

The Geology and Significance of North Mountain in the Bras D'Or Zone, Cape Breton Island

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The greater part of North Mountain (southern Cape Breton Island) is underlain by granitoid plutons which have intruded the Lime Hill gneissic complex and the George River Group carbonate-clastic sequence. The Lime Hill complex consists of polydeformed migmatitic paragneisses, orthogneiss and minor marble, amphibolite and calc-silicate rocks that have been metamorphosed to low pressure, upper amphibolite facies. These rocks have been intruded by a variety of granitic to mafic dykes.

Stratiform sphalerite mineralization at the Lime Hill zinc showing is hosted by dolomitic marble of the gneissic complex. Analysis of phase relationships suggests that the migmatites formed at temperatures above 650°C and pressures below 400 MPa; geothermobarometry indicates peak conditions at about 750°C and 350 MPa. In fault contact with the Lime Hill gneissic complex are low-grade rocks of the George River Group. These include slate, phyllite, quartzite, fine to coarsely recrystallized

calcareous to dolomitic marbles and minor mafic metavolcanic rocks. Because of complex folding, the internal stratigraphy of the George River Group remains uncertain.

The granitoid rocks have been subdivided into three major units. Most extensive is the Marble Mountain hornblende-biotite granodiorite which has intruded and contains several large xenoliths of George River Group rocks. It is weakly foliated and ranges in composition from tonalite to granodiorite. K/Ar dating of hornblende separates indicate an age of 526 ± 21 Ma. The Big Brook hornblende-biotite granodiorite and the West Bay hornblende-biotite monzogranite, have intruded the Lime Hill gneissic

complex. The Big Brook granodiorite is massive and varies in composition from granodiorite to tonalite. The West Bay monzogranite is typically highly fractured, coarse grained and K-feldspar porphyritic. Plagioclase has been completely replaced by albite. Younger cogenetic granophyric and porphyritic dykes intrude the granite. The Marble Mountain and Big Brook units display typical I-type characteristics whereas the West Bay monzogranite can best be described as highly felsic I-type.

The geology of North Mountain is typical of the Bras d'Or Zone, displaying a low pressure gneissic basement, platformal sedimentary rocks and intruded by I-type granitoid rocks.