Abstract: 2011 GSA Annual Meeting in Minneapolis (9–12 October 2011)
Paper No. 190-5

GEOCHEMISTRY AND NEODYMIUM ISOTOPE COMPOSITIONS FOR THE NORTH CARIBOU GREENSTONE BELT, ARCHEAN SUPERIOR PROVINCE

DUFF, J.[1], HATTORI, K.[1], SCHNEIDER, D.A.[1], and BICZOK, J.[2], (1) Department of Earth Sciences, University of Ottawa, Ottawa, ON K1N 6N5, Canada, jduff018@uottawa.ca, (2) Goldcorp Canada Ltd., Musselwhite Mine, P.O. Box 7500, Thunder Bay, ON P7B 6S8, Canada

The North Caribou Greenstone Belt (NCGB) is located within the North Caribou Terrane, the nucleus of the western Superior Province, to which smaller terranes accreted between 2.83 and 2.68 Ga. We present new geochemical and Nd isotopic data for sediments which are extensively exposed in the eastern arm of the NCGB. These rocks have been interpreted as the eastern portion of the Eyapamikama Lake Assemblage (ELS), the youngest lithotectonic assemblage of the NCGB, but the relationship between the eastern and western parts of the sediments is not certain. Samples from this eastern arm consist of quartz and feldspathic arenites, lithic wackes and felsic volcanoclastics. The rocks are mostly unaltered, yet potassic alteration is observed in some samples. All samples show LREE enrichment and relatively flat MREE to HREE patterns [$(La/Sm)_{CN}$ = 2.61 to 5.22; $(Gd/Yb)_{CN}$ = 1.04 to 2.53]. Extended REE patterns show significant Nb negative and negligible negative Eu anomalies. The rocks contain relatively high concentrations of compatible elements (Cr = 6 to 239 ppm, Co = 4 to 53 ppm and Ni = 7 to 190 ppm). Immobile element ratios suggest these sediments deposited in an active margin tectonic setting (Zr/Sc = 2 to 32.6, Th/Sc = 0.88 to 1.45, Sr/Y = 1.21 to 22.8 and La/Yb = 3.73 to 24.6). Epsilon Nd (2.85 Ga) for the samples range from -1.71 to + 0.90 yielding T_{DM} between 3.04 and 3.57 Ga. Recalculated ε_{Nd} values at 2.85 Ga for the external granitoids and felsic volcanics obtained by Wyman et al. (2011) range from -7.5 to +1.2. Although this spectrum encompasses all ε_{Nd} values and may possibly suggest multiple sources for the sediments, the geochemical data show stronger similarities to the felsic volcanics (ε_{Nd} = -1.6 to -1.4) relative to the granitoids (ε_{Nd}= -4.9 to +0.8). In contrast, mafic metavolcanics from this study within the NCGB show a more juvenile signature at 2.85 Ga ($\varepsilon_{Nd} \approx +4.0$). Based on isotopic and geochemical evidence, a prospective provenance for the sediments is the felsic volcanics rather than the external granitoids or mafic volcanics. Nevertheless, we cannot rule out the mafic volcanics as a provenance considering the significant concentration of compatible elements found in these sediments. Calculated T_{DM} ages are 200-720 Ma older than known detrital ages indicative of crustal reworking during the evolution of the NCGB.

Session No. 190--Booth# 333
Tectonics and Metallogeny (Posters)
Geological Society of America *Abstracts with Programs*, Vol. 43, No. 5, p. 470