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Miscellaneous Release—Data 395

Pyrrhotite Distribution in Ontario: Near-Surface Occurrences and Discussion of Deleterious Effects in Concrete

by K.E. Hahn

This publication can be downloaded from

http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD395

This digital data release provides the results of a project studying the distribution of pyrrhotite in Ontario. The mineral pyrrhotite is considered deleterious when present in aggregate that is used to produce concrete. Several examples of premature concrete failure or excessive damage resulting from the presence of pyrrhotite in aggregate have been documented in North America, although to date (mid-2021), this problem has not occurred in Ontario. A study was undertaken, using the Ontario Geological Survey's Mineral Deposit Inventory* (MDI) database, to map the known occurrences of the mineral pyrrhotite in the province of Ontario. The MDI database contains 3843 unique records of the mineral pyrrhotite. Of these records, 2981 were assessed to contain enough accurate information to be included on a map of pyrrhotite occurrences (using point locations) in Ontario. Pyrrhotite occurs near surface at 562 locations, whereas 2419 locations were deemed as "other" (i.e., either occurring at depth, or the data point did not include enough information to classify as "near surface"). The files are provided in a compressed (.zip) file that contains a report (as a portable document format (.pdf) file) and an accompanying digital map (as an ESRI® ArcMap® (.mxd) document and geodatabase (.gdb)). The digital map includes additional information for point locations described in the report as well as hyperlinks to the original MDI records.

[*The Mineral Deposit Inventory (MDI) has been renamed to the Ontario Mineral Inventory (OMI). This digital data release was compiled prior to the update. All OMI records retain the original MDI identifying numbers (e.g., MDI52N04SW00033). For the purpose of this data release, original MDI nomenclature and definitions are retained.]

This digital data release comprises the following files:

MRD395_Pyrrhotite_report.pdf is a report that summarises where pyrrhotite occurs in the province of Ontario and also its deleterious nature when present in aggregate used for concrete.

MRD395.gdb is the geodatabase file consisting of the digital data used to create the map figure in the report and accompanying map document.

MRD395.mxd is an ESRI® ArcMap® map document. The map contains point locations of the mineral pyrrhotite, sourced from MDI, throughout the province of Ontario. These point locations are overlain on a simplified version of the 1:250 000 scale *Bedrock Geology of Ontario* (Ontario Geological Survey 2011). Only polygons that intersect with a pyrrhotite point are included in this map. The map is intended to be used as a quick-reference guide to provincial-scale trends in the distribution of the mineral pyrrhotite and is not meant to replace site-specific evaluation. Local 1:20 000 or 1:50 000 scale geological maps should be used to gain additional information about local bedrock geology.

References

Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release—Data 126 – Revision 1.

Ontario Geological Survey 2021. Mineral Deposit Inventory; Ontario Geological Survey, Mineral Deposit Inventory (May 2021 update), online database.