Stratigraphy and mineralogy of the Goldenville Group-Halifax Group transition (GHT) of the Meguma Supergroup at Caribou gold district (drillcore LL81-5A), Nova Scotia

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Drillcore LL81-5A recovered from Caribou gold district, Halifax County, Nova Scotia, by Sherritt Gordon Mines Limited in 1981, is a 628.8 m continuous section of the Goldenville-Halifax Transition of the Cambro-Ordovician Meguma Supergroup. This drillcore provides an unusually complete section of the GHT, which appears to exert significant control on trace metal concentration in the Meguma Supergroup. The purpose of this study is to develop a stratigraphic and geochemical log of LL81-5A and to apply this to regional correlative studies, which should promote a better local and regional understanding of the GHT.

LL81-5A was studied between July and September 1996, at the Department of Natural Resources Drill Core Library in Stellarton, Pictou County, Nova Scotia, where it has been stored since 1984. Based on observations of lithology, mineralogy, sedimentary structures, metamorphism, deformation and structure, a descriptive log of the NQ-diameter drillcore was produced. Sixty-five representative ~15 cm sections of core were split by sawing for detailed study. Nineteen polished thin sections were prepared from these samples and described.

Three conformable stratigraphic units are noted in LL81-5A. Unit A - undifferentiated Goldenville Group (39.62 m): fining-upward sequences, generally consisting of massive, thickly-bedded, light grey-green, carbonate-rich, chloritic, fine to medium grained metawacke, with minor to locally significant pyrrhotite, overlain by thin, dark-grey, chloritic silty slate, with minor pyrrhotite and pyrite. Contacts between individual sequences are typically sharp. Unit B - Mosher s Island Formation, Halifax Group (123.68 m, stratigraphic thickness of 112.63 m): monotonous, thinly-bedded, light green-grey, chloritic silty slate, with thin interbeds of typically parallel-laminated, light grey-green, chloritic metasiltstone and light grey-green, locally carbonate-rich, very fine to fine grained metawacke. Pyrrhotite and minor chalcopyrite are present in all lithologies. The upper half of this unit is rich in spessartine garnet, quartz and carbonate-rich bands and nodules. Unit C - Cunard Formation, Halifax Group (465.50 m): fining upward bottom cut-out Bouma sequences, typically consisting of a basal interval of parallel-laminated, light-grey, in part carbonate-rich, pyrrhotiferous metasiltstone, overlain by an interval of cross-laminated, light-grey, locally carbonate-rich, pyrrhotiferous metasiltstone and capped by an interval of graphitic, slate with generally minor pyrite and pyrrhotite. Variations from this succession are common, with the cross-laminated interval often absent. Contacts between metasiltstone intervals are typically gradational, whereas contacts with slate are approximately evenly distributed between sharp and transitional over ~1 cm contacts. Secondary sedimentary structures related to dewatering, such as convoluted bedding, ball and pillow structures and load casts, are abundant in this unit, especially the upper half. Contacts between individual sequences are generally sharp. In all three units, sulphides are typically present as millimetre-long blebs oriented along cleavage planes.