

Gold enrichment in the South Mountain Batholith, Nova Scotia

M.A. MacDonald and G.A. O'Reilly

Nova Scotia Department of Mines and Energy, P.O. Box 1087, Halifax, Nova Scotia B3J 2X1

Elevated values of gold (89 ppb - 10.94 ppm) are reported from seven locations within the South Mountain Batholith of southwestern Nova Scotia. These include: 525 ppb Au in a pyrite-arsenopyrite bearing quartz-greisen vein system at Sandwich Point; 89 ppb Au in a silicified (quartz and amethyst) and brecciated pyrite-bearing fault zone from Roachs Pond; 2010 ppb Au in an arsenopyrite-pyrite bearing quartz vein/albite zone near Upper New Cornwall; 525 ppb Au in a wolframite-scheelite-chalcopyrite-molybdenite (+ unidentified bismuth mineral)-bearing quartz vein from Big Indian Lake; 690 ppb Au from a quartz-muscovite-tourmaline-molybdenite-bearing greisen zone at Inglisville; 2035 ppb Au in a chalcopyrite-galena-sphalerite-pyrite-arsenopyrite-bearing quartz vein from a fault zone near Little Tobeatic Lake; and 10.94 ppm Au from a K-feldspathized granite porphyry near Westfield. This enrichment

in Au is significant when compared to either the 'Clarke Index-I' value for crustal rocks (4 ppb Au) or the relatively unaltered rocks of the SMB (av. 5.9 ppb Au, N-422).

All occurrences except Roachs Pond are proximal to a granite-metasediment contact and have associated metasomatic alteration (e.g., greisenization, albitization). A model is proposed in which granitic rocks are the source of heat, aqueous fluids and 'granophile' elements (e.g., F, B, W, Sn, Mo, Cu, Pb, Zn, \pm Au, Ag). Meguma Group metasediments and underlying basement rocks provide aqueous fluids and Au, Ag, As, Cu, Pb, Zn, Bi and Sb. The contact acts as an impermeable cap, thus providing a locus for fluids and deposition of polymetallic minerals. The Au enrichment in the Roachs Pond fault zone is associated with successive periods of silicification and brecciation and may represent another mode of occurrence.