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ZEN GEOMAP INC.

Assessment Report

Drone Magnetic Survey

Shine Property

Churchill Township

Larder Lake Mining Division

Prepared for:

Great Lakes Nickel Limited

Prepared by:

Kevin Cool – Technical Report

Matthew Johnston, P. Geo. – Geophysical Maps and Interpretation

Mining Claims:

566284, 561419, 561420, 566283, 566285, 561421, 561422, 566282,

561423, 561424, 566281, 566280, 561425, 561426, 566279, 566278

December 3, 2021

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1.0 Introduction

The Great Lakes Nickel, ***Shine Property*** consists of a contiguous group of 16 Active Mining Claims. This report covers a drone magnetic survey carried out across **10** of the Active Mining Claims.

A drone magnetic survey was conducted on a portion of ***Shine Property*** (see ***Figure 2***).
Mining claims covered by this survey are located in Churchill Township, Larder Lake Mining Division. ***Table 1*** includes a list of mining claims, including the work value completed on each claim.

On November 29th , 2021 the mining claims were surveyed using a Geometrics MFAM magnetometer mounted on a DJI M600 drone. Zen Geomap of Timmins, Ontario, carried out the magnetic survey on a contract basis for the client. The survey was performed to evaluate bedrock structure related to gold exploration within the survey grid area.

Data processing and maps were completed between November 29 and December 2, 2021 and the assessment report was prepared between November 27, 2021 and December 3, 2021.

2.0 Location and Access

The property is accessed by travelling west along Hwy 101 from Timmins and South on Hwy 144, for 140km to the intersection of Hwy 560 (locally known as the Watershed), then 35km east along Hwy 560 to the intersection of a main logging road, then 25km north–northeast along the logging road to the Shine Property. The total driving distance from Timmins to the property is 200km.

Figure 1 shows location and access.

		($)	(sq. m)			($)
	Anniversary	Work	Area	Area	Area %	Work
Claim #	Date	Required	Surveyed	Notes	of Total	Completed
566284	2021-12-09	400	166820	Portion of cell surveyed	12.31	1311
561419	2022-10-07	400	208003	Portion of cell surveyed	15.34	1634
561420	2022-10-07	400	201415	Portion of cell surveyed	14.86	1582
566283	2021-12-09	400	126578	Portion of cell surveyed	9.34	994
566285	2021-12-09	400	131500	Portion of cell surveyed	9.70	1033
561421	2022-10-07	400	217485	Full cell surveyed	16.04	1709
561422	2022-10-07	400	216751	Portion of cell surveyed	15.99	1703
566282	2021-12-09	400	28590	Portion of cell surveyed	2.11	225
561423	2022-10-07	400	16501	Portion of cell surveyed	1.22	130
561424	2022-10-07	400	41971	Portion of cell surveyed	3.10	330
566281	2021-12-09	400	0	Not Surveyed	0.00	0
566280	2021-12-09	400	0	Not Surveyed	0.00	0
561425	2022-10-07	400	0	Not Surveyed	0.00	0
561426	2022-10-07	400	0	Not Surveyed	0.00	0
566279	2021-12-09	400	0	Not Surveyed	0.00	0
566278	2021-12-09	400	0	Not Surveyed	0.00	0
			1355614	Total Area Surveyed on Active Mining Claims	**100.00**	**10650**
			10650	Total Survey Cost (not including HST)		

Table 1

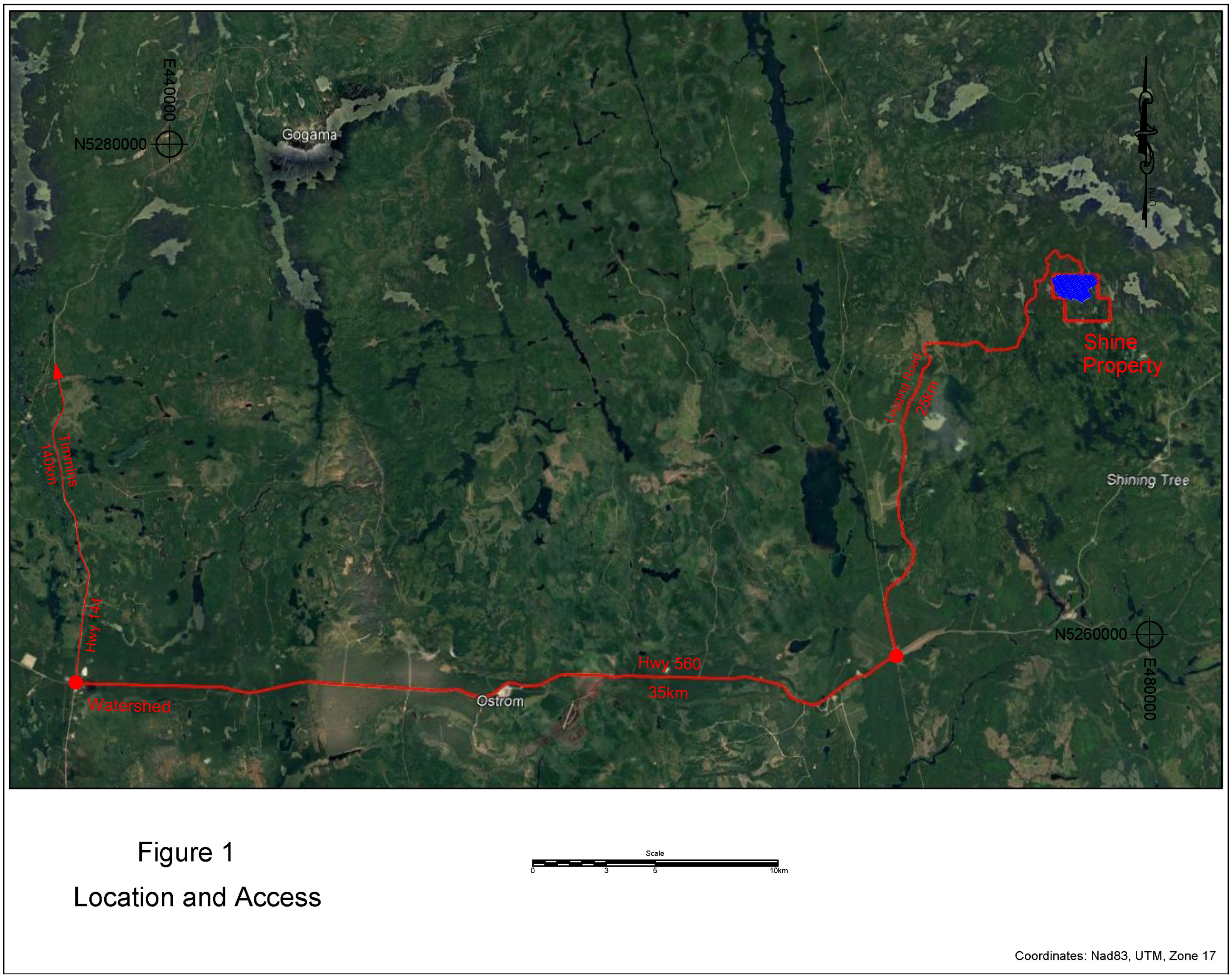


Figure 1 – Location and Access

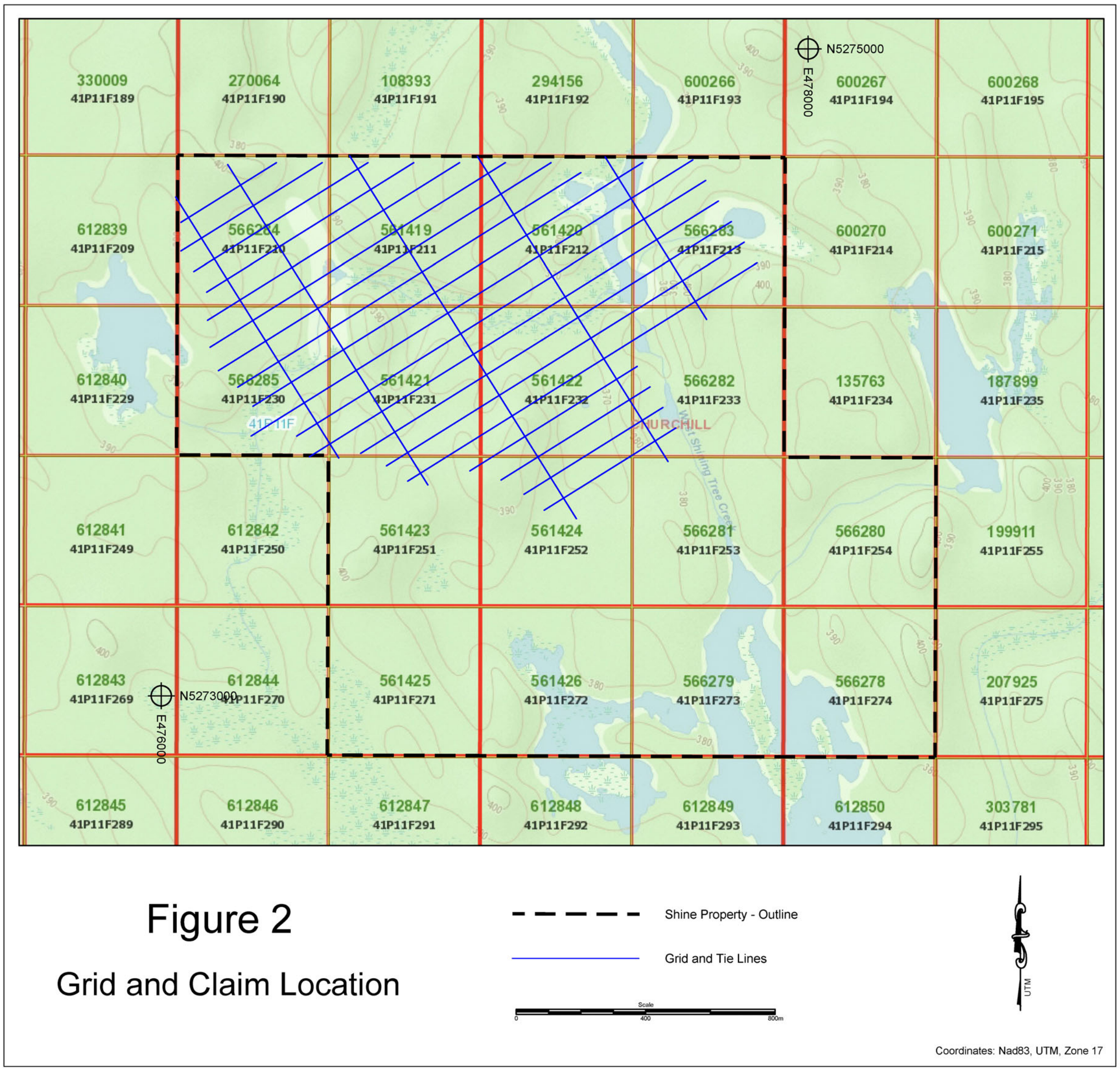


Figure 2 – Grid and Claim Location Map

3.0 Regional and Local Geology

Regional Geology

Shining Tree Gold Camp

The ***Shine Property*** is located in Churchill Township, 8 km north-west of Shining Tree, Ontario, Larder Lake Mining Division.

The Shining Tree gold camp lies south of the Timmins camp and south-west of the Kirkland Lake camp. Churchill Township is grouped along with other surrounding townships, as part of the Shining Tree gold camp.

The map-area shown in ***Figure 3*** is based on the compilation map from ***OFR 5346, Shining Tree Area, 1981, by M.W. Carter***. The following 2 paragraphs include wording from OFR 5346;

The Shining Tree Area metavolcanic-metasedimentary belt and adjacent granitic rocks, contain occurrences of gold, copper, lead, zinc, molybdenum, asbestos, nickel, iron, cobalt and silver.

The Shining Tree map-area is bounded by Longitudes 81 to 81-30 and Latitudes 47-30 to 47-45 and includes the village of Shining Tree. It covers an area of about 1000 sq. km and is a compilation of all or portions of 12 contiguous townships.

Connaught and Churchill Townships were mapped in 1973 by M.W. Carter. ***Figure 3*** shows where the ***Shine Property*** sits within the township and within the broader Shining Tree gold camp.

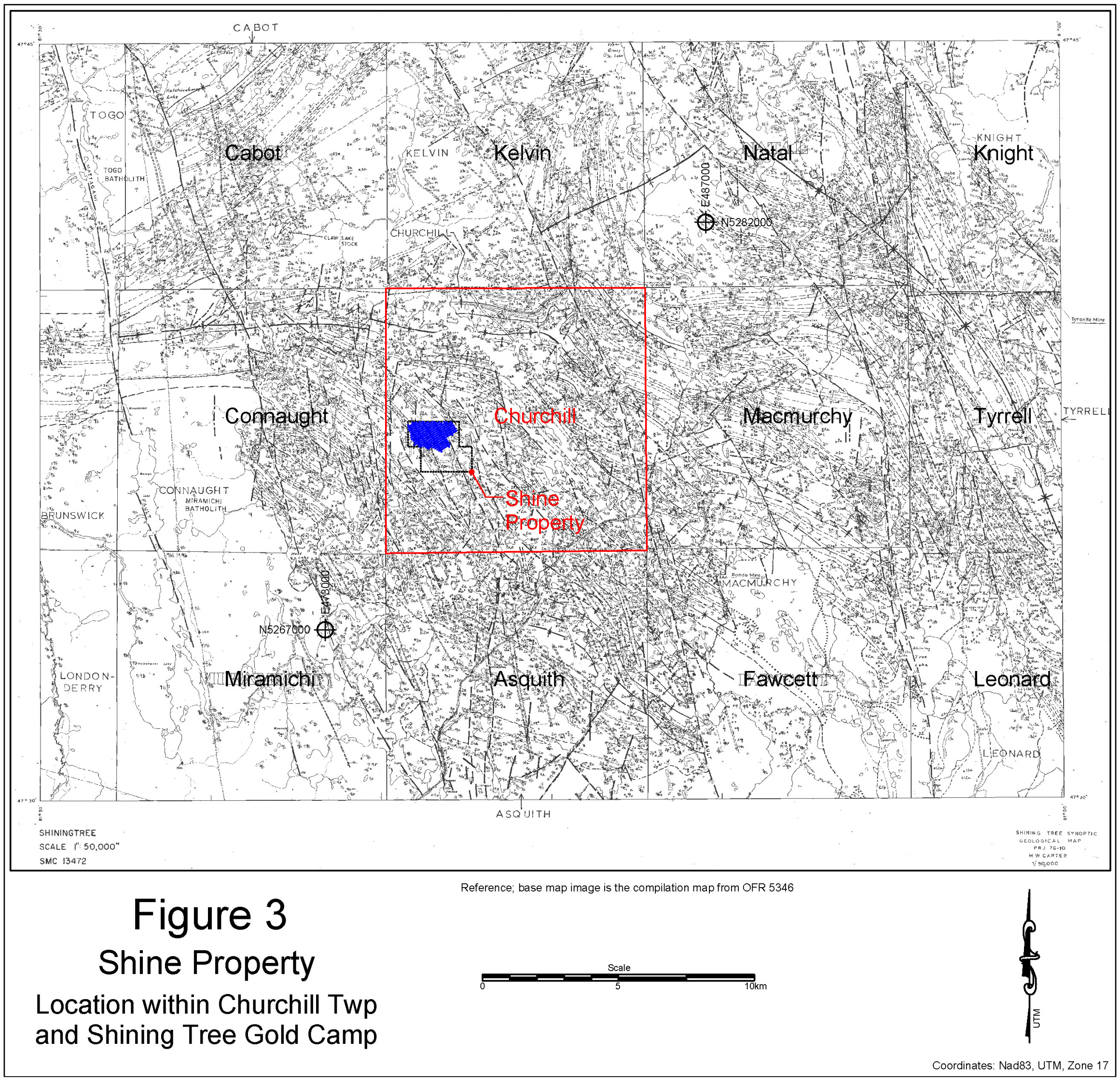


Figure 3 – Location of Shine Property within the Shining Tree gold camp

Map P3521

Map P3521 was published in 2003 by the Ontario Geological Survey at a scale of 1:50,000. ***Figure 4*** overlays ***Shine Property*** on a portion of P3521.

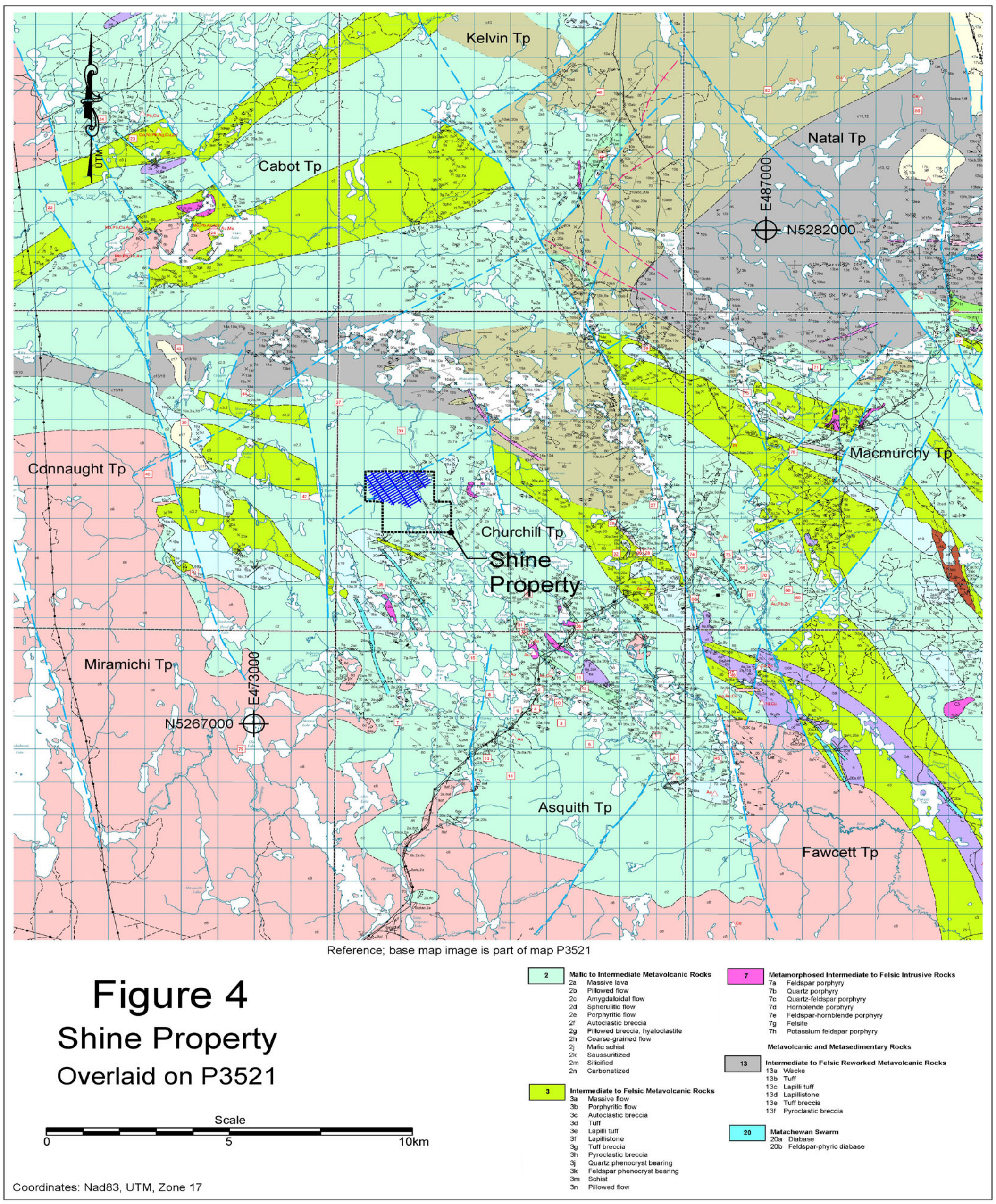


Figure 4 – Shine Property overlaid on P3521

Figure 4 includes an insert of legend items from P3521, covering rock types within Churchill Twp and provides an overview of Precambrian Geology across part of the Shining Tree area.

Regional Geology from Assessment File 41P11NW0401 ("Northgate Report")

Assessment File 41P11NW0401 was filed in 1992 by P.J. Doyle, for Northgate Exploration Limited. The report is comprehensive, at 530 pages and includes work under several categories, Geology, Geochemistry, Geophysical and Other. The following section includes wording from the Northgate Report;

Government regional geological mapping in the Churchill and Connaught Township area indicates that all consolidated (bedrock) exposures belong to Early, Early-to-Late and Middle Precambrian ages. Bedrock exposures are blanketed by unconsolidated Cenozoic sediments ranging in age from Pleistocene to Recent.

Early Precambrian rocks form the local basement and consist of a suite of subalkalic-alkalic metavolcanics interlayered with mafic and ultramafic units as well as clastic and chemical metasediments. The subalkalic metavolcanics suite range compositionally from basalt to rhyolite. The alkalic metavolcanics range from hawaiite to trachyte in composition. Ultramafic and mafic interlayers within the metavolcanic sequence are rare. Ultramafics occur as serpentinized dunites which mafic rocks are gabbroic in composition.

The metasedimentary sequence consists of a variety of lithologies including conglomerate, greywacke, siltstone, chert, argillite, slate and iron formation. The metasedimentary units are best exposed in NE Churchill Township and are rare elsewhere.

The metavolcanic-metasedimentary package have been intruded by granitic rocks as exposed in the Elephant Head Lake area of Connaught Township. Early to late Precambrian rocks principally diabase dykes varying in trend from NW to NE cut metavolcanic, metasedimentary and granitic rocks and therefore belong to the Matachewan and Abitibi dyke sets.

Middle Precambrian rocks rest unconformably on older Early Precambrian rocks. These units belong to the Espanola formation of the Quirke Lake Group, the Gowganda Formation of the Cobalt Group and Nipissing Diabase. Sedimentary lithologies include limestone to argillite and quartzite. The Huronian aged Nipissing Diabase consists of diabase, coarse amphibole gabbro and granophyric diabase.

Cenozoic sediments comprise the youngest units in the region and consist of Pleistocene and Recent sand, gravel, muskeg and alluvium.

(End wording from Northgate Report)

Local Geology

Map P3420

Map P3420 was published in 2000 by the Ontario Geological Survey at a scale of 1:30,000.

Figure 5 overlays ***Shine Property*** on a portion of P3420.

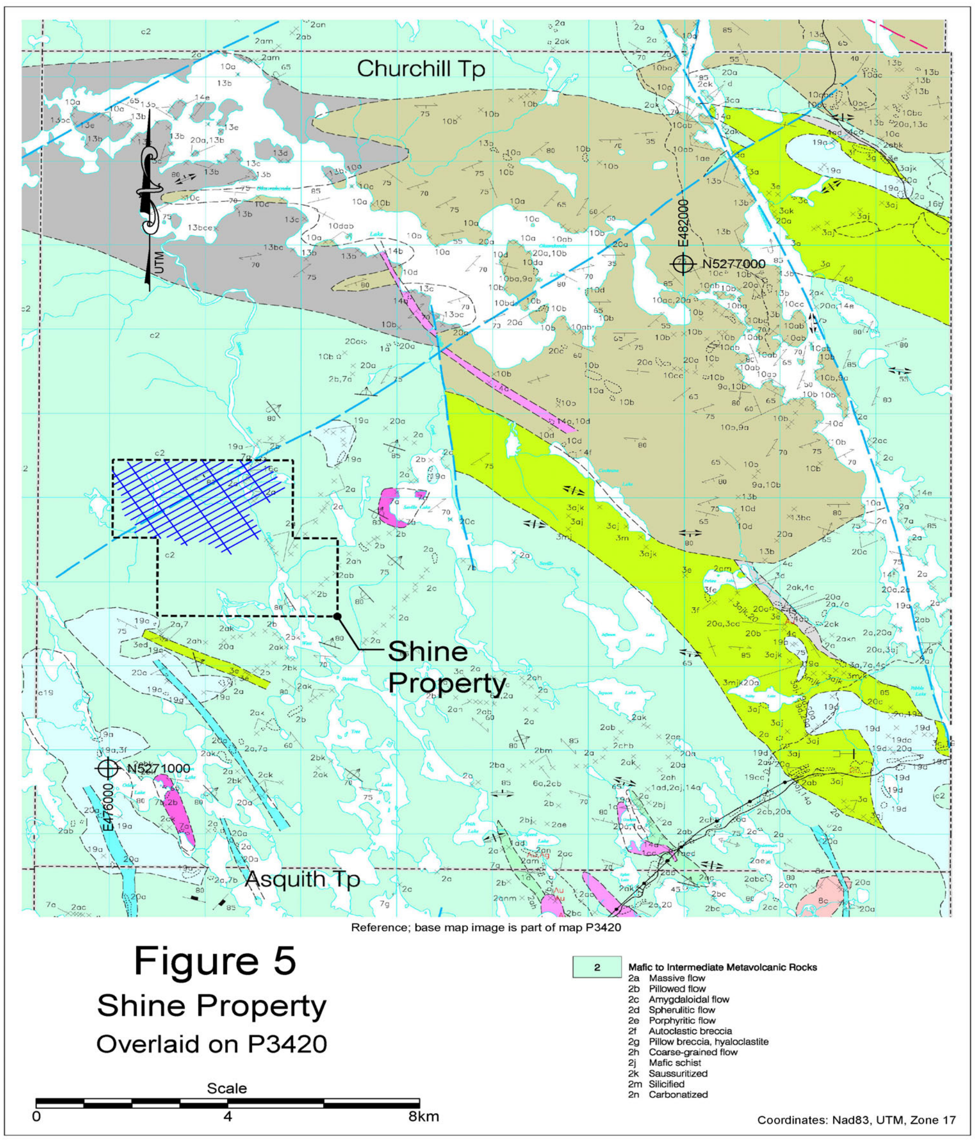


Figure 5 – Shine Property overlaid on P3420

The ***Shine Property*** covers rock type 2 (Mafic to Intermediate Metavolcanic Rocks), according the legend provided on map P3420.

Nearby Mineral Showings

There are 2 mineral showings within a 3km radius of the ***Shine Property***, identified as #33 and #35 on ***Figure 4***, map P3521.

#33 – Jonsmith – Cu – References MDI41P11NW00016
#35 – Pacesetter – Au – References MDI41P11SW00008

Jonsmith:
There are no Cu values reported in MDI41P11NW00016

Pacesetter:
Best Section 1985 assays 9.6 g/t Au over 4.6m / 6.9 g/t Au in grab / up to 10 g/t Au in trench / 1.54 g/t Au over 0.91m in a drillhole sample.

4.0 Property History

Table 2 on Page 15 is a list of past assessment work carried out within or proximal to the area covered by the current drone magnetic survey. Collectively, past work covers most of the categories listed under the OGS Earth (Ontario Assessment Files Database – OAFD). The categories are Airborne Geophysics, Diamond Drilling, Geochemistry, Geology, Ground Geophysics and Other.

As the current report relates primarily to Airborne Geophysics, two of the past assessment files (41P11NE0464 and 20000004462) will be described in more detail, aside from the basic info included on ***Table 2***.

Past airborne geophysical work – identified through AFRI

41P11NE0464 (Manwa Exploration Services)

In 1984 Manwa Exploration Services filed a 170 page DIGHEM Survey, covering ground within or proximal to the current drone magnetic survey. The survey included airborne magnetometer and the following specifications were included in the report;

Line Spacing: 200 Yards (**183m**)
Sensor Height: The report states “aircraft altitude” was 36m

In general, the survey outlined several possible bedrock conductors which flank or coincide with magnetite-rich rock units. The report states that “most of these anomalies warrant further investigation using appropriate surface exploration techniques”.

20000004462 (Creso Resources Inc)

In 2008 Creso Resources filed a 41 page magnetic and radiometric airborne survey, covering ground within or proximal to the current drone magnetic survey. The survey included airborne magnetometer and the following specifications were included in the report;

Line Spacing: 100m
Sensor Height: 70m mean terrain clearance

Comparative – Specifications of current drone magnetic survey

By comparison, the current drone magnetic survey covers a relatively small area, at tighter line spacing and at low altitude.

Line Spacing: 40m
Sensor Height: 40m height above ground

Past Work – carried out within the current survey grid

Table 2 is a list of past assessment work carried out within or proximal to the area covered by the current drone magnetic survey.

Table 2 - Past Assessment Work			
Work Type	Assessment File Number	Year	Performed For
Airborne Geophysics	41P11NE0464	1984	Manwa Exploration Services
	20000004462	2008 - 2009	Creso Resources Inc
Diamond Drilling	20000004462	2008 - 2009	Creso Resources Inc
Geochemistry	41P11NW0401	1992	Northgate Exploration Ltd
	20000008839	2013	Creso Exploration Inc
	41P11NW2003	2004	Roy Annett
Geology	41P11NW0401	1992	Northgate Exploration Ltd
	20000006516	2010 - 2011	Creso Resources Inc / Platinex
Ground Geophysics	20000008839	2013	Creso Exploration Inc
	41P11NW0402	1990	Northgate Exploration Ltd
Physical	NA	NA	NA
Other	41P11NW0401	1992	Northgate Exploration Ltd
	20000008839	2013	Creso Exploration Inc

Table 2

5.0 Summary of 2021 Drone Magnetic Survey

The program consisted of 1 grid summarized as follows:

Surveyed Nov 29, 2021:	**Total 23.9 line kilometers**
Altitude:	4**0m above ground level**
Area:	**Total Survey Area 135.6 ha**

The grid lines were spaced 40 m apart and flown at an azimuth of 58 degrees with 5 tie lines spaced at approximately 334m intervals and flown at an azimuth of 148 degrees.
A Geometrics MFAM magnetometer mounted on a DJI M600 Pro hexacopter drone was used to survey all grid lines.

A Geometrics G856AX proton procession magnetometer was operated as a base station throughout the survey to provide diurnal monitoring of the local magnetic field variations. (Loc; **E476895 N5274460**)
Equipment specifications are provided in ***Appendix 1, 2 and 3***.
The survey covered 10 Active mining claims. (***Figure 2***)

6.0 Processing

Magnetometer data was collected on 2 Geometrics MFAM sensors operating at 1000hz. The data was processed through a custom program operating in Python. This converts raw data from Geometrics MFAM into a format compatible with Geosoft Oasis Montaj.

Customized import templates were used within Geosoft, to identify and separate mag readings into organized grid and tie lines. This step eliminates extraneous mag data collected as the drone travels to and from the grid.

Grid and tie line data were corrected to remove heading error and lag.
Corrected grid data was then levelled based on tie lines.

7.0 Interpretation, Conclusions and Recommendations

The current survey was successful at identifying and mapping the magnetic anomalies at the Shine project. The magnetic survey on the Shine grid indicates a very quiet magnetic background with residual magnetic values ranging between -157 and 102 nT. The background magnetic field strength is -100 nT.

The overall magnetic pattern is disrupted by one linear anomalous magnetic high. The linear magnetic high is located in the west portion of the grid area and is easily observed on the magnetic contour map. This magnetic anomaly may represent a mafic diabase dike, common to this geologic setting or possibly underlying mafic or ultramafic lithology.

The interpreted fault lineament is also shown bisecting the grid at an approximate azimuth of 335 degrees. This interpreted structural lineament divides the more active magnetic lithology to the west from the more quiescent magnetic domain in the central portion of the grid area.

The most significant interpreted magnetic anomaly is an anomalous magnetic low located in the central portion of the grid area. This anomaly has been identified and marked as anomaly A. It is somewhat circular to ellipsoidal in shape and measures approximately 850 metres by 625 metres. This anomaly may represent an area of bedrock alteration or possibly a pipe shaped intrusion.

The isomagnetic contour pattern suggests an underlying lithology striking in a north -south direction; notwithstanding the disruptive magnetic anomalies located within the grid area. All of the anomalies are easily identified on the contour maps. The results of the magnetic survey are presented as contoured total field and 1st vertical derivative maps.

The magnetic survey completed over the Shine grid was successful in mapping magnetic anomalies. These anomalies are thought to arise from bedrock sources and may have implications for follow-up exploration.

Any existing geological or geochemical information for the surveyed grid area will aid in further assessing any geophysical anomalies and should be incorporated into an overall assessment of the property prior to further exploration.

Magnetic data collected by drone at high density and low altitude is ideal for 3D inversion modelling. The cost for this type of advanced modelling would start at approximately $2,000 and up to $8,000. 3D inversion modelling is recommended as the next step for evaluating the Shine property.

Statement of Qualifications

Author - Kevin Cool		
		Education
from	to	Description
	1983	Photography - 1 year, Humber College, Toronto Ontario
1988	1990	Survey Engineering Technician - 2 year honours diploma, Northern College Porcupine Campus
	2014	Received Permanent Prospectors Licence, by reason of having held a Prospector's Licence for 25 years or more
	2014	Aviation Ground School, Transport Canada Compliant Unmanned Aerial System training seminar
	2014	Radio Operators Certificate - Aeronautical
		Companies owned and operated
1990	2001	**General Surveys & Exploration** - mining, exploration, aggregate, construction survey and computer drafting.
2000	2005	**Big Red Diamond Corp.** - traded publicly on TSX Venture excahange under symbol DIA. Junior mining company exploring for diamonds.
		Participated in and managed regional-scale airborne geophysical programs, stream sampling, geochem sampling and camp construction.
		Property-scale work includes ground magnetometer, grid cutting and survey.
2005	2011	**True North Mineral Laboratories Inc.** - heavy mineral separation by heavy liquid. Crushing / pulverizing for other assay. 30+ employees.
		Provided services to the mining and exploration industry such as claim staking, till and geochem sampling, magnetometer survey.
2014	current	**UAV Timmins** - drone aerial mapping and survey. 1st company to apply drone air photo survey as valid mining claim assessment in Ontario.
2017	current	**Zen Geomap Inc.** - drone magnetometer survey. 1st company to apply drone mag survey as valid mining claim assessment in Ontario.

I, Kevin Scott Cool, of 15 Prospector St., Gold Centre in the City of Timmins, Province of Ontario, hereby certify that:

1) I am a graduate of Northern College of Applied Arts and Technology, May 26th 1990, Porcupine Campus, with a 2 year Honors Diploma in Survey Engineering Technology

2) I have subsequently operated above businesses, directly engaged with the mining and exploration industry.

3) I have been actively engaged in my profession since May, 1990, in all aspects of ground and airborne exploration programs including the planning and execution of regional and property-scale programs, supervision, data processing, maps, interpretation and reports.

Kevin Scott Cool

Zen Geomap
204-70C Mountjoy ST. N.
Timmins, ON P4N 4V7

Statement of Qualifications

This is to certify that: MATTHEW JOHNSTON

I am a resident of North Bay; province of Ontario since November 1, 2017.

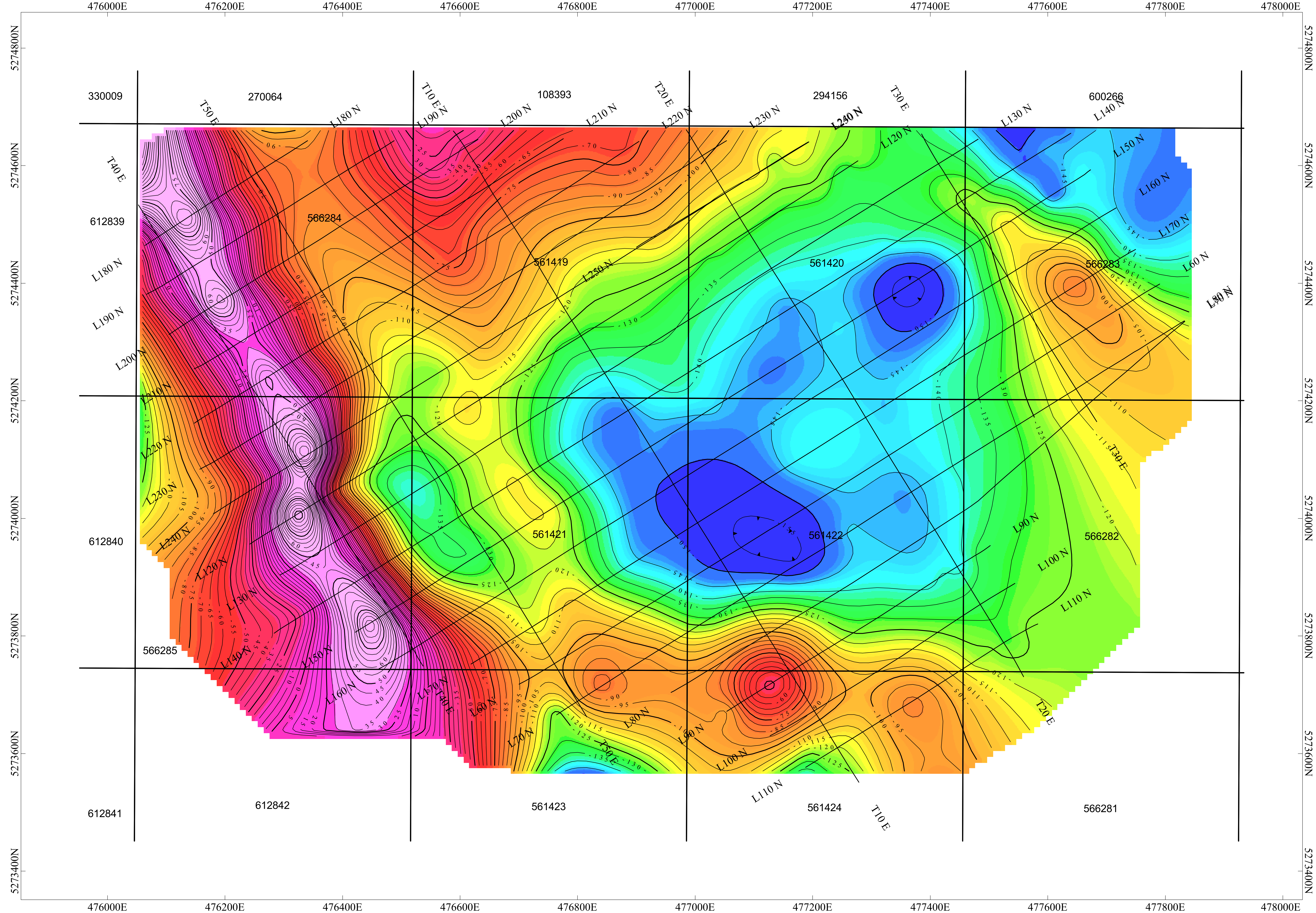
I am self-employed as a Consulting Geophysicist, based in North Bay, Ontario.

I have received a B.Sc. in geophysics from the University of Saskatchewan; Saskatoon, Saskatchewan in 1986.

I have been employed as a professional geophysicist in mining exploration, environmental and other consulting geophysical techniques since 1986.

I am a member in good standing with the Association of Professional Geoscientists of Ontario as a Practicing member; membership no. 2046

Signed in North Bay, Ontario, this December 3, 2021



TMI RESIDUAL MAGNETICS
nT

nT
51
30
6
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-150

Scale 1:5000

100 0 100 200 300
metres

NAD83 / UTM zone 17N

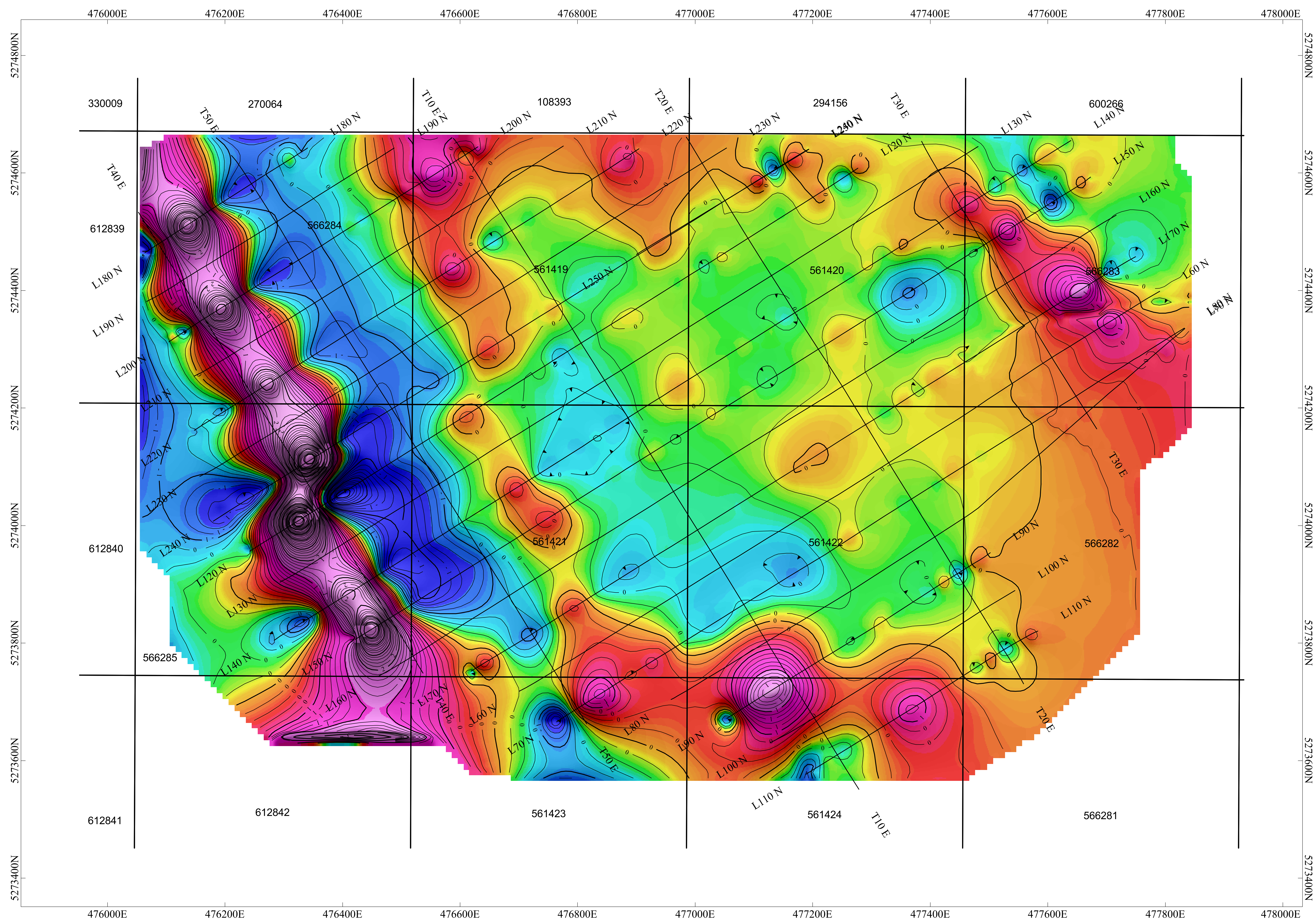
LINE KILOMETRES SURVEYED: 24.3

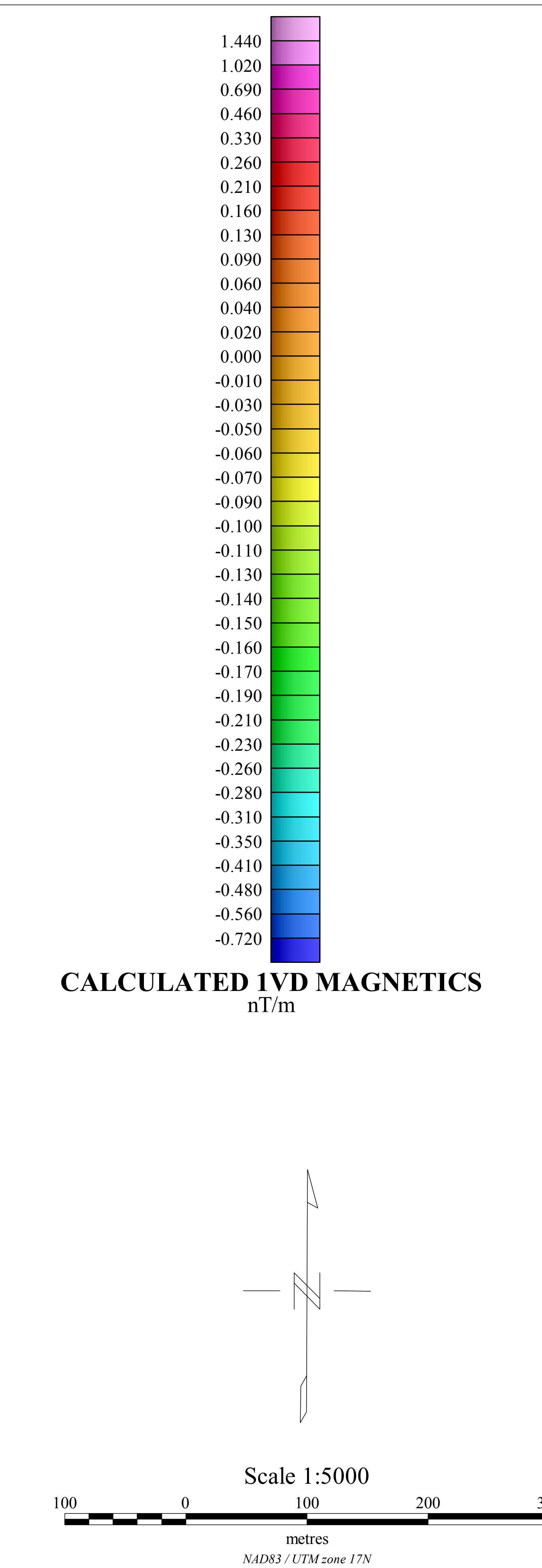
GREAT LAKES NICKEL LIMITED

SHINE PROPERTY
DRONE MAGNETIC SURVEY - TMI CONTOURS
NOVEMBER 29 - 2021

CHURCHILL TWP. - LARDER LAKE MINING DIVISION
CLAIMS POSTED ON MAP
CONTOUR INTERVAL = 5, 25 nT
INSTRUMENT: GEOMETRICS MFAM SENSOR - M600 DRONE

SURVEYED BY: ZEN GEOMAP INC.





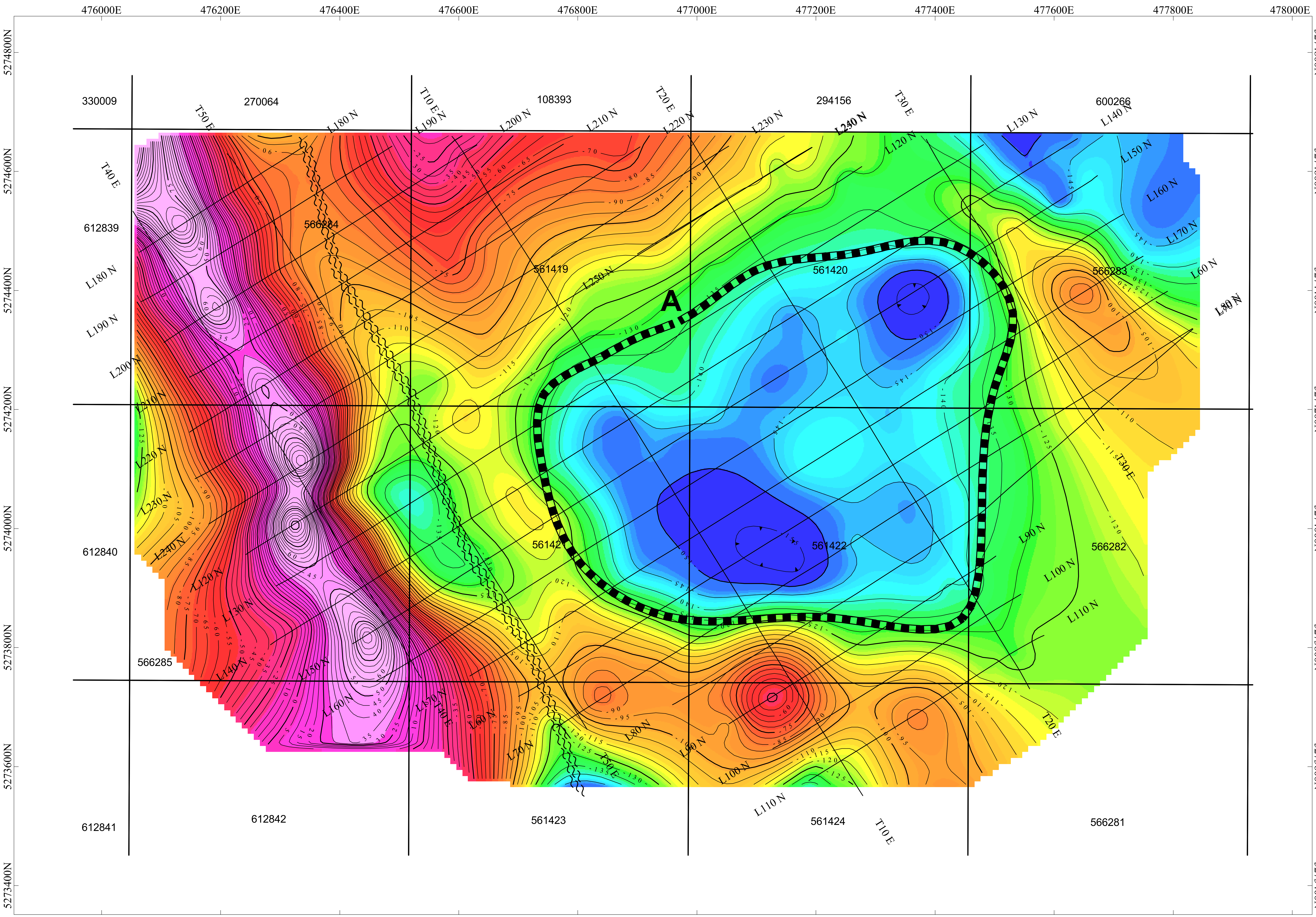
LINE KILOMETRES SURVEYED: 24.3

GREAT LAKES NICKEL LIMITED

SHINE PROPERTY
DRONE MAGNETIC SURVEY - CALCULATED 1VD MAGNETICS
NOVEMBER 29 - 2021

CHURCHILL TWP. - LARDER LAKE MINING DIVISION
CLAIMS POSTED ON MAP
CONTOUR INTERVAL = 0.1, 0.5 nT/m
INSTRUMENT: GEOMETRICS MFAM SENSOR - M600 DRONE

SURVEYED BY: ZEN GEOMAP INC.



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-150

TMI RESIDUAL MAGNETICS
nT

Interpreted Fault/Structural Lineament
Interpreted Magnetic Anomaly

N

Scale 1:5000
100 0 100 200 300
metres
NAD83 / UTM zone 17N

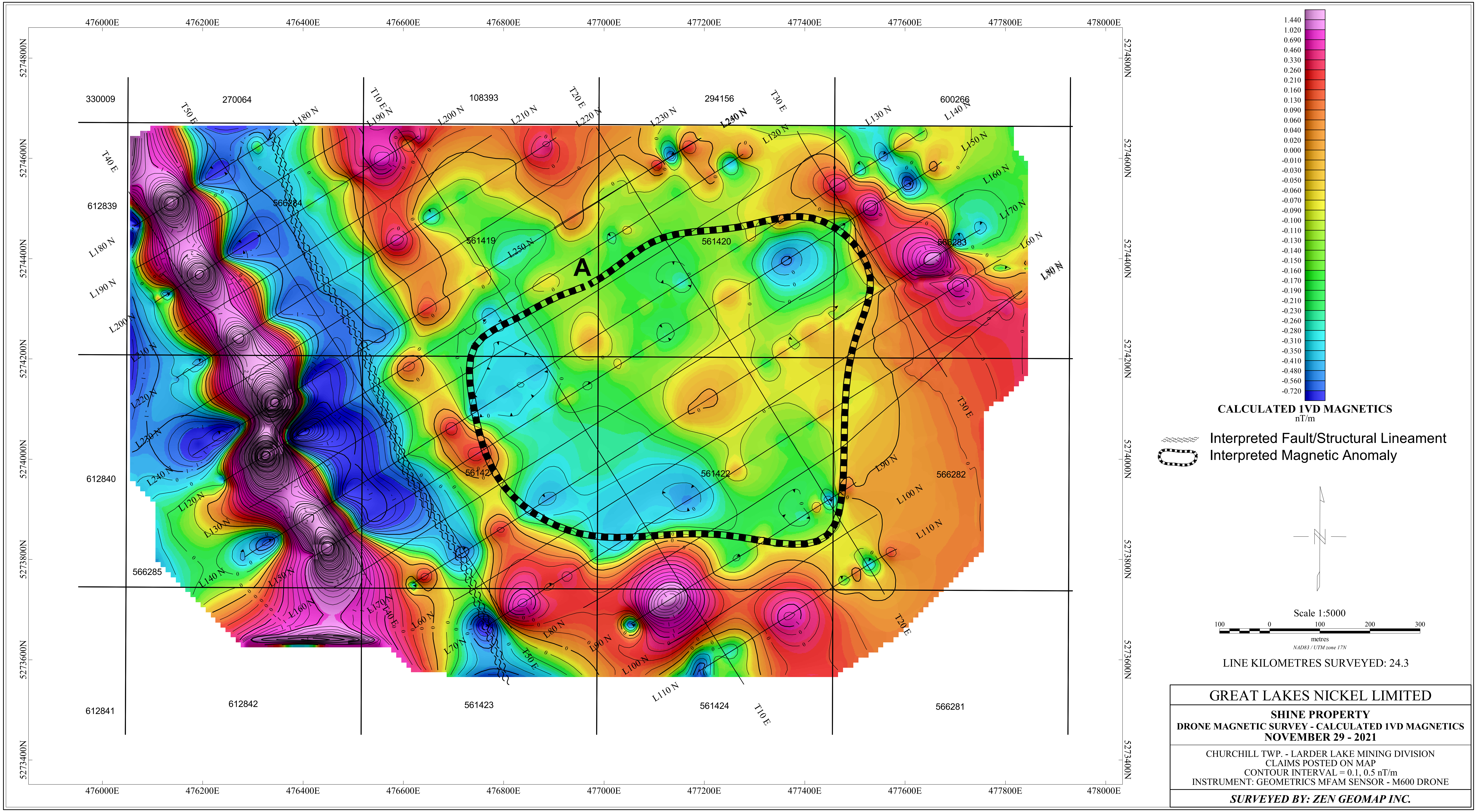
LINE KILOMETRES SURVEYED: 24.3

GREAT LAKES NICKEL LIMITED

SHINE PROPERTY
DRONE MAGNETIC SURVEY - TMI CONTOURS
NOVEMBER 29 - 2021

CHURCHILL TWP. - LARDER LAKE MINING DIVISION
CLAIMS POSTED ON MAP
CONTOUR INTERVAL = 5, 25 nT
INSTRUMENT: GEOMETRICS MFAM SENSOR - M600 DRONE

SURVEYED BY: ZEN GEOMAP INC.



GREAT LAKES NICKEL LIMITED
SHINE PROPERTY
DRONE MAGNETIC SURVEY - CALCULATED 1VD MAGNETICS
NOVEMBER 29 - 2021
CHURCHILL TWP. - LARDER LAKE MINING DIVISION
CLAIMS POSTED ON MAP
CONTOUR INTERVAL = 0.1, 0.5 nT/m
INSTRUMENT: GEOMETRICS MFAM SENSOR - M600 DRONE
SURVEYED BY: ZEN GEOMAP INC.
CALCULATED 1VD MAGNETICS
nT/m
Interpreted Fault/Structural Lineament
Interpreted Magnetic Anomaly
Scale 1:5000
metres
NAD83 / UTM zone 17N
LINE KILOMETRES SURVEYED: 24.3
A
330009
270064
108393
294156
600266
612839
566284
561419
561420
566283
612840
561421
561422
566282
566285
612841
612842
561423
561424
566281

Appendix I

Geometrics MFAM Magnetometer Specifications

System Basics

- System utilizes 2 MFAM sensors
- Sensors are controlled by 1 sensor module
- Sensor module communicates with a Texas Instruments main board
- Sensitivity: 0.00003nT
- Sensors operate at 1000Hz (collect 1000 readings per second on both sensors)

Technical Specifications

SPECIFICATIONS:

Mechanical:
    Enclosure Dimensions: 9” x 6 5/8” x 1 3/16”
    Sensor Cable length (Development box to Sensor): 20.5 inches
Power:
    AC adapter: 13.5 to 16 Volts DC at 1.0A
    Battery Pack: 12 volt 1800 mA-Hour Lithium Polymer

FEATURES:

1) **TIVA TM4C1294NCPDT Micro controller:** This is a 32 bit ARM Cortex-MF4 based microcontroller running at up to 120 MHz. It has 1024K of flash, with 256K bytes of RAM, and 6 KBytes of EEPROM.

2) **USB 2.0 Micro Connector:** USB functionality is provided by the TIVA microcontroller and TIVAWare support libraries.

3) **Four User LEDs:** Four user controlled LEDs are wired to TIVA microcontroller GPIO pins PK0, PK1, PN0, and PN1.

4) **Two User Switches:** Two user read switches are wired to the microcontroller pins PK6 and PJ1.

5) **One Microcontroller Reset Switch:** This switch is used to reset the microcontroller.

6) **Wi-Fi port for TI CC3100 Wi-Fi Booster Pack:** The Development board layout allows a TI CC3100 Wi-Fi Booster pack to be directly plugged in. Using TIVAWare libraries, software can be developed to allow Wi-Fi communication between the Development board and a computer.

7) **USB XDS110 Port for Firmware Downloading and Debugging:** This second USB port is used as a debug/firmware download interface between the TI Code Composer Studio development suite and the Development Kit.

8) **Two RS-232 Serial Ports with RJ-45 Connectors:** Two general purpose serial ports are available to the user. The first serial port is wired to TIVA microcontroller UART4, and supports RTS and CTS handshaking. The second serial port is wired to TIVA microcontroller UART5. This port supports only TxD and RxD. Both of these ports use +/- 8 volt voltage swings, and support baud rates up to 920 KBaud. Note that these two ports are wired as Data Terminal Equipment (DTE) Thus to connect either of these two ports to a computer it would need to connect through a null modem. .

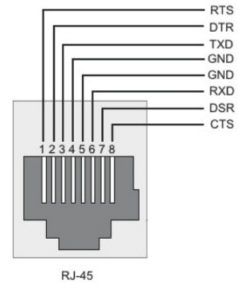


Figure 3: Serial Port Pinout

9) **On Board GPS Module:** An Adafruit GPS module is included with the Development Kit. It features 66 channels, -165 dBm sensitivity, and 3 Meter accuracy. An external GPS antenna is included so that signals can be received inside the box even with the cover in place. By default the GPS powers up to 9600 baud with several GPS sentences being output. The firmware that comes with the Development kit reconfigures the GPS to output only an RMC sentence at 115200 baud. This RMC string is sent with the output TCP data packet as described in the “Ethernet Data Format” section. The GPS is wired to UART7 on the TIVA microcontroller using 0-3.3 volt logic swings.

   The 1PPS pulse from this GPS goes to the MFAM development module and disciplines the cycle rate to exactly 1 kiloSamples per second.

10) **Micro SD Card Slot for Storing Data Locally:** A micro SD card slot is available for the user to read and write data using a SPI interface. It is connected to SPI port 1 of the TIVA microcontroller.

11) **10 MHZ Timing Reference Input Port:** This input port takes a 10 MHz reference signal from a GPS disciplined reference oscillator, buffers and squares it up, and sends it to the MFAM module. The purpose of this signal is to lock the MFAM clocking system to this reference signal so that the Larmor frequency can be measured to an absolute standard. At this time, the MFAM does not support this feature. This function will be implemented in the future.

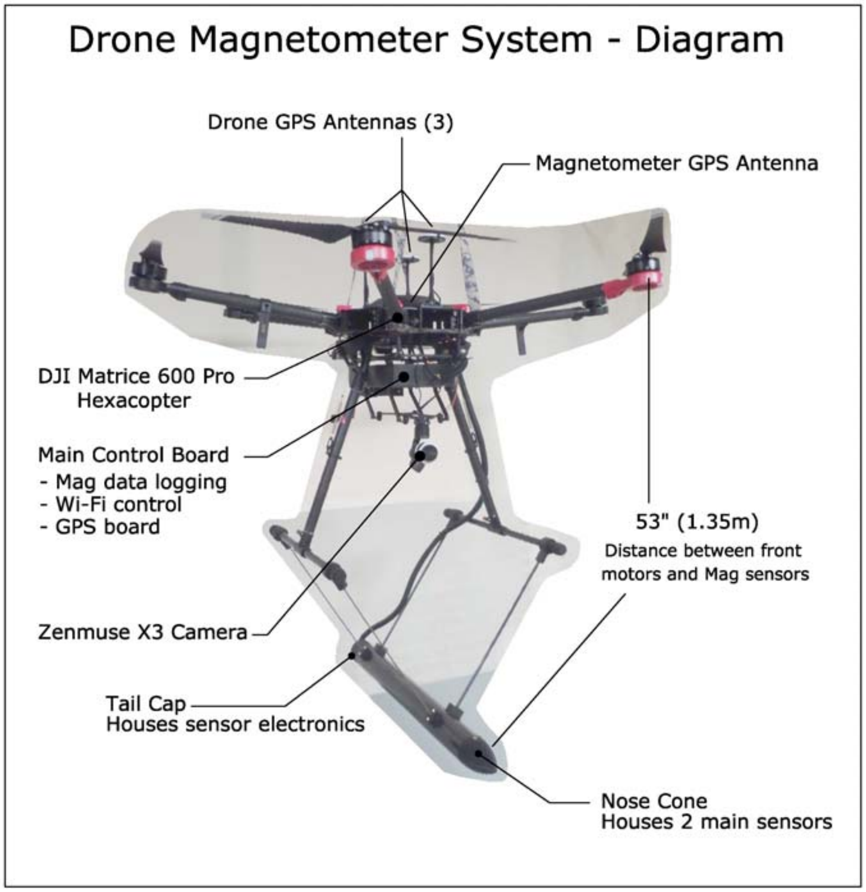
12) **Ethernet port with Power over Ethernet Compatibility**: The Tiva microcontroller contains a fully integrated Ethernet MAC and PHY. In addition, the Ethernet port can power the Development Kit via Power over Ethernet (PoE) using an Ethernet power injector.

13) **1.8 Amp-Hour Battery pack:** Three on board lithium/polymer batteries can power the system for 2 hours. A switch on the Development board allows the battery to be turned on/off. In addition, if the battery voltage falls below 8 volts the MFAM module will automatically shut down while keeping the microcontroller alive.

14) **Integrated Battery Charging system:** A lithium/polymer battery charging system is on board. If the battery switch is turned on, and the AC power adapter is plugged in, the batteries will be charged.

15) **Four Differential Analog Input Channels:** There are four differential analog inputs available for use. Channels 0 and 1 are +/- 2.5 volts full scale, while channels 2 and 3 are 0 to +5 volts full scale. In the firmware supplied with the Development kit (which sends MFAM/GPS data to the MFAMConsole program on the computer), all four channels are sampled synchronously with the MFAM data input to the Tiva are included in the data stream.

16) **On board Power/Status LEDs:** Several Status and Power LEDs are arranged along the front edge of the board. They include the four user LEDs, Power status LEDs (which power source is powering the board, and whether the battery is charging or the voltage low). They are listed in the Front and Back Panel Connection and Indicator section below.



Description and Location of components

The Geometrics MFAM magnetometer "main board" is attached directly below the central body of the DJI Matrice 600 Pro hexacopter drone. This box contains a small, Texas Instruments computer that collects and stores magnetometer readings on a micro-SD card. It also houses a 66 channel Adafruit GPS module, which operates independent of the (3) internal drone GPS modules. The Adafruit GPS collects and stores "GPS readings" (Lat / Long / Altitude / Time). The GPS readings are assigned to each mag reading, as the drone navigates along grid lines. A Wi-Fi module is attached to the Texas Instruments computer, which allows the operator to start and stop the magnetometer at a distance.

The Geometrics MFAM magnetometer operates using 2 separate mag sensors, attached to a "sensor module" with a flexible circuit board. The sensor module and 2 sensors are housed in a carbon graphite tube, which is mounted (suspended) 53 inches (1.35m) below the 2 front motors of the drone.

Magnetic shielding (mu-metal) is installed at 6 locations around the drone body, to provide additional shielding between drone components and the 2 mag sensors.

The magnetometer GPS antenna (for the internal Adafruit GPS) is mounted on top the drone body, to allow for clear signal. The vertical distance between this antenna and the 2 mag sensors, is 1.20m. This value is considered when reporting "mean terrain clearance", by subtracting 1.2m from the elevation assigned to each mag reading.

Appendix II

Geometrics G856AX
Proton procession magnetometer specifications

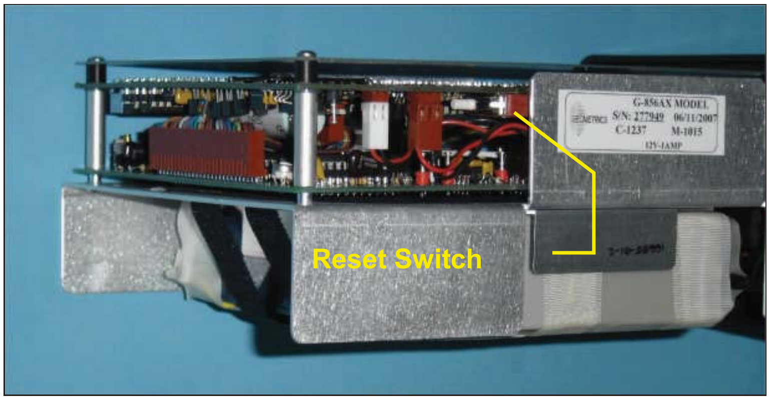


Figure 23. Internal reset switch.

Specifications

- Displays - Six digit display of magnetic field to resolution of 0.1 gamma or time to nearest second. Additional three-digit display of station, day of year, and line number.

- Resolution - Typically 0.1 gamma in average conditions. May degrade to lower resolution in weak fields, noisy conditions or high gradients.

- Absolute accuracy - One gamma, limited by remnant magnetism in sensor and crystal oscillator accuracy.

- Clock - Julian clock with stability of 5 seconds per month at room temperature and 5 seconds per day over the temperature range of -20 to +50 degrees Celsius.

- Tuning - Push button tuning from keyboard with current value displayed on request. Tuning range 20 to 90 µT.

- Gradient - Tolerates gradients to 1800 gammas/meter. When high Tolerance gradients truncate count interval, maintains partial reading to an accuracy consistent with data.

- Cycle Time - Complete field measurement in three seconds in normal operation. Internal switch selection for faster cycle (1.5 seconds) at reduced resolution or longer cycles for increased resolution.

- Manual Read - Takes reading on command. Will store data in memory on command.

- Memory - Stores more than 5700 readings in survey mode, keeping track of time, station number, line number day and magnetic field reading. In base station operation, computes for retrieval but does not store time of recording designated by sample interval, allowing storage of up to 12,000 readings.

- Output - Plays data out in standard RS-232 format at selectable baud rates. Also outputs data in real time byte parallel, character serial BCD for use with digital recorders.

- Inputs - Will accept an external sample command.

- Special - An internal switch allows:
  - adjustment of Functions polarization time and count time to improve performance in marginal areas or to improve resolution or speed operation
  - three count averaging
  - choice of lighted displays in auto mode.

- Physical -
  - Instrument console: 7 x 10 ½ x 3 ½ inches (18 x 27 x 9 cm), 6 LB (2.7 kg)
  - Sensor: 3 1/2 x 5 inches (9 x 13 cm), 4 LB (1.8 kg)
  - Staff: 1 inch x 8 feet (3cm x 2.5m), 2 LB (1kg)

- Environmental: Meets specifications from 1 to 40°C. Operates satisfactorily from -20 to 50°C.

- Power - Depending on version, operates from internal rechargeable Gel-cells or 9 D-cell flashlight batteries . May be operated from external power ranging from 12 to 18 volts external power. Power failure or replacement of batteries will not cause loss of data stored in memory.

- Standard system (P/N 16600-02) components:
  - Sensor (P/N 16076-01) and sensor cable (P/N 16134-01)
  - Console (P/N 16601-01)
  - Staff, one top section (P/N 16535-01), two middle sections (P/N 16536-01) and 1 bottom section (P/N 16537-01)
  - Carry harness (P/N 16002-02)
  - Two sets of rechargeable batteries (P/N 16697-01) and battery charger (P/N 16699-01)
  - Carrying case (P/N 16003-01)
  - Download cable (P/N 16492-01)
  - Hardcopy operation manual (P/N 18101-02)
  - Magnetometer CD (P/N 26648-01)

- Optional accessories:
  - Tripod kit for base-station operation (P/N 16708-02)
  - Gradiometer kit (P/N 166651-01)
  - Gradiometer carry/storage case (16003-01)

Specifications

• Aircraft	
Diagonal Wheelbase	1133 mm
Dimensions	1668 mm × 1518 mm × 727 mm with propellers, frame arms and GPS mount unfolded (including landing gear) 437 mm × 402 mm × 553 mm with propellers, frame arms and GPS mount folded (excluding landing gear)
Weight (with six TB47S batteries)	9.5 kg
Weight (with six TB48S batteries)	10 kg
Max Takeoff Weight Recommended	15.5 kg
Hovering Accuracy (P-GPS)	Vertical: ±0.5 m, Horizontal: ±1.5 m
Max Angular Velocity	Pitch: 300°/s, Yaw: 150°/s
Max Pitch Angle	25°
Max Wind Resistance	8 m/s
Max Ascent Speed	5 m/s
Max Descent Speed	3 m/s
Max Speed	40 mph / 65 kph (no wind)
Max Service Ceiling Above Sea Level	2170 propellers: 2500 m, 2195 propellers: 4500 m
Hovering Time* (with six TB47S batteries)	No payload: 32 min, 6 kg payload: 16 min
Hovering Time* (with six TB48S batteries)	No payload: 38 min, 5.5 kg payload: 18 min
Flight Control System	A3 Pro
Supported DJI Gimbals	Ronin-MX; ZENMUSE™ Z30, Zenmuse X5/X5R, Zenmuse X3, Zenmuse XT, Zenmuse Z15 Series HD Gimbal: Z15-A7, Z15-BMPCC, Z15-5D III, Z15-GH4
Retractable Landing Gear	Standard
Operating Temperature	14° to 104° F (-10° to 40° C)
• Remote Controller	
Operating Frequency	920.6 MHz to 928 MHz (Japan); 5.725 GHz to 5.825 GHz, 2.400 GHz to 2.483 GHz
Max Transmission Distance	FCC Compliant: 3.1 mi (5 km), CE Compliant: 2.2 mi (3.5 km) (Unobstructed, free of interference)
Transmitter Power (EIRP)	10 dBm @ 900M, 13 dBm @ 5.8G, 20 dBm @ 2.4G
Video Output Port	HDMI, SDI, USB
Operating Temperature	14° to 104° F (-10° to 40° C)
Battery	6000 mAh LiPo 2S
• Charger (Model: MC6S600)	
Voltage Output	26.1 V
Rated Power	600 W
Single Battery Port Output Power	100 W
• Standard Battery (Model: TB47S)	
Capacity	4500 mAh
Voltage	22.2 V
Battery Type	LiPo 6S
Energy	99.9 Wh
Net Weight	595 g
Operating Temperature	14° to 104° F (-10° to 40° C)
Max Charging Power	180 W
• Optional Battery (Model: TB48S)	
Capacity	5700 mAh
Voltage	22.8 V
Battery Type	LiPo 6S
Energy	129.96 Wh
Net Weight	680 g
Operating Temperature	14° to 104° F (-10° to 40° C)
Max Charging Power	180 W

CE1313 RoHS

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

HDMI

DJI incorporates HDM™ technology. The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries

* Hovering time is based on flying at 10 meters above sea level in a no-wind environment and landing with a 10% battery level.

Download the detailed user manual at:
www.dji.com/matrice600-pro

※ This content is subject to change without prior notice.

Drone Operation and Ground Control Methods

The DJI Matrice 600 Pro drone is programmed to fly an automated flight path (the survey grid lines and tie lines), using software that is available and ready to use on a wide variety of drones. Zen Geomap uses UgCS software, Drone Deploy and Pix4D software;

- Drone Deploy and Pix4D, on simple grids that do not require advanced control with regards to following complex terrain (example – flying in relatively flat ground, using Google Earth or other simple elevation model).
- UgCS, in rugged terrain, where we obtain a detailed 3D terrain model (DEM or DTM) using photogrammetric drone prior to magnetic survey. In this case we upload our own, custom DEM into UgCS software and the DJI M600 drone will follow the terrain at a fixed offset.

Using a Drape

The automated flight path will always use (follow) a "drape" in one form or another.

- On simple grids in flat terrain, the drape is generated as an offset of a simple DEM, such as Google Earth or other coarse elevation model such as DEMs available on-line through USGS.
- In complex terrain, the drape is generated as an offset of our own, custom DEM.

All of our piloting software is capable of following a drape at a fixed offset. We typically program the drone to fly 50m above coarse DEMs, such as Google Earth, or USGS. When a custom DEM is available, we typically fly 25-30m above DEM.

The actual / final "height above terrain" (or mean terrain clearance), is determined in the field by our crews. They visually inspect and look for obstacles such as hills, trees, buildings and towers.

The height above terrain (or mean terrain clearance) is included in the logistical and assessment reports we prepare for our clients.

Ground Control Methods

The DJI M600 drone uses a combination of 3 separate GPS receivers and 3 separate barometers. This system developed by DJI is called the A3 Controller.

The A3 controller is designed to maintain a stable altitude, relative to the take-off point. Over a 5 year period (2014 to current), we have found the A3 controller to be reliable to sub-metre accuracy, when it comes to maintaining stable altitude over a typical 20 to 30 minute flight.

Based on this long-term record, we rely on the A3 controller to navigate the drone at a pre-programmed, fixed offset above DEM. Over the same 5 year period, we have observed consistent and accurate agreement between the A3 GPS locations and the Adafruit (Magnetometer) GPS locations. When plotted in plan view, the A3 GPS tracks have always agreed with the Adafruit tracks to approximately 1 metre accuracy.

The author if this report has been an active surveyor since 1990 and is familiar with real-time (RTK) GPS and post-processed GPS methods.

Appendix IV

Statement of Costs

$ 6000.00	6 flights @ $1,000 Nov 29, 2021
$ 400.00	Mobe / Demobe
$ 1800.00	Processing and Maps
$ 450.00	ATV
$ 2000.00	Assessment Report

$10,650.00	Total Survey Cost (total does not include HST)

<u>Calculation of Costs – Completed across 10 Active Mining Claims;</u>

$10,650 **Total Survey Cost applied across 10 Active Mining Claims**

Table 1 provides detail of how costs are applied to each mining claim

Appendix V

Quality Control / Tests and Calibrations / Processing Steps

Quality Control

Throughout the data acquisition phase, data are monitored closely for quality control and error-checking on all channels. Output from the Geometrics MFAM magnetometer includes a wide range of error codes, which are written to the raw data file to help diagnose problems when they occur in the field.

All data are checked on a daily basis, as field data are transferred to Zen Geomap offices in Timmins or North Bay, Ontario. When errors or problems occur, the field crew is instructed to re-fly problem areas.

Tests and Calibrations

The following tests and calibrations are carried-out on all magnetometer equipment and sensors employed by Zen Geomap Inc.;

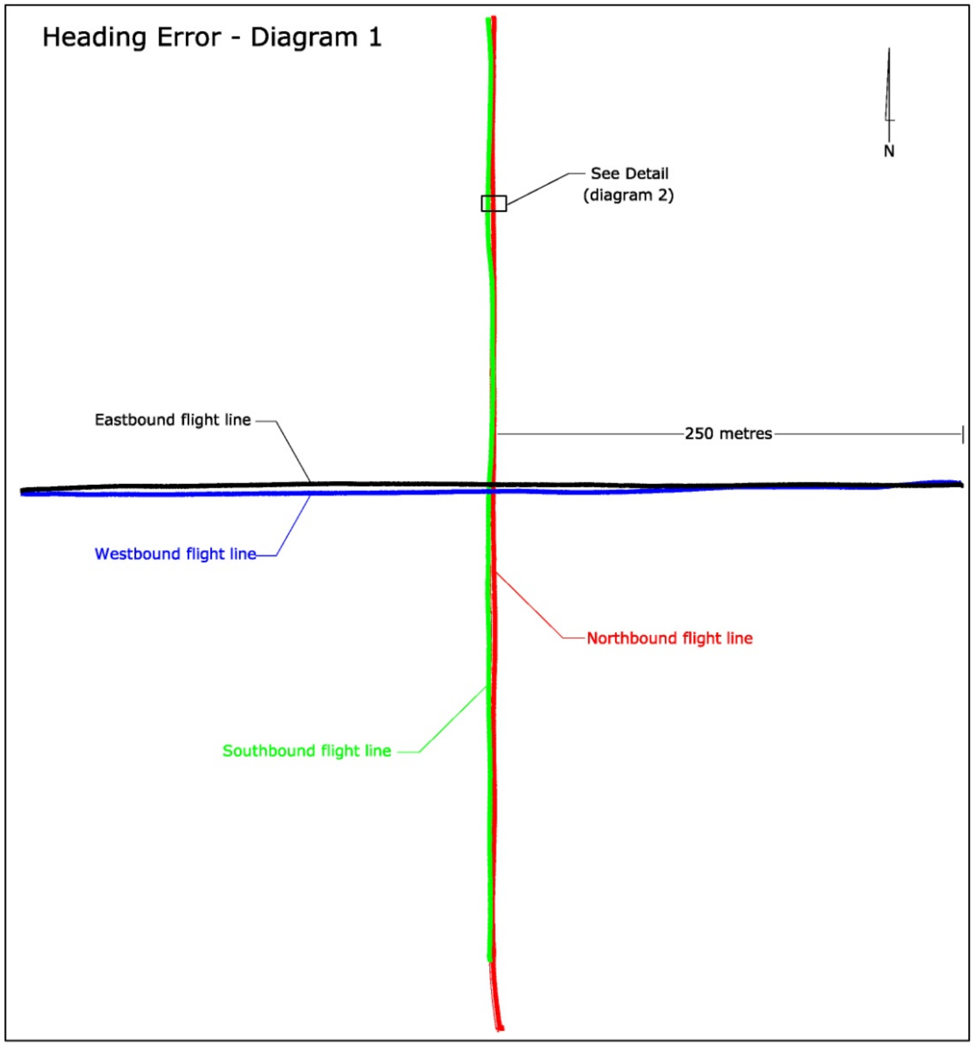
Heading Error

Upon receipt of a new magnetometer (or after significant repair or modification to any system component), a test flight is carried-out to determine heading error.

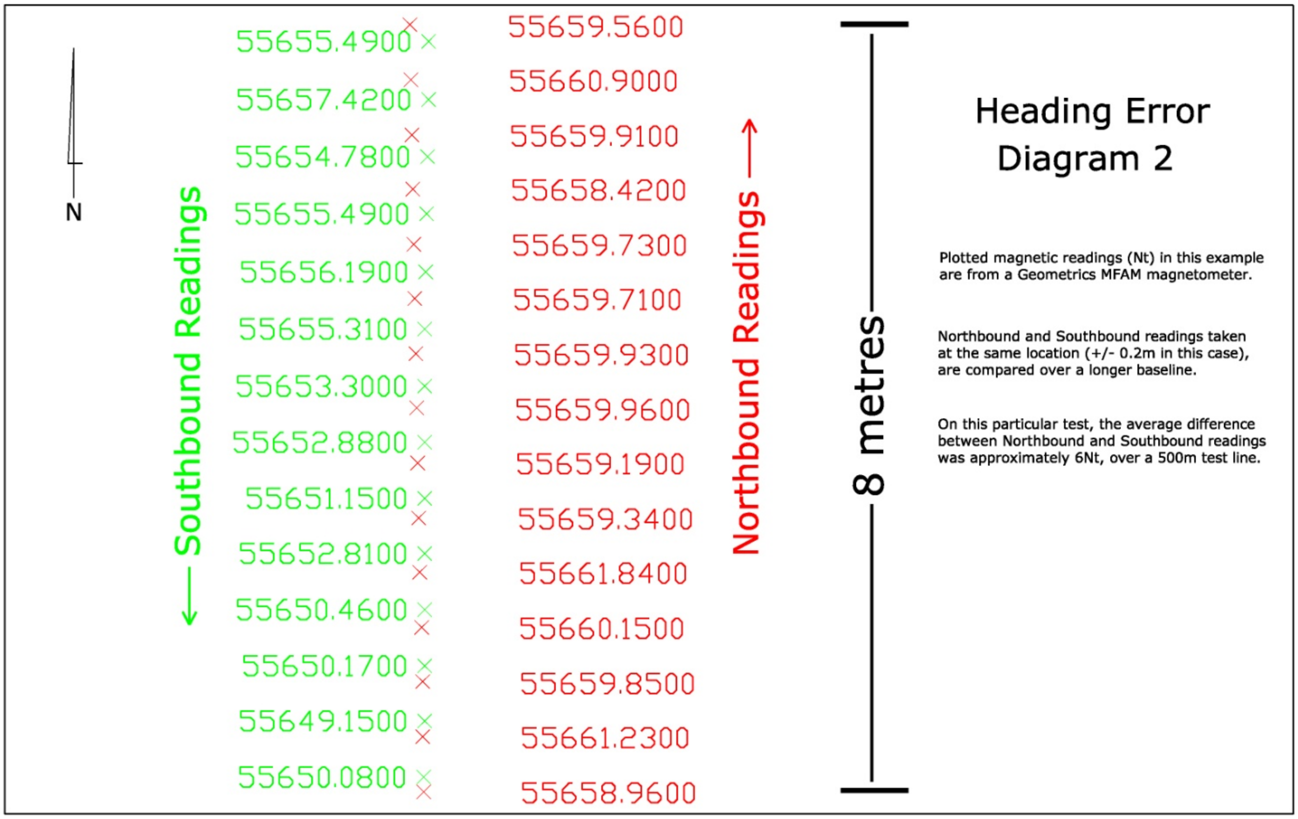
A cross-pattern is flown as shown in ***Diagram 1***, with 500 metre N-S and E-W lines.
Magnetic readings are collected along the same lines, flown in opposite directions.

Northbound and Southbound readings at the same location (+/- 0.2m in this example) are compared.
Eastbound and Westbound readings undergo the same process.

(See: Heading Error – ***Diagram 2***).



Example test flight by Zen Geomap, August, 2019



Example – Geometrics MFAM readings, August, 2019

The difference between Northbound and Southbound readings, averaged over a 500m baseline is calculated. The resulting value (6 Nt in above example), is used to apply a correction for heading error during processing.

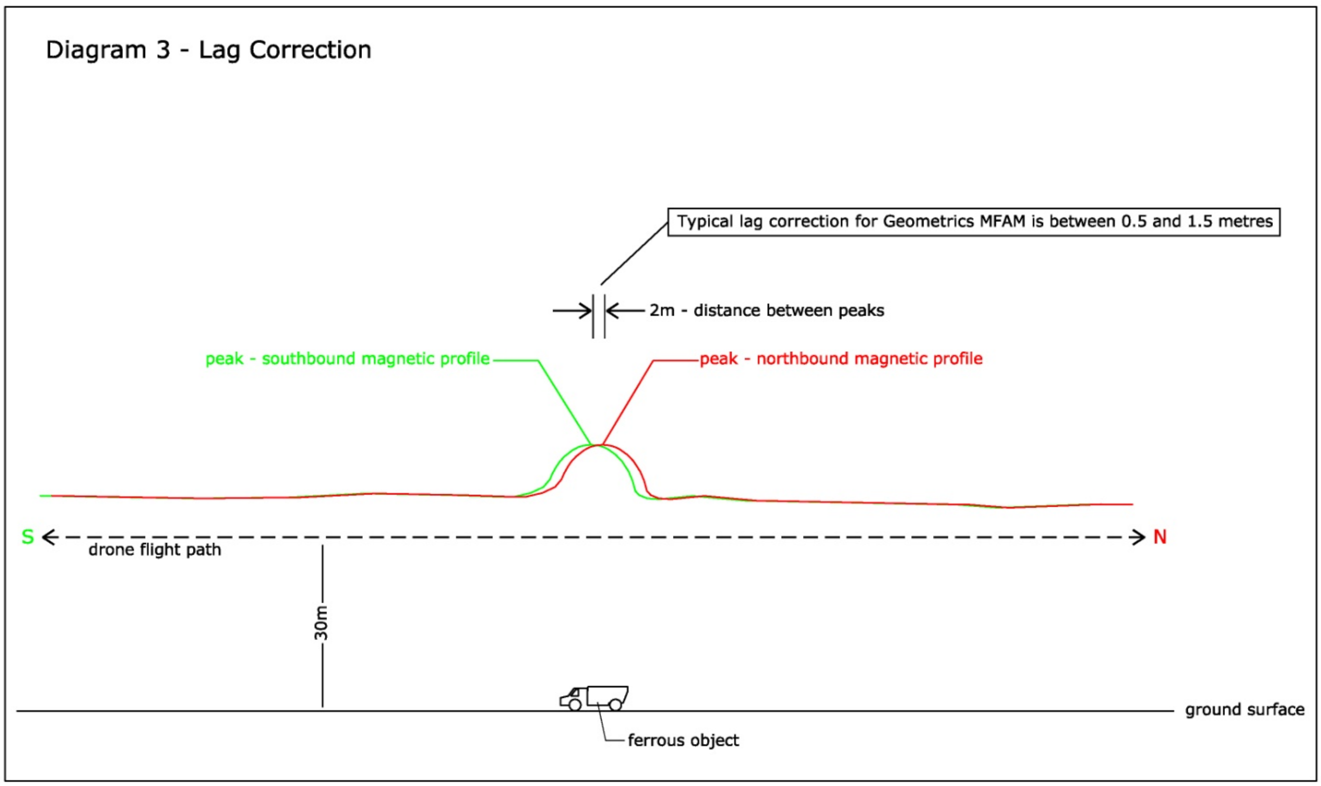
Each mag sensor will produce a unique result, however we typically apply a correction of 3Nt or less, to adjacent flight lines.

Lag Correction

Tests are performed to determine lag correction, by flying the drone magnetometer in opposite directions over top a ferrous object. Suitable objects include steel bridges, vehicles or heavy equipment.

Diagram 3 shows a typical flight test to determine lag correction.

A Geometrics MFAM magnetometer will typically have a lag error between 0.5 and 1.5 metres. Each mag sensor will produce a unique value. We typically apply a correction of 1m or less, to the location of magnetic readings on adjacent lines.



Diurnal Correction

A Geometrics G856AX proton procession magnetometer is operated as a base station on all projects, to provide diurnal monitoring of the local magnetic field variations. Adjustment may be applied to the raw MFAM readings, when variations exceed 10 or more Nt over the course of any flight. However, we typically re-fly grid lines, if the magnetic field variation is excessive.

The location (UTM coordinate) of the base station is included in the report body.

Processing Steps

Diurnal is examined for flights covering tie lines.
If magnetic field variation is excessive during tie line flights, all readings across tie lines are corrected using the base station data.

Tie lines provide a framework for leveling grid lines.
Readings on grid lines (once corrected for heading error and lag), are translated to conform to the tie lines. This process involves adjusting individual grid line segments, based on tie line intersections.

Unlike conventional airborne survey, such as fixed-wing or helicopter, a drone will take-off and land multiple times during the course of a survey. The resulting ferry lines are removed from the overall dataset prior to processing. Zen Geomap has developed import templates that run in Geosoft Oasis Montaj, to accomplish this task.

Geometrics MFAM data is not directly compatible with industry-standard software such as Geosoft.
Zen Geomap has developed software (Python code) to convert raw MFAM data into a format compatible with Geosoft and other industry-standard geophysical software. The raw data from MFAM is processed through Python, prior to initial processing.

The Python code developed by Zen Geomap has been adopted by Geometrics, as the standard conversion software for drone-mounted MFAM. Geometrics has been the industry leader for airborne magnetometer equipment since 1969.