

Geochemistry and Petrogenesis of the Weese Lake Mafic Intrusion in the Fort Hope Greenstone Belt, Uchi Subprovince, and Its Relationship to Regional Mafic Intrusions

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Northern Ontario contains many mafic-ultramafic intrusions, some of which contain world-class Cr deposits (e.g., Black Thor, Blackbird), some of which contain significant Ni-Cu-(PGE) deposits (e.g., Eagles Nest), and some of which have potential for Fe-Ti-V mineralization (e.g., Thunderbird). The Weese Lake Mafic Intrusion in the Fort Hope Greenstone Belt of the Uchi Subprovince contains some Ni-Cu mineralization. It is located between a sequence of mafic metavolcanic rocks to the east and a younger granodiorite intrusion to the west. The regional metamorphism ranges from lower to upper amphibolite facies. The main body is a massive coarse grained to very coarse grained anorthosite, which sporadically contains disseminated pyrite, pyrrhotite and chalcopyrite. Past exploration of the Weese Lake intrusion indicated local concentrations of Cu (maximum 9570 ppm) and minor Ni (maximum 639 ppm) associated with the main anorthositic body. Drill core assays of the mafic intrusions in proximity to Weese Lake and Gould Lake have yielded up to 22 ppm Ag, up to 4240 ppm Pb, and up to 9030 ppm Zn in gabbros, and up to 1.4 wt% Cu and 0.46% of Ni in a pyroxenite. Currently, only one claim is active in the area with minimal activity. Mapping of the area indicated an irregular trend of the different units (anorthosite, coarse grained leucocratic to melanocratic gabbro) of the intrusion cross-cut by a later finer grained gabbro. Whole-rock geochemical analysis and comparison of 20 samples taken from these units will help characterize and identify the nature and origin of the intrusion. Thin section petrography and energy-dispersive X-ray emission spectrometric (SEM) mineral analyses will establish changing mineralogy and mineral chemistry across the intrusion. Another 22 samples have been taken from the Gould Lake Mafic Intrusion, 18 km to the southwest of Weese Lake, to compare and possibly relate it to the Weese Lake Mafic Intrusion. The geochemistry of mafic intrusions in the Fort Hope Greenstone Belt has been compiled by Anne-Aurelie Sappin (GSC-Québec) and will be compared with the newly acquired geochemistry to identify the regional similarities and trends of the mafic intrusions in the area. This research will assist in the completion of the understanding of mafic intrusion and their associated deposits in the Uchi Subprovince.