RESULTS OF RECENT MAPPING OF THE SOUTH MOUNTAIN BATHOLITH AND THE IMPLICATIONS FOR MINERAL POTENTIAL

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Geological mapping of the eastern half of the South Mountain Batholith (SMB) has delineated approximately twenty discrete intrusive phases consisting of granodiorite, transitional granite (monzogranite and granodiorite), biotite monzogranite, biotite-muscovite monzogranite (i/ megacrystic, ii/ equigranular) and complex intrusives (highly variable texture and mineralogy). Contacts between units are both intrusive and gradational.

Approximately fifty smaller, fine-to medium-grained muscovite-biotite monzogranitic and leucogranitic bodies (<1->5 km^2) occur within the above granitic rocks. Contacts with host rocks are predominantly intrusive; however, some gradational contacts were observed.

Three plutonic centres of two-mica monzogranite have been outlined within the biotite granodiorites and transitional granite units. Two of these intrusions, the Halifax and New Ross plutons (≈ 30 km in diam.), are zoned with a biotite-muscovite border phase surrounding a more mafic core of biotite (+/- muscovite) monzogranite. Conversely, the Lake George- Springfield monzogranites (1-7 x 50 km and 5 x 20 km respectively), comprising the third plutonic centre, are long and narrow, unzoned, dyke-like bodies which are separated by an intensely sheared wedge of transitional granite.

To date approximately 30 significant new mineral showings (sulphides, W, Sn, U) have been discovered and are classifed into three general types as follows: (1) polymetallic (As, Cu, Zn, W, Sn, Mo, U) mineralization associated with quartz-greisen veins which are frequently related to granite/ metasediment contacts. Host rocks range from granodioritic to leucogranitic. (2) polymetallic (F, Cu, Zn, Mo, W, U) mineralization occurring both as disseminations and fracture fillings in monzogranites and leucogranites. (3) U (+/- Cu) mineralization in intensely altered and sheared(?) rock of granodioritic to leucogranitic composition.

The modes of occurrence of all known mineral showings have been used to create a comprehensive model for mineralization in the SMB.

Distinct zones of the SMB tend to have characteristic mineralization (i.e., W-Cu; As-Cu; F; U-Cu; etc.), with some of these areas corresponding to the metallogenic domains outlined by Chatterjee (1983). For example, the geochemical signatures and mineralogy of the monzogranitic rocks of the Halifax Pluton (HP), appear to more closely resemble the Musquodoboit Batholith (MB) than the central portions of the SMB. These parameters include: concentrations of P_2O_5 and normative corundum (0.24%, 3.23% (HP); 0.25%, 2.78% (MB, MacDonald and Clarke, 1985); 0.12%, 2.16% (central SMB, MacKenzie and Clarke, 1975); and the modal percentages of cordierite (several large areas >10 km^2 with 2-5% in HP and MB, cordierite-rich areas very restricted in central SMB). The presence of quartz-wolframite vein systems in the Halifax Pluton suggests potential for tungsten mineralization - another similarity to the Musquodoboit Batholith.

Potential for gold mineralization in the Halifax Pluton is indicated by elevated gold values in lake sediments from the western part of the peninsula. Gold anomalies are most abundant over the Halifax peninsula monzogranite suggesting possible bedrock control.