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Sugar Cube Property

Heliborne Magnetic and TDEM Survey

Sault Ste. Marie Mining Division, Ontario

NTS 42C14

Magone (G-2787) and Hambleton (G-2768)

For

First Class Metals Canada Inc.

March 1, 2023

By

Cathy Salo, PGO

Contents

1. Summary

The Sugar Cube property is located roughly 366 kilometres west of Thunder Bay, Ontario between the Hemlo and the Dayohessarah Greenstone Belt. The south end of the property is approximately 24 km due north of White River. The property has easy assess to and withing the property boundary. There is also excellent infrastructure with the highway, hydro line and railway nearby. First Class Metals' analysis of historic geological data led it to the interpretation that Sugar Cube contains the remnants of a greenstone belt along similar contact to Sugar Zone. The Sugar Zone mine is high grade underground mine, approximately 30km north of White River in northern Ontario and went into commercial production in January 2019.

Prospectair conducted a heliborne magnetic (MAG) and time-domain electromagnetic (TDEM) survey for the mineral exploration company First Class Metals Canada Inc. on its Sugar Cube Property, located in the White River area, Sault Ste. Marie Mining Division, Province of Ontario. The survey was flown from January 19 to 24, 2023. One survey block was flown for a total of 408 l-km. A total of 4 production flights were performed using Prospectair's Airbus H125, registration C-GATM. The helicopter and survey crew operated out of the Manitouwadge Airport, located about 55 km to the northwest of the block. See Appendix III for the Heliborne Magnetic and TDEM Survey technical report by Prospectair Geosurveys.

The Sugar Zone deposit is hosted within the Dayohessarah Greenstone Belt located in the Abitibi-Wawa Subprovince of the SuperiorProvince east of the Hemlo Belt. The deposit is defined by sets of parallel, mineralized quartz veins, quartz flooding of strongly altered wall rock, thin intermediary porphyry lenses and dykes / sills parallel to stratigraphy and foliation, and gold mineralization. Gold mineralization mainly occurs in quartz veins, stringers, and quartz-flooded zones predominantly associated with porphyry zones, porphyry contact zones, hydrothermally altered basalts and, rarely, weakly altered or unaltered basalt within the three subzone.

Figure 1 Location map

2. Property Description and Access

The project consists of 205 Single Cell Mining Claims, covering 4343 hectares. (See Appendix I for claim cells details).

The property can be accessed north of highway 11 at White River onto Danny Lake Road for

Approximately 25 kilometres then west for another 5 kilometres west Davis Lake Rd to the southern claim. See figure 5 for claim map.

The property is in Sugar Cube is located Magone and Hambleton gplan, NTS 42C14, center 631,515 m E, 5,413,250 m N See figure 2 for general location of the property in the White River Area.

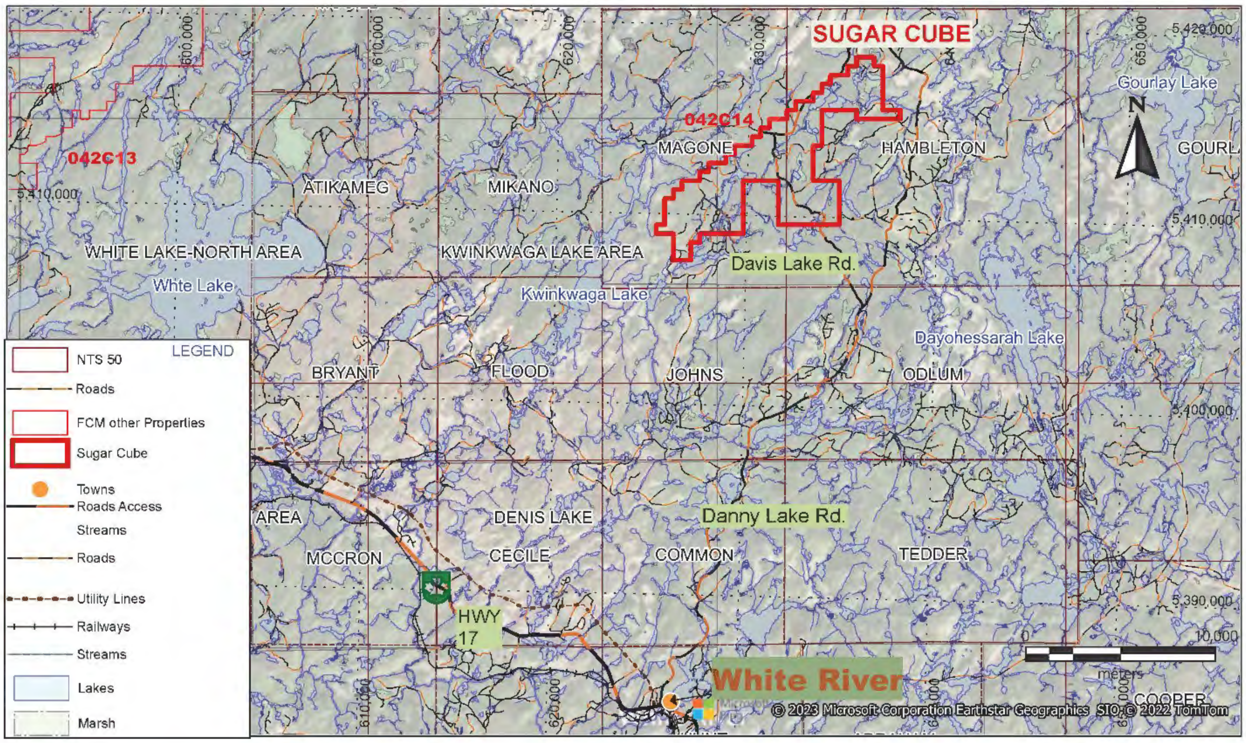

Figure 2 General location map.

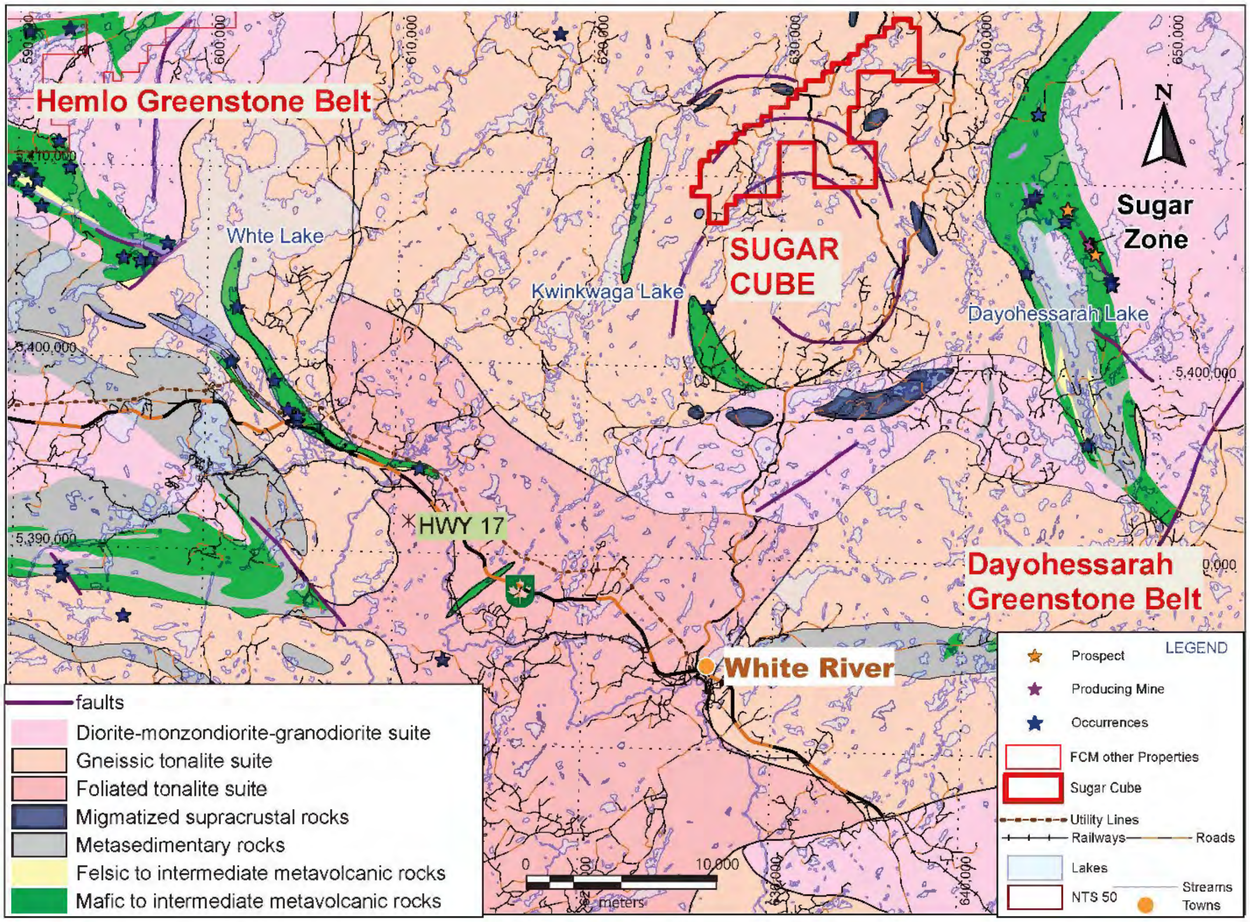

Figure 3: General geology based on 1:250,000 Bedrock Geology.

3. General Geology

First Class Metals' analysis of historic geological data led it to the interpretation that Sugar Cube contains the remnants of a greenstone belt along similar contact to Sugar Zone. During recent ground reconnaissance, previously-unmapped, sulphide-rich metasediments were located off property while greenstone boulders were located on the claim block. The DGB is situated between two larger greenstone belts; the Hemlo Greenstone Belt to the west and the Kabinakagami Greenstone Belt to the east. These greenstone belts are part of the larger east trending Schreiber-White River Belt of the Wawa Subprovince of the Superior Craton. The Late Archean DGB trends northwest and forms a narrow, eastward concave crescent. The belt is approximately 36 km in length and varies in width from 1.5 to 5.5 Kilometres. Principal lithologies in the belt are moderately to highly deformed metamorphosed volcanics, volcaniclastics and sediments that have been enclosed and intruded by tonalitic to granodioritic quartz-porphyry plutons. The greenstone belt is bordered to the east by the Strickland Pluton and to the west by the Black Pic Batholith. The Danny Lake Stock borders the south-western edge of the DGB. The Strickland Pluton is characterized by a granodioritic composition, quartz phenocrysts, fine grained titanite and hematitic fractures. The Black Pic Batholith is similar to the Strickland Pluton, but locally more potassic. The Black Pic Batholith also contains interlayers of monzogranite. The Danny Lake Stock is characterized by hornblende porphyritic quartz monzonite to quartz monzodiorite (G. M. Stott, 1999).

The DGB has been metamorphosed to upper greenschist to amphibolite facies. The Strickland Pluton seems to have squeezed the greenstone belt and imposed upon it a thermal metamorphism. Most of the mafic volcanics are composed primarily of plagioclase and hornblende. Almandine garnets are widely observed in the clastic metasediments and locally, along with pyrope garnets, in the mafic volcanics (G.M. Stott, 1996a,b,c). Alteration throughout the belt consists of diopsidation, albitization, weak magnesium biotization, weak carbonatization and moderate to strong silicification which accompanied the emplacement of the porphyry dykes/sills and quartz veining. The belt has been strongly foliated, flattened and strained. Deformation seen in the supracrustal rocks has been interpreted to be related to the emplacement of the Strickland Pluton. Strongly developed metamorphic mineral lineations in the supracrustal rocks closely compare with the orientations of the quartz phenocryst lineations seen in the Strickland Pluton. This probably reflects a constant strain aureole imposed by the pluton upon the belt (G.M. Stott, 1996a,b,c).

The strain fabric is best observed a few hundred meters from the Strickland Pluton in the Sugar Zone, which has been characterized as the most severely strained part of the belt. The Sugar Zone is defined by sets of parallel mineralized quartz veining, quartz flooding of strongly altered wall-rock, thin intermediate porphyry lenses and dykes/sills parallel to stratigraphy and foliation, and gold mineralization. Foliations and numerous top indicators define a synclinal fold in the central portion of the belt. The synclinal fold has been strongly flattened and stands upright with the fold hinge open to the south and centered along Dayohessarah Lake.

4. Exploration

Prospectair conducted a heliborne magnetic (MAG) and time-domain electromagnetic (TDEM) survey for the mineral exploration company First Class Metals Canada Inc. on its Sugar Cube Property, located in the White River area, Sault Ste. Marie Mining Division, Province of Ontario. The survey was flown from January 19 to 24, 2023. One survey block was flown for a total of 408 l-km. A total of 4 production flights were performed using Prospectair’s Airbus H125, registration C-GATM. The helicopter and survey crew operated out of the Manitouwadge Airport, located about 55 km to the northwest of the block.

5. Conclusions and Recommendations

The area depicts several magnetic domains with low background values and settled signal variations mostly consisting in low amplitude anomalies. This is characteristic of areas dominated by meta-sedimentary or intermediate to felsic intrusive rocks. Several slightly stronger magnetic anomalies, occurring either in compact or linear shapes, are found locally and could pertain to intermediate/mafic intrusive rocks or meta-volcanosedimentary horizons enriched in magnetic minerals. Stronger anomalies are associated to linear features likely related to mafic dykes, but the strongest anomaly of the survey ratherconsists in a discrete and compact feature, oriented E-W and located at the northeast end of the block. Stronger anomalies are best seen on Figure 8 which shows the residual TMI data with a linear color distribution. Magnetic lineaments are very variable in strike in the area. The main family of lineaments is trending NW-SE and consists in very straight anomalies extending over long distances. These are most likely associated to Matachewan dykes, which are very common in the area. There are also several isolated lineaments striking at different angles, some varying from N-S to NNE-SSW and others rather trending E-W to ENE-WSW. There are a few instances of curved magnetic lineaments, possibly indicative of intrusions’ internal structures or outlines, or of deformation structures which could be of interest for exploration. In general terms, magnetic lineaments are related to rock formations that are enriched in magnetic minerals (magnetite and/or pyrrhotite). Throughout the block, it is possible to detect structural features offsetting observed magnetic lineaments and causing abrupt interruption or changes of the magnetic response. These features are typically caused by faults, fractures and shear zones. If they are thought to be favorable structures in the exploration context of the Sugar Cube project, they should be paid particular attention to and should be the object of a comprehensive structural interpretation, which is beyond the scope of this report.

On the Sugar Cube block, all TDEM responses have been very close to zero and have never exceeded the expected noise envelope of the system. As a result, no TDEM anomalies have been identified by this survey. The discussion on the geological implication of the survey data is minimal in this report. A more general study including information regarding the local geology and all other geoscience data available in the area would be necessary to extract the full potential of the geophysical data and help to confirm and prioritize exploration targets. From a geophysical point of view, given the lack of EM responses detected within the Property, and since the geological context may be considered prospective for nonconductive mineralization, it is recommended to use the newly acquired magnetic data, together with known local geological information, to carry out a comprehensive geophysical and structural interpretation to guide ground investigations. If interesting results are obtained, or if overburden thickness prevents proper ground follow-up, it is recommended to use the resistivity/IP technique to conduct exploration and eventually to accurately define drilling targets. This technique has been proven to detect disseminated sulphides associated to gold and other deposit types (Dubé, 2023).

6. Statement of Qualifications

I Cathy Salo, of Thunder Bay, Ontario, do hereby certify that:

1. I hold a Bachelor of Science Degree in Earth Science (1989) from Memorial University of Newfoundland, St. John's, Newfoundland and Labrador.

2. I have practiced my profession in Ontario since 1989 and have been consulting for junior mining companies in Ontario since 2002 as the sole proprietary of Salo Geoscience Services.

3. I am a professional geologist.

Cathy Salo, P.Geo

Salo Geoscience Services

Date: January 20, 2023

7. Reference

David B. Stevenson, M.Sc., P.Geo., May 02, 2020. 2019 Prospecting Program, Sugar Zone Property, Dayohessarah Lake Area, White River Ontario

Dubé, Joël,. P.Eng., February 23, 2023, Dynamic Discovery Geoscience Technical Report, Heliborne Magnetic and TDEM Survey, Sugar Cube Project, White River Area Sault Ste. Marie Mining Division, Ontario, 2023, Prospectair Geosurveys

Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release–Data 126 - Revision 1

Stott, G.M., 1996a. Precambrian Geology of Dayohessarah Lake Area (North half), Ontario Geological Survey, Preliminary map no. 3309.

Stott, G.M., 1996b. Precambrian Geology of Dayohessarah Lake Area (Central area), Ontario Geological Survey, Preliminary map no. 3310.

Stott, G.M., 1996c. Precambrian Geology of Dayohessarah Lake Area (South half), Ontario Geological Survey, Preliminary map no. 3311.

Appendix I

Tenure No	Type	Status	Issue date	Anniversary	Claim due	Holder
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650637	Single Cell Mining Claim	Active	20210412	20230412	20230412	(100) FCMCI
642961	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642974	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
650644	Single Cell Mining Claim	Active	20210412	20230412	20230412	(100) FCMCI
642976	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
650647	Single Cell Mining Claim	Active	20210412	20230412	20230412	(100) FCMCI
642931	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642940	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642990	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642992	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642994	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643032	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643034	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643036	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643002	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643004	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643006	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643015	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643023	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643046	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI

Tenure No	Type	Status	Issue date	Anniversary	Claim due	Holder
643048	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643050	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
657811	Single Cell Mining Claim	Active	20210521	20230521	20230521	(100) FCMCI
657817	Single Cell Mining Claim	Active	20210521	20230521	20230521	(100) FCMCI
657823	Single Cell Mining Claim	Active	20210521	20230521	20230521	(100) FCMCI
657828	Single Cell Mining Claim	Active	20210521	20230521	20230521	(100) FCMCI
650642	Single Cell Mining Claim	Active	20210412	20230412	20230412	(100) FCMCI
642933	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642935	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642941	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
650657	Single Cell Mining Claim	Active	20210412	20230412	20230412	(100) FCMCI
642971	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642917	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
642929	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643001	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
643018	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI
657814	Single Cell Mining Claim	Active	20210521	20230521	20230521	(100) FCMCI
657820	Single Cell Mining Claim	Active	20210521	20230521	20230521	(100) FCMCI
657826	Single Cell Mining Claim	Active	20210521	20230521	20230521	(100) FCMCI
650661	Single Cell Mining Claim	Active	20210412	20230412	20230412	(100) FCMCI
642937	Single Cell Mining Claim	Active	20210312	20230312	20230312	(100) FCMCI

FCMCI First Class Metals Canada Inc.

Appendix II


Ontario
Sugar Cube
Raven Lake
Siren Lake
Kenshoe Lake
Joseph Lake
KINKWAGA RIVER
042C14
MAGONE
HAMBLETON
Valentine Lake
Grouse Lake
Plate Lake
GOURLAY LAKE
WHITE LAKE
DAYOHESSARAH LAKE
White River
5,415,000
5,412,500
5,410,000
5,407,500
N
0 1,000
meters
Scale 1:25,000
legend
Residual Total Magnetic Intensity (nT)
-154 -88 -76 -65 -54 -44 -34 -24 -14 -5 2 7 12 21 34 55 328
MAG TDEM Flight Lines
Roads
Utility Lines
First Class Metals Claims
Operational Cell Claims
Streams
Lakes
NTS 50
gplan
Township
First Class Metals
Sugar Cube Property
TMI &
Flight Lines
Date: 2023-03-06
Author: csalo
Office:
Drawing:
Scale: 1:25000
Projection: UTM Zone 16 (NAD 83)

Appendix III

Technical Report

Heliborne Magnetic and TDEM Survey

Sugar Cube Project, White River Area
Sault Ste. Marie Mining Division, Ontario, 2023

First Class Metals Canada Inc.
55 York Street
Toronto, ON
Canada, M5J 1R7

Prospectair Geosurveys

Dynamic Discovery Geoscience

Prepared by:
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February 2023

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Survey flown by :

PROSPECTAIR Geosurveys

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FIGURES

TABLES

I. INTRODUCTION

Prospectair conducted a heliborne magnetic (MAG) and time-domain electromagnetic (TDEM) survey for the mineral exploration company First Class Metals Canada Inc. on its Sugar Cube Property, located in the White River area, Sault Ste. Marie Mining Division, Province of Ontario (Figure 1). The survey was flown from January 19 to 24, 2023.

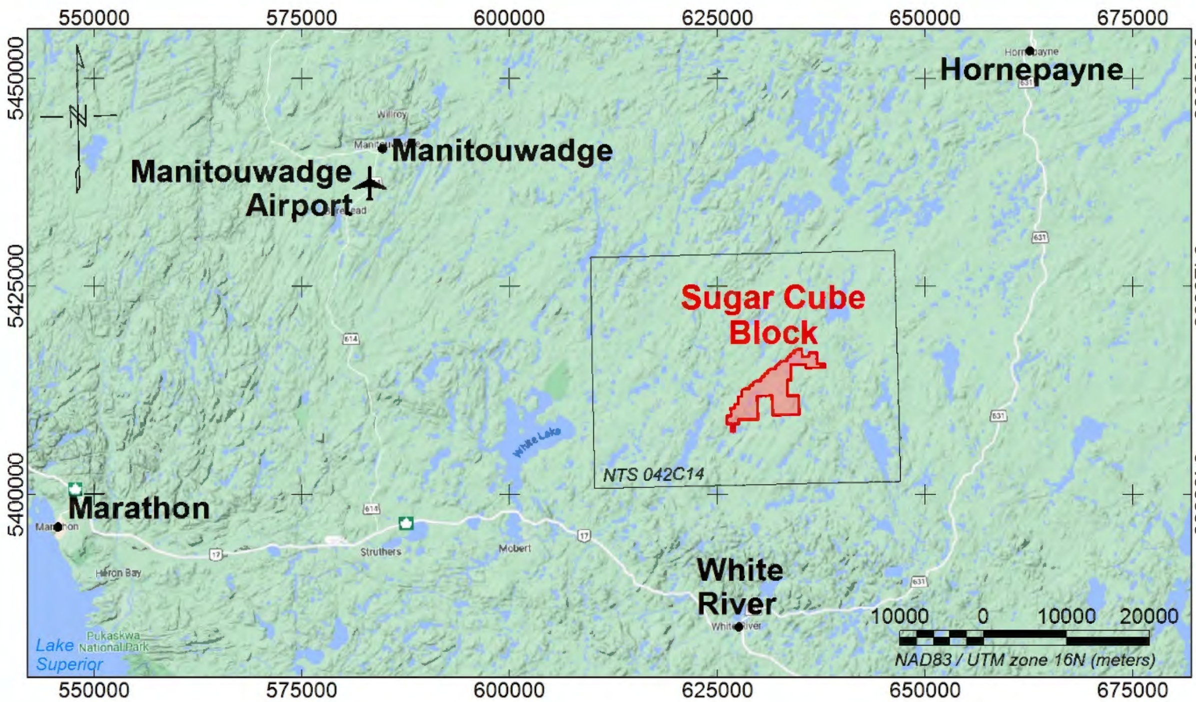
Figure 1: **General survey location**

One survey block was flown for a total of 408 l-km (Table 1). A total of 4 production flights were performed using Prospectair's Airbus H125, registration C-GATM. The helicopter and survey crew operated out of the Manitouwadge Airport, located about 55 km to the northwest of the block (Figure 2).

Table 1: **Survey block particulars**

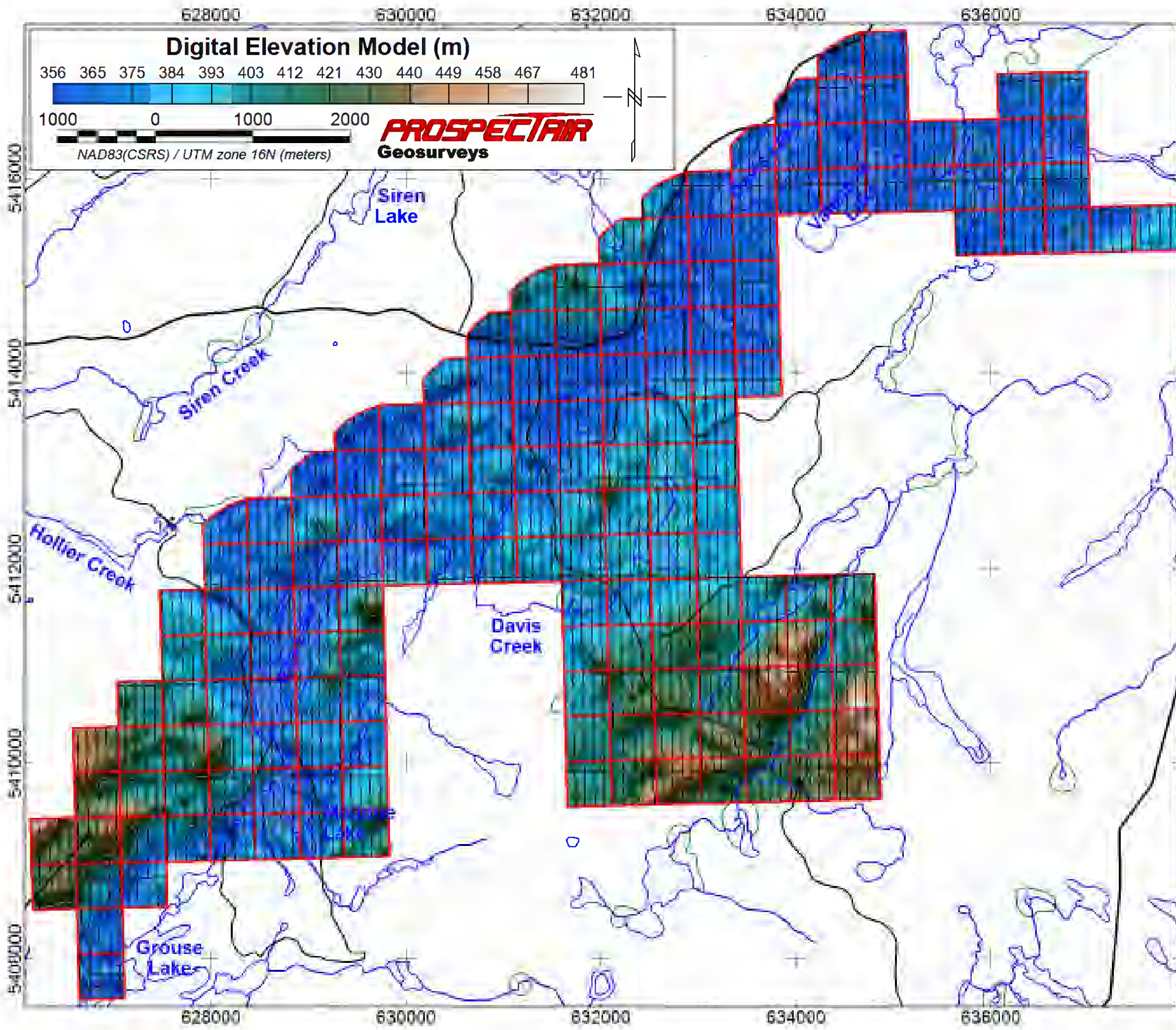
Block	NTS Mapsheets	Line-km flown	Flight numbers	Dates Flown
Sugar Cube	042C14	408 l-km	Flt 1 to 4	January 19 to 24

Figure 2: **Survey location and base of operation**



The Sugar Cube block was flown with traverse lines at 50 m spacing and control lines spaced every 500 m. The survey lines were oriented N000 and the control lines were oriented perpendicular to traverse lines. The nominal survey height for the MAG-TDEM survey was 85 m, but the active topography found locally resulted in an average height above ground of the helicopter of 86 m, with the mag sensor and receiver coil at 61 m, and the transmitter loop at 36 m above the ground. The average survey flying speed (calculated equivalent ground speed) was 32.0 m/s. The survey area is covered by forest, lakes and a few wetlands. The topography is mostly gently undulating, with a few low-level hills. The elevation is ranging from 356 to 481 m above mean sea level (MSL). Several small lakes are found within the block, such as the Magone, Rita, Davis and Valentine lakes. From the ground, the block can be easily accessed via secondary forestry roads connecting to the village of White River, located less than 30 km to the south of the block. Coordinates outlining the survey block are given in Appendix A, with respect to NAD-83 datum, UTM projection zone 16N. The location of the Sugar Cube Property claims covered by the survey (in red) and of the survey lines is shown on Figure 3. The Property claims numbers, as well as the approximate amount of line-km flown over each claim, are also listed in Appendix B.

Figure 3: **Survey lines and Sugar Cube Property claims covered by the survey**



II. SURVEY EQUIPMENT

Prospectair provided the following instrumentation for this survey.

Airborne Magnetometer

Geometrics G-822A

The heliborne system used a non-oriented (strap-down) optically-pumped Cesium split-beam sensor. These magnetometers have a sensitivity of 0.005 nT and a range of 15,000 to 100,000 nT with a sensor noise of less than 0.02 nT. The heliborne sensor was mounted in a bird made of non-magnetic material located 25 m below the helicopter when flying. Total magnetic field measurements were recorded at 10 Hz in the aircraft.

Time-Domain Electromagnetic Transmitter and Receiver

ProspecTEM

Prospectair Geosurveys significantly modified and improved the *Emosquito II* that was built by THEM Geophysics of Gatineau (Québec) to develop ProspecTEM. It is a powerful light-weight system adapted for small size helicopters and easy manoeuvrability enabling the system to be flown as close to the ground as safely possible and ensuring maximum data resolution. Advanced signal processing technique and a full processing package was developed in house to optimize the ProspecTEM data. The technical specifications are listed below in Table 2.

ProspecTEM system employs a transient or time-domain electromagnetic transmitter that drives an alternating current through an insulated electrical coil system. The towing bridle is constructed from a Kevlar rope and multi-paired shielded cables. It is attached to the helicopter by a weak link assembly. An onboard harness with outboard connectors mounted on a plate allows for quick disconnection or connection of the exterior elements. The system uses a 4 KW generator and a large condenser to transmit alternating 2.75-ms half sine pulses with intervening off-times of 13.916 ms electric pulse, 60 pulses per second.

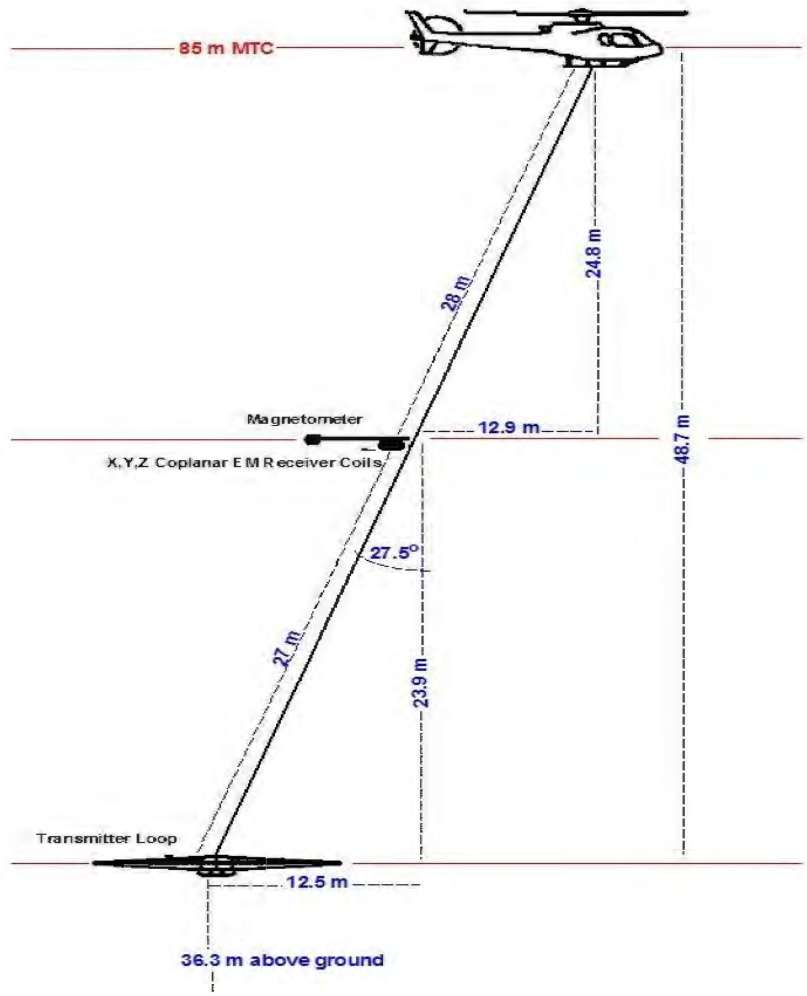
The current in the coil produces an electromagnetic field. Termination of the current flow is not instantaneous, but occurs over a very brief period of time (a few microseconds) known as the ramp time, during which the magnetic field is time-variant. The time-variant nature of the primary electromagnetic field, which propagates downward and outward into the subsurface, induces eddy currents which characteristics are governed by rocks conductivity distribution. These eddy currents generate a secondary electromagnetic field, in accordance with Faraday's Law. This secondary field immediately begins to decay in the process. Measurements of the secondary field are made only during the time-off period by a vertical component receiver located almost half way between the helicopter and the transmitter loop. It is placed with the magnetometer taped to a horizontal boom which supports the receiving coils tear-drop shape vessel at its end. The boom has an elastic suspension. A proprietary suspension system protects the orthogonal coils assembly and limits the total field excursions. The tear-drop vessel acts as a vane and maintains the mast in the line of flight.

Depth of investigation depends on the time interval after shutoff of the current, since at later times the receiver is sensing eddy currents at progressively greater depths. The intensity of the eddy currents at specific times and depths is determined by the bulk conductivity of subsurface rock units and their contained fluids.

Table 2: **Technical specifications of the ProspecTEM Time-Domain system**

Item	Specification
Transmitter:	
Loop Diameter:	5.6 meters
Current Waveform:	Half-Sine
Turns:	2
Pulse Length	2.75 ms
Frequency	30 Hz
Loop Area	25 m^2
Peak Current	3000A
Tow Cable Length	65 meters
Self-Powered	13HP Honda coupled with 28 Volts Alternator
Receiver:	
Coils axis	Z
Configuration	Coaxial (Z)
Two channels	Current and Z
Max Sampling rate	1000 points per half cycle at 90 Hz
Survey sampling rate	1000 per half cycle at 30Hz
Sampling	Full waveform
Gates	Programmable
On time signal	Recorded
Mechanical:	
Maximum survey speed:	120 km per hour
Transmitter height	30 meters AGL
Receiver height	55 meters
Weight (Total)	200 kg

Figure 4: **ProspecTEM system configuration**



Real-Time Differential GPS

Omnistar DGPS

Prospectair uses an OmniStar differential GPS navigation system to provide real-time guidance for the pilot and to position data to an absolute accuracy of better than 5 m. The *Omnistar* receiver provides real-time differential GPS for the IMPAC on-board navigation system. The differential correction data set was relayed to the helicopter via the appropriate Omnistar network satellite for the survey location. The receiver optimizes the corrections for the current location.

Airborne Navigation and Data Acquisition System

Nuvia IMPAC system

The airborne geophysical information system (IMPAC) is advanced, software driven instrument specifically designed for mobile aerial or ground geophysical survey work. The IMPAC instrumentation package includes a GPS based navigation system, real-time flight path information that is displayed over a map image of the area, and reliable data acquisition software. Thanks to simple interfacing, the radar and barometric altimeters, the TDEM system and the Geometrics magnetometer are easily integrated into the system and digitally recorded. Automatic synchronization to the GPS position and time provides very close correlation between data and geographical position. The IMPAC is equipped with a software suite allowing easy maintenance, upgrades, data QC, and project and survey area layout planning.

Magnetic Base Station

GEM GSM-19

A GEM GSM-19 Overhauser magnetometer, a computer workstation and a complement of spare parts and test equipment serve as the base station. Prospectair establish the base station in a secure location with low magnetic noise. The GSM-19 magnetometer has resolution of 0.01 nT, and 0.2 nT accuracy over its operating range of 20,000- to 100,000 nT. The ground system was recording magnetic data at 1 Hz.

Altimeters

Free Flight Radar Altimeter

The Free Flight radar altimeter measures height above ground to a resolution of 0.5 m and an accuracy of 5% over a range up to 2,500 ft. The radar altimeter data is recorded and sampled at 10 Hz.

Prospectair Digital Barometric Pressure Sensor

The barometric pressure sensor measures static pressure to an accuracy of ± 4 m and resolution of 2 m over a range up to 30,000 ft above sea level. The barometric altimeter data are sampled at 10 Hz.

Survey helicopter

Airbus H125 (registration C-GATM)

The survey was flown using Prospectair’s H125 helicopter that handles efficiently the equipment load and the required survey range. Table 3 presents the H125 technical specifications and capacity, and the aircraft is shown in Figure 5.

Table 3: **Technical specifications of the H125 Airbus helicopter**

Item	Specification
Powerplant	One 710kW (952shp) Safran Helicopter Arriel 2D
Rate of climb	1,959 ft/min
Cruise speed	260 km/h – 140 kts
Service ceiling	7,010 m
Range with no reserve	630 km
Empty weight	1,305 kg
Maximum takeoff weight	2,800 kg

Figure 5: **C-GATM Airbus H125**

III. SURVEY SPECIFICATIONS

Data Recording

The following parameters were recorded during the course of the survey:

In the helicopter:

- GPS positional data: time, latitude, longitude, altitude, heading and accuracy (PDOP) recorded at intervals of 0.1 s.
- Total magnetic field: recorded at intervals of 0.1 s.
- Terrain clearance as measured by the radar altimeter at intervals of 0.1 s.
- Z and Current TDEM channels at 90000Hz.

At the base and remote magnetic ground stations:

- Total magnetic field: recorded at intervals of 1 s.
- GPS time recorded every 1 s to synchronize with airborne data.

Technical Specifications

The data quality control was performed on a daily basis. The following technical specifications were adhered to:

- *Height* – 85m target terrain clearance for the MAG-TDEM survey except in areas where Transport Canada regulations prevent flying at this height, or as deemed necessary by the pilot to ensure safety. Traverse lines and control lines must be flown at the same altitude at points of intersection; the altitude tolerances are limited to no more than 30 m difference between traverse lines and control lines.
- *Airborne Magnetometer Data* - The noise envelope not to be exceeded 0.5 nT more than 500 m line-length without a reflight.
- *Diurnal Specifications* – A maximum tolerance of 5.0 nT (peak to peak) deviation from a long chord of one minute at the base station.
- *EM data* – No spikes on Z channel and constant current confirmed.
- *Flying Speed* – The average ground speed for the survey aircraft shall be 120 kph. The acceptable high limit is 160 kph over flat topography.
- *Radar Altimeter* – minimal accuracy of 5%, minimum range of 0-2500 m.
- *Barometer* – Absolute air pressure to 0.1 kPa.
- *Flight Path Following* – Maximum deviation of 30% of line spacing allowed over a maximum line distance of 300 m.

IV. SYSTEM TESTS

Magnetometer System Calibration

The survey configuration using a bird towed 25 m below any magnetic piece of the helicopter allows the simplification of the magnetic calibration requirement. Consequently, heading error and aircraft movement noise was considered negligible and no correction was applied to the data.

Instrumentation Lag

The data lag is a combination of two factors: 1) the time difference between when a reading is sensed, and when that value is recorded by the acquisition system, and 2) the time taken for the sensor to arrive at the location of the GPS antenna. The second factor is defined by the physical distance between the GPS antenna and any given sensor, and the speed of the aircraft. The total magnetic lag value for the IMPAC acquisition system has been calculated to 2.14 s for this survey. The TDEM lag has been calculated to 1.00 s.

V. FIELD OPERATIONS

The survey operations were conducted out of the Manitouwadge Airport from January 19 to 24, 2023. The MAG-TDEM data acquisition required 4 flights. At the end of each production day, the data were sent to Dynamic Discovery Geoscience's office via internet. The data were then checked for Quality Control to ensure they fulfilled contractual specifications. The full dataset was inspected prior to provide authorization for the field crew to demobilize. The GEM-19 magnetic base station was set up in a magnetically quiet area close to the airport, at latitude 49.0852306°N, longitude 85.8559741°W. The survey pilot was Lenka Tremblay and the survey system technician was Pascal St-Denis Mercier.

Figure 6: **Example of a magnetic base station setup**

VI. DIGITAL DATA COMPILATION

Data compilation including editing and filtering, quality control, and final data processing was performed by Joël Dubé, P.Eng. Processing was performed on high performance desktop computers optimized for quick daily QC and processing tasks. Geosoft software Oasis Montaj version 2022.1 and Matlab R2018a were used.

Magnetometer Data

The airborne magnetometer data, recorded at 10 Hz, were plotted and checked for spikes and noise on a flight basis. A 2.14 second lag correction was applied to all data to correct for the time delay between detection and recording of the airborne data.

Ground magnetometer data were recorded at 1 sample per second and interpolated by a spline function to 10 Hz to match airborne data. Data were inspected for cultural interference and edited where necessary. Some low-pass filtering was deemed necessary on the ground station magnetometer data to remove minor high frequency noise. The diurnal variations were removed by subtracting the ground magnetometer data from the airborne data and then adding back the average magnetic field value of the ground magnetometer.

The levelling corrections were applied in several steps. First, a correction for altitude was applied by multiplying the First Vertical Derivative of the pre-levelled data by the difference between the actual survey altitude and the average survey altitude. Standard levelling corrections were then performed using intersection statistics from traverse and tie lines. After statistical levelling was considered satisfactory, decorrugation was applied on the data to remove any remaining subtle non-geological features oriented in the direction of the traverse lines.

Once the Total Magnetic Intensity was gridded, its First Vertical Derivative and Second Vertical Derivative (SVD) were calculated to enhance narrow and shallow geological features. Finally, the component of the normal Earth's magnetic field, described by the International Geomagnetic Reference Field (IGRF), has been removed from the TMI to yield the residual TMI.

In order to enhance the subtle magnetic features some more, the Tilt Angle Derivative (TILT) was also computed for this project.

It has been shown that it is possible to use the Tilt Angle Derivative to estimate both the location and depth of magnetic sources (Salem et al., 2007).

When two bodies of different magnetic susceptibility are in contact, the vertical and horizontal gradients along a horizontal line perpendicular to the vertical contact are governed by the following equations:

$\delta M/\delta h=2KFc(z_c/(h^2+z_c^2))$
$\delta M/\delta z=2KFc(h/(h^2+z_c^2))$

where
K = susceptibility contrast
F = magnetic field's strength
c = $1-\cos^2$(field Inclination)$\sin^2$(field Declination)
h = location along an horizontal axis perpendicular to the contact
z_c = contact depth
$\delta M/\delta h = \mathrm{sqrt}((\delta M/\delta x)^2+(\delta M/\delta y)^2)$

The Tilt Angle (θ) is defined as
$\theta = \tan^{-1}[(\delta M/\delta z)/(\delta M/\delta h]$

By substitution of the gradients we get
$\theta = \tan^{-1} [h/z_c]$

This has two main implications for any given anomaly:

1- The 0° angle line is located directly above the contact between a magnetic source and the surrounding rock. This allows for accurate estimation of source location.
2- The distance between the 0° and the +45° lines as well as the distance between the -45° and the 0° lines are equal to the depth of the source at the contact. This allows for a direct estimation of the depth of the source of the anomaly. The depth estimated with this method is actually the distance between the magnetic sensor and the top of the source. Knowing that the sensor was 61 m above the ground in average enables direct depth estimates.

In practice, the signal originating from multiple sources at different depth within a same area will cause convolution of the Tilt Angle values, and complicate location and depth estimation. Nevertheless, the method remains an excellent tool for rapid assessment of sources characteristics, without the need for complex assumptions to be made or heavy computer requirements, as is the case with 3D Euler deconvolution or 3D data inversions.

Radar Altimeter Data
The terrain clearance measured by the radar altimeter in metres was recorded at 10 Hz. The data were filtered to remove high frequency noise using a 1 sec low pass filter. The final data were plotted and inspected for quality.

Positional Data
Real time DGPS correction provided by Omnistar was applied to the recorded GPS positional data.

Positional data (Lat, long, UTM X, UTM Y, geoid height) were recorded at 10 Hz sampling rate and all data processing was performed in the WGS-84 datum. The delivered data are provided in X, Y locations in UTM projection zone 16 North, with respect to the NAD-83 (CSRS) datum. Altitude data were initially recorded relative to the GRS-80 ellipsoid, but are delivered as orthometric heights (MSL elevation).

Terrain Data
Terrain elevation data (also referred to as digital elevation model, or DEM) are computed from the altitude of the helicopter, given by DGPS recordings, and the radar altimeter data.

TDEM Data
The PicoEnvirotec EM Digital Acquisition System records the vertical component (Z) of the receiver coils at a sampling rate of 90000Hz. There are 30 full cycles (60 half cycles) of the full waveform (Tx ON and OFF time) every second.

The first data manipulation involves a stacking procedure where each half cycle is weighted with respect to the previous cycle (±¼), the next cycle (±¼) and its own value (±½). The positive and negative signs of the respective multiplication coefficients are used to make positive all negative half cycles. The next step is the half cycle averaging corresponding to the desired sampling rate. In the present case, from the 60 stacked positive half cycles per second, 6 consecutive half cycles are averaged to produce one sample every 0.1 sec.

The windowing settings for the 40 different channels are presented in Table 4. Channels 1 to 11 correspond to the ON-time measurements and channels 12 to 40 correspond to the OFF-time. Channel 12 isn't used for interpretation and mapping as some 'ramp-off' effects remain that alters the data quality. Each window is filtered with a median filter removing spikes and with a finite impulse response (FIR) selective filter of the 251th order improving the signal to noise ratio. An average lag correction of 0.85 sec was applied to the data after being empirically determined by flying a sharp anomaly in opposite directions.

Table 4: **Setting used in the windowing of the full waveform**

Channel #	Starting time (msec)	Width (msec)	Pulse	Channel #	Starting time (msec)	Width (msec)	Pulse
1	0.16667	0.01667	**ON**	**21**	3.15000	0.53333	**OFF**
2	0.25000	0.01667	**ON**	**22**	3.26667	0.53333	**OFF**
3	0.33333	0.01667	**ON**	**23**	3.40000	0.53333	**OFF**
4	1.30000	0.01667	**ON**	**24**	3.40000	1.10000	**OFF**
5	1.31667	0.01667	**ON**	**25**	3.45000	1.10000	**OFF**
6	1.33333	0.01667	**ON**	**26**	3.65000	1.10000	**OFF**
7	2.58333	0.01667	**ON**	**27**	3.88333	1.10000	**OFF**
8	2.66667	0.01667	**ON**	**28**	4.13333	1.10000	**OFF**
9	2.80000	0.08333	**ON**	**29**	4.43333	1.10000	**OFF**
10	2.81667	0.08333	**ON**	**30**	4.76667	1.10000	**OFF**
11	2.83333	0.08333	**ON**	**31**	5.16667	1.10000	**OFF**
12	2.85000	0.16667	**RAMP**	**32**	5.20000	2.20000	**OFF**
13	2.86667	0.18333	**OFF**	**33**	5.55000	2.20000	**OFF**
14	2.86667	0.25000	**OFF**	**34**	6.13333	2.20000	**OFF**
15	2.86667	0.36667	**OFF**	**35**	6.78333	2.20000	**OFF**
16	2.91667	0.36667	**OFF**	**36**	7.51667	2.20000	**OFF**
17	2.91667	0.53333	**OFF**	**37**	8.36667	2.20000	**OFF**
18	2.95000	0.53333	**OFF**	**38**	9.33333	2.20000	**OFF**
19	3.00000	0.53333	**OFF**	**39**	10.4500	2.20000	**OFF**
20	3.03333	0.53333	**OFF**	**40**	11.7000	2.20000	**OFF**

As for the magnetic data, levelling corrections were applied to the TDEM data using intersection statistics from traverse and tie lines, as well as light decorrugation based on gridded information, in order to remove base line offsets. The levelled TDEM data are delivered in the database.

Gridding

The magnetic, early off-time TDEM (channel 13), mid off-time TDEM (channel 20), and late off-time TDEM (channel 27) data were interpolated onto a regular grid using a bi-directional gridding algorithm to create a two-dimensional grid equally incremented in x and y directions.

The final grids were created with a 20 m grid cell size, appropriate for the survey lines spaced at 100 m. Traverse lines were used in the gridding process.

VII. RESULTS AND DISCUSSION

Magnetic data

The Residual Total Magnetic Intensity (TMI) of the Sugar Cube block, presented in Figure 7 together with TDEM anomalies, is relatively settled and varies over a range of 482 nT, with an average of -18 nT and a standard deviation of 57 nT.

The area depicts several magnetic domains with low background values and settled signal variations mostly consisting in low amplitude anomalies. This is characteristic of areas dominated by meta-sedimentary or intermediate to felsic intrusive rocks. A number of slightly stronger magnetic anomalies, occurring either in compact or linear shapes, are found locally and could pertain to intermediate/mafic intrusive rocks or meta-volcano-sedimentary horizons enriched in magnetic minerals. Stronger anomalies are associated to linear features likely related to mafic dykes, but the strongest anomaly of the survey rather consists in a discrete and compact feature, oriented E-W and located at the northeast end of the block. Stronger anomalies are best seen on Figure 8 which shows the residual TMI data with a linear color distribution.

Magnetic lineaments are very variable in strike in the area. The main family of lineaments is trending NW-SE and consists in very straight anomalies extending over long distances. These are most likely associated to Matachewan dykes, which are very common in the area. There are also a number of isolated lineaments striking at different angles, some varying from N-S to NNE-SSW and others rather trending E-W to ENE-WSW. There are a few instances of curved magnetic lineaments, possibly indicative of intrusions' internal structures or outlines, or of deformation structures which could be of interest for exploration. In general terms, magnetic lineaments are related to rock formations that are enriched in magnetic minerals (magnetite and/or pyrrhotite).

Throughout the block, it is possible to detect structural features offsetting observed magnetic lineaments and causing abrupt interruption or changes of the magnetic response. These features are typically caused by faults, fractures and shear zones. If they are thought to be favorable structures in the exploration context of the Sugar Cube project, they should be paid particular attention and should be the object of a comprehensive structural interpretation, which is beyond the scope of this report.

Shorter wavelength anomalies are greatly enhanced on the FVD (Figure 9) and on the TILT (Figure 10) products. Since the FVD attenuates longer wavelength anomalies, and the TILT enhances very weak amplitude anomalies, they are the preferred products for structural interpretation. As well, a joint analysis of these results with the topography data (Figure 11) can help in the interpretation process of geological structures.

Figure 7: **Total magnetic intensity with equal area color distribution**

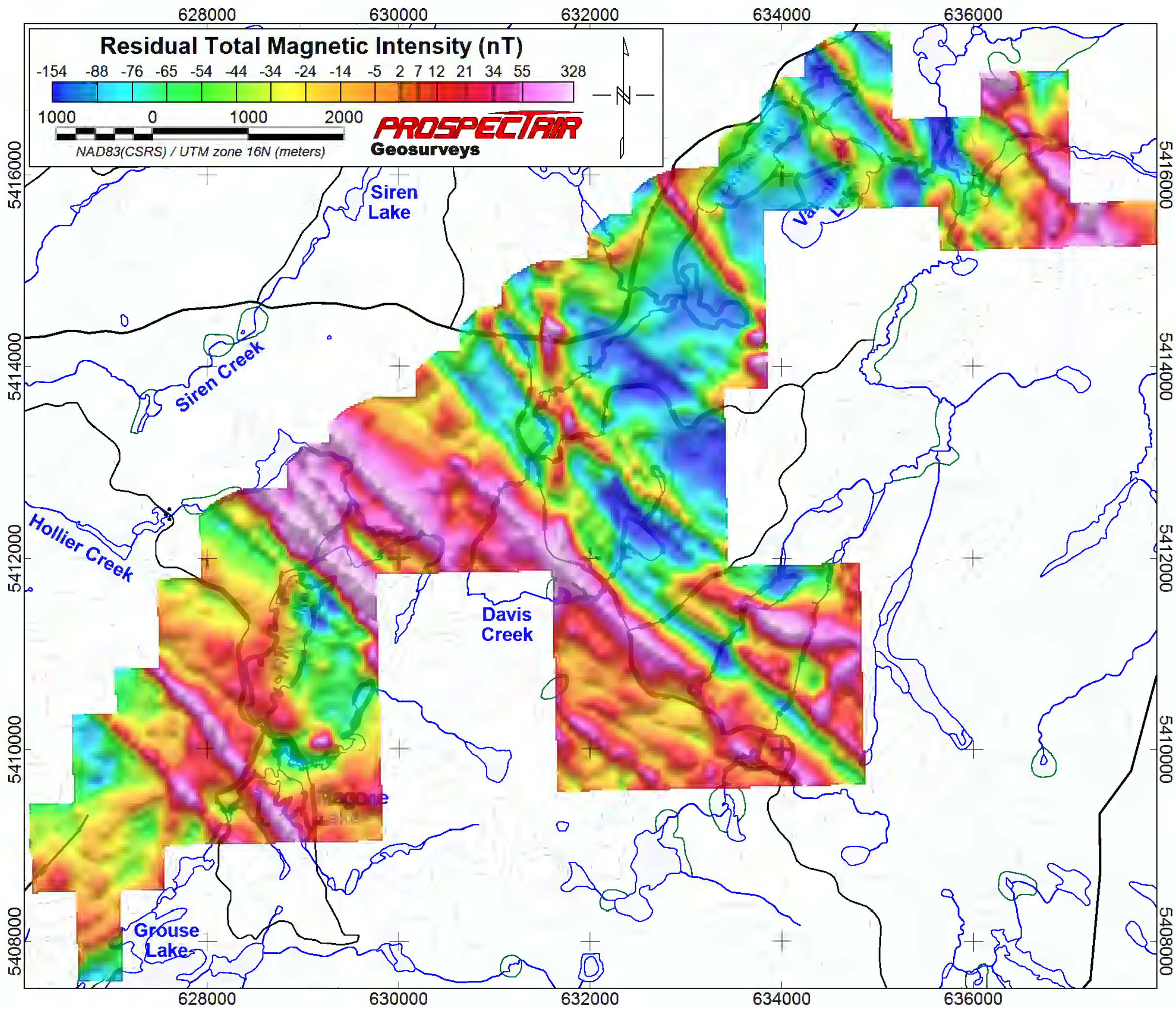


Figure 8: **Total magnetic intensity with linear color distribution**

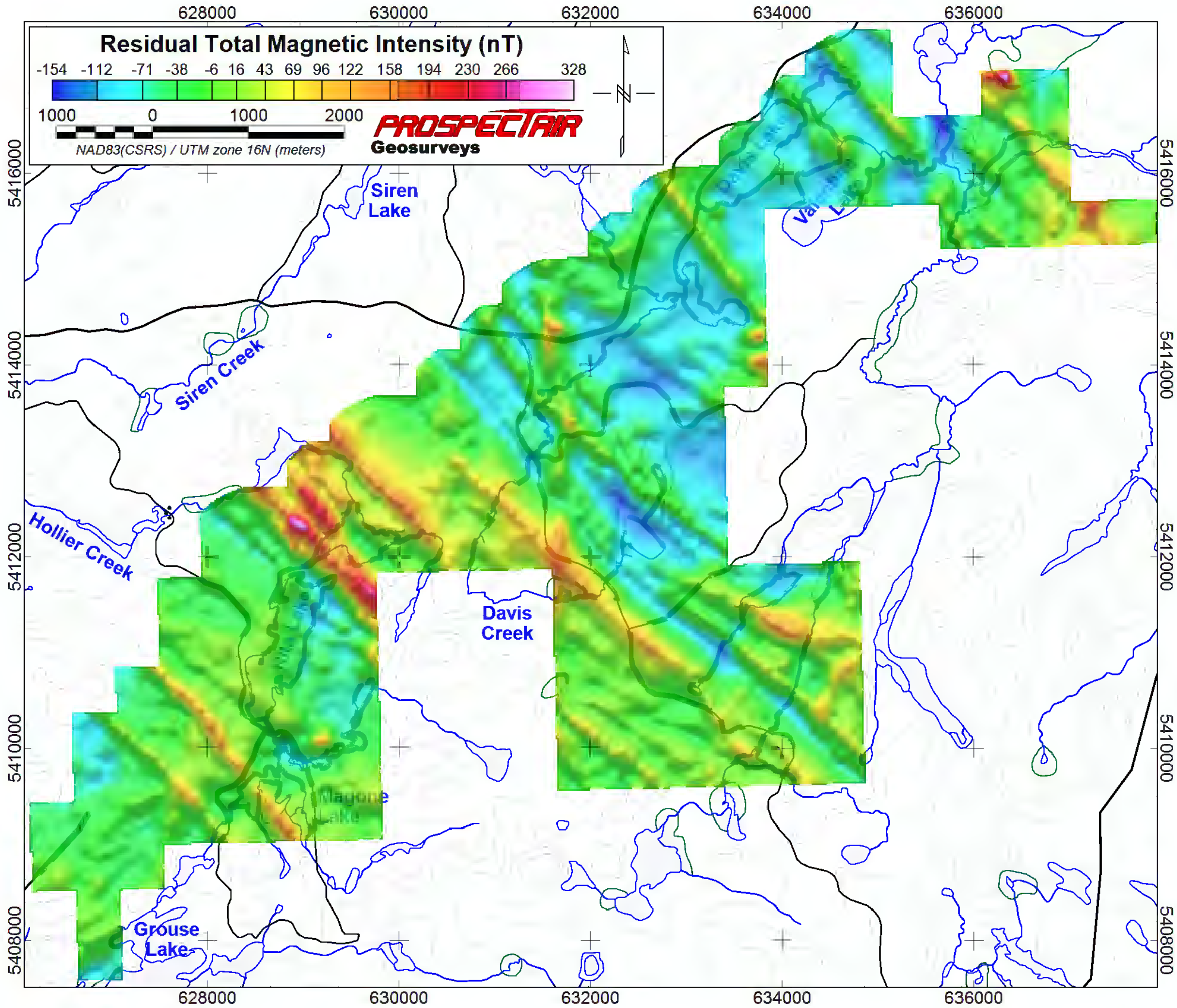


Figure 9: **First vertical derivative of TMI**

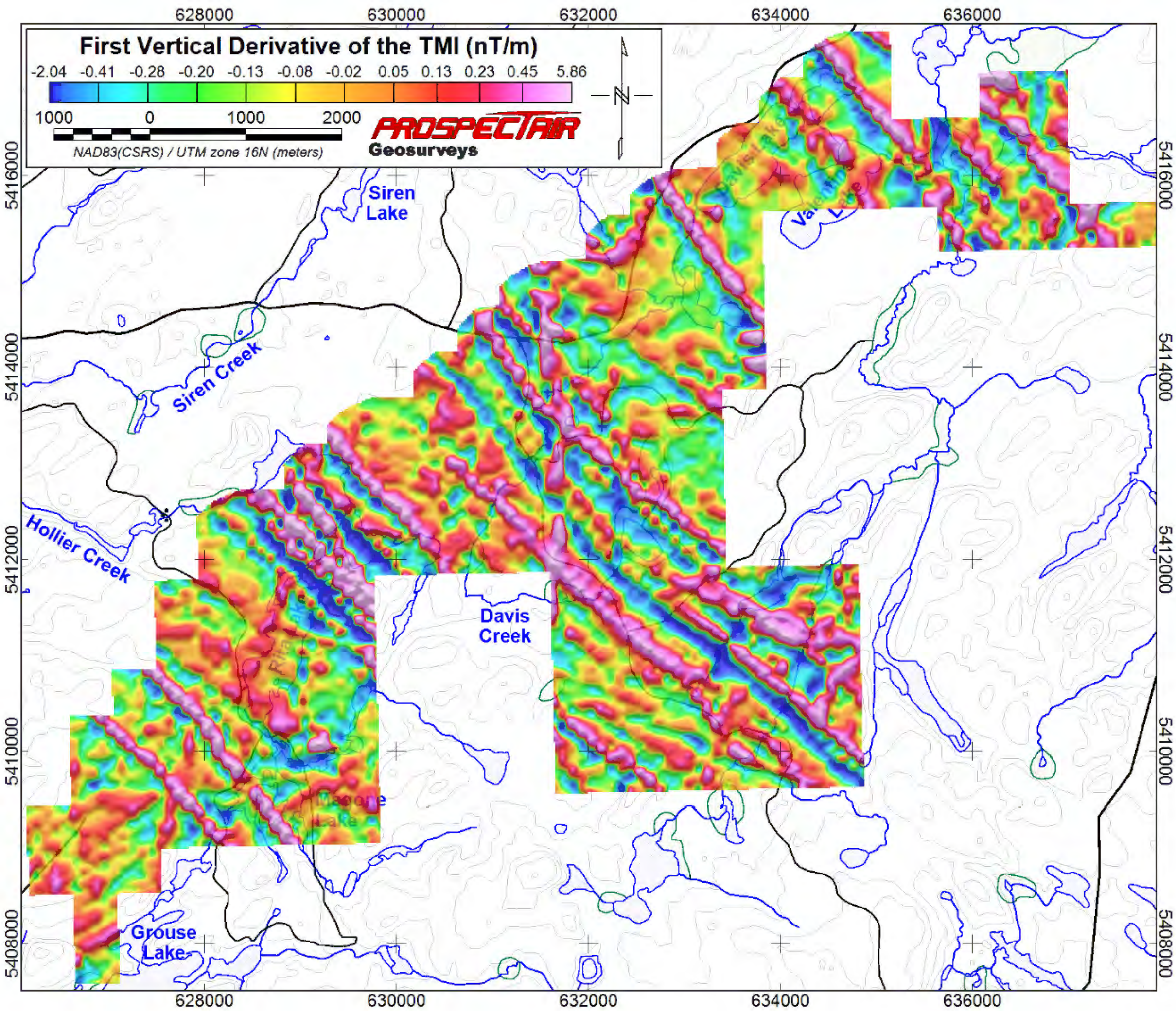


Figure 10: **Magnetic tilt angle derivative**

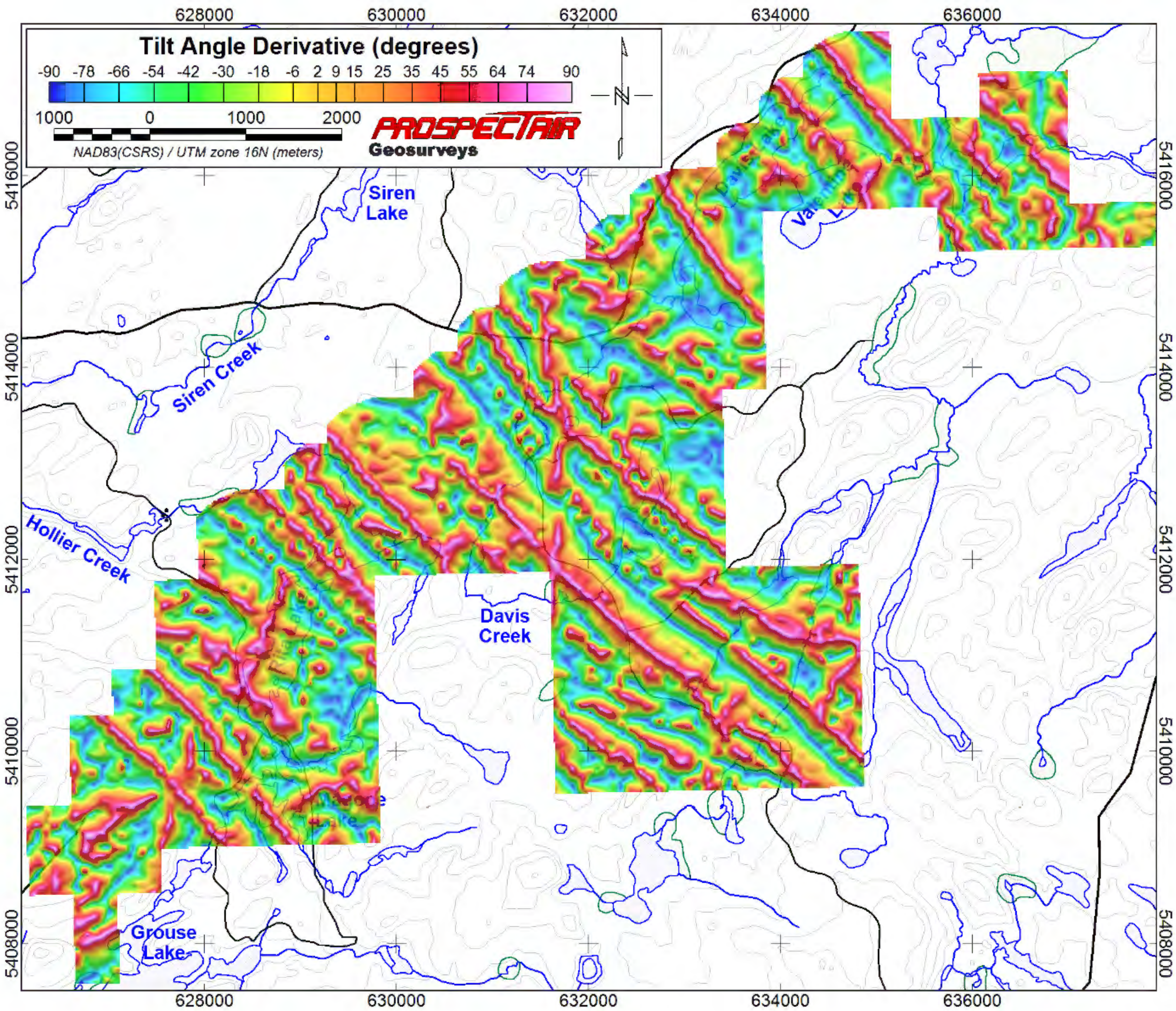
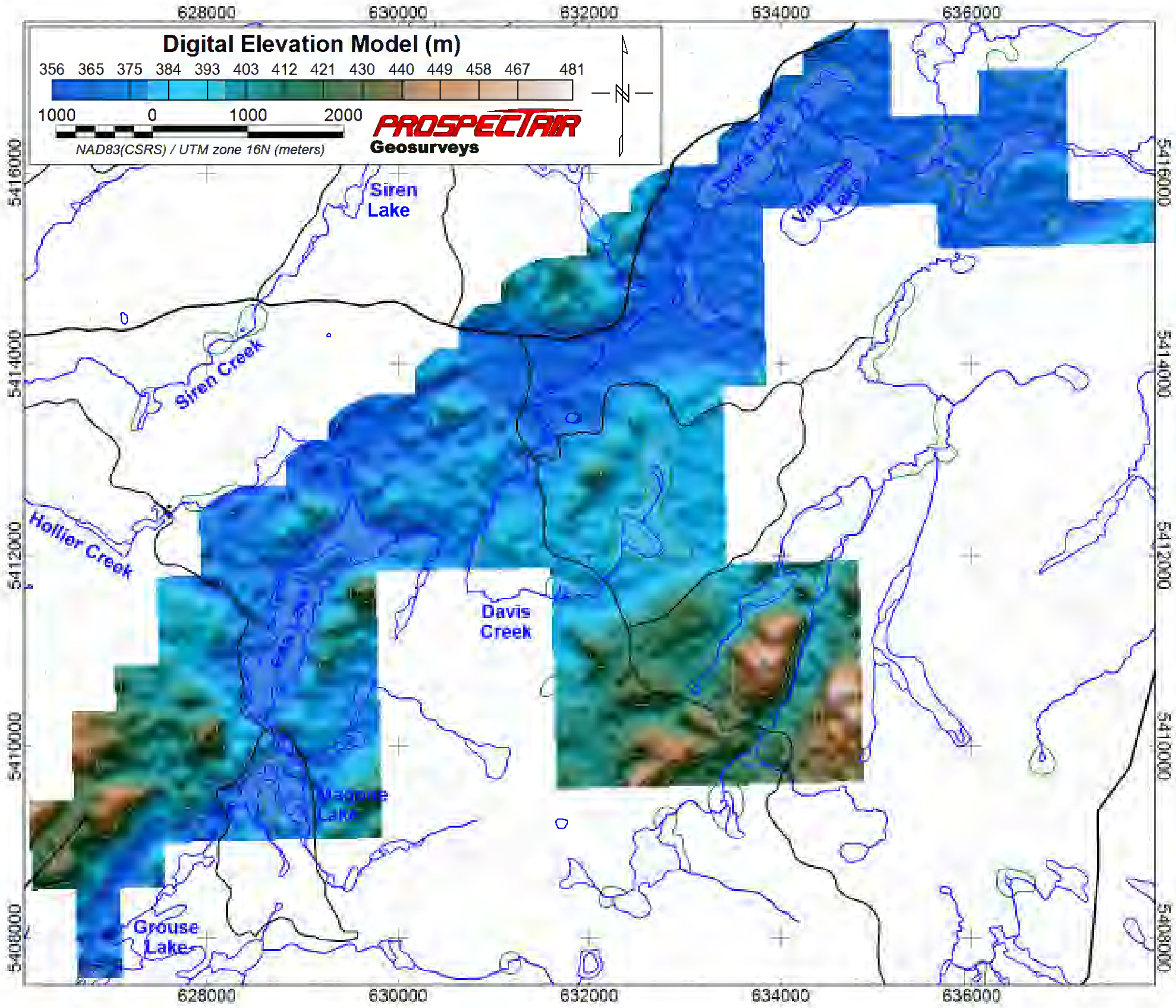


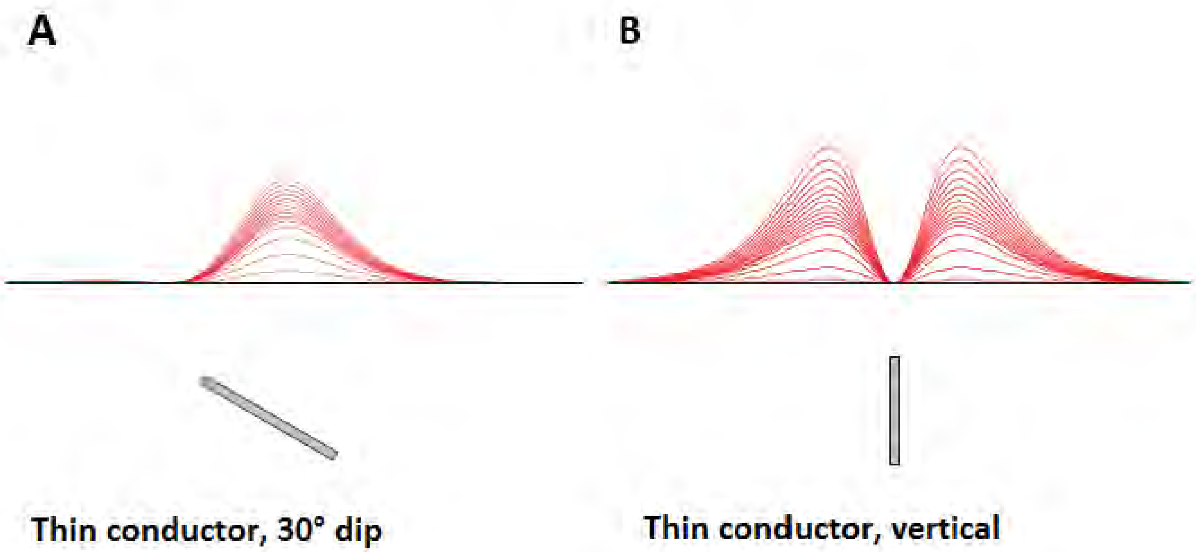
Figure 11: **Digital elevation model**



Time-Domain Electromagnetic data

There is no automatic picking program involved in the interpretation procedures of the ProspecTEM system. Identification of the EM anomalies is made from the EM profiles. Most of the time, the location of anomalies is based on the assumption that the causative source is a somewhat thick or flat lying conductor, which would generate an anomaly mostly centered over the conductor (Figure 12, A). It is important to understand that some other conductive bodies could generate a strong EM response that is offset from the mass centre of the source. For instance, a thin conductor with a steep dip would generate an "M" shape anomaly (Figure 12, B), with the stronger shoulder on the dip side. Therefore, caution must be taken when planning work at the location of an anomaly. It is recommended to combine other available geoscientific information and to review the EM anomaly location before to investigate an anomaly of interest.

Figure 12: **Example of EM response over thin conductors**

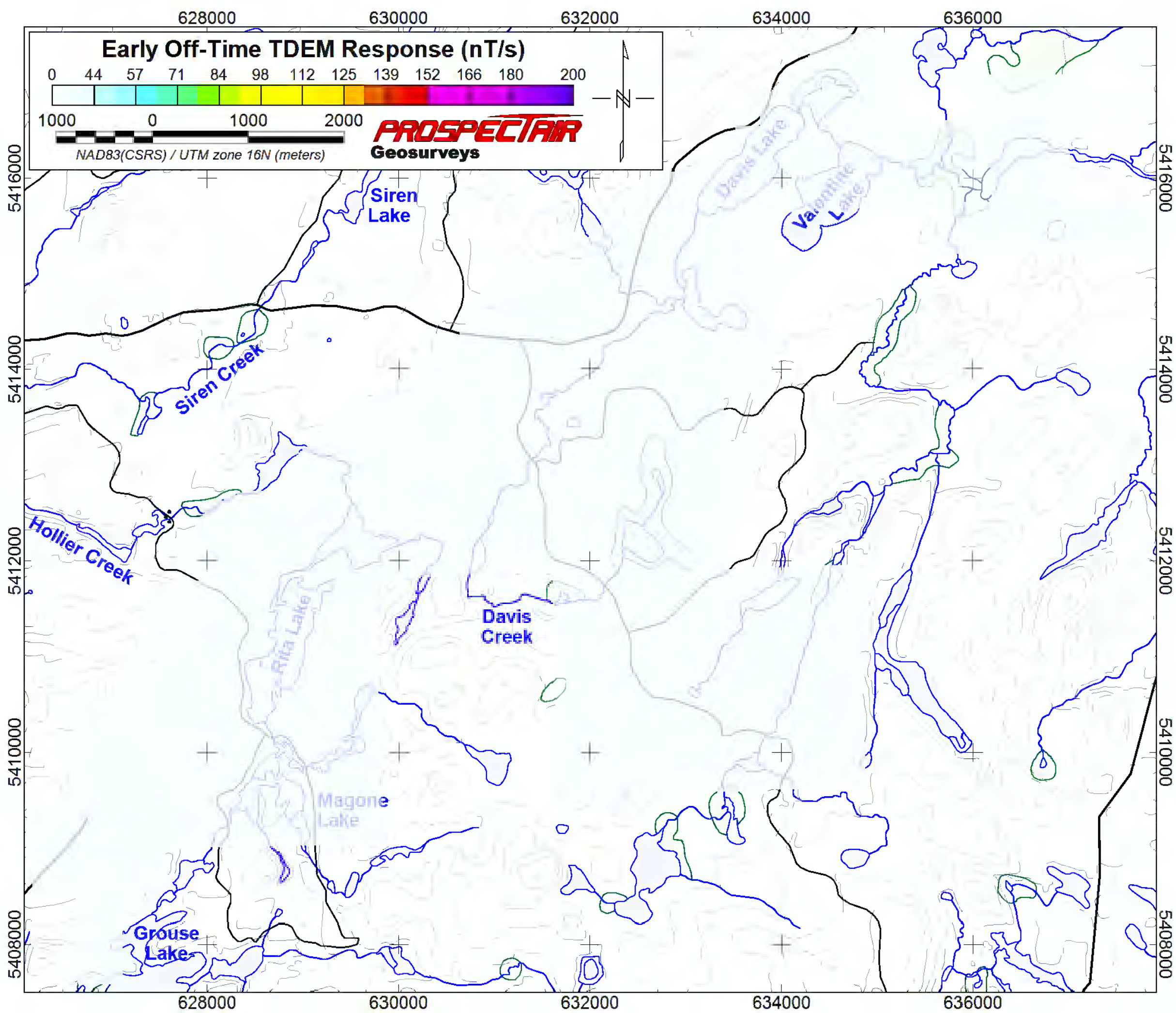


The classification of anomalies is based on the calculated time constant (TAU). The EM time constant is a general measure of the speed of decay of the electromagnetic response and reflects the "conductance quality" of a source. The decay rate of the secondary EM field recorded by the TDEM system is a function of the conductivity and geometry of conductors detected. A weak conductor, such as shallow conductive overburden, will show rapid response decay, thus a small value of the time constant. Conversely, a good conductor, such as a graphite or sulphide orebody, will have a response decaying slowly, relating to a large TAU value. The TAU is calculated using proprietary software and is derived from the best exponential least squares fit for channels Z13 to Z27. Calculating TAU for low amplitude anomalies that have their first off-time channel (channel 13) amplitude smaller than 75 nT/s can yield unreliable results given the weak response. As well, in some rare cases, despite stronger response of the first off-time channel, noise in the mid to late channels can cause the TAU estimation to be unreliable. No best fit were tried on these noisy or low signal anomalies and an arbitrary minimal time constant of 0.10 msec was attributed. Moreover, the resulting exponential best fit of the decay curve is extrapolated to the zero-delay time, which can be used to compare the amplitude of anomalies.

On the Sugar Cube block, all TDEM responses have been very close to zero and have never exceeded the expected noise envelope of the system. As a result, no TDEM anomalies have been identified by this survey. This can be seen on the early off-time map and figure (Figure 13) which uses a standard colour bar for the TDEM data from this system.

As general remarks, it is important to point that the TDEM response amplitude is governed by three main factors: the conductivity of the source, the volume of the conductive source, and the distance between the source and the TDEM sensor. The connectivity between the conductive minerals at the same dimensional scale as the survey system apparatus is also critical for a source to be detectable by a TDEM system such as the one employed for this survey. As a result, mostly disseminated or discontinuous mineralized occurrences possibly located within the Property are not necessarily responding to EM techniques, and would be better assessed by ground-based resistivity/IP methods.

Figure 13: **Early off-time TDEM response**



VIII. WORK RECOMMENDATION

The discussion on the geological implication of the survey data is minimal in this report. A more general study including information regarding the local geology and all other geoscience data available in the area would be necessary to extract the full potential of the geophysical data and help to confirm and prioritize exploration targets.

From a geophysical point of view, given the lack of EM responses detected within the Property, and since the geological context may be considered prospective for non-conductive mineralization, it is recommended to use the newly acquired magnetic data, together with known local geological information, to carry out a comprehensive geophysical and structural interpretation to guide ground investigations. If interesting results are obtained, or if overburden thickness prevents proper ground follow-up, it is recommended to use the resistivity/IP technique to conduct exploration and eventually to accurately define drilling targets. This technique has been proven to detect disseminated sulphides associated to gold and other deposit types.

IX. FINAL PRODUCTS

Digital line data

The Geosoft database is provided with the channels detailed in Table 5.

Table 5: **MAG-TDEM line data channels**

No.	Name	Description	Units
1	UTM_X	UTM Easting, NAD-83, Zone 16N	m
2	UTM_Y	UTM Northing, NAD-83, Zone 16N	m
3	Lat_deg	Latitude in decimal degrees (WGS-84)	Deg
4	Long_deg	Longitude in decimal degrees (WGS-84)	Deg
5	GPS_Z	Helicopter altitude (w.r.t. MSL)	m
6	Gtm_sec	Second since midnight GMT	Sec
7	Radar	Ground clearance given by the radar altimeter	m
8	Terrain	Digital Elevation Model calculated from GPS and Radar	m
9	Mag_Raw	Raw magnetic data	nT
10	Mag_Lag	Lagged magnetic data	nT
11	Gnd_mag	Base station magnetic data	nT
12	Mag_Cor	Magnetic data corrected for diurnal variation	nT
13	TMI	Fully levelled Total Magnetic Intensity	nT
14	TMIres	Residual TMI (IGRF removed)	nT
15	OFF_TIME	Amplitude of Off-time channels (13 to 36)	nT/s

Maps

All maps are referenced to NAD-83 in the UTM projection Zone 16 North, with coordinates in metres. Maps are at a 1:15,000 scale. They are provided in PDF, PNG, Geotiff and Geosoft MAP formats for the products detailed in Table 6.

Table 6: **Maps delivered**

No.	Name	Description
1	DEM+FlightPath_Claims	Digital Elevation Model with flight path and properties claims
2	TMI	Residual Total Magnetic Intensity
3	FVD	First Vertical Derivative of the TMI
4	TILT	Tilt Angle Derivative of the TMI
5	Early_OffTime	Early_Off-Time TDEM response (Channel 13)
6	TDEM_Profiles+Anomalies	TDEM profiles with anomalies

Grids

All grids are referenced to NAD-83 in the UTM projection Zone 16 North, with coordinates in metres. Grids are provided in Geosoft GRD format, with a 20 m grid cell size, as well as in the Geotiff format for the products listed in Table 7.

Table 7: **Grids delivered**

No.	Name	Description	Units
1	TERRAIN	Digital Elevation Model measured by helicopter	m
2	TMI	Total Magnetic Intensity	nT
3	FVD	First Vertical Derivative of TMI	nT/m
4	SVD	Second Vertical Derivative of TMI	nT/m^2
5	TMIres	Residual TMI (IGRF removed)	nT
6	TILT	Tilt Angle Derivative of the TMI	Degree
7	Early_Off-Time	Early Off-Time TDEM response (Channel 13)	nT/s
8	Mid_Off-Time	Mid Off-Time TDEM response (Channel 20)	nT/s
9	Late_Off-Time	Late Off-Time TDEM response (Channel 27)	nT/s

Project report

The report is submitted in PDF format. The anomaly table presented in annex is also provided as a separate Excel spreadsheet.

Respectfully submitted,

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Joël Dubé, P.Eng.
February 24, 2023

X. Statement of Qualifications

Joël Dubé
7977 Décarie Drive
Ottawa, ON, Canada, K1C 3K3

Phone: 819.598.8486
E-mail: jdube@ddgeoscience.ca

I, Joël Dubé, P.Eng., do hereby certify that:

1. I am a Professional Engineer specialized in geophysics, President of Dynamic Discovery Geoscience Ltd., registered in Canada.

2. I earned a Bachelor of Engineering in Geological Engineering in 1999 from the École Polytechnique de Montréal.

3. I am an Engineer registered with the Ordre des Ingénieurs du Québec, No. 122937, and a Professional Engineer with Professional Engineers Ontario, No. 100194954 (CofA No. 100219617), with the Association of Professional Engineers and Geoscientists of New Brunswick, No. L5202 (CofA No. F1853), with the Association of Professional Engineers of Nova Scotia, No. 11915 (CofC No. 51099), with Engineers Geoscientists Manitoba, No. 43414. (CofA No. 6897), with Professional Engineers & Geoscientists Newfoundland & Labrador, No. 10012 (PtoP No. N1134) and with the Northwest Territories and Nunavut Association of Professional Engineers & Geoscientists, No. L4447 (PtoP No. P1414).

4. I have practised my profession for 23 years in exploration geophysics.

5. I have not received and do not expect to receive a direct or indirect interest in the properties covered by this report.

Dated this 24th day of February, 2023

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Joël Dubé, P.Eng. #100194954

XI. Appendix A – Survey block outline

Sugar Cube Block

Easting	Northing
627113	5407593
626649	5407583
626628	5408509
626169	5408499
626148	5409430
626607	5409440
626586	5410367
627044	5410377
627034	5410840
627492	5410851
627471	5411777
627930	5411788
627915	5412447
628021	5412554
628185	5412652
628372	5412724
628825	5412735
628819	5412998
628898	5413078
629049	5413204
629273	5413209
629269	5413401
629377	5413511
629540	5413608
629733	5413683
630179	5413693
630173	5413955
630253	5414037
630393	5414162
630627	5414167
630622	5414396
630707	5414501
630858	5414636
631074	5414641
631069	5414837
631174	5414946
631339	5415044
631521	5415115
631980	5415126
631974	5415390
632053	5415470
632201	5415594
632426	5415600

632422	5415693
632421	5415791
632528	5415901
632609	5415956
632694	5416000
632888	5416074
633332	5416085
633330	5416349
633407	5416430
633545	5416553
633779	5416559
633774	5416788
633860	5416895
634008	5417028
634226	5417033
634222	5417232
634325	5417340
634490	5417440
634661	5417507
635136	5417518
635159	5416592
636070	5416614
636059	5417077
636980	5417100
637014	5415711
637928	5415733
637940	5415265
635646	5415209
635635	5415672
633807	5415628
633851	5413775
633393	5413764
633437	5411916
634813	5411950
634869	5409629
631653	5409552
631598	5411868
629769	5411825
629834	5409046
627540	5408993
627550	5408530
627092	5408520

XII. Appendix B – Property claims covered by the survey

Tenure number	Holder	l-km within claim
642914	(100) First Class Metals Canada Inc.	1.800
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