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These data accompany:
Preliminary Map P.3826, *Precambrian Geology of Syine Township, Northwestern Ontario*

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Miscellaneous Release—Data 375

Geological, Geochemical and Petrographic Data from Syine Township, Western Schreiber–Hemlo Greenstone Belt, Wawa–Abitibi Terrane, Superior Province, Northwestern Ontario

by S.J. Magnus

This publication can be downloaded from
http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD375

This release contains field notes and outcrop photographs collected during the summer field seasons of 2015, 2016 and 2017 as part of 1:20 000 scale bedrock geology mapping in Syine Township (Project Unit NW-17-002). Whole-rock geochemical data and petrographic data are provided for collected samples. These data augment Preliminary Map P.3826, *Precambrian Geology of Syine Township, Northwestern Ontario* (Magnus 2019); the legend and marginal notes for this map are also provided. This release comprises 43 photographs (as *.jpg* files), 4 Microsoft® Excel® for Office 365 (*.xlsx*) workbook files and 6 documents in portable document format (*.pdf*).

The Syine Township mapping project was undertaken consecutively with the Tuuri and Walsh townships mapping project (Project Unit PU15-004) to improve on outdated bedrock maps in the western Schreiber–Hemlo greenstone belt. By gathering new field data and applying modern analytical techniques, the goal of this project and future projects in the belt is to produce an updated genetic model for the greenstone belt that may be used as a framework for more detailed academic and mineral exploration activities. Inferences made about the deposition history of the supracrustal rocks and the structural history of the bedrock in the map area, based on field observations, whole rock geochemistry and U/Pb geochronology data, are summarized in the marginal notes for Preliminary Map P.3826 (Magnus 2019) and in 4 Ontario Geological Survey Summary of Field Work articles (Magnus and Walker 2015; Magnus and Arnold 2016; Arnold, Hollings and Magnus 2017; Magnus 2017).

Data are organized into 4 folders:

1. Field data
2. Geology
3. Geochemistry
4. Petrography

1. Field Data. This folder contains 2 Microsoft® Excel® for Office 365 (*.xlsx*) workbook files, which contain raw data collected while working in the field during the summers of 2015, 2016 and 2017 using a customized ESRI® ArcPad® application on portable computers (Trimble® Juno™ SB Handheld and Trimble® Juno™ 5 Handheld).

MRD375_Syine_Field Data.xlsx consists of 5 worksheets, labelled "Station", "Structure", "Mineralization", "Sample" and "Alteration". The "Station" worksheet includes brief descriptions of each station visited, including descriptions of the observed outcrops and their surroundings, the rock type code associated with each station on the map (P.3826, Magnus 2019) as well as the date of each visit and the geographic co-ordinates for each station (in Universal Transverse Mercator (UTM) co-ordinates in North American Datum 1983 (NAD83), Zone 16). The "Structure", "Mineralization" and "Alteration" worksheets provide descriptions of any alteration, mineralization and structural features observed at each of the stations described in the "Station" worksheet. The "Sample" worksheet includes brief descriptions of each sample collected at the stations described in the "Station" worksheet and includes information about how the samples were analyzed.

MRD375_Syine_Rock Types.xlsx consists of 5 worksheets, labelled "Volcanic Flow", "Volcanic Pyroclastic", "Sedimentary", "Metamorphic" and "Intrusive", in which the mineral, rock, and outcrop textures and relationships for each station visited are described and the geographic co-ordinates for each station are provided (in Universal Transverse Mercator (UTM) co-ordinates in North American Datum 1983 (NAD83), Zone 16).

2. Geology. This folder contains 3 portable document format (*.pdf*) files and 13 subfolders containing 43 field photographs (as *.jpg* files).

P3826_Legend.pdf is the general legend (rock codes) used as the base for Ontario Geological Survey Map P.3826, *Precambrian Geology of Syine Township, Northwestern Ontario*. Material in the geochemistry description file, petrography description file, and all of the spreadsheets in the "Field Data" folder are cross-referenced to rock codes in the legend.

P3826_Marginal Notes.pdf provides additional information on the study area using a version of the marginal notes, with 2 tables and 2 figures, from Preliminary Map P.3826.

MRD375_Syine_Photo Descriptions.pdf provides descriptions for each photograph in the 13 subfolders in the "Geology" folder.

The 13 subfolders correspond to 13 of the rock units in the legend (*P3826_Legend.pdf*). Rock type 13, "Diabase (undifferentiated)", does not have a subfolder, since dikes in this category look like those in rock types 11 or 12 but have not been assigned to those groups using geochemical or other methods. Each folder contains photographs that are representative of the rock units described in the legend. Each photograph is labelled with its corresponding legend code, followed by the station number for the outcrop from which it was collected (for example, *1bd 17SJM013.jpg* is a photograph of a variolitic pillowed mafic flow (unit 1bd) at station 17SJM013).

3. **Geochemistry.** This folder contains 1 Microsoft® Excel® for Office 365 (*.xlsx*) workbook file and 2 portable document format (*.pdf*) files.

MRD375_Syine_Major and Trace Element Geochemistry.xlsx consists of 3 worksheets that contain the results of all geochemical analyses performed at the Geoscience Laboratories (Geo Labs), Ontario Geological Survey, Sudbury. The samples are split into 3 worksheets, "2015 samples", "2016 samples" and "2017 samples" according to which year the samples were analyzed, because the analytical methods used each year differed, and analytes reported by Geo Labs changed in 2017. For example, the "IML-100" method was used in 2015 but not in 2016 or 2017, and in 2017, the "XRF-M01" method reported "LOI at 1000 degrees" and "Nitrogen 105", whereas in 2015 and 2016, the "XRF-M01" method reported "Total LOI". The methods used, lower detection limit for each method, and reported units for each method are included for each element (and oxide) listed. These worksheets also contain location data "Easting, "Northing" and "Township", as well as "Rock Type" and stratigraphic information, if known, for each sample collected; UTM co-ordinates are provided in North American Datum 1983 (NAD83), Zone 16.

2015 Geo Labs Brochure.pdf describes the analytical methods used at the Ontario Geological Survey Geoscience Laboratories for rocks analyzed during 2015 and 2016.

2017 Geo Labs Brochure.pdf describes the analytical methods used at the Ontario Geological Survey Geoscience Laboratories for rocks analyzed during 2017.

4. **Petrography.** This folder contains 1 Microsoft® Excel® for Office 365 (*.xlsx*) workbook file.

MRD375_Syine_Petrographic Data.xlsx consists of 1 worksheet that contains a modal analysis for every sample collected during this study. Notes on the mineral and rock textures and relationships are included for each sample. For samples that contain a modal abundance reported under the column "other", the known or speculated mineral is discussed in the "Notes" column. This worksheet also contains the rock type for each sample based on the Total Alkalis versus Silica Diagram (LeMaitre 1989), cross-referenced from the geochemical data in this data release, and the geographic co-ordinates for each sample (in Universal Transverse Mercator (UTM) co-ordinates in North American Datum 1983 (NAD83), Zone 16).

Acknowledgments

This study focussed on the geology and geochemistry of the western Schreiber–Hemlo greenstone belt in Syine Township with the intent of interpreting a depositional (for supracrustal rocks), emplacement (for intrusive rocks) and structural history for this part of the belt. It is the intent of the author that these data and interpretations be used as a broad framework upon which more detailed academic and mineral exploration activities may improve and expand, and upon which the author intends to continue expanding while mapping the remainder of the western Schreiber–Hemlo greenstone belt.

The author would like to thank the field crews from the summers of 2015 (Joseph Walker, Andrea Nywening, Matthew Hanewich and Lauren Madronich), 2016 (Kira Arnold, Mallory Metcalf, Lucas Wolfe and Haley Aldred) and 2017(Kira Arnold, Joshua Nguyen, Maddison Hodder and Gabrielle Klemt) for their hard work and perseverance through the particularly rough terrain. The author would also like to thank the Richards family of Terrace Bay, who hosted the crew at their Jackfish Lake cottages on Highway 17 during the 2015–2017 field seasons, with special thanks to local prospector Wayne Richards, for all of his logistical aid and for sharing his abundance of local mineral exploration knowledge. Thanks to the people of Pic River and Pic Mobert First Nations communities for their gracious blessing and for allowing us to work on their traditional lands. The author would also like to thank local prospector Rudy Wahl, Miko Koziol of Alto Ventures Ltd. and Troy Gill of Sanatana Resources for tours of their properties and allowing us access to their properties over the last several field seasons. Thanks also to Dorothy Campbell and Mark Puumala of the Resident Geologist Program Thunder Bay office for their help during this project.

Further information pertaining to this body of work is available through the author.

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