

Predicting acid drainage from rocks of the Halifax Formation, Meguma Group, Nova Scotia

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Two of the most widely accepted acid drainage static tests are the B.C. Research Initial Test (IT) and the U.S. Environmental Protection Agency's Acid-Base-Accounting procedure (ABA). Considerable controversy exists over which of these two tests provides the best results for predicting acid drainage. In most areas of North America the ABA procedure is the most widely accepted; in Nova Scotia the IT is commonly applied. We are currently conducting a study that compares these two tests on rocks from a variety of geological environments within the Halifax Formation. Samples from contact metamorphic (containing cordierite and andalusite) and regional greenschist facies (biotite grade) environments near the city of Halifax, and from the Eastville zinc-lead deposit (40 km southeast of Truro) have been collected to date.

All samples contain sulphide minerals in various proportions. Only two of the samples (from Eastville) contain visible carbonate minerals. These two samples also contain

the lowest percent total S (0.011 and 0.017). Paste pH values are generally between 7.00 and 8.00. Acid Potential (AP), which is calculated from total percent sulphur, ranges from 0.344 to 191.3 tonnes CaCO₃ equivalent per 1000 tonnes. Acid consuming tests are currently in progress. However, based on past experience the acid consuming ability of rocks from the Halifax Formation is likely to be relatively low except in localized areas containing carbonate minerals. Our work to date shows that rocks from the Halifax Formation vary considerably in the sulphide type, abundance, texture and mode of occurrence. We recommend that a complete geological assessment should be performed in areas where Halifax Formation rocks are to be disrupted. For example, we have found that bedding, cleavage, and joints or fractures are possible controls for sulphide occurrence. Therefore the prediction of acid drainage from the Halifax Formation includes the sampling procedure as well as the type of analytical test used.