

Proposal for a Helicopter-borne TIME DOMAIN ELECTROMAGNETIC Geophysical Survey with a Bfield-VTEM system



For

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DRAKE - PROPOSAL

INTRODUCTION

Geotech Airborne Malta Limited is pleased to submit this proposal for a helicopter-borne geophysical survey for approximately 1,687 line-kms of VTEM and magnetics over the Tullsta, Jugansbo and Saxa Areas in Sweden and Nordgruva Area in Norway.

DRAKE have requested a proposal for an airborne electromagnetic and magnetic survey for the purposes of investigating the mineral potential within the Tullsta, Jugansbo, Saxa and Nordgruva project areas. The survey location is detailed in the figures presented in section B1.

We propose the Geotech Versatile Time-Domain Electromagnetic (VTEM) geophysical system to survey your area, comprising the following main instrumentation:

- The B-field VTEM Time Domain EM system for locating conductive anomalies and mapping earth resistivities
- A high-sensitivity cesium magnetometer for mapping geologic structure and lithology.
- A cesium magnetometer base station for diurnal correction.
- A Radar altimeter with an accuracy of approximately 1 meter
- A GPS Navigation System providing an in-flight accuracy up to 3 meters

The following are some of the features of our proposal, which will be of particular benefit to DRAKE:

- The latest technology Time Domain System, exhibiting significant advantages over other commercially available systems such as:
 - *The industries highest signal/noise ratio and spatial resolution of conductors*
 - *Both dB/dt and B-field EM signals measuring the x- and z- components;*
 - *Unparalleled depth of penetration AND highest resolution*
 - ✓ *25 or 30 Hz base frequency*
 - ✓ *26m Transmitter coil is the largest diameter loop size available on any airborne geophysical platform*
 - ✓ *Small footprint to discriminate smaller targets (eg. kimberlites)*
 - *Superior "Repair or Replace" Time*
 - ✓ *The VTEM system is field repairable within a few hours using the on-site available spares kit, even after damage due to hard landings, etc.*
 - ✓ *Multiple systems available. – In the event of a serious system or aircraft failure for whatever reason, the ready availability of identical systems will ensure that there will be no delays.*
 - *Concentric Transmitter – Receiver geometry ensures positive anomaly location*
 - ✓ *No need for ground follow-up resulting in huge time savings and cost savings.*
 - *Advanced trapezoid wave-form with a longer 'on-time' pulse width of 7 ms for more effective conductor saturation.*
 - *Helicopter Platform to provide the highest resolution survey.*
- Mobilization to the survey site after signature of contract and is anticipated to be in May or June 2011.
- Complete set of spares on site for this system
- High-resolution cesium magnetometer, resolution 0.02 nT, sampling 10 times per second



- GPS satellite navigation utilizing latest NovAtel's OEM4-G2 GPS receiver, WAAS enabled
- Satellite Internet equipment (depending upon signal and local authority approvals) in the field to send the data from the field to the office daily. Data QC and data processing are done by experienced data processors; preliminary data may be made available on FTP site daily upon request.
- Data processing and mapping, by experienced geophysicists, using the latest computer technology and state-of-the-art software.



Terms & Conditions (separate document)

Schedule A. Pricing and Payments

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- A3. Payments
- A4. Terms of Payment

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- B2. Flight Line specifications

Schedule C. Data Acquisition

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- C3. Survey Scheduling
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Standby charges will also apply for all days, or part days that are lost due to delays in acquiring local permits and licenses that are the responsibility of the Client, as well as the unavailability of on-site fuel for the helicopter. Standby charges will apply as well for any days or part days lost due to bureaucratic delays such as customs, etc., including delays entering and exiting the country.

A3. Payments

The minimum charge is defined as the number of estimated survey kilometres multiplied by the survey price per kilometre. The final survey charge is calculated on the basis of actual kilometres flown calculated by flight path.

The invoices shall be payable to the account, which will be provided on each invoice.

A3.1 Standard Preliminary Deliverables (no digital data released during course of survey)

Field preliminary maps will be prepared progressively throughout the actual survey flying. These maps will be provided in PDF format only. The maps will only be released upon receipt of payments as indicated below:

- 50% minimum payment before mobilization.
- 40% minimum payment when completion of flying
- 10% payment before delivery of final products.

A3.2 Optional Preliminary Deliverables (digital data released during course of survey)

If necessary, it can be arranged for digital data to be provided during the course of the survey. Digital data will be provided as long as CLIENT's account remains in good standing. All invoices, with the exception of the mobilization invoice are due on receipt.

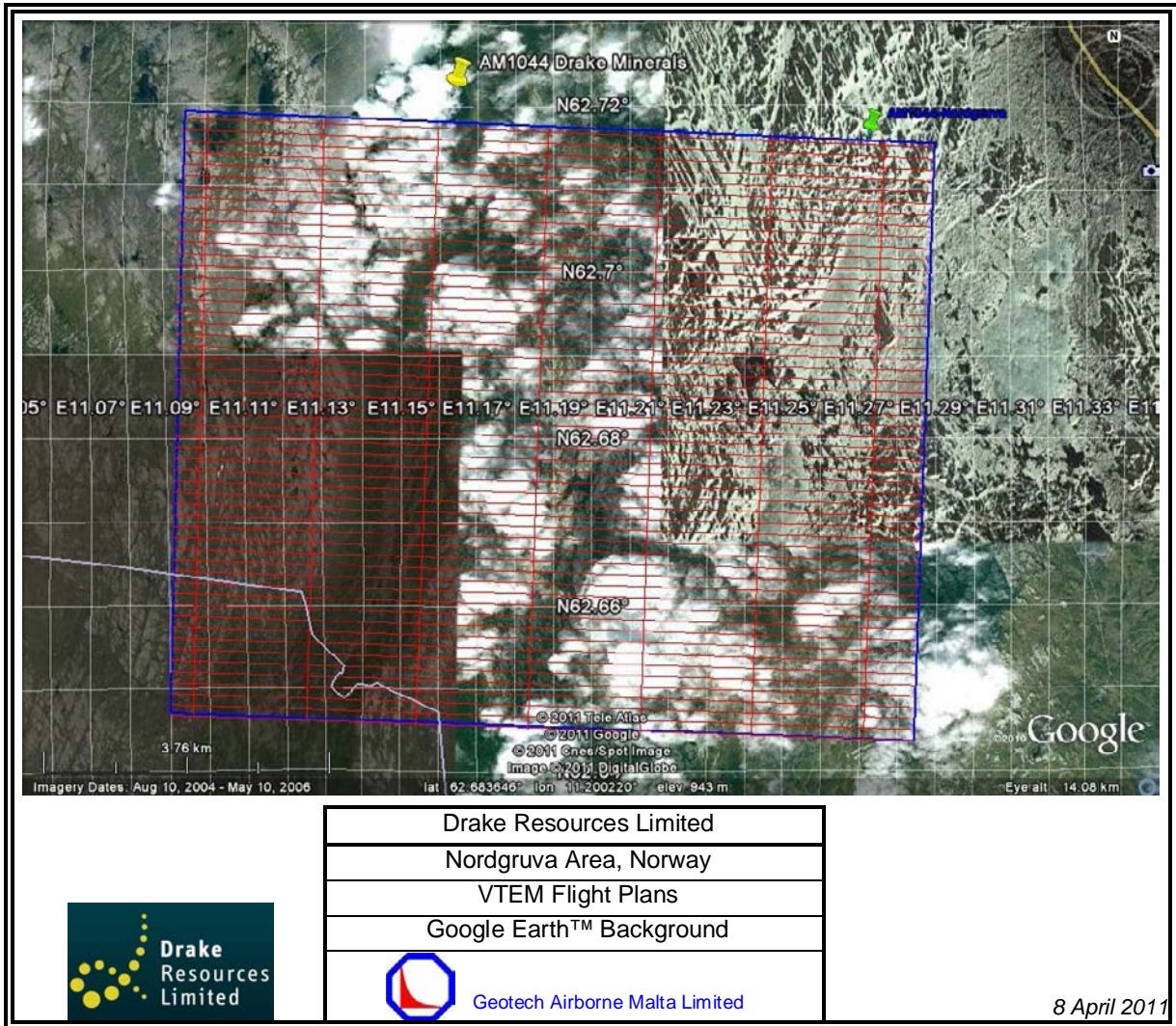
- 50% minimum payment before mobilization
- 20% minimum payment when flying begins.
- 20% minimum payment when completion of 50% of total flying.
- 10% billing/payment before delivery of final products.

A4. Terms of Payment

Geotech will issue invoices for payment as required, as per Section A3 above. These invoices will be due for immediate payment upon their receipt by the Client. Payments should be made by telegraphic bank transfer to Geotech's bank. Instructions will be posted on all invoices. Late payments will be subject to a 1.5% per month late payment charge on 14 days overdue.



Nordgruva Area, Norway:



Final survey co-ordinates must be provided in WGS84 UTM and will be agreed upon in writing prior to commencement of survey operations.

The above area was generated using the following UTM coordinates supplied by DRAKE, assuming UTM Z 33N in Sweden and UTM Z 32N in Norway and the WGS84 spheroid.

Easting UTM 33N	Northing UTM 33N
TULLSTA, SWEDEN	
577547.35	6644323.21
585678.86	6644438.26
585750.51	6638540.67
577612.22	6638425.89
577547.35	6644323.21
JAGANSBO, SWEDEN	
586812.36	6645995.19
590970.16	6645889.52
590966.73	6650419.21
591458.15	6650451.08
591348.01	6653115.8
586794.03	6652982.64
586812.36	6645995.19
SAXA, SWEDEN	
457091.56	6630518.44
462706.77	6630628.99
460396.98	6636513.04
455751.38	6636540.95
457091.56	6630518.44
Easting UTM 32N	Northing UTM 32N
NORDGRUVA, NORWAY	
617099.03	6955968.17
617099.03	6947961.1
607119.78	6947961.1
607119.78	6956007.62
617099.03	6955968.17



B2. Flight line Specifications

1,687

SWEDEN :

	Line spacing	Line Direction	TieLine Spacing	TieLine Direction	Line-kms
AM1044-Tullsta	100	000-180	1,000	090-270	522
AM1044-Jugansbo	100	090-270	1,000	000-180	343
AM1044-Saxa	150	090-270	1,000	000-180	226
					1091

NORWAY :

	Line spacing	Line Direction	TieLine Spacing	TieLine Direction	Line-kms
AM1044-Nordgruva	150	090-270	1,500	000-180	596
					596

Total Estimated kms for Sweden and Norway = 1,687 line kilometres



SCHEDULE C

DATA ACQUISITION

C1. Helicopter

Geotech will fly the survey with a SA315B Lama (or equivalent) with the necessary cargo hook. This helicopter has the necessary range and flight duration to fly this type of survey.

C2. Services provided by Geotech

1. Supervision of the helicopter and its crew.
2. Provision of the necessary qualified personnel required to complete the survey.
3. Supply of the technical equipment with spares necessary to fly the survey in an expeditious manner.
4. Quality Control of the geophysical data.
5. Preparation and delivery to DRAKE of all the final products specified in Schedule E.

C3. Survey Scheduling

1. Survey preparations and mobilization to the survey area are expected to be in May or June 2011, and the survey operations will take an estimated 1 Week.
2. Field preliminary maps will be prepared progressively throughout the actual survey flying and delivered in the field, if required.
3. Standard preliminary products will normally be delivered 2 weeks after receipt of the field data at Geotech's processing centre and after the second payment, due upon completion of flying, is received
4. Final maps and report will normally be delivered eight weeks after delivery of the preliminary products.

All phases of the survey scheduling will be coordinated with the requirements of the Client.

C4. Flight Specifications

1. Flight Lines

Line directions and spacing are as specified in Schedule B. The pilot will make every effort not to deviate from the flight plan more than 50m over a distance of 2km, but due to the terrain it could be more.

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

Helicopter – 75 to 85 meters (tow cable dependant)

EM sensor – 35 to 45 meters

Magnetic sensor – 60 to 70 meters (tow cable dependant)

Terrain clearance may vary, based on the pilot's judgment of safe flying conditions around man-made structures or in rugged terrain.



2. Airspeed

Normal helicopter airspeed will be approximately 90 km/hr, but this may vary in areas of rugged terrain. With a data-recording rate of 0.1 point per second, geophysical measurements are acquired approximately every 2 to 4 meters along the survey line dependent on wind conditions.

3. Electromagnetic Data

Data will be re-flown at the Contractor's expense when the standard deviation of the normally processed 6340 μ s time gate EM channel exceeds 0.01 pico volts per Amp-m⁴ continuously over a horizontal distance of 2 km under normal survey conditions, or when Geotech's on-site representative deems the data to be un-interpretable.



C5. Survey Instruments

1. VTEM System

The VTEM or Versatile Time Domain Electro Magnetic system is the most innovative and successful airborne electromagnetic system to be introduced in more than 30 years. The proprietary receiver design using the advantages of modern digital electronics and signal processing delivers exceptionally low-noise levels. Coupled with a high dipole moment transmitter, the result is unparalleled resolution and depth of investigation in precision electromagnetic measurements.

Key features include:

- Superior Exploration Depth – Over 400 metres
- Low Base Frequency (25 or 30 Hz) for Penetration through conductive cover
- High Spatial Resolution – 2 to 3 metres
- Improved Interpretability due to Receiver-Transmitter symmetry
- Spotting drill targets directly off of the airborne results
- Excellent resistivity discrimination and detection of weak anomalies
- Virtually impervious to spheric activity.

The system was designed to be field configurable to best suit a large variety of different geophysical requirements from deep penetration to optimizing the discrimination within a narrow range of resistivity values.

The system is easily transportable. It can be disassembled for packaging in relatively small units for shipping to surveys around the world.

In the event of damage to the EM bird in-flight or while being transported between survey sites, the unique design allows the easy replacement of any part of the system in the field. The transmitter loop can be assembled or disassembled in 3-4 hours.

The recent surveys flown with VTEM have produced superior results over the same test areas flown by competing airborne EM surveys. VTEM has flown the Reid-Mahaffy, Caber, Perseverance and Montcalm test ranges and the results have demonstrated that VTEM provides the Industries highest signal/noise ratio and conductor spatial resolution.

2. Magnetometer

A Geometrics/Scintrex split-beam total field magnetic sensor, with a sampling interval of 0.1 seconds and an in-flight sensitivity of 0.02 nT, will be utilized. The magnetometer will perform continuously in areas of high magnetic gradient with the ambient range of the sensor approximately 20k-100k nT. Aerodynamic magnetometer noise will not exceed 0.5 nT.



3. Electronic Navigation - GPS

A GPS system utilizing the Novatel WAAS enable OEM4-G2-3151W GPS receiver will provide in-flight navigation control. This system determines the absolute position of the helicopter in three dimensions. As many as 11 GPS and two WAAS satellites may be monitored at any one time. The position accuracy (CEP) is 1.8 m, with WAAS on – 1.2 m.

4. Altimeter

An altimeter system will record the ground clearance to an accuracy of approximately 1 m. The altimeters will be interfaced to the data acquisition system with an output repetition rate of 0.5 second. Recording will be in digital form.

5. Data Acquisition/Recording System

A Geotech data acquisition system will be used. Data will be recorded on a PCMCIA flash card.

6. Field Computer Workstation

A dedicated PC-based field computer workstation will be used in the field for purposes of displaying geophysical data for quality control, calculating and displaying the navigation, producing preliminary EM anomaly information and diurnally corrected magnetic maps, and copying/verifying the digital data.

7. Safety

Installation of the survey equipment in the helicopter will be done by qualified personnel. An airworthiness approval certificate is maintained for all installations.

8. Spares

A normal compliment of spare parts and necessary test instrumentation will be available in the field.

9. Base station

A dedicated computer including high sensitivity base station cesium magnetometer will be employed to record magnetic activity.

C6. Survey Crew

The survey crew will consist of at least the following personnel:

1. An experienced Geophysicist or Geophysical Technician/Project Manager to supervise the survey operations, perform quality control of the data and to assist in arranging the survey logistics and field operations.
2. A Geophysical Operator to maintain and operate the geophysical instruments.
3. An experienced Survey Pilot, who has demonstrated his ability to fly the geophysical instrumentation safely and within survey specifications.



4. An experienced Aircraft Mechanic will be on stand-by at the helicopter base and should be ready to be on the survey site with minimal delay.

Curriculum Vitae of the key personnel who may be utilized during the survey work are available upon request.



SCHEDULE D

FIELD DATA PROCESSING / QUALITY CONTROL

The field data processing includes the following quality control measures:

1. All digital data will be inspected on a daily basis to ensure that bad data is not present and to identify missing data sections.
2. A preliminary flight path map will be plotted and checked against survey specifications.
3. All digitally acquired survey data will be merged into a Geosoft Montaj database. Profiles will be edited to ensure completeness of all data traces.
4. The recorded EM data will be digitally processed to remove spheric events and filtered to reduce any system noise. Following the filtering process, base level adjustments will be made to the EM profile data, as required.

SCHEDULE E

PRODUCTS FOR DELIVERY

E1. Preliminary maps

The digital preliminary maps will be produced as soon after the completion of flying as possible. The products will include:

- Color magnetic map
- EM profiles map

The preliminary maps are provided in digital form.

E2. Final standard products

1. Final standard digital maps at a scale specified will be delivered in two copies on CD-ROM or DVD-ROM.

- Color magnetic map
- EM profiles map at a logarithmic scale

2. The processed digital data will be delivered in two copies on CD-ROM or DVD-ROM. The line data will be delivered in the Geosoft Montaj GDB format. The maps will be delivered in the Geosoft Montaj MAP format. Full descriptions of the digital data formats will be included in the final report and as text files on each CD-ROM

3. Operational report will be delivered in two copies. The report will provide information pertaining to the acquisition, processing and presentation of the data.



E3. Additional products

The following additional products can be produced, if required. The “map form” prices below are per block in digital form.

<ul style="list-style-type: none"> EM anomaly map (minimum €1000) 	- €3.00/ line-km
<ul style="list-style-type: none"> Apparent conductivity map for a selected time gate 	<ul style="list-style-type: none"> - €100/ channel as a Geosoft Database channel - €250/ channel as a Geosoft Database channel and in map form
<ul style="list-style-type: none"> Late Channel Time Constant (Tau) calculated on Automatically selected time gates and discriminated by correlation coefficient 	<ul style="list-style-type: none"> - €200 as a Geosoft Database channel - €350 as a Geosoft Database Channel and in map form
<ul style="list-style-type: none"> Magnetic derivative data (IGRF removed, 1st, 2nd, vertical gradient, horizontal gradient, Reduction-to-the-Pole, analytical signal) 	<ul style="list-style-type: none"> - €100 per process as a Geosoft Database channel - €250 per process as a Geosoft Database channel and in map form
<ul style="list-style-type: none"> Digital Terrain map (derived from the radar altimeter and GPS height) 	- €250 per map
<ul style="list-style-type: none"> Resistivity-depth section on paper 	- €100 per section (minimum €1000 per block)
<ul style="list-style-type: none"> Customer designed map 	- €300 per map -
Additional copies:	
<ul style="list-style-type: none"> Paper copy from existing files 	- €80 per sheet
<ul style="list-style-type: none"> Mylar copy from existing files 	- €120 per sheet
<ul style="list-style-type: none"> Extra paper copy of the report 	- €40
<ul style="list-style-type: none"> Extra copy of a CD/DVD 	- €40

*** THE PRICES ABOVE ARE EXCLUDING DELIVERY/MAIL/COURIER CHARGES**



SCHEDULE F

ACKNOWLEDGEMENTS

1. The client agrees to acknowledge in all press releases and other publications that the survey was flown with the VTEM time-domain system. The client also agrees that Geotech may advertise that the VTEM system was used by the client in the event that news articles are published purporting to a discovery in the Survey area, providing that the client approves the advertisement, which approval will not be unreasonably withheld.
2. Geotech will not divulge any information with respect to the Survey to third parties.
3. Until payment is received in full, the information, documents and data pertaining to the Survey shall remain the property of Geotech.

Proposal Accepted,
SIGNED for and on behalf of
Drake Resources Limited

SIGNED for and on behalf of
Geotech Airborne Malta Limited

Name:

Name:

Title:

Title:

Date:

Date:

