ASSESSMENT REPORT ON A HELICOPTER-BORNE

VERSATILE DOMAIN ELECTROMAGNETIC (VTEM MAX) AND

AEROMAGNETIC SURVEY

STARBURST PROPERTY

SOUTH LORRAIN TOWNSHIP, ONTARIO
LARDER LAKE MINING DIVISION

FOR

THOMAS OBRADOVICH

Prepared by:

Joerg M. Kleinboeck, P.GEO.

February 3rd, 2022

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1. INTRODUCTION

The Starburst Property ("Property") is located within South Lorrain Township, Larder Lake Mining Division, approximately 85 km north of North Bay, Ontario. The Property is covered by National Topographic System (NTS) map sheets 31M/04H and 31M/03E.

The Property is comprised of 67 mining claims, totalling approximately 1,471.6 ha in area.

From February 10th to 12th, 2021, Geotech Ltd. completed a helicopter-borne geophysical survey over the Property. Principal geophysical sensors included a versatile time domain electromagnetic (VTEM Max) system, as well as a caesium magnetometer. Ancillary equipment included a GPS navigation systema and a radar altimeter. A total of 135 line-kilometres of geophysical data was acquired during the survey, and forms the basis of this assessment report.

2. PROPERTY DESCRIPTION AND LOCATION

2.1 Location and Access

The Property is located within South Lorrain Township, Ontario (Figure 1). The Project is bounded by UTM NAD83 coordinates 17N 611925E to 616680E, and 5216500N to 5220660N.

Access to the Property is provided by Hwy 567, a well-maintained gravel highway, as well as secondary gravel roads. Local resources on the Property consist of mixed deciduous and coniferous trees.

A full range of services and supplies are provided in the City of Temiskaming Shores located 50 km to the north. Accommodations can be provided at several tourist lodges and motels located along Highway 567 or along Highway 11B.

2.2 Topography and Vegetation

The local terrain is variable from swamps to steep cliffs. Typical vegetation on the Property consists of a boreal forest with a mixture of coniferous and deciduous trees, including poplar, white birch, red pine, white pine, white spruce, black spruce, balsam, cedar, and alders. The elevation of the Property ranges from approximately 179 to 385 m above mean sea level.

Figure 1: Location of the Starburst Property, Ontario

2.3 Mineral Dispositions

The Property is comprised of 67 mining claims, totalling approximately 1,471.6 ha in area (Figure 2, Table 1).

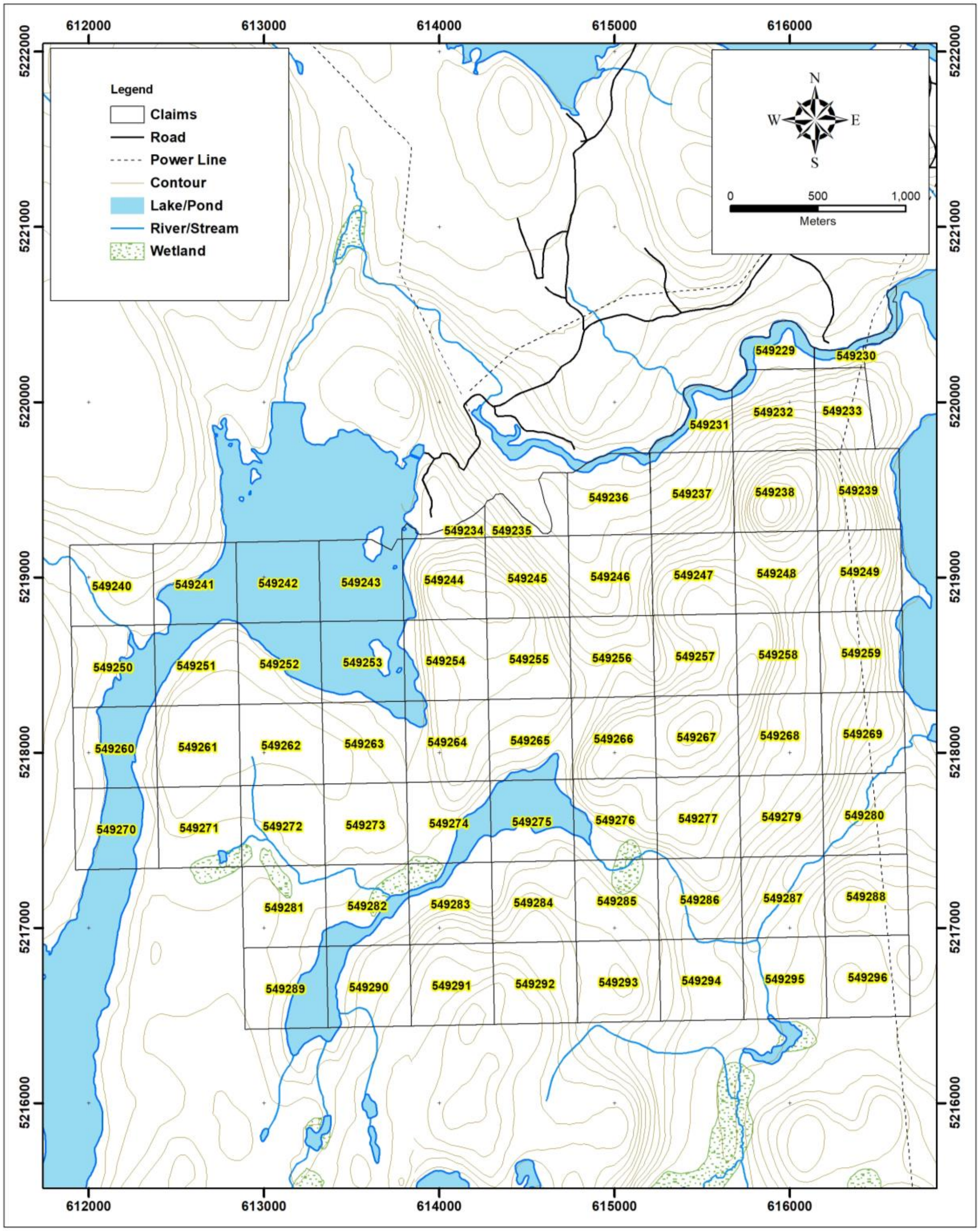

Figure 2: Land Tenure of the Starburst Property

Table 1 : Claim Details

Tenure ID	Anniversary Date	Tenure Status	Work Required	Work Applied	Available Consultation Reserve	Available Exploration Reserve	Total Reserve
549296	2022-05-04	Active	400	0	0	0	0
549295	2022-05-04	Active	400	0	0	0	0
549294	2022-05-04	Active	400	0	0	0	0
549293	2022-05-04	Active	400	0	0	0	0
549292	2022-05-04	Active	400	0	0	0	0
549291	2022-05-04	Active	400	0	0	0	0
549290	2022-05-04	Active	400	0	0	0	0
549289	2022-05-04	Active	400	0	0	0	0
549288	2022-05-04	Active	400	0	0	0	0
549287	2022-05-04	Active	400	0	0	0	0
549286	2022-05-04	Active	400	0	0	0	0
549285	2022-05-04	Active	400	0	0	0	0
549284	2022-05-04	Active	400	0	0	0	0
549283	2022-05-04	Active	400	0	0	0	0
549282	2022-05-04	Active	400	0	0	0	0
549281	2022-05-04	Active	400	0	0	0	0
549280	2022-05-04	Active	400	0	0	0	0
549279	2022-05-04	Active	400	0	0	0	0
549277	2022-05-04	Active	400	0	0	0	0
549276	2022-05-04	Active	400	0	0	0	0
549275	2022-05-04	Active	400	0	0	0	0
549274	2022-05-04	Active	400	0	0	0	0
549273	2022-05-04	Active	400	0	0	0	0
549272	2022-05-04	Active	400	0	0	0	0
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549230	2022-05-04	Active	400	0	0	0	0
549229	2022-05-04	Active	400	0	0	0	0

3.0 HISTORY

3.1 Historical Mineral Exploration

Assessment files covering the Property were sourced online through ENDM's Assessment File Research Imaging (AFRI) database. Very limited documented work has been completed on the Property. A trench is shown on map M2194 east of Copper Lake, however there is no documented files in the AFRI database regarding this work.

1996: Panterra Minerals Inc. completed a fixed-wing airborne geophysical survey consisting of magnetic and spectrometer data collection.

4. GEOLOGICAL SETTING AND MINERALIZATION

4.1 Regional Geology

The Property is located within the southern part of the Cobalt Embayment which lies within the south margin of the Superior Structural Province of the Canadian Shield. The regional geology consists of early Precambrian metavolcanics and metasediments which correlate with the 2,737 Ma Chambers-Briggs Assemblage, part of the Temagami Greenstone Belt (Jackson & Fyon, 1991). These rocks are intruded by vertical Matachewan diabase dykes dated at 2,454 Ma. In the Property area, these older rocks are unconformably overlain by Middle Precambrian Huronian sedimentary rocks deposited between 2,220 and 2,500 Ma. Nipissing Diabase sills, relatively flat lying and dated at 2,219 Ma, intrude the Huronian and older rocks (Bennett, Dressler, & Robertson, 1991). The youngest rocks in the area are olivine diabase dykes, dated at 1,238 Ma (Osmani, 1991).

4.2 Property Geology

The Property is located within the Cobalt embayment at the south margin of the Superior Province of the Canadian Shield (Figure 3). The Property geology is dominated by sedimentary rocks belonging to the Coleman Formation, part of the Huronian Supergroup. According to map M2194, the predominant rock types include quartzose siltstones and greywackes, followed by lesser amounts of conglomerate. Nipissing diabase has been intruded as a sill east of Copper Lake, which overlies the Coleman Formation rocks.

A northwestern trending olivine diabase dyke is also shown southwest of Copper Lake. All of the rock types have been block faulted along predominantly west-northwest, and northwest trending faults that are part of the Lake Temiskaming Structural Zone, which is spatially associated with kimberlite intrusions in the area.

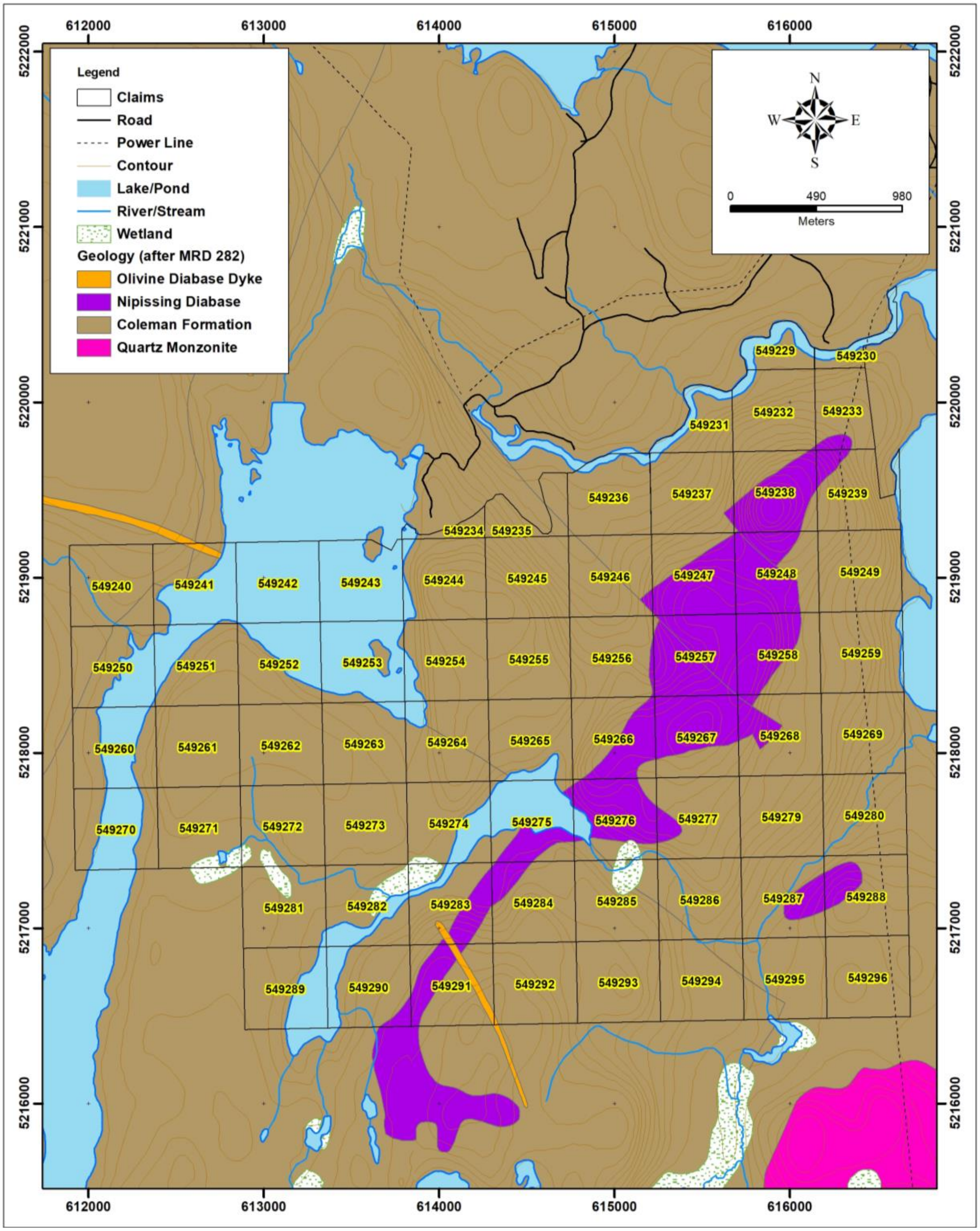

Figure 3: Property Geology

5. SUMMARY OF HELICOPTER-BORNE VERSATILE DOMAIN ELECTROMAGNETIC AND AEROMAGNETIC SURVEY

From February 10th to 12th, 2021, Geotech Ltd. completed a helicopter-borne geophysical survey over the Starburst Property. Principal geophysical sensors included a versatile time domain electromagnetic (VTEM Max) system, as well as a caesium magnetometer. Ancillary equipment included a GPS navigation systema and a radar altimeter. A total of 135 line-kilometres of geophysical data was acquired during the survey, cover an area of 24 km2. Flight lines were spaced at 100 m intervals, oriented north-south, with perpendicular tie lines spaced at 1,000 m intervals.

A detailed report completed by Geotech Ltd. can be found in Appendix II, and map products can be found in Appendix III.

6. INTERPRETATION AND CONCLUSIONS

The helicopter-borne versatile time domain electromagnetic (VTEM Max) and magnetic geophysical survey completed by Geotech Ltd. over the Starburst Property identified a number of geophysical (both magnetic and electromagnetic) anomalies. The primary anomaly of interest is a large circular magnetic feature located to the north of the Property which may represent a buried mafic intrusion. If possible, the claims covering the anomaly should be acquired, followed by geological mapping and ground truthing over the anomaly. Diamond drilling will likely be required to explain this anomaly.

19. REFERENCES

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Osmani, I. 1991. Proterozoic Mafic Dike Swarms in the Superior Province of Ontario, in Geology of Ontario, Ontario Geological Survey, Special Volume 4, Part 1. p. 661-681.

Percival, J.A., Easton, R.M. 2007. Geology of the Canadian Shield in Ontario: An update; Geological Survey of Canada, Open File 5511, Ontario Geological Survey, Miscellaneous Release Data 216.

APPENDIX I: STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Joerg Martin Kleinboeck of 147 Lakeside Drive, North Bay, Ontario, do hereby certify that:

I am a graduate of Laurentian University, Sudbury, Ontario with a B.Sc. Geology, 2000, and have been practising my profession as a geologist since.

I am a member with the Association of Professional Geoscientists of Ontario (#1411).

I have an active prospector's license for the province of Ontario (#1002600).

I am a member of the Prospectors and Developers Association of Canada.

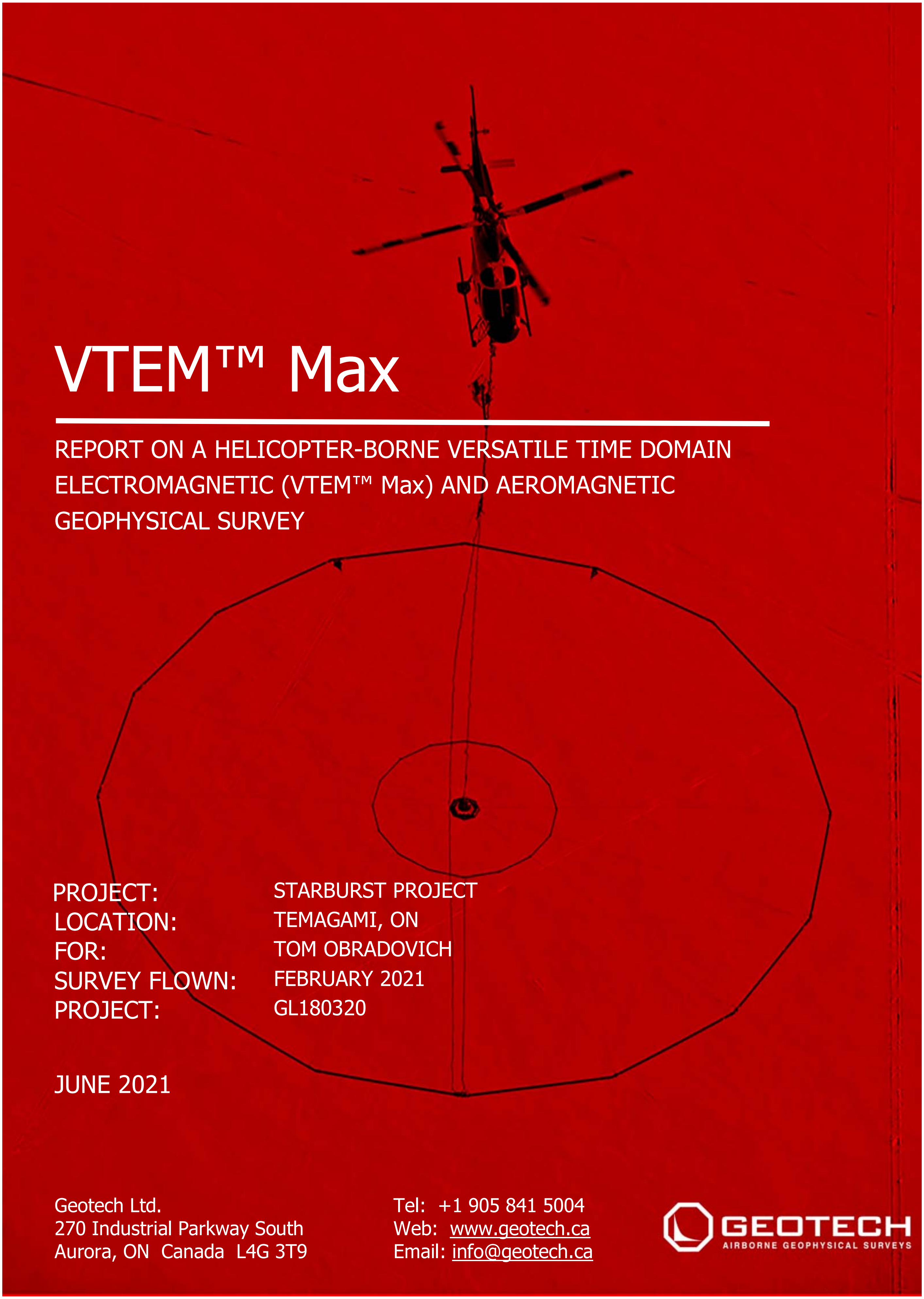
I do not hold any interest or rights in the subject Property.

Joerg Martin Kleinboeck

February 3rd, 2022

North Bay, Ontario

APPENDIX II: GEOPHYSICAL REPORT



VTEM™ Max

REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN ELECTROMAGNETIC (VTEM™ Max) AND AEROMAGNETIC GEOPHYSICAL SURVEY

PROJECT: STARBURST PROJECT
LOCATION: TEMAGAMI, ON
FOR: TOM OBRADOVICH
SURVEY FLOWN: FEBRUARY 2021
PROJECT: GL180320

JUNE 2021

Geotech Ltd.
270 Industrial Parkway South
Aurora, ON Canada L4G 3T9

Tel: +1 905 841 5004
Web: www.geotech.ca
Email: info@geotech.ca

GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

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EXECUTIVE SUMMARY

STARBURST PROJECT
TEMAGAMI, ON

During February 10th to February 12th, 2021, Geotech Ltd. carried out a helicopter-borne geophysical survey over the Starburst Project situated near Temagami, ON.

Principal geophysical sensors included a versatile time domain electromagnetic (VTEM™ Max) system and a caesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 135 line-kilometres of geophysical data were acquired during the survey.

In-field data quality assurance and preliminary processing were carried out on a daily basis during the acquisition phase. Preliminary and final data processing, including generation of final digital data and map products were undertaken from the office of Geotech Ltd. in Aurora, Ontario.

The processed survey results are presented as the following maps:

- Electromagnetic stacked profiles of the B-field Z Component,
- Electromagnetic stacked profiles of dB/dt Z Components,
- B-Field Z Component Channel grid
- dB/dt Z Component Channel grid
- Fraser Filtered dB/dt X Component Channel grid,
- Total Magnetic Intensity (TMI)
- Calculated Magnetic Vertical Derivative (CVG)
- Calculated Z component Time Constant (Tau) with Calculated Vertical Derivative contours,
- Resistivity Depth Image (RDI) cross sections and depth-slices.

Digital data includes all electromagnetic and magnetic products, plus ancillary data including the waveform.

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

1. INTRODUCTION

1.1 GENERAL CONSIDERATIONS

Geotech Ltd. performed a helicopter-borne geophysical survey over Starburst Project situated near Temagami, ON (Figure 1 & Figure 2).

Tom Obradovich represented his company during the data acquisition and data processing phases of this project.

The geophysical surveys consisted of helicopter borne EM using the versatile time-domain electromagnetic (VTEM™) Max system with Full-Waveform processing. Measurements consisted of Vertical (Z), In-line, and Crossline Horizontal (X & Y) components of the EM fields using an induction coil and the aeromagnetic total field using a caesium magnetometer. A total of 135 line-km of geophysical data were acquired during the survey.

The crew was based out of Temagami, ON (Figure 2) for the acquisition phase of the survey. Survey flying started on February 10th and was completed on February 12th, 2021.

Data quality control and quality assurance, and preliminary data processing were carried out on a daily basis during the acquisition phase of the project. Final data processing followed immediately after the end of the survey. Final reporting, data presentation and archiving were completed from the Aurora office of Geotech Ltd. in June 2021.

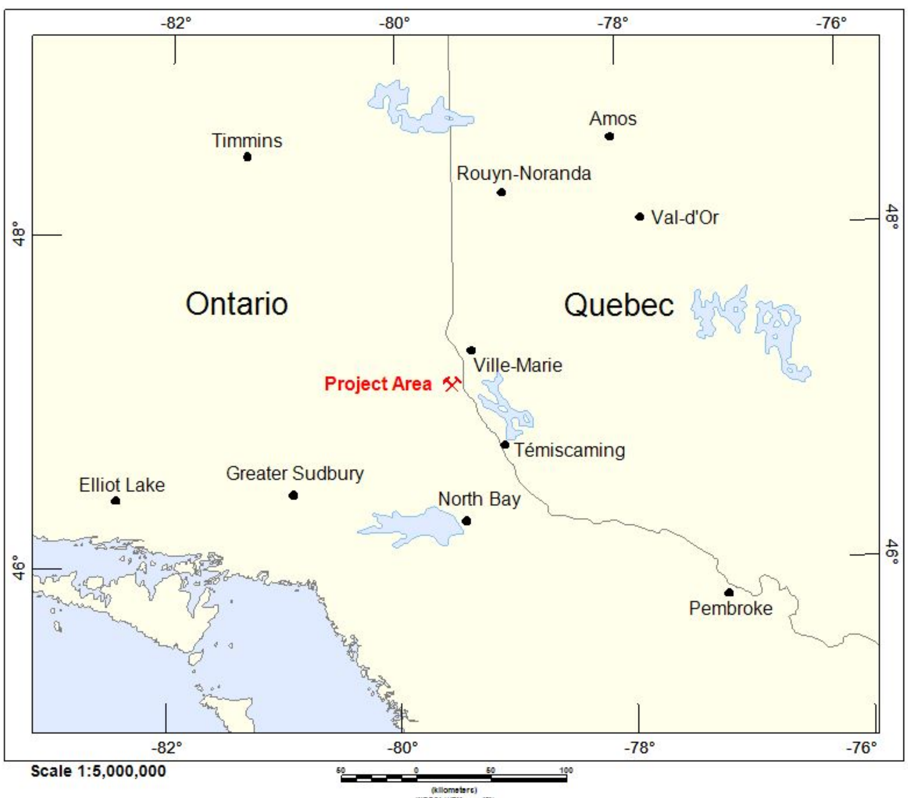


Figure 1: Survey location

1.2 SURVEY AND SYSTEM SPECIFICATIONS

The Starburst Project survey area is located approximately 21 kilometres northeast of Temagami, ON (Figure 2).

Figure 2: Survey area location on Google Earth.

The survey area was flown in a south to north (N 0° E azimuth) direction with traverse line spacing of 100 metres as depicted in Figure 3. Tie lines were flown perpendicular to the traverse lines at 1000 metre spacing. For more detailed information on the flight spacing and direction, see Table 1.

1.3 TOPOGRAPHIC RELIEF AND CULTURAL FEATURES

Topographically, the survey area exhibits relief with elevations ranging from 179 to 385 metres above mean sea level over an area of 24 square kilometres (Figure 3).

There are several lakes and rivers in the Starburst project area, along with signs of culture such as roads and powerlines.

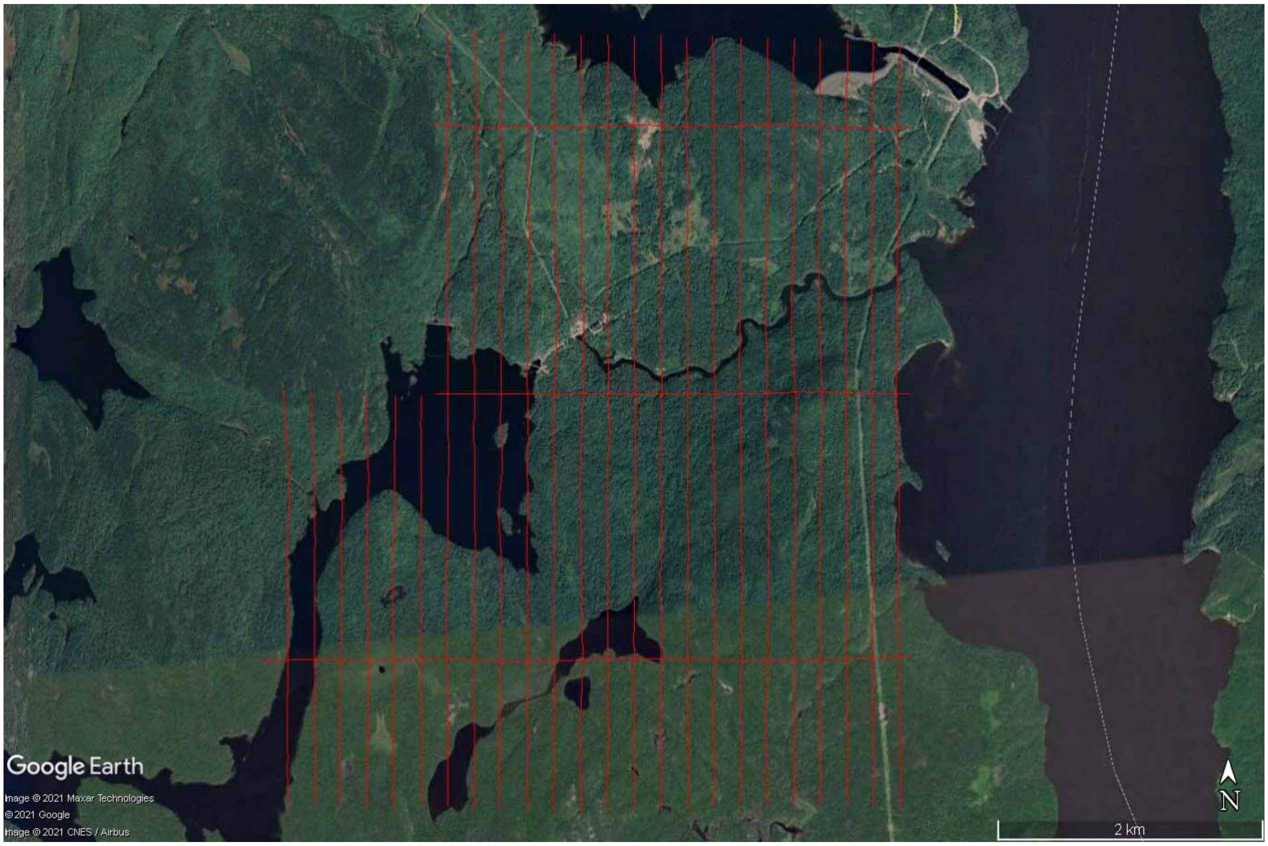


Figure 3: Flight path over a Google Earth Image

2. DATA ACQUISITION

2.1 SURVEY AREA

The survey area (see Figure 3 and Appendix A) and general flight specifications are as follows:

Table 1: Survey Specifications

Survey block	Line spacing (m)	Area (Km²)	Planned[1] Line-km	Actual Line-km	Flight direction	Line numbers
Starburst Project	Traverse: 100	24	132	135	N 0° E / N 180° E	L1000 – L1230
	Tie: 1000				N 90° E / N 270° E	T2000 – T2030
Total		24	132	135		

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

2.2 SURVEY OPERATIONS

Survey operations were based out of Temagami, ON from February 10th until February 12th, 2021. The following table shows the timing of the flying.

Table 2: Survey schedule

Date	Comments
02/10/2021	Production Flight – 86.60 km flown
02/11/2021	Production Flight – 86.60 km flown
02/12/2021	Demobilization

[1] Note: Actual Line kilometres represent the total line kilometres in the final database. These line-km normally exceed the Planned Line-km, as indicated in the survey NAV files.

2.3 FLIGHT SPECIFICATIONS

During the survey, the helicopter was maintained at a mean altitude of 114 metres with an average survey speed of 70 km/hour. This allowed for an actual average Transmitter-receiver loop terrain clearance of 65 metres and a magnetic sensor clearance of 104 metres.

The on-board operator was responsible for monitoring 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 features.

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. The data were then uploaded via ftp to the Geotech office in Aurora for daily quality assurance and quality control by qualified personnel.

2.4 AIRCRAFT AND EQUIPMENT

2.4.1 SURVEY AIRCRAFT

The survey was flown using an Aerospatiale (A-star) 350 B3 helicopter, registration C-FBZN. The helicopter is owned and operated by Geotech Aviation. Installation of the geophysical and ancillary equipment was carried out by a Geotech Ltd crew.

2.4.2 ELECTROMAGNETIC SYSTEM

The electromagnetic system was a Geotech Time Domain EM (VTEM™ Max) full receiver-waveform streamed data recorded system. The "full waveform VTEM system" uses the streamed half-cycle recording of transmitter and receiver waveforms to obtain a complete system response calibration throughout the entire survey flight. VTEM with the Serial number 35 had been used for the survey. The VTEM™ transmitter current waveform is shown diagrammatically in Figure 4.

The VTEM™ Receiver and transmitter coils were in concentric-coplanar and Z-direction oriented configuration. The receiver system for the project also included a coincident-coaxial X-direction coil to measure the in-line dB/dt and calculate B-Field responses. The Transmitter-receiver loop was towed at a mean distance of 49 metres below the aircraft as shown in Figure 5.

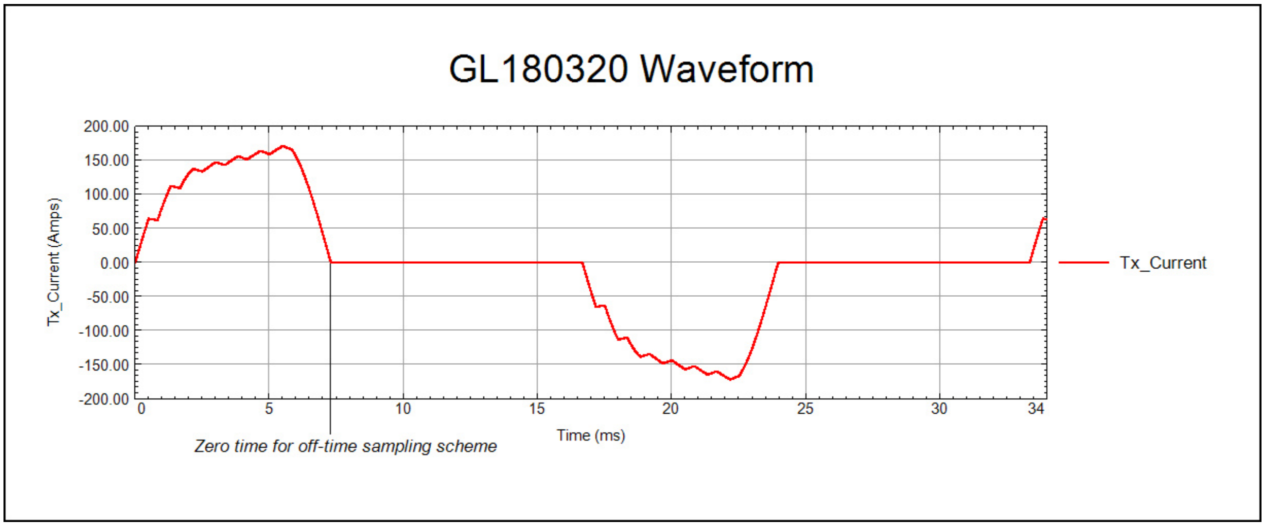


Figure 4: VTEM™ Transmitter Current Waveform

The VTEM™ decay sampling scheme is shown in Table 3 below. Forty-three time measurement gates were used for the final data processing in the range from 0.021 to 8.083 msec. Zero time for the off-time sampling scheme is equal to the current pulse width and is defined as the time near the end of the turn-off ramp where the dI/dt waveform falls to 1/2 of its peak value.

Table 3: Off-Time Decay Sampling Scheme

VTEM max™ Decay Sampling Scheme				
Index	Start	End	Middle	Width
Milliseconds				
4	0.018	0.023	0.021	0.005
5	0.023	0.029	0.026	0.005
6	0.029	0.034	0.031	0.005
7	0.034	0.039	0.036	0.005
8	0.039	0.045	0.042	0.006
9	0.045	0.051	0.048	0.007
10	0.051	0.059	0.055	0.008
11	0.059	0.068	0.063	0.009
12	0.068	0.078	0.073	0.010
13	0.078	0.090	0.083	0.012
14	0.090	0.103	0.096	0.013
15	0.103	0.118	0.110	0.015
16	0.118	0.136	0.126	0.018
17	0.136	0.156	0.145	0.020
18	0.156	0.179	0.167	0.023
19	0.179	0.206	0.192	0.027
20	0.206	0.236	0.220	0.030
21	0.236	0.271	0.253	0.035
22	0.271	0.312	0.290	0.040

VTEM max™ Decay Sampling Scheme				
Index	Start	End	Middle	Width
Milliseconds				
23	0.312	0.358	0.333	0.046
24	0.358	0.411	0.383	0.053
25	0.411	0.472	0.440	0.061
26	0.472	0.543	0.505	0.070
27	0.543	0.623	0.580	0.081
28	0.623	0.716	0.667	0.093
29	0.716	0.823	0.766	0.107
30	0.823	0.945	0.880	0.122
31	0.945	1.086	1.010	0.141
32	1.086	1.247	1.161	0.161
33	1.247	1.432	1.333	0.185
34	1.432	1.646	1.531	0.214
35	1.646	1.891	1.760	0.245
36	1.891	2.172	2.021	0.281
37	2.172	2.495	2.323	0.323
38	2.495	2.865	2.667	0.370
39	2.865	3.292	3.063	0.427
40	3.292	3.781	3.521	0.490
41	3.781	4.341	4.042	0.560
42	4.341	4.987	4.641	0.646
43	4.987	5.729	5.333	0.742
44	5.729	6.581	6.125	0.852
45	6.581	7.560	7.036	0.979
46	7.560	8.685	8.083	1.125

Z Component: 4 - 46 time gates
X Component: 20 - 46 time gates
Y Component: 20 - 46 time gates

VTEM™ system specifications:

Transmitter	Receiver
• Transmitter loop diameter: 35 m • Number of turns: 4 • Effective Transmitter loop area: 3849 m^2 • Transmitter base frequency: 30 Hz • Peak current: 171 A • Pulse width: 7.29 ms • Waveform shape: Bi-polar trapezoid • Peak dipole moment: 659,625 nIA • Average transmitter-receiver loop terrain clearance: 65 metres above the ground	• X Coil diameter: 0.32 m • Number of turns: 245 • Effective coil area: 19.69 m^2 • Y Coil diameter: 0.32 m • Number of turns: 245 • Effective coil area: 19.69 m^2 • Z-Coil diameter: 1.2 m • Number of turns: 100 • Effective coil area: 113.04 m^2

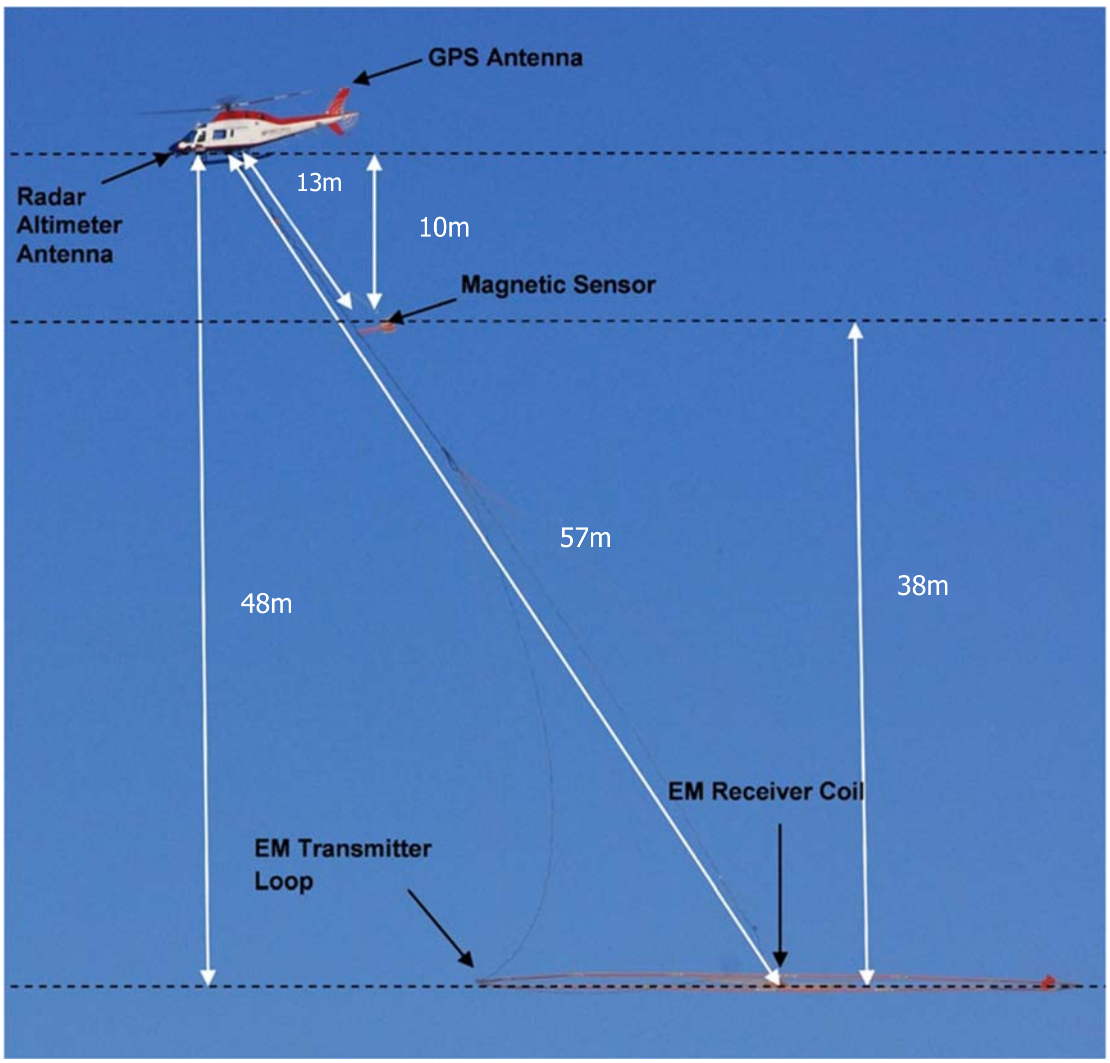


Figure 5: VTEM™max System Configuration.

2.4.3 Airborne Magnetometer

The magnetic sensor utilized for the survey was Geometrics optically pumped caesium vapour magnetic field sensor mounted 10 metres below the helicopter, as shown in Figure 5. The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds.

2.4.4 Full waveform VTEM™ sensor calibration

The calibration is performed on the complete VTEM™ system installed in and connected to the helicopter, using special calibration equipment. This calibration takes place on the ground at the start of the project prior to surveying.

The procedure takes half-cycle files acquired and calculates a calibration file consisting of a single stacked half-cycle waveform. The purpose of the stacking is to attenuate natural and man-made magnetic signals, leaving only the response to the calibration signal.

This calibration allows the transfer function between the EM receiver and data acquisition system and also the transfer function of the current monitor and data acquisition system to be determined. These calibration results are then used in VTEM full waveform processing.

2.4.5 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 (Figure 5).

2.4.6 GPS Navigation System

The navigation system used was a Geotech PC104 based navigation system utilizing a NovAtel's WAAS (Wide Area Augmentation System) enabled GPS receiver, Geotech navigate software, a full screen display with controls in front of the pilot to direct the flight and a NovAtel GPS antenna mounted on the helicopter tail (Figure 5). As many as 11 GPS and two WAAS satellites may be monitored at any one time. The positional accuracy or circular error probability (CEP) is 1.8 m, with WAAS active, it is 1.0 m. The co-ordinates of the survey area were set-up prior to the survey and the information was fed into the airborne navigation system.

2.4.7 Digital Acquisition System

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

Table 4: Acquisition Sampling Rates

Data Type	Sampling
TDEM	0.1 sec
Magnetometer	0.1 sec
GPS Position	0.2 sec
Radar Altimeter	0.2 sec
Inclinometer	0.1 sec

2.5 BASE STATION

A combined magnetometer/GPS base station was utilized on this project. A Geometrics Caesium 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 in a secured location away from culture and electric transmission lines and moving ferrous objects such as motor vehicles. The base station data were backed-up to the data processing computer at the end of each survey day.

3. PERSONNEL

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

FIELD:

Project Manager:	TaiChyi Shei (Office)
Data QC:	Marta Orta
Crew chief:	Paul Taylor Colin Lennox Juan Carlos Florez Osorio
Operator:	Juan Carlos Florez Osorio

The survey pilot and the mechanical engineer were employed directly by the helicopter operator – Geotech Aviation.

Pilot:	Steve McGreer Bill Hofstede
Mechanical Engineer:	Barry Orme

OFFICE:

Preliminary Data Processing:	Marta Orta
Final Data Processing:	Emily Data
Data QA/QC:	Keeme Mokubung Jean M. Legault
Reporting/Mapping:	Moyosore Lanisa

Processing and Interpretation phases were carried out by Emily Data under the supervision of Keeme Mokubung & Jean M. Legault, M.Sc.A, P.Eng, and P.Geo - Chief Geophysicist. The customer relations were looked after by Jean Legault.

4. DATA PROCESSING AND PRESENTATION

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

4.1 FLIGHT PATH

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the WGS84 UTM Zone 17 North 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 easting's (x) and UTM northing's (y).

4.2 ELECTROMAGNETIC DATA

The Full Waveform EM specific data processing operations included:

- Half cycle stacking (performed at time of acquisition);
- System response correction;
- Parasitic and drift removal.

A three-stage digital filtering process was used to reject major sferic events and to reduce noise levels. 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 sferic events.

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 15 metres. This filter is a symmetrical 1 sec linear filter.

The results are presented as stacked profiles of EM voltages for the time gates, in linear - logarithmic scale for the B-field Z component and dB/dt responses in the Z and X components. B-field Z component time channel recorded at 1.760 milliseconds after the termination of the impulse is also presented as a colour image. Calculated Time Constant (TAU) with Calculated Vertical Derivative contours is presented in Appendix C. Resistivity Depth Image (RDI) is also presented in Appendix G.

VTEM™ has three receiver coil orientations. Z-axis coil is oriented parallel to the transmitter coil axis and both are horizontal to the ground. The X-axis coil is oriented parallel to the ground and along the line-of-flight. The Y-axis coil is oriented parallel to the ground and perpendicular to the line-of-flight. This combined three-coil configuration provides information on the position, depth, dip and thickness of a conductor. Generalized modeling results of VTEM data, are shown in Appendix D.

In general X-component data produce cross-over type anomalies: from "+ to – "in flight direction of flight for "thin" sub vertical targets and from "- to +" in direction of flight for "thick" targets. Z component data produce double peak type anomalies for "thin" sub vertical targets and single peak for "thick" targets.

The limits and change-over of "thin-thick" depends on dimensions of a TEM system (Appendix D, Figure D-16).

Because of X component polarity is under line-of-flight, convolution Fraser Filter (Figure 6) is applied to X component data to represent axes of conductors in the form of grid map. In this case positive FF anomalies always correspond to "plus-to-minus" X data crossovers independent of the flight direction.

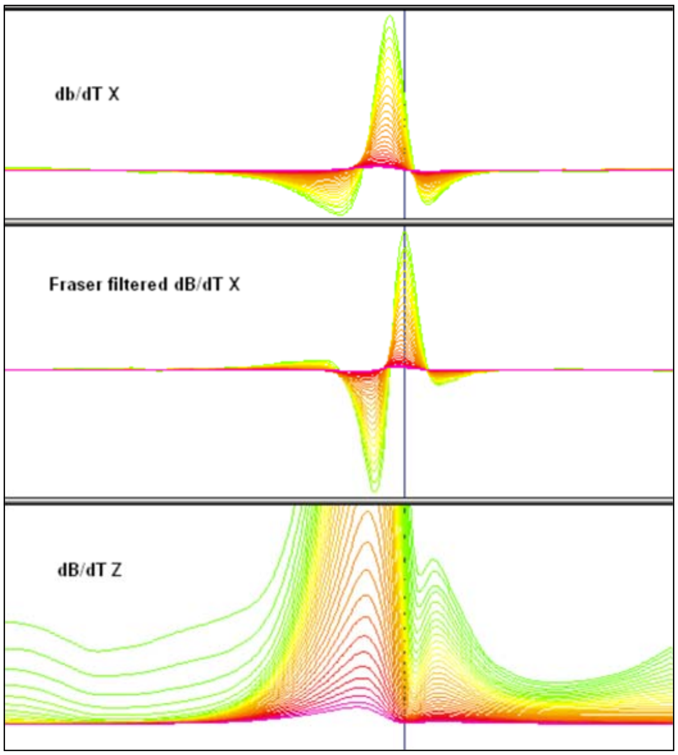


Figure 6: Z, X and Fraser filtered X (FFx) components for "thin" target.

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 traverse lines. A micro-levelling procedure was applied to remove persistent low-amplitude components of flight-line noise remaining in the data.

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

4.4 TAU PARAMETER AND CVG CALCULATION

The processed VTEM survey results are presented as a calculated Z-component dB/dt time constant (Tau), which is an indicator of geological unit's electrical conductance.

An explanation of the EM decay time constant calculation is provided in Appendix F. The TAU dB_Z/dt map is presented in Appendix C. The map is accompanied by an overlay of the calculated vertical gradient of TMI anomaly contours for tracing possible EM-MAG anomaly correlations.

The CVG contour layer, on the top of TAU colour grid, generally is more representative of the smaller scale and shallower magnetic sources in comparison with the TMI. CVG is designed to emphasize the structures and lithological units that might not otherwise be seen on the TMI due to the nearby presence of stronger magnetic responses, showing a high resolution in terms of individual structures.

The combined TAU-CVG map will indicate how well the most highly conductive targets (with maximal TAU) are correlated with either magnetic or non-magnetic sources in the bedrock geology.

5. DELIVERABLES

5.1 SURVEY REPORT

The survey report describes the data acquisition, processing, and final presentation of the survey results. The survey report is provided in two paper copies and digitally in PDF format.

5.2 MAPS

Final maps were produced at scale of 1:15,000 for best representation of the survey size and line spacing. The coordinate/projection system used was WGS84 Datum, UTM Zone 17 North. All maps show the flight path trace and topographic data; latitude and longitude are also noted on maps.

The results of the survey are presented as EM profiles, a late-time gate gridded EM channel, and a colour magnetic TMI contour map.

- Maps at 1:15,000 in Geosoft MAP format, as follows:

GL180320_**_dBdt:	dB/dt profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale.
GL180320_**_BField:	B-field profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale.
GL180320_**_BFz35:	B-field late time Z Component Channel 35, Time Gate 1.760 ms colour image.
GL180320_**_SFxFF25:	Fraser Filtered dB/dt X Component Channel 25, Time Gate 0.440 ms colour image.
GL180320_**_SFz30:	VTEM dB/dt Z Component Channel 30, Time Gate 0.880 ms.
GL180320_**_TauSF:	Mid-Time dB/dt Calculated Time Constant (Tau) with Calculated Vertical Derivative of TMI contours.
GL180320_**_TMI:	Total magnetic intensity colour image and contours.
GL180320_**_CVG:	Calculated Vertical Derivative of Total Magnetic Intensity, colour image.

Where ** represents company and map scale, eg. *GL180320_TomObradovich _15K_BFz35.map*

- Maps are also presented in PDF format.

- The topographic base and inset map data were derived from 1:250,000 CANVEC data. Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/).

- A Google Earth file *GL180320_TomObradovich.kml* showing the flight path of the block is included. Free versions of Google Earth software from: http://earth.google.com/download-earth.html

5.3 DIGITAL DATA

Two copies of the data and maps on DVD were prepared to accompany the report. Each DVD contains a digital file of the line data in GDB Geosoft Montaj format as well as the maps in Geosoft Montaj Map and PDF format.

- DVD structure.

  Data contains databases, grids and maps, as described below.
  Report contains a copy of the report and appendices in PDF format.

Databases in Geosoft GDB format, containing the channels listed in Table 5.

Table 5: Geosoft GDB Data Format

Channel name	Units	Description
X	metres	UTM Easting NAD83 Zone 17 North
Y	metres	UTM Northing NAD83 Zone 17 North
Longitude	Decimal Degrees	WGS 84 Longitude data
Latitude	Decimal Degrees	WGS 84 Latitude data
Z	metres	GPS antenna elevation (above Geoid)
Zb	metres	EM bird elevation (above Geoid)
Radar	metres	helicopter terrain clearance from radar altimeter
Radarb	metres	Calculated EM transmitter-receiver loop terrain clearance from radar altimeter
DEM	metres	Digital Elevation Model
GTime	Seconds of the day	GPS time
Basemag	nT	Magnetic diurnal variation data
Mag1	nT	Raw Total Magnetic field data
Mag2	nT	Diurnal corrected Total Magnetic field data
Mag3	nT	Levelled Total Magnetic field data
CVG	nT/m	Calculated Magnetic Vertical Gradient
SFz[4]	pV/(A*m4)	Z dB/dt 0.021 millisecond time channel
SFz[5]	pV/(A*m4)	Z dB/dt 0.026 millisecond time channel
SFz[6]	pV/(A*m^4)	Z dB/dt 0.031 millisecond time channel
SFz[7]	pV/(A*m^4)	Z dB/dt 0.036 millisecond time channel
SFz[8]	pV/(A*m^4)	Z dB/dt 0.042 millisecond time channel
SFz[9]	pV/(A*m^4)	Z dB/dt 0.048 millisecond time channel
SFz[10]	pV/(A*m^4)	Z dB/dt 0.055 millisecond time channel
SFz[11]	pV/(A*m^4)	Z dB/dt 0.063 millisecond time channel
SFz[12]	pV/(A*m^4)	Z dB/dt 0.073 millisecond time channel
SFz[13]	pV/(A*m^4)	Z dB/dt 0.083 millisecond time channel
SFz[14]	pV/(A*m^4)	Z dB/dt 0.096 millisecond time channel
SFz[15]	pV/(A*m^4)	Z dB/dt 0.110 millisecond time channel
SFz[16]	pV/(A*m^4)	Z dB/dt 0.126 millisecond time channel
SFz[17]	pV/(A*m^4)	Z dB/dt 0.145 millisecond time channel
SFz[18]	pV/(A*m^4)	Z dB/dt 0.167 millisecond time channel
SFz[19]	pV/(A*m^4)	Z dB/dt 0.192 millisecond time channel
SFz[20]	pV/(A*m^4)	Z dB/dt 0.220 millisecond time channel
SFz[21]	pV/(A*m^4)	Z dB/dt 0.253 millisecond time channel
SFz[22]	pV/(A*m^4)	Z dB/dt 0.290 millisecond time channel
SFz[23]	pV/(A*m^4)	Z dB/dt 0.333 millisecond time channel

Channel name	Units	Description
SFz[24]	pV/(A*m^4)	Z dB/dt 0.383 millisecond time channel
SFz[25]	pV/(A*m^4)	Z dB/dt 0.440 millisecond time channel
SFz[26]	pV/(A*m^4)	Z dB/dt 0.505 millisecond time channel
SFz[27]	pV/(A*m^4)	Z dB/dt 0.580 millisecond time channel
SFz[28]	pV/(A*m^4)	Z dB/dt 0.667 millisecond time channel
SFz[29]	pV/(A*m^4)	Z dB/dt 0.766 millisecond time channel
SFz[30]	pV/(A*m^4)	Z dB/dt 0.880 millisecond time channel
SFz[31]	pV/(A*m^4)	Z dB/dt 1.010 millisecond time channel
SFz[32]	pV/(A*m^4)	Z dB/dt 1.161 millisecond time channel
SFz[33]	pV/(A*m^4)	Z dB/dt 1.333 millisecond time channel
SFz[34]	pV/(A*m^4)	Z dB/dt 1.531 millisecond time channel
SFz[35]	pV/(A*m^4)	Z dB/dt 1.760 millisecond time channel
SFz[36]	pV/(A*m^4)	Z dB/dt 2.021 millisecond time channel
SFz[37]	pV/(A*m^4)	Z dB/dt 2.323 millisecond time channel
SFz[38]	pV/(A*m^4)	Z dB/dt 2.667 millisecond time channel
SFz[39]	pV/(A*m^4)	Z dB/dt 3.063 millisecond time channel
SFz[40]	pV/(A*m^4)	Z dB/dt 3.521 millisecond time channel
SFz[41]	pV/(A*m^4)	Z dB/dt 4.042 millisecond time channel
SFz[42]	pV/(A*m^4)	Z dB/dt 4.641 millisecond time channel
SFz[43]	pV/(A*m^4)	Z dB/dt 5.333 millisecond time channel
SFz[44]	pV/(A*m^4)	Z dB/dt 6.125 millisecond time channel
SFz[45]	pV/(A*m^4)	Z dB/dt 7.036 millisecond time channel
SFz[46]	pV/(A*m^4)	Z dB/dt 8.083 millisecond time channel
SFx[20]	pV/(A*m^4)	X dB/dt 0.220 millisecond time channel
SFx[21]	pV/(A*m^4)	X dB/dt 0.253 millisecond time channel
SFx[22]	pV/(A*m^4)	X dB/dt 0.290 millisecond time channel
SFx[23]	pV/(A*m^4)	X dB/dt 0.333 millisecond time channel
SFx[24]	pV/(A*m^4)	X dB/dt 0.383 millisecond time channel
SFx[25]	pV/(A*m^4)	X dB/dt 0.440 millisecond time channel
SFx[26]	pV/(A*m^4)	X dB/dt 0.505 millisecond time channel
SFx[27]	pV/(A*m^4)	X dB/dt 0.580 millisecond time channel
SFx[28]	pV/(A*m^4)	X dB/dt 0.667 millisecond time channel
SFx[29]	pV/(A*m^4)	X dB/dt 0.766 millisecond time channel
SFx[30]	pV/(A*m^4)	X dB/dt 0.880 millisecond time channel
SFx[31]	pV/(A*m^4)	X dB/dt 1.010 millisecond time channel
SFx[32]	pV/(A*m^4)	X dB/dt 1.161 millisecond time channel
SFx[33]	pV/(A*m^4)	X dB/dt 1.333 millisecond time channel
SFx[34]	pV/(A*m^4)	X dB/dt 1.531 millisecond time channel
SFx[35]	pV/(A*m^4)	X dB/dt 1.760 millisecond time channel
SFx[36]	pV/(A*m^4)	X dB/dt 2.021 millisecond time channel
SFx[37]	pV/(A*m^4)	X dB/dt 2.323 millisecond time channel
SFx[38]	pV/(A*m^4)	X dB/dt 2.667 millisecond time channel
SFx[39]	pV/(A*m^4)	X dB/dt 3.063 millisecond time channel
SFx[40]	pV/(A*m^4)	X dB/dt 3.521 millisecond time channel
SFx[41]	pV/(A*m^4)	X dB/dt 4.042 millisecond time channel
SFx[42]	pV/(A*m^4)	X dB/dt 4.641 millisecond time channel
SFx[43]	pV/(A*m^4)	X dB/dt 5.333 millisecond time channel
SFx[44]	pV/(A*m^4)	X dB/dt 6.125 millisecond time channel
SFx[45]	pV/(A*m^4)	X dB/dt 7.036 millisecond time channel
SFx[46]	pV/(A*m^4)	X dB/dt 8.083 millisecond time channel

Channel name	Units	Description
SFy	$(pV*ms)/(A*m^4)$	Y dB/dt data for time channels 4 to 48
BFz	$(pV*ms)/(A*m^4)$	Z B-Field data for time channels 4 to 48
BFy	$(pV*ms)/(A*m^4)$	Y B-Field data for time channels 4 to 48
BFx	$(pV*ms)/(A*m^4)$	X B-Field data for time channels 20 to 48
SFxFF	$pV/(A*m^4)$	Fraser Filtered X dB/dt for time channels 20 to 48
NchanBF		Latest time channels of TAU calculation
TauBF	ms	Time constant B-Field
NchanSF		Latest time channels of TAU calculation
TauSF	ms	Time constant dB/dt
PLM		60 Hz power line monitor

Electromagnetic B-field and dB/dt Z component data is found in array channel format between indexes 4 – 46, and X & Y component data from 20 – 46, as described above.

- Database of the Resistivity Depth Images in Geosoft GDB format, containing the following channels:

Table 6: Geosoft Resistivity Depth Image GDB Data Format

Channel name	Units	Description
Xg	metres	UTM Easting NAD83 Zone 17 North
Yg	metres	UTM Northing NAD83 Zone 17 North
Dist:	metres	Distance from the beginning of the line
Depth:	metres	Array channel, depth from the surface
Z:	metres	Array channel, depth from sea level
AppRes:	Ohm-m	Array channel, Apparent Resistivity
TR:	metres	EM system height from sea level
Topo:	metres	digital elevation model
Radarb:	metres	Calculated EM transmitter-receiver loop terrain clearance from radar altimeter
SF:	pV/(A*m^4)	Array channel, dB/dT
MAG:	nT	Mag3 data
CVG:	nT/m	CVG data
DOI:	metres	Depth of Investigation: a measure of VTEM depth effectiveness
PLM:		60Hz Power Line Monitor

- Resistivity Depth Image:

Sections contains apparent resistivity sections along each line in .GRD and .PDF format.

Slices contains apparent resistivity slices at selected depths from 25m to depth of investigation, at an increment of 25m in .GRD and .PDF format.

Voxel contains 3D Voxel imaging of apparent resistivity data clipped by digital elevation and depth of investigation.

- Database of the VTEM Waveform “GL180320_Waveform.gdb” in Geosoft GDB format, containing the following channels:

Table 7: Geosoft database for the VTEM waveform

Channel name	Units	Description
Time:	milliseconds	Sampling rate interval, 5.2083 microseconds
Tx_Current:	amps	Output current of the transmitter

- Grids in Geosoft GRD and GeoTIFF format, as follows:

GL180320_BFz35:	B-Field Z Component Channel 35 (Time Gate 1.760 ms)
GL180320_CVG:	Calculated Vertical Gradient (nT/m)
GL180320_DEM:	Digital Elevation Model (metres)
GL180320_Mag3:	Total Magnetic Intensity (nT)
GL180320_PLM:	Power Line Monitor
GL180320_SFxFF25:	Fraser Filtered dB/dt X Component Channel 25 (Time Gate 0.440 ms)
GL180320_TauBF:	B-Field Z Component, Calculated Time Constant (ms)
GL180320_TauSF:	dB/dt Z Component, Calculated Time Constant (ms)
GL180320_SFz20:	dB/dt Z Component Channel 20 (Time Gate 0.220 ms)
GL180320_SFz30:	dB/dt Z Component Channel 30 (Time Gate 0.880 ms)
GL180320_SFz40:	dB/dt Z Component Channel 40 (Time Gate 3.521 ms)

A Geosoft .GRD file has a .GI metadata file associated with it, containing grid projection information. A grid cell size of 25 metres was used.

6. CONCLUSIONS AND RECOMMENDATIONS

A helicopter-borne versatile time domain electromagnetic (VTEM™ Max) and magnetic geophysical survey has been completed over Starburst Project situated near Temagami, ON.

The total area coverage is 24 km². Total survey line coverage is 135 line-kilometres. The principal sensors included a time domain VTEM™ Max system and a caesium magnetometer. Results have been presented as stacked profiles, and contour colour images at a scale of 1:15,000. A formal interpretation has not been included in this report, however RDI resistivity-depth imaging has been performed in support of the VTEM data.

Geophysical anomalies have been identified on the property, most notably a prominent, moderate strength (>350nT), intrusion-like magnetic high feature that is centred in the northern half of the block. Other, weaker dyke-like, NW-SE lineaments are also noticeable, however the main geologic strike trend appears to be NE-SW. Although the EM response is dominated by a false conductive, sinuous lineament that is attributable to a roadside powerline in the northern and east part of the block, a shallow-buried, weak to moderate EM conductive anomaly (A) is defined in the center of the survey area (Figure 7). This NE-SW trending EM conductor has a >700m strike-length and sits on the southeastern flank of the prominent magnetic high. Based on the RDI depth slices, the top depth is approx. near surface to 25 metres and extends to ~250m depth, with anomalous resistivities as low as ~50 ohm-m. Other weakly conductive anomalies are defined throughout the block but could be attributed to conductive overburden.

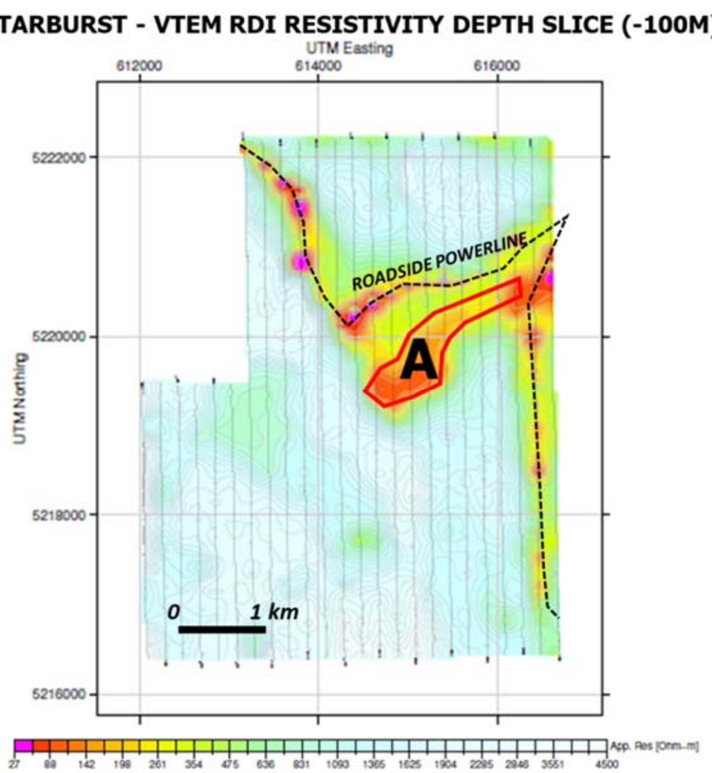


Figure 7 – VTEM RDI resistivity depth slice at 100m depth over Starburst Project, showing anomaly of interest (A).

The geophysical results at Starburst Project are visibly affected by man-made culture, including a roadside powerline that produces false conductive lineament anomalies and added EM Noise. Although magnetic features are far less affected, care should be exercised when evaluation anomalies on the block, particularly in the EM data.

The Starburst Project is believed to be prospective for polymetallic base metal MS style mineralization (J. Kleinboeck, pers. comm., 2018) and it is likely that both EM and magnetic results will be of exploration interest. We recommend that EM anomaly picking be performed along with Maxwell EM plate modeling of major anomalies of interest prior to ground follow up and drill testing. More advanced 1D layered earth modeling of the EM data will prove useful in establishing source-depth and layering of resistivity anomalies. Magnetic CET structural analysis and 3D MVI magnetic inversions will be useful for mapping structure, alteration, and lithology in 2D-3D space across the property. We recommend that more advanced, integrated interpretation be performed on these geophysical data and these results further evaluated against the known geology for future targeting.

Respectfully submitted[2],

Marta Orta
Geotech Ltd.

Emily Data
Geotech Ltd.

PROFESSIONAL GEOSCIENTIST
JEAN M. LEGAULT
PRACTISING MEMBER
0948

Jean M. Legault, M.Sc.A, P.Eng, P.Geo.
Geotech Ltd.

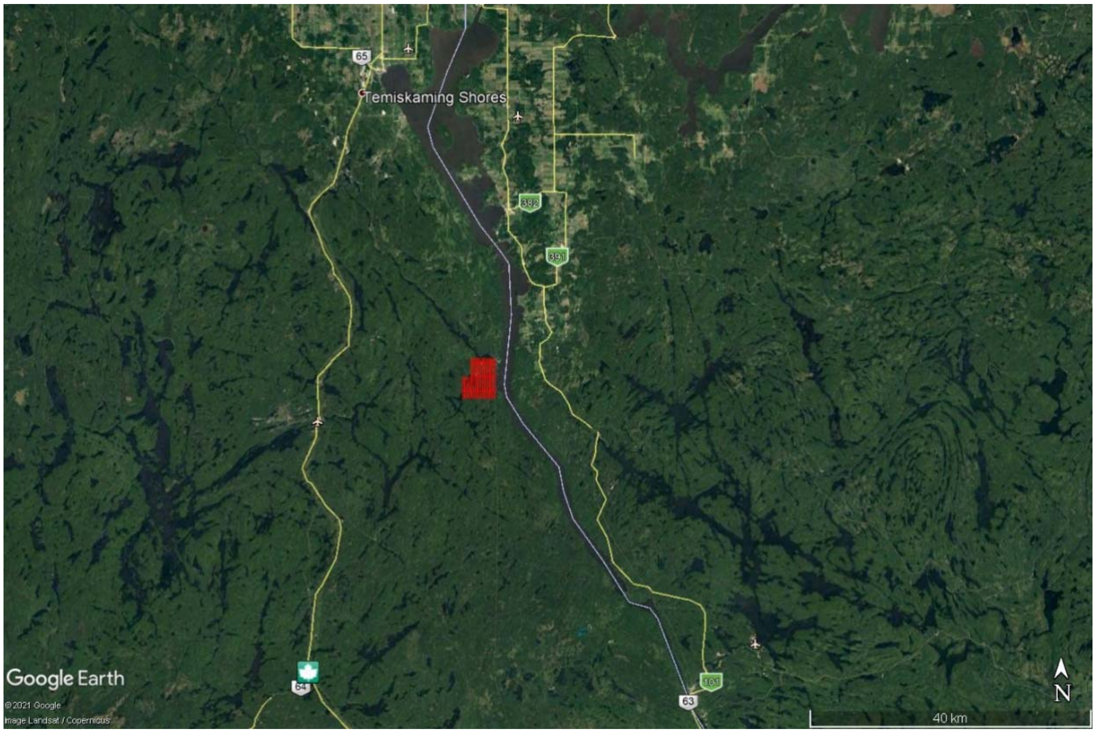
Moyosore Lanisa
Geotech Ltd

June 2021.

[2] Final data processing of the EM and magnetic data was carried out by Emily Data, from the office of Geotech Ltd. in Aurora, Ontario, under the supervision of Jean M. Legault, M.Sc.A, P.Eng, and P.Geo - Chief Geophysicist.

APPENDIX A

SURVEY AREA LOCATION MAP



Overview of the Survey Area

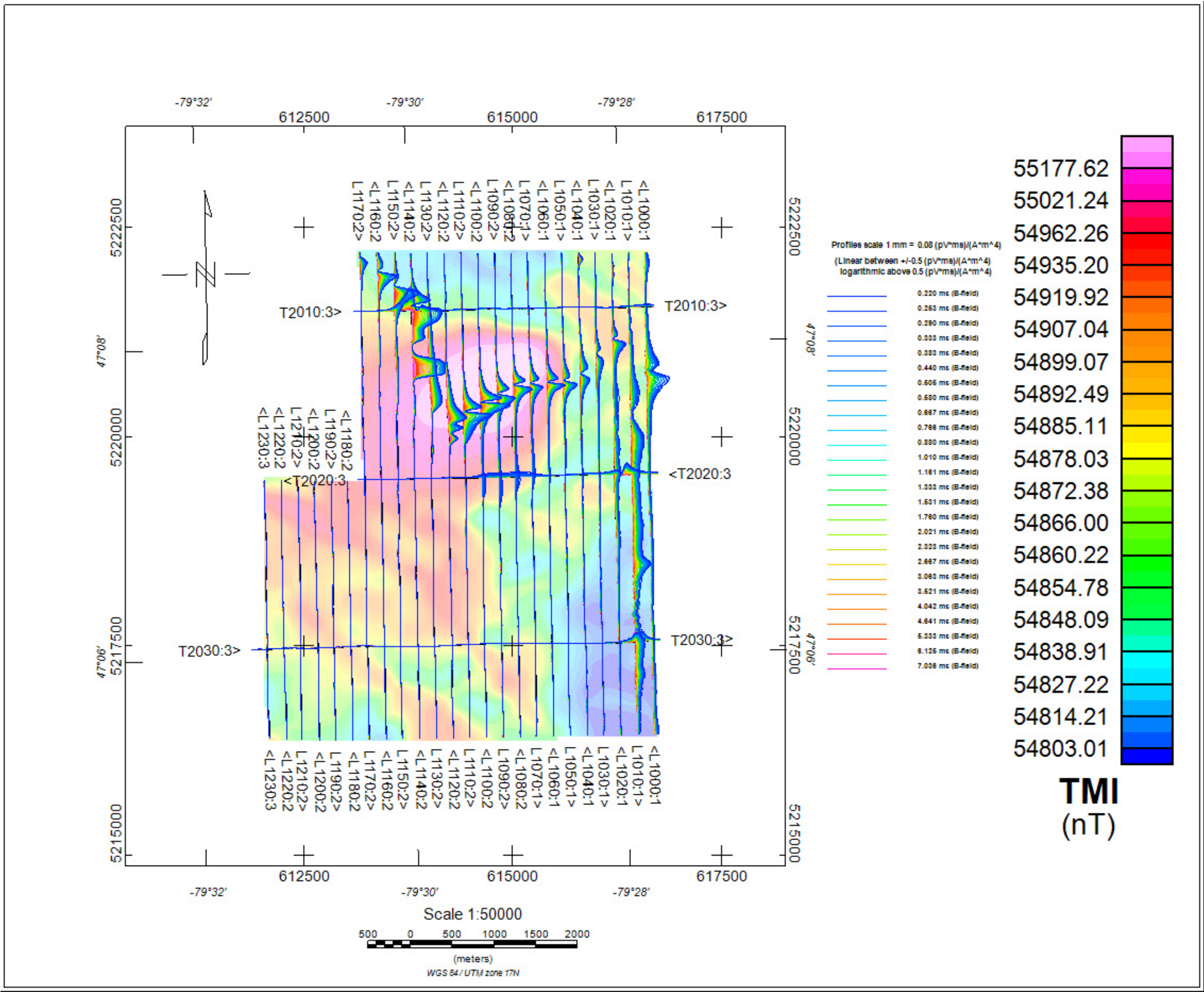
APPENDIX B

SURVEY AREA COORDINATES

(WGS84, UTM Zone 17 North)

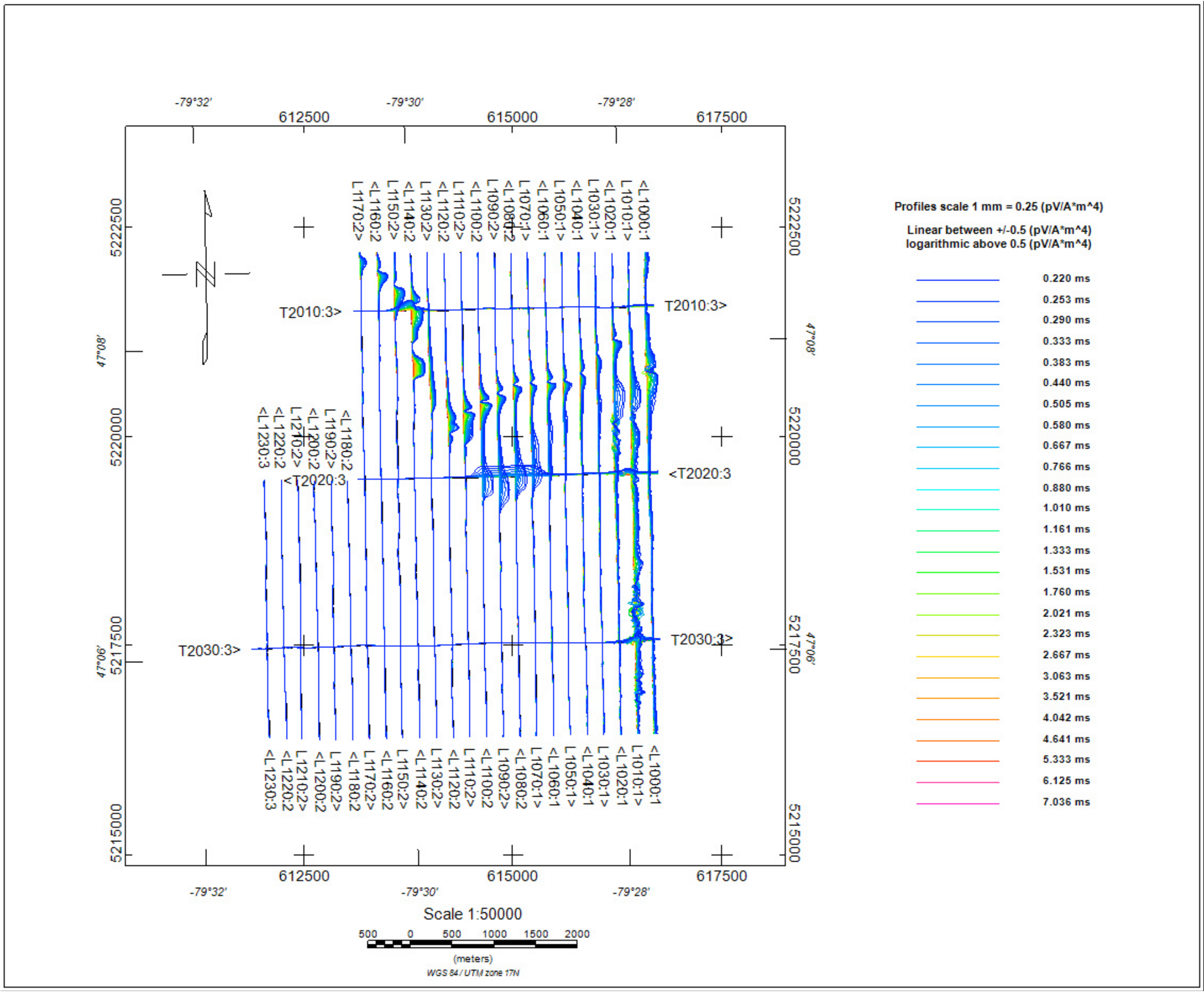
X	Y
612004	5219490
613210	5219506
613126	5222205
616642	5222222
616752	5216420
612013	5216353
612013	5219498

APPENDIX C - GEOPHYSICAL MAPS[1]

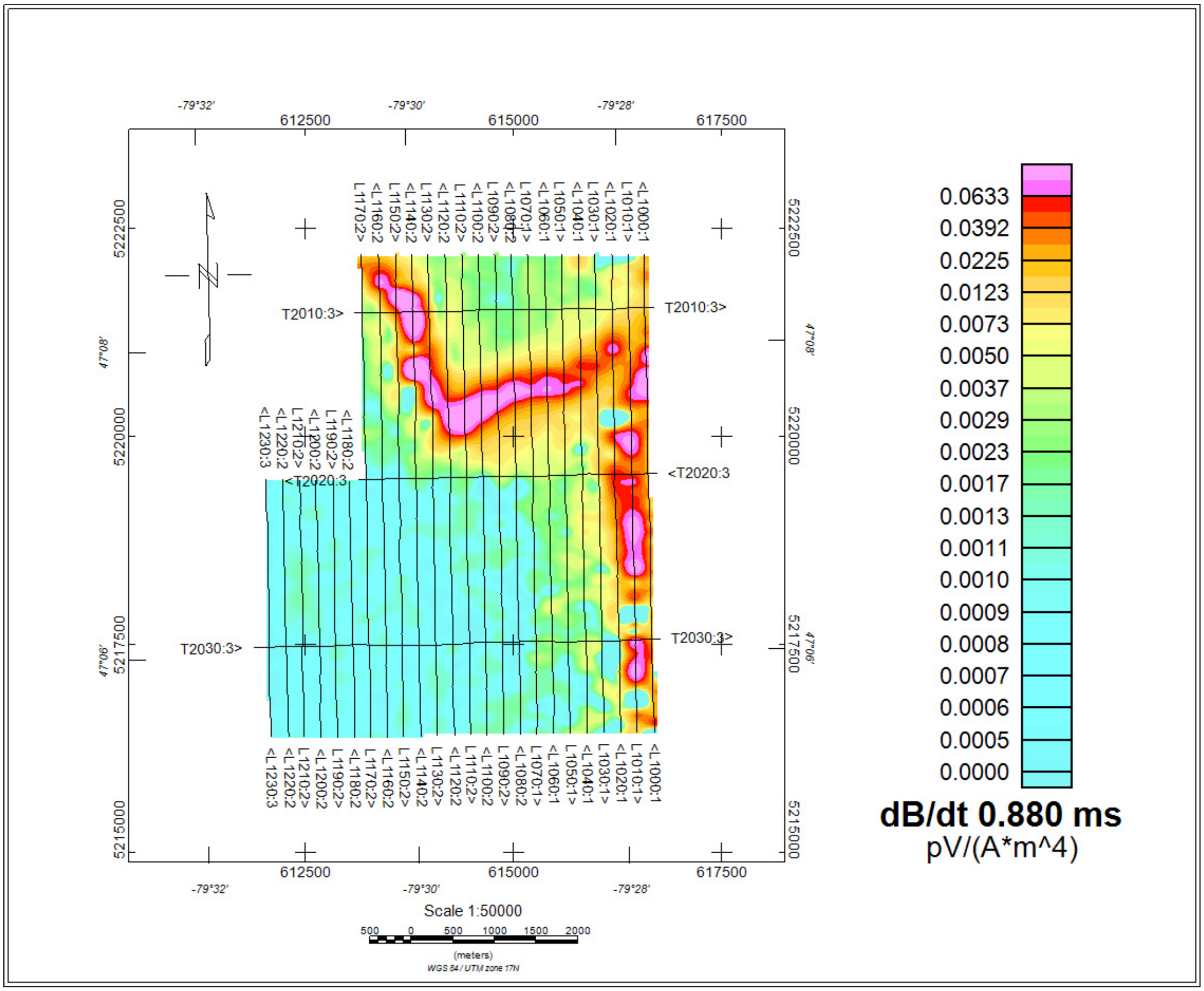


VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms over Total Magnetic Intensity, Reduced to Pole

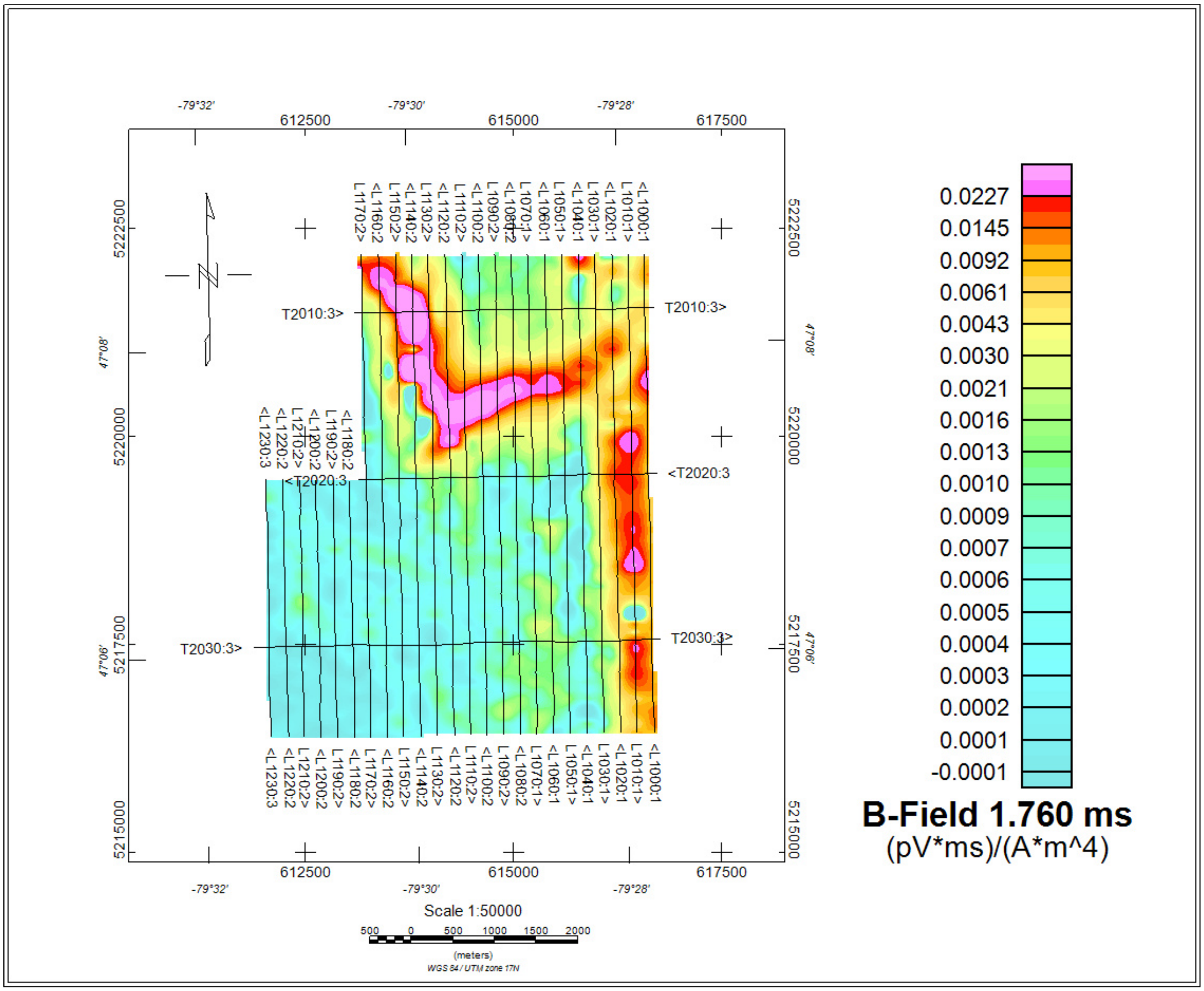
[1] Complete full size geophysical maps are also available in PDF format located in the final data maps folder.



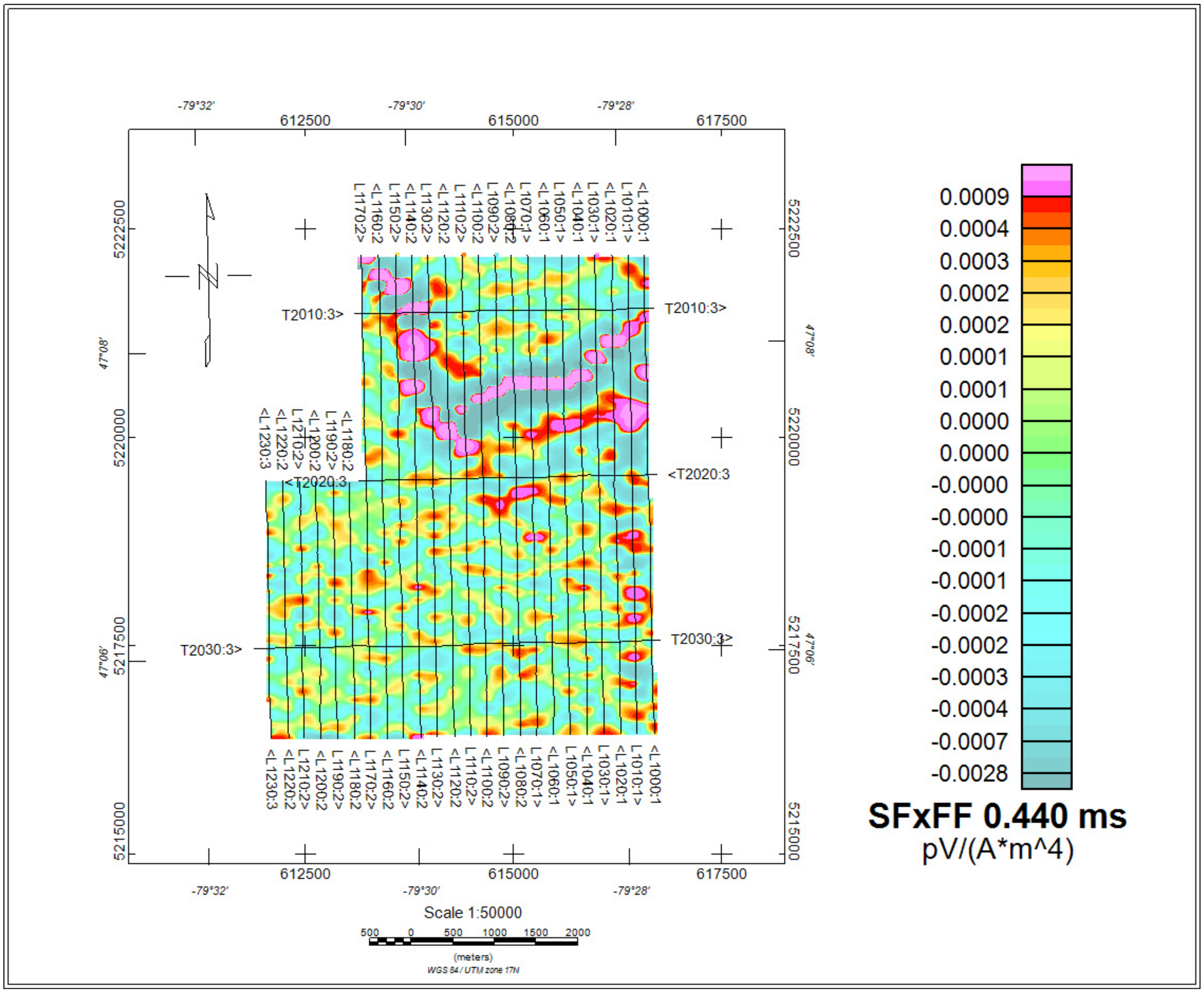
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms



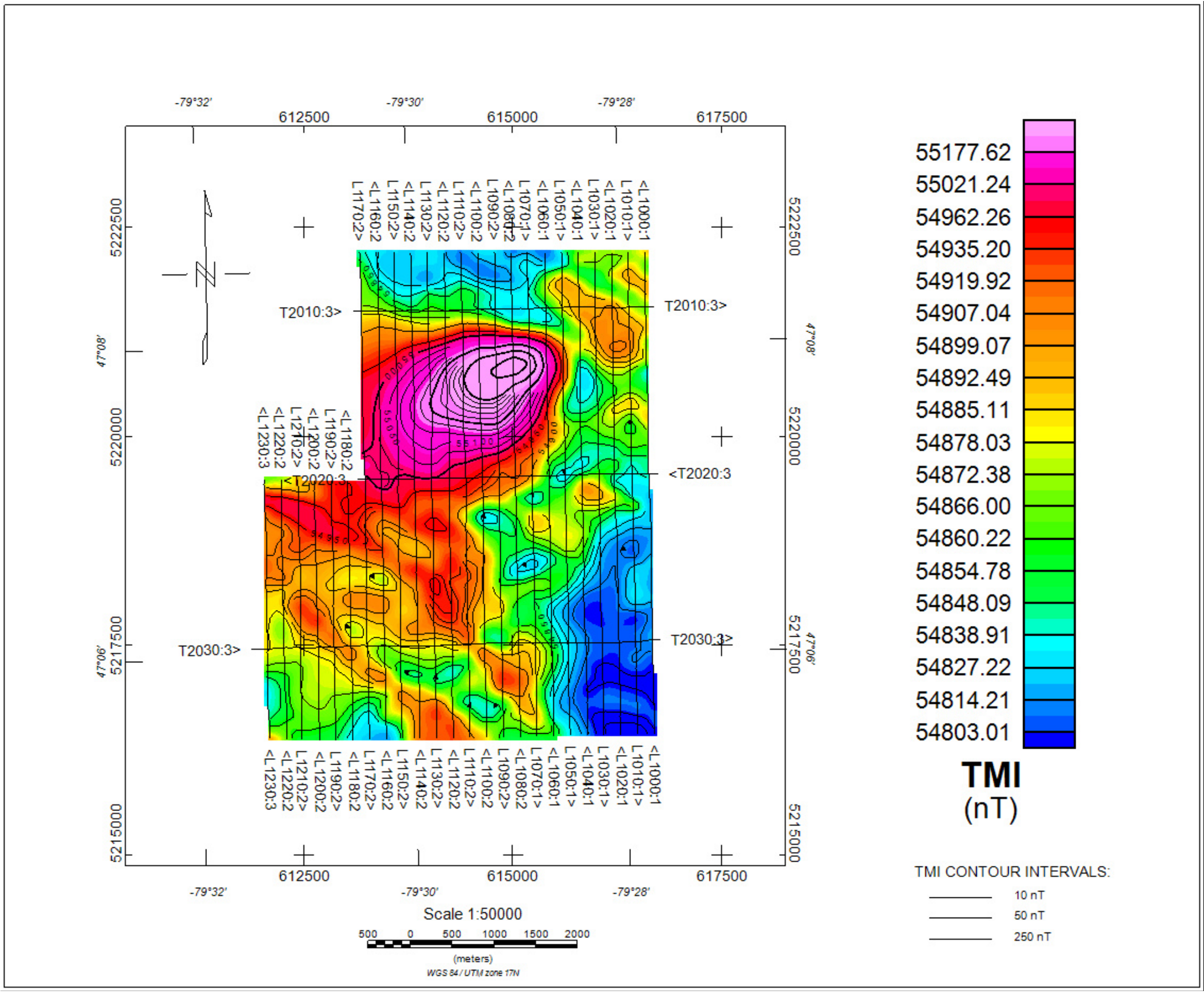
VTEM dB/dt Z Component Channel 30, Time Gate 0.880 ms



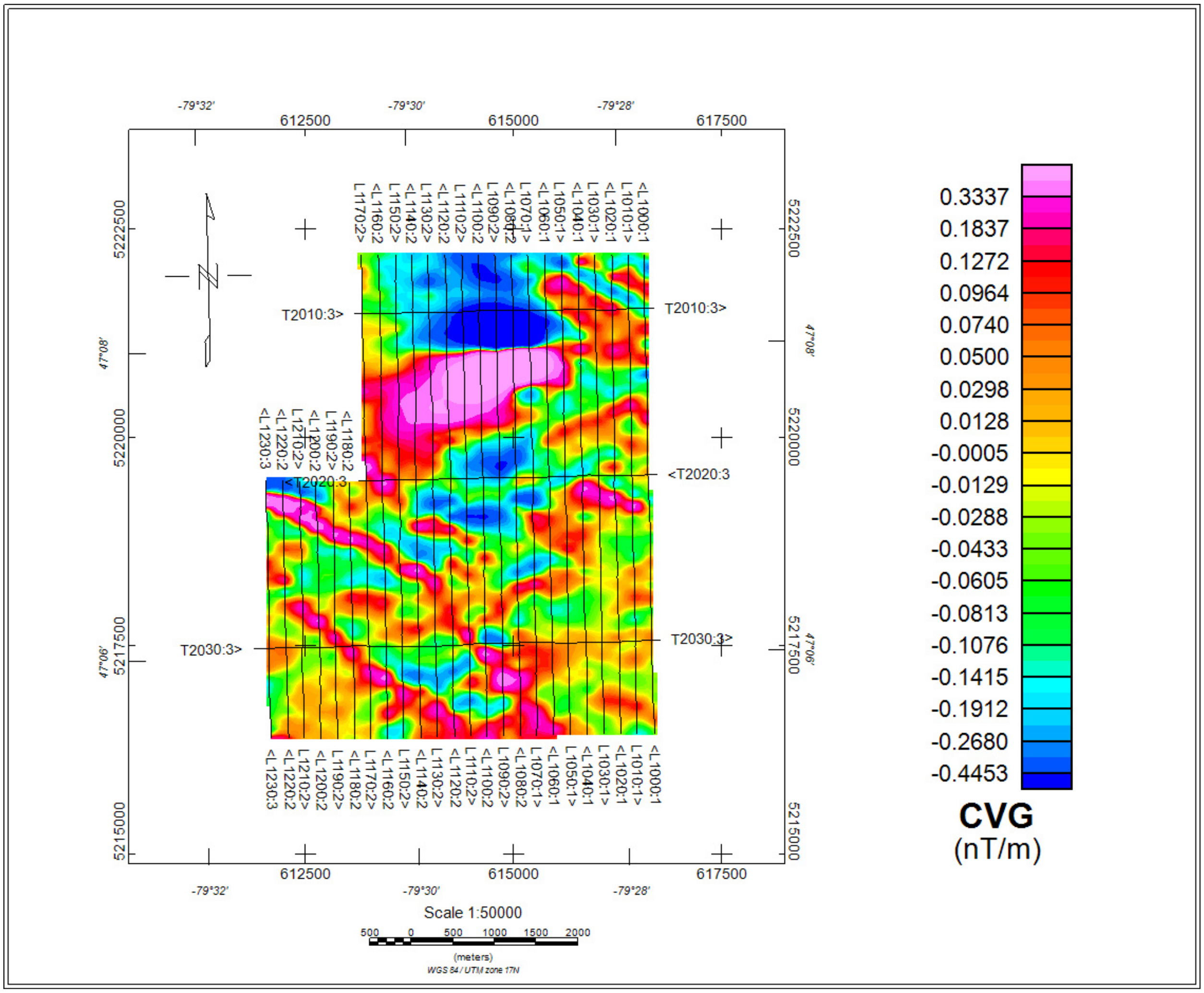
VTEM B-Field Z Component Channel 35, Time Gate 1.760 ms



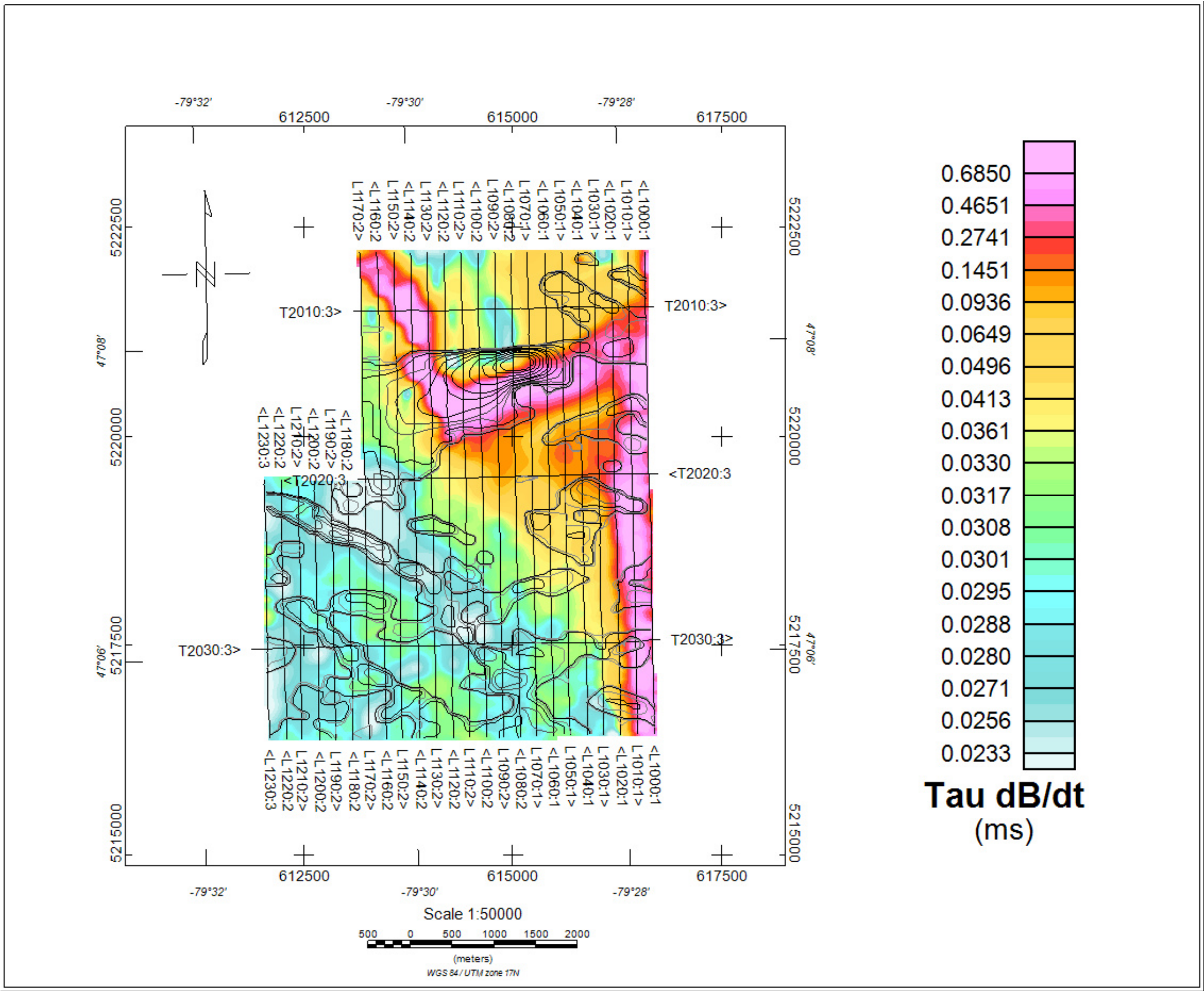
Fraser Filtered dB/dt X Component Channel 25 Time Gate 0.440 ms



Total Magnetic Intensity

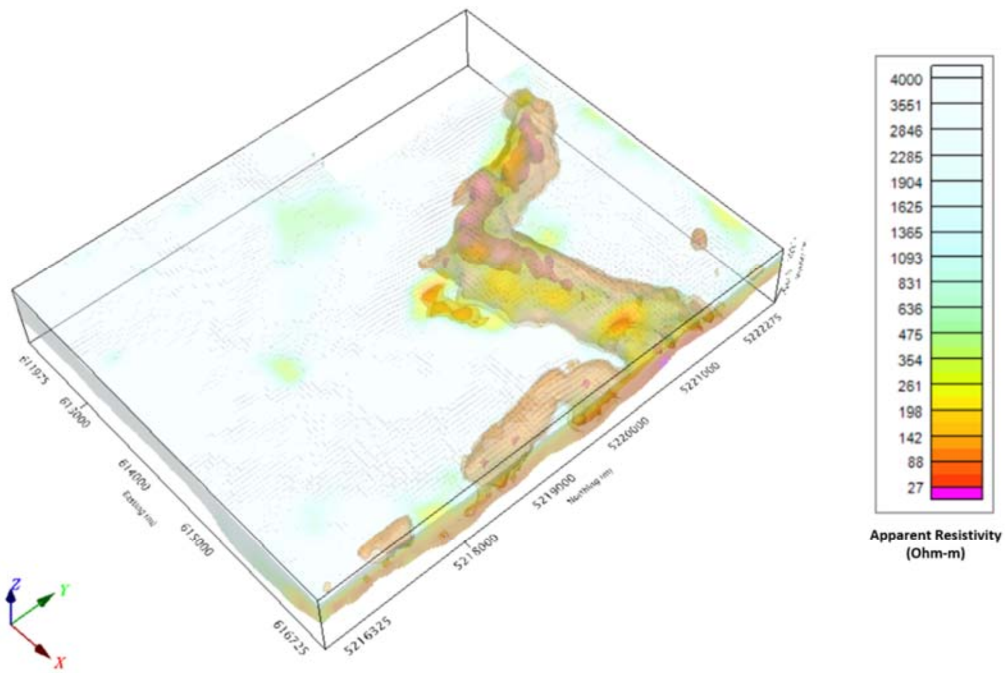


Calculated Vertical Gradient of Total Magnetic Intensity (TMI)



dB/dt Z Component Calculated Time Constant (TauSF) with Calculated Vertical Derivative contours

RESISTIVITY DEPTH IMAGE (RDI)



Tom Obradovich
Starburst Project
Temagami, ON

3D View of Resistivity-Depth Image (RDI)

APPENDIX D

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 transmitter loop that produces a primary field. The wave form is a bi-polar, modified square wave with a turn-on and turn-off at each end.

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.

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.

A set of models has been produced for the Geotech VTEM™ system dB/dT Z and X components (see models D1 to D15). The Maxwell ™ modeling program (EMIT Technology Pty. Ltd. Midland, WA, AU) used to generate the following responses assumes a resistive half-space. 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.

As the plate dips and departs from the vertical position, the peaks become asymmetrical.

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 90º to about 30º. The method is not sensitive enough where dips are less than about 30º.

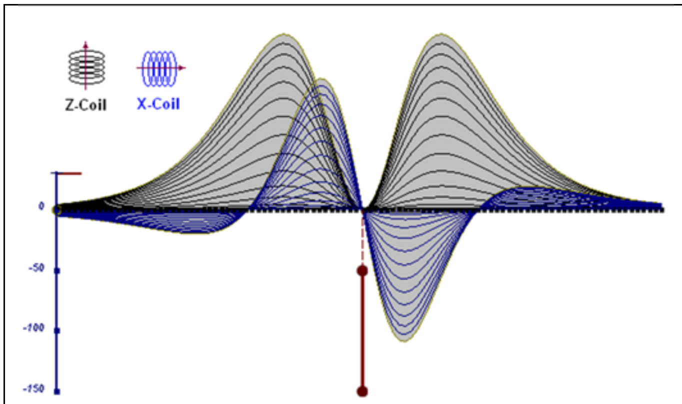


Figure D-1: vertical thin plate

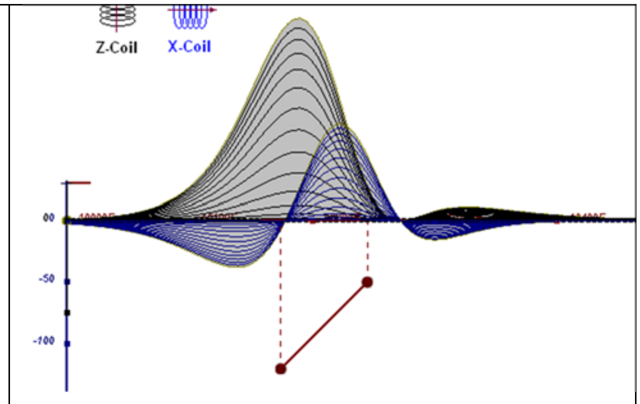


Figure D-2: inclined thin plate

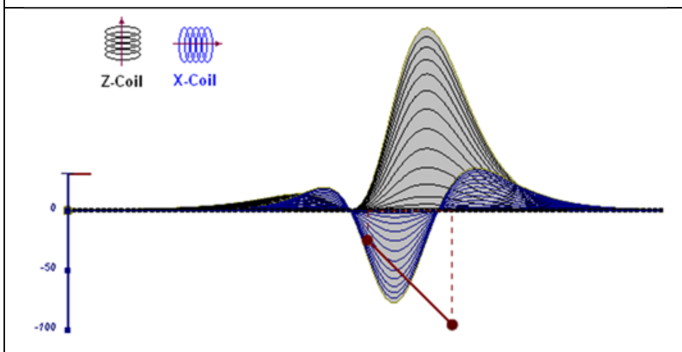


Figure D-3: inclined thin plate

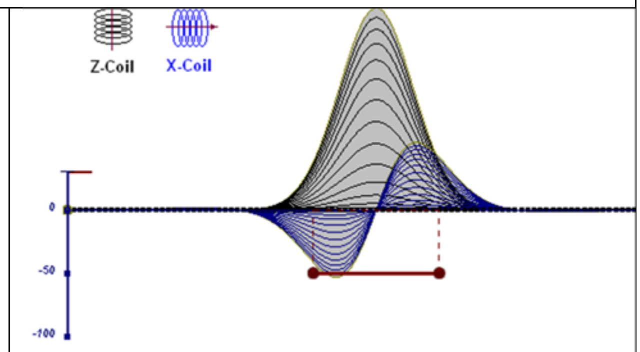


Figure D-4: horizontal thin plate

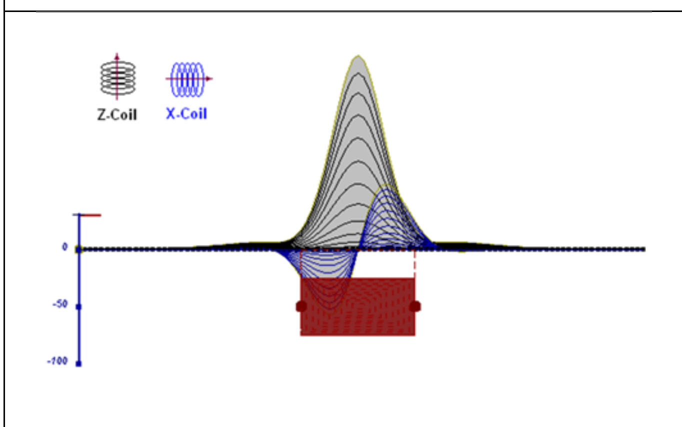


Figure D-5: horizontal thick plate (linear scale of the response)

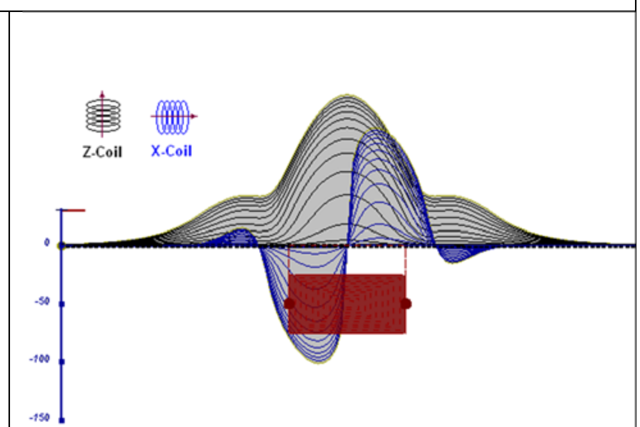


Figure D-6: horizontal thick plate (log scale of the response)

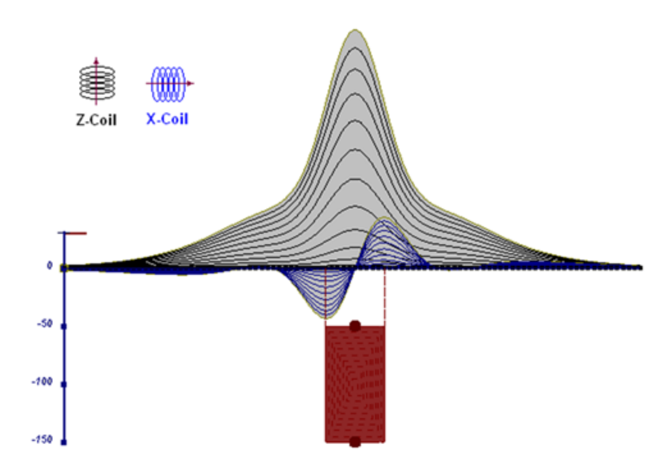


Figure D-7: vertical thick plate (linear scale of the response). 50 m depth

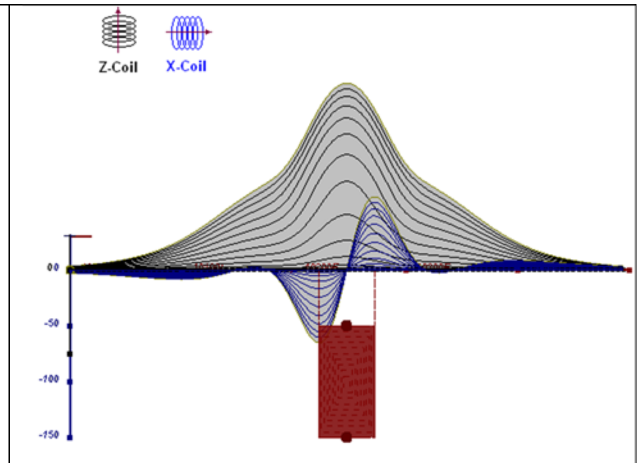


Figure D-8: vertical thick plate (log scale of the response). 50 m depth

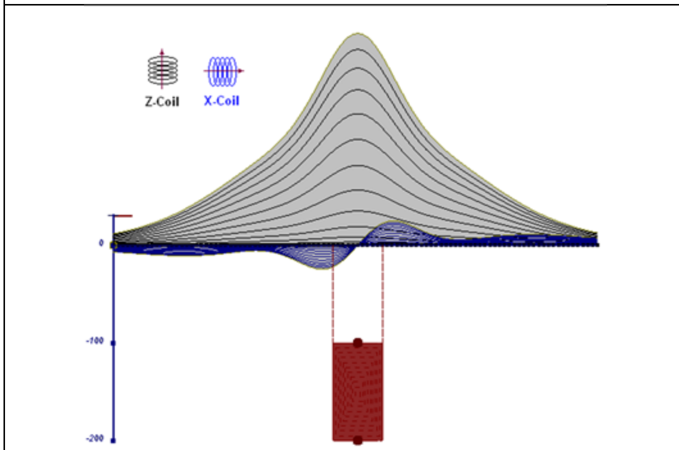


Figure D-9: vertical thick plate (linear scale of the response). 100 m depth

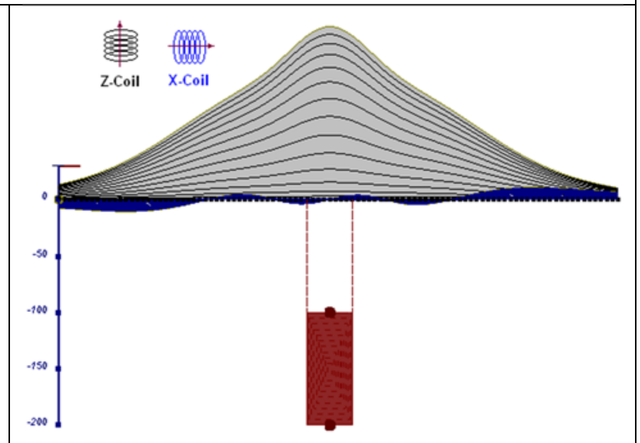


Figure D-10: vertical thick plate (linear scale of the response). Depth / horizontal thickness=2.5

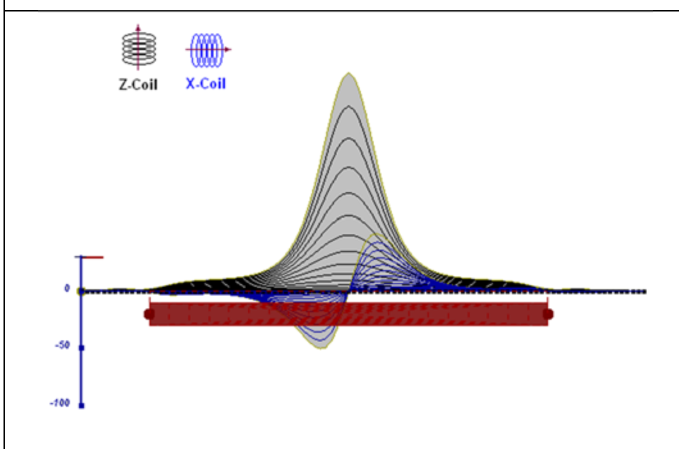


Figure D-11: horizontal thick plate (linear scale of the response)

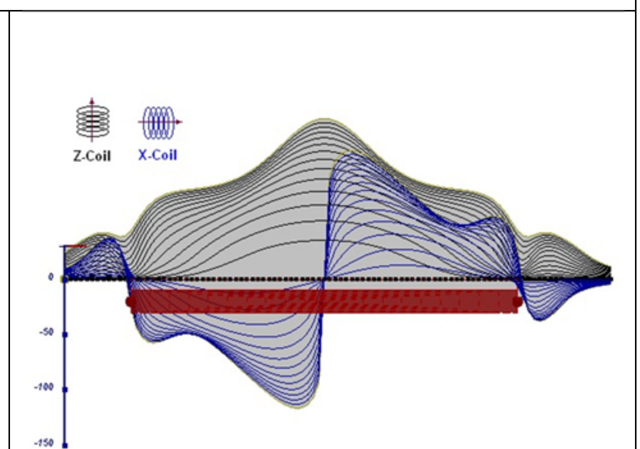


Figure D-12: horizontal thick plate (log scale of the response)

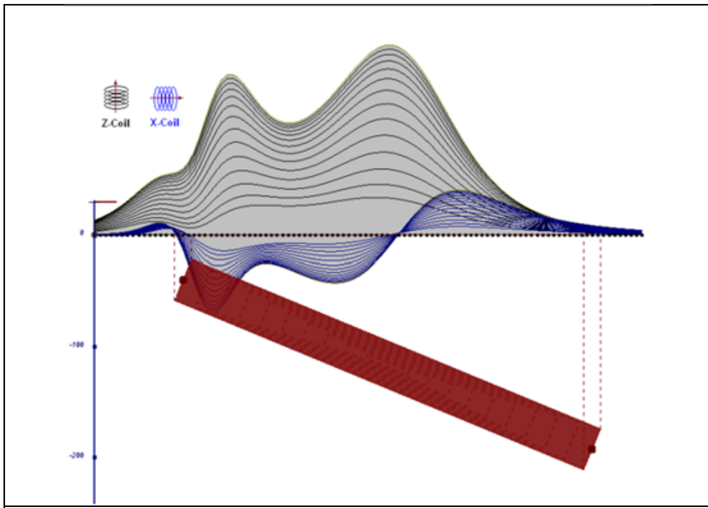


Figure D-13: inclined long thick plate

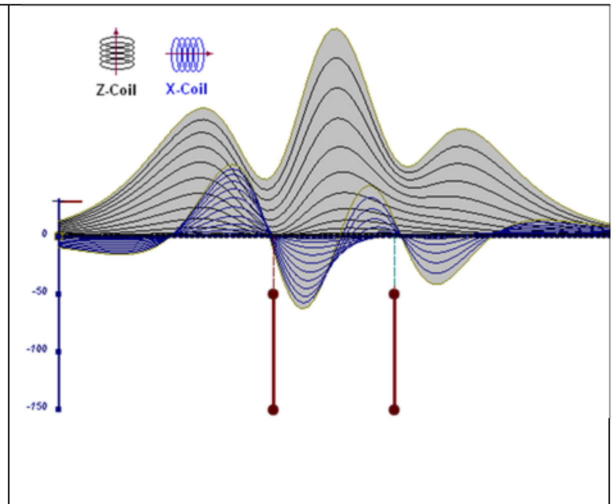


Figure D-14: two vertical thin plates

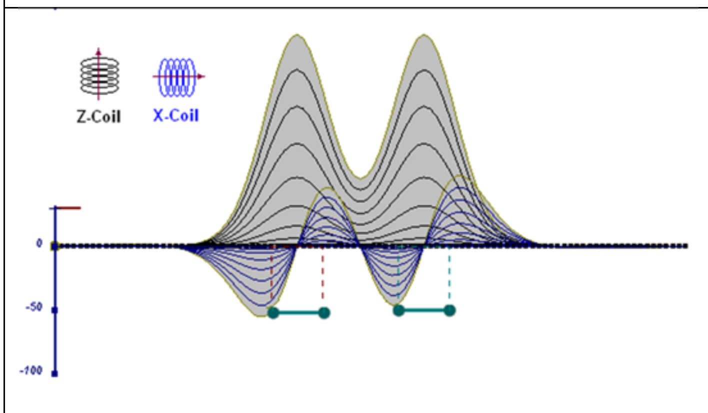


Figure D-15: two horizontal thin plates

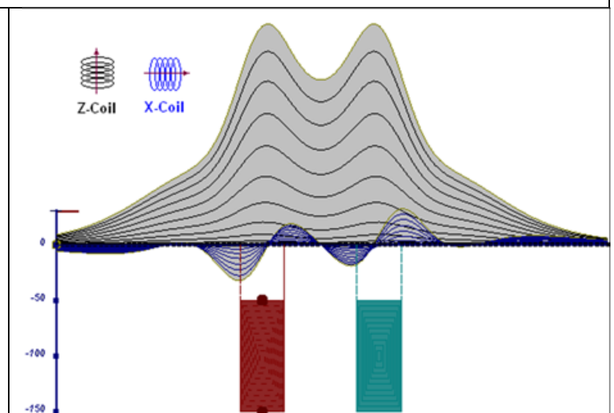


Figure D-16: two vertical thick plates

The same type of target but with different thickness, for example, creates different form of the response:

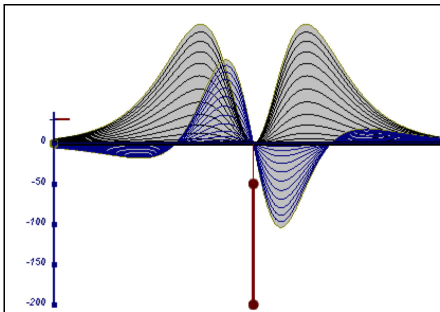
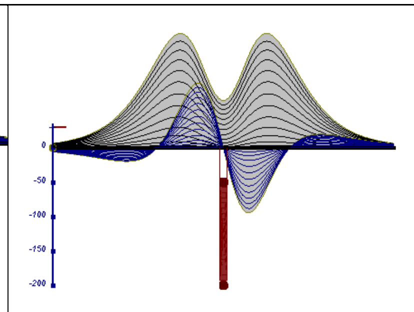
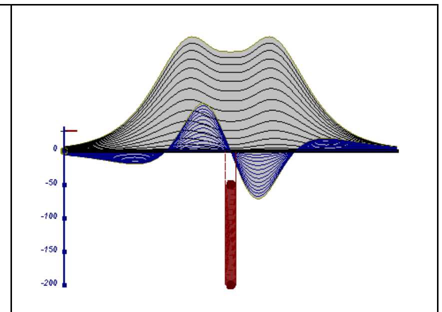
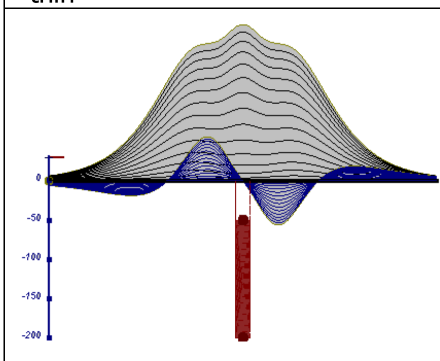
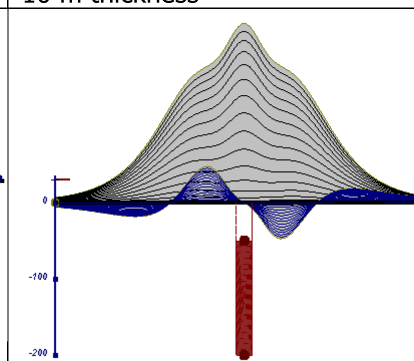
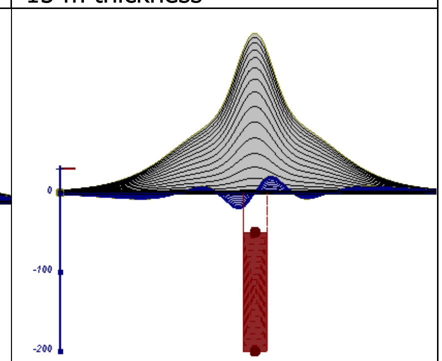
		
"thin"	10 m thickness	15 m thickness
		
18 m thickness	20 m thickness	30 m thickness

Figure D-17: Conductive vertical plate, depth 50 m, strike length 200 m, depth extends 150 m.

Alexander Prikhodko, PhD, P.Geo
Geotech Ltd.

September 2010

APPENDIX E

EM TIME CONSTANT (TAU) ANALYSIS

Estimation of time constant parameter[1] in transient electromagnetic method is one of the steps toward the extraction of the information about conductances beneath the surface from TEM measurements.

The most reliable method to discriminate or rank conductors from overburden, background or one and other is by calculating the EM field decay time constant (TAU parameter), which directly depends on conductance despite their depth and accordingly amplitude of the response.

THEORY

As established in electromagnetic theory, the magnitude of the electro-motive force (emf) induced is proportional to the time rate of change of primary magnetic field at the conductor. This emf causes eddy currents to flow in the conductor with a characteristic transient decay, whose Time Constant (Tau) is a function of the conductance of the survey target or conductivity and geometry (including dimensions) of the target. The decaying currents generate a proportional secondary magnetic field, the time rate of change of which is measured by the receiver coil as induced voltage during the Off time.

The receiver coil output voltage (**e_0**) is proportional to the time rate of change of the secondary magnetic field and has the form,

$$e_0 \, \alpha \, (1 / \tau) \, e^{-(t/\tau)}$$

Where,
τ = L/R is the characteristic time constant of the target (TAU)
R = resistance
L = inductance

From the expression, conductive targets that have small value of resistance and hence large value of τ yield signals with small initial amplitude that decays relatively slowly with progress of time. Conversely, signals from poorly conducting targets that have large resistance value and small τ, have high initial amplitude but decay rapidly with time[1] (Fig. E1).

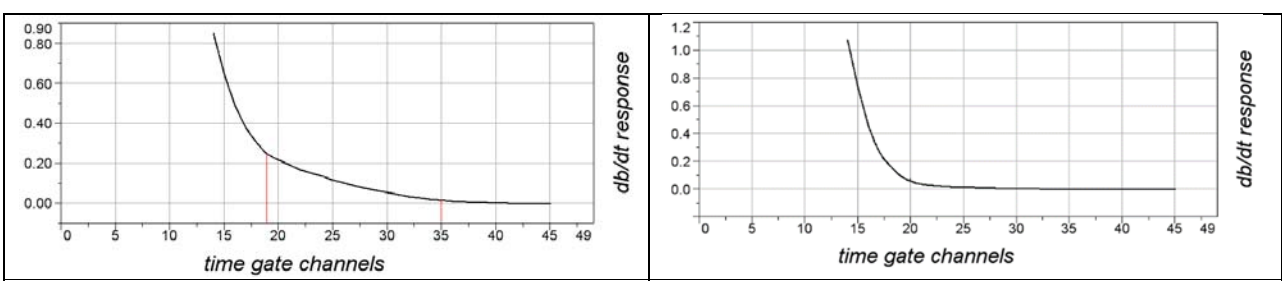


Figure E-1: Left – presence of good conductor, right – poor conductor.

[1] McNeill, JD, 1980, "Applications of Transient Electromagnetic Techniques", Technical Note TN-7 page 5, Geonics Limited, Mississauga, Ontario.

EM Time Constant (Tau) Calculation

The EM Time-Constant (TAU) is a general measure of the speed of decay of the electromagnetic response and indicates the presence of eddy currents in conductive sources as well as reflecting the “conductance quality” of a source. Although TAU can be calculated using either the measured dB/dt decay or the calculated B-field decay, dB/dt is commonly preferred due to better stability (S/N) relating to signal noise. Generally, TAU calculated on base of early time response reflects both near surface overburden and poor conductors whereas, in the late ranges of time, deep and more conductive sources, respectively. For example, early time TAU distribution in an area that indicates conductive overburden is shown in Figure 2.

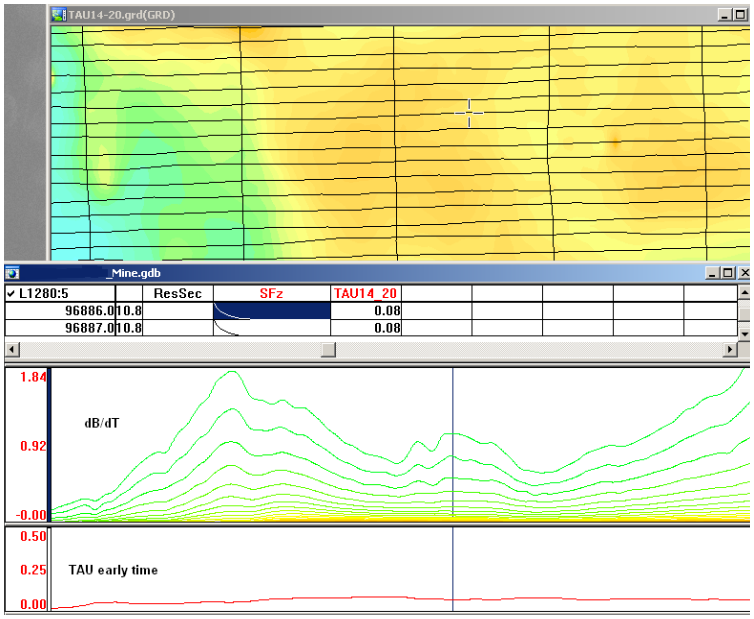


Figure E-2: Map of early time TAU. Area with overburden conductive layer and local sources.

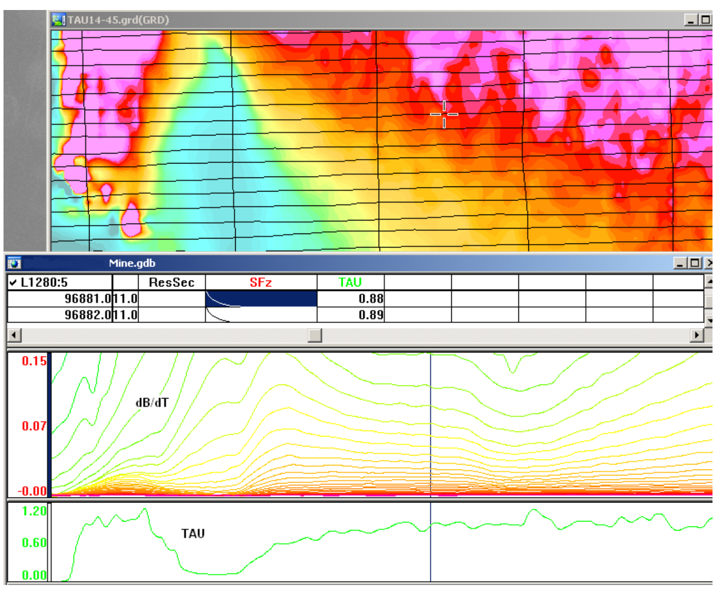


Figure E-3: Map of full time-range TAU with EM anomaly due to deep highly conductive target.

There are many advantages of TAU maps:

- TAU depends only on one parameter (conductance) in contrast to response magnitude.
- TAU is an integral parameter, which covers time range, and all conductive zones and targets are displayed independently of their depth and conductivity on a single map.
- Very good differential resolution in complex conductive places with many sources with different conductivity.
- Signs of the presence of good conductive targets are amplified and emphasized independently of their depth and level of response accordingly.

In the example shown in Figure 4 and 5, three local targets are defined, each of them with a different depth of burial, as indicated on the resistivity depth image (RDI). All are very good conductors, but the deeper target (number 2) has a relatively weak dB/dt signal yet also features the strongest total TAU (Figure 4). This example highlights the benefit of TAU analysis in terms of an additional target discrimination tool.

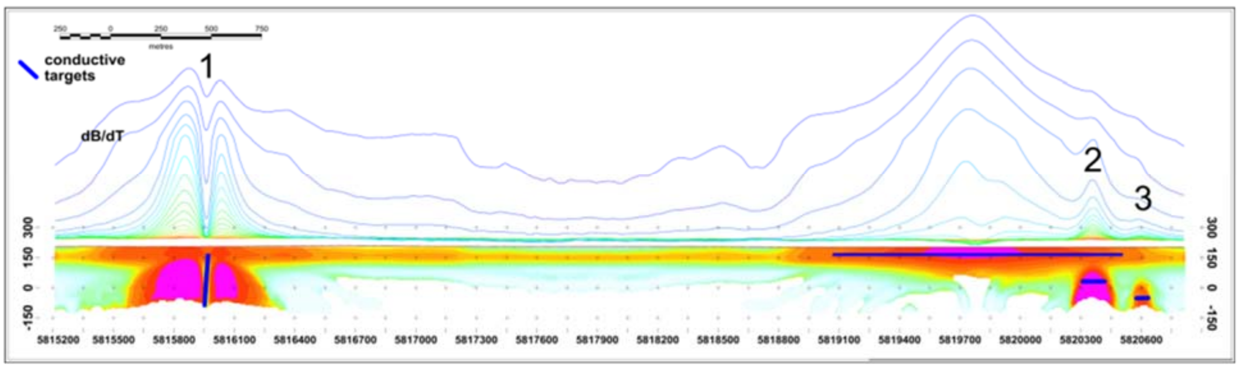


Figure E-4: dB/dt profile and RDI with different depths of targets.

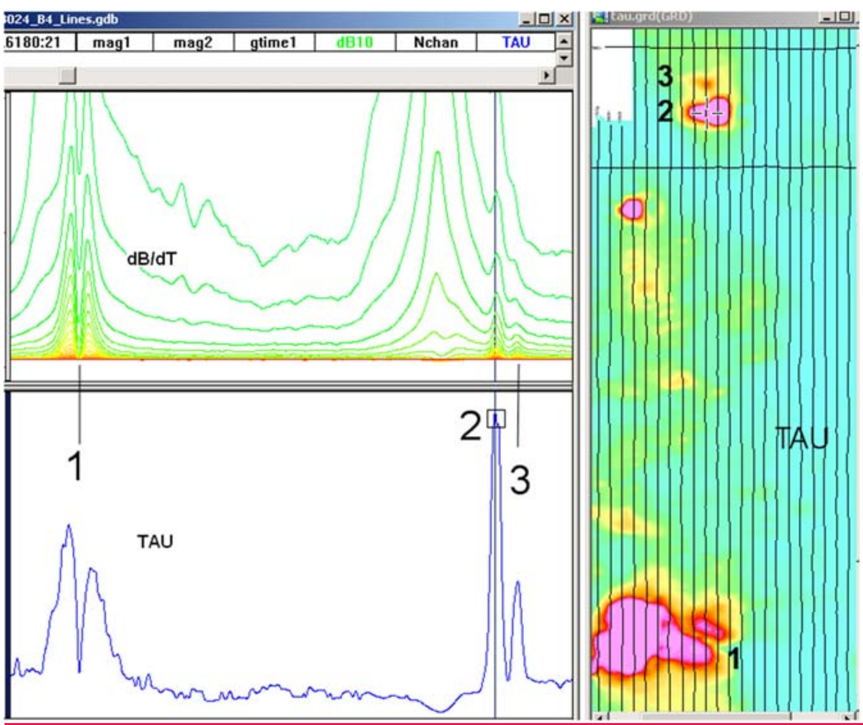


Figure E-5: Map of total TAU and dB/dt profile.

The EM Time Constants for dB/dt and B-field were calculated using the "sliding Tau" in-house program developed at Geotech[2]. The principle of the calculation is based on using of time window (4 time channels) which is sliding along the curve decay and looking for latest time channels which have a response above the level of noise and decay. The EM decays are obtained from all available decay channels, starting at the latest channel. Time constants are taken from a least square fit of a straight-line (log/linear space) over the last 4 gates above a pre-set signal threshold level (Figure F6). Threshold settings are pointed in the "label" property of TAU database channels. The sliding Tau method determines that, as the amplitudes increase, the time-constant is taken at progressively later times in the EM decay. Conversely, as the amplitudes decrease, Tau is taken at progressively earlier times in the decay. If the maximum signal amplitude falls below the threshold or becomes negative for any of the 4 time gates, then Tau is not calculated and is assigned a value of "dummy" by default.

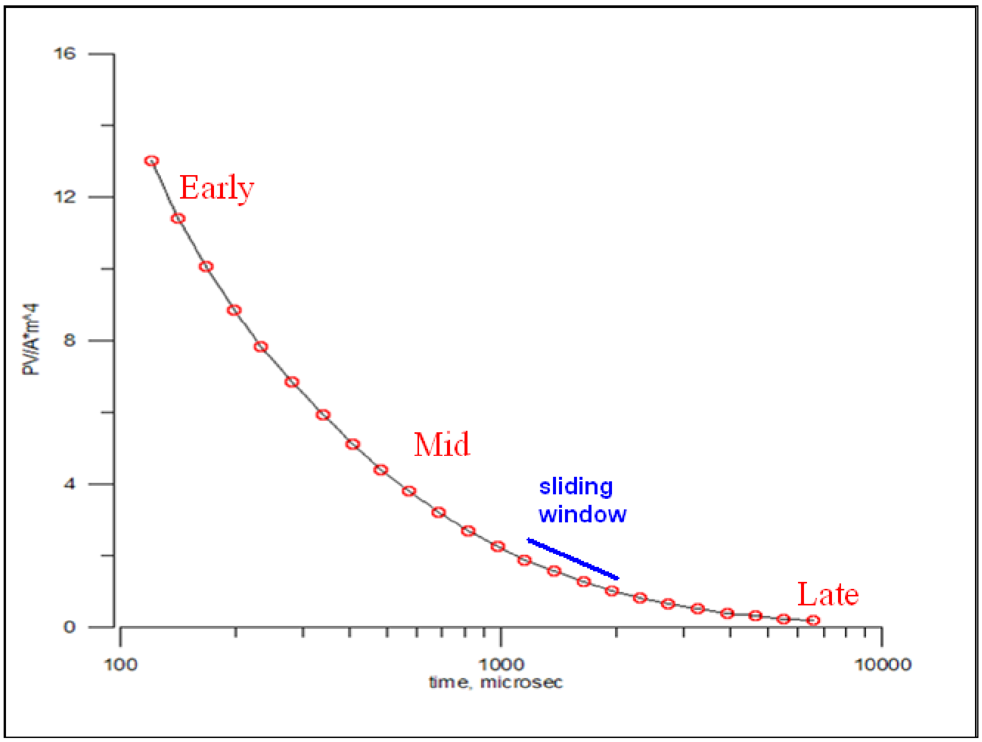


Figure E-6: Typical dB/dt decays of VTEM data

Alexander Prikhodko, PhD, P.Geo
Geotech Ltd.

September 2010

[2] by A.Prikhodko

APPENDIX F

TEM RESISTIVITY DEPTH IMAGING (RDI)

Resistivity depth imaging (RDI) is technique used to rapidly convert EM profile decay data into an equivalent resistivity versus depth cross-section, by deconvolving the measured TEM data.
The used RDI algorithm of Resistivity-Depth transformation is based on scheme of the apparent resistivity transform of Maxwell A.Meju (1998)[1] and TEM response from conductive half-space. The program is developed by Alexander Prikhodko and depth calibrated based on forward plate modeling for VTEM system configuration (Fig. 1-10).

RDIs provide reasonable indications of conductor relative depth and vertical extent, as well as accurate 1D layered-earth apparent conductivity/resistivity structure across VTEM flight lines. Approximate depth of investigation of a TEM system, image of secondary field distribution in half space, effective resistivity, initial geometry and position of conductive targets is the information obtained on base of the RDIs.

Maxwell forward modeling with RDI sections from the synthetic responses (VTEM system).

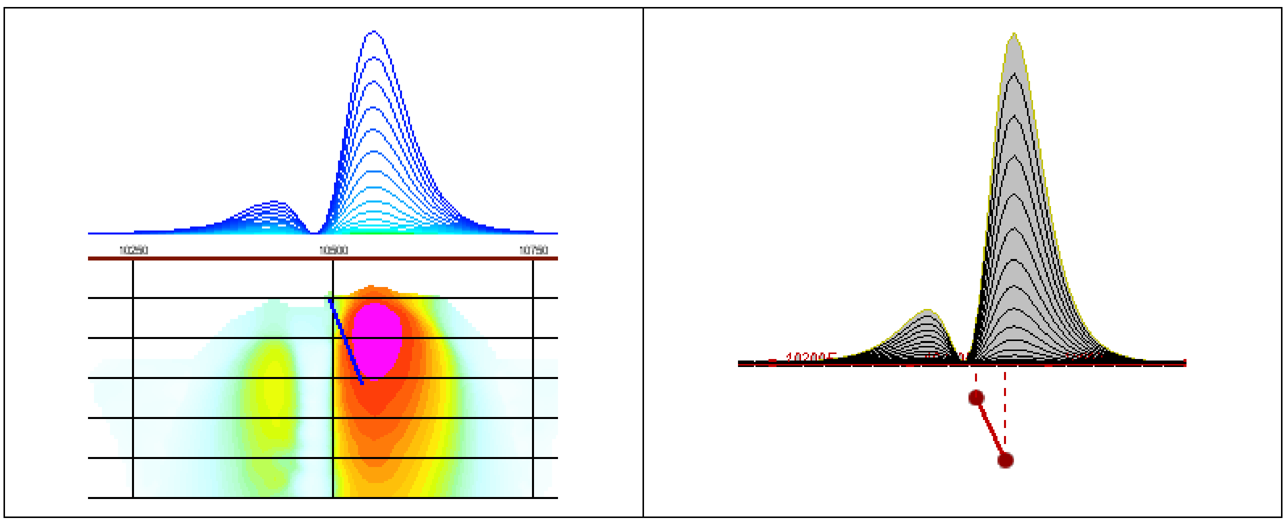


Figure F-1: Maxwell plate model and RDI from the calculated response for conductive "thin" plate (depth 50 m, dip 65 degrees, depth extend 100 m).

[1] Maxwell A.Meju, 1998, Short Note: A simple method of transient electromagnetic data analysis, Geophysics, **63**, 405–410.

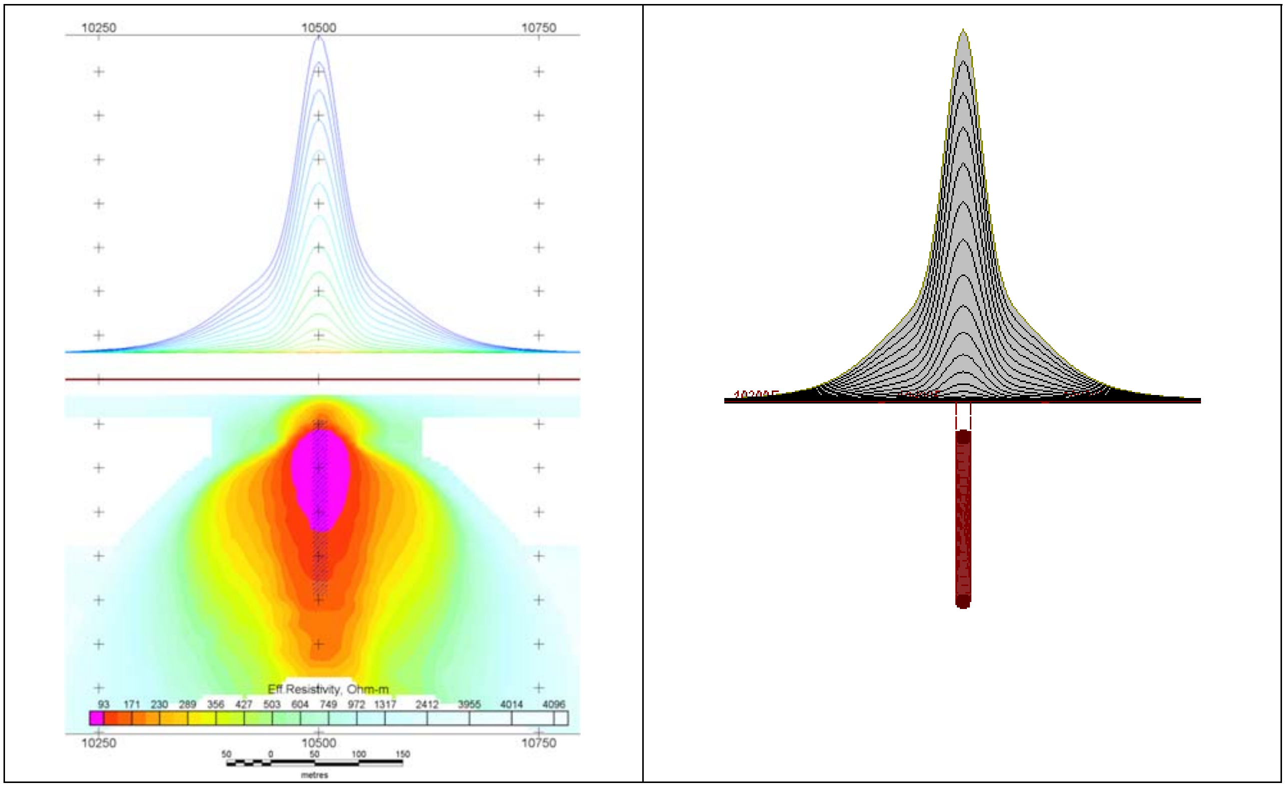


Figure F-2: Maxwell plate model and RDI from the calculated response for "thick" plate 18 m thickness, depth 50 m, depth extend 200 m).

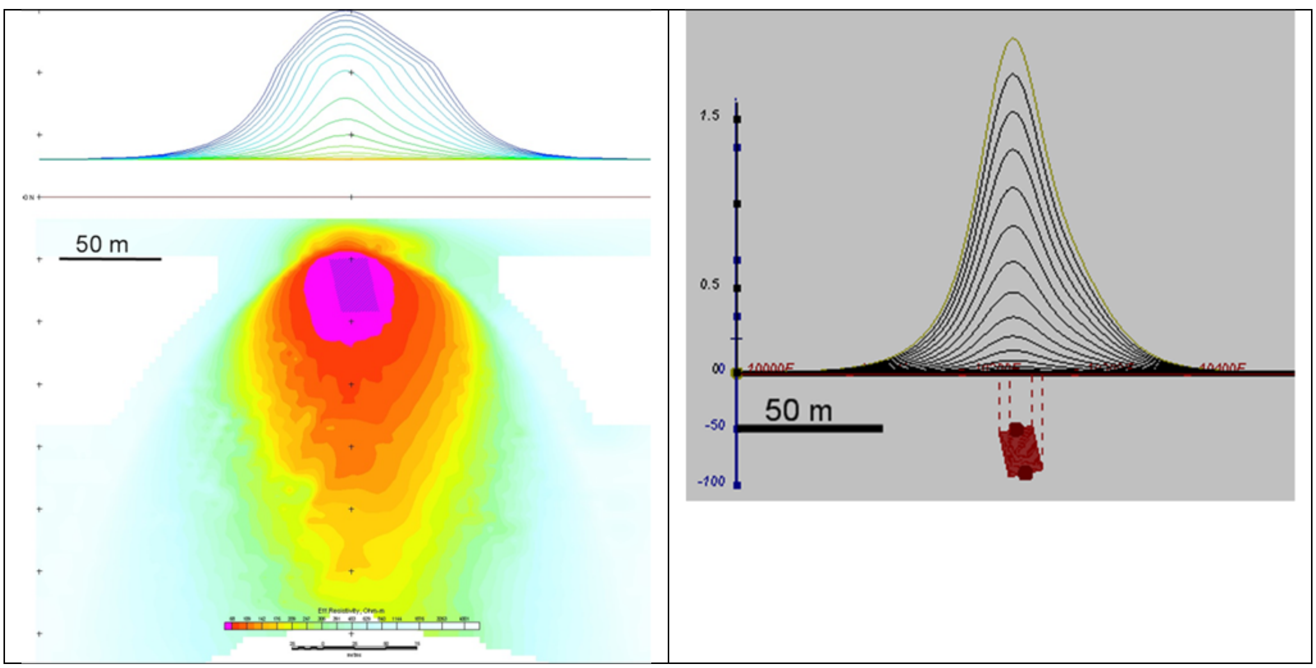


Figure F-3: Maxwell plate model and RDI from the calculated response for bulk ("thick") 100 m length, 40 m depth extend, 30 m thickness.

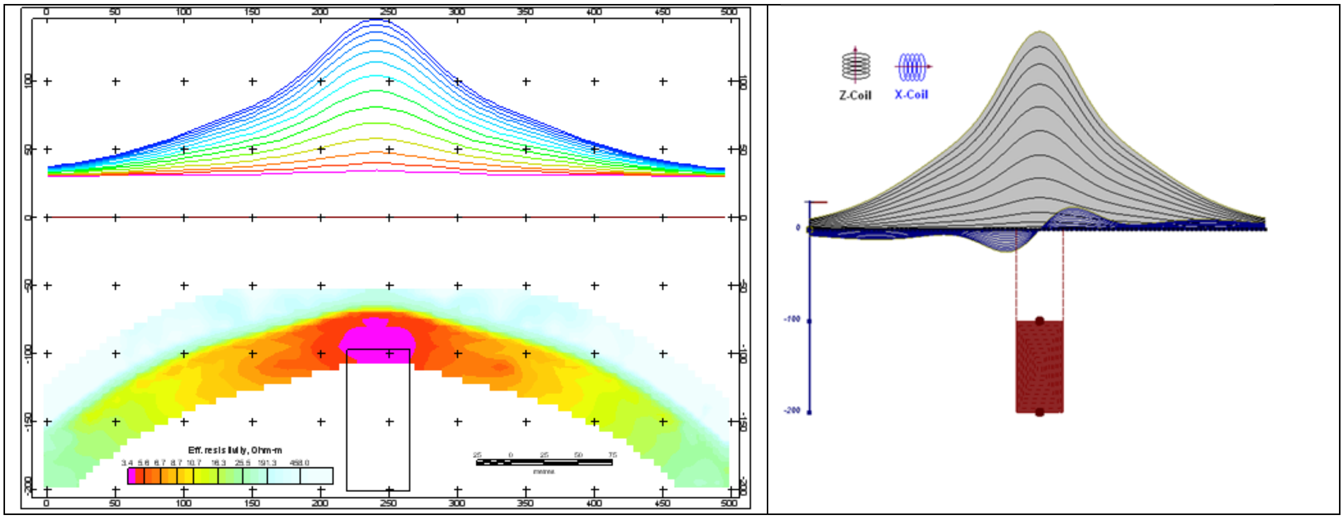


Figure F-4: Maxwell plate model and RDI from the calculated response for "thick" vertical target (depth 100 m, depth extend 100 m). 19-44 chan.

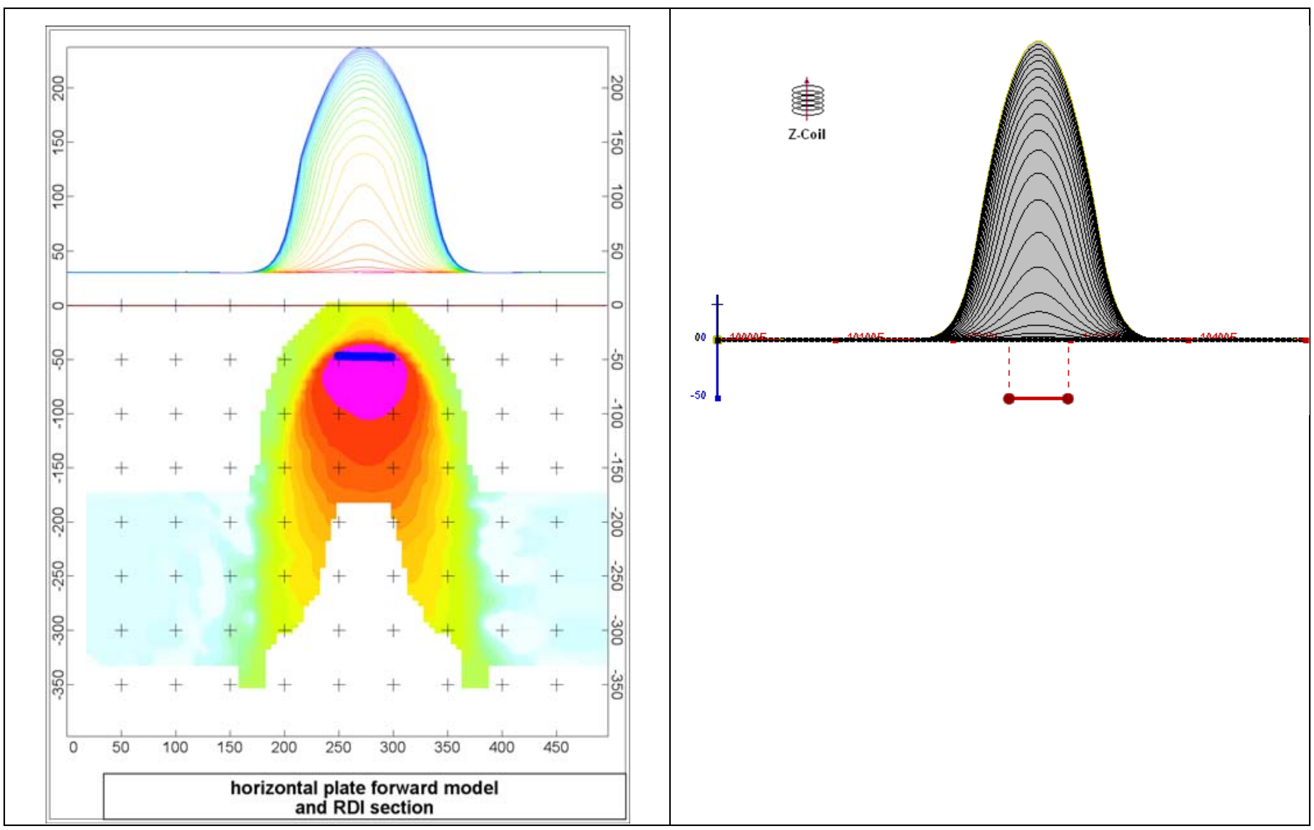


Figure F-5: Maxwell plate model and RDI from the calculated response for horizontal thin plate (depth 50 m, dim 50x100 m). 15-44 chan.

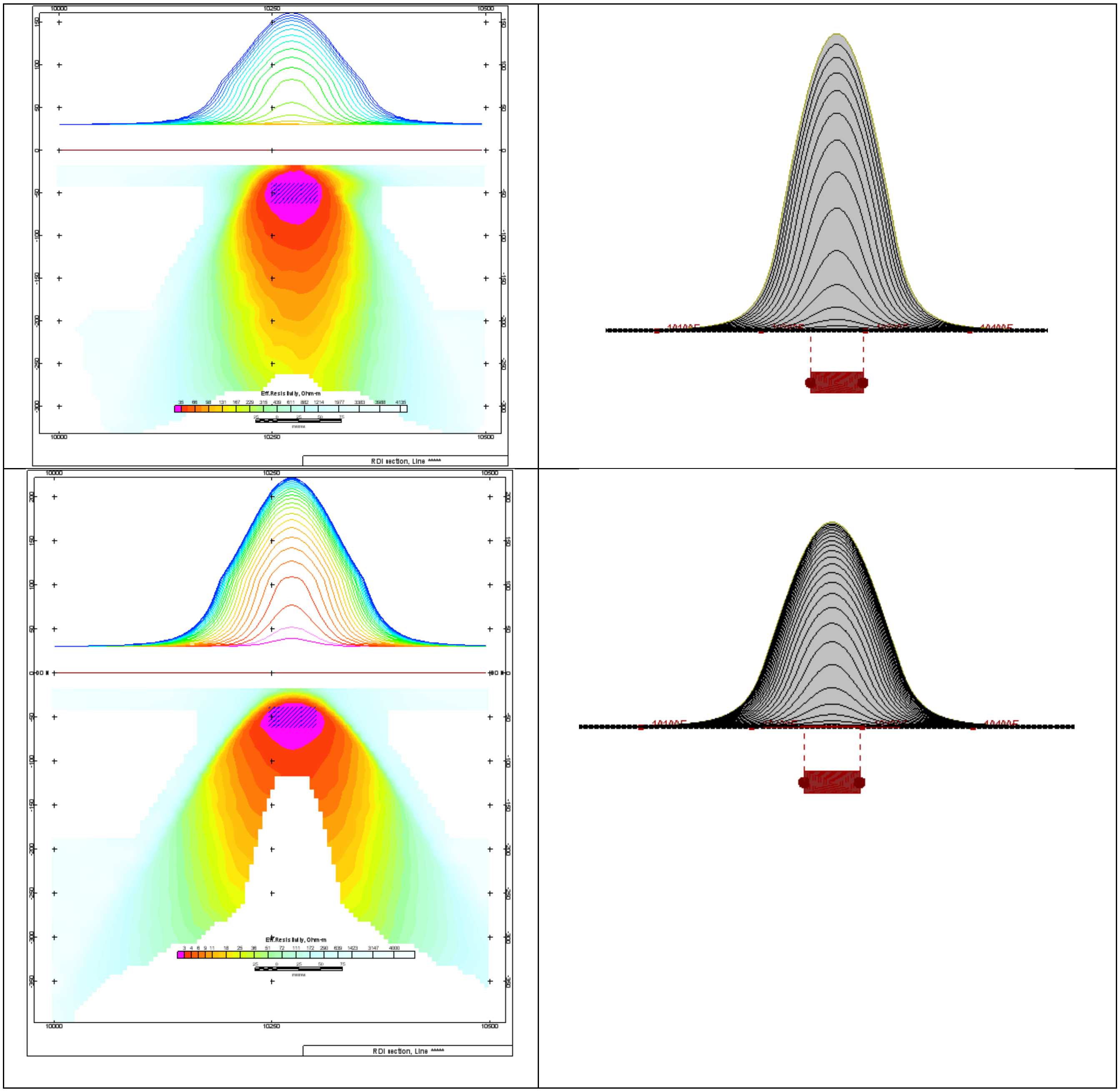


Figure F-6: Maxwell plate model and RDI from the calculated response for horizontal thick (20m) plate – less conductive (on the top), more conductive (below).

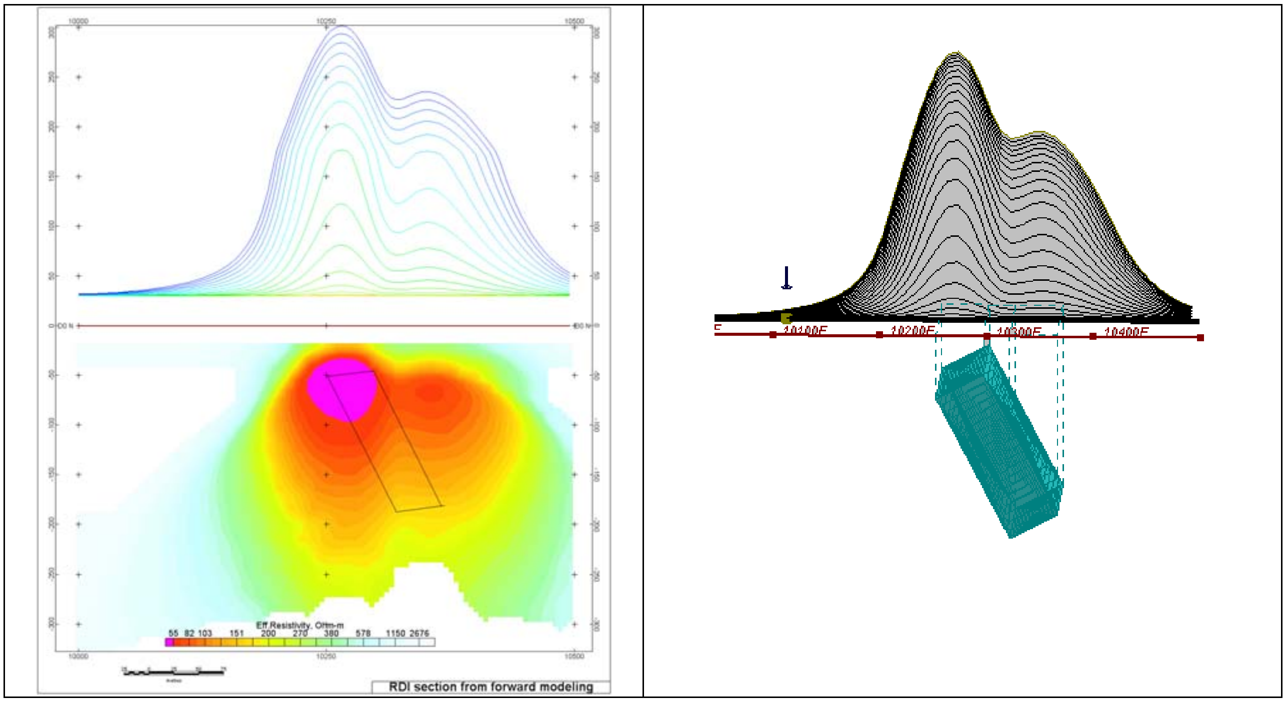


Figure F-7: Maxwell plate model and RDI from the calculated response for inclined thick (50m) plate. Depth extends 150 m, depth to the target 50 m.

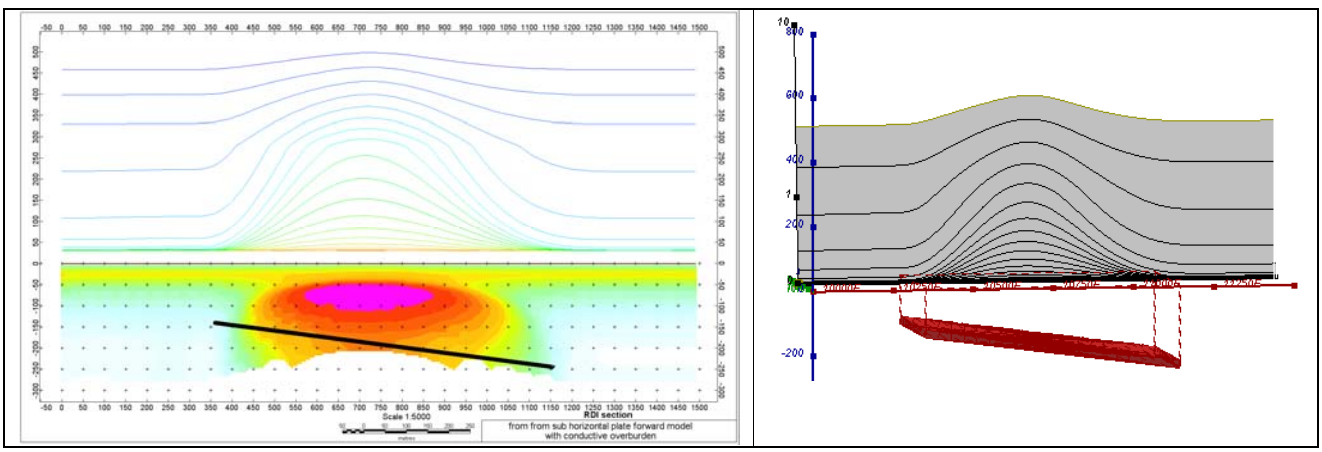


Figure F-8: Maxwell plate model and RDI from the calculated response for the long, wide and deep subhorizontal plate (depth 140 m, dim 25x500x800 m) with conductive overburden.

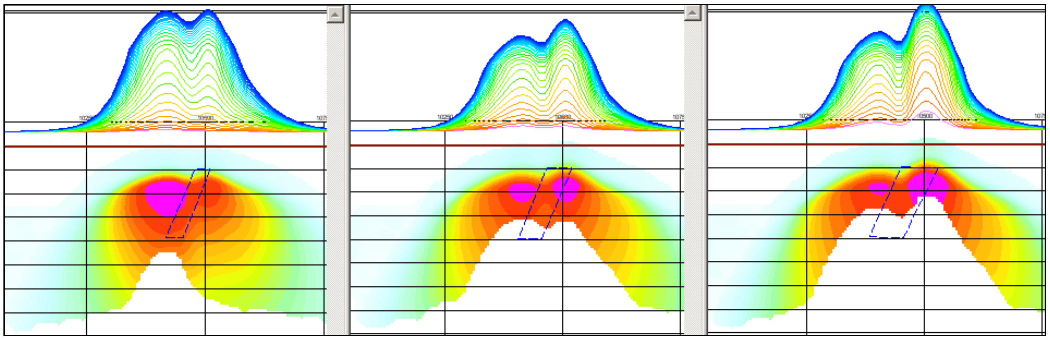


Figure F-9: Maxwell plate models and RDIs from the calculated response for "thick" dipping plates (35, 50, 75 m thickness), depth 50 m, conductivity 2.5 S/m.

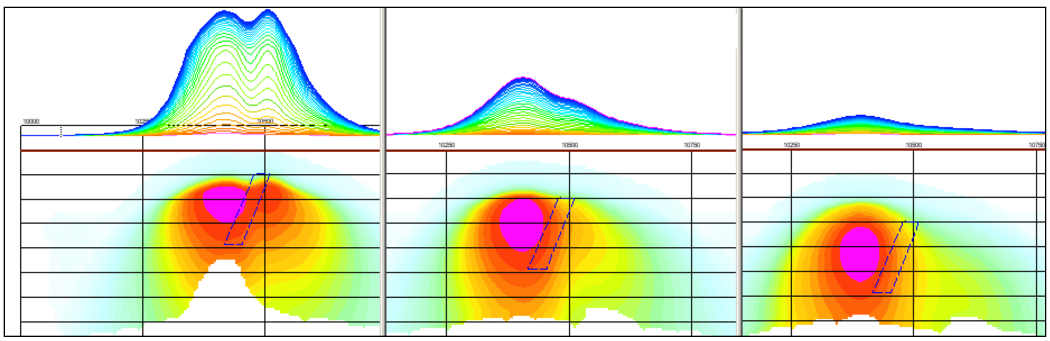


Figure F-10: Maxwell plate models and RDIs from the calculated response for "thick" (35 m thickness) dipping plate on different depth (50, 100, 150 m), conductivity 2.5 S/m.

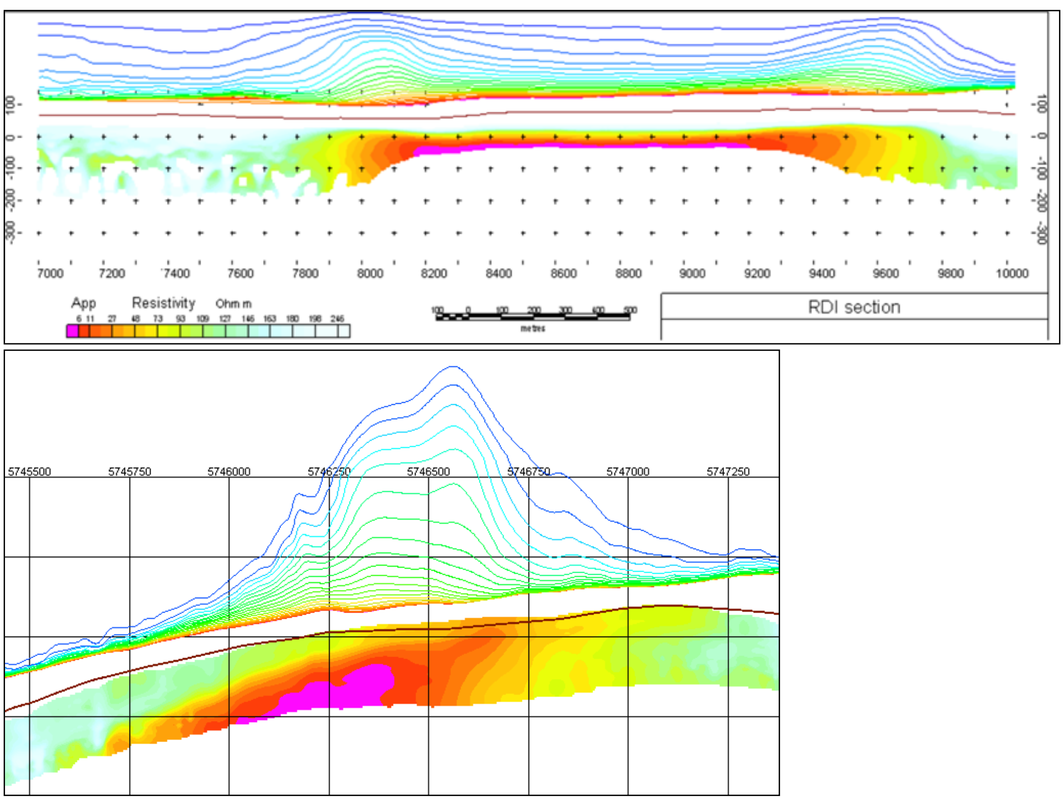
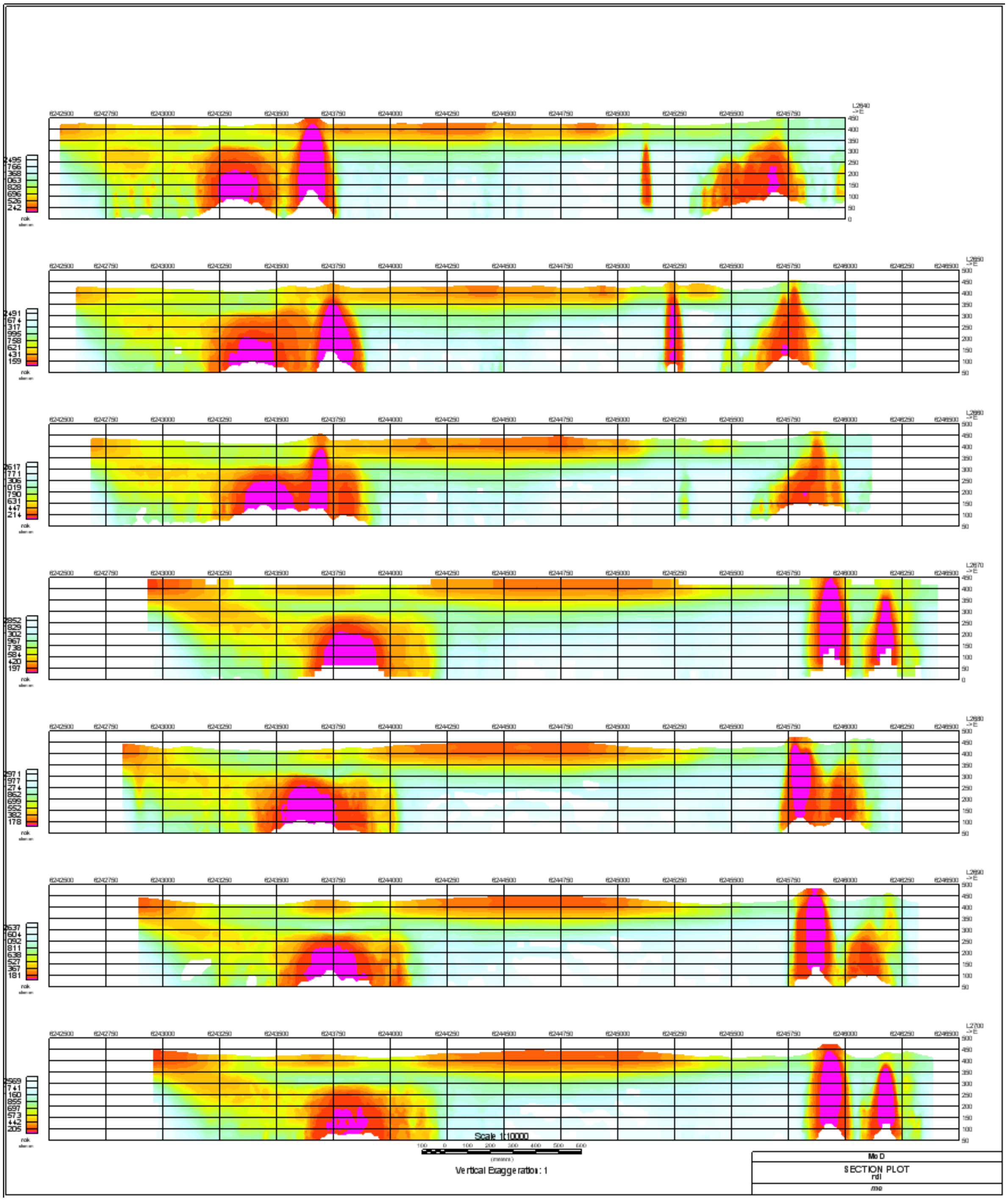


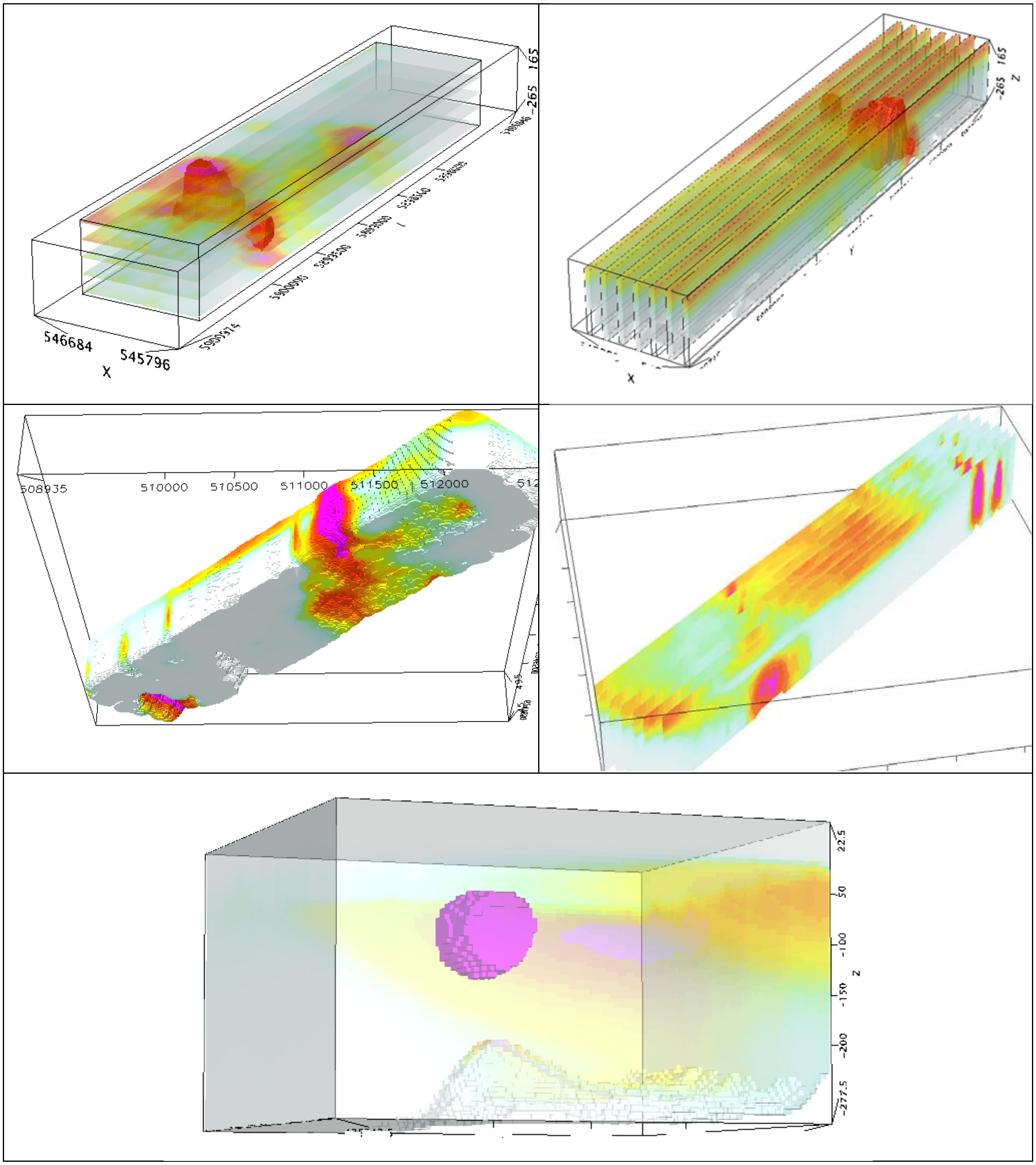
Figure F-11: RDI section for the real horizontal and slightly dipping conductive layers.

FORMS OF RDI PRESENTATION

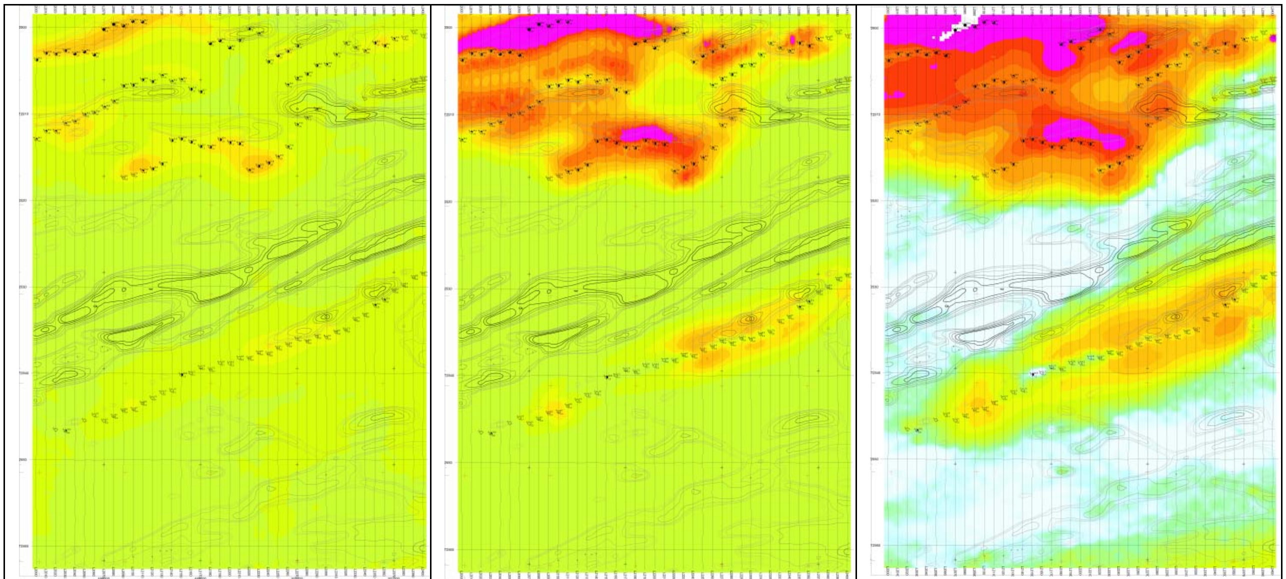
PRESENTATION OF SERIES OF LINES



3D PRESENTATION OF RDIS

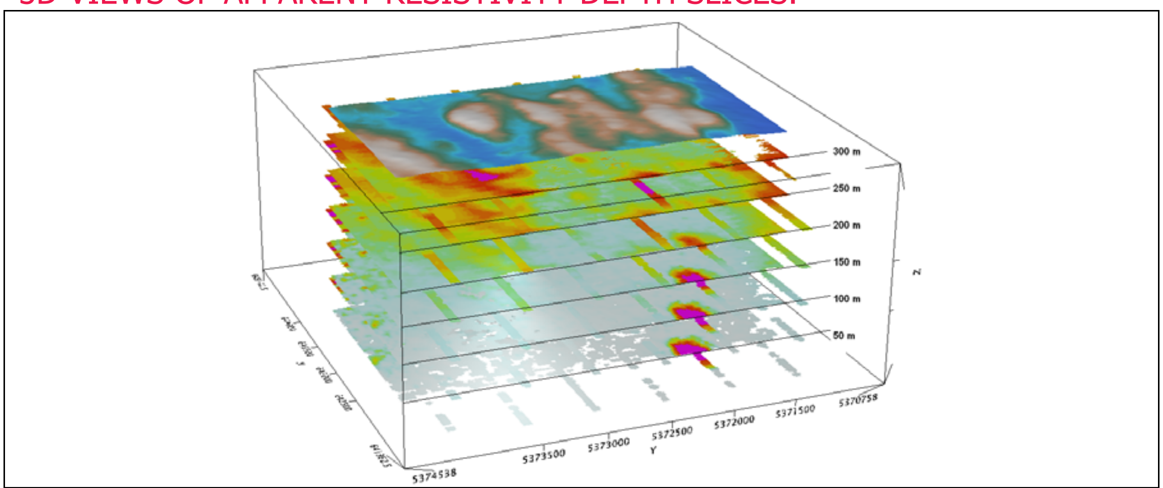


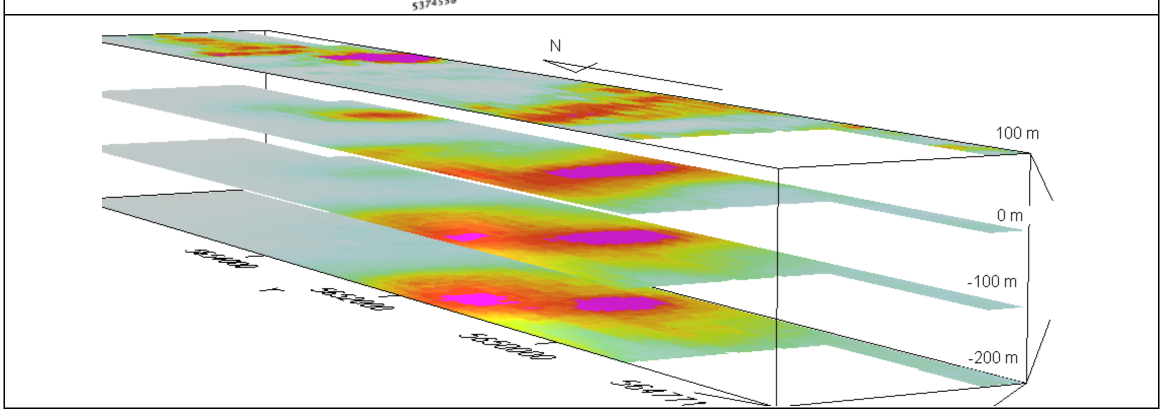
APPARENT RESISTIVITY DEPTH SLICES PLANS:



0 m (surface)	-100 m	-200 m

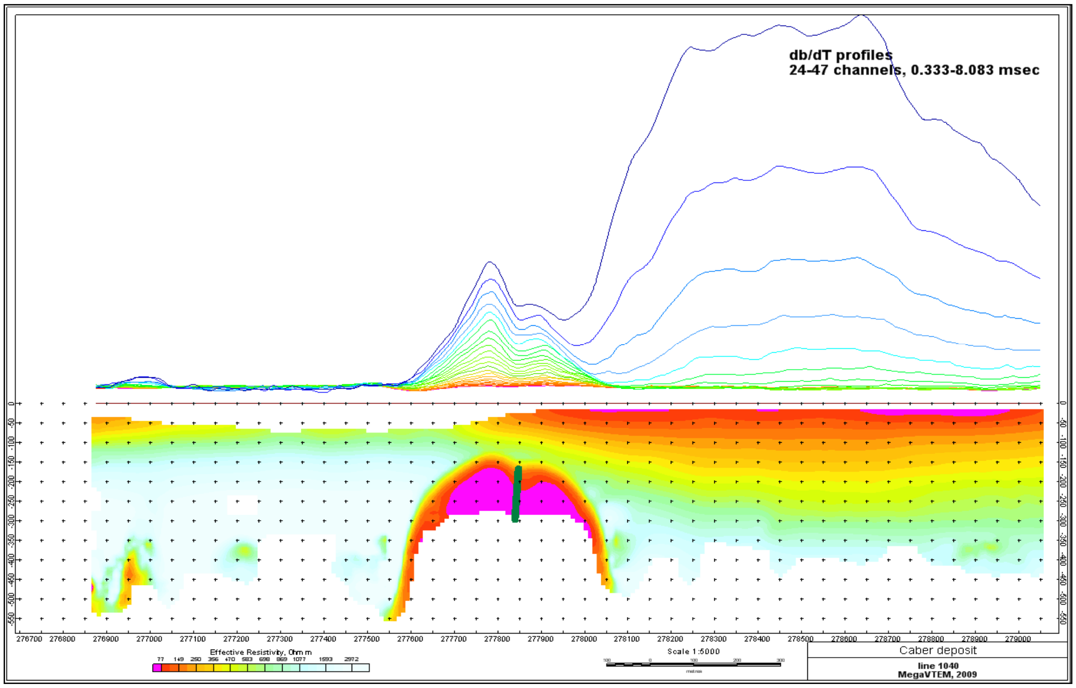
3D VIEWS OF APPARENT RESISTIVITY DEPTH SLICES:



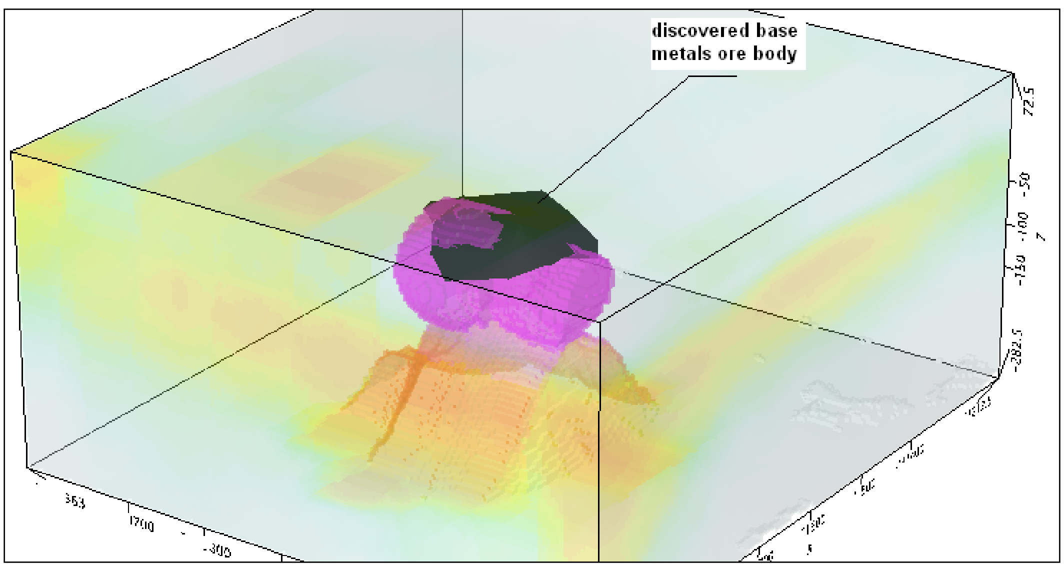


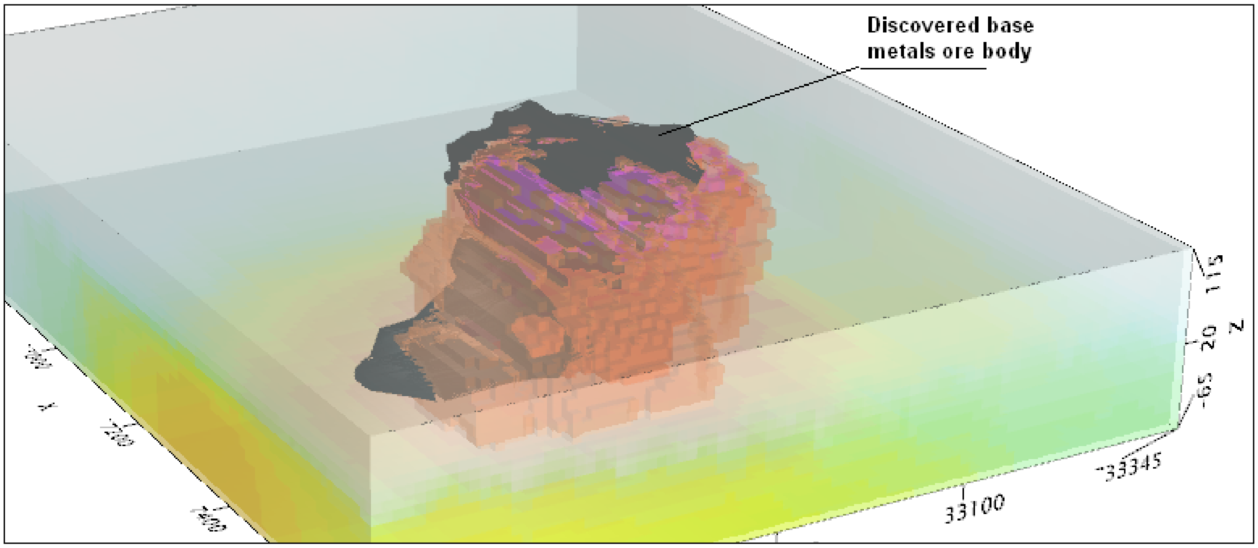
REAL BASE METAL TARGETS IN COMPARISON WITH RDIS:

RDI section of the line over Caber deposit ("thin" subvertical plate target and conductive overburden.



3D RDI VOXELS WITH BASE METALS ORE BODIES (MIDDLE EAST):





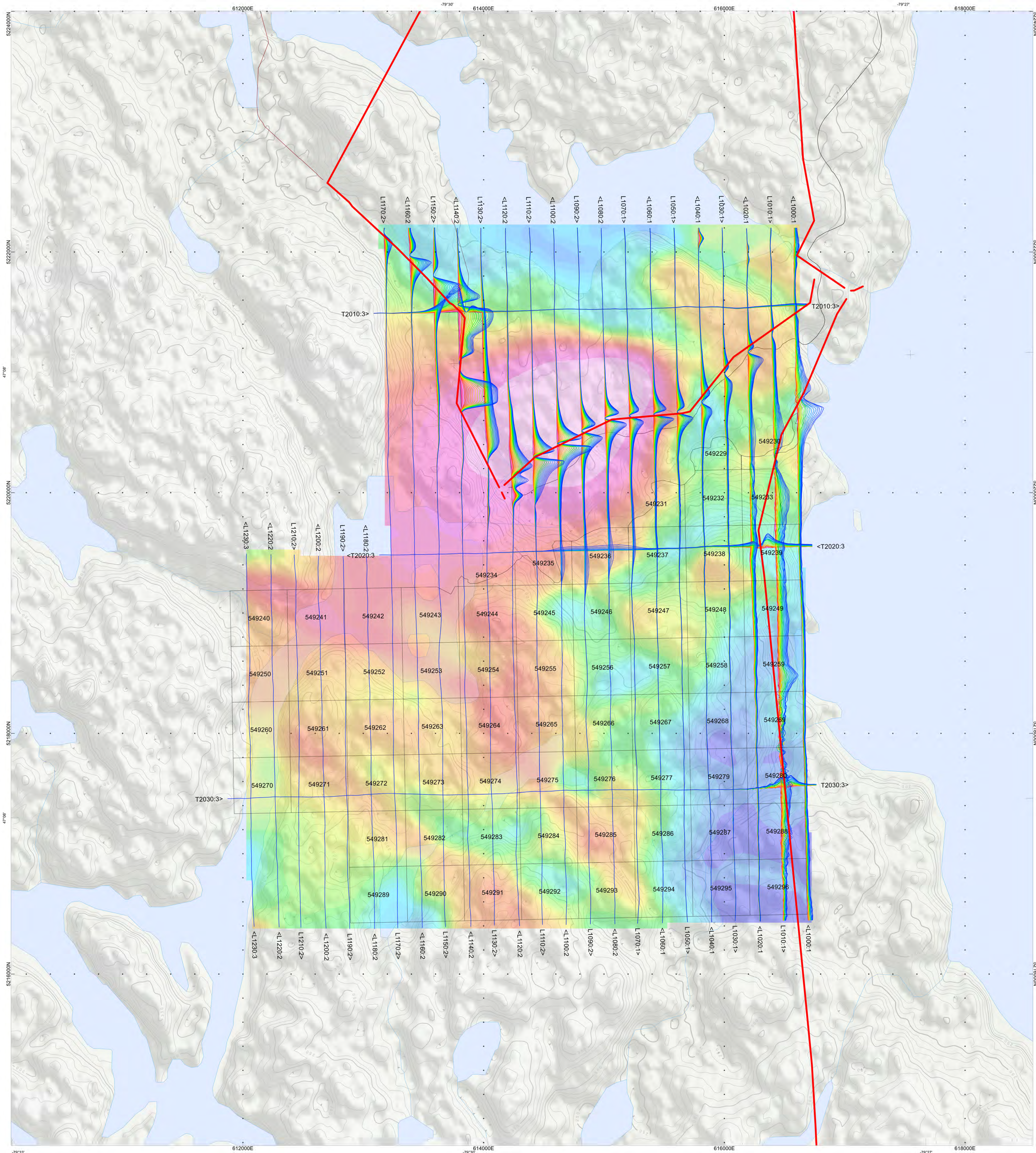
Alexander Prikhodko, PhD, P.Geo
Geotech Ltd.
April 2011

APPENDIX G

RESISTIVITY DEPTH IMAGES (RDI)

Please see RDI Folder on DVD for the PDF's

APPENDIX III: MAPS



GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

SURVEY SPECIFICATIONS:
- Survey Date: February 10th to February 12th, 2021
- Survey Base: Temagami, ON
- Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
- Survey Line Spacing: 100 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: 1000 Meters
- Tie Line Direction: N 90° E / N 270° E
- Mean Terrain Clearance: 114 Meters
- EM Loop: Towed at a mean terrain clearance of 65m
- Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS
- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
- Z-Coil Loop: Diameter 1.2 Meters
- Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
- Dipole Moment: 659,625 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms
- Geometrics High Sensitivity Cesium Magnetometer
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
- Datum: WGS84
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378137.000
- Eccentricity: 0.081819191

Profiles scale 1 mm = 0.03 (pV*ms)/(A*m^4)

(Linear between +/-0.5 (pV*ms)/(A*m^4) logarithmic above 0.5 (pV*ms)/(A*m^4)

- 0.220 ms (B-field)
- 0.253 ms (B-field)
- 0.290 ms (B-field)
- 0.333 ms (B-field)
- 0.383 ms (B-field)
- 0.440 ms (B-field)
- 0.505 ms (B-field)
- 0.580 ms (B-field)
- 0.667 ms (B-field)
- 0.766 ms (B-field)
- 0.880 ms (B-field)
- 1.010 ms (B-field)
- 1.161 ms (B-field)
- 1.333 ms (B-field)
- 1.531 ms (B-field)
- 1.760 ms (B-field)
- 2.021 ms (B-field)
- 2.323 ms (B-field)
- 2.667 ms (B-field)
- 3.063 ms (B-field)
- 3.521 ms (B-field)
- 4.042 ms (B-field)
- 4.641 ms (B-field)
- 5.333 ms (B-field)
- 6.125 ms (B-field)
- 7.036 ms (B-field)

55357.38
55177.62
55084.54
55021.24
54989.53
54962.26
54947.27
54935.20
54926.26
54919.92
54913.12
54907.04
54903.10
54899.07
54895.68
54892.49
54889.02
54885.11
54881.38
54878.03
54875.18
54872.38
54869.29
54866.00
54863.04
54860.22
54857.63
54854.78
54851.71
54848.09
54843.60
54838.91
54833.39
54827.22
54821.69
54814.21
54807.94
54803.01

TMI
(nT)

TOPOGRAPHIC LEGEND:
- Roads
- Trails
- Powerlines
- Streams / Rivers
- Contours
- Lakes / Ponds

Scale 1:15000

250 0 250 500 750

(meters)

WGS 84 / UTM zone 17N

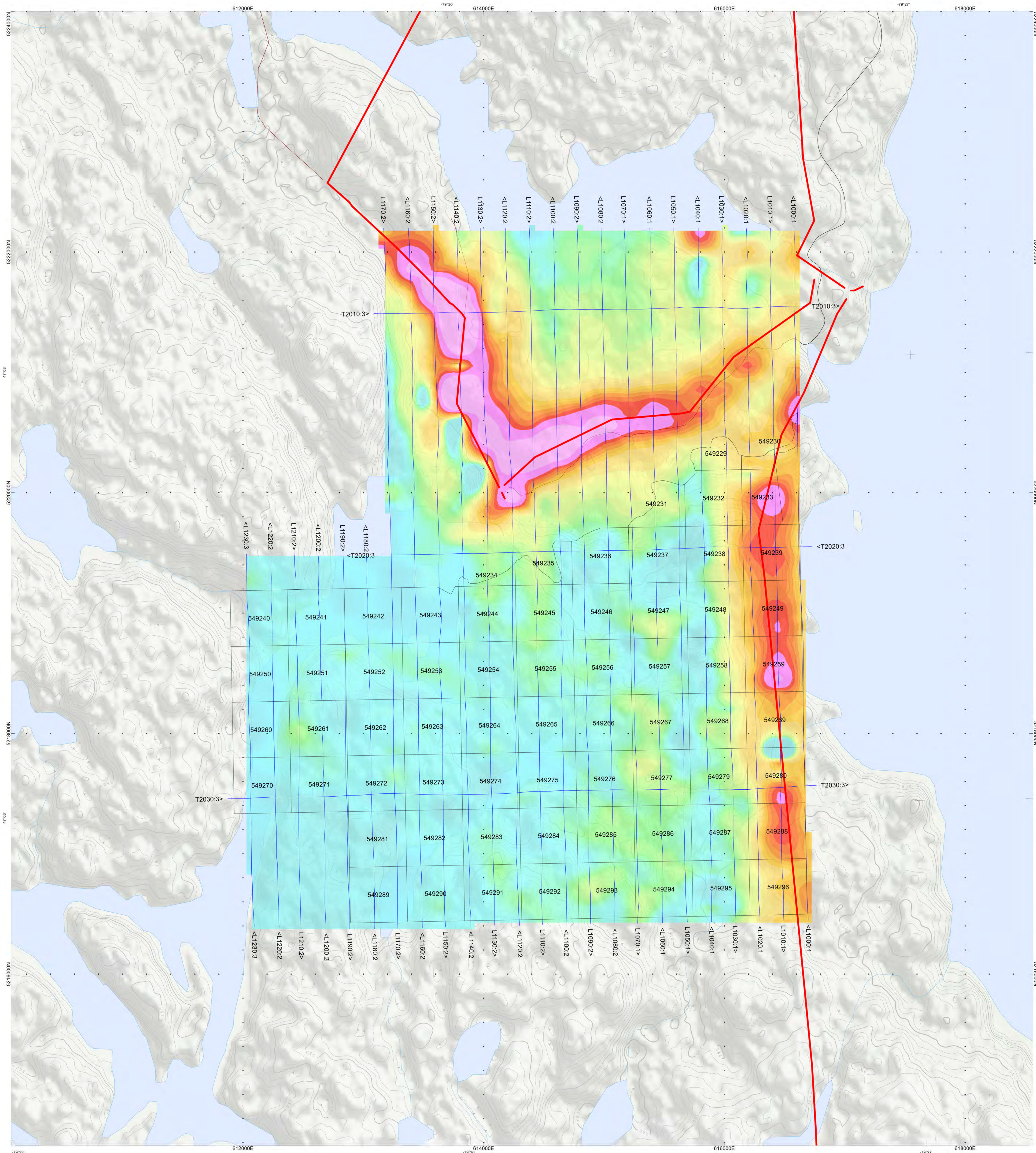
The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

Tom Obradovich
Starburst Project
Temagami, ON

Geotech VTEM System
VTEM B-Field Z Component Profiles
Time Gates 0.220 - 7.036 ms
over Total Magnetic Intensity

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021



GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

SURVEY SPECIFICATIONS:
- Survey Date: February 10th to February 12th, 2021
- Survey Base: Temagami, ON
- Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
- Survey Line Spacing: 100 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: 1000 Meters
- Tie Line Direction: N 90° E / N 270° E
- Mean Terrain Clearance: 114 Meters
- EM Loop: Towed at a mean terrain clearance of 65m
- Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS
- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
- Z-Coil Loop: Diameter 1.2 Meters
- Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
- Dipole Moment: 659,625 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms
- Geometrics High Sensitivity Cesium Magnetometer
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
- Datum: WGS84
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378137.000
- Eccentricity: 0.081819191

0.0360
0.0227
0.0182
0.0145
0.0114
0.0092
0.0075
0.0061
0.0052
0.0043
0.0036
0.0030
0.0025
0.0021
0.0018
0.0016
0.0014
0.0013
0.0011
0.0010
0.0009
0.0009
0.0008
0.0007
0.0007
0.0006
0.0005
0.0005
0.0004
0.0004
0.0003
0.0003
0.0002
0.0002
0.0001
0.0000
-0.0001

B-Field 1.760 ms
(pV*ms)/(A*m^4)

TOPOGRAPHIC LEGEND:
- Roads
- Trails
- Powerlines
- Rivers / Streams
- Contours
- Lakes / Ponds

Scale 1:15000
250 0 250 500 750
(meters)
WGS 84 / UTM zone 17N

The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

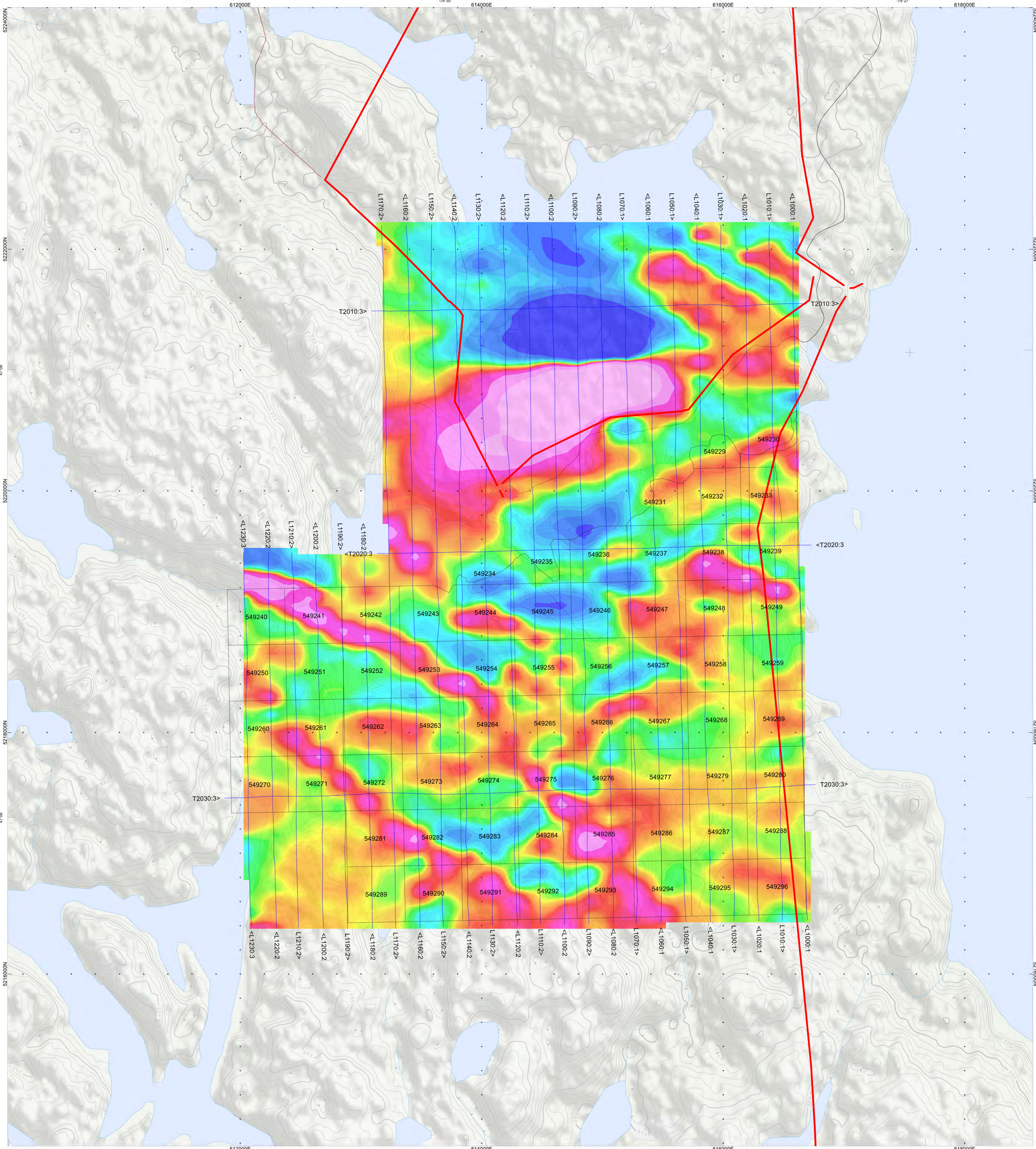
Tom Obradovich
Starburst Project
Temagami, ON

Geotech VTEM System

VTEM B-Field Z Component
Channel 35, Time Gate 1.760 ms

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021



GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

SURVEY SPECIFICATIONS:

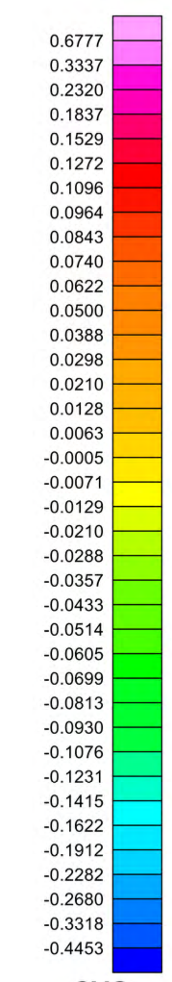
- Survey Date: February 10th to February 12th, 2021
- Survey Base: Temagami, ON
- Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
- Survey Line Spacing: 100 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: 1000 Meters
- Tie Line Direction: N 90° E / N 270° E
- Mean Terrain Clearance: 114 Meters
- EM Loop: Towed at a mean terrain clearance of 65m
- Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS

- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
- Z-Coil Loop: Diameter 1.2 Meters
- Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
- Dipole Moment: 659,625 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms
- Geometrics High Sensitivity Cesium Magnetometer
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION

- Datum: WGS84
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378137.000
- Eccentricity: 0.081819191



CVG
(nT/m)

TOPOGRAPHIC LEGEND:

- Roads
- Trails
- Powerlines
- Streams / Rivers
- Contours
- Lakes / Ponds

Scale 1:15000

250 0 250 500 750 (meters)

WGS 84 / UTM zone 17N

The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

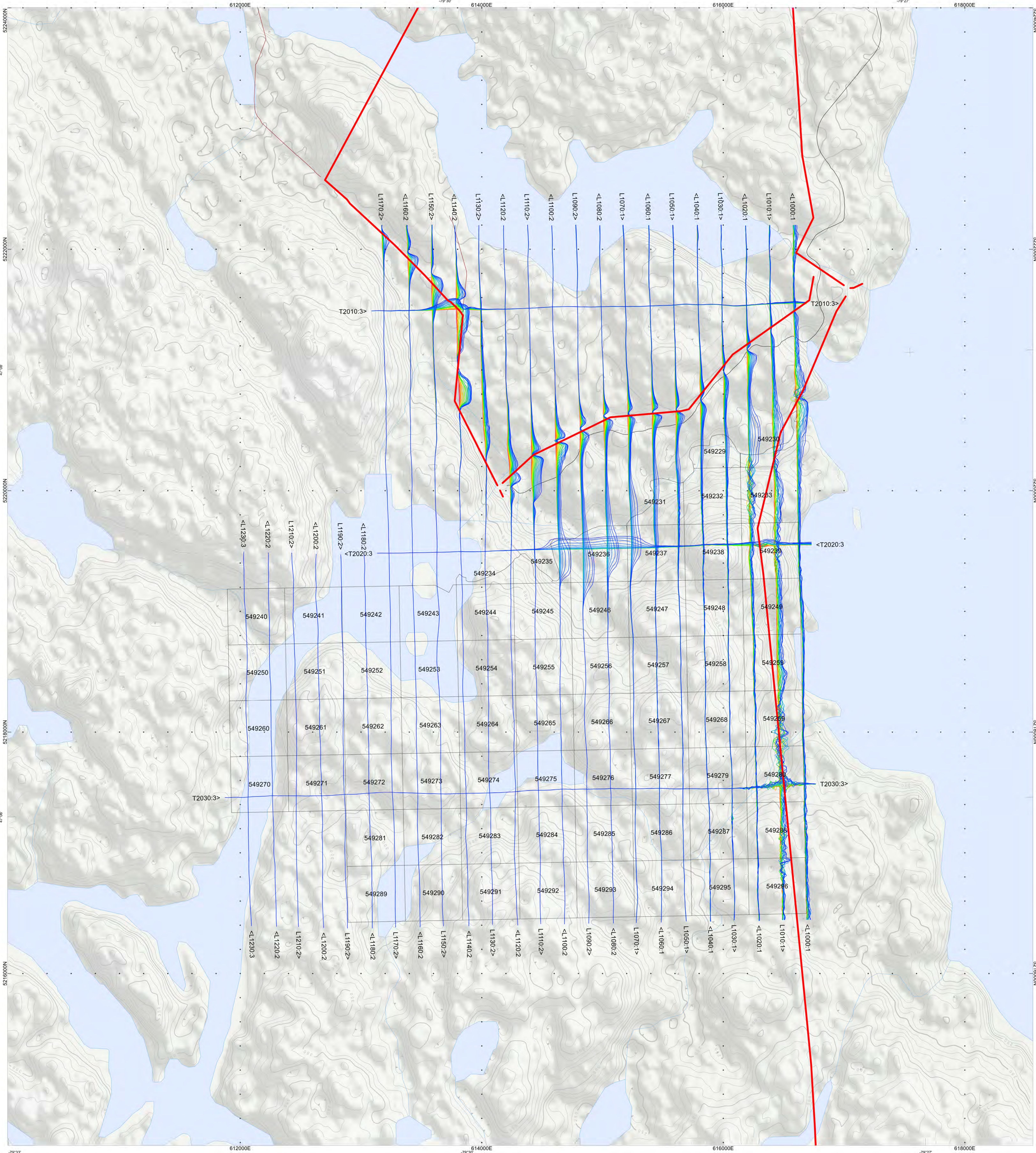
Tom Obradovich Starburst Project Temagami, ON

Geotech VTEM System

Calculated Vertical Gradient (CVG)

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021



GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

Scale 1:5,000,000

SURVEY SPECIFICATIONS:
- Survey Date: February 10th to February 12th, 2021
- Survey Base: Temagami, ON
- Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
- Survey Line Spacing: 100 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: 1000 Meters
- Tie Line Direction: N 90° E / N 270° E
- Mean Terrain Clearance: 114 Meters
- EM Loop: Towed at a mean terrain clearance of 65m
- Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS
- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
- Z-Coil Loop: Diameter 1.2 Meters
- Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
- Dipole Moment: 659,625 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms.
- Geometrics High Sensitivity Cesium Magnetometer
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
- Datum: WGS84
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378137.000
- Eccentricity: 0.081819191

Profiles scale 1 mm = 0.08 (pV/A*m^4)

Linear between +/-0.5 (pV/A*m^4)
logarithmic above 0.5 (pV/A*m^4)

0.220 ms
0.253 ms
0.290 ms
0.333 ms
0.383 ms
0.440 ms
0.505 ms
0.580 ms
0.667 ms
0.766 ms
0.880 ms
1.010 ms
1.161 ms
1.333 ms
1.531 ms
1.760 ms
2.021 ms
2.323 ms
2.667 ms
3.063 ms
3.521 ms
4.042 ms
4.641 ms
5.333 ms
6.125 ms
7.036 ms

TOPOGRAPHIC LEGEND:
- Roads
- Trails
- Powerlines
- Streams / Rivers
- Contours
- Lakes / Ponds

Scale 1:15000
250 0 250 500 750
(meters)
WGS 84 / UTM zone 17N

The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

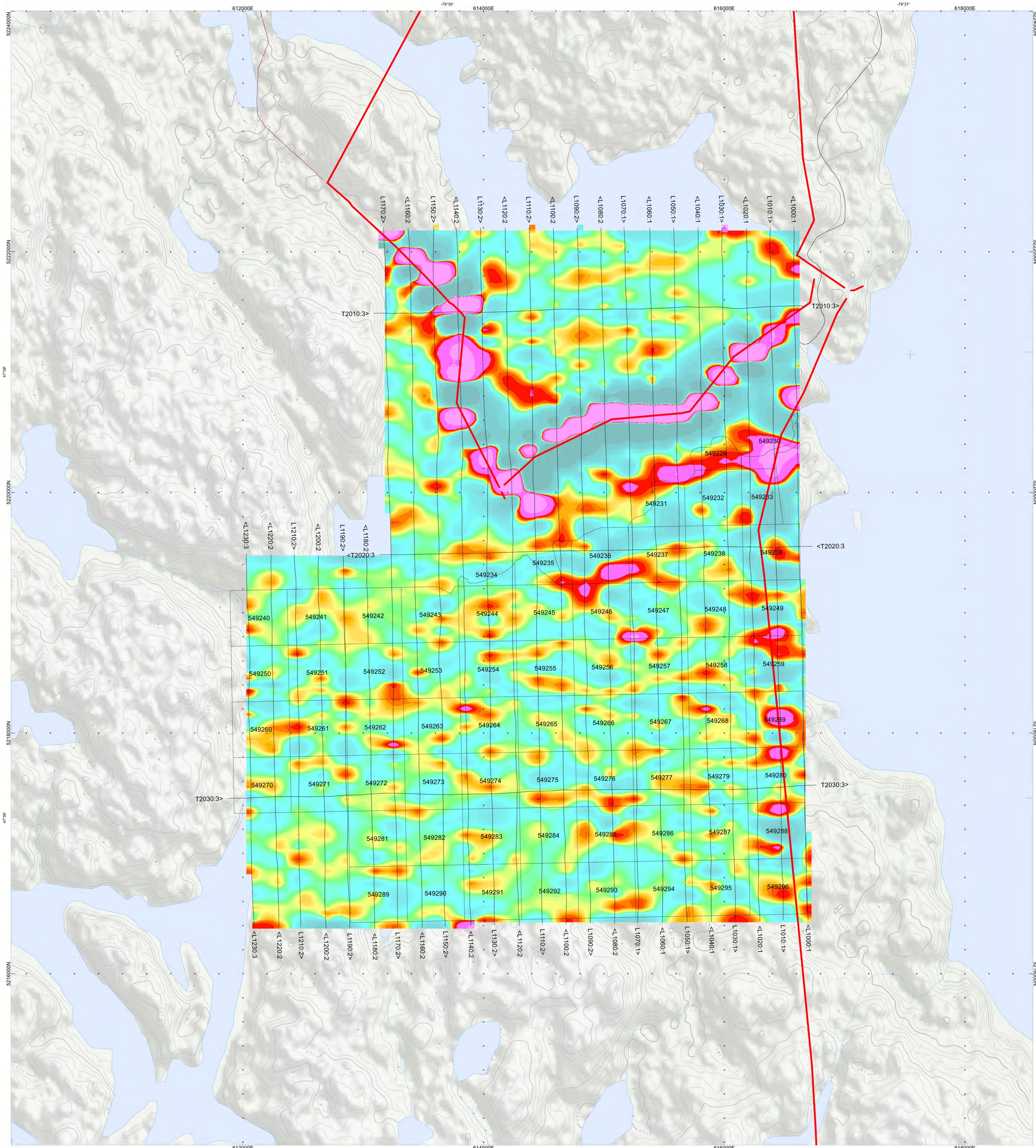
Tom Obradovich
Starburst Project
Temagami, ON

Geotech VTEM System

VTEM dB/dt Z Component Profiles
Time Gates 0.220 - 7.036 ms

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021



SURVEY SPECIFICATIONS:

- Survey Date: February 10th to February 12th, 2021
- Survey Base: Temagami, ON
- Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
- Survey Line Spacing: 100 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: 1000 Meters
- Tie Line Direction: N 90° E / N 270° E
- Mean Terrain Clearance: 114 Meters
- EM Loop: Towed at a mean terrain clearance of 65m
- Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS

- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
- Z-Coil Loop: Diameter 1.2 Meters
- Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
- Dipole Moment: 659,625 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms
- Geometrics High Sensitivity Cesium Magnetometer
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION

- Datum: WGS84
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378137.000
- Eccentricity: 0.081819191

SFxFF 0.440 ms
pV/(A*m^4)

TOPOGRAPHIC LEGEND:

- Roads
- Trails
- Powerlines
- Streams / Rivers
- Contours
- Lakes / Ponds

Scale 1:15000
(meters)
WGS 84 / UTM zone 17N

The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

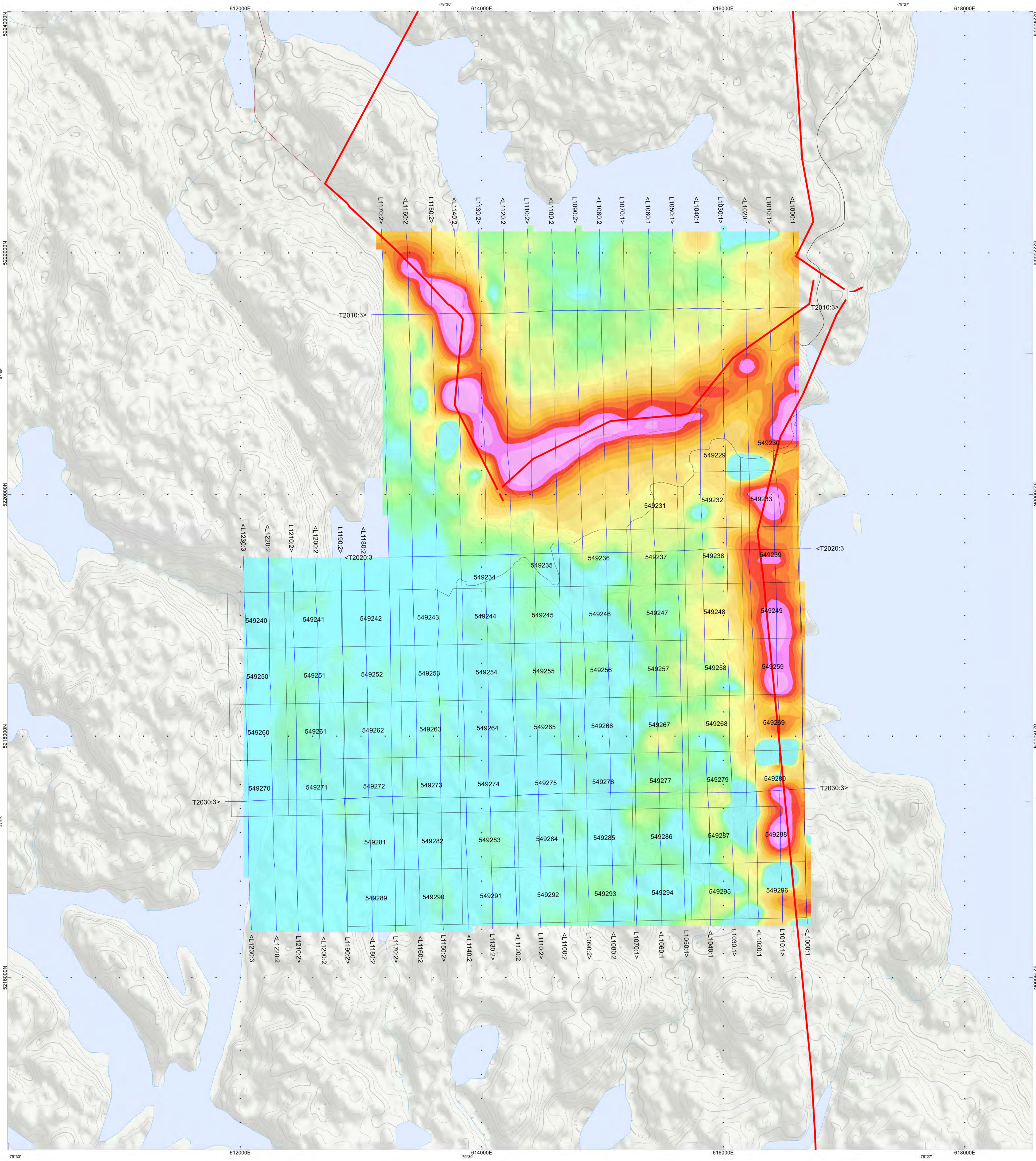
Tom Obradovich
Starburst Project
Temagami, ON

Geotech VTEM System

Fraser Filtered dB/dt X Component
Channel 25, Time Gate 0.440 ms

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021

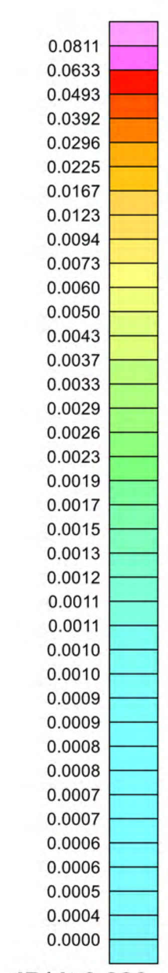


GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

SURVEY SPECIFICATIONS:
- Survey Date: February 10th to February 12th, 2021
- Survey Base: Temagami, ON
- Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
- Survey Line Spacing: 100 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: 1000 Meters
- Tie Line Direction: N 90° E / N 270° E
- Mean Terrain Clearance: 114 Meters
- EM Loop: Towed at a mean terrain clearance of 65m
- Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS
- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
- Z-Coil Loop: Diameter 1.2 Meters
- Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
- Dipole Moment: 659,625 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms
- Geometrics High Sensitivity Cesium Magnetometer
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
- Datum: WGS84
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378137.000
- Eccentricity: 0.081819191



dB/dt 0.880 ms
pV/(A*m^4)

TOPOGRAPHIC LEGEND:
- Roads
- Trails
- Powerlines
- Streams / Rivers
- Contours
- Lakes / Ponds

Scale 1:15000
250 0 250 500 750
(meters)
WGS 84 / UTM zone 17N

The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

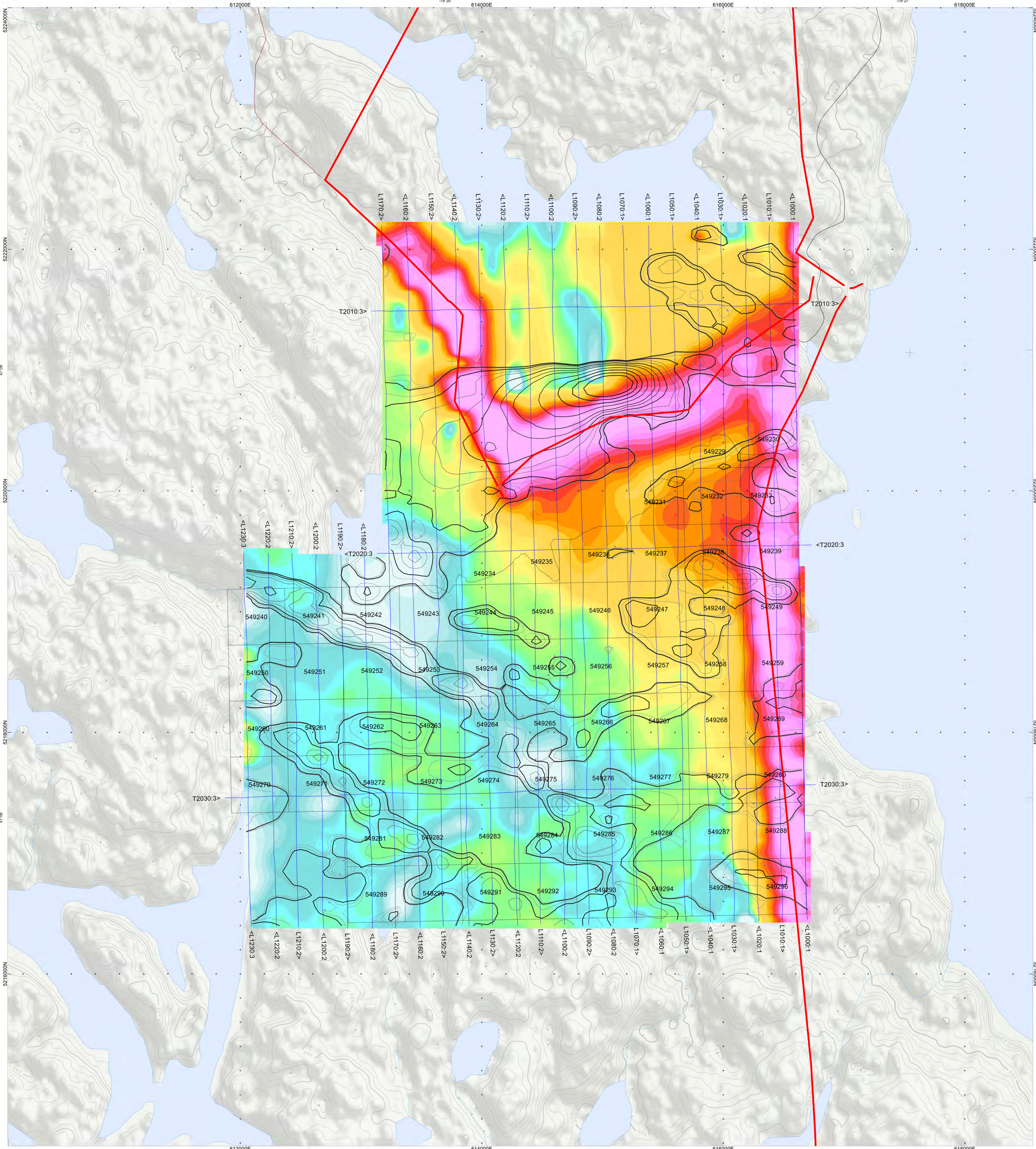
Tom Obradovich
Starburst Project
Temagami, ON

Geotech VTEM System

VTEM dB/dt Z Component
Channel 30, Time Gate 0.880 ms

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021



GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

SURVEY SPECIFICATIONS:
Survey Date: February 10th to February 12th, 2021
Survey Base: Temagami, ON
Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
Survey Line Spacing: 100 Meters
Survey Line Direction: N 0° E / N 180° E
Tie Line Spacing: 1000 Meters
Tie Line Direction: N 90° E / N 270° E
Mean Terrain Clearance: 114 Meters
EM Loop: Towed at a mean terrain clearance of 65m
Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS
Geotech Time Domain Electromagnetic System (VTEM)
Concentric Rx/Tx Geometry
X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
Z-Coil Loop: Diameter 1.2 Meters
Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
Dipole Moment: 659,625 nIA
Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms
Geometrics High Sensitivity Cesium Magnetometer
Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
Datum: WGS84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.000
Eccentricity: 0.081819191

Tau dB/dt
(ms)

TOPOGRAPHIC LEGEND:
Roads
Trails
Powerlines
Streams / Rivers
Contours
Lakes / Ponds

Scale 1:15000
250 0 250 500 750
(meters)
WGS 84 / UTM zone 17N

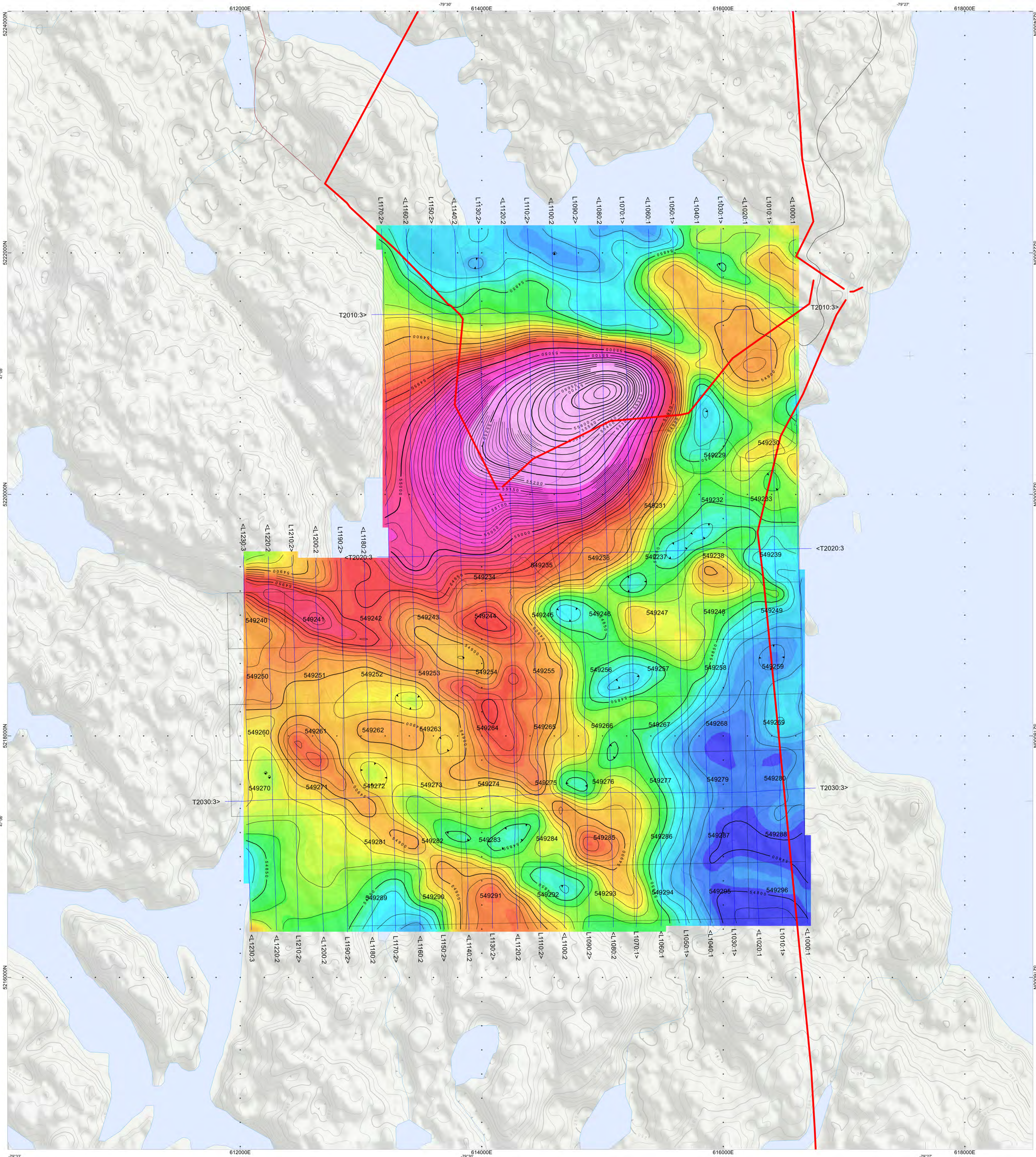
The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

Tom Obradovich
Starburst Project
Temagami, ON

Geotech VTEM System
dB/dt Calculated Time Constant (Tau) with Calculated Vertical Derivative contours

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021



SURVEY SPECIFICATIONS:

Survey Date: February 10th to February 12th, 2021
Survey Base: Temagami, ON
Aircraft: Aerospatiale A-Star 350 B3 (C-FBZN)
Survey Line Spacing: 100 Meters
Survey Line Direction: N 0° E / N 180° E
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Tie Line Direction: N 90° E / N 270° E
Mean Terrain Clearance: 114 Meters
EM Loop: Towed at a mean terrain clearance of 65m
Magnetic Sensor: Towed at a mean terrain clearance of 104m

INSTRUMENTS

Geotech Time Domain Electromagnetic System (VTEM)
Concentric Rx/Tx Geometry
X-Coil Loop & Y-Coil Loop: Diameter 0.32 Meters
Z-Coil Loop: Diameter 1.2 Meters
Transmitter Loop: Diameter 35 Meters,Base Frequency 30 Hz
Dipole Moment: 659,625 nIA
Transmitter Wave Form: Trapezoid, Pulse Width 7.29 ms
Geometrics High Sensitivity Cesium Magnetometer
Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION

Datum: WGS84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.000
Eccentricity: 0.081819191

55357.38
55177.62
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54857.63
54854.78
54851.71
54848.09
54843.60
54838.91
54833.39
54827.22
54821.69
54814.21
54807.94
54803.01

TMI
(nT)

TOPOGRAPHIC LEGEND:

Roads
Trails
Powerlines
Streams / Rivers
Contours
Lakes / Ponds

TMI CONTOUR INTERVALS:

10 nT
50 nT
250 nT

Scale 1:15000

250 0 250 500 750
(meters)
WGS 84 / UTM zone 17N

The topographic data base was derived from 1:250,000 CANVEC data
Background shading is derived from ASTER GDEM (https://gdex.cr.usgs.gov/gdex/)
Inset data derived from Geocommunities (www.geocomm.com)

Tom Obradovich
Starburst Project
Temagami, ON

Geotech VTEM System

Total Magnetic Intensity (TMI)

Flown and processed by Geotech Ltd.
270 Industrial Parkway South,
Aurora, Ontario, Canada L4G 3T9
www.geotech.ca

June, 2021