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Ontario Geological Survey 2015. Airborne magnetic and electromagnetic surveys, shaded colour image of the second vertical derivative of the residual magnetic field and Keating coefficients, Matachewan– Timmins area—Purchased data; Ontario Geological Survey, Map 60 428, scale 1:20 000.

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## SHADED IMAGE SUN ANGLE

- 47°59'17"

314000 m



## LEGEND





#### KEATING COEFFICIENTS

itive correlation		Negative correlation
0	90%	Ο
0	85%	0
0	80%	0
0	75%	0

#### SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD GRID nanoteslas per metre<sup>2</sup> (nT/m<sup>2</sup>)

0 088000	
0.041250	
0.021750	
0.021750	
0.012000	
0.006500	
0.003500	
0.002000	
0.001250	
0.000750	
0.000250	
0.000000	
-0.000500	
-0.000750	
-0.001250	
-0.001750	
-0.002250	
-0.003000	
-0.004000	
-0.005250	
-0.006750	
-0.009000	
-0.011750	
-0.015500	
-0.021000	
-0.029500	
-0.043750	
-0.075250	

# DESCRIPTIVE NOTES

This survey was flown using the Aeroquest AeroTEM™ helicopter-borne magnetic and electromagnetic system. The aircraft was also equipped with a GPS navigation system and a digital data acquisition system. Second Vertical Derivative of the Magnetic Field

The second vertical derivative values of the magnetic field were computed directly from the gridded residual magnetic intensity data using a fast Fourier transform, combining the transfer functions of the second vertical derivative and a halfcosine low-pass filter (100 m cut-off wavelength). The low-pass filter was aimed at attenuating unwanted high frequencies enhanced by the derivative operator.

#### The shaded relief parameters are: Illumination inclination: 45° Illumination declination: 45°

Introduction

may not.

Keating Correlation Coefficients

Possible kimberlite targets have been identified from the residual magnetic intensity data, based on the identification of roughly circular anomalies. This procedure was automated by using a known pattern-recognition technique (Keating 1995), which consists of computing, over a moving window, a first-order regression between a vertical cylinder model anomaly and the gridded magnetic data. Only the results where the absolute value of the correlation coefficient is above a threshold of 75% were retained. The results are depicted as circular symbols, scaled to reflect the correlation value. The most favourable targets are those that exhibit a cluster of high amplitude solutions. Correlation coefficients with a negative value correspond to reversely magnetized sources. It is important to be aware that other magnetic sources may correlate well with the vertical cylinder

#### The cylinder model parameters are as follows: Cylinder diameter: 200 m Cylinder length: infinite Overburden thickness: 4.9 m to 24.0 m Window size: 10 x 10 cells (400 m x 400 m)

#### SURVEY PARAMETERS

model, whereas some kimberlite pipes of irregular geometry

AIRCRAFT Type: Aerospatiale AS350B2 Registration: C-FAVI

- MAGNETOMETER Type: Geometrics® G823A cesium-vapour Sensitivity: 0.001 nT Sample interval: 10 readings per second Sensor location: 19 m below aircraft
- ELECTROMAGNETIC SYSTEM Type: AeroTEM™ Base frequency: 150 Hz Current waveform: bipolar triangular Peak dipole moment (NIA): 38 800 Am<sup>2</sup> Pulse width: 1150 µsec
- Off-time: 2183 µsec Parameters: X- and Z-components of dB/dt Sample interval: 10 readings per second Bird Location: 40 m below aircraft
- NAVIGATION SYSTEM GPS receiver: Trimble® AgGPS®132 GPS sample interval: 5 readings per second Radar altimeter: Terra 3500/TRI-30 Video flight path recorder: 8 mm high resolution colour video Guidance system: Ag-Nav Inc. AG-NAV2

Digital acquisition system: AeroDAS, RMS Instruments

- DGR33A BASE STATION Magnetometer: Scintrex® CS-2 cesium GPS receiver: Leica® MX9212
- Sample interval: 1 reading per second SURVEY SPECIFICATIONS Survey date: April 24 to May 12, 2004 Nominal aircraft terrain clearance: 70 m
- Traverse line spacing: 50 and 100 m Control line spacing: 200 m Traverse line direction: North-South and East-West Control line direction: East-West
- CO-ORDINATE SYSTEM Projection: Universal Transverse Mercator Datum: NAD83 Central meridian: 93°00'W (UTM zone 17) Central scale factor: 0.9996 False easting: 500 000 m False northing: 0 m

# Ontario

Ontario Geological Survey MAP 60 428

#### AIRBORNE MAGNETIC AND ELECTROMAGNETIC SURVEYS

Shaded colour image of the second vertical derivative of the residual magnetic field and Keating coefficients

# MATACHEWAN-TIMMINS AREA

0

Ontario Geological Survey.

500 m

# Purchased Data

Scale 1:20 000

0.5

# NTS Reference: 41 P/14

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#### SOURCES OF INFORMATION

Base map information derived from the Land Information Ontario Data Warehouse, Land Information Ontario, Ministry of Natural Resources and Forestry, scale 1:50 000. Magnetic declination for the centre of the map area was approximately 10°26'W in 2015.

Fiset, N. 2004. Report on a helicopter-borne magnetic and electromagnetic survey, featuring the Aeroquest AeroTEM™ system, Redstone Property, Adams Township, Timmins area, Ontario; unpublished report for Mustang Minerals Corp., Sudbury Resident Geologist's office, assessment file AFRO# 2.28796, AFRI# 42A06SE2024, 45p.

Fiset, N. 2004. Report on a helicopter-borne magnetic and electromagnetic survey, featuring the Aeroquest AeroTEM™ system, Bannockburn Property, Bannockburn Township, Matachewan area, Ontario; unpublished report for Mustang Minerals Corp., Sudbury Resident Geologist's office,

Fiset, N. 2004. Report on a helicopter-borne magnetic and electromagnetic survey, featuring the Aeroquest AeroTEM™ system, McArthur Property, McArthur Township, Timmins area, Ontario; unpublished report for Mustang Minerals Corp., Sudbury Resident Geologist's office, assessment file AFRO# 2.29089, AFRI# 42A03NE2010, 41p.

Fiset, N. 2004. Report on a helicopter-borne magnetic and electromagnetic survey, featuring the Aeroquest AeroTEM™ system, Midlothian Property, Midlothian Township, Matachewan area, Ontario; unpublished report for Mustang Minerals Corp., Sudbury Resident Geologist's office, assessment file AFRO# 2.29935, AFRI# 20000000463, 41p.

Fiset, N. 2004. Report on a helicopter-borne magnetic and electromagnetic survey, featuring the Aeroquest AeroTEM™ system, Montrose Property, Montrose Township, Matachewan area, Ontario; unpublished report for Mustang Minerals Corp., Sudbury Resident Geologist's office, assessment file AFRO# 2.29867, AFRI# 20000000456, 39p.

Fiset, N. 2004. Report on a Helicopter-borne magnetic and electromagnetic survey, featuring the Aeroquest AeroTEM™ system, Powell Property, Powell Township, Matachewan area, Ontario; unpublished report for Mustang Minerals Corp., Sudbury Resident Geologist's office, assessment file AFRO# 2.29869, AFRI# 20000000457, 41p.

Fiset, N. 2004. Report on a helicopter-borne magnetic and electromagnetic survey, featuring the Aeroquest AeroTEM™ system, Serpentine Property, Semple and Sothman townships, Matachewan area, Ontario; unpublished report for Mustang Minerals Corp., Sudbury Resident Geologist's office, assessment file AFRO# 2.28603, AFRI# 41P14NE2014, 52p. Ontario Geological Survey 1999. Single master gravity and

#### REFERENCE

Keating, P.B. 1995. A simple technique to identify magnetic anomalies due to kimberlite pipes; Exploration and Mining Geology, v.4, no.2, p.121-125.

#### CREDITS

Data acquisition, data compilation by Aeroquest International, Mississauga, Ontario for Mustang Minerals Corp., Toronto, Ontario.

Data reprocessing and map production by Scott Hogg and Associates, Toronto, Ontario.

Contract management, base maps and map surrounds by the Ministry of Northern Development and Mines, Sudbury, Ontario. Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ministry

of Northern Development and Mines does not assume liability for any errors that may occur. Users should verify critical information. The geophysical data on this map were purchased from the

private sector. The original data acquisition was neither supervised by the Ontario Geological Survey (OGS) nor carried out to OGS technical specifications. However, the purchased data do meet a pre-defined valuation criteria set out by the OGS. Some quality assurance and quality control checks have been carried out on the digital data.

Corresponding digital data for this survey are available from the following Ontario Geological Survey publication: Ontario Geological Survey 2015. Ontario airborne geophysical

surveys, magnetic and electromagnetic data, grid and profile data (ASCII and Geosoft® formats) and vector data, Matachewanmins area—Purchased data; Ontario Geological Survey, Geophysical Data Set 1243. Issued 2015.

Information from this publication may be quoted if credit is given. It is recommended that reference be made in the following form: Ontario Geological Survey 2015. Airborne magnetic and electromagnetic surveys, shaded colour image of the second vertical derivative of the residual magnetic field and Keating

coefficients, Matachewan-Timmins area-Purchased data; Ontario Geological Survey, Map 60 428, scale 1:20 000.

Users of OGS products are encouraged to contact those Aboriginal communities whose traditional territories may be located in the mineral exploration area to discuss their project.

47°51'44

02000 n

52'







assessment file AFRO# 2.29671, AFRI# 41P15NW2014, 42p.

aeromagnetic data for Ontario, Geophysical Data Set 1036.