

THESE TERMS GOVERN YOUR USE OF THIS DOCUMENT

Your use of this Ontario Geological Survey document (the “Content”) is governed by the terms set out on this page (“Terms of Use”). By downloading this Content, you (the “User”) have accepted, and have agreed to be bound by, the Terms of Use.

Content: This Content is offered by the Province of Ontario’s *Ministry of Northern Development and Mines* (MNDM) as a public service, on an “as-is” basis. Recommendations and statements of opinion expressed in the Content are those of the author or authors and are not to be construed as statement of government policy. You are solely responsible for your use of the Content. You should not rely on the Content for legal advice nor as authoritative in your particular circumstances. Users should verify the accuracy and applicability of any Content before acting on it. MNDM does not guarantee, or make any warranty express or implied, that the Content is current, accurate, complete or reliable. MNDM is not responsible for any damage however caused, which results, directly or indirectly, from your use of the Content. MNDM assumes no legal liability or responsibility for the Content whatsoever.

Links to Other Web Sites: This Content may contain links, to Web sites that are not operated by MNDM. Linked Web sites may not be available in French. MNDM neither endorses nor assumes any responsibility for the safety, accuracy or availability of linked Web sites or the information contained on them. The linked Web sites, their operation and content are the responsibility of the person or entity for which they were created or maintained (the “Owner”). Both your use of a linked Web site, and your right to use or reproduce information or materials from a linked Web site, are subject to the terms of use governing that particular Web site. Any comments or inquiries regarding a linked Web site must be directed to its Owner.

Copyright: Canadian and international intellectual property laws protect the Content. Unless otherwise indicated, copyright is held by the Queen’s Printer for Ontario.

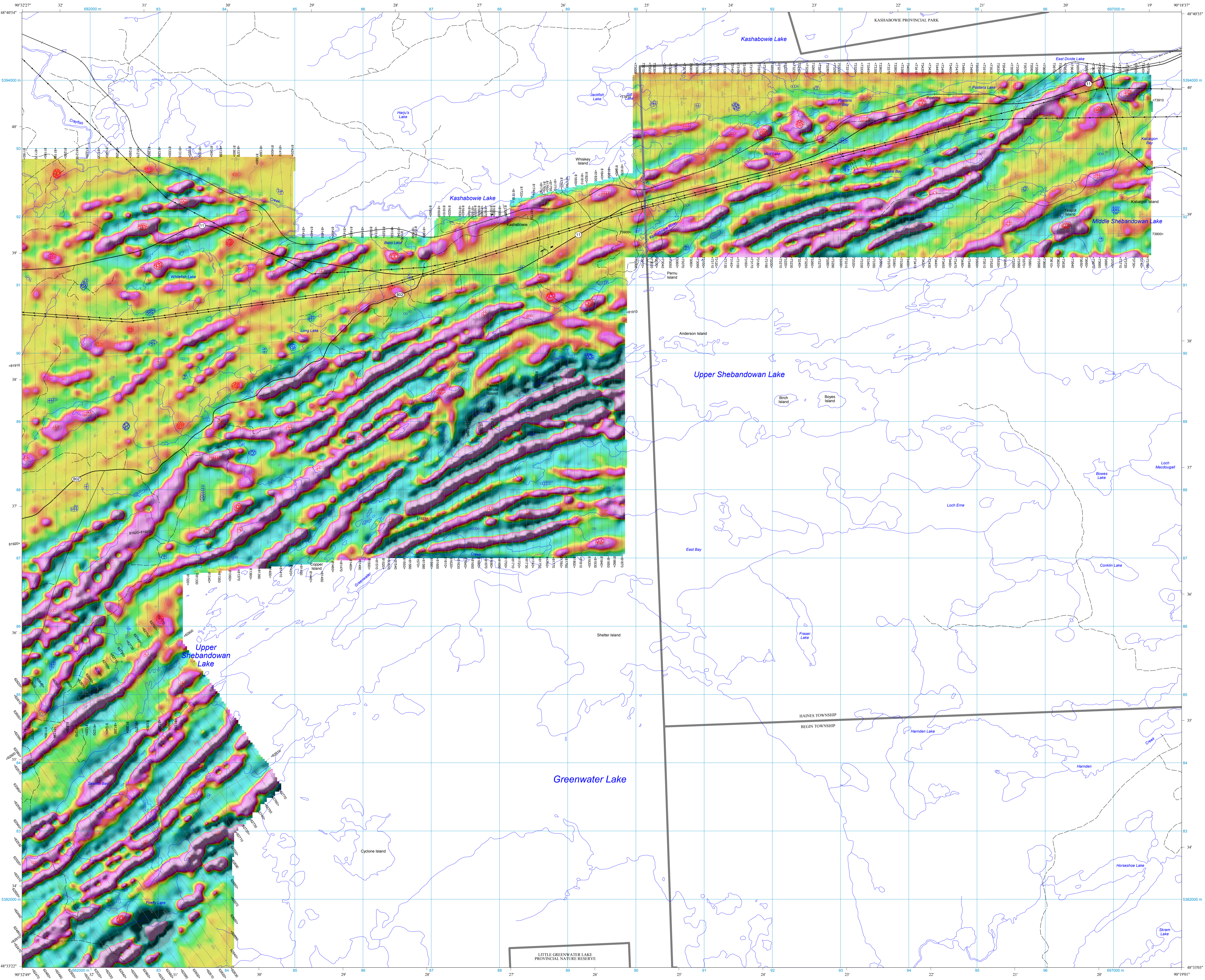
It is recommended that reference to the Content be made in the following form:

Ontario Geological Survey 2014. Airborne magnetic and electromagnetic surveys, shaded colour image of the second vertical derivative of the residual magnetic field and Keating coefficients, Burchell Lake area—Purchased data; Ontario Geological Survey, Map 60 406, scale 1:20 000.

Use and Reproduction of Content: The Content may be used and reproduced only in accordance with applicable intellectual property laws. *Non-commercial* use of unsubstantial excerpts of the Content is permitted provided that appropriate credit is given and Crown copyright is acknowledged. Any substantial reproduction of the Content or any *commercial* use of all or part of the Content is prohibited without the prior written permission of MNDM. Substantial reproduction includes the reproduction of any illustration or figure, such as, but not limited to graphs, charts and maps. Commercial use includes commercial distribution of the Content, the reproduction of multiple copies of the Content for any purpose whether or not commercial, use of the Content in commercial publications, and the creation of value-added products using the Content.

Contact:

FOR FURTHER INFORMATION ON	PLEASE CONTACT:	BY TELEPHONE:	BY E-MAIL:
The Reproduction of the Content	MNDM Publication Services	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	Pubsales.ndm@ontario.ca
The Purchase of MNDM Publications	MNDM Publication Sales	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	Pubsales.ndm@ontario.ca
Crown Copyright	Queen’s Printer	Local: (416) 326-2678 Toll-Free: 1-800-668-9938 (inside Canada, United States)	Copyright@gov.on.ca



DESCRIPTIVE NOTES

Introduction

This map was compiled from multiple proprietary airborne surveys purchased by the Ontario Ministry of Northern Development and Mines. These surveys were flown using the Geotech VTEM helicopter-borne magnetic and electromagnetic system. The aircraft was also equipped with GPS navigation systems and digital data acquisition systems.

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 derivative with a 30 m Upward Continuation operator. The Upward Continuation was applied in order to attenuate unwanted high frequencies enhanced by the derivative operator.

The shaded relief parameters are:
Illumination inclination: 45°
Illumination declination: 315°

Magnetic declination on the mean survey date of April 10, 2004, for the centre of the survey area was 1° 5' W and magnetic inclination was 75.0° N. Magnetic field strength was 58 003 nT (calculated using GRS76).

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 overlying westward sources. It is important to be aware that other magnetic sources may correlate well with the vertical cylinder model, whereas some kimberlite pipes of irregular geometry may not.

The cylinder model parameters are as follows:
Cylinder diameter: 200 m
Cylinder length: infinite
Overburden thickness: 3.8 m
Window size: 10 x 10 cells (300 m x 300 m)

SHADED IMAGE SUN ANGLE

Illumination Inclination = 45°
Illumination Declination = 315°

Plan view
Side view

Shaded image is produced by applying an artificial sun illumination to the second vertical derivative of the magnetic field grid.

LEGEND

FLIGHT LINE INFORMATION

Line number
Line direction
Fiducial

KEATING COEFFICIENTS

Positive correlation
Negative correlation

90%
85%
80%
75%

SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD GRID

nanoteslas per metre² (nT/m²)

0.0046
0.0014
0.0078
0.0038
0.0054
0.0026
0.0018
0.0012
0.0006
0.0000
-0.0004
-0.0008
-0.0012
-0.0014
-0.0018
-0.0022
-0.0026
-0.0032
-0.0040
-0.0050
-0.0060
-0.0076
-0.0100
-0.0142
-0.0240

SURVEY PARAMETERS

AIRCRAFT

Type: Aerospatiale AS350B-2 (Blocks 1, 5, 6, 8)
Aerospatiale AS350B4 (Blocks 2, 3, 7)
Aerospatiale AS350B-4 (Block 4)
Registration: C-FNS (Blocks 1, 5, 6, 8)
C-CHSM (Blocks 2, 3, 7)
C-GLNE (Blocks 3, 7)
C-COYE (Block 4)

MAGNETOMETER

Type: cesium-vapour
Sensitivity: 0.02 nT
Sample interval: 10 readings per second
Sensor location: 10 m below aircraft (Blocks 1, 6, 8)
15 m below aircraft (Blocks 2, 3, 4, 5, 7)

ELECTROMAGNETIC SYSTEM

Type: VTEM (Blocks 1, 2, 4, 5, 6, 8)
Type: Dreamcatcher (Blocks 3, 7)
Base frequency: 30 Hz
Current waveform: trapezoid
Peak dipole moment (N/A): 250 000 Am² (Blocks 1, 6, 8)
200 000 Am² (Block 2)
147 800 Am² (Blocks 3, 7)
234 500 Am² (Blocks 4, 5)
Pulse width: 7400 µsec (Blocks 1, 6, 8)
7600 µsec (Blocks 2, 4, 5)
6333 µsec (Blocks 3, 7)
Off-time: 18 533 µsec (Blocks 1, 6, 8)
18 133 µsec (Blocks 2, 4, 5)
16 667 µsec (Blocks 3, 7)
Parameters: 2-component of dB/dt
Sample interval: 10 readings per second
Bird location: 45 m below aircraft (Blocks 1, 3, 4, 5, 6, 7, 8)
35 m below aircraft (Block 2)

NAVIGATION SYSTEM

GPS receiver: Novatel OEM4-G2-3151W
GPS sample interval: 5 readings per second
Radar altimeter: Terra 3000/TR-40
Radar sample interval: 5 readings per second
Odinance system: Geotech
Digital acquisition system: Geotech

BASE STATION

Type: Geomac/cap cesium-vapour
Magnetometer sample interval: 1 reading per second
GPS sample interval: 1 reading per second

SURVEY SPECIFICATIONS

Survey dates:
December 17, 2004 to December 20, 2004 (Blocks 1, 6)
February 21, 2004 to February 22, 2004 (Block 2)
February 11, 2003 to February 16, 2003 (Block 3)
May 20, 2005 to June 7, 2005 (Blocks 4, 5)
February 11, 2003 to February 12, 2003 (Block 7)
December 10, 2004 to December 18, 2004 (Block 8)

Nominal aircraft terrain clearance: 75 m (Blocks 1, 6, 8)
85 m (Blocks 2)
80 m (Blocks 3, 7)
85 m (Blocks 4, 5)
Traverse line spacing: 150 m (Block 1)
100 m (Block 2)
100 m (Blocks 3, 4, 8)
200 m (Block 5)
150/100 m (Block 7)
Control line spacing: 2000 m (Blocks 1, 8)
2200 m (Block 2)
2800 m (Block 5)
2600 m (Block 7)
2000 m (Block 4)
Traverse line direction: N35°W (Block 1)
E51°S (Block 2)
North-south (Blocks 3, 7, 8)
N140°E (Blocks 4, 5)
N35°W (Block 6)
Control line direction: N52.7°E (Block 1)
N50°E (Blocks 2, 5)
East-west (Blocks 3, 8)
N87°E (Block 4)
N65°E (Block 6)
N85°E (Block 7)

CO-ORDINATE SYSTEM

Projection: Universal Transverse Mercator
Datum: NAD83
Central meridian: 83°00' W (UTM Zone 18N)
Central scale factor: 0.9996
False easting: 500 000 m
False northing: 0 m
Ellipsoid: GRS80

Data purchased from:
East West Resource Corp. and Maple Mineral Corporation. (Blocks 1, 2, 6)
East West Resource Corp. (Blocks 3, 4, 5)
Canadian Golden Dragon Resources Corp. (Blocks 7, 8)

LEGEND

Survey Location Map

Block 1 (Powell-Hamlin)
Block 2 (Deary)
Block 3 (Deary)
Block 4 (Telle)
Block 5 (Burchell)
Block 6 (Burchell)
Block 7 (Vanguard A2003)
Block 8 (Vanguard A407)

The original names of the purchased surveys have been converted to block numbers as follows:

Block 1: Powell-Hamlin
Block 2: Hamlin (431)
Block 3: Deary
Block 4: Telle
Block 5: Burchell (532)
Block 6: Burchell (485)
Block 7: Vanguard (A2003)
Block 8: Vanguard (A407)

SOURCES OF INFORMATION

Base map information derived from the Land Information Ontario Data Warehouse, Land Information Ontario, Ontario Ministry of Natural Resources and Forestry, scale 1:50 000.

Magnetic declination for the centre of the map area was approximately 2° 49.7' W in 2014.

Baglinski, A. 2003. Report on a helicopter-borne time domain electromagnetic geophysical survey, Norton Lake, Lanes Bay, Deary Creek blocks, Thunder Bay area, Ontario, unpublished report for East West Resource Corp. by Geotech Ltd.

Baglinski, A. 2003. Report on a helicopter-borne time domain electromagnetic geophysical survey, Vanguard East block, Ontario, unpublished report for Canadian Golden Dragon Resources Corp. by Geotech Ltd.

Baglinski, A. 2004. Report on a helicopter-borne time domain electromagnetic geophysical survey, Hamlin Property, Kashabowie area, Thunder Bay area, Ontario, unpublished report for East West Resource Corp. and Maple Minerals Inc. by Geotech Ltd.

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.

Orta, M. 2005. Report on a helicopter-borne time domain electromagnetic geophysical survey, Telle and Burchell-2 blocks, Ontario, unpublished report for East West Resource Corp. by Geotech Ltd.

Orta, M. 2005. Report on a helicopter-borne time domain electromagnetic geophysical survey, Powell-Hamlin and Burchell blocks, Ontario, unpublished report for Maple Minerals Corp. and East West Resource Corp. by Geotech Ltd.

CREDITS

Data acquisition, data compilation by Geotech Limited, Aurora, Ontario, for East West Resource Corp., Maple Minerals Inc. and Canadian Golden Dragon Resources Corp., Vancouver, British Columbia.

Data processing and map production by CGI Controlled Geophysics Inc., Thornhill, Ontario.

Contract management, base maps and map surrounds by the Ontario Ministry of Northern Development and Mines, Sudbury, Ontario.

To enable the rapid dissemination of information, this map has not received a technical edit. Every possible effort has been made to ensure the accuracy of the information presented; however, the Ontario Ministry of Northern Development and Mines does not assume liability for any errors that may occur. Users may wish to verify critical information.

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

Ontario Geological Survey 2014. Airborne magnetic and electromagnetic surveys, shaded colour image of the second vertical derivative of the residual magnetic field and Keating coefficients, Burchell Lake area—Purchased data, Ontario Geological Survey Geophysical Data Set 1241.

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.

Issued 2014.

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 2014. Airborne magnetic and electromagnetic surveys, shaded colour image of the second vertical derivative of the residual magnetic field and Keating coefficients, Burchell Lake area—Purchased data, Ontario Geological Survey, Map 60 406, scale 1:20 000.

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