ALEXANDRIA MINERALS CORPORATION – CARMAX MINING CORPORATION

GPS-POSITIONED GROUND MAGNETIC SURVEY

MATACHEWAN PROJECT

CAIRO & FLAVELLE TOWNSHIPS, KIRKLAND LAKE, ONTARIO, CANADA

LOGISTICS & INTERPRETATION REPORT

15N011 FEBRUARY 2015

PGE C Fe Ag Cu Au Zn REE Li Mo U Ni Cr Pb

Abitibi Geophysics Inc. 1746 chemin Sullivan, Val-d'Or, Québec J9P 7H1 T. : 819.874.8800 F. : 819.874.8801 www.ageophysics.com

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ABSTRACT

*On behalf of Alexandria Minerals Corporation and Carmax Mining Corporation, a **GPS-positioned Ground Magnetic** survey was carried out on the Matachewan property located within the Cairo & Flanelle Townships, in the Matachewan gold mining camp, Ontario. The goal of this geophysical campaign was to improve the geological understanding of the property (lithological mapping of the Intermediate-mafic and ultramafic volcanic* rocks *that may carry significant amounts of Au mineralization) by measuring their magnetic signatures.*

*From **January 23 to 31, 2015**, a total of **94.70 km** of magnetic data were gathered over 51 NW-SE regularly spaced lines divided into two blocks. Survey specifications, instrumentation control, data acquisition and processing were all successfully performed within our Quality System framework.*

*The ground magnetic survey successfully and clearly mapped the lithological formations of the Matachewan property. The dominant interpreted features on the eastern block are two NE-SW broad magnetic lineaments (**MT-1** & **MT-2**) and a bipolar magnetic anomaly trending NW-SE. Faulting patterns with the major NE-SW shear zone crossing the property were also successfully identified.*

A 3D magnetic susceptibility model probably corresponding to mafic-ultramafic volcanic rocks, was built and proposed for the Matachewan grid. For direct delineation of gold (Au) occurrences within the identified magnetic structures, we suggest integration of other geophysical methods such as Resistivity / Induced Polarization (OreVision® configuration.

1. MANDATE

- *PROJECT ID* — **Matachewan Project**
  (Our reference: **15N011**)

- *GENERAL LOCATION* — 60 km west of Kirkland Lake, Ontario, Canada

- *CUSTOMER* — **Alexandria Minerals Corporation –**
  Carmax Mining Corporation
  1, Toronto St., Suite 201 – Box 10
  Toronto, Ontario M5C 2V6
  Telephone: (416) 363-9372
  http://www.azx.ca

- *REPRESENTATIVE* — **Mr. Philippe Berthelot, P. Geo.**
  V-P Exploration
  1952, 3rd Avenue
  Val-d'Or, Québec J9P 7B2

  Telephone: (819) 874-1333 ext. 209
  pberthelot@azx.ca

- *SURVEY TYPE* — **GPS-positioned Ground Magnetic**

- *GEOPHYSICAL OBJECTIVE* — To improve the geological understanding of the property (lithological mapping and structural features underlying the property).

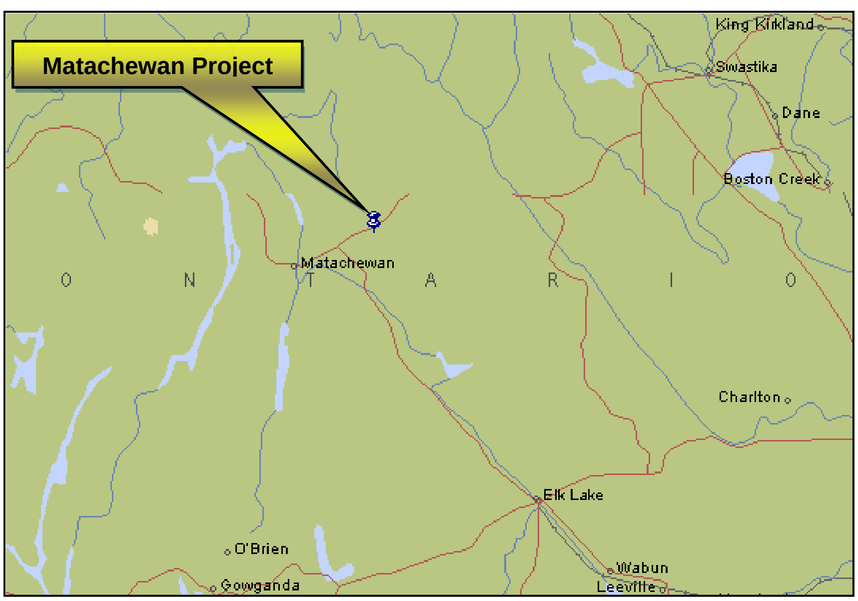


Figure 1. General location of the Matachewan Project

2. MATACHEWAN PROJECT

❑ *LOCATION*	**Cairo and Flavelle Townships, Kirkland Lake mining district, Ontario** Latitude: 48°59' N, Longitude: 80°33' W UTM : 533 500 mE, 5 314 000 mN (NAD83, zone 17N) NTS sheet: **41P/15**
❑ *NEAREST SETTLEMENTS*	**Matachewan**: 10 km to the southwest. **Kirkland Lake**: 60 km to the northeast.
❑ *ACCESS*	From Kirkland Lake, the Matachewan grid is directly accessible by the Highway 66.
❑ *GEOMORPHOLOGY*	The terrain of the Matachewan property shows moderate topographic relief in the south part of the grid and a rugged relief at the north with elevation varying from 297 to 436 m above mean see level. Vegetation is classified as thick boreal forest. Hydrographically, several streams connected to small lakes pass through the studied area. 5% of the surveyed area is also swampy.
❑ *CULTURAL FEATURES*	Among the cultural features encountered in the studied grid there is a power line that follows the Highway 66. The magnetic data gathered in this zone were not significantly affected.
❑ *MINING LAND TENURE*	The location of the Matachewan grid is illustrated on the following page. The claims encompassed in the present project are owned (50% each) by Alexandria Minerals Corporation and Carmax Mining Corporation.
❑ *SECURITY AND ENVIRONMENT*	As part of the Abitibi Geophysics EHS program, crew members received first aid training and are provided with the safety equipment and specialized training for the geophysical techniques utilized on this project. No incident was reported during this project.
❑ *SURVEY GRID*	The ground magnetic survey consists of two blocks. A total of fifty-one lines (L 54+00E to L 105+00E) regularly spaced at 100 m and oriented NW-SE, were surveyed. The lines vary from 0.2 to 4.3 km in length. Refer to figure 2, on page 4 for a plan view of the region covered by the present survey.
❑ *COORDINATE SYSTEM*	Projection: Universal Transverse Mercator (UTM), zone 17N Datum: NAD 83

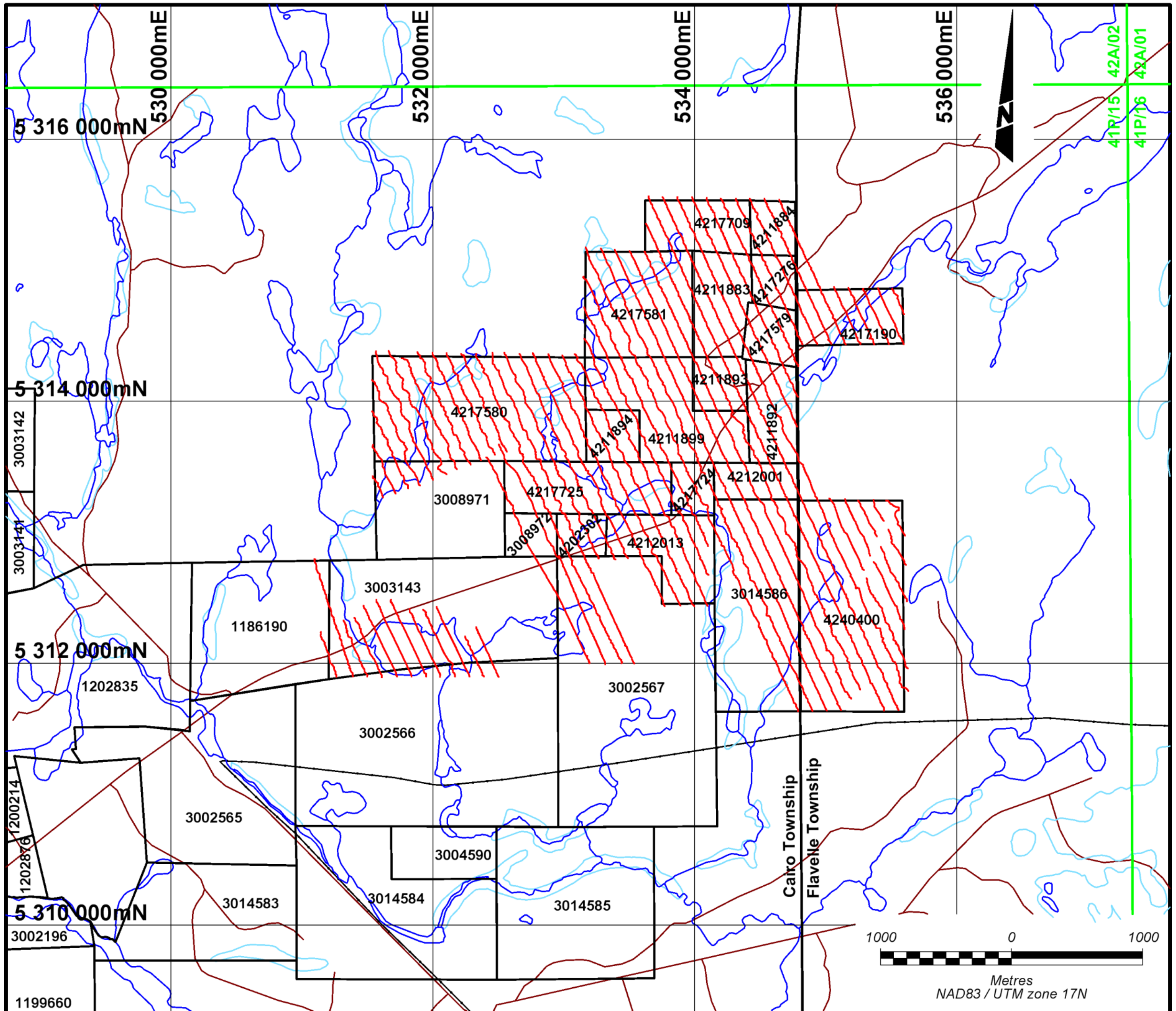


Figure 2. Index of claims and ground magnetic survey coverage over the Matachewan Project

3. GPS-POSITIONED GROUND MAGNETIC FIELD SURVEY

❑ *TYPE OF SURVEY*	Measurement of the Total Magnetic Intensity (TMI) with GPS readings recorded every second. The plotted values were corrected for diurnal variations using readings from a synchronized MAG base station.	
❑ *PERSONNEL*	Sylvain Brousseau,	Chief crew, geophysical operator
	Philippe Larouche,	Geophysical operator
	Carole Picard, Tech.,	Plotting
	Martin Dubois, P. Geo.,	Logistics
	Madjid Chemam, P. Geo.,	QC, Data processing & interpretation
	Thomas Loader, P. Geo.,	Final validation of product conformity
❑ *DATA ACQUISITION*	From January 23 to 31, 2015	
❑ *SURVEY COVERAGE*	**94.70 km**	
❑ *FIELD MAGNETOMETERS*	**GEM Systems GSM-19W**, s/n 2085540, 6112165	
	Proton precession magnetometers with Overhauser effect and built-in GPS.	
	Resolution:	0.01 nT / 1 m
	Absolute accuracy:	0.2 nT / 2-5 m
	Gradient tolerance:	>10 000 nT/m
	TMI sensor:	at a height of 1.8 m above ground
	Sensors:	83450 & 83191
❑ *BASE STATION*	**GEM Systems GSM-19**, s/n 56465	
	Proton precession magnetometer with Overhauser effect	
	Resolution:	0.01 nT
	Absolute accuracy:	0.2 nT
	Cycle time:	**10 seconds**
	Sensor:	21777
	Location (UTM NAD83):	5 315 586 mN, 536 110 mE
	Reference field:	57 000 nT

❑ *QUALITY CONTROLS*
(RECORDS AVAILABLE UPON REQUEST)

Before the survey:

✓ All magnetometers were successfully field-tested on Abitibi Geophysics' private control line.

Every day during data acquisition:

✓ Every morning, the operator had to successfully test for any magnetic contamination.
✓ In the evening, the geophysical operator reviewed the base station and the mobile units recordings using MAGneto ® processing and QC, in-house software.
✓ The geophysical operator ensures no active geomagnetic activity would be encountered during the survey by visiting the Space Weather Canada website (www.spaceweather.gc.ca).

At the Base of Operations:

✓ Field QCs were inspected & validated.
✓ All profiles were inspected and a few spikes were removed from the database.

❑ *QUALITY STATISTICS*

Table 1. Quality statistics – Ground Magnetic

Matachewan Project – MAG-GPS survey		
Field magnetometer s/n: 2085540		
Reading	**Readings towards**	
	North	South
1	56628.07 nT	56629.22 nT
2	56628.43 nT	56629.71 nT
3	56628.91 nT	56629.03 nT
Average	56628.47 nT	56629.32 nT
Difference	0.85 nT (must be ≤ 2 nT)	
Field magnetometer s/n: 6112165		
1	57150.77	57151.39
2	57151.91	57151.56
3	57151.89	57151.35
Average	57151.52	57151.43
Difference	0.09 nT (must be ≤ 2 nT)	

4. Data Presentation

- ***Total Magnetic Field Contours***

The total magnetic intensity (TMF) was gridded using a minimum curvature algorithm with grid cell size of 25 m. One pass of a 3 x 3 Hanning filter was applied to the resulting grid, which was then re-gridded with a cell size of 10 m to improve the overall appearance of the final map (1.2). The Oasis Montaj colour table (Clrb64.tbl) was used with linear interval of 100 nT from 55 700 nT to 59 600 nT.

- ***Residual Anomaly Contours***

To isolate the local magnetic anomaly from the regional component for the Mattachewan grid, an upward continuation of the total magnetic field at 1500 m was implemented.

The residual anomaly was generated in a straightforward way by removing the calculated regional grid from the Total magnetic field grid (figure 4.A).

- ***First Vertical Derivative***

Using a convolution filter method, the first vertical derivative (vertical gradient) of the TMI anomaly was calculated (2.7). One pass of a Hanning 3 x 3 filter was applied to the resulting grid to improve the overall appearance of the final map (#1.4).

The Oasis Montaj color table (Clra64.tbl) was used with linear interval of 2 nT/m from -32 to 32 nT/m.

- ***Maps Produced***

The following colour maps are bound or inserted in pockets at the end of this report. All plan maps are registered to the NAD 83, zone 17N, UTM grid coordinate system.

Our Quality System requires every final map to be inspected by at least two qualified persons before being approved and included within a final report.

Table 2. Maps produced

Map #	**Description**	**Scale**
	MAG-GPS Survey	
1.1	GPS-positioned Ground Magnetic Survey – Total Magnetic Intensity Anomaly Profiles (nT)	1:5000
1.2	GPS-positioned Ground Magnetic Survey – Total Magnetic Intensity Anomaly Contours (nT)	1:5000
1.4	GPS-positioned Ground Magnetic Survey – Calculated Vertical Gradient Contours (nT/m)	1:5000
10.0	Geophysical Interpretation	1:5000

- ***Digital Data***

The above-described maps are delivered in the Oasis Montaj map and JPG file formats on DVD-Rom.

A copy of all survey acquisition data (ASCII text format) and processed data (Geosoft Montaj databases) are also delivered on DVD-Rom.

5. GEOPHYSICAL INTERPRETATION

- *GROUND MAGNETIC SURVEY*

The area of investigation is located between longitudes 80° 35' and 80° 31' W, and latitudes 47° 57' and 47°59' N. The magnetic survey method is a useful mapping tool, outlining both lithological and structural trends. The principal purpose of this study is to delineate the magnetic features that may correspond to intermediate and mafic-ultramafic volcanic rocks which spatially, the Au mineralization is associated with and also to map the shear zones and faults that play important role in the localization of the gold deposits.

This study covered a total of fifty-one (51) profiles at 100 m intervals on two blocks on the Matachewan property.

The total magnetic field (TMF) within the Matachewan property shows a very complex character, reflecting the geological complexity of the studied area belonging to the Archean-aged Abitibi Belt, consisting of supracrustal sequences of volcanic rocks and interbedded sedimentary rocks, intruded by plutonic rocks (mafic-ultramafic to intermediate and felsic rocks), which in turn are intruded by diabase dykes, adding to the intense tectonic activity (deformation), characterized by folds, shear zones and faults.

Eastern block: the most dominant features on the eastern block (figure 4.A) are two broad ENE trending magnetic lineaments of more than 2.5 km in length:

- Amplitudes of the magnetic lineament **MT-1** outlined in the south part of the grid range from 800 to 1200 nT above a magnetic background of 56 450 nT. Quick 2D magnetic inversion performed on a NW-SE profile crossing this lineament shows that the causative source is buried at a depth of 200 - 280 m and has a width of approximately 300 m. The source seems dipping with an angle of 70° to the NW, and its magnetic susceptibility is likely to be in the range of 0.08 to 0.15 SI.

- As for the magnetic lineament **MT-2** outlined in the center of the eastern grid, this feature appears spatially associated to a major NE-SW shear zone, disrupted by a few NW-SE & NE-SW faults, and in turn intruded by a diabase dyke. This anomaly shows strong amplitudes ranging from 1250 to more than 5000 nT above a magnetic background of 56 500 nT. A 3D magnetic inversion was performed on this anomaly using Voxi Earth modelling Technology. The recovered geometrical and physical parameters of the causative source are presented in the next chapter.

- It's worthwhile to note the presence of a strong bipolar magnetic anomaly of about 500 x 200 m in size at the UTM coordinates (533 300 mE; 5 314 360 mN). The positive and negative amplitudes of this feature are reaching +5600 nT and -1100 nT, respectively. Spatially this anomaly seems to be associated with a NW-SE fault. This unusual magnetic signature is caused by the remanent magnetization and indicates that a causative sources of about 145 m has intruded the Archean Matachewan ground at a different time than the outlined magnetic lineament **MT-2.**

Analysis of the magnetic data also allowed the identification of a few dyke structures and short wavelength (band limited) magnetic features scattered in different areas of the Matachewan property:

South Western block: this zone is characterized by very low magnetic background of 55 300 nT which correspond to the passage of the main NE-SW shear zone (figure 6). An elongated magnetic anomaly of 2000 nT in amplitude has been outlined at the UTM coordinates (531 900 mE; 5 312 200 mN) between the lines 59+00E to 62+00E. This anomaly appears to be buried at a depth of 40 m, has a width of 120 m, and its magnetic susceptibility is estimated at 0.2 SI.

At the coordinates 531 455 mE; 5 312 275 mN, a circular magnetic anomaly (pipe like structure) of 125 m in width has been also delineated. This source appears buried at a depth of 40 m and has a magnetic susceptibility of around 0.05 SI. This anomaly is associated with the shear zone. A few other open ended magnetic highs were also detected in the south, east and at the north of the SW block.

To help with the interpretation procedure, an enhancement techniques consisting of vertical gradient and total gradient amplitude *(analytic signal)* are calculated in order to highlight subtle features and better characterize / define the magnetic contacts or boundaries of the causative sources (figure 5).

A simplified structural interpretation map (figure 7) was also generated for the eastern Matachewan block. The major faulting patterns with the projection to the surface of the magnetic susceptibilities have been reported.

❑ *UNCONSTRAINED 3D MAGNETIC INVERSION OF THE EASTERN GRID*

The principal purpose of this interpretation is to produce a subsurface magnetic susceptibility model for the Matachewan eastern block (**MT-2** structure). The resulting 3D map will provide a model of the architecture that should assist in the identification of favourable zones (mafic-ultramafic units) for Au deposits, therefore helping in the design of a follow up exploration program.

The 3D magnetic inversion was performed using the advanced Voxi Earth modelling Technology developed by Geosoft, more specifically the Magnetization Vector Inversion (MVI), method that takes into account the remanent magnetization effect.

The modeled area consists of a mesh of 70 x 58 x 23 cells discredited horizontally at 50 m intervals and in the vertical direction at 25 m intervals. The built 93 380 cells below the ground surface define the susceptibility model of the **MT-2** Matachewan structure, and the inverse problem is therefore formalized by inverting 488 data points to recover the susceptibilities in those cells.

The final inversion result is illustrated in figure 8, as three-dimensional isosurfaces rendered at 0.02 SI and as horizontal sections of the subsurface magnetic susceptibility at different elevations (figure 9).

As shown in these figures, the 3D magnetic inversion reveals the 3D geometry of the major structures of the **MT-2** Matachewan structure (eastern block). The recovered model susceptibilities range from 0.02 SI to up 0.15 SI. Outlined high susceptibility values ($>$ 0.08 SI) may correspond to mafic-ultramafic intrusives intruded in the Matachewan Archean ground.

Due to the unconstrained character of the 3D magnetic inversion and the non-uniqueness of potential field modeling, any parametric calculation resulting from this study is only one possible solution. Only sampling by drilling through the rock formation may give the final answer to the origin and nature of the outlined magnetic features.

6. CONCLUSIONS

The interpretation of the ground magnetic survey has improved the understanding of the geological setting of the Matachewan Project. Several magnetic structures showing generally low to high amplitudes, were identified from the present magnetic survey. The major tectonic features cutting the property were successfully mapped.

High quality displays of the TMF of the residual anomaly, of the total gradient amplitude (analytic signal) and of the first vertical derivative were generated in order to highlight and define mainly subtle magnetic features and to improve the magnetic picture of the Matachewan property.

The 3D geophysical interpretation has shown a possible 3D geometry for the mafic-ultramafic rocks having high magnetic susceptibility values. The resulting inversion model has important implication for target generation and for developing exploration strategies to determine the potential zones for gold occurrences.

For direct location of the gold mineralized zones associated with the sulphides (pyrite and pyrrhotite) within the Matachewan property, we recommend integrating additional geophysical methods (direct methods) such the Resistivity/IP (OreVision configuration) survey.

The interpretation of the geophysical data embodied in this report is essentially a geophysical appraisal of the Matachewan Project. As such, it incorporates only as much geoscientific information as the author had on hand at the time. Geologists thoroughly familiar with the area may be in a better position to evaluate the geological significance of the various geophysical signatures. Moreover, as time passes and data provided by follow-up programs are compiled, the priority and significance of exploration targets reported in this study may be downgraded or upgraded.

Respectfully submitted,
Abitibi Geophysics Inc.

GÉOLOGUE / GEOLOGIST
MADJID CHEMAM
1259
QUÉBEC

Madjid Chemam, P.Geo.
Geophysicist
OGQ # 1259

MC/mw

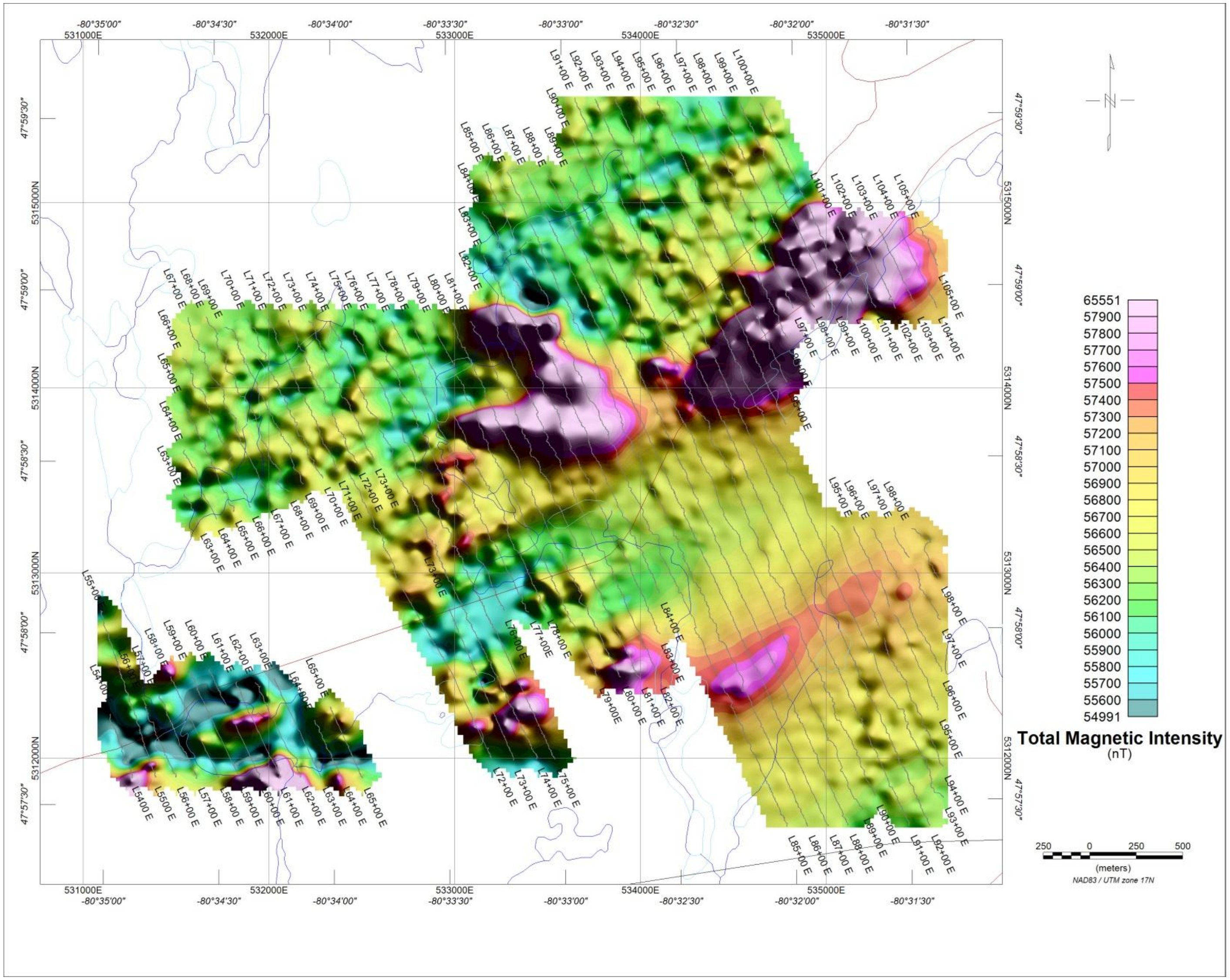


Figure 3. Total Magnetic Intensity Contour map of the Matachewan Project

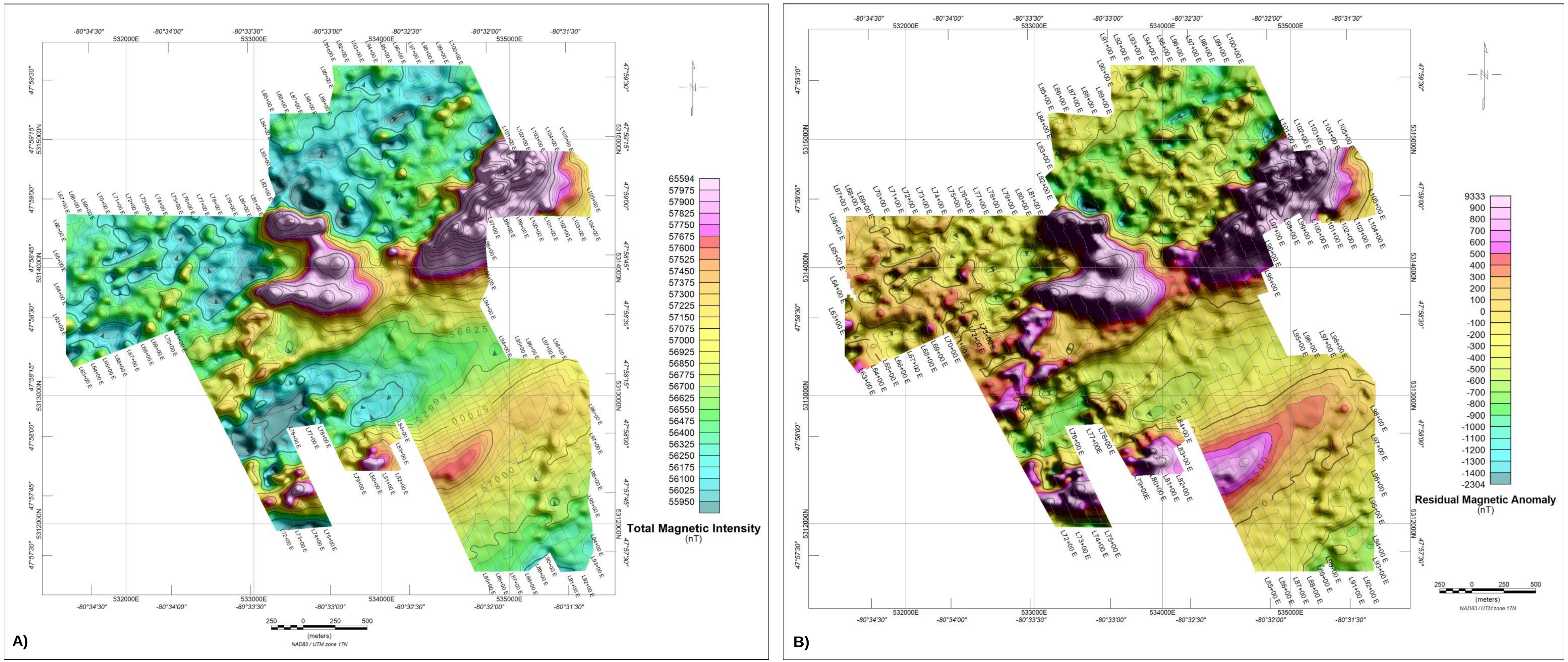


Figure 4. A) Total Magnetic Field Contour map; B) Residual Magnetic Anomaly Contour map of the Eastern Matachewan block

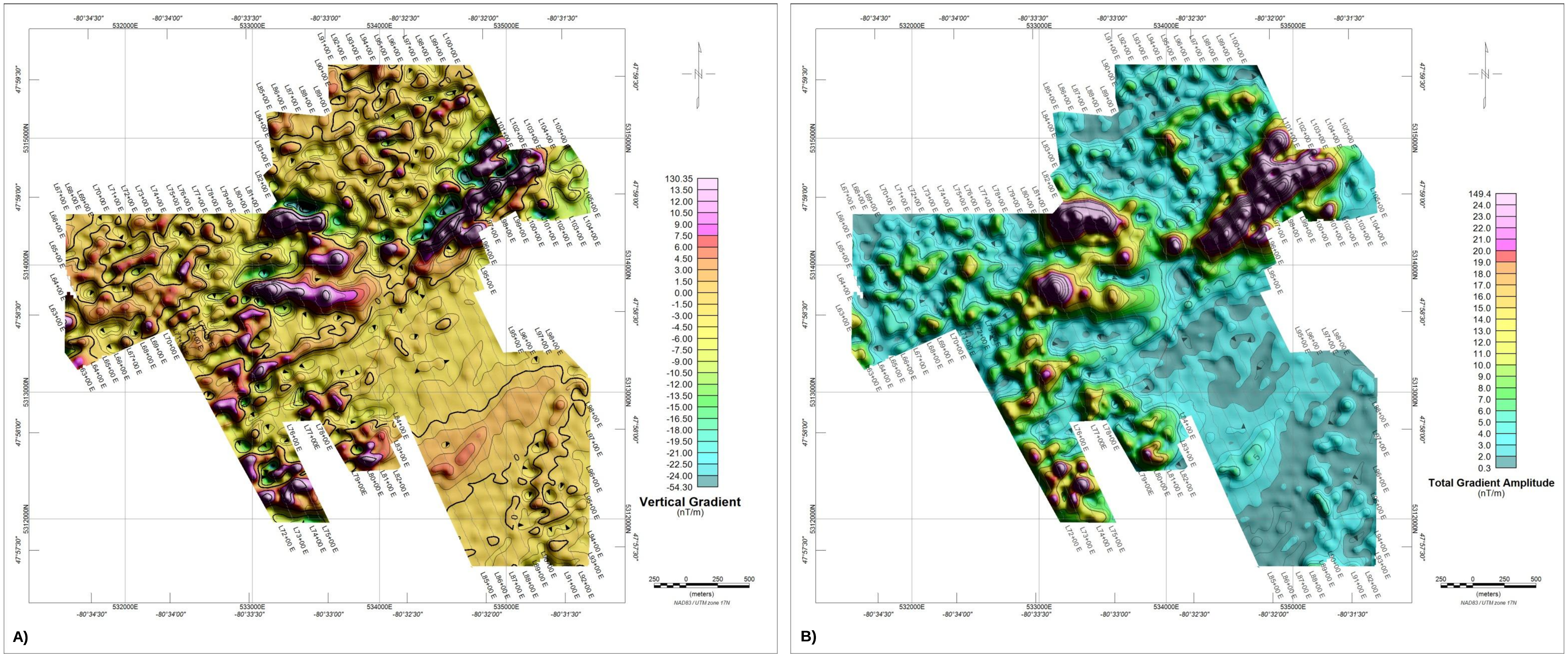


Figure 5. A) First Vertical Derivative Contour map; B) Total Gradient Amplitude (Analytic Signal) Contour map of the Eastern Matachewan block

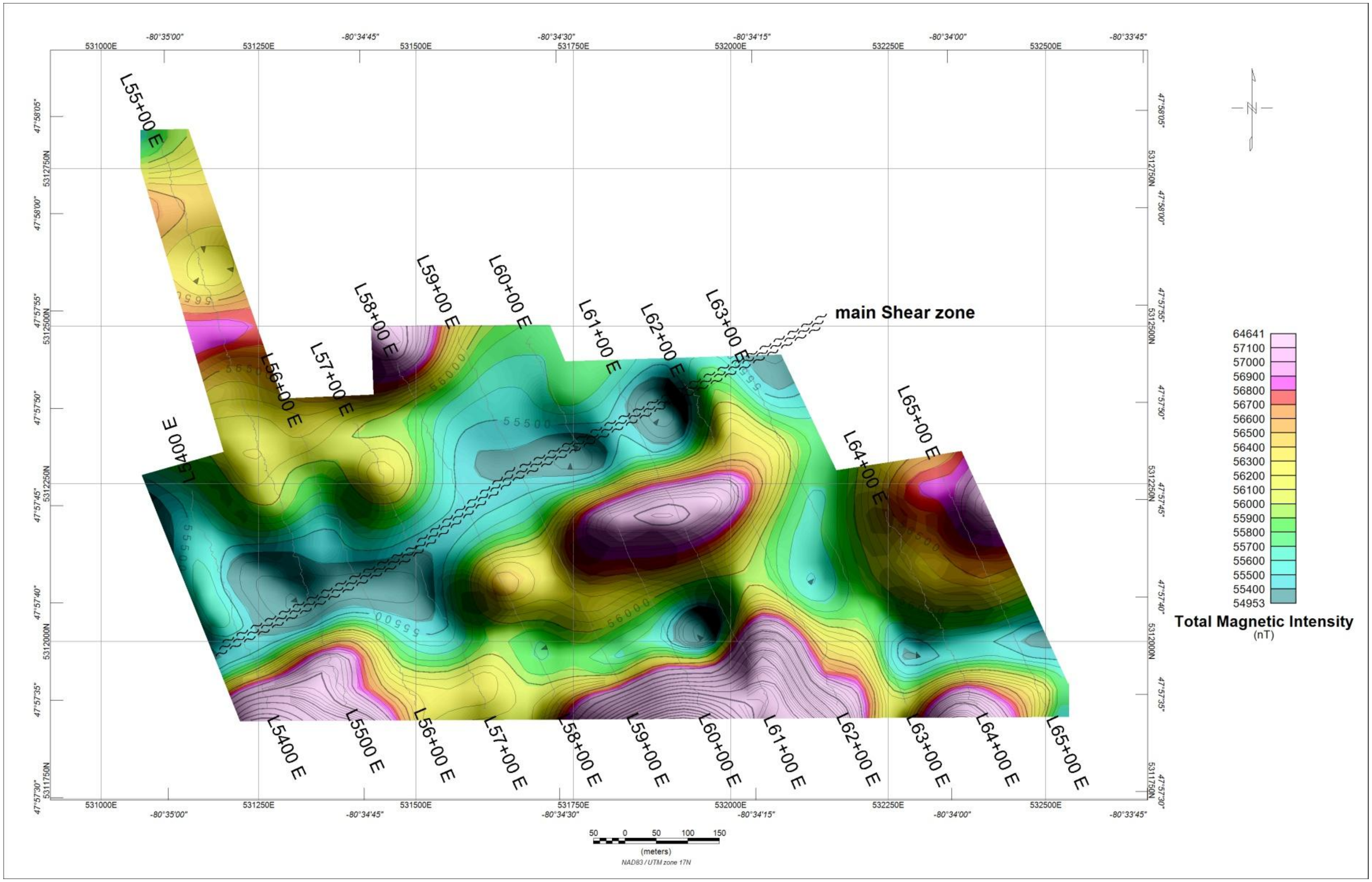


Figure 6. Total Magnetic Intensity Contour map of the south-western Matachewan block

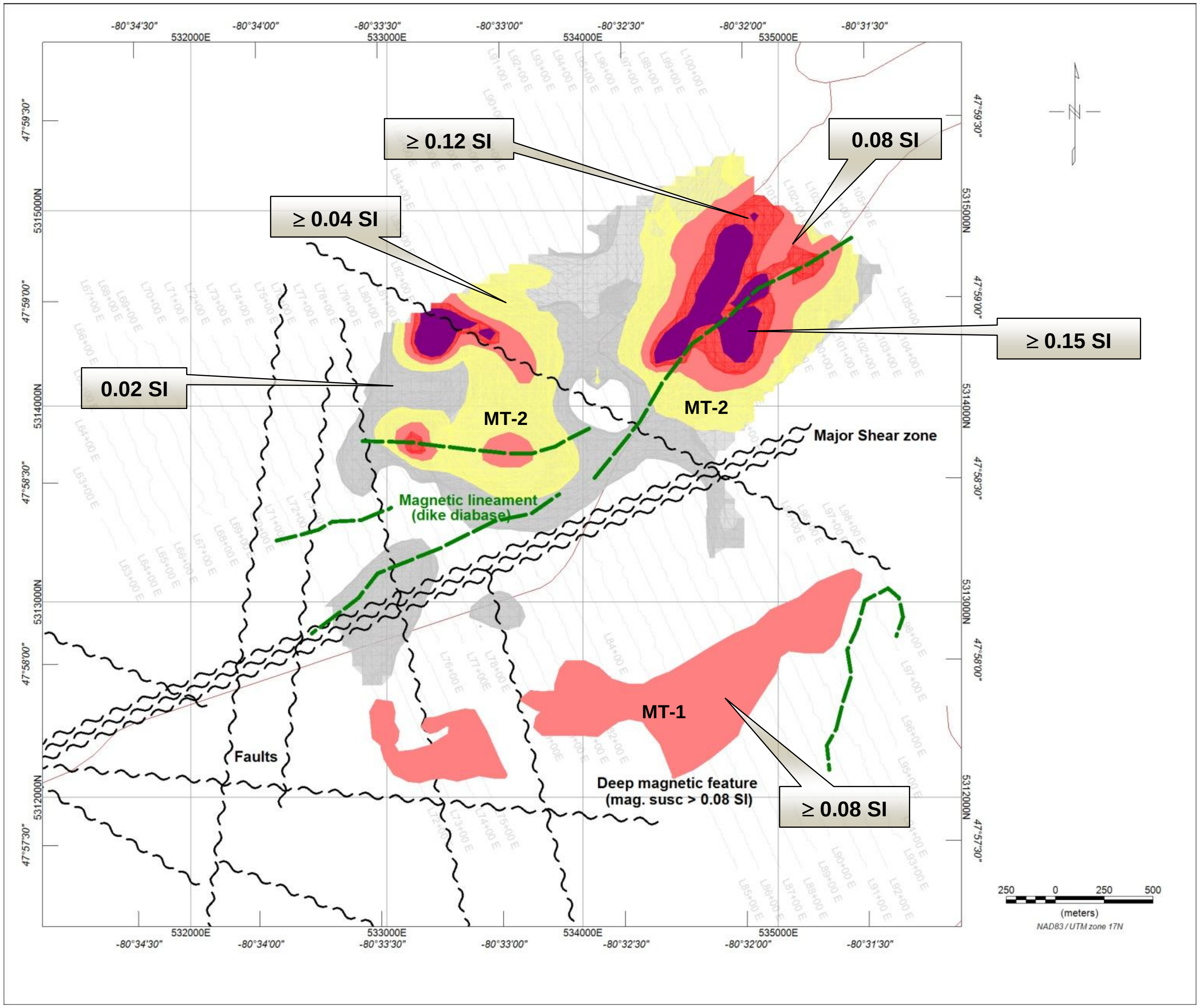


Figure 7. Simplified structural interpretation map of the Matachewan Project

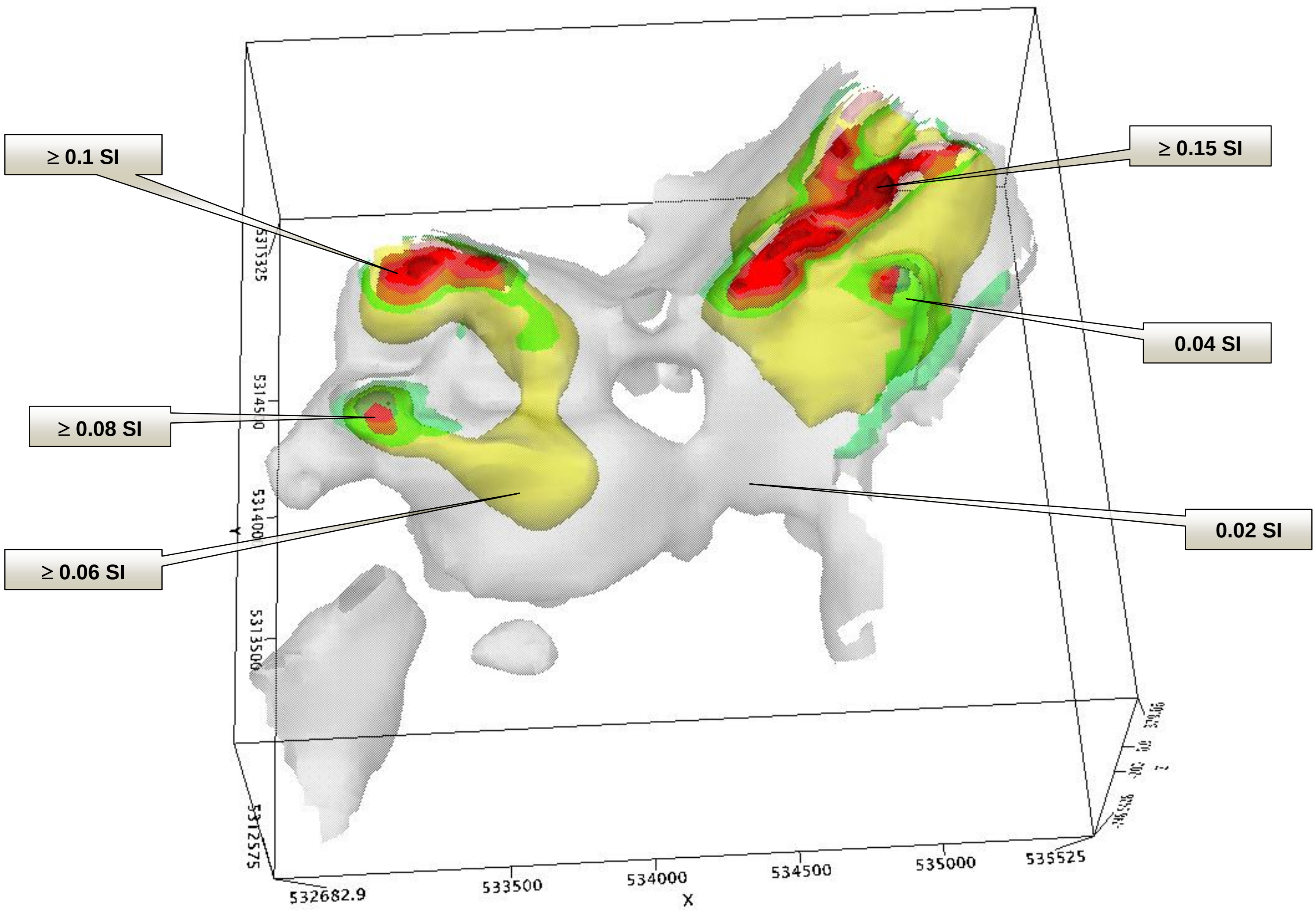


Figure 8. Perspective view showing the subsurface magnetic susceptibility isosurfaces rendered at 0.02 SI (grey shell) to 0.15 SI (dark red shell)

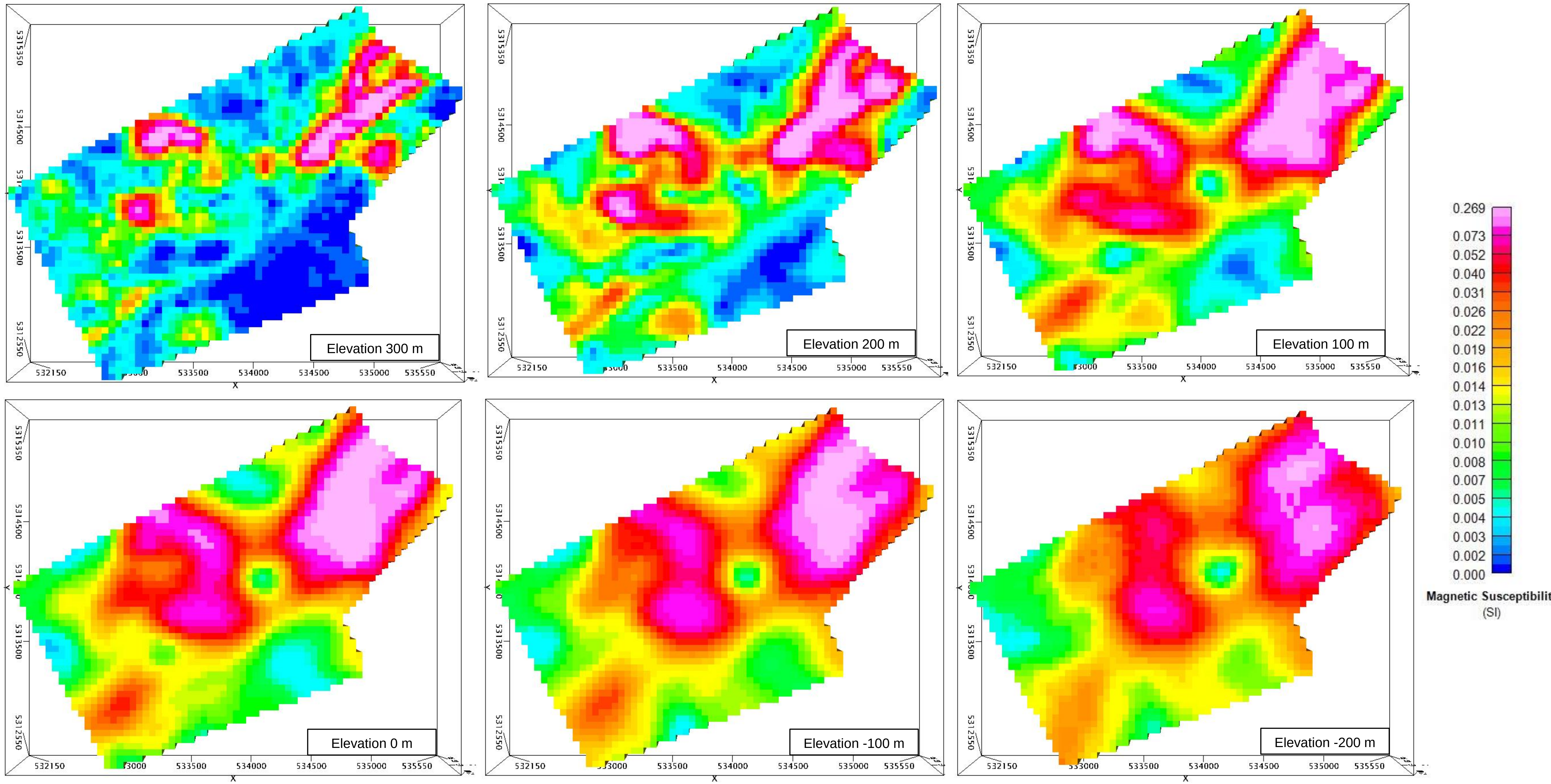
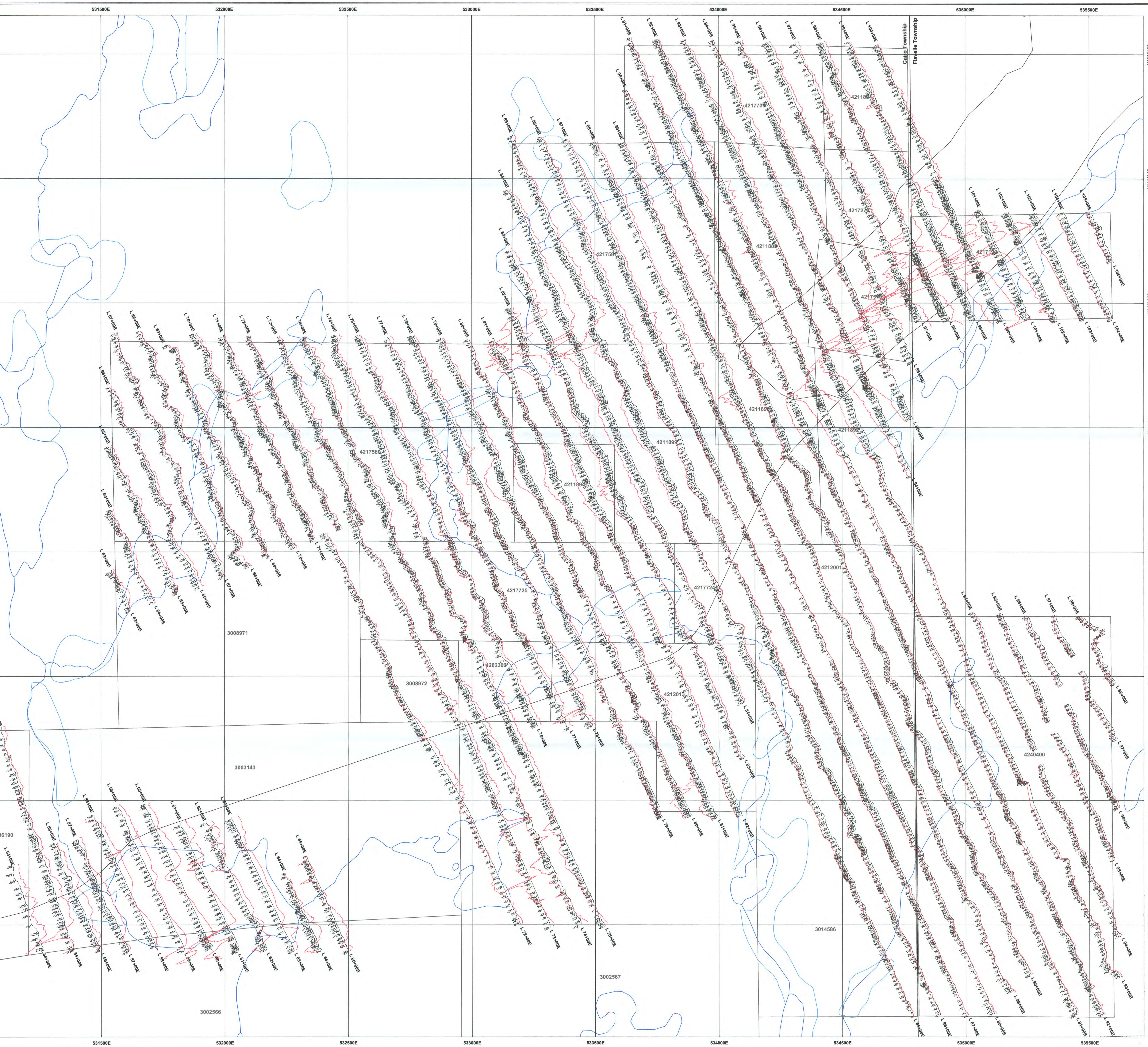
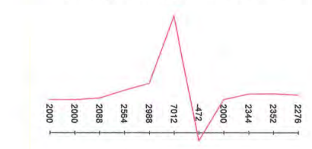


Figure 9. Horizonal sections showing the distribution of the magnetic susceptibility of the Matachewan Property at different elevations: 300 m, 200 m, 100 m, 0 m, -100 m and -200 m

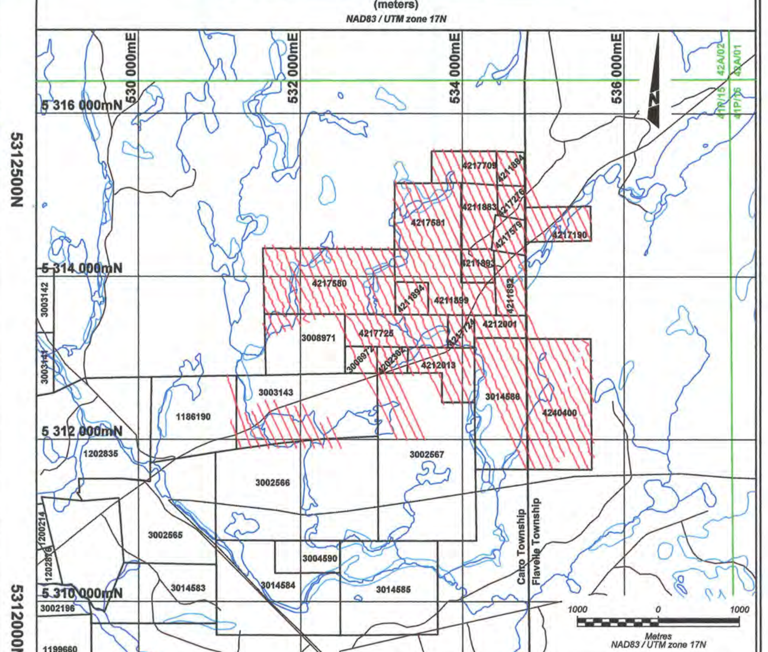


Total Field Profiles



Base level: 56500 nT
Profile scale: 2000 nT/cm
Survey line instrument:
GSM-19W from GEM Systems
Base station instrument:
GSM-19 from GEM Systems, cycle of 10 s

Scale 1:5000



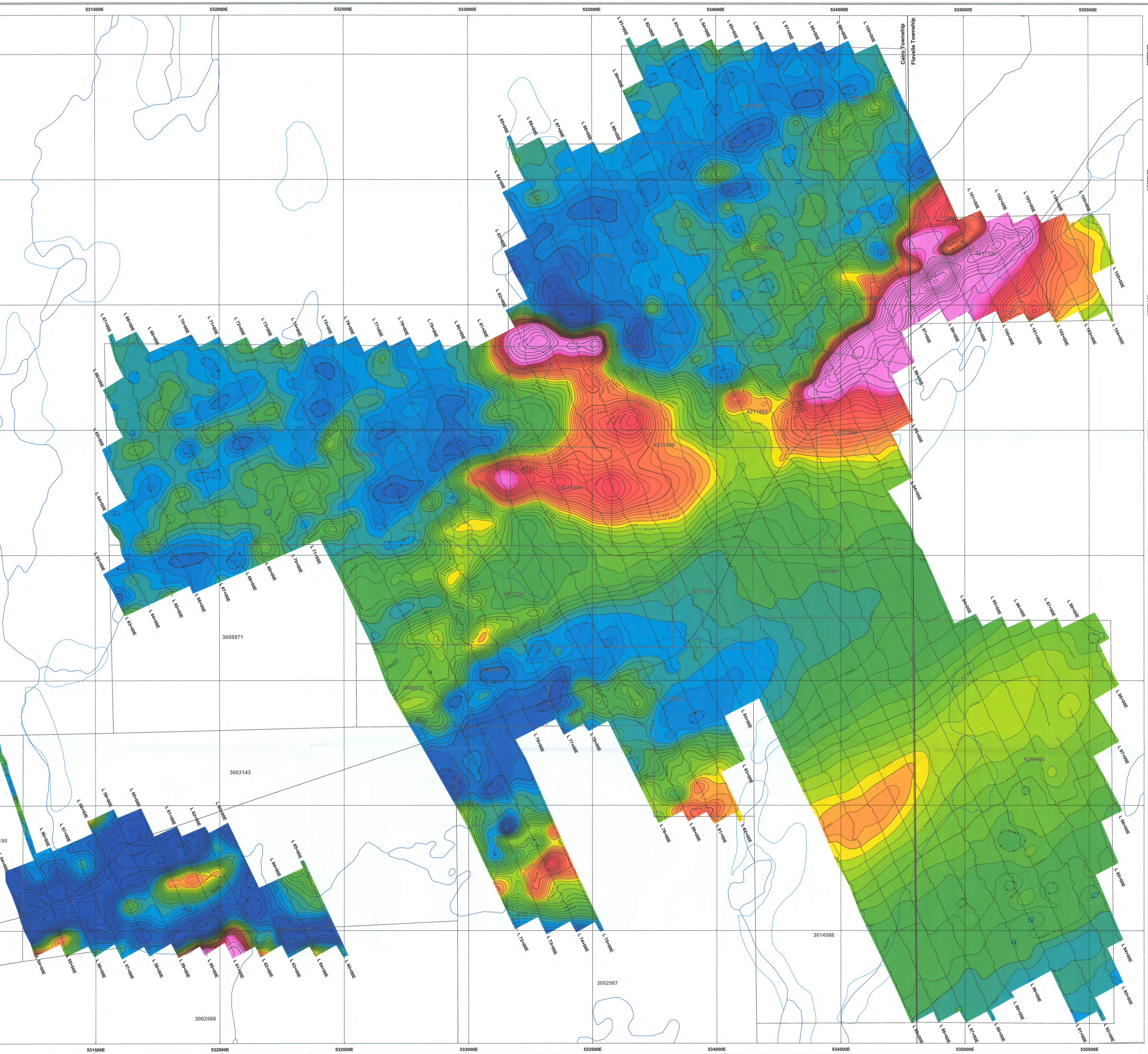
Alexandria Minerals Corp. - Carmax Mining Corp.
Matachewan Project
Cairo & Flavelle Townships, Ontario

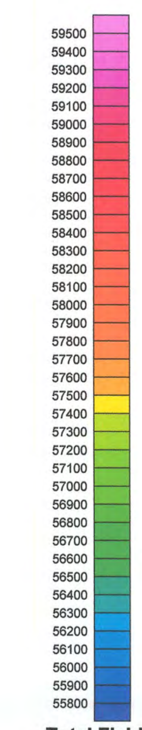
2.55809

GPS-positioned Ground Magnetic Survey
Total Magnetic Intensity Anomaly Profiles
(nT)

Interpreted by:	M. Chemam, P.Geo.	2015/02
Surveyed by:	Abitibi Geophysics Inc.	2015/01
Approved by:	T. Loader, P.Geo.	2015/02
Reference map: 41P/15		Scale 1:5000
Project no: 15N011		Map no: 1.1

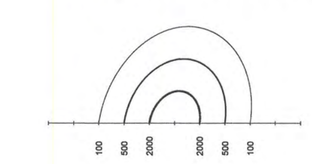
ABITIBI GEOPHYSICS





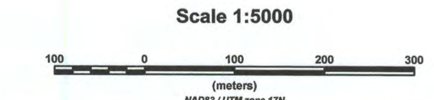
Total Field
(nT)

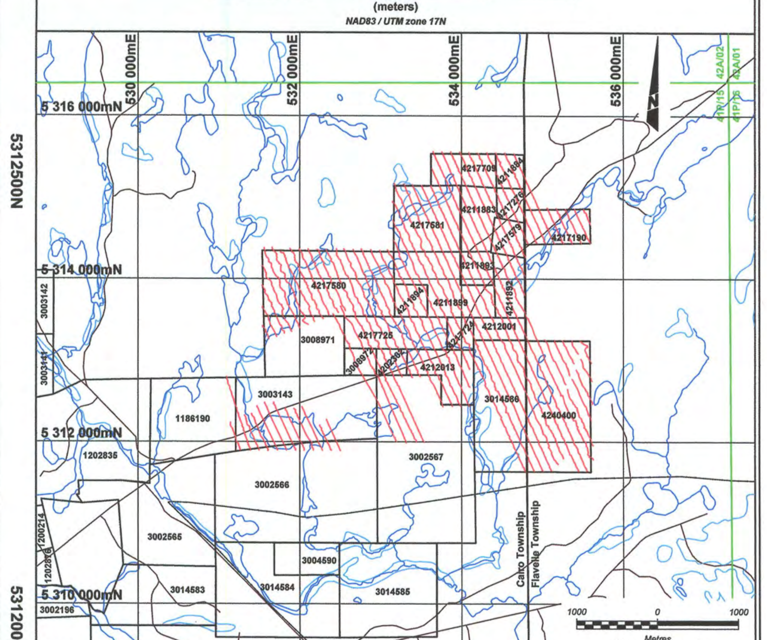
Total Field Contours



Unit: nT
Survey line instrument:
GSM-19W from GEM Systems
Base station instrument:
GSM-19 from GEM Systems, cycle of 10 s

Scale 1:5000





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Total Magnetic Intensity Anomaly Contours
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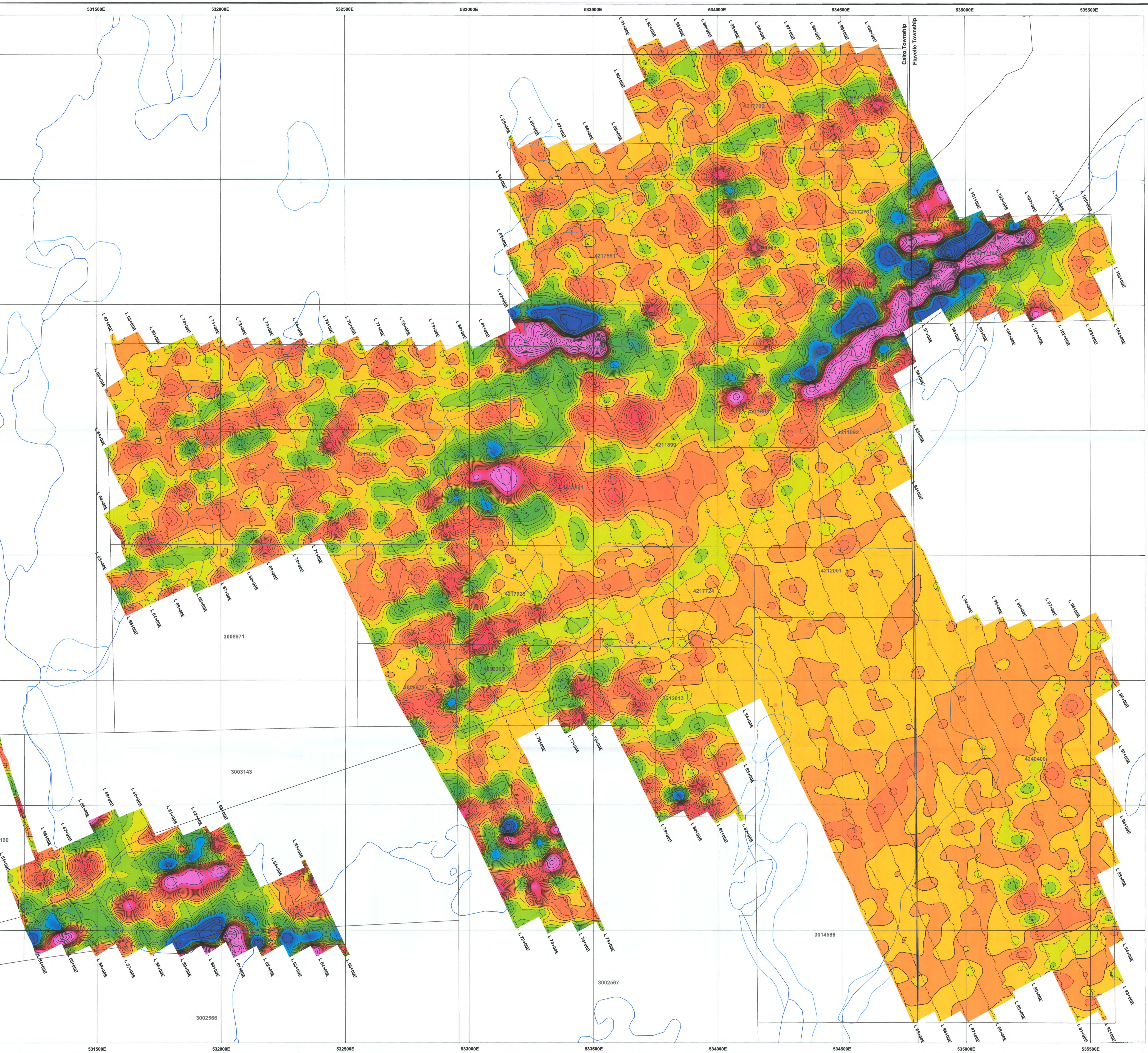
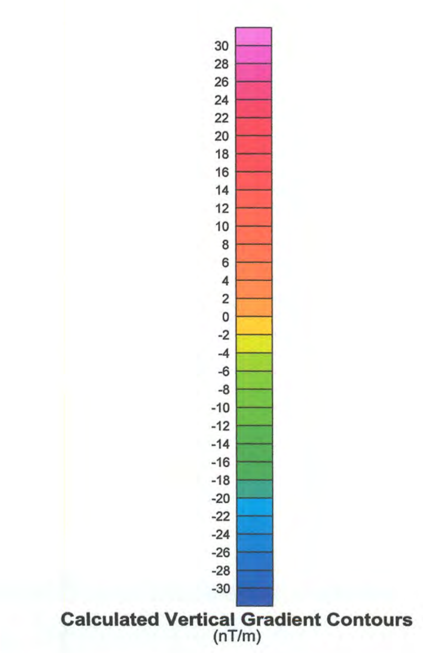
Interpreted by:	M. Chemam, P.Geo.	2015/02
Surveyed by:	Abitibi Geophysics Inc.	2015/01
Approved by:	T. Loader, P.Geo.	2015/02
Reference map: 41P/15		Scale 1:5000
Project no: 15N011		Map no: 1.2

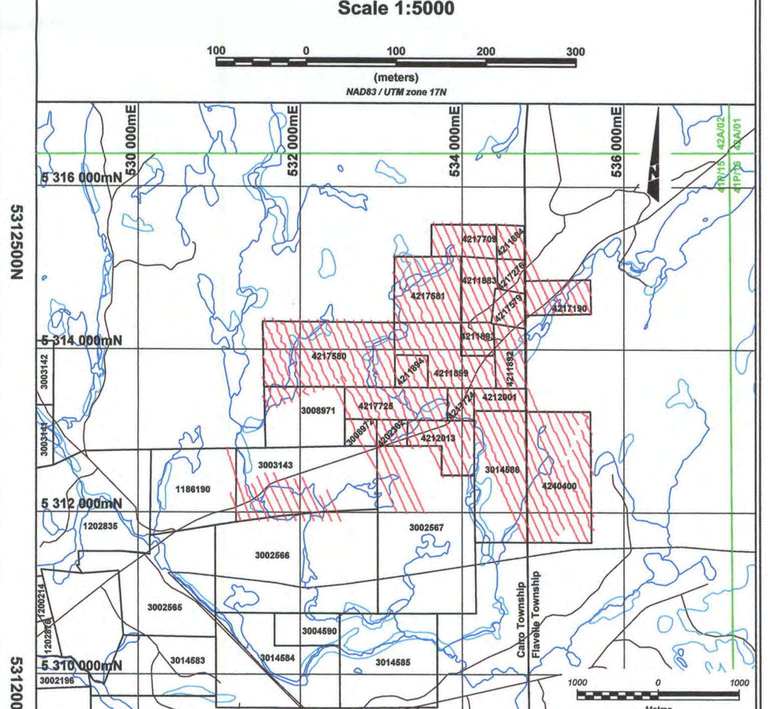




Calculated Vertical Gradient Contours

Unit: nT/m

Scale 1:5000



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GPS-positioned Ground Magnetic Survey
Calculated Vertical Gradient Contours
(nT/m)

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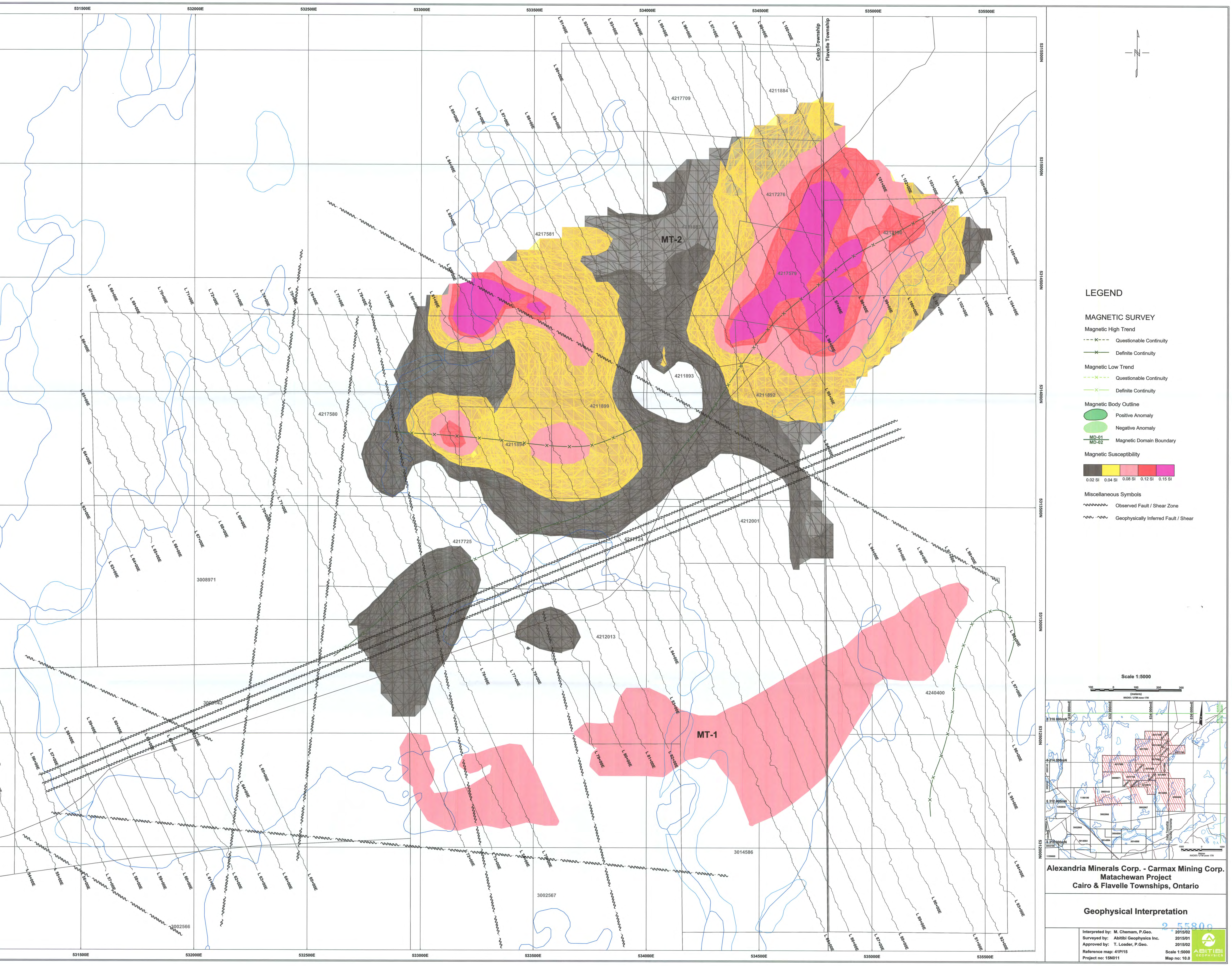
Reference map: 41P/15		Scale 1:5000
Project no: 15N011		Map no: 1.4



LEGEND
MAGNETIC SURVEY
Magnetic High Trend
Questionable Continuity
Definite Continuity
Magnetic Low Trend
Questionable Continuity
Definite Continuity
Magnetic Body Outline
Positive Anomaly
Negative Anomaly
MD-01
MD-02
Magnetic Domain Boundary
Magnetic Susceptibility
0.02 SI
0.04 SI
0.08 SI
0.12 SI
0.15 SI
Miscellaneous Symbols
Observed Fault / Shear Zone
Geophysically Inferred Fault / Shear
MT-2
MT-1
Cairo Township
Flavelle Township
Scale 1:5000
Alexandria Minerals Corp. - Carmax Mining Corp.
Matachewan Project
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Geophysical Interpretation
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