</sup>)  
 C1600f: Raw 1600 microsecond time channel (pV/A/m<sup>4</sup>)  
 C1900f: Raw 1900 microsecond time channel (pV/A/m<sup>4</sup>)  
 C2240f: Raw 2240 microsecond time channel (pV/A/m<sup>4</sup>)  
 C2660f: Raw 2660 microsecond time channel (pV/A/m<sup>4</sup>)  
 C3180f: Raw 3180 microsecond time channel (pV/A/m<sup>4</sup>)  
 C3780f: Raw 3780 microsecond time channel (pV/A/m<sup>4</sup>)  
 C4460f: Raw 4460 microsecond time channel (pV/A/m<sup>4</sup>)  
 C5300f: Raw 5300 microsecond time channel (pV/A/m<sup>4</sup>)  
 C6340f: Raw 6340 microsecond time channel (pV/A/m<sup>4</sup>)  
 C7540f: Raw 7540 microsecond time channel (pV/A/m<sup>4</sup>)  
 PLinef: Power line monitor (linear trend removed)

- Grids in Geosoft GRD format, as follow,

Bar\_magfin: Total Magnetic field (nT)

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

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

bar\_magfin: Total Magnetic Field image and contours

BAR\_EM\_LP: Logarithmic scale profiles, Time Gates 0.22 – 6.34 ms

- ASCII file VTEM WaveForm.xyz in Geosoft format containing the following channel:

Volt: output voltage of the receiver coil  
(volts, sampling rate 20 microseconds)

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

## 6. CONCLUSIONS

A versatile time domain electromagnetic helicopter-borne geophysical survey has been completed over 10 blocks located in Yukon Territory, Canada, including **Bar Property.**

Total survey line coverage is 2750.77 line kilometres, including 171 line-km. for the **Bar Property.** The principal sensors included a Time Domain EM system and a magnetometer. Results have been presented as colour contour maps and stacked profiles.

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

Respectfully submitted,

Marta Orta  
on behalf of

George Lev  
Geotech Limited  
November 8, 2006

## APPENDIX A

### SURVEY BLOCK LOCATION MAP



**APPENDIX B**  
**SURVEY BLOCK COORDINATES**

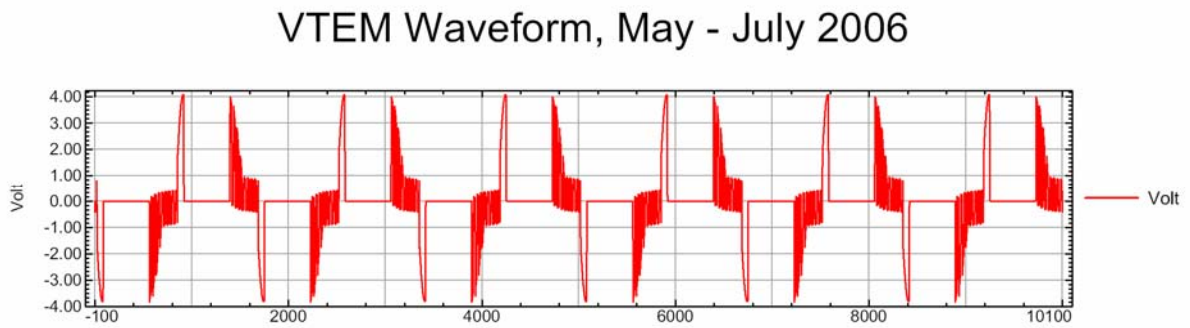
(WGS 84, UTM zone 8N)

<b>BAR</b>	
653581.0	6709324.0
651291.0	6707231.0
648524.0	6710517.0
649203.0	6711166.0
648807.0	6711646.0
650310.0	6712987.0

## APPENDIX C

### General Modeling Results of the VTEM Stysem

**APPENDIX D**  
**VTEM WAVE FORM**



# GENERALIZED MODELING RESULTS OF THE VTEM SYSTEM

## 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 metres 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.

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°. 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° to about 30°. The method is not sensitive enough where dips are less than about 30°. Figure E shows a plate dipping 45° and, at this angle, the

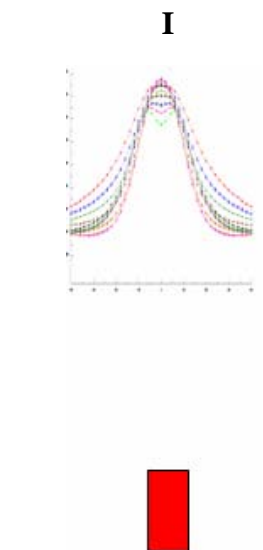
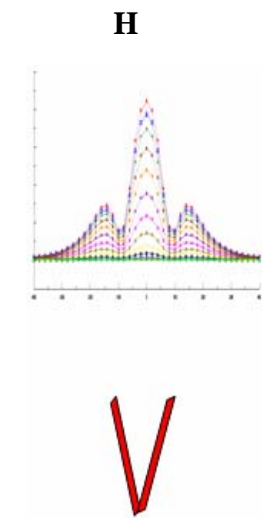
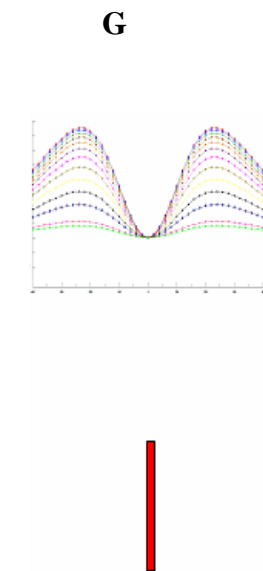
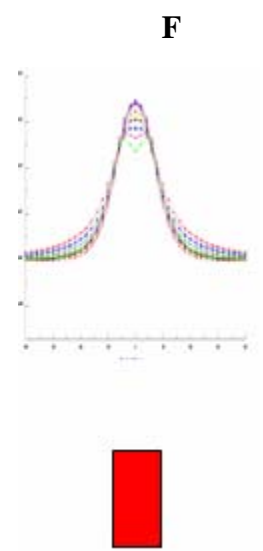
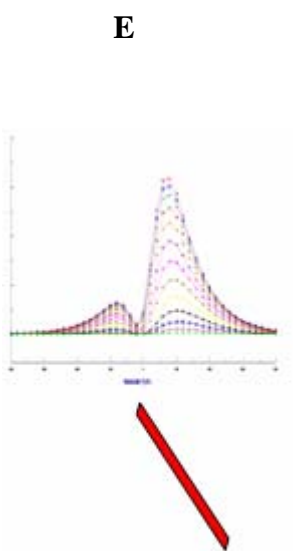
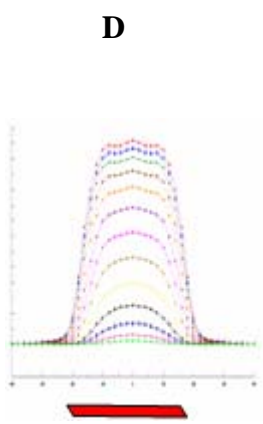
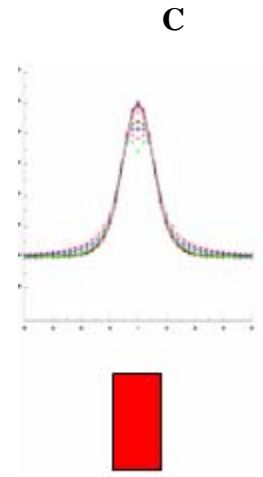
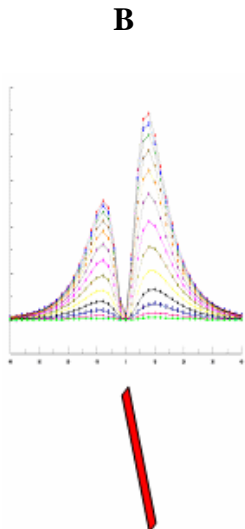
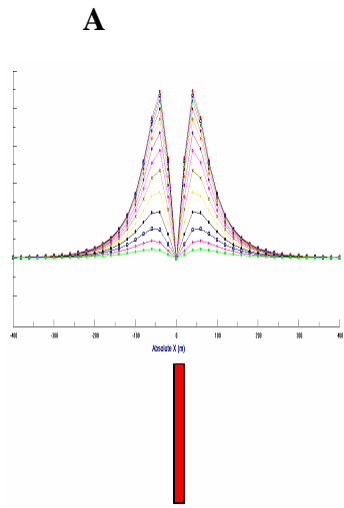
minimum shoulder starts to vanish. In Figure D, a flat lying plate is shown, relatively near surface. Note that the twin peak anomaly has been replaced by a symmetrical shape with large, bell shaped, channel amplitudes which decay relative to the conductance of the plate.

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.



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

**BAR PROPERTY**  
Yukon Territory, Canada

for  
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Survey flown in May - July 2006

Project 663  
February, 2007

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# REPORT ON A HELICOPTER-BORNE TIME DOMAIN ELECTROMAGNETIC INTERPRETATION

**Bar Property, Yukon Territory, Canada**

## 1. INTRODUCTION

During the period of May 20<sup>th</sup> to July 8<sup>th</sup>, 2006 a helicopter-borne electromagnetic survey was carried out by Geotech Ltd. for Strategic Metals Ltd. over eight Properties located in Yukon Territory, Canada.

This report includes the results of the geophysical interpretation, over the Convert Property, located at approximately 150 km south-east from Whitehorse, in the Yukon Territory. The geographic coordinates of the block extents are: longitudes, 132° 12' W and 132° 18' W, and latitudes, 60° 26' N and 60° 32' N. The surveyed area is 15 km<sup>2</sup>, and the total line kilometers flown are 171 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.

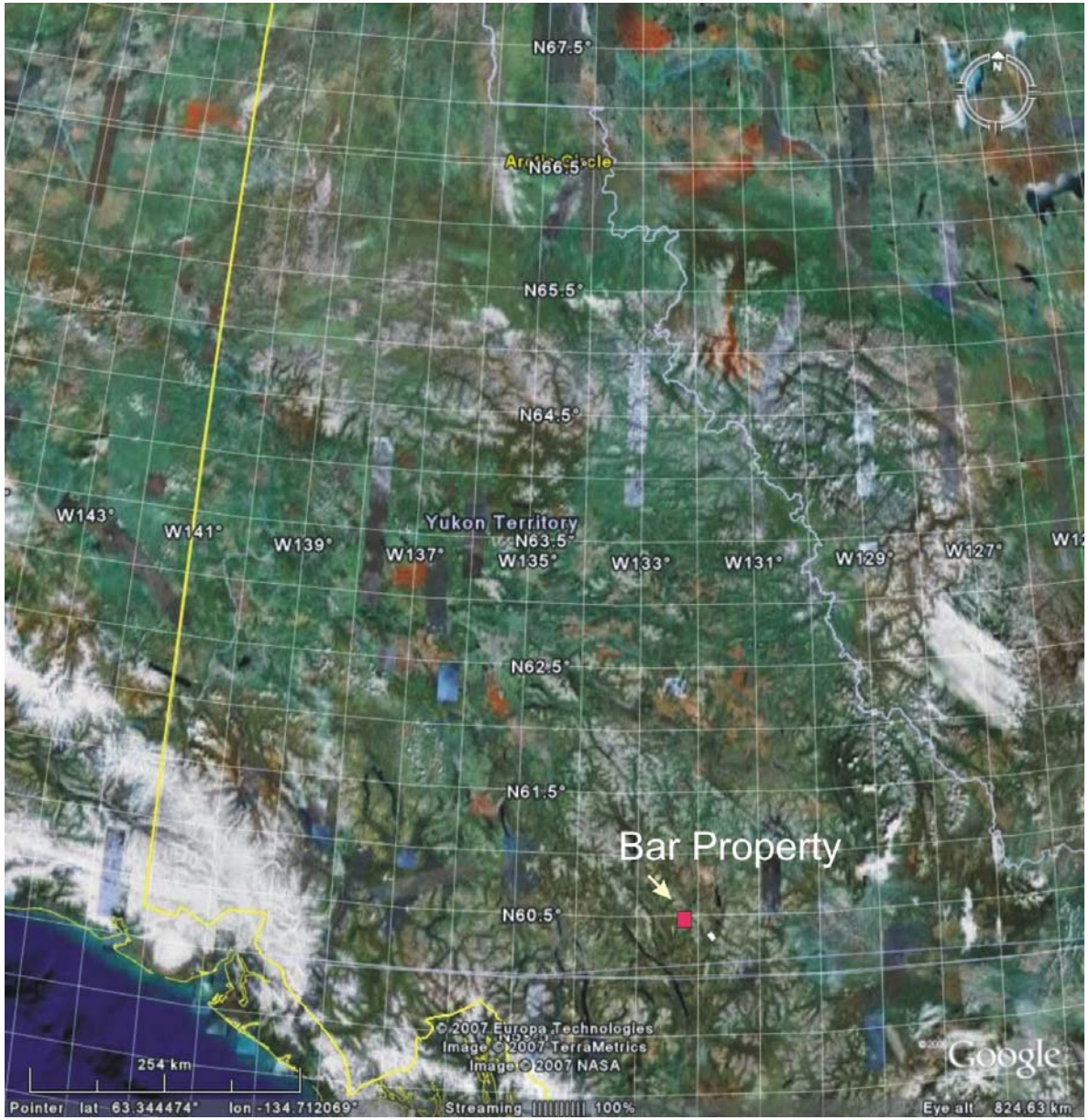


Fig. 1 Location of the Bar Property on the satellite image.

## 2. Topographic relief.

The Bar Property is located on a rugged mountainous relief, with an elevations ranging from 850 metres to 1240 metres above sea level.



Fig. 2 Flight path showing Lines and Tie-lines superimposed on the relief satellite image.

### 3. Flight specifications

Flight path orientation, total flown line-km and other specifications are summarized in the following tables.

Property name	Line /Tie spacing (m)	Line /Tie km	Sensor Altitude, m (AGL)	Line / Tie direction	Line number	Line KM
<b>Bar</b>	100	151.8	50	N48°E	1010 - 1500	170.9
	960	19.1		N42°W	1910 - 1940	

Table 1. Flight specifications of the surveyed block.

<b>Bar Property Utm zone 8N</b>	
Easting (m)	Nothing (m)
653581	6709324
651291	6707231
648524	6710517
649203	6711166
648807	6711646
650310	6712987

Table 2 Coordinates of the survey block.

### 3.1 Helicopter and equipment

#### 3.1.1 Survey Aircraft

An Astar B2 helicopter, registration C-GTNU - owned and operated by TransNorth Helicopters Ltd. was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Geotech Ltd.

#### 3.1.2 Electromagnetic System

The electromagnetic system was a Geotech Versatile Time Domain EM (VTEM) system. The layout of the configuration used for this survey is as indicated in Figure 3 below.

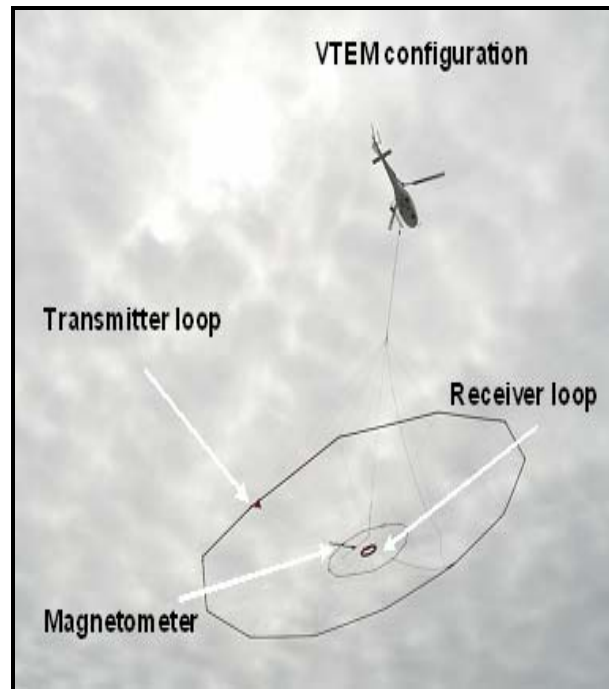


Figure 3 - VTEM Configuration

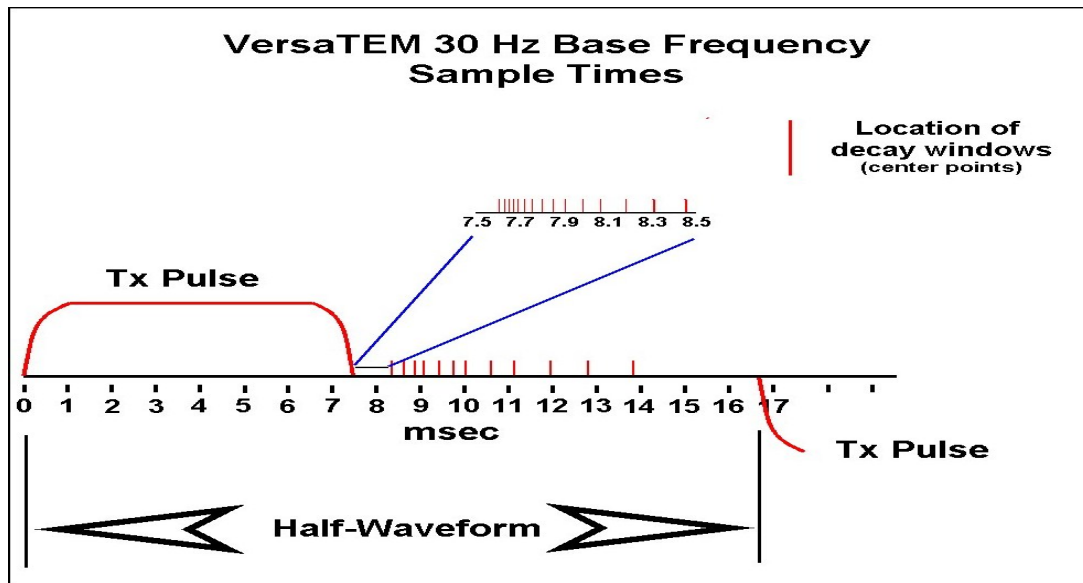


Figure 4 - VTEM Transmitter waveform schematized shape and sampling gates.

Transmitter coil diameter was 26 metres (area= 531 m<sup>2</sup>), the number of turns was 4.  
 Transmitter pulse frequency - 30 Hz.  
 Peak current - 167 A.  
 Duty cycle - 37%.  
 Peak dipole moment - 355,000 A×m<sup>2</sup>  
 Receiver coil diameter was 1.2 metre (area= 1.13 m<sup>2</sup>), the number of turns was 100.  
 Wave form – trapezoid.  
 Recording sampling rate -10 samples per second.  
 The EM bird was towed 42 m below the helicopter.

<b>VTEM Decay Sampling scheme (Microsecond)</b>			
<b>Time gate</b>	<b>Start</b>	<b>End</b>	<b>Width</b>
130	120	140	20
150	140	160	20
170	160	180	20
190	180	205	25
220	205	240	35
260	240	280	40
300	280	325	45
350	325	380	55
410	380	445	65
480	445	525	80
570	525	625	100
680	625	745	120
810	745	885	140
960	885	1045	160
1130	1045	1235	190
1340	1235	1470	235
1600	1470	1750	280
1900	1750	2070	320
2240	2070	2450	380
2660	2450	2920	470
3180	2920	3480	560
3780	3480	4120	640
4460	4120	4880	760
5300	4880	5820	940
6340	5820	6860	1040
7540	6860	8220	1360

Table 3 - Time Gate Delays of VTEM channels.

### 3.1.3 Airborne magnetometer

The magnetic sensor used for the survey was a Geometrics optically pumped high resolution cesium total magnetic field sensor. It was mounted in a separate bird towed at the same altitude as the EM receiver loop (i.e. 42 m below the helicopter). The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) and the sampling interval was 0.1 seconds. The magnetic field strength measurements in nanoTesla (nT) were transmitted and recorded in the acquisition system via the RS-232 port.

### 3.1.4 Ancillary Systems

#### 3.1.4.1 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.

#### 3.1.4.2 GPS Navigation System

The navigation system was a Geotech PC based navigation system using 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 introduced into the airborne navigation system.

#### 3.1.4.3 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. Contents and update rates were as follows:

DATA TYPE	SAMPLING, sec
TDEM	0.1
Magnetometer	0.1
GPS Position	0.2
Radar Altimeter	0.2

Table 4 - Sampling Rates

#### **3.1.4.4 Magnetic 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 away from electric transmission lines and moving ferrous objects such as motor vehicles. The data recorded by the magnetometer base station were backed-up to the data processing computer at the end of each survey day.



## 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 WGS84/UTM zone 8N 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 digital filtering process was used to reject major atmospheric noise known as sferic events and to reduce system noise. Local sferic 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 sferics. The filter used was a 16 points 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.

Because of the presence of the drift phenomena in the electromagnetic channels, a levelling procedure based on a polynomial approximation was used to level the EM channels. Filtered and levelled EM channels are presented as stacked profiles for the time gates using adequate linear-logarithmic scale.

### **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 were 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 variations.

1D non-linear filtering procedure was applied to magnetic data to remove spikes and drop off in the data, and then a 1D low-pass filtering operation was applied to refine magnetic profiles.

Tie line levelling was carried out by adjusting intersection points along the traverse lines using polynomial approximation method. Microlevelling procedure, using decorrugation filtering in the frequency domain was performed to remove any remaining line oriented noise.

The corrected and filtered magnetic data were interpolated between survey lines using a random point gridding method to yield x-y grid values for a standard grid cell size of approximately 0.2 cm at the mapping scale. The Minimum Curvature algorithm was used to interpolate values onto a square regular spaced grid.



## 5 DATA INTERPRETATION

### 5.1 Geological Considerations

The Yukon Territory occupies the northern portion of a large geologic (and physiographic) province known as the Cordillera. This province is composed of relatively young mountain belts that range from Alaska to Mexico. Like most of the Cordillera, Yukon is composed of a diverse array of rock types that record more than a billion years of geological history. Most of the rocks have been affected by folding, faulting, metamorphism and uplift during various deformation events over at least the last 190 million years. This deformation has resulted in a complex arrangement of rock units and the mountainous terrain we see today. In Yukon, there are two main geological components which are largely separated by a major, northwest-trending fault (the Tintina): 1) the northeastern region is composed of a thick, older sequence of sedimentary rocks which was deposited upon a stable geological basement; and 2) the southwestern region is composed of a younger, complex mosaic of varying rock types that amalgamated and accreted to the stable sedimentary package.

Yukon's geology divides into two essential components that are, for the most part, separated by the Tintina Trench (fig.5). Rocks northeast of the Tintina Trench are mainly sedimentary and represent the *Ancient North American* margin. Rocks southwest of the Tintina Trench are mostly igneous and metamorphic, and represent numerous crustal fragments called *accreted terranes*.

The Bar Property is located in the Intermontane Superterrane, formed of several terranes and composed of sedimentary and volcanic rocks.

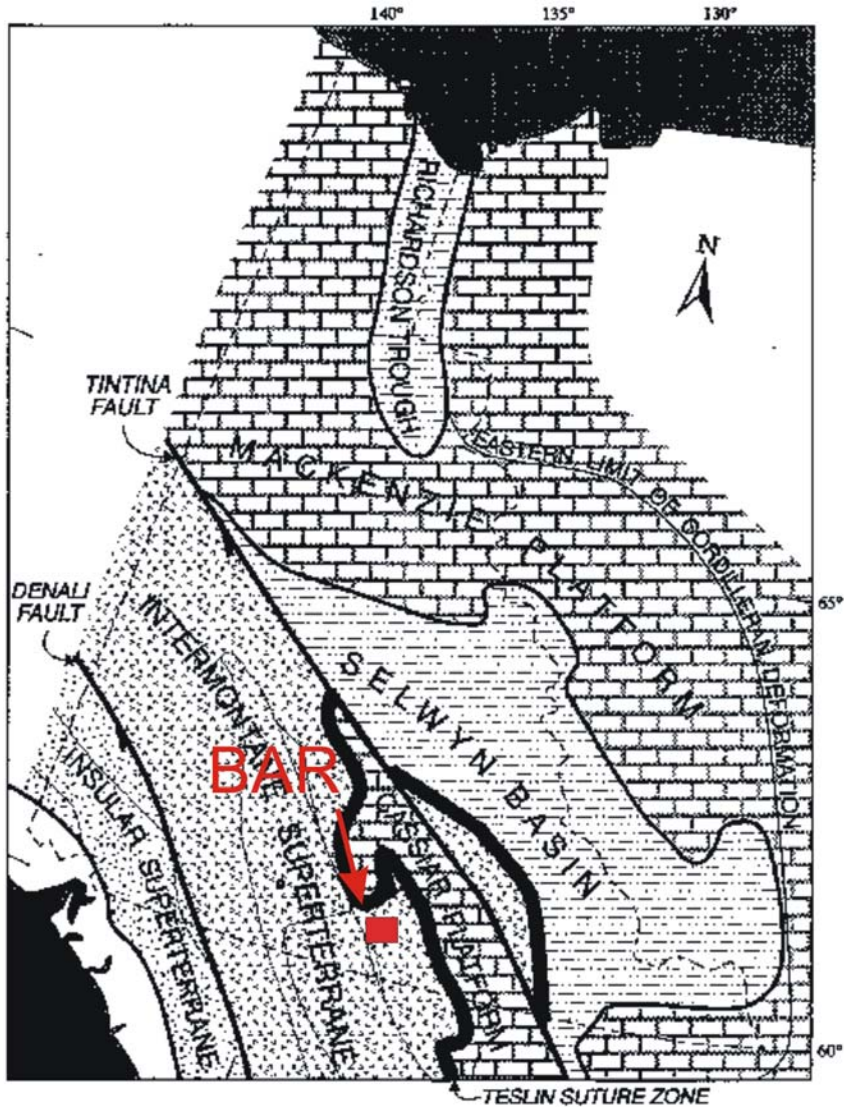


Fig.5 shows the Yukon's major tectonic elements indicating that the territory is underlain by two dominant rock packages. Northeast of the Tintina Fault are a thick assemblage of sedimentary rocks that belong to the Ancient North American continental margin. They are platformal (mainly limestones) and basinal (mainly shale) in origin. Southwest of the Tintina Fault are numerous dissimilar crustal fragments called Terranes. The terranes were amalgamated into the Insular and Intermontane Superterrane prior to their accretion to the Ancient North American margin. The zone of deformation between the accreted terranes and Ancient North America is represented by the Teslin Suture Zone.

## **5.2 Magnetic Interpretation**

### **5.2.1 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).

### **5.2.2 Analysis of the Magnetic data**

The observed magnetic field over the Bar Property (Fig.6) shows values ranging from 57470 to 57610 nT. This yields a difference in the magnetic field intensity of 140 nT. The observed magnetic field expresses a quiet character with low gradients over most of the area. This is very specific to this area, which is composed mainly of sedimentary rocks that do not yield any significant magnetic signature. The highest anomalies forming a large band trending in the NW direction are observed in the south western border of the area. This banding anomaly is related with a weak and deep magnetic structure, the nature of which could be a shear zone with mafic rocks contents. Some isolated anomalies are observed in the southern and northern parts of this block and probably related to some isolated mafic rocks.

Figures 7 and 8 show the relief of the magnetic field and the field reduced to the pole, respectively. The reduced to the map image does not differ too much from the original map because this area is located at high geographical latitude.

A better illustration of the magnetic relief of the area is given by the shaded images. The northeastern area characterized by a magnetic low is easily be delineated. The magnetic anomaly observed in the southwestern part can be clearly observed.

Since the contents of the observed magnetic maps include the response of shallow and deep magnetic sources, it is difficult to analyze the maps with a large band of wavelength contents. Distinguishing shallow features from deeper ones can be performed via several methods of field separation and filtering. The fig. 9 shows the tilt derivative of the magnetic field. The tilt derivative known as being the local phase is computed from the vertical and horizontal gradients. The map highlights the short wavelength anomalies related with shallow sources. As illustrated in the Tilt derivative map several shallow magnetic structures can be identified in this area.

By contrast to the tilt derivative map, the magnetic field upward continued attenuates the short

wavelength anomalies and shows the response of deeper sources. Figure 10, illustrates the magnetic field upward continued to 100 m. The map shows that all the short wavelength anomalies have been suppressed. Only the banding anomaly situated at the southwestern border and related with a deep structure persists after the upward continuation transformation.

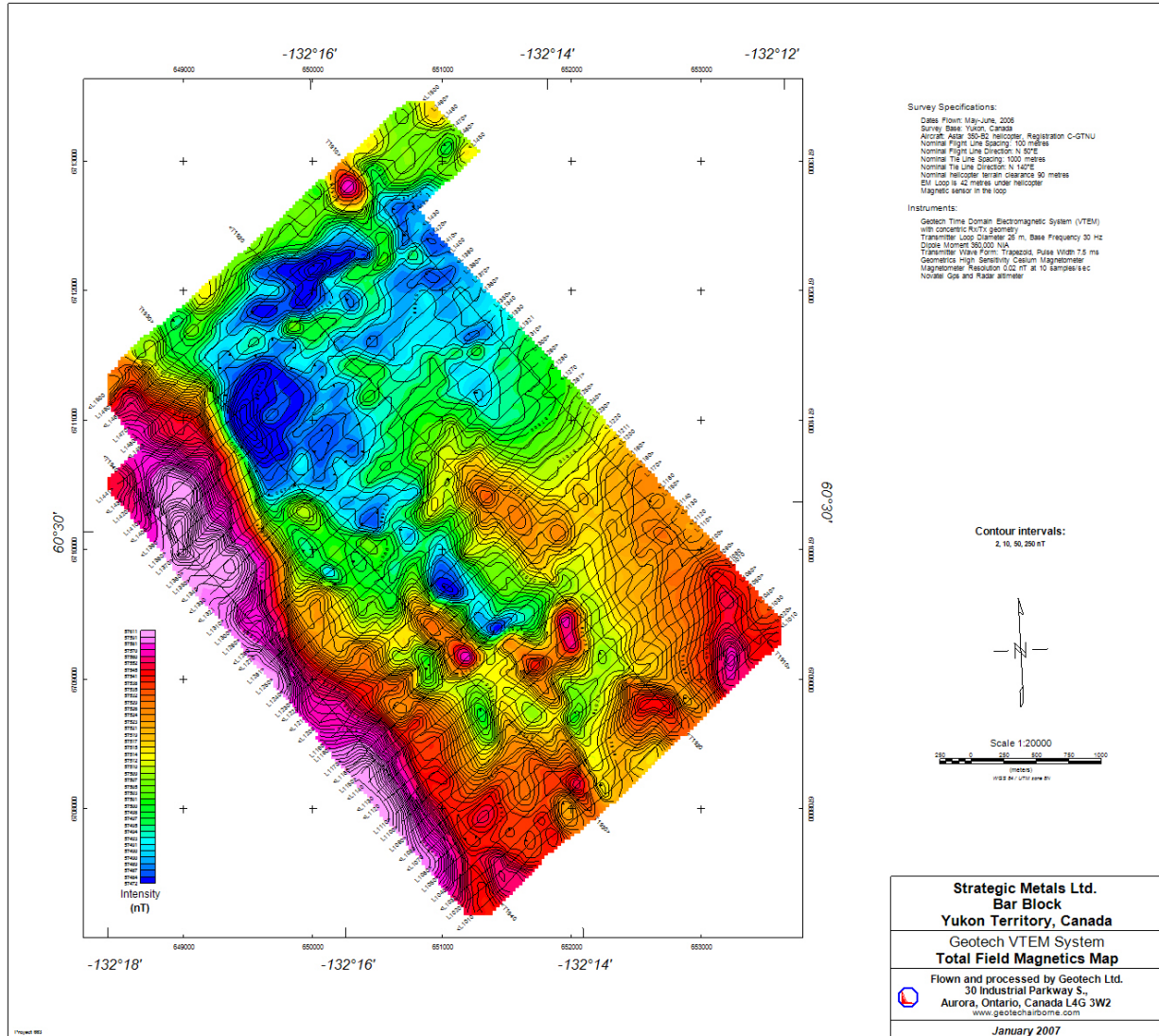
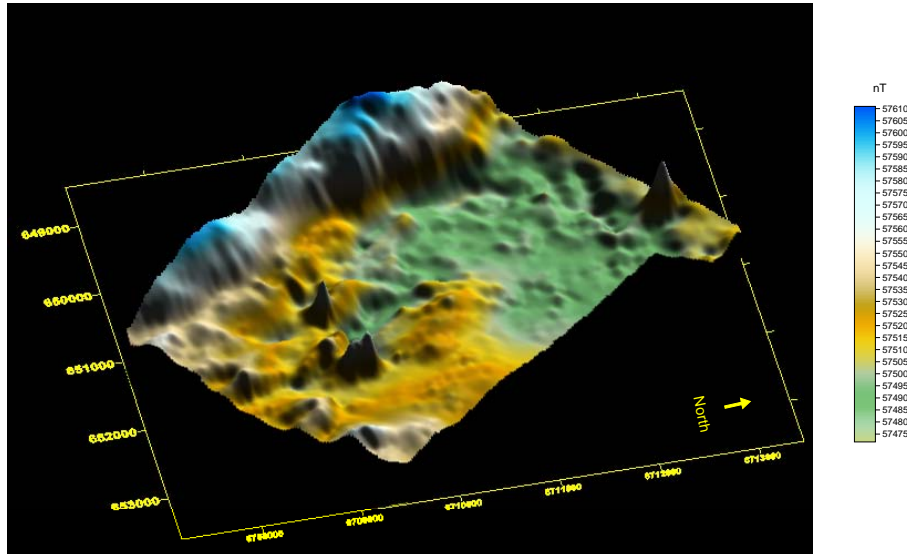
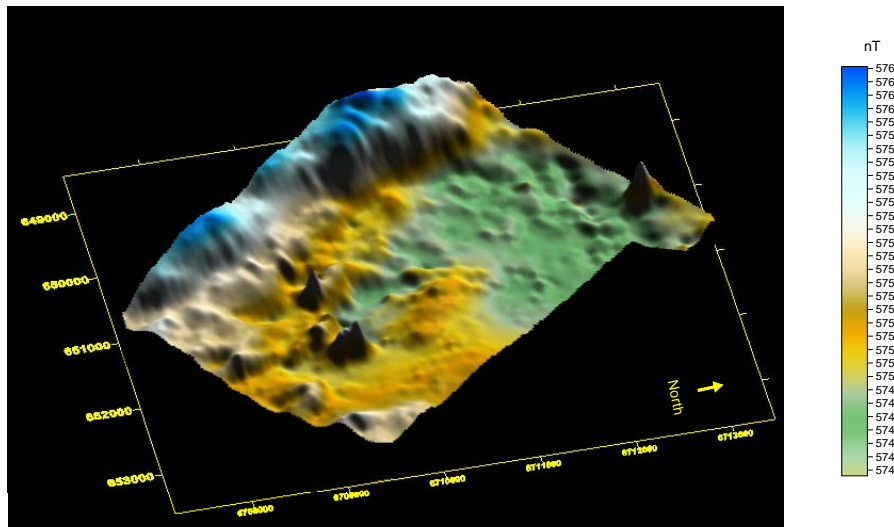


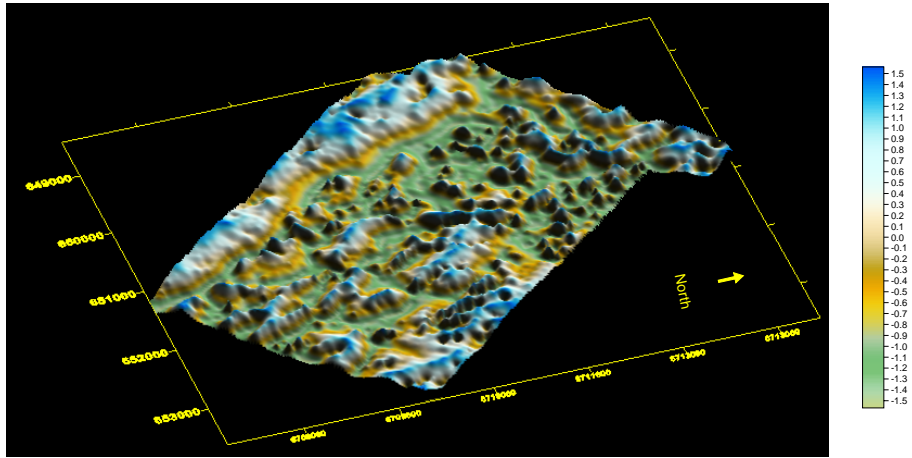
Fig. 6 Magnetic field image with contours of the bar Property.



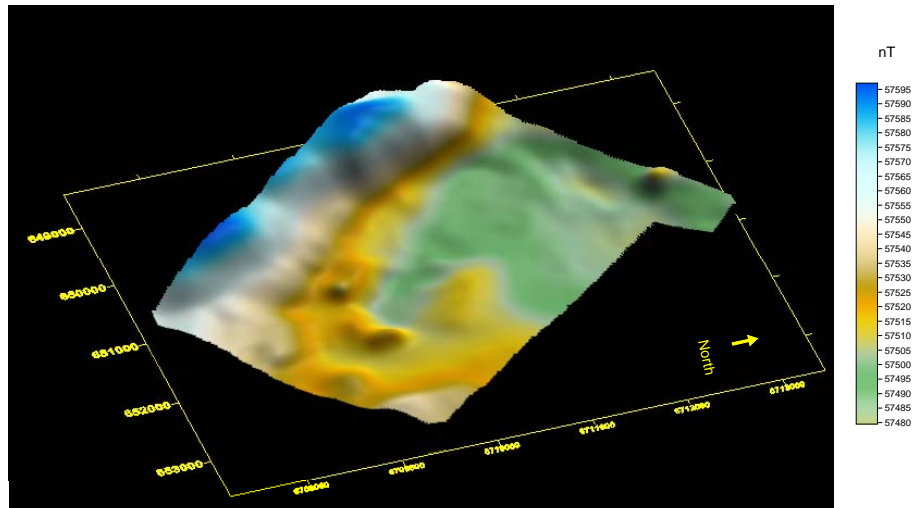
**Fig. 7 color shaded relief of the magnetic field map.**



**Fig.8 Color shaded relief of the magnetic field reduced to the pole.**



**Fig. 9 Tilt derivative map showing short wavelength anomalies.**



**Fig. 10 Magnetic field reduced to the pole and upward continued (+100 metres)**

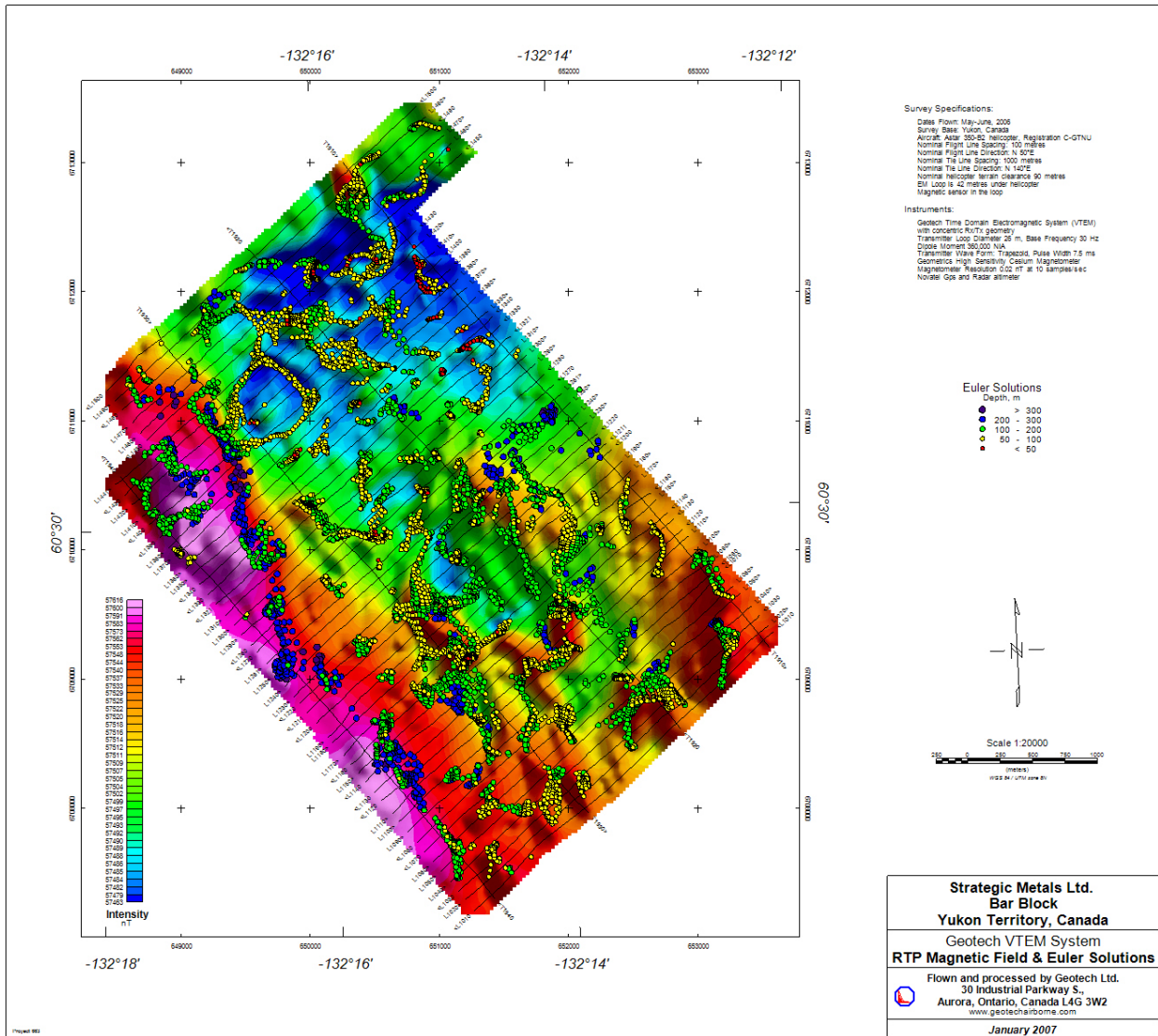
### 5.2.3 Inversion of the magnetic data

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. 11 shows the results obtained with the Euler deconvolution inversion using a structural index of 0.5, a depth tolerance of 10% and a square deconvolution window having a size of  $350 \times 350$  metres.

Estimated depths for the Bar area are ranging from 0 to 300 metres and greater.

Several shallow magnetic linear and circular structures have been identified in this area. The shallowest sources are located in the northwestern and southeastern parts of the Block. The deepest sources ( $>300$  m) are located in southwestern part of the block and related to the large anomaly mentioned above. Sources at intermediate depths ( $100 \text{ m} < \text{depths} < 200 \text{ m}$ ) are located in the central area.



## 5.3 VTEM Interpretation

### 5.3.1 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 Vtem Transmitter uses a trapezoid waveform shape with about 5.8 ms duration operating at a base frequency of 30Hz. The dipole moment was about 350 000 NIA. The used half-waveform was about 16.7 ms. All the decay windows are located on the off-time portion of the waveform (fig. 12).

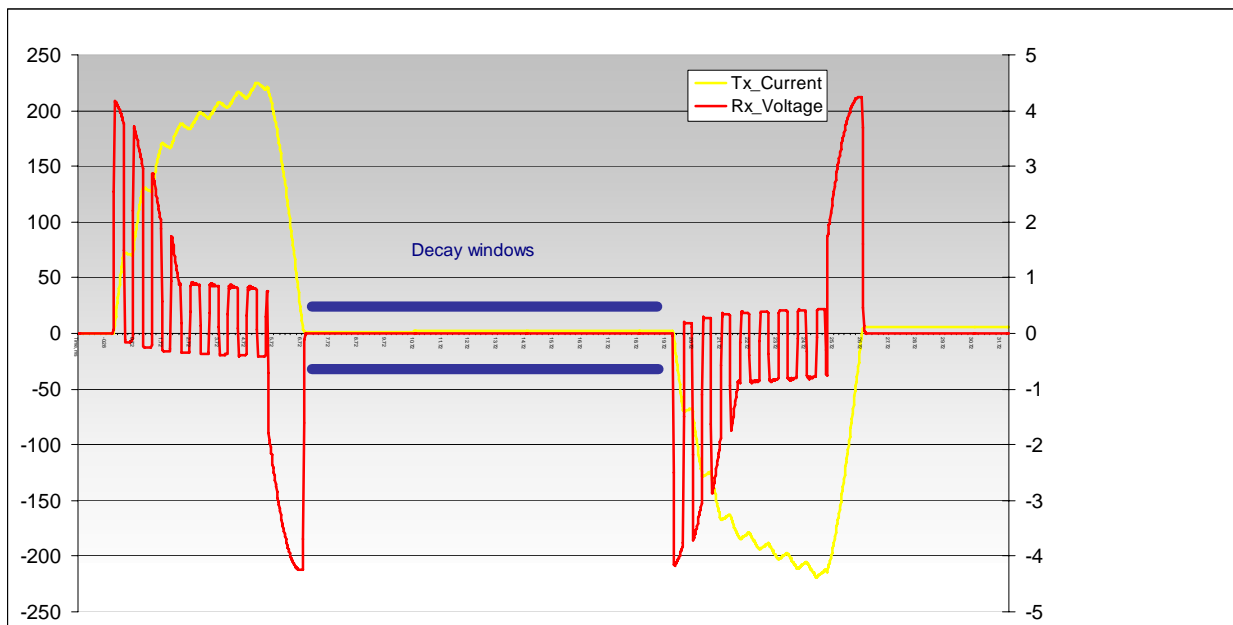


Fig. 12 VTEM waveform and decay windows.

### 5.3.1 EM anomalies shape

For concentric-loop geometry systems when both loops are oriented in the Z-axis (VTEM system) thick dipping 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. In the case of X-axis oriented receiver, cross-over are observed above conductors. The fig. 13 below illustrates the response of two dipping conductive plates for both cases. At early times induced eddy currents circulate at the surface of the conductive bodies while at late times they penetrate into the conductor. This fact can be translated by the presence of a response in the receiver at early times and late times of conductors with depth extension, while conductive overburden shows a response at early times solely. Analysis of early times and late times responses can be used as a visual criterion for discriminating conductive overburden.

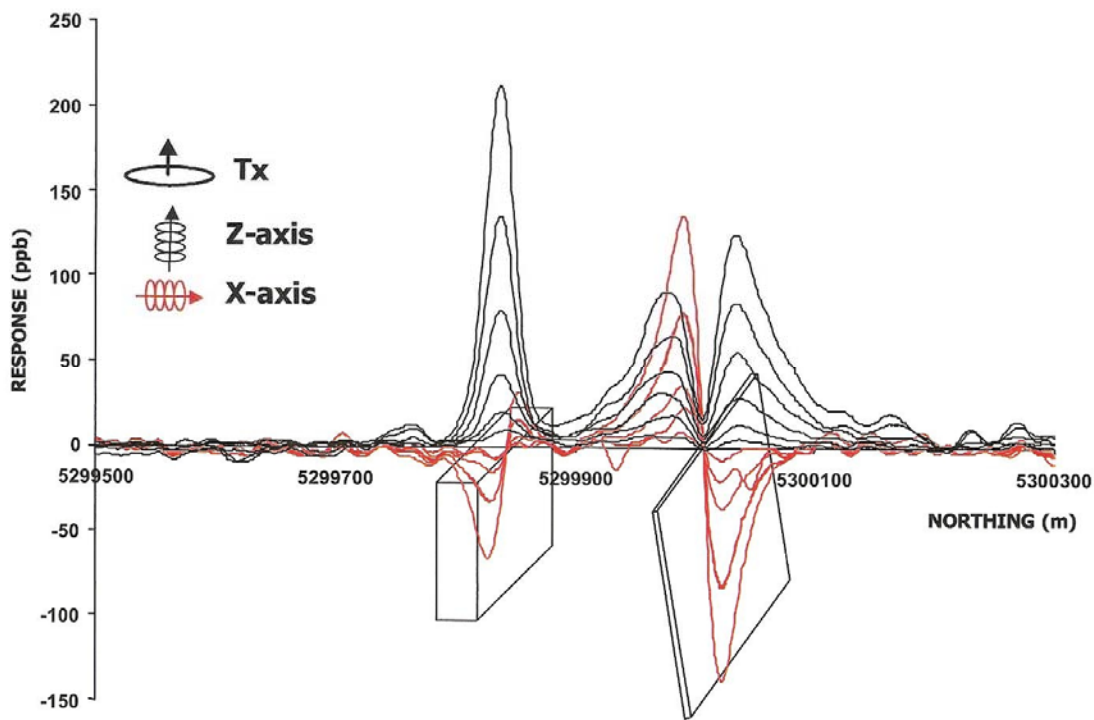


Fig. 13 Response of a vertical thick conductor, and a steeply dipping thin conductor. In black, response in the Z-axis loop (VTEM case) and in red in X-axis loop.

### 5.3.2 Analysis of the EM results

Fig. 14 shows the stacked profiles in log-linear scale of the early time channels (130  $\mu$ sec- 680  $\mu$ sec). The map shows several broad anomalies situated in the central and eastern parts of the Block. The map does not reveal the existence of any shallow thin conductors. Most of the anomalies are related with thick conductive zones. The broad anomalies situated in the western corner of the map are associated with overburden. Middle time channels ( 810  $\mu$ sec -3180  $\mu$ sec) profiles map is illustrated in Fig. 15. Three anomalous zones can be observed, but they are associated with fairly good conductive zones with large horizontal extents. Late time channels (3780  $\mu$ sec -7540  $\mu$ sec) stacked profiles map (fig. 16) yields useful information confirming the existence of a fairly good conductor (A) in the northern part of the map. Weak responses are over by the eastern and central conductive zones (B,C and D).

Interpretation of the Em profiles was performed using an in-house built software allowing the picking of the anomalies along the profiles and yielding estimates of the conductance and decay constant ( $\tau$ ) of isolated anomalies. Results of the interpretation are illustrated on Figures 17 and 18.

The estimates conductance values are less than 20 S suggesting the absence of good conductors in this area. However, some fairly good conductors are detected in the northern area (A) and some others probably belonging to the same structure are located in the eastern and south-eastern parts of the Block (B, C, D).

Vtem anomalies are not correlated with the magnetic sources locations, when compared with to the Euler deconvolution solutions (Fig. 19).However, the detected EM anomalies are located on weak magnetic field gradient (fig. 20) suggesting that the conductive zones could be associated with deep structural contacts or shear zones.

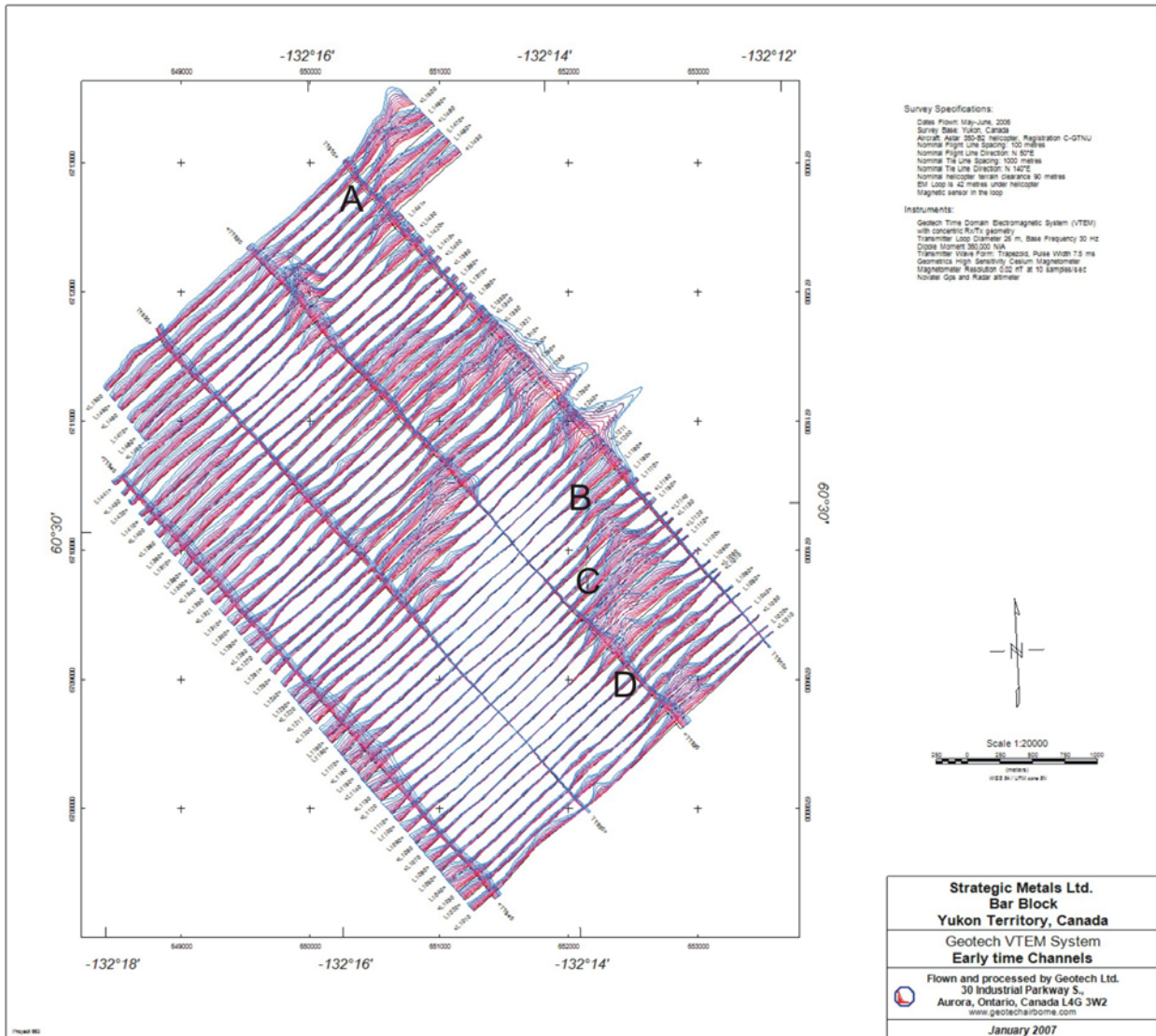


Fig. 14 Stacked EM profiles (Early Time Channels) plotted at log-linear scale.

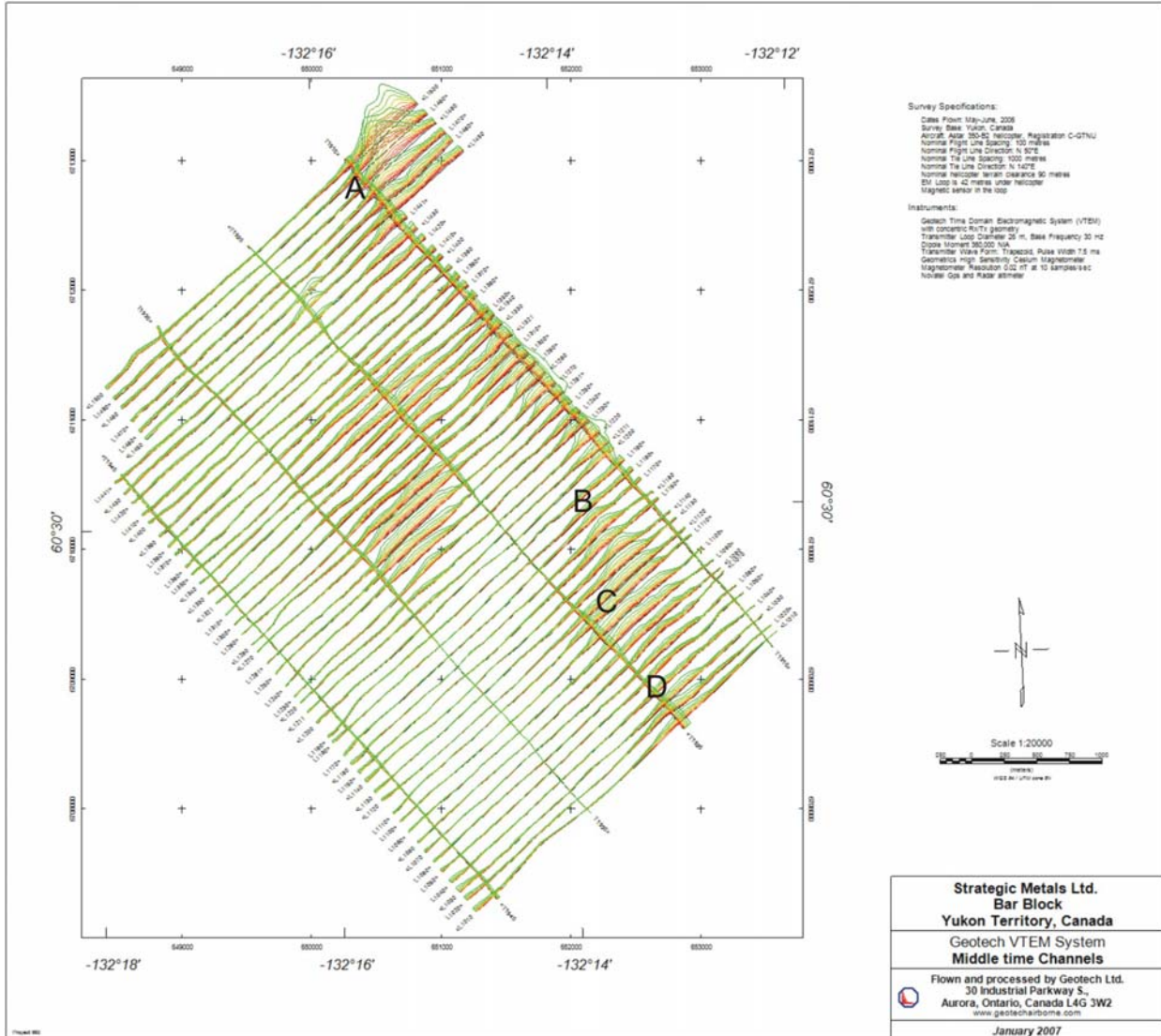


Fig. 15 Stacked EM profiles (Middle Time Channels) plotted at log-linear scale.

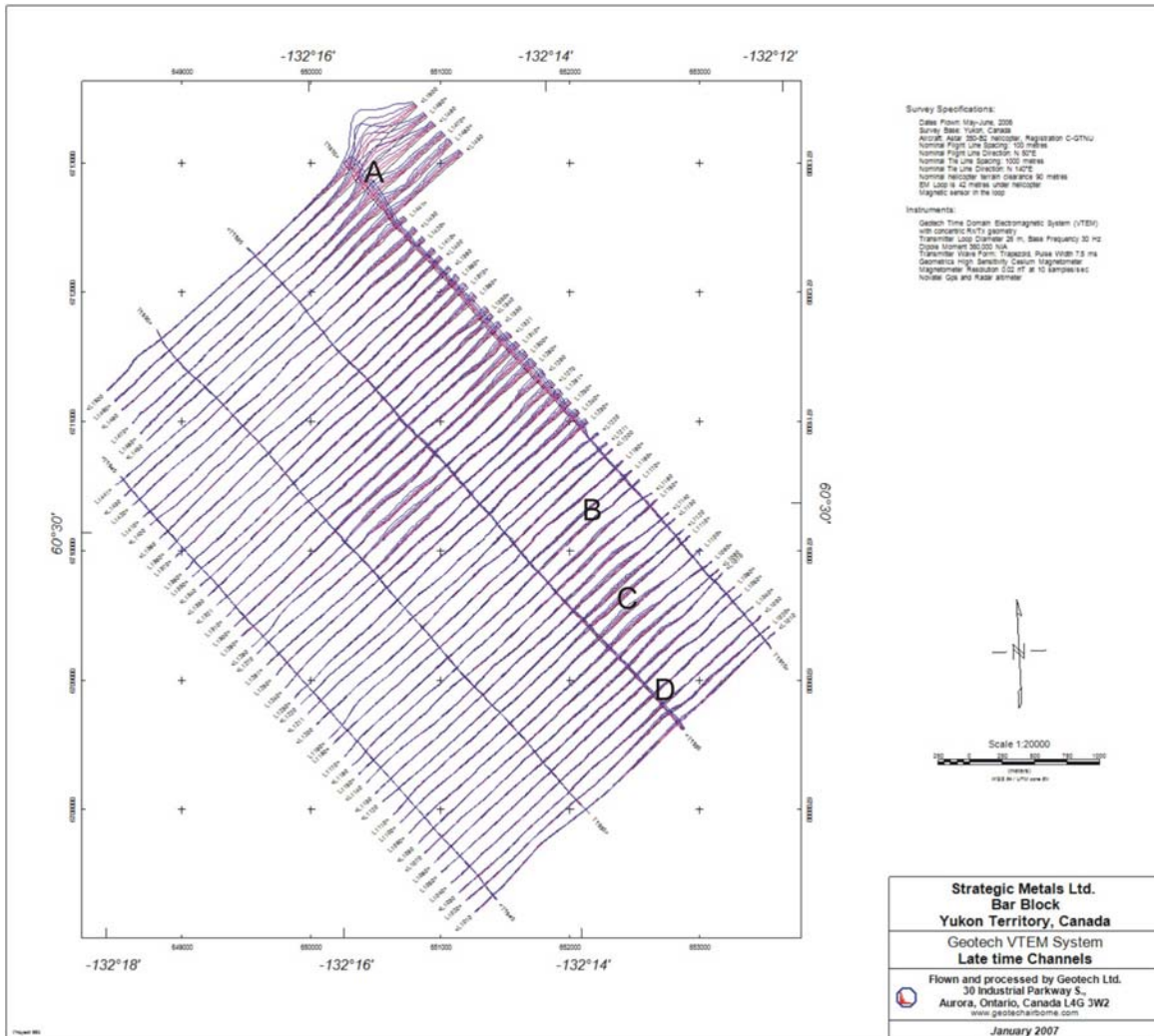


Fig. 16 Stacked EM profiles (Late Time Channels) plotted at log-linear scale.

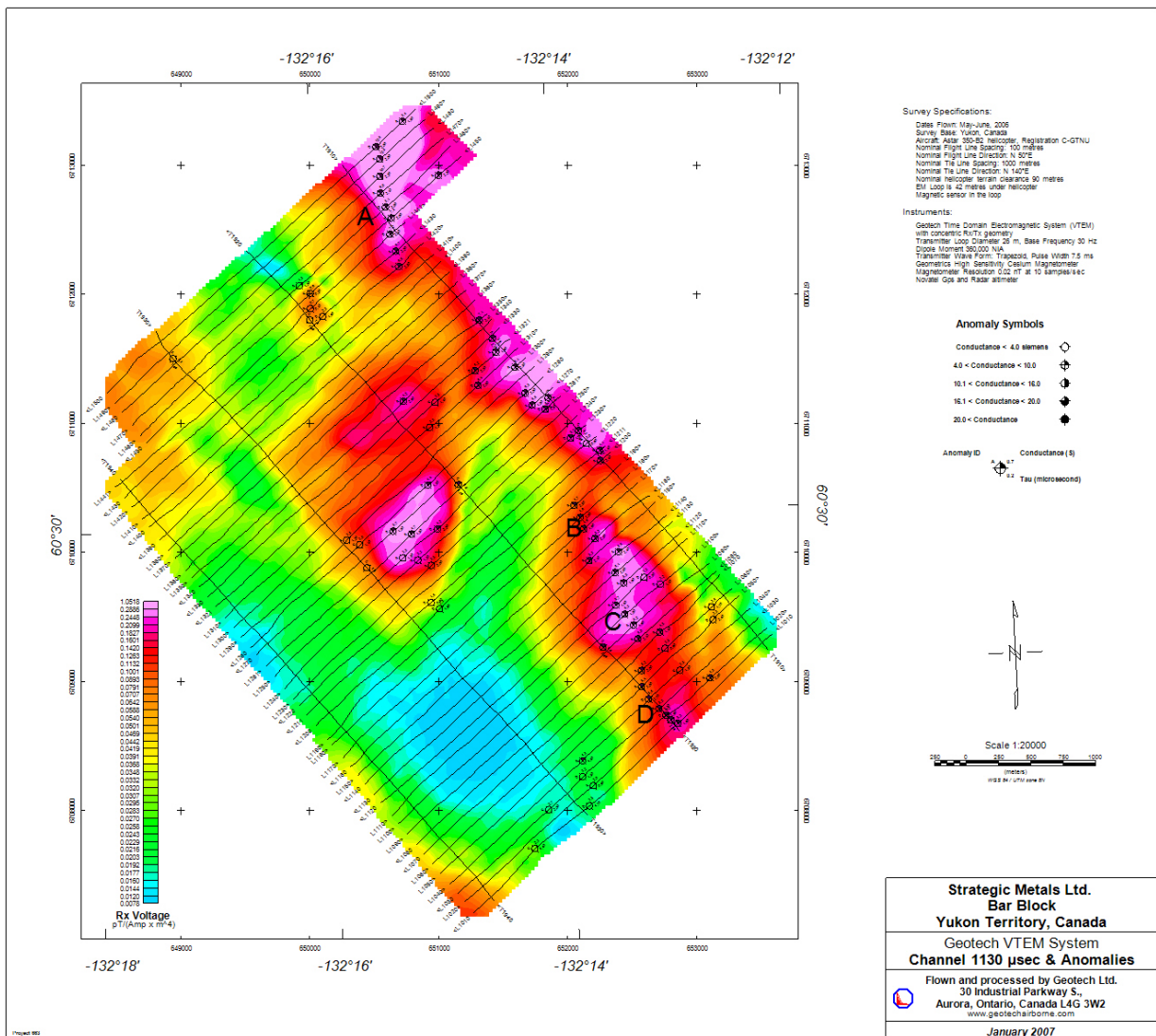


Fig. 17 Picked EM anomalies superimposed on the 1130 μsec Channel.

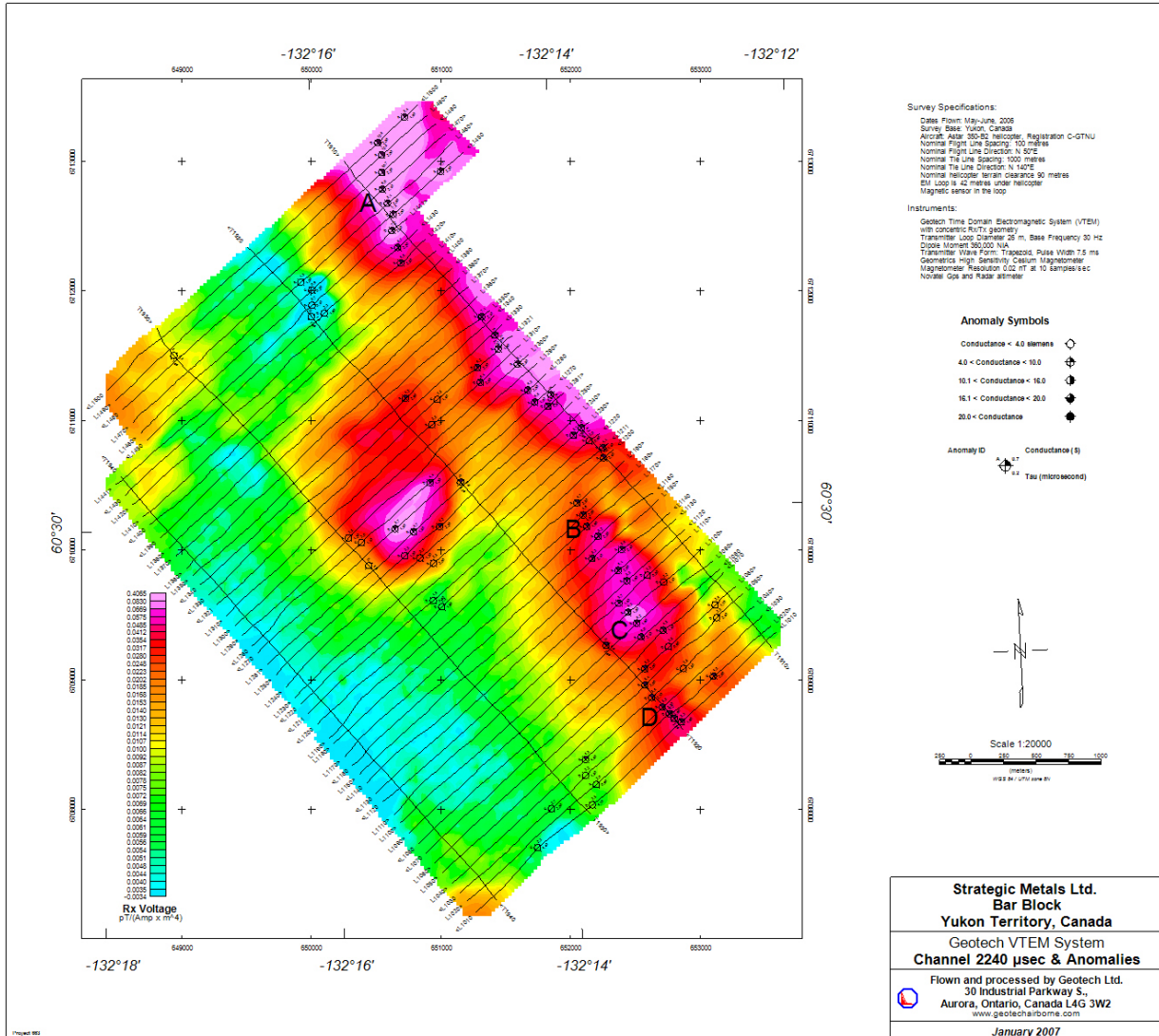


Fig. 18 Picked EM anomalies superimposed on the 2240 µsec Channel.

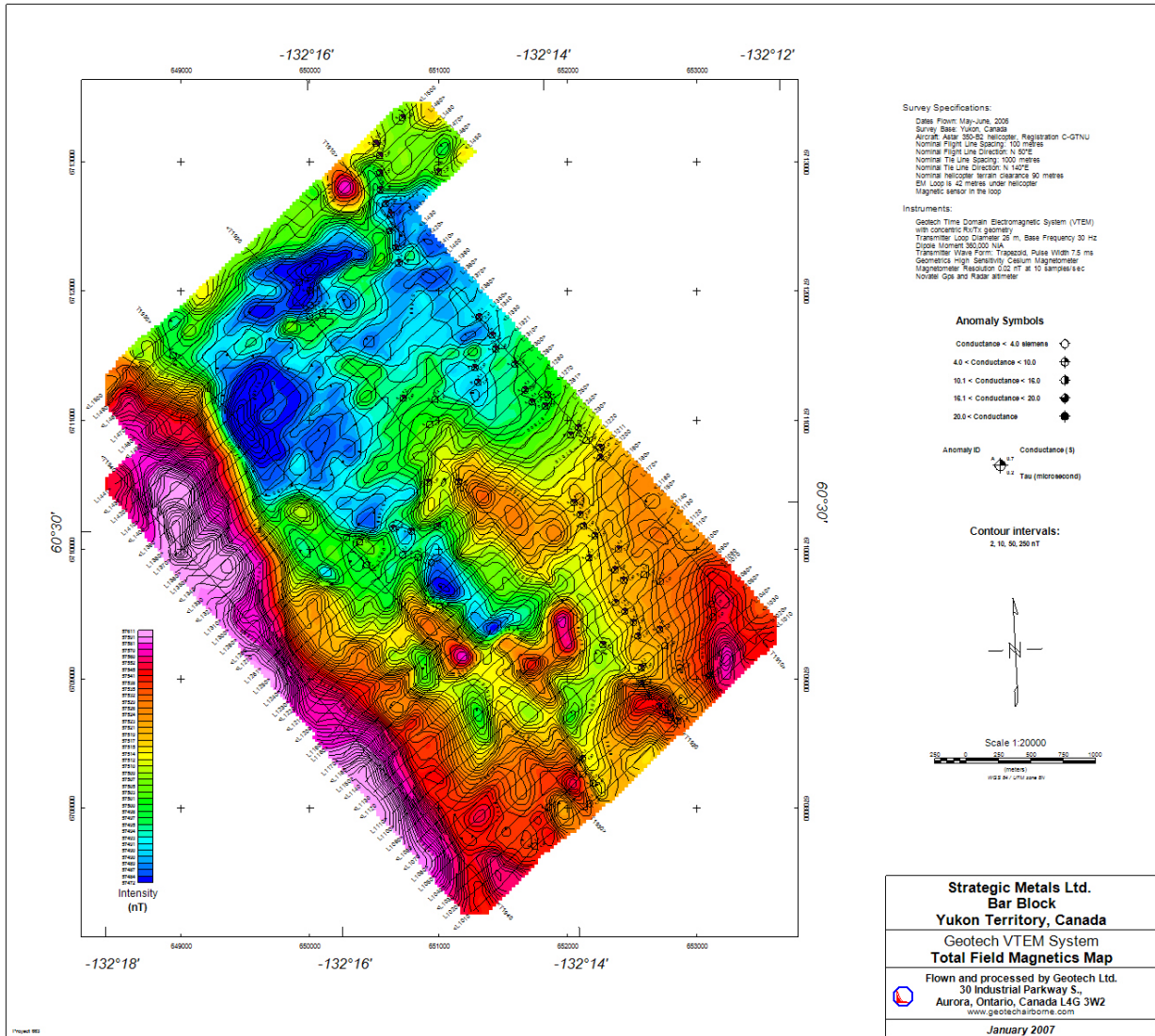


Fig. 19 Picked EM anomalies superimposed on the RTP magnetic field image.

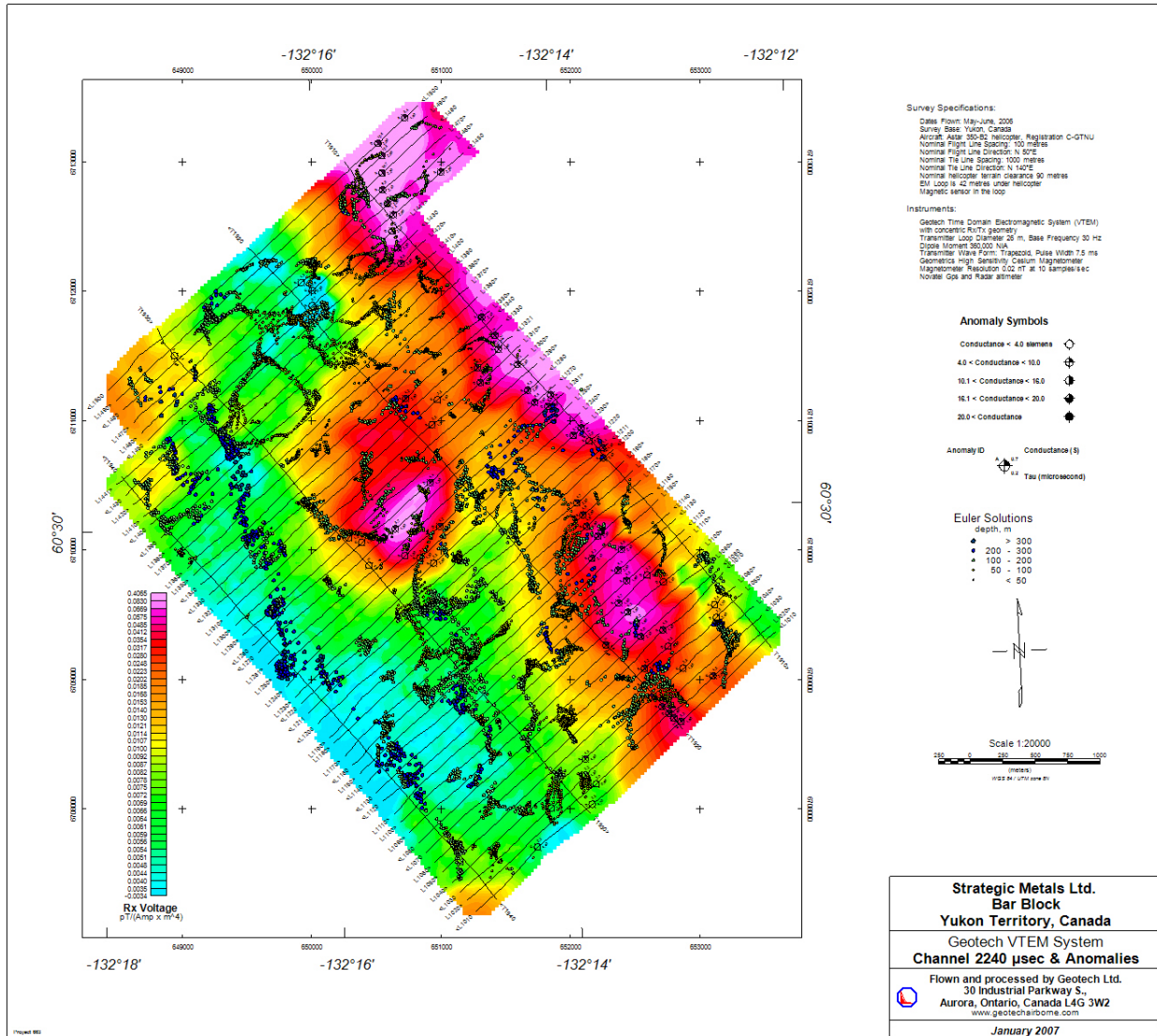


Fig. 20 Picked EM anomalies and Euler solutions superimposed on the 2240 μsec Channel.

### 5.3.3 Selected anomalies

04 anomalies situated on lines: L1480, L1170, L1090 and L1030 have been selected for detailed ground follow up and for drilling tests (Figs. 21 and 22)

Anomalies A, B, and C are peak type and are caused by steeply dipping thick conductors, while anomaly D is double peak type and is caused by a steeply dipping thin conductor. Table 5 gives the summarized results of the EM interpretation.

Line	Anomaly ID	Anomaly Type	Conductor geometry	X- location m	Y-location m	Conductance S	Tau msec
L1480	A	One peak	Steeply dipping thick plate	650545	6712916	10.2	2.2
L1170	B	One peak	Steeply dipping thick plate	652124	6710185	4.9	1.9
L1090	C	One peak	Steeply dipping thick plate	652509	6709439	6.2	1.9
L1030	D	Double peak	Steeply dipping thin plate	652707	6708792	5.8	2.3

Table 5. Summarized results of the EM interpretation on selected anomalies.

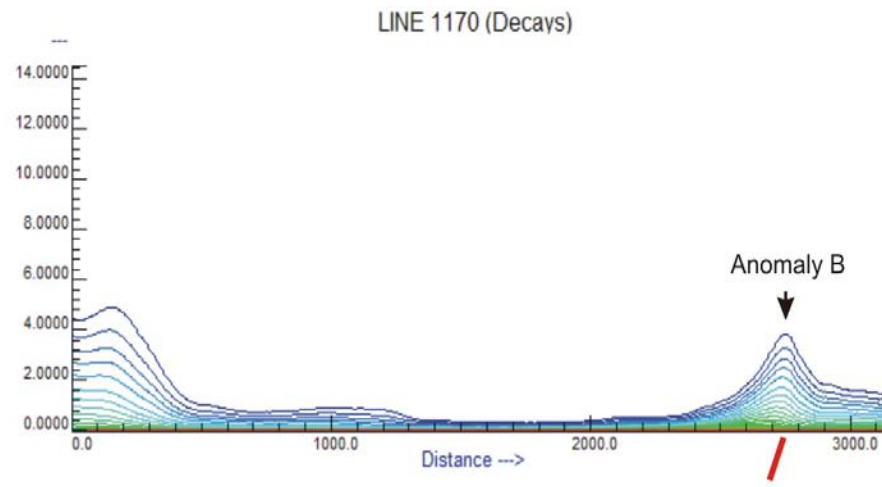
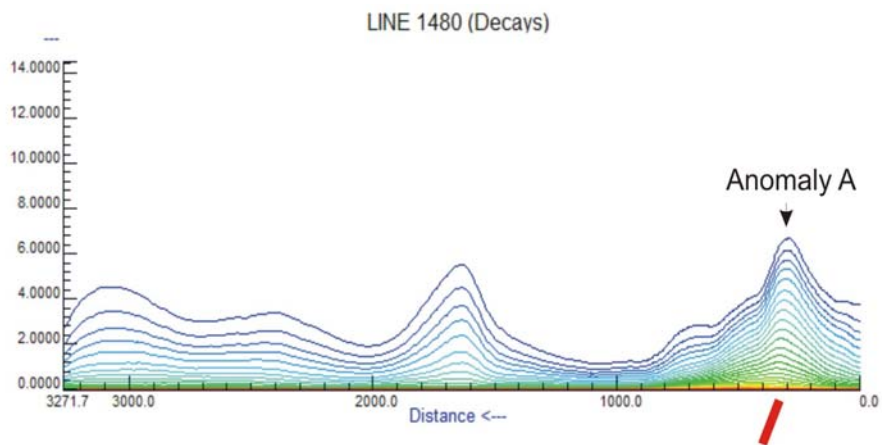


Figure 21 shows anomalies of interest A and B and the location of the conductors.

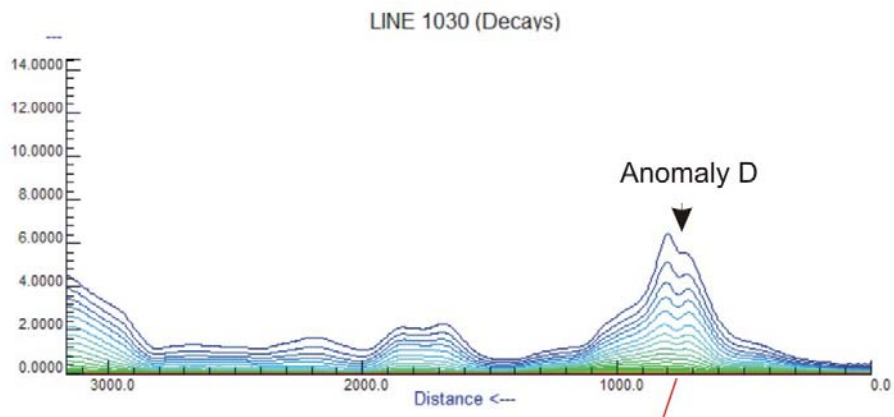
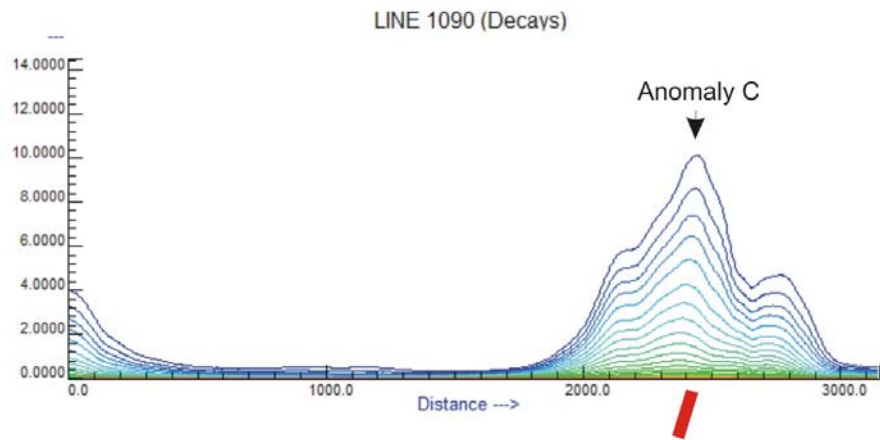


Figure 22 shows anomalies of interest C and D and the location of the conductors.

## 6 Conclusions and recommendations

The analysis of the magnetic map of the Convert property does not reveal any noticeable magnetic activity. The high magnetic field consisting of a banding positive anomaly is observed on the southwestern border of the Block and may be related to deep mafic structure or a shear zone with magnetic contents.

Some isolated and circular magnetic anomalies have been observed mainly in the southern part of the Property. In the northern and central parts, the magnetic field is quiet with low values corresponding to a non magnetic medium.

The Vtem survey reveals the existence of some fairly poor conductors located in northern and eastern parts of the Block and trending in a north western direction. The estimates of the conductance from the Vtem channels revealed that they do not exceed 16 S. The calculated tau values are less than 4 ms.

No correlation of the Em anomalies with the magnetic field has been observed.

The obtained results suggest that the detected EM anomalies are mostly related with thick and steeply dipping poor conductors except in the south eastern part where the EM anomalies are associated with a thin steeply dipping fairly poor conductor.

The recommendation is to conduct some ground profiles on the selected anomalies with the Induced Polarization method to confirm the existence of disseminated metallic occurrences. It is also recommended to perform some drilling tests on the selected anomalies to determine the nature of the conductors yielding the EM anomalies.

Respectfully submitted,

Dr. Nasreddine Bournas  
Geotech Ltd.



## 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. B.R. SPIES AND P.D. PARKER, 1984, Limitations of large loop transient electromagnetic surveys in conductive terrains, *geophysics*, 49, 902-912
3. A.B. REID, J.M. ALLSOP, H. GRANSER, 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 III**  
**CERTIFICATES OF ANALYSIS**



# ALS Chemex

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Page: 1  
Finalized Date: 28-NOV-2006  
Account: MTT

## CERTIFICATE VA06117812

Project: Bar

P.O. No.:

This report is for 5 Rock samples submitted to our lab in Vancouver, BC, Canada on 26-OCT-2006.

The following have access to data associated with this certificate:

JOAN MARIACHER

## SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

## ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	34 Element Aqua Regia ICP-AES	ICP-AES

To: STRATEGIC METALS LTD.  
ATTN: JOAN MARIACHER  
C/O ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
1016-510 W HASTINGS ST  
VANCOUVER BC V6B 1L8

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature: \_\_\_\_\_

Keith Rogers, Executive Manager Vancouver Laboratory



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Project: Bar

Page: 2 - A

Total # of pages: 2 (A - C)

Finalized Date: 28-NOV-2006

Account: MTT

## CERTIFICATE OF ANALYSIS VA06117812

Sample Description	Method Analyte Units LOR	WEI-21	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
		Recvd Wt. kg	Au ppm	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %
		0.02	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
C106180		3.16	<0.005	0.4	0.05	1470	<10	40	<0.5	<2	0.03	<0.5	<1	<1	16	44.5
C106181		0.52	<0.005	2.3	0.02	41	<10	220	<0.5	3	0.04	<0.5	1	7	4	1.21
C106182		1.54	<0.005	20.2	0.01	184	<10	130	<0.5	2	0.02	1.3	<1	5	7	2.34
C106183		2.30	<0.005	2.0	0.04	2280	<10	80	<0.5	<2	0.01	<0.5	2	<1	6	34.5
C106184		1.62	<0.005	<0.2	0.02	30	<10	300	0.7	<2	19.5	2.1	49	<1	8	21.0



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Page: 2 - B  
 Total # of pages: 2 (A - C)  
 Finalized Date: 28-NOV-2006  
 Account: MTT

Project: Bar

<b>CERTIFICATE OF ANALYSIS VA06117812</b>
-------------------------------------------

Sample Description	Method Analyte Units LOR	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	
		Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
		ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
		10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
C106180		<10	<1	1.70	<10	<0.01	<5	19	0.09	7	760	168	4.33	170	<1	67
C106181		<10	15	0.09	<10	<0.01	28	2	<0.01	1	40	103	0.35	25	<1	54
C106182		<10	448	0.07	<10	<0.01	28	4	0.02	1	110	2160	0.49	389	<1	114
C106183		<10	11	2.39	<10	<0.01	<5	36	0.06	4	1110	964	5.25	476	<1	49
C106184		<10	4	0.02	<10	0.11	14100	<1	0.01	103	20	14	<0.01	5	<1	171



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Page: 2 - C  
 Total # . pages: 2 (A - C)  
 Finalized Date: 28-NOV-2006  
 Account: MTT

Project: Bar

<b>CERTIFICATE OF ANALYSIS VA06117812</b>
-------------------------------------------

Sample Description	Method Analyte Units LOR	ME-ICP41 Ti %	ME-ICP41 Ti ppm	ME-ICP41 U ppm	ME-ICP41 V ppm	ME-ICP41 W ppm	ME-ICP41 Zn ppm
		0.01	10	10	1	10	2
C106180		0.02	450	<10	47	<10	36
C106181		<0.01	30	<10	1	<10	10
C106182		0.01	50	<10	4	<10	1115
C106183		0.03	1150	<10	40	<10	15
C106184		<0.01	210	<10	1	<10	2190

**APPENDIX IV**  
**ROCK SAMPLE DESCRIPTIONS**

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**Rock Sample Descriptions**Project: Howling Wolf Property: Bar

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Sample Number:	Grid East:	E	Grid North:	N	Type: SPECIMEN	Dimension: 20X20X20 CM
C106180	UTM:	651200 E	UTM:	6710844 N	Sample Width:	Abundance: VERY
	Elevation:	m				

Comments: Reddy brown ferricrete with clats of mudstone and lesser felsic schist and limonite

---

Sample Number:	Grid East:	E	Grid North:	N	Type: SPECIMEN	Dimension: 15x10x10
C106181	UTM:	651200 E	UTM:	6710844 N	Sample Width:	Abundance: moderate
	Elevation:	m				

Comments: tan weathering crudely banded quartz-eye rhyolite

---

Sample Number:	Grid East:	E	Grid North:	N	Type: SPECIMEN	Dimension: 14x12x12 cm
C106182	UTM:	651200 E	UTM:	6710844 N	Sample Width:	Abundance: moderate
	Elevation:	m				

Comments: quartz muscovite schist with abundant orange-brown-pale green vuggy boxwork patches and laminations

---

Sample Number:	Grid East:	E	Grid North:	N	Type: SPECIMEN	Dimension: 50x20x20 cm
C106183	UTM:	651200 E	UTM:	6710844 N	Sample Width:	Abundance: VERY
	Elevation:	m				

Comments: crudely stratified orange-brown ferricrete with thin yellow oxide coatings along some of the layers

---

Sample Number:	Grid East:	E	Grid North:	N	Type: CHIP	Dimension: 10 X25 M GOSSAN
C106184	UTM:	651549 E	UTM:	6709156 N	Sample Width: 50 CM	Abundance:
	Elevation:	m				

Comments: Deep blood red ferricrete gossan bleeding out of seep. Previously handpitted in center but likely 3 to 4 m thick.

---

Sample Number:	Grid East:	E	Grid North:	N	Type:	Dimension:
	UTM:	E	UTM:	N	Sample Width:	Abundance:
	Elevation:	m				

Comments: