Correlation among four drill holes in the Faribault Brook Formation near the Road 2 showing, western Cape Breton Highlands, Nova Scotia, Canada: implications for stratigraphy, structure, and economic mineralization

BRENDAN J. VIBERT[1], CHRIS E. WHITE[2], AND SANDRA M. BARR[1]

1. Department of Earth and Environmental Science, Acadia University, Wolfville, Nova Scotia B4P 2R6, Canada <124767v@acadiau.ca>

2. Nova Scotia Department of Natural Resources, Halifax, Nova Scotia B3J 2T9, Canada

The Faribault Brook Formation in the Cape Breton Highlands east of Cheticamp has been a focus of mineral exploration since the 1890s and at least 15 occurrences of sphalerite, chalcopyrite, galena, arsenopyrite, and/or native gold have been reported. The formation consists of interlayered metasedimentary and mafic and felsic metavolcanic rocks, but stratigraphy and age are poorly constrained, as is the mineralization style. Previous studies have suggested that the metavolcanic rocks may be seafloor basalts and that the mineral occurrences are exhalative massive sulphide deposits, although at least some of the latter are in association with rhyolite. This study is the first to examine the lithological and geochemical characteristics of the formation in a small area to better define the component units and investigate whether or not their interlayering is stratigraphic or tectonic. The study focuses on core from four vertical holes, each 50-m deep, drilled 50 m apart along a north-south transect in the Faribault Brook Formation by Globex Mining Enterprises Limited. These holes were drilled in the area referred as the Road 2 showing where previous studies showed anomalously high base metal samples. Although mainly logged as volcanic rocks, more than half of the core consists of metasedimentary rocks, including metapelite, metapsammite, and calcsilicate rocks, and the other half are metabasaltic tuff and flows. One hole contains about 2.7 m of flow-banded rhyolitic tuff and ash. Altered very fine-grained to glassy amygdaloidal dykes/sills up to 3 m wide are present in all holes and are highly magnetic. Younging directions evident in the rhyolitic tuff and ash and some sandy layers in the metasedimentary units indicate that the rocks are right way up, but subhorizontal recumbent folds are evident in some places in the metasedimentary units, indicating that stratigraphic relations are not straight-forward, and direct correlation between holes may not be possible. Preliminary chemical data obtained using a portable XRF instrument indicated that most of the elevated Zn values are associated with the calc-silicate and metapelitic layers with a few anomalous values greater than 12 000 ppm. Associated Cu and Pb are generally below the detection limits of about 5 ppm; however, a few samples have elevated Cu and Pb up to 1500 ppm and 800 ppm, respectively.

Atlantic Geology, 2018, Volume 54
Atlantic Geoscience Society Abstracts – 44th Colloquium & Annual General Meeting 2018
doi: 10.4138/atlgeol.2018.003