

## THESE TERMS GOVERN YOUR USE OF THIS PRODUCT

***Your use of this electronic information product (“EIP”), and the digital data files contained on it (the “Content”), is governed by the terms set out on this page (“Terms of Use”). By opening the EIP and viewing the Content, you (the “User”) have accepted, and have agreed to be bound by, the Terms of Use.***

**EIP and Content:** This EIP and Content is offered by the Province of Ontario’s *Ministry of Energy, Northern Development and Mines* (ENDM) as a public service, on an “as-is” basis. Recommendations and statements of opinions expressed 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 EIP and its 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. ENDM does not guarantee, or make any warranty express or implied, that the Content is current, accurate, complete or reliable or that the EIP is free from viruses or other harmful components. ENDM is not responsible for any damage however caused, which results, directly or indirectly, from your use of the EIP or the Content. ENDM assumes no legal liability or responsibility for the EIP or the Content whatsoever.

**Links to Other Web Sites:** This EIP or the Content may contain links, to Web sites that are not operated by ENDM. Linked Web sites may not be available in French. ENDM 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:

Gao, C., Crabtree, D.C., Dyer, R.D. and Clarke, S.A. 2021. Indicator mineral and geochemistry data for the till and alluvium sampling survey in the McFaulds Lake (“Ring of Fire”) area, northern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 322 – Revised.

**Use and Reproduction of Content:** The EIP and 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 ENDM. 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 EIP or Content	ENDM Publication Services	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	<a href="mailto:Pubsales.ndm@ontario.ca">Pubsales.ndm@ontario.ca</a>
The Purchase of ENDM Publications	ENDM Publication Sales	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	<a href="mailto:Pubsales.ndm@ontario.ca">Pubsales.ndm@ontario.ca</a>
Crown Copyright	Queen’s Printer	Local: (416) 326-2678 Toll-Free: 1-800-668-9938 (inside Canada, United States)	<a href="mailto:Copyright@ontario.ca">Copyright@ontario.ca</a>

These data supplement

Open File Report 6309, *Results of Regional Till and Modern Alluvium Sampling in the McFaulds Lake (“Ring of Fire”) Area, Northern Ontario.*

For information on purchasing all publications, including digital data, contact:

Publication Sales

Ministry of Energy, Northern Development and Mines

933 Ramsey Lake Rd., Level A3

Sudbury, Ontario P3E 6B5

Tel: 1-888-415-9845, ext. 5691 (toll-free inside Canada and the United States)

Tel: (705) 670-5691 (local calls)

Fax: (705) 670-5770

---

Users of OGS products should be aware that Indigenous communities may have Aboriginal or treaty rights or other interests that overlap with areas of mineral potential and exploration.

---

Miscellaneous Release—Data 322 – Revised

**Indicator Mineral and Geochemistry Data for the Till and Alluvium Sampling Survey in the McFaulds Lake (“Ring of Fire”) Area, Northern Ontario**

by C. Gao, D.C. Crabtree, R.D. Dyer and S.A. Clarke

This publication can be downloaded from

[http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm\\_dir.asp?type=pub&id=MRD322-REV](http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD322-REV)

This digital data release is a revision of Miscellaneous Release—Data (MRD) 322, which was published in 2016. These digital data present the results of a regional till and modern alluvium sampling survey in the McFaulds Lake (“Ring of Fire”) area, in northern Ontario. The samples were collected during the summer field seasons between 2011 and 2015.

The data consist of indicator mineral grain counts, geochemical and compositional data of kimberlite indicator minerals (KIMs), chromite, metamorphic/magmatic massive sulphide indicator minerals (MMSIM<sup>®1</sup>), and gold grains recovered from till and river sand and gravel (alluvium) samples. In addition, this revised version provides bulk mineralogy of fine-fraction, 0.125–0.25 mm nonmagnetic heavy mineral concentrates (HMC); proportional dot maps of the spatial distribution of the fine-fraction detrital chromite grains; and an expanded microprobe data of detrital chromite grains, including those from sand- to pebble-size chromitite clasts.

In this revision, Appendix 8 has been revised, and Appendixes 18, 19 and 20 provide new data.

The files contain specific information on sample site locations, sample processing data, KIMs picked and picking remarks, electron probe microanalyzer results of KIM and chromite grains, adjusted KIM results, gold grain data, MMSIM<sup>®1</sup> data, clastic lithology data and geochemical data from the <0.063 mm fraction of the bulk samples, as well as the spatial distribution of the fine-fraction detrital chromite grains and photomicrographs of the chromitite clasts. The sample locations were determined in the field using a Garmin GPSmap 60Cx. This release comprises 19 Microsoft<sup>®</sup> Excel<sup>®</sup> for Office 365 (.xlsx) files, 20 backscattered electron images (.tif files) and 3 documents in portable document format (.pdf).

---

<sup>1</sup> MMSIM is a registered trademark of Overburden Drilling Management Limited, Nepean, Ontario.

This release supplements Open File Report (OFR) 6309 (Gao and Crabtree 2016; available separately) providing the data (as 20 appendixes) generated during the study. Four of the appendixes (1, 6, 9, 11) are included in OFR 6309. Three appendixes (18, 19, 20) provide new data, and are not discussed in OFR 6309.

## CONTENTS

The following files and folder are included in this release.

*MRD322-REV\_Appendix 1\_Sample locations.xlsx* consists of 1 worksheet and provides the locations of samples collected during the regional till and modern alluvium sampling survey in the McFaulds Lake (“Ring of Fire”) area, northern Ontario. Sample location data (“Easting”, “Northing”) provided as UTM co-ordinates in North American Datum 1983 (NAD83), Zone 16.

*MRD322-REV\_Appendix 2\_Tabling and clast lithology data.xlsx* consists of 2 worksheets and provides 1) the results of tabling and clast lithology of samples, and 2) abbreviations used.

*MRD322-REV\_Appendix 3\_Remarks on metallic minerals in pan concentrate.xlsx* consists of 2 worksheets and provides 1) remarks about the metallic minerals found in the pan concentrate of samples, and 2) abbreviations used.

*MRD322-REV\_Appendix 4\_Summary of <0.25 mm heavy minerals.xlsx* consists of 1 worksheet and provides a summary of the <0.25 mm (“-0.25”) fraction of heavy minerals extracted from samples.

*MRD322-REV\_Appendix 5\_Heavy mineral concentrates for KIM and MMSIM picking.xlsx* consists of 1 worksheet and provides details on ferromagnetic and nonmagnetic fractions of heavy mineral concentrates of samples. The nonmagnetic heavy mineral concentrate was the fraction for picking kimberlite indicator minerals (KIM) and metamorphic/magmatic massive sulphide indicator minerals (MMSIM<sup>®</sup>).

*MRD322-REV\_Appendix 6\_Summary of KIM counts.xlsx* consists of 3 worksheets and provides 1) the number and classification of grains for kimberlite indicator minerals (KIMs) in samples, 2) the original data for the number and classification of grains for KIMs, and 3) the abbreviations used.

*MRD322-REV\_Appendix 7\_KIM grain picking remarks.xlsx* consists of 1 worksheet and provides remarks about kimberlite indicator minerals (KIM) grains from samples.

*MRD322-REV\_Appendix 8\_Microprobe data for KIM and chromite grains.xlsx* consists of 8 worksheets and provides electron probe microanalyzer (“microprobe”) analytical data for chromite grains and for kimberlite indicator mineral (KIM) grains from samples. The worksheets are as follows: 1) “Chromite-revised data” (this release), 2) “Chromite-former data” (the data released in 2016), 3) “Garnet”, 4) “Other oxides”, 5) “Pyroxene”, 6) “Olivine”, 7) “Rutile”, and 8) “Abbreviations”.

*MRD322-REV\_Appendix 9\_Summary of adjusted KIM counts.xlsx* consists of 3 worksheets and provides 1) a summary of adjusted counts for kimberlite indicator minerals (KIM) grains in samples, 2) the method used for data correction and adjustment, and 3) the abbreviations used.

*MRD322-REV\_Appendix 10\_Summary of MMSIM counts.xlsx* consists of 2 worksheets and provides 1) a summary of counts and other information for metamorphic/magmatic massive sulphide indicator minerals (MMSIM<sup>®</sup>) grains from samples, and 2) the abbreviations used.

*MRD322-REV\_Appendix 11\_Numerically converted MMSIM counts.xlsx* consists of 3 worksheets: 1) “Numerical MMSIM counts”, which is numerically converted counts of metamorphic/magmatic massive sulphide indicator minerals (MMSIM<sup>®</sup>) grains from samples, 2) “Numerical conversion”, which provides an explanation of the conversion, and 3) the abbreviations used.

*MRD322-REV\_Appendix 12\_Summary of gold grain counts.xlsx* consists of 2 worksheets and provides a 1) summary of counts of visible gold grains from samples, and 2) the abbreviations used.

*MRD322-REV\_Appendix 13\_Details on gold grains.xlsx* consists of 2 worksheets and provides 1) details about gold grain analytical results from samples, and 2) the abbreviations used.

*MRD322-REV\_Appendix 14\_Indicator minerals.xlsx* consists of 2 worksheets and provides 1) a summary of analytical results for indicator minerals from samples, and 2) abbreviations used.

*MRD322-REV\_Appendix 15\_ICP-MS, ICP-OES and INAA\_data for -0.063 mm fraction bulk samples.xlsx* consists of 2 worksheets and provides 1) the inductively coupled plasma mass spectrometry (ICP–MS), inductively coupled plasma optical emission spectroscopy (ICP–OES) and instrumental neutron activation analysis (INAA) analytical results for samples; and 2) the abbreviations used.

*MRD322-REV\_Appendix 16\_ICP-MS, ICP-OES and INAA\_duplicates\_QC data.xlsx* consists of 3 worksheets and provides 1) overall quality-control data, 2) duplicate sample analytical results of samples, and 3) the abbreviations used.

*MRD322-REV\_Appendix 17\_ICP-MS, ICP-OES and INAA\_Reference Material\_QC data.xlsx* consists of 5 worksheets and provides 1) overall quality-control data; 2) the quality-control data for reference materials used during analyses of samples; 3) the statistics for reference standard Till-1; 4) the statistics for reference standard MDM; and 5) the abbreviations used.

*MRD322-REV\_Appendix 18\_Bulk mineralogy of fine-fraction nonmagnetic HMC.xlsx* consists of 3 worksheets and provides 1) the analytical results by “% Points” for bulk mineralogy of the fine-fraction nonmagnetic heavy mineral concentrate from selected samples; 2) the analytical results by “% Area”; and 3) a description of the method and observations for the analytical results.

*MRD322-REV\_Appendix 19\_Proportional dot maps of fine-fraction chromite grains.pdf* provides the analytical results, shown as proportional dot maps, showing the regional distribution of fine-fraction 0.25–0.125 mm detrital chromite grains compared with coarse-fraction 2.0–0.25 mm chromite grains.

**Appendix 20** This folder contains 1 portable document format (.pdf) file, 1 Microsoft® Excel® for Office 365 (.xlsx) file and 1 subfolder “**Appendix 20\_Chromitite Clasts**” with 20 photomicrographs (as .tif files).

*MRD322-REV\_Appendix 20\_Chromitite pebble (annotated photos).pdf* provides annotated photos of 1) sample locations along the Attawapiskat River, 2) a single-sample chromitite pebble, and 3, 4) backscattered electron images of chromite grains in the chromitite pebble.

*MRD322-REV\_Appendix 20\_Microprobe data for chromitite pebble.xlsx* consists of 1 worksheet and provides the oxide analytical results by electron probe microanalyzer of chromite grains in a single-sample chromitite pebble.

## Reference

Gao, C. and Crabtree, D.C. 2016. Results of regional till and modern alluvium sampling in the McFaulds Lake (“Ring of Fire”) area, northern Ontario; Ontario Geological Survey, Open File Report 6309, 164p.

## Related Publications

Crabtree, D.C. 2003. Preliminary results from the James Bay Lowland indicator mineral sampling program; Ontario Geological Survey, Open File Report 6108, 115p.

——— 2003. Preliminary indicator mineral results from the James Bay Lowland sampling program; Ontario Geological Survey, Miscellaneous Release—Data 119.

Crabtree, D.C. and Felix, V.E. 2005. Additional indicator mineral results from the James Bay Lowland sampling program; Ontario Geological Survey, Miscellaneous Release—Data 161.

Crabtree, D.C. and Gleeson, C.F. 2003. Results of the “Spider 3” regional kimberlite indicator mineral and geochemistry survey carried out in the vicinity of the upper Attawapiskat and Ekwan rivers, northern Ontario; Ontario Geological Survey, Open File Report 6097, 127p.

——— 2003. Indicator mineral and geochemistry data release, “Spider 3” regional survey, upper Attawapiskat and Ekwan rivers, northern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 109.

- Dell, K.M., Dyer, R.D. and Burke, H.E. 2015. Nakina and McFaulds Lake (“Ring of Fire”) areas lake sediment and till geochemistry infill sampling, northern Ontario; *in* Summary of Field Work and Other Activities, 2015, Ontario Geological Survey, Open File Report 6313, p.30-1 to 30-9.
- Dyer, R.D. and Burke, H.E. 2012. Preliminary results from the McFaulds Lake (“Ring of Fire”) area lake sediment geochemistry pilot study, northern Ontario; Ontario Geological Survey, Open File Report 6269, 26p.
- Dyer, R.D. and Handley, L.A. 2013. McFaulds Lake (“Ring of Fire”) area high-density lake sediment and water survey, Far North, Ontario; *in* Summary of Field Work and Other Activities, 2013; Ontario Geological Survey, Open File Report 6290, p.31-1 to 32-17.
- 2014. McFaulds Lake (“Ring of Fire”) area lake, stream and till geochemistry in-fill sampling, Far North, Ontario; *in* Summary of Field Work and Other Activities, 2014, Ontario Geological Survey, Open File Report 6300, p.28-1 to 28-5.
- 2015. McFaulds Lake (“Ring of Fire”) area stream sediment geochemistry; Ontario Geological Survey, Miscellaneous Release—Data 321.
- Gao, C. 2011. Surficial geology mapping and drift sediment sampling in the McFaulds Lake (“Ring of Fire”) area, northern Ontario; *in* Summary of Field Work and Other Activities, 2011, Ontario Geological Survey, Open File Report 6270, p.23-1 to 23-7.
- 2013. Till sampling for indicator minerals in the McFaulds Lake (“Ring of Fire”) area, Far North of Ontario; *in* Summary of Field Work and Other Activities, 2013, Ontario Geological Survey, Open File Report 6290, p.26-1 to 26-6.
- Gao, C. and Crabtree, D.C. 2016. Results of regional till and modern alluvium sampling in the McFaulds Lake (“Ring of Fire”) area, northern Ontario; Ontario Geological Survey, Open File Report 6309, 164p.
- Gao, C., Crabtree, D.C. and Dyer, R.D. 2016. Indicator mineral and geochemistry data for the till and alluvium sampling survey in the McFaulds Lake (“Ring of Fire”) area, northern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 322.
- Gao, C., Lee, V.L. and Yeung, K.H. 2015. Field studies in support of remote predictive mapping in the Missisa Lake area, Far North of Ontario; *in* Summary of Field Work and Other Activities, 2015, Ontario Geological Survey, Open File Report 6313, p.27-1 to 27-12.