

Early Carboniferous hydrothermal events of the western Cobequid Highlands, Nova Scotia

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Qualitative petrological suite analysis, quantitative microprobe, and whole-rock geochemical data are used to document hydrothermal activity in intrusive bodies immediately north of the Cobequid Fault. The plutons concerned with this study are the Cape Chignecto, Hanna Farm, Moose River, and North River plutons. 1:500,000 litho-geochemical and airborne radiometric maps indicate elemental anomalies possibly related to hydrothermal events. In particular, airborne radiometric maps indicate a strong potassic anomaly along the Cobequid Fault. Major hydrothermal activity is characterized by albitization, biotitization, and chloritization. Minor activity is marked by the presence of carbonate, chlorite, rutile-haematite bearing veins. Possible REE mineralization is present within the Cape Chignecto Pluton. REE mineralization is marked by the presence of fluorite and curious isotropic minerals infilling fractures and vugs.

Albitization and biotitization of granites are early high

temperature events based upon criteria of formation and cross-cutting relationships. Except the North River Pluton, albitization of K-feldspar and perthite is present in all the studied plutons. Biotitization occurs in gabbroic bodies of the Cape Chignecto, Hanna Farms, and Moose River plutons. Biotitization of the gabbroic intrusives is primarily the replacement of primary hornblende and biotite by secondary biotite. Biotitization textures within the gabbroic phases can be strongly correlated with those seen in the Santa Rita porphyry copper deposit, New Mexico. Strong biotitization documented in the Santa Rita porphyry is strongly related to potassic alteration. Pervasive potassic alteration may be related to airborne radiometric anomalies along the Cobequid Fault. Chloritization, carbonization, and rutile-haematization are considered late stage events possibly related to mafic dyke emplacement in an extensional environment.