

**Volcanic rocks in the White Rock Formation in the Torbrook area, Nova Scotia:
petrology and tectonic setting**

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Previous mapping and stratigraphic work have shown that volcanic rocks are a significant component of the White Rock Formation in the Torbrook area in the southwestern part of the Meguma terrane of Nova Scotia. The volcanic rocks include

both mafic and felsic units, and a U-Pb (zircon) age of 442 ± 4 Ma has been reported for felsic volcanic rocks at the base of the section. However, no detailed study of the petrology of the volcanic rocks has been done. The purpose of this project is to map and sample the volcanic rocks, describe their petrochemical features, and compare them to volcanic units of similar age in the Yarmouth area that are also assigned to the White Rock Formation. The petrochemical features of the volcanic rocks will also be used to interpret the tectonic setting in which they were formed. The chemical compositions of the mafic volcanic rocks will be compared to the compositions of mafic sills and dykes that are abundant in the underlying Halifax Formation in the Torbrook area, as well as in the Wolfville area, in order to determine whether or not the mafic intrusive rocks are likely to be co-genetic with the Silurian volcanic rocks, or with younger volcanic episodes such as that in the late Silurian New Canaan Formation.

Previous work in the Torbrook area has suggested that the volcanic units occur on both limbs of the Torbrook syncline, and can be traced over a strike length of about 35 km. The relationship with the underlying Halifax Formation appears conformable; however, based on the presence of fossils no younger than Tremadocian in the Halifax Formation, and the ca. 442 Ma age (latest Ordovician to early Silurian) from the felsic volcanic rocks at the base of the White Rock formation, the contact is more likely to be a disconformity representing an age gap of as much as 40 million years. The volcanic rocks occur interbedded with the slate and are overlain by the quartzite units that are characteristic of the White Rock Formation. Pillow basalts have been reported in Fales River, overlying the felsic volcanic rocks. The felsic volcanic rocks are mainly welded tuffs, with well-preserved igneous textures in spite of a strong regional and local contact metamorphic overprint.